Ebenezer Plaza 1 Property

96 New Lots Avenue

Borough of Brooklyn

Kings County, New York

SITE MANAGEMENT PLAN

NYSDEC Site Number: C224240

Prepared for:

Ebenezer Plaza Owner, LLC

456 East 173rd Street

Bronx, New York 10457

New York State Department of Environmental Conservation –

Division of Environmental Remediation

625 Broadway

Albany, New York 12233

Prepared by:

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NOVEMBER 2019

CERTIFICATION STATEMENT

I, Mr. Joseph Lanaro, certify that I am currently a NYS registered professional engineer as in defined in 6 NYCRR Part 375 and that this Site Management Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

____________________ P.E.

11/11/19 ____________________ DATE

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LIST OF ACRONYMS

AS	Air Sparging
ASP	Analytical Services Protocol
BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CAMP	Community Air Monitoring Plan
CCR	Construction Completion Report
C/D	Construction and Demolition
CFR	Code of Federal Regulation
CLP	Contract Laboratory Program
COC	Certificate of Completion
CO2	Carbon Dioxide
CP	Commissioner Policy
DER	Division of Environmental Remediation
EC	Engineering Control
ECL	Environmental Conservation Law
ELAP	Environmental Laboratory Approval Program
ERP	Environmental Restoration Program
ESD	Explanation of Significant Difference
EWP	Excavation Work Plan
GHG	Green House Gas
GWE&T	Groundwater Extraction and Treatment
HASP	Health and Safety Plan
IC	Institutional Control
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYCRR	New York Codes, Rules and Regulations
O&M	Operation and Maintenance
OM&M	Operation, Maintenance and Monitoring
OSHA	Occupational Safety and Health Administration
OU	Operable Unit
PID	Photoionization Detector
PRP	Potentially Responsible Party
PRR	Periodic Review Report
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
RAO	Remedial Action Objective
RAWP	Remedial Action Work Plan
RCRA	Resource Conservation and Recovery Act
REC	Recognized Environmental Concern
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RP	Remedial Party
RSO	Remedial System Optimization

SAC	State Assistance Contract
SCG	Standards, Criteria and Guidelines
SCO	Soil Cleanup Objective
SDG	Significant Data Gap
SMP	Site Management Plan
SOP	Standard Operating Procedures
SOW	Statement of Work
SPDES	State Pollutant Discharge Elimination System
SSD	Sub-slab Depressurization
SVE	Soil Vapor Extraction
SVI	Soil Vapor Intrusion
TAL	Target Analyte List
TCL	Target Compound List
TCLP	Toxicity Characteristic Leachate Procedure
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VCA	Voluntary Cleanup Agreement
VCP	Voluntary Cleanup Program

ES EXECUTIVE SUMMARY

The following provides a brief summary of the controls implemented for the Site, as well as the inspections, monitoring, maintenance and reporting activities required by this Site Management Plan:

Site Identification: [BCP Site No. C224240] [Ebenezer Plaza 1 Property 96 New Lots Ave and 672 Powell St., Brooklyn, New York]

Institutional Controls:	1. The property may be used for restricted residential, commercial, and industrial use.
	2. Environmental Easement, Groundwater Use Restrictions
	3. All ECs must be inspected at a frequency and in a manner defined in the SMP.
Engineering Controls:	1. Cover system
	2. Active Sub-Slab Depressurization System 3. Granular Activated (micro) Carbon barrier wall

Inspections:	Frequency
1. Cover System and Site-Wide Inspection	Quarterly
2. Sub-Slab Depressurization System	Quarterly
Monitoring:	
1. Groundwater Monitoring Wells	Quarterly
2. Soil Vacuum Monitoring Points	Quarterly
3. System operating data collection	Quarterly
4. Sub-slab and Indoor Air Quality	Semi-annually
Maintenance:	
1. Concrete floor sealing	as needed
2. Blower maintenance	as needed

Site Identification: [BCP Site No. C224240] [Ebenezer Plaza 1 Property 96 New Lots Ave and 672 Powell St., Brooklyn, New York]

5. Inspect SSDS piping to confirm integrity and operation of appropriate valves	Quarterly
6. Inspect pressure gauges for proper operation	Quarterly
7. Check for presence of water or in the knockout tank	Quarterly
8. Check air filters, and clean if necessary	Quarterly
9. Check motor for any build-up of foreign material or excessive wear	Quarterly
10. Record run-time for blower units	Quarterly
11. Check water level shut down circuit	Quarterly
Reporting:	
1. Groundwater and SSDS Data Summary Report	Annual
2. Periodic Review Report	Annual
3. Remedial Optimization Assessment Report	As needed

Further descriptions of the above requirements are provided in detail in the latter sections of this Site Management Plan.

1.0 INTRODUCTION AND DESCRIPTION OF REMEDIAL PROGRAM

1.1 General

This Site Management Plan (SMP) is a required element of the remedial program for the Ebenezer Plaza 1 Property located in the Borough of Brooklyn, New York (hereinafter referred to as the "Site"). The Site is currently in the New York State (NYS) Brownfield Cleanup Program (BCP) Site No. C224240 administered by New York State Department of Environmental Conservation (NYSDEC). A Site Location Map is included as **Figure 1**.

Ebenezer Plaza Owner, LLC entered into a Brownfield Cleanup Agreement (BCA) on December 5, 2016, with the NYSDEC to remediate the site. A Site Boundary and Layout map is included as **Figure 2**. The boundaries of the site are more fully described in the metes and bounds site description that is part of the Environmental Easement provided in **Appendix A**.

After completion of the remedial work, some contamination was left at this site, which is hereafter referred to as "remaining contamination". Institutional and Engineering Controls (ICs and ECs) have been incorporated into the site remedy to control exposure to remaining contamination to ensure protection of public health and the environment. An Environmental Easement granted to the NYSDEC and recorded with the Kings County Clerk, requires compliance with this SMP and all ECs and ICs placed on the site.

This SMP was prepared to manage remaining contamination at the site until the Environmental Easement is extinguished in accordance with ECL Article 71, Title 36. This plan has been approved by the NYSDEC, and compliance with this plan is required by the grantor of the Environmental Easement and the grantor's successors and assigns. This SMP may only be revised with the approval of the NYSDEC.
It is important to note that:

- This SMP details the site-specific implementation procedures that are required by the Environmental Easement. Failure to properly implement the SMP is a violation of the Environmental Easement, which is grounds for revocation of the Certificate of Completion (COC);

- Failure to comply with this SMP is also a violation of Environmental Conservation Law, 6NYCRR Part 375 and the BCA for the site, and thereby subject to applicable penalties.

All reports associated with the site can be viewed by contacting the NYSDEC or its successor agency managing environmental issues in New York State. A list of contacts for persons involved with the site is provided in **Appendix B** of this SMP.

This SMP was prepared by The Chazen Companies (Chazen), on behalf of Ebenezer Plaza 1 Owner, LLC, in accordance with the requirements of the NYSDEC's DER-10 ("Technical Guidance for Site Investigation and Remediation"), dated May 2010, and the guidelines provided by the NYSDEC. This SMP addresses the means for implementing the ICs and/or ECs that are required by the Environmental Easement for the site.

1.2 Revisions

Revisions to this plan will be proposed in writing to the NYSDEC's project manager. Revisions will be necessary upon, but not limited to, the following occurring: a change in media monitoring requirements, upgrades to or shut-down of a remedial system, post-remedial removal of contaminated sediment or soil, or other significant change to the site conditions. In accordance with the Environmental Easement for the site, the NYSDEC will provide a notice of any approved changes to the SMP and append these notices to the SMP that is retained in its files.

1.3 Notifications

Notifications will be submitted by the property owner to the NYSDEC, as needed, in accordance with NYSDEC's DER – 10 for the following reasons:

- 60-day advance notice of any proposed changes in site use that are required under the terms of the BCA, 6NYCRR Part 375 and/or Environmental Conservation Law.

- 7-day advance notice of any field activity associated with the remedial program.

- 15-day advance notice of any proposed ground-intrusive activity pursuant to the Excavation Work Plan (**Appendix C**).

- Notice within 48-hours of any damage or defect to the foundation, structures or EC that reduces or has the potential to reduce the effectiveness of an EC, and likewise, any action to be taken to mitigate the damage or defect.

- Verbal notice by noon of the following day of any emergency, such as a fire; flood; or earthquake that reduces or has the potential to reduce the effectiveness of ECs in place at the site, with written confirmation within 7 days that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public.

- Follow-up status reports on actions taken to respond to any emergency event requiring ongoing responsive action submitted to the NYSDEC within 45 days describing and documenting actions taken to restore the effectiveness of the ECs.

Any change in the ownership of the site or the responsibility for implementing this SMP will include the following notifications:

- At least 60 days prior to the change, the NYSDEC will be notified in writing of the proposed change. This will include a certification that the prospective purchaser/Remedial Party has been provided with a copy of the Brownfield Cleanup Agreement (BCA), and all approved work plans and reports, including this SMP.

- Within 15 days after the transfer of all or part of the site, the new owner's name, contact representative, and contact information will be confirmed in writing to the NYSDEC.

Table A on the following page includes contact information for the above notification. The information on this table will be updated as necessary to provide accurate contact information. A full listing of site-related contact information is provided in **Appendix B**.

Table A: Notifications Contacts*

Name	**Contact Information**
Aaron Fischer (NYSDEC Project Manager)	Phone: 518-402-9767 Email: aaron.fischer@dec.ny.gov
Heidi Dudek (NYSDEC Section Chief)	Phone: 518-402-9767 Email: Heidi.dudek@dec.ny.gov
Gerard Burke (NYSDEC Director, Remedial Bureau B)	Phone: 518-402-9767 Email: gerard.burke@dec.ny.gov

* Note: Notifications are subject to change and will be updated as necessary.

2.0 SUMMARY OF PREVIOUS INVESTIGATIONS AND REMEDIAL ACTIONS

2.1 Site Location and Description

The site is located in the Borough of Brooklyn, Kings County, New York and is identified as Block 3862 and Lot 1 on the Borough of Brooklyn Tax Map (see **Figure 3**). The site is an approximately 1.26-acre area and is bounded by New Lots Avenue to the north, Hegeman Avenue to the south, Powell Street to the east, and Sackman Street to the west (see Figure 2– Site Boundary and Layout Map). The boundaries of the site are more fully described the Environmental Easement included in **Appendix A** –. The owners of the site parcel(s) at the time of issuance of this SMP include: HP Ebenezer Plaza Housing Development Fund Company, Inc.; Ebenezer Plaza Owner LLC; HP Ebenezer 1B Housing Development Fund Company, Inc.; and, Ebenezer Plaza Owner Phase 1B LLC.

2.2 Physical Setting

2.2.1 Land Use

The Site consists of the following: one eleven-story concrete building approximately 16,853 square-feet (ft^2) in total area ("Tower A2 Residential"); one nine-story concrete building approximately 14,692 ft^2 in total area ("Tower A1 Residential"); one single-story concrete building with roof deck and recreational areas ("Community Facility"); and areas of open space at surface grade. All portions of Tower A1 and A2 Residential are constructed on steel columns supported by concrete footers with concrete basements. The Community Facility is constructed with steel columns with slab-on-grade concrete floors (the building does not contain a basement). All building floor slabs are underlain by an impermeable moisture barrier extending to the top of the exterior sub-grade foundation walls. The Site is zoned C2-4 (Commercial/Residential) and is currently vacant. Site occupants include residents, a community church, retail stores, and offices. The property is serviced with municipal water and sewer.

The properties adjoining the Site and in the neighborhood surrounding the Site primarily includes, residences, commercial properties and a community center.

The properties south of the Site, across Hegeman Street, include the Brownsville Recreation Center (park, basketball, tennis, and racquet ball courts), a rail yard, nursing home facility, Linden Avenue and commercial warehouse properties; the properties north of the Site, across New Lots Avenue, include a community garden, Isabahlia Farmers Market and Nursery, construction company truck storage, and residential properties; the properties immediately east of the Site, across Powell Street, include commercial properties (Feel Beauty, Family Dollar, Burger King), a railroad, auto storage and garages, and residential properties; and, the properties to the west of the Site, across Sackman Street, include currently vacant land identified as Ebenezer Plaza 2 (NYS BCP site C224241), vacant commercial property (former NY Metal Supply), and residential properties.

2.2.2 Geology

Geologic characterization of the soil cores collected by Chazen in numerous investigations performed from 2011 through 2017 established that the on-Site soil consisted of a layer of typical urban fill (a mixture brick, block, building stone, asphalt, coal, coal ash, and metal fragments) ranging from 3 to 12 feet in a sand and gravel matrix. The urban fill was present across the entire site. The native soil beneath the fill consists of a massive homogeneous fluvial sand deposit estimated to be greater than 200 feet thick consisting of medium sand, with lesser but varying amounts of fine and coarse sands, and silt.

Cross sectional sketches of the site geology before and after remediation are included as **Figure 4a** (southwest - northeast**)** and **Figure 4b** (northwest-southeast). The soil boring logs used for the cross-sections are attached in **Appendix D**.

A review of the Surficial Geologic Map of New York (Lower Hudson Sheet, 1989) indicates that surficial soils in the Site area are mapped as outwash sand and gravel. The United States Department of Agriculture (USDA) National Cooperative Soil Survey of Kings County, New York maps soils on the Site as being composed of Urban Land which is described as areas where soil surface has been covered by impervious materials such as buildings, roadways and parking lots.

Soil Survey and Surficial Geologic Map indicates that bedrock in the area of the Site is greater than 10 inches below grade. Bedrock was not encountered in any borings to a depth of 30 feet below grade and is expected to be greater than 200 feet below grade. . It is mapped on the Geologic Map of New York (Lower Hudson Sheet, 1970) as Upper Cretaceous-aged rocks of the Monmouth Group, Matawan Group. .

2.2.3 Hydrogeology

No surface water bodies are located on the property. The surrounding water body in closest proximity of the Site is the Fresh Creek Basin located approximately 0.8 miles (4,000 feet) southeast of the Site. Fresh Creek Basin is the remnant estuary of Fresh Creek (a former surface water drainage channel that flowed southeast across Brooklyn into Jamaica Bay but has been covered by urban development).

Numerous groundwater monitoring wells and temporary piezometers have been installed on-Site during environmental investigations performed by Chazen since 2011. Water table elevation data collected from those well points indicates that the water table varies seasonally from approximately 12 to 16 feet below grade.

Based on the water table data, the primary groundwater flow direction across the site is consistently to south-southeast at a relatively shallow gradient of approximately 0.01 ft/ft. No hydraulic conductivity testing or grain size distribution data was collected for the site to determine the conductivity of the native sands. However, based on the boring logs, the native sands are a homogenous medium sand with trace fines. The typical hydraulic conductivity of an unconsolidated medium sand aquifer with trace fines ranges from 0.01 to 0.001 cm/sec. Given the gradient (i =0.01) and conductivity (k = 0.1 to 0.01); groundwater is expected to migrate downgradient to the southeast an estimate 10 to 100 feet per year.

A groundwater contour map based on water level data collected from four on-site piezometers on May 20, 2019 is shown in **Figure 5a**. The groundwater elevation data used in **Figure 5a** is provided in **Table 1**. Boring logs of piezometers used for the contour map in **Figure 5a** are included in **Appendix D**.

Five permanent groundwater monitoring wells were installed in November 2019. A map of the locations of the wells and groundwater contours from water table data collected on November 20, 2019 is included as **Figure 5b**.

The wells are located along the eastern property boundary downgradient from the former LUSTs discovered and removed during the remedial action. The wells monitor the migration of impacted groundwater from the spill/release source area through the Petrofix barrier wall. These wells will be periodically sampled to monitor the effectiveness of the remedy.

A well installation report including survey and elevation data, water table elevation (on November 20, 2019), summary of soil and groundwater sampling data, laboratory analytical reports, Data Usability Summary Reports, and boring logs are included in **Appendix M** of the FER.

2.3 Investigation and Remedial History

The following narrative provides a remedial history timeline and a brief summary of the available project records to document key investigative and remedial milestones for the Site.

2.3.1 Past Land Use

The Site had been developed since approximately 1928 with various uses including residential buildings, auto repair garage, dry cleaner, gasoline filling station, car wash, warehouse, parking, used auto sales, public center, church, newspaper distribution, restaurant supply and auto wrecking lots. Such historic uses led to contamination on-Site. In the Fall of 2017, the Site buildings were demolished in preparation for redevelopment of the Site. In 2018, re-development construction activities began and included removal of soil, construction of foundations, and construction activities associated with building multi-story residential structures.

2.3.2 Investigation and Remediation History

This section summarizes previous Site investigation and remediation activities conducted between 2004 and 2019 by the following consultants: Don Carlo Environmental Services Inc. of Brooklyn, New York; Eastern Environmental Solutions, Inc. of Manorville, New York; Hillmann Consulting, LLC of Union, New Jersey; and The Chazen Companies.

Tank Closure Report Prepared by Don Carlo Environmental Services (2004)

This report documents the closure/removal of nine on-Site tanks from the Site. Additionally, this report documents the removal of three underground storage tanks (USTs) and two oil/water separators on adjacent properties.

Two 550-gallon gasoline USTs were removed from 799A Sackman Avenue (Former Block 3862, Lot 1). No staining or odors were detected in the tank excavation and volatile organic compounds (VOCs) were not detected with field screening instrumentation. Five end point samples were collected from the tank excavation to confirm the lack of impacted soils. The soil samples were analyzed for VOCs via USEPA Method 8021. Toluene was detected in one of the samples at a concentration of four parts per billion (ppb). This concentration is well below the NYSDEC regulatory cleanup guidance value. No other compounds were detected in the five samples.

Six 550-gallon gasoline USTs were removed from 666 Powell Street (Former Block 3862, Lot 26). This area was identified as a former gasoline station and was most recently used as an auto dealership. No visual, olfactory, or field screening evidence of impacts were observed in the tank excavation. Five end point samples were collected from the tank excavation to confirm the lack of impacted soil. The soil samples were analyzed for VOCs via USEPA Method 8021. No VOC compounds were detected in these samples.

One 3,000-gallon fuel oil UST was removed from beneath the sidewalk at 114 New Lots Avenue (Former Block 3862, Lot 1). The tank was full of fuel oil and water when removed. No visual, olfactory, or field screening evidence of impacts were observed in the tank excavation. Five end point samples were collected from the tank excavation to confirm the lack of impacted soils. The soil samples were analyzed for VOCs via USEPA Method 8021 and semi-volatile organic compounds (SVOCs) via USEPA Method 8270. No VOC or SVOC compounds were detected in the five samples.

Based on the lack of identified releases associated with the nine removed on-site USTs, the consultant recommended no further action.

Tank Closure conducted by Eastern Environmental Solutions, Inc. (September 2009)

Eight underground storage tanks (USTs) located beneath the concrete floor inside the building formerly located at 650 Powell Street (former Block 3862, Lot 1) were closed by Eastern Environmental Solutions, Inc. ("EES") between June and November 2009. Petroleum-impacted soils were discovered in September of 2009 during the closure work resulting in the reporting of a release and assignment of NYSDEC Spill No. 09-06674. Approximately 267 tons of impacted soil in the vicinity of the tanks and associated piping network were excavated to 12 feet below the surface and were disposed off-Site. Structural concerns did not allow for further excavation of impacted soil and residual petroleum impacts were present in soil and groundwater at the bottom of the excavation.

Phase I ESA conducted by Chazen Companies (November 2009)

This Phase I ESA identified the following "recognized environmental conditions" (RECs) for the Site associated with past activities at the property:

- The current and historic uses of the Site for auto body and automotive repair, vehicle dismantling, and dry cleaning suggests that there is a likelihood for petroleum and chemical releases to the subsurface from floor drain, surface or storage vessel discharges and poor housekeeping/waste handling practices. Additionally, an open spill exists for the Site which appears to be related to the removal of the tanks formerly located on the northeastern Site area. At the time, the excavation was open and no additional information was provided. This relates to work conducted by EES in 2009 (see summary of the EES report in previous text within this report section).

- A 2004 Tank Closure report documents the removal of nine on-Site USTs and indicates that soil impacts were not discovered during the tank removals. However, because of the sandy nature of the soils and the apparent lack of groundwater quality investigations during those activities, releases could have quickly moved through the soil to groundwater and may not have been identified during those closure activities. Additionally, historic mapping and other documents suggest the potential for additional buried gasoline and fuel oil tanks on the property.

- Surrounding properties have also been historically industrial and auto-related. Tanks are shown on historic mapping in both eastern and western adjacent garage buildings, but these sites were not identified as regulated tanks sites. If these tanks are still present, there may be undocumented releases associated with them which could impact soil or groundwater quality at the subject site. Similarly, automotive waste handling practices on the adjacent sites are unknown.

Data gaps (SDGs) that were encountered during the 2009 Phase I ESA included the following:

- Several auto garage spaces were inaccessible during the site visit; therefore, Chazen could not make statement as to petroleum and chemical handling practices or other conditions in these locations. Additionally, while no in-ground hydraulic lifts were noted in the accessible garage areas, a statement could not be made as to the presence of such lifts or floor drains in inaccessible areas.

- A steel fabrication facility was in one tenant space at the northeast end of the Site. This space was inaccessible during the 2009 site visit, so Chazen could not make a statement with regards to Site operations and petroleum or chemical handling practices or other conditions in this area. This area of the building was also historically part of the dry-cleaning facility.

- The first story area of 114 New Lots Avenue (northeast corner of the Site) was inaccessible. This building was historically part of a dry-cleaning facility and contained a boiler room. Additionally, access was limited to the interior location of the former dry-cleaning facility that contained benzene tanks. The UST removal excavation extended the width of the building and prevented Chazen from accessing or visibly assessing the back area of the building.

- Access was not provided to the storage yard (Linden Used Cars) on the east end of the Site. Three buildings were historically present in this area. Building Department records indicate that these former buildings were heated by oil boilers. It is unknown if oil at these buildings was stored in underground tanks, and if so, if tanks were removed at the time of demolition in 1984.

Limited Phase II ESA (2009) and a Remedial Investigation (2012) conducted by Chazen Companies for the Site and western adjoining property (Ebenezer Plaza 2, BCP No. C224241)

The Phase II ESA identified areas of subsurface soil and groundwater impacted by VOCs in the eastern and northern areas, few shallow VOC impacts in the southwestern areas of both Site areas (east and west), and elevated lead concentrations in the southwestern Site area (former auto dismantling yard). The Phase II identified groundwater with VOC impacts extending under the 650 Powell Street building and west of Sackman Street beneath the 90 New Lots Avenue building.

EES submitted a Remedial Investigation Work Plan (RIWP) to further characterize the 650 Powell Street spill area and develop recommendations for further remedial actions. The RIWP was approved by the NYSDEC on December 17, 2010 in accordance with the Stipulation Agreement R2-20100217-63 effective February 22, 2010. Given the property ownership transfer in May 2011 between the former Site owner, Linden Plaza, and the present day owner, the Church of God of East Flatbush, the Stipulation Agreement was transferred to the new owner.

As the technical consultant representative to the new Site owner, Chazen subsequently completed and submitted a modified RI Report documenting the following conclusions:

- No evidence of VOC impacts was identified anywhere on the Site in shallow soils above the water table.
- Groundwater sample results confirmed the presence of two distinct priority areas with total dissolved VOC concentrations exceeding 100 ug/L; one area peaking at 650 Powell Street and the second focused under 90 New Lots Avenue.
- Groundwater impacts from around the 650 Powell building extend off-Site to the east along Powell Street and downgradient to Linden Boulevard.
- Groundwater impacts from around the building at 90 New Lots Avenue naturally attenuate within the boundaries of the Site.
- VOC-impacted soils were identified at the water table interface and below in seven on-Site borings and the six off-Site soil borings located along Powell Street and Linden Boulevard; however, only one VOC compound (1,2,4-trimethylbenzene) exceeded the NYSDEC Commercial Use Soil Cleanup Objective (SCO).
- Elevated lead concentrations were identified in four samples in near surface soils in the auto-dismantling area located in the southwestern Site area; two of these samples reported concentrations greater than the NYSDEC Part 375 Commercial Use SCO of 1,000 mg/kg. Elevated barium concentrations greater than the NYSDEC Part 375 Commercial Use SCO of 400 mg/kg were reported in three near-surface soil samples in the Brownsville Auto Dismantling area; three near surface samples in the Linden Used Car lot area lot met the Residential SCO. Neither lead nor barium were detected in groundwater samples collected from this site area during the 2009 Chazen Phase II investigation. Elevated concentrations of lead and barium are commonly associated with urban soils where demolition debris and/or fill materials of unknown origin have been used. Fill materials and demolition debris were reported in many of the soil borings installed during the investigation.

- Tetrachloroethylene (PCE) was reported in low concentrations (1.2 µg/L to 38 µg/L) in monitoring wells MW-6, MW-10, MW-13, MW-17, and MW-21. The distribution of PCE and relatively low reported concentrations indicate that there is no evidence of a significant release or an on-Site source for PCE.

<u>Ongoing Remediation:</u> Following a comprehensive Site-wide remedial investigation, Chazen began an in-situ hydrogen peroxide injection program in October 2013 to remediate petroleum impacted groundwater associated with NYSDEC Spill No. 09-06674. Remedial efforts have included peroxide injections in 2013 and 2015 that have focused in the eastern Site area near the spill source location (interior of 650 Powell Street). In addition, a pilot test was performed in the northern side of the western Site area and demonstrated the effectiveness of in-situ chemical oxidation (ISCO) to remediate impacted groundwater. Periodic sampling since October 2013 has documented continued reduction of petroleum contaminants in groundwater near the assumed source areas.

<u>Phase I ESA conducted by Chazen Companies (November 2015)</u>

In November 2015, Chazen conducted a Phase I ESA of the Site and western adjoining City Block in conformance with the scope and limitations of ASTM Practice E 1527-13. The 2015 ESA noted the following recognized environmental conditions in connection with the Site:

- The Site is and has historically been used for auto body and automotive repair. Additionally, a coal and coke business, and a dry cleaning were formerly located on the Site. Sampling at the property has identified contamination related to these uses which are considered REC**s**, including:
    - Known areas of contamination: former benzene tank location, former gasoline tank location, and southwestern auto dismantling facility (Brownsville Auto Salvage).
    - On-Site PCE contamination.

- An open-top 5-gallon container, approximately half full of a black oily liquid, was observed in the basement of the BNI Supply space (former Block 3862, Lot 1). An approximately eight-inch diameter stain was observed on the concrete floor near this container; floor drains are present in the area and storage blocked the views of much of the surrounding floor area. The material threat of release from this container is considered a REC.

- Floor drains were observed within the BNI Supply, Carl's Auto Body & Sale, and Panamerica Auto Repair tenant spaces. Additionally, patching consistent with former floor drains were observed in the Linden Used Car painting area. The municipal sewer system was constructed in New York City by the early 1900s. Therefore, the discharge point of these drains is likely to the municipal sewer system; however, information confirming the discharge points and the current condition of the associated piping was not provided. Due to the age of the NYC sewer system and the Site buildings, subsurface cracked piping is likely. Petroleum products are widely used on the Site with observed areas of staining. Therefore, the presence of these drains is considered an REC.

SDGs related to the Site that were encountered during the 2015 Phase I ESA included the following:

- Former Coal and Coke business.
- Former tank locations, conditions of subsurface in UST areas, and lack of historical heating system information.
- Potential releases to the subsurface from repeated releases to the concrete floors.
- Concrete patching.
- Former piping discharging to the floor drain in the BNI supply tenant space and concrete lined pit in the basement of the BNI Supply tenant space.
- Possible storm water catch basin in the parking lot of the Linden Used Car tenant space, with unknown discharge location.
- Environmental Control Board Liens and UCC lien against the Site.
- Evidence of fill material in subsurface soil samples.

- Wood trap-door in the Church tenant space.
- Possible historic fire in the BNI tenant space.
- Former elevator.
- Former heat sources and possible heating oil storage on the Site.
- Limited of access to tenant spaces and tenant interviews.
- Lack of information regarding off Site auto facilities.

<u>Phase I ESA conducted by</u> <u>Hillmann Consulting (June 2016)</u>

In June 2016 Hillmann Consulting conducted a Phase I ESA of the Site and western adjoining property. The Phase I ESA identified the following RECs:

- Active/Open NYSDEC spill case no. 09-06674 for the 650 Powell Street Property address was identified as a REC. According to a Phase II Environmental Site Assessment of the Property (The Chazen Companies, February 8, 2010) soil and groundwater exhibited elevated concentrations of VOCs.

- Historical use of the Property including gas station, dry cleaner, auto repair/auto body shops, and auto dismantling facility was identified as a REC.

- The current (at the time of the 2016 report) use of the Property including auto repair/auto body shops was identified as a REC.

- The potential for unregistered USTs and oil water separators associated with former heating systems and auto repair activities to be encountered during site redevelopment was identified as a REC.

- Drums and ASTs including waste oil that may be left by tenants upon vacating the Property were identified as a REC.

- According to a prior Phase I ESA report (The Chazen Companies, November 3, 2015), evidence of a hydraulic elevator was observed in the basement of the 654 Powell Street building. No information regarding the closure of the hydraulic elevator was provided and therefore, it was identified as a REC. This area was inaccessible at the time of Hillmann's site assessment.

Hillmann also identified the following Historical Recognized Environmental Conditions (HRECs):

- Three fill ports filled with concrete indicative of USTs were identified on the curb in the Powell Street sidewalk buffer area in front of 666 Powell Street. Tank removal information and PBS registration documents indicates that six 550-gallon gasoline USTs were removed at 666 Powell Street with no date provided. Considering the status, the USTs were identified as a HREC.

- Tank removal information and PBS registration documents indicates that two 3,000 or 4,000 gallon heating oil USTs were removed at 114 New Lots Avenue with no date provided. Considering the status, the USTs were identified as a HREC

Remedial Investigation (RI) and Supplemental Remedial Investigation (SRI), Chazen May 2017]

A Remedial Investigation Report (RIR) summarizing the historical analytical data for the Site and Remedial Action Work Plan (RAWP) to complete Site-wide remediation under the New York State Brownfield's Clean-up Program was prepared and submitted to NYSDEC in February 2017.

Based on NYSDEC's comments, a Supplemental RI (SRI) was performed in May 2017 to resolve the limited data gaps identified in the RI. The additional data was necessary to secure approval of the RAWP, provided in **Appendix E**.

The SRI confirmed the presence of a heterogeneous layer of urban fill across the entire Site with detection of semi-volatile organic compounds and heavy metals and historical spills of gasoline (BTEX) and chlorinated solvents (CVOCs) underground from historical underground storage tanks and at grade from surface spills.

The composition, thickness, and chemical characteristics of the urban fill are highly variable indicating multiple historical placement events with materials from multiple sources. The impacts in the fill are non-hazardous and range from meeting Unrestricted Use SCOs to exceeding Industrial Use SCOs and appear to be endemic to the nature of the fill and not the result of on-Site activities. However, removal of the fill is necessary to achieve the required clean-up of the Site for its intended use, and the urban fill that exceeds the approved clean-up standards for the Site will be removed during completion of the approved RAWP.

Historical releases to the soils from USTs and at grade spills have resulted in residual impacts to the on-Site soils and groundwater with BTEX and CVOCs. The BTEX soil impacts are confined to the northwest quadrant of the Site, near the closed USTs at 95 New Lots Ave, and exhibit concentrations at and below the water table that exceed the Protection of Groundwater Standards. These soils will also be removed during the performance of the RAWP.

Groundwater in some areas, extending from the soil impact beneath the identified LUSTs to the east and southeast corner of the Site and may extend off-Site to the east was impacted with BTEX compounds at concentrations that exceed ambient water quality standards. Since the Site is in an urban area with municipally supplied potable water and sewers, with no surface water exposures, or sensitive downgradient receptors, remediation of the groundwater is not required by the NYSDEC provided the known source area soils are removed.

The SRI also identified trace concentrations of CVOCs in the groundwater that exceed ambient water quality standards near the southeast property boundary. The source is unknown and no source of CVOCs has been detected in the soils. As the location where the CVOCs were reported is within the planned footprint of the deep basement excavation (part of the Site redevelopment plan) the soils above the water table and residual impacts from CVOCs will be removed during the RAWP. Lacking a source at the water table, groundwater remediation for CVOCs is not planned.

The SRI also detected perfluorinated compounds (PFCs) in the groundwater at concentrations that exceed the EPA lifetime/consumption exposure guidance thresholds of 70 parts per trillion (ppt). These concentrations are similar to those reported in the groundwater on adjacent properties in the area and are believed to be endemic to the entire neighborhood and surrounding urban area. As no source or elevated concentrations greater than area background conditions were detected, remediation for PFCs is not included in the RAWP.

The results of the SRI were submitted to NYSDEC in June 2017, accepted by NYSDEC in August 2017, and incorporated into the Final RAWP for the Site. The fact sheet for the remediation was prepared by NYSDEC and published for public comment in September 2017. The 30-day public comment period expired October 16, 2017 with no comments or objection to the proposed action and development plans for the Site. Chazen has been informed that the RAWP has been approved.

At this time, the known and/or suspected environmental impacts associated with the historical usage of the Site have been identified and delineated to the satisfaction of NYSDEC and New York State Department of Health (NYSDOH). Site wide remediation will be conducted in accordance with the NYS Brownfields Clean-Up Program (BCP) to the Track 4 clean-up standard included in 6 NYCCR Part 375. The remediation of environmental impacts will be completed prior to construction/redevelopment during the performance of the approved RAWP.

Once the certification of completion of the RAWP is approved by NYSDEC, the outstanding RECs, associated with the Site will likely be considered either controlled recognized environmental conditions (CRECs) or historic recognized environmental conditions (HRECs).

Supplemental Site Investigation (SSI), Chazen (December 2017)

Supplemental soil data was collected at eighteen soil boring locations to identify and delineate VOCs at concentrations greater than Protection of Groundwater SCOs (PGWSCOs) at and/or below the water table and confirm that metals impacts at the Site were limited to the urban fill materials. The goal was to quantify, to the extent practical, the additional volume of impacted soil that must be removed during remediation to achieve the RA goals for the Site. Soil vapor data was collected from twelve installed soil vapor probes to assess the potential for post-construction vapor encroachment issues and determine the need for an active sub-slab depressurization system for the new construction.

The SSI identified VOC concentrations in exceedance of PGWSCOs at or beneath the water tables in nine of the eighteen soil borings. Reported VOC exceedances were typical of gasoline range organics (GROs). Additional soil removal volumes were quantified based upon soil samples analyses.
Elevated soil gas concentrations of New York State Department of Health (NYSDOH) matrix listed chlorinated volatile organic compounds (CVOCs) were unexpected but observed at the Site. Although the use of engineering controls to protect the future occupants was already anticipated, the planned passive Vapor Barrier System (VBS) was expanded to an active SSDS for added public health protection.

Phase I ESA, Chazen (March 2018)

In March 2018, Chazen conducted a Phase I ESA of the Site in conformance with the scope and limitations of ASTM Practice E 1527-13. The 2018 Phase I ESA revealed the following recognized environmental conditions:

- Known areas of contamination on the Site including on-Site PCE contamination.

Significant data gaps that were encountered during the 2018 Phase I ESA included the following:

- Former Coal and Coke business.
- Environmental Control Board Liens and UCC lien against the Site.
- Evidence of fill material in subsurface soil samples.
- Cut pipe and lack of information regarding potential associated underground features.

- Possible historic fire in the BNI tenant space.
- Lack of information regarding off-Site auto facilities.

Remedial Action, Chazen (July 2018 to July 2019)

The following remedial actions have been performed on Site under the direct technical oversight of Chazen:

- Excavation and removal of ~13,000 cubic yards of urban fill from the property to an average depth of 6.5 feet below grade;
- Post excavation samples confirming the removal of the urban fill;
- Removal of (23) historical underground storage tanks (with one LUST) and all inground infrastructure;
- Removal of approximately 250 yards of grossly contaminated petroleum impacted soils located above the water table associated with discovered LUST;
- Removal of 350 cubic yards of grossly contaminated petroleum impacted soil from below the water table associated with the LUST ;
- Post-excavation soil sampling demonstrating the successful removal of the grossly impacted soils;
- Excavation of ~9,000 cubic yards of native soils to 14 feet below grade from beneath the footprint of two planned residential tower buildings;
- Reuse of ~4,000 cards of clean-native soils to restore portion of site to near original grade for construction of at-grade central building area and courtyard;
- Construction of sub-slab depressurization system (SSDS) collection piping beneath floor of South Tower building (note: SSDS beneath north tower and central building area to be completed prior to issuance of FER);
- Injection of 60,000 gallons (ISCO1) of Fenton's reagent (Iron sulfate and hydrogen peroxide) into a 72-point infusion grid to treat an 18,000 ft² area with approximately 4,200 cubic yards of residually impacted soils beneath the water table that exceeded PGWSCOs;

- Post-injection soils and groundwater sampling and analysis with delineation of approximately 4,500 ft^2 of soils containing approximately 1,000 yd^3 of soils that required additional mitigation;
- Injection an additional 15,000 gallons of Fenton's reagent into 15 injection points to target delineated residual impacts;
- Post ISCO2 soil and groundwater sampling, comparison to ISCO 2 action levels with identification of 400 yd^3 of soils for additional mitigation;
- Installation of 2,400 bs of Petrofix® to form a 20-foot thick barrier wall along eastern property boundary to prevent off-site migration of residual groundwater impacts; and,
- Installation of an additional 1,600 lbs of Petrofix at four locations (5 pts per location).

All remedial actions were conducted in conformance with the NYSDEC approved RAWP and/or supplemental work plans under the regulatory oversight of the NYSDEC Case manager.

Residual impacts to soils beneath the water table that exceed PGWSCOs and residual groundwater impacts exceeding NYS Ambient Water Quality Standards will remain on-site and will attenuate (enhanced by Petrofix) under the control/management of NYSDEC approved Engineering and Institutional controls. Remaining impacts are discussed in Section 2.5.

2.4 Remedial Action Objectives

The Remedial Action Objectives (RAOs) for the Site as listed in the Decision Document dated March 9, 2018 are as follows:

Groundwater

RAOs for Public Health Protection

- Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards.

- Prevent contact with, or inhalation of volatiles, from contaminated groundwater.

RAOs for Environmental Protection

- Restore ground water aquifer to pre-disposal/pre-release conditions, to the extent practicable.

- Remove the source of ground or surface water contamination.

Soil

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil.

- Prevent inhalation of or exposure from contaminants volatilizing from contaminants in soil.

RAOs for Environmental Protection

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

Soil Vapor

RAOs for Public Health Protection

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

2.5 Remaining Contamination

2.5.1 Soil

The Site-specific primary contaminants of concern (COCs) (surrogates) outlined in the RAWP, provided in **Appendix E**, included 1,2,4-trimethylbenzene and Perchloroethylene (VOCs), benzo(a)anthracene (SVOCs), and barium and lead (metals). Six emerging contaminates (PFCs) were also detected at trace concentrations in the groundwater at concentrations ranging from 2 to 66 ng/l but were not considered primary COCs nor included in the RAWP.

Site-specific COCs were developed taking into consideration the planned future Site use including development that met NYSDEC Part 375 Restricted-Residential land use criteria. The remedial action objective (RAO) for soil specified in the RAWP was to generally achieve Restricted Residential Use SCOs (RRUSCO) and PGWSCOs.

The RAWP (including amendments and supplements) included:

- excavation and removal of urban fill from the Site exceeding RRUSCOs;

- removal of all unknown, suspected, and observed USTs;
- excavation and removal of contaminated media (GCM) above the water table that exceed RUSCOs;
- removal of "grossly contaminated" soils beneath the water table,
- in-situ direct chemical oxidation of residually impacted soils beneath the water table to substantially reduce impacts to soils and groundwater;
- installation of engineering controls consisting of:
- a site-wide cover system, installation of vapor barriers beneath building foundations,
- installation of an SSDS beneath all future occupied spaces to eliminate potential impacts to indoor air;
- installation of an activated carbon barrier wall beneath the water table along the eastern property boundary downgradient of the source area to prevent off-site migration of residually impacted groundwater;
- installation of activated carbon containment zones around residual hotspots to reduce and degrade residual concentration in isolated pockets of residual soil impacts; and
- institutional controls consisting of an Environmental Easement and this Site Management Plan.

The Site cover system was required to meet RRUSCOs and allow for restricted residential land use of Site soils in areas that are not otherwise covered by structures such as buildings, sidewalks, pavement, or backfilled with fill material brought to the Site meeting SCOs as set forth in 6 NYCRR Part 375-6.7(d).

Remedial action excavation activities were conducted in phases with oversight provided by qualified Chazen environmental professionals and geologists to delineate and document extents of impacted urban fill, native soils and GCM. Excavation activities began in July 2018 with the removal of the urban fill across the entire Site. Once all impacted urban fill had been removed post-excavation confirmation soil samples were collected from the base of excavations, (ft. bgs.) to demonstrate that the remedy had achieved RRUSCOs in soils above the groundwater table.

A total of 70 excavation endpoint confirmation soil samples were collected after removal of Site-wide urban fill. Excavation confirmation samples were collected at a frequency of one grab sample and one 5-point composite sample per 900 square feet of base. Grab samples were submitted for laboratory analysis of ASP TCL-VOCs by EPA Method 8260. Composite samples were submitted for laboratory analysis of SVOCs by EPA Method 8270 and Part 375 metals by EPA Method 6010. The excavation confirmation samples were compared to 6 NYCRR Part 375 RRUSCOs.

No exceedances of RRUSCOs or PGWSCOs for VOCs, SVOCs, or metals were observed in the underlying native soils in Quadrants Q-1, Q-3, and Q-4. No exceedance of RRUSCOs were observed in the twenty post-excavation confirmation samples collected in Quadrant Q-2.

Exceedances of the PGWSCOs for VOCs were reported in two of the twenty Q-2 samples. A hotspot was discovered associated with four vaulted USTS associated with the former dry-cleaning operations. This pocket of soil appeared near saturated with free-product from the base of the USTs at 8 feet bgs to the water table at 14 feet bgs. Subsequent excavation of this hotspot removed approximately 600 cubic yards of grossly impacted soils from this “source area” to a depth of approximately 4 feet below the table (approximately 0 ft AMSL).

No known or suspected impacts remain within the on-site soils at or above the water table at 14 feet below grade (4 feet AMSL).

Residual volatile organic compounds (ranging from ~50 mg/kg to ~900 mg/kg with an average concentration of ~220 mg/kg (of which 60-70% is TMB) remain detectable in the on-site soils below the water table from 14 feet to up to 20 feet below grade at concentrations that exceed PGWSCOs. The source of these residual impacts (the LUST and associated grossly contaminated soils) has been removed.

Approximately 400 cubic yards of residually impacted soils remained in the east central portion of the Site and along the eastern property boundary on completion of the second round of ISCO tretament. These residually impacted soils were treated with the injection of 4,000 lbs of Petrofix® slurry containing 1,200 lbs of granular(micro) activated carbon.

It is expected that the Petrofix® will bind dissolved contaminants to the micro-carbon, steadily reducing the concentration of VOCs in the groundwater and significantly enhance their attenuation and achieve water quality standards over time. Long-term monitoring and evaluation is required to demonstrate the effectiveness of the remedy and/or identify corrective actions that may be necessary and implemented in the future.

As a Volunteer, the quality of off-site soils was not an obligation of the Volunteer to investigate or remediate. Six soil were borings installed within the ROW of Powell street during a Spill investigation conducted in 2012. No impacts were observed in the soils in those borings above the water table. Samples collected from below the water table detected concentrations of site related COCs exceeding PGWSCOs in borings immediately adjacent the site eastern property boundary. The detections decreased to less than PGWSCOs in borings to the east (across Powell) and south (along Hegeman).

Two soil borings (MW-4 and MW-5) were installed along the curb line of Powell street in November 2019 for the installation of the post-remediation monitoring well network. Impacted soils were observed at the water table at approximately 14.5 feet below grade and extending downward to approximately 18 feet below grade. The results of soil sample analysis confirmed that petroleum impacts that exceed the PGWSCOs are present at these off-site locations at concentrations that are similar but somewhat less than the on-site residual impacts. Total VOCs in the sample interval from 16-19 feet below grade were reported at 521.9 mg/kg in MW-4 and 431.7 mg/kg in MW-5.

Based on limited field observations, petroleum impacted soils are considered likely in the off-site soils beneath the sidewalk along the northern property boundary near the intersection of New Lots and Powell.

No information or data concerning the off-site soil immediately to the to the west (Sackman Street) or to the south (Hegeman street.) is available.

No separate/distinct demarcation barrier layer separating impacted native soils from clean-fill was installed nor considered necessary. The vapor barrier beneath the basement floor of each building section will be used as the demarcation barrier for management or removal/disturbance of on-site soils if there is additional construction below the ground in the future.

There are no remaining historical on-Site utilities nor infrastructure, nor any newly constructed utilities located within residually impacted soils.

Table 2 and **Figure 6** summarize the results of all soil samples collected that exceed the PGWSCOs and/ or RRSCOs after completion of the remedial actions with concentration isopleths. Representative cross sections (north-south, and west-east) through the area of the residual impacts is included as **Figure 6.a** and **Figure 6.b**, respectively.

2.5.2 Groundwater

On-Site groundwater remains impacted with volatile organic compounds consisting primarily of 1,2,4 and 1,3,5 trimethyl benzene (65-80% of total impact) and other gasoline range organic compounds at concentrations greater than Ambient Water Quality Standards.

Table 3 and **Figure 7** summarize the results of all samples of groundwater that exceed the SCGs after completion of the remedial action. Groundwater contours and isopleth maps are included on **Figure 5a (May 2019)** and **Figure 5b** (November 2019)

There are no known pockets of "grossly contaminated soil" as that term is defined by Part 375-1.2(u) remaining on site. However, pockets remain of residually impacted soils at and below the water table that exceed PGWSCOs both on and off-site with the same gasoline range organic compounds present in the groundwater. The on-site pockets have been treated by the application of Petrofix to bind the dissolving residual contamination and rapidly attenuate their migration. The effectiveness of the Petrofix will be evaluated by the periodic monitoring included in this Plan.

2.5.3 Soil Vapor

Chlorinated Volatile Organic Compounds (CVOCs) were reported in all of the twelve soil vapor samples collected during the 2017 Supplemental Remedial Investigation with total CVOC concentrations ranging from 313.4 µg/M^3 to 18,207 µg/M^3. The highest concentration of any individual compound was Tetrachloroethene (PCE) at 14,240 µg/M^3. Based on the data, the soil vapor appeared to be emanating radially outward from a small pocket of impacted urban fill located near the northeast corner of the southwest quadrant (Q3) of the Site which has been removed.

Post-excavation samples collected from the native soils after removal of the urban fill in this area where the highest concentration of PCE had been detected indicated only residual trace concentration of PCE site at concentrations well below the UUSCOs with a maximum reported concentration of 0.051 mg/kg.

No post removal SVI samples were considered necessary nor required as an active SSDS system was included beneath the floors of all newly constructed interior space.

Periodic monitoring at pre-installed monitoring points included in the active sub-slab depressurization system design will be used to evaluate the post-construction soil vapor concentrations and performance of the SSDS. The monitoring will be continued in accordance with the approved SMP until determined by NYSDEC and NYSDOH to be no longer required.

3.0 INSTITUTIONAL AND ENGINEERING CONTROL PLAN

The institutional control for the Site consists of an Environmental Easement that restricts the future use of the Site to Restricted-Residential Use, require compliance with this SMP, and prohibit the use of Site groundwater for potable, irrigation or process purposes without written approval from the NYSDEC and the City of New York. The Environmental Easement will also require the property owner to complete and submit to the NYSDEC a periodic certification of institutional and engineering controls in accordance with Part 375-1.8(h)(3).

Engineering controls consisting of site-wide cover system and an active SSDS were incorporated into the final approved construction design plans to prevent direct contact with residually impacted soil, groundwater, or soil vapor intrusion into above-grade mixed-use commercial residential structures.

3.1 General

This IC/EC Plan describes the procedures used for implementation and management of the IC/ECs at the site. The IC/EC Plan is one component of the SMP and is subject to revision by the NYSDEC.

This plan provides:

- A description of all IC/ECs on the site;
- The basic implementation and intended role of each IC/EC;
- A description of the key components of the ICs set forth in the Environmental Easement;
- A description of the controls to be evaluated during each required inspection and periodic review;
- A description of plans and procedures to be followed for implementation of IC/ECs, such as the implementation of the Excavation Work Plan (EWP) (as provided in **Appendix C** for the proper handling of remaining contamination that may be disturbed during maintenance or redevelopment work on the site; and

- Any other provisions necessary to identify or establish methods for implementing the IC/ECs required by the site remedy, as determined by the NYSDEC.

3.2 Institutional Controls

A series of ICs is required by the Decision Document to: (1) implement, maintain and monitor Engineering Control systems; (2) prevent future exposure to remaining contamination; and, (3) limit the use and development of the site to Restricted-Residential uses only. Adherence to these ICs on the site is required by the Environmental Easement and will be implemented under this SMP. ICs identified in the Environmental Easement may not be discontinued without an amendment to or extinguishment of the Environmental Easement. The IC boundary is site-wide.

The ICs are:

- The property may be utilized for restricted-residential, commercial, and industrial use;
- The use of on-site groundwater as a potable or non-potable water supply is prohibited without prior written approval of NYSDEC. Local permits and approvals may also apply.
- All ECs must be operated and maintained as specified in this SMP;
- All ECs must be inspected at a frequency and in a manner defined in the SMP;
- Groundwater and other environmental or public health monitoring must be performed as defined in this SMP;
- Data and information pertinent to site management must be reported at the frequency and in a manner as defined in this SMP;
- Future activities that will disturb remaining contaminated material must be conducted in accordance with this SMP and approved by NYSDEC;
- Operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical component of the remedy shall be performed as defined in this SMP;

- Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in this SMP;

- Access to the site must be provided to agents, employees or other representatives of the State of New York with reasonable prior notice to the property owner to assure compliance with the restrictions identified by the Environmental Easement.

- The potential for vapor intrusion must be evaluated for any buildings developed in the area within the IC boundaries (site wide), and any potential impacts that are identified must be monitored or mitigated; and

- Agriculture and vegetable gardens on the Site are prohibited.

3.3 Engineering Controls

3.3.1 Site Cover System

Exposure to remaining contamination at the site is prevented by a cover system placed over the site. This cover system is comprised primarily of concrete building floor slabs and walkways covering an estimated 94% of the site.

A minimum of 24 inches of clean soil was used in the approximately 4,100 ft² landscaped courtyard area abutting Powell Street. All impacted soils exceeding RRSCOs were excavated and removed from this area to a depth of 6.5 feet below grade, no demarcation barrier was installed nor considered necessary. The upper six inches of placed soil is of sufficient quality to maintain a vegetative layer.

Soil cover material, including any fill material brought to the Site, will met SCOs for cover material for use of the Site as set forth in 6 NYCRR Part 375-6.7(d). **Figure 8 –** Engineering Control Locations, presents the location of the cover system and applicable demarcation layers. The Excavation Work Plan (EWP) provided in **Appendix C** outlines the procedures required to be implemented in the event the cover system is breached, penetrated or temporarily removed, and any underlying remaining contamination is disturbed. Procedures for the inspection of this cover are provided in the Monitoring and

Sampling Plan included in Section 4.0 of this SMP. Any work conducted pursuant to the EWP must also be conducted in accordance with the procedures defined in a Health and Safety Plan (HASP) and associated Community Air Monitoring Plan (CAMP) prepared for the site and provided in **Appendix F**.

3.3.2 Sub-slab Depressurization System

A passive vapor barrier system and an active SSDS have been installed beneath the concrete floor slabs of the newly constructed buildings. Procedures for operating and maintaining the vapor barrier and SSDS will be documented in the Operation and Maintenance Manual ,which will be prepared and submitted to NYSDEC upon completion of construction of the above grade system components on or about June 2020. A copy of the system O&M Plan will be appended as section 5.0 of this document for future use.

Design drawings, signed and sealed by a professional engineer, are included in **Appendix G** – Operations and Maintenance Manual. **Figure 8** shows the area covered by the SSDS across the site. As built drawings will be included in the O&M Manual to be submitted later and appended to this document for future use.

A sub-slab depressurization system capable of maintaining a negative differential of not less than -0015 inches of water between the indoor and sub-slab air pressure has been installed beneath the basement floor slabs of the two residential tower buildings and the slab-on grade commercial/community center/church building between the towers. Each of the three buildings has an independent system.

Each system is divided into multiple independently controlled collection zones ranging in area from 2,400 to 3,200 ft^2. Each zone has two 40-60 foot lengths of perforated 4-inch PVC collection pipes set in a 12 inch deep gas-permeable gravel-bedded trench connected by a six-inch thick layer of gas permeable gravel beneath the entire floor slab. There is a sub-slab vacuum monitoring point in each zone.

The collection pipes in each zone are plumbed together with 6-inch solid piping to a manifold in the base level of the building equipped with independent flow control valves, sampling ports, and vacuum monitoring points for each zone. The manifold is connected to the riser with extends the piping to the blower unit on the roof of the building. System controls and wiring diagrams will be included is the as-builts to be submitted with the O&M manual upon completion of the systems.

At this time, sub-slab vapor extraction collection system piping beneath the floors of the buildings and zone monitoring points have been installed and initial testing completed to confirm that a negative pressure differential can be generated with an extraction pump in each leg of the system (when not inundated by groundwater).

The design package for the SSDS prepared by EnviroTrak Environmental Services is included in **Appendix G**. As previously discussed with NYSDEC, installation of the above grade extraction system components (blowers, control units, system alarms, and exhaust piping) will not be installed and start-up tests of the fully functional system conducted until after construction of the tower buildings are completed.

A Construction Completion Report will be submitted to NYSDEC and NYSDOH for review and approval along with applicable test data prior used for final selection and installation of the blower systems. A copy of the approved CCR for the SSDS will be included in the first periodic review report.

3.3.3 Petrofix Barrier Wall

The Petrofix barrier wall along the eastern (Powell street) property boundary is intended to control off-site migration of on-site groundwater impacts by binding the dissolved phase contaminants to the activated carbon. The wall was designed to capture the entire estimated mass of on-site residual impacts in both the soils and the groundwater and hold it in place as it biodegrades. The initial and continued effectiveness of the wall will be evaluated by monitoring. **Figure 8** shows the Petrofix barrier wall location.

Periodic augmentation of the barrier through the injection of additional Petrofix and/or biological degradation enhancers may be considered in the future based on the results of groundwater sampling and analysis and discussion with NYSDEC to improve or maintain the effectiveness of the wall.

3.4 Criteria for Completion of Remediation/Termination of Remedial Systems

Generally, remedial processes are considered completed when monitoring indicates that the remedy has achieved the remedial action objectives identified by the decision document. The framework for determining when remedial processes are complete is provided in Section 6.4 of NYSDEC DER-10.

3.4.1 Cover System

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

3.4.2 Sub-Slab Depressurization System (SSDS)

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

3.4.3 Petrofix Wall and Monitoring Wells

Groundwater monitoring activities to assess the effectiveness of the remedial action and demonstrate the continued effectiveness of the Petrofix Barrier will continue, as determined by the NYSDEC with consultation with NYSDOH, until residual on-site groundwater concentrations are determined to be consistently less than ambient water quality standards, the site SCGs, or have become asymptotic at an acceptable level (to be determined by NYSDEC and NYSDOH) over an extended period.

In the event that monitoring data indicates that monitoring for off-site migration may no longer be required, a proposal to discontinue the system will be submitted by the remedial party. Monitoring will continue until permission to discontinue is granted in writing by the NYSDEC.

If groundwater contaminant concentrations become asymptotic at a level that is not acceptable to the NYSDEC, additional source removal, treatment and/or control measures will be evaluated.

3.5 Excavation Work Plan

In the event that future Site renovation/repair/replacement/or alteration of the Site could result in the excavation of potentially impacted soils or any existing engineering controls, that work is subject to the conditions in the Excavation Work Plan included in **Appendix C**. No such work is to be performed without prior notification of NYSDEC and their written approval.

4.0 MONITORING AND SAMPLING PLAN

4.1 General

This Monitoring and Sampling Plan describes the measures for evaluating the overall performance and effectiveness of the remedy. This Monitoring and Sampling Plan may only be revised with the approval of the NYSDEC. Details regarding the sampling procedures, data quality usability objectives, analytical methods, etc. for all samples collected as part of site management for the site are included in the Quality Assurance Project Plan provided in **Appendix H.**

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

- Sampling and analysis of all appropriate media (e.g., groundwater, indoor air, soil vapor,);
- Assessing compliance with applicable NYSDEC standards, criteria and guidance (SCGs), particularly groundwater standards and Part 375 SCOs for soil; and
- Evaluating site information periodically to confirm that the remedy continues to be effective in protecting public health and the environment;

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

- Sampling locations, protocol and frequency;
- Information on all designed monitoring systems;
- Analytical sampling program requirements;
- Inspection and maintenance requirements for monitoring wells;
- Monitoring well decommissioning procedures; and
- Annual inspection and periodic certification.

Reporting requirements are provided in Section 7.0 of this SMP.

4.2 Site-Wide Inspection

Site-wide inspections will be performed quarterly for a minimum of one year. Modification to the frequency or duration of the inspections after one year will require approval from the NYSDEC. Site-wide inspections will also be performed after all severe weather conditions that may affect ECs or monitoring devices. During these inspections, an inspection form will be completed as provided in **Appendix I** – Site Management Forms. The form will compile sufficient information to assess the following:

- Compliance with all ICs, including site usage;
- An evaluation of the condition and continued effectiveness of ECs;
- General site conditions at the time of the inspection;
- The site management activities being conducted including, where appropriate, confirmation sampling and a health and safety inspection; and
- Confirm that site records are up to date.

Inspections of all remedial components installed at the site will be conducted. A comprehensive site-wide inspection will be conducted and documented according to the SMP schedule, regardless of the frequency of the Periodic Review Report. The inspections will determine and document the following:

- Whether ECs continue to perform as designed;
- If these controls continue to be protective of human health and the environment;
- Compliance with requirements of this SMP and the Environmental Easement;
- Achievement of remedial performance criteria; and
- If site records are complete and up to date.

Reporting requirements are outlined in Section 7.0 of this plan.

Inspections will also be performed in the event of an emergency. If an emergency, such as a natural disaster or an unforeseen failure of any of the ECs occurs that reduces or has the potential to reduce the effectiveness of ECs in place at the site, verbal notice to the NYSDEC must be given by noon of the following day. In addition, an inspection of the site will be conducted within 5 days of the event to verify the effectiveness of the IC/ECs implemented at the site by a qualified environmental professional, as determined by the NYSDEC. Written confirmation must be provided to the NYSDEC within 7 days of the event that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public.

4.3 SSDS Monitoring and Sampling

Monitoring of the SSDS will be performed upon initial start-up and then on a periodic basis, as identified in **Table B** Remedial System Monitoring Requirements and Schedule (see below). Modification to the frequency or sampling requirements will require approval from the NYSDEC. A visual inspection of the complete system will be conducted during each monitoring event. Unscheduled inspections and/or sampling may take place when a suspected failure of the SSDS has been reported or an emergency occurs that is deemed likely to affect the operation of the system. SSDS components to be monitored include, but are not limited to, the components included in **Table B** below.

Table B – Remedial System Monitoring Requirements and Schedule

System Component	Monitoring Parameter	Operating Range	Monitoring Schedule
Blowers	Cfm/ΔP	TBD	Quarterly
Vacuum Gauges	Pressure reading	-0.01 to 0.5 inches	Quarterly
Zone leg	PID measurement	1 to 10000 ppm	Quarterly

A complete list of components to be inspected is provided in the Inspection Checklist, provided in **Appendix I** - Site Management Forms. If any equipment readings are not within their specified operation range, any equipment is observed to be malfunctioning or the system is not performing within specifications; maintenance and repair, as per the Operation and Maintenance Plan, is required immediately.

4.3.1 SSDS Sampling

One sample will be collected semi-annually for each of the three buildings from the zone collection leg in that building that demonstrates the highest running average PID measurement over the past four monitoring events or the largest increase since the previous sampling event. The samples will be collected from the in-line sampling port on the manifold system. An indoor air quality sample will also be collected from that same zone. Samples will be collected with certified clean summa canisters with laboratory calibrated 8-hour flow regulators. The samples will be submitted to an ELAP certified environmental laboratory for analysis by EPA Method TO-15 for VOCs. Modification to the frequency or sampling requirements will require approval from the NYSDEC.

Table C – SSDS Sampling Requirements and Schedule

Sampling Location (per building)	**Analytical Parameters**	**Schedule**
	VOC (EPA Method TO-15)	
Zone Collection Leg (3)	X	Semi-Annually
Indoor Air (3)	X	Semi-Annually

A detailed work plan will be submitted to NYSDEC for review and approval prior to initial system start-up. General sample collection and analytical procedures and protocols are provided in **Appendix H** – Quality Assurance Project Plan. Deviation, if any, to the generic QAPP will be addressed in the work plan.

4.4 Post-Remediation Media Monitoring and Sampling

Samples of groundwater and soil vapor shall be collected periodically to evaluate the and demonstrate the effectiveness of the remedial action program for the Site. Groundwater samples will be collected form the groundwater monitoring well network. Soil vapor samples will be collected semi-annually from the sub-slab vacuum monitoring points include with the SSDS design. One soil vapor sample will be collected from each building from the sub-slab vacuum monitoring point located in the same Zone collection leg used to sample the collection system using the same methods procedures, and analysis.

Sampling locations required analytical parameters and schedule are provided in **Table D** – Remedial System Sampling Requirements and Schedule below. Modification to the frequency or sampling requirements will require approval from the NYSDEC.

Table D – Post Remediation Sampling Requirements and Schedule

Sampling Location	**Analytical Parameters**	**Schedule**
Monitoring Wells (5)	VOCs (EPA Method 8260C)	Quarterly
Sub-Slab Monitoring Point (3)	VOCs (EPA Method TO-15)	Semi-Annually

Detailed sample collection and analytical procedures and protocols will be provided in the work plan submitted prior to the SSDS system start-up event. General sample collection and analytical procedures and protocols are provided in **Appendix H** – Quality Assurance Project Plan. Deviation, if any, to the generic QAPP will be addressed in the work plan.

4.4.1 <u>Groundwater Sampling</u>

Groundwater monitoring will be performed quarterly to assess the performance of the remedy. Modification to the frequency or sampling requirements will require approval from the NYSDEC.

A network of five permanent groundwater monitoring wells were installed to monitor the on-Site and downgradient off-Site groundwater conditions at the site. The well network consists of three on-site and two off-site wells.

Residual groundwater impact consisting primarily (60-70%) of trimethylbenzenes (TMB) and lesser concentrations of other gasoline range organics is detectable in the northeast quadrant of the property. The impact extends from the assumed source location beneath four historical mineral spirt tanks in Site Grid H-5 and associated distribution piping (in H-6 and H-7) where grossly impacted soils (now removed) were detected and removed. The remaining residual impacts extend east-southeast from Grid H-5 to the Eastern property boundary along Powell.

Approximately 400-600 cubic yards of residually impacted soils remain on-Site with concentrations of TMB that exceed PGWs. A smear zone extending from the water table to approximately 4-6 feet below the water table beneath the eastern most portion of the slab-on grade building and in the landscaped courtyard along the Powell Street between the two tower buildings. There is no exposure pathway to this residual soil.

- Three wells (MW-1, MW-2, and MW-3) wells are located within the footprint of the onsite residual soil impact area. Soil impacts that exceed PGWs remain below the water table with concentrations of total VOCs ranging from 500-800 mg/kg.
    - One well (MW-1) is located close to the former source area removal area.
    - Two of the wells (MW-2 and MW-3) are located on-Site approximately 12-feet west of the eastern property boundary. These wells are within the Petrofix® barrier zone along the long axis of the zone parallel to Powell street in the area with the highest suspected residual soil impacts
- Two wells (MW-4 and MW-5) are located off-site along the western sidewalk of Powell street approximately 10 feet east of the property boundary and downgradient from the two on-site wells.

The positions of the wells were selected in consultation with NYSDEC. The intent was to monitor the changing residual on-site conditions resulting from the remedial action and provide long-term data needed to assess the effectiveness of the barrier wall at controlling off-site migration of residually impacted groundwater.

The monitoring wells will be sampled on a quarterly basis commencing with the second Quarter of 2020 and the results submitted to NSYDEC periodically. Periodic review and analysis of the data will be provided annually. Any changes in the monitoring or reporting schedule will be approved by NYSDEC in advance in writing.

The wells will be secured and maintained to remain serviceable for the duration of their required period of use. Repairs and/or replacement of wells in the monitoring well network will be performed on a timely basis based on assessments of structural integrity and overall performance.

If biofouling or silt accumulation occurs in the on-site and/or off-site monitoring wells, the wells will be physically agitated/surged and redeveloped. Additionally, monitoring wells will be properly decommissioned and replaced, if an event renders the wells unusable.

The NYSDEC will be notified prior to any repair or decommissioning of any monitoring well for the purpose of replacement, and the repair or decommissioning and replacement process will be documented in the subsequent Periodic Review Report. Well decommissioning without replacement will be done only with the prior approval of the NYSDEC. Well abandonment will be performed in accordance with NYSDEC's guidance entitled "CP-43: Groundwater Monitoring Well Decommissioning Procedures." Monitoring wells that are decommissioned because they have been rendered unusable will be replaced in kind in the nearest available location, unless otherwise approved by the NYSDEC.

The sampling frequency may only be modified with the approval of the NYSDEC. This SMP will be modified to reflect changes in sampling plans approved by the NYSDEC. Deliverables for the groundwater monitoring program are specified in Section 7.0 – Reporting Requirements.

4.4.2 Soil Vapor Intrusion Sampling

Soil vapor sampling will be performed in conjunction with the monitoring and sampling of the SSDS as specified in Section 4.3. Samples of the sub-slab vapor and indoor air will be collected periodically, and the results summarized and compared to action matrices in NYSDOH guidance documents and reported.

4.4.3 Monitoring and Sampling Protocol

All sampling activities will be recorded in a field book and associated sampling log as provided in **Appendix I** - Site Management Forms. Other observations (e.g., groundwater monitoring well integrity, etc.) will be noted on the sampling log. The sampling log will serve as the inspection form for the monitoring network. Additional detail regarding monitoring and sampling protocols are provided in the site-specific Quality Assurance Project Plan provided as **Appendix H** of this document.

5.0 OPERATION AND MAINTENANCE PLAN

5.1 General

This Operation and Maintenance Plan provides a brief description of the measures necessary to operate, monitor and maintain the mechanical components of the remedy selected for the site. This Operation and Maintenance Plan:

- Includes the procedures necessary to allow individuals unfamiliar with the site to operate and maintain the SSDS systems;
- Will be updated periodically to reflect changes in site conditions or the manner in which the SSDS systems are operated and maintained.

Further detail regarding the Operation and Maintenance of the SSDS will be provided in the SSDS Operation and Maintenance Manual to be submitted to NYSDEC with the Construction Completion report upon completion of the SSDS. A copy of the NYSDEC approved O&M Manual will be appended to this document in **Appendix G**. A copy of O&M Manual, along with the complete SMP, is to be maintained at the site. The Operation and Maintenance Plan is not to be used as a stand-alone document, but as a component document of this SMP.

5.2 Engineering Control Performance Criteria

The three engineering controls intend to reduce human health risk exposures to the residual on-site impacts include the cover system(s), the SDS systems, and the Petrofix Barrier. The objective/purpose and evaluation criteria are summarized in the table below.

Control	Objective	Performance Evaluation Criteria
Cover	Prevent Direct Contact with Residuals	Remain intact
SSDS	Reduce SVI Potential	Maintain negative pressure differential
Petrofix	Control off-site Groundwater Migration	Reduce off-site impacts to acceptable levels

The cover system is a passive system that require no operation and maintenance. The results of periodic inspections with repair as necessary and implementation of the attached EWP in the event of planned disturbances of the cover should be sufficient for this control.

5.3 Operation and Maintenance of Sub-slab Depressurization System

The following sections provide a description of the operations and maintenance of the SSDS. Design drawings for SSDS are provided in **Appendix G.** The Operations and Maintenance Manual for SSDSs will be prepared and submitted to NYSDEC for approval after the system CCR been completed, reviewed, and approved by NYSDEC.

5.3.1 System Start-Up and Testing

Detailed system start-up procedures and testing requirements for the SSDS will be submitted to NYSDEC for review and approval. Documentation of the start-up test results will be included in the CCR.

The system testing described above will be conducted if, in the course of the SSDS system lifetime, system components fail and need to be replaced or if significant changes are made to the system components.

5.3.2 Routine System Operation and Maintenance

Routine system O&M procedures for the SSD systems will be included in the Operations & Maintenance Manual submitted to NYSDEC for review and approval

5.3.3 Non-Routine Operation and Maintenance

Procedures for Non-Routine system O&M (emergency repair/contingencies/upgrades etc) for the SSD systems will be included in the O& manual and submitted to NYSDEC for a review and approval with the final system designs.

5.3.4 System Monitoring Devices and Alarms

There are no planned automatic monitoring devices or alarms for the SSD systems except for the run-time monitors used to record system operation time between successive reporting periods and the code-mandatory electrical circuit ground fault interrupter.

Each system has a single active blower unit. The blower will be controlled by a single toggle that turns power on or off with a run-time meter. The zones beneath the tower slabs will be equipped with gate valves, floating interrupt-switches and separate run-time totalizers. This will allow the units to operate in continuous run-mode even under high water table conditions without pulling excess water vapor and/or straining the fan motors and track of the duration that the tower systems are inactive.

Applicable maintenance and repairs and system restart will be conducted, as specified in the Operation and Maintenance Plan. Operational problems will be noted in the Periodic Review Report to be prepared for that reporting period.

5.4 Petrofix Barrier

The Petrofix barrier along the eastern property boundary is a passive engineering control that requires no operational considerations. It may, however, periodically require maintenance to remain effective. As impacted groundwater moves through the barrier and is adsorbed to the carbon, the available bonding sites may be exhausted, and breakthrough can occur (similar to the breakthrough in a LPGAC tank). If breakthrough occurs, the concentration of COCs in the well downgradient from the wall will begin to rise and a definable trend will appear in the monitoring data.

If periodic monitoring of the groundwater well network demonstrates;

- Significant concentrations of COCs remain in the on-site wells; and,
- Significant off-site migration (ie, g.w. concentrations near the boundary remain high over time) is being detected in the Powell Street well downgradient from the barrier; and,

- The data indicates that concentrations in the Powell Street well have increased for three consecutive quarterly sampling events.

Then an RSO would be prepared and submitted to NYSDEC for approval to augment the barrier wall. The plan would include an evaluation of the barrier and available augmentation options, a design analysis based on the manufacturers recommended design criteria, and the infusion of an additional quantity of Petrofix, electron donors, and/or bio-augmentation (bug juice) as recommended by the analysis to restore/enhance the performance of the barrier.

6.0 PERIODIC ASSESSMENTS/EVALUATIONS

6.1 Climate Change Vulnerability Assessment

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

The site is located in a minimal-risk flood zone (FEMA), 4,000 feet from the nearest coast line, at an elevation of 18 feet AMSL, in a NYC Zone 4 Hurricane risk area. However, the building designs as approved by NYC DOB were completed to Enterprise Green Community Standards which incorporates the NYC Resiliency Design Group recommendations for sustainable development for the dynamic climate.

No climate change vulnerability assessment is needed as it relates to residual soil and groundwater impacts and/or engineering controls. Given that all known residual impacts are below the water table at 14+ feet below surface grade in an area with minimal potential for flooding or erosion and covered with concrete floor slabs, the potential for long term climate change effects to impact the remedy are considered minimal.

The long-term impact from climate change induced increasing water table elevations (from rising sea levels) on the on-site residual impacts and remedial systems could result in the SSDS system becoming permanently inoperable and the Petrofix barrier wall becoming less effective.

The SSDS systems are equipped with water level sensors that turn the systems off when the water table rises above the base of the collection system bedding trench. This is to prevent the system from drawing excessive water vapor or a generating a water induced vacuum. If the system is down for protracted periods there is a potential for vapor to accumulate beneath the slab.

Changing water table elevations over time has the potential to reduce the effectiveness of the Petrofix barrier along the eastern boundary. Raising the water level above the top of the barrier creates a potential migration pathway for untreated groundwater to pass over the barrier. Similarly, if the water table was lowered significantly, untreated impacted water could flow beneath the barrier.

The planned periodic monitoring and assessment of the SSDS operations parameters, water table elevation, and groundwater quality should be sufficient to provide early alert to the changing conditions so an appropriate response, if needed, can be implemented.

6.2 Green Remediation Evaluation

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

There are no water usage, vapor emissions, or ecological disturbances associated with the post remedial action management plan to be evaluated.

Solid waste generated by the required operation and maintenance of the SSDS and groundwater monitoring is minimal and includes:

- Approximately 10-15 gallons of potentially impacted groundwater per sampling event;

- Approximately 100 feet of dedicated downhole disposable LDPE tubing per sampling event; and,
- Approximately 10-12 40 ml VOA bottles per event.

The total waste generation is considered minimal at less than 50 lbs per event or approximately one drum of disposable materials per year of system operations, almost all of which is liquids. Solids (spent tubing and lab ware) would be disposed of as trash. Groundwater will be removed for off-site disposal, discharged to impermeable surfaces and allowed to evaporate, or discharged to the on-site soils in the courtyard area upgradient from the barrier wall with consent of NYSDEC.

The energy use required for the continuous operation of the SSDS(s) assuming three 250 watt blowers operating 24/7/365 is estimated at 6,570 kw-hr/year (less than single family home) but has not been determined. Actual maximum use will be calculated once the optimal blower sizes of the three systems have been determined.

The results of the initial system tests to be completed and used to complete the design blower selection will be submitted to NSYDEC for review and approval before installation. The results of the start-up test and confirmatory sampling data will be submitted with the first annual periodic review report.

6.2.1 Frequency of System Checks, Sampling and Other Periodic Activities

Transportation to and from the Site and use of consumables in relation to visiting the Site in order to conduct system checks and or collect samples and shipping samples to a laboratory for analyses have direct and/or inherent energy costs. The schedule and/or means of these periodic activities have been prepared so that these tasks can be accomplished in a manner that does not impact remedy protectiveness but reduces expenditure of energy or resources.

The planned initial quarterly system checks, site inspections, and groundwater monitoring frequency is the minimal frequency necessary to evaluate the effectiveness of the remedial action program at achieving and maintaining the post-remedial action objectives. Once sufficient data has been generated, a reduction in the monitoring frequency may be implemented as warranted with the consent of NYSDEC.

Telemetric monitoring of the SSDS system is possible for a considerable capital expense but provides no significant benefit. As the manual checks can be accomplished in the same mobilization of field personnel needed to conduct the groundwater sampling events(which must be performed manually) telemetry reduces the field-effort but provides no reduction in the mobilization/demobilization effort.

6.2.2 Metrics and Reporting

As discussed in Section 7.0 and as shown in **Appendix I** – Site Management Forms, information on energy usage, solid waste generation, transportation and shipping, water usage and land use and ecosystems will be recorded to facilitate and document consistent implementation of green remediation during site management and to identify corresponding benefits; a set of metrics has been developed.

6.3 Remedial System Optimization

A Remedial Site Optimization (RSO) study will be conducted any time that the NYSDEC or the remedial party requests in writing that an in-depth evaluation of the remedy is needed. An RSO may be appropriate if any of the following occur:

- The remedial actions have not met or are not expected to meet RAOs in the time frame estimated in the Decision Document;
- The management and operation of the remedial system is exceeding the estimated costs;

- The remedial system is not performing as expected or as designed;
- Previously unidentified source material may be suspected;
- Plume shift has potentially occurred;
- Site conditions change due to development, change of use, change in groundwater use, etc.;
- There is an anticipated transfer of the site management to another remedial party or agency; and
- A new and applicable remedial technology becomes available.

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

The RSO study will focuses on overall site cleanup strategy, process optimization and management with the intent of identifying impediments to cleanup and improvements to site operations to increase efficiency, cost effectiveness and remedial time frames. Green remediation technology and principals are to be considered when performing the RSO.

7.0. REPORTING REQUIREMENTS

7.1 Site Management Reports

All site management inspection, maintenance and monitoring events will be recorded on the appropriate site management forms provided in **Appendix I**. These forms are subject to NYSDEC revision and will be provided in the first Periodic Review Report following construction completion certification and start up tests of SSDS.

All applicable inspection forms and other records, including media sampling data and system maintenance reports, generated for the site during the reporting period will be provided in electronic format to the NYSDEC in accordance with the requirements of **Table E** and summarized in the Periodic Review Report.

Table E: Schedule of Interim Monitoring/Inspection Reports

Task/Report	Reporting Frequency*
Inspection Report	Quarterly
Periodic Review Report	Annually, or as otherwise determined by the Department

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

All interim monitoring/inspections reports will include, at a minimum:

- Date of event or reporting period;
- Name, company, and position of person(s) conducting monitoring/inspection activities;
- Description of the activities performed;

- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents noted (included either on the checklist/form or on an attached sheet);
- Type of samples collected (e.g., sub-slab vapor, indoor air, outdoor air, etc);
- Copies of all field forms completed (e.g., well sampling logs, chain-of-custody documentation, etc.);
- Sampling results in comparison to appropriate standards/criteria;
- A figure illustrating sample type and sampling locations;
- Copies of all laboratory data sheets and the required laboratory data deliverables required for all points sampled (to be submitted electronically in the NYSDEC-identified format);
- Any observations, conclusions, or recommendations; and
- A determination as to whether contaminant conditions have changed since the last reporting event.

Routine maintenance event reporting forms will include, at a minimum:

- Date of event;
- Name, company, and position of person(s) conducting maintenance activities;
- Description of maintenance activities performed;
- Any modifications to the system;
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents noted (included either on the checklist/form or on an attached sheet); and,
- Other documentation such as copies of invoices for maintenance work, receipts for replacement equipment, etc., (attached to the checklist/form).

Non-routine maintenance event reporting forms will include, at a minimum:

- Date of event;
- Name, company, and position of person(s) conducting non-routine maintenance/repair activities;
- Description of non-routine activities performed;

- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents (included either on the form or on an attached sheet); and
- Other documentation such as copies of invoices for repair work, receipts for replacement equipment, etc. (attached to the checklist/form).

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

7.2 Periodic Review Report

A Periodic Review Report (PRR) will be submitted to the Department beginning sixteen (16) months after the Certificate of Completion is issued. After submittal of the initial Periodic Review Report, the next PRR shall be submitted annually to the Department or at another frequency as may be required by the Department. In the event that the site is subdivided into separate parcels with different ownership, a single Periodic Review Report will be prepared that addresses the site described in **Appendix A**-Environmental Easement. The report will be prepared in accordance with NYSDEC's DER-10 and submitted within 30 days of the end of each certification period. Media sampling results will also be incorporated into the Periodic Review Report. The report will include:

- Identification, assessment and certification of all ECs/ICs required by the remedy for the site.
- Results of the required annual site inspections and severe condition inspections, if applicable.
- All applicable site management forms and other records generated for the site during the reporting period in the NYSDEC-approved electronic format, if not previously submitted.
- A summary of any discharge monitoring data and/or information generated during the reporting period, with comments and conclusions.

- Data summary tables and graphical representations of contaminants of concern by media (groundwater, soil vapor, etc.), which include a listing of all compounds analyzed, along with the applicable standards, with all exceedances highlighted. These will include a presentation of past data as part of an evaluation of contaminant concentration trends.

- Results of all analyses, copies of all laboratory data sheets, and the required laboratory data deliverables for all samples collected during the reporting period will be submitted in digital format as determined by the NYSDEC. Currently, data is supplied electronically and submitted to the NYSDEC EQuIS™ database in accordance with the requirements found at this link: http://www.dec.ny.gov/chemical/62440.html.

- A site evaluation, which includes the following:

  - The compliance of the remedy with the requirements of the site-specific RAWP, ROD or Decision Document;

  - The operation and the effectiveness of all treatment units, etc., including identification of any needed repairs or modifications;

  - Any new conclusions or observations regarding site contamination based on inspections or data generated by the Monitoring and Sampling Plan for the media being monitored;

  - Recommendations regarding any necessary changes to the remedy and/or Monitoring and Sampling Plan; and

  - Trends in contaminant levels in the affected media will be evaluated to determine if the remedy continues to be effective in achieving remedial goals as specified by the Decision Document.
  - The overall performance and effectiveness of the remedy.

7.2.1 Certification of Institutional and Engineering Controls

Following the last inspection of the reporting period, a qualified environmental professional or Professional Engineer licensed to practice in New York State will prepare, and include in the Periodic Review Report, the following certification as per the requirements of NYSDEC DER-10:

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

- *The inspection of the site to confirm the effectiveness of the institutional and engineering controls required by the remedial program was performed under my direction;*
- *The institutional control and/or engineering control employed at this site is unchanged from the date the control was put in place, or last approved by the Department;*
- *Nothing has occurred that would impair the ability of the control to protect the public health and environment;*
- *Nothing has occurred that would constitute a violation or failure to comply with any site management plan for this control;*
- *Access to the site will continue to be provided to the Department to evaluate the remedy, including access to evaluate the continued maintenance of this control;*
- *If a financial assurance mechanism is required under the oversight document for the site, the mechanism remains valid and sufficient for the intended purpose under the document;*
- *Use of the site is compliant with the environmental easement;*
- *The engineering control systems are performing as designed and are effective;*
- *To the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program and generally accepted engineering practices; and*
- *The information presented in this report is accurate and complete.*

I certify that all information and statements in this certification form are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law. I, [name], of [business address], am certifying as [Owner/Remedial Party or Owner's/Remedial Party's Designated Site Representative] (and if the site consists of multiple properties): *[I have been authorized and designated by all site owners/remedial parties to sign this certification] for the site."*

For BCP projects, every five years the following certification will be added if applicable:

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

The signed certification will be included in the Periodic Review Report.

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

7.3 Corrective Measures Work Plan

If any component of the remedy is found to have failed, or if the periodic certification cannot be provided due to the failure of an institutional or engineering control, a Corrective Measures Work Plan will be submitted to the NYSDEC for approval. This plan will explain the failure and provide the details and schedule for performing work necessary to correct the failure. Unless an emergency condition exists, no work will be performed pursuant to the Corrective Measures Work Plan until it has been approved by the NYSDEC.

7.4 Remedial Site Optimization Report

In the event that an RSO is to be performed (see Section 6.3, upon completion of an RSO, an RSO report must be submitted to the Department for approval. The RSO report will document the research/ investigation and data gathering that was conducted, evaluate the results and facts obtained, present a revised conceptual site model and present recommendations. RSO recommendations are to be implemented upon approval from the NYSDEC. Additional work plans, design documents, HASPs etc., may still be required to implement the recommendations, based upon the actions that need to be taken. A final engineering report and update to the SMP may also be required.

The RSO report will be submitted, in electronic format, to the NYSDEC Central Office, Regional Office in which the site is located, Site Control and the NYSDOH Bureau of Environmental Exposure Investigation.

8.0 REFERENCES

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

NYSDEC DER-10 – "Technical Guidance for Site Investigation and Remediation".

NYSDEC, 1998. Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1. June 1998 (April 2000 addendum).

TABLES

TABLE 1

Groundwater Elevation Data
Ebenezer Plaza 1 (BCP Site C224240)
Brooklyn, New York

Piezometers Location ID	Date	Top of Casing (ft. AMSL)	Depth to Water (ft. BTOC)	Groundwater Elevation (ft. AMSL)
PZ E-3/4	5/20/2019	20.50	15.80	4.70
PZ E-1/6	5/20/2019	18.69	13.80	4.89
PZ W-1/2	5/20/2019	18.34	13.46	4.88
PZ W-4/5	5/20/2019	18.34	13.55	4.79

Notes:
ft. AMSL - feet above mean sea level
ft. BTOC - feet below top of casing

Well ID	Date	Top of Casing Elevation	DTW (ft)	GW Elevation (ft. amsl)
MW-1	9/20/2019	18.35	14.05	4.30
MW-2	9/20/2019	18.41	14.18	4.23
MW-3	9/20/2019	17.75	13.80	3.95
MW-4	9/20/2019	17.66	13.41	4.25
MW-5	9/20/2019	17.89	13.73	4.16

TABLE 2

Soil Sample Exceedances of RRSCOs and PGWSCOs

Ebenezer Plaza 1 (BCP Site C224240)

Brooklyn, New York

Sample Location / Sampling Date / Units / COMPOUND	NYSDEC Part 375 Soil Cleanup Objectives (SCOs) (mg/kg): Protection of Groundwater (PGWSCO)	Restricted Residential (RRSCO)	MW-IR(14-17) 5/20/2019	MW-IR(17-20) 5/20/2019	W-2R(14--17) 5/20/2019	W-2R(17-20) 5/20/2019	MW-ER(17-20) 5/20/2019	MW-ER(14-17) 5/20/2019	W-5R(14--17) 5/20/2019	W-5R(17-20) 5/20/2019	MW-HR(17-20) 5/20/2019	MW-HR(14-17) 5/20/2019	SBR-4BR(17-20) 5/20/2019	SBR-4BR(14-17) 5/20/2019
			Results (mg/kg)											
Ethyl Benzene	1	41	4.9	2.9	ND	ND	0.002	ND	ND	0.0858	ND	ND	ND	ND
Total Xylenes	1.6	100	14.2	22.5	ND	24.2	ND	ND	ND	ND	ND	ND	ND	ND
n-propylbenzene	3.9	100	28.8	51.5	4.2	66.4	0.0084	18.5	ND	ND	ND	2.7	ND	2.4
1,3,5-Trimethylbenzene	8.4	52	78.4	67	39.9	ND	0.09	11.9	ND	ND	ND	ND	ND	ND
tert-Butylbenzene	5.9	100	2.8	4.1	ND	ND	0.0112	5.8	ND	ND	ND	ND	ND	6
1,2,4-Trimethylbenzene	3.6	52	239	306	276	583	1.7	147	200	ND	0.0047	56.4	0.0019	26
sec-Butylbenzene	11	100	21	31.7	30.2	37.5	0.0308	34.7	ND	ND	ND	6.6	ND	32.7
n-Butylbenzene	12	100	37.9	47	36.6	44.2	0.0097	46.4	ND	ND	ND	9.5	ND	9.7

Sample Location / Sampling Date / Units / COMPOUND	NYSDEC Part 375 Soil Cleanup Objectives (SCOs) (mg/kg): Protection of Groundwater (PGWSCO)	Restricted Residential (RRSCO)	SBR-2BR(14-17) 5/20/2019	SBR-2BR(17-20) 5/20/2019	E2-3R(14-17) 5/20/2019	E2-3R(17-20) 5/20/2019	E3-4R(14-17) 5/20/2019	E3-4R(17-20) 5/20/2019	SBR-3BR(14-17) 5/20/2019	SBR-3BR(17-20) 5/20/2019	E-6R(14-17) 5/20/2019	E-6R(17-20) 5/20/2019	E-7R(14-17) 5/20/2019	E-7R(17-20) 5/20/2019
			Results (mg/kg)											
n-propylbenzene	3.9	100	72	41.3	80.7	28.1	56.5	ND	35.9	15.4	51.2	0.94	12.9	48.4
1,3,5-Trimethylbenzene	8.4	52	ND	ND	117	1.1	109	0.0564	ND	ND	ND	1.5	ND	ND
tert-Butylbenzene	5.9	100	5.5	4.8	9.6	3.1	5.6	ND	4.3	2.6	4.8	ND	2.9	4.9
1,2,4-Trimethylbenzene	3.6	52	359	269	463	14.4	312	3.2	335	11.5	ND	8.1	120	ND
sec-Butylbenzene	11	100	33.8	30.2	61.9	23.7	38	0.42	29.2	16.3	28.8	0.74	18.2	30.5
n-Butylbenzene	12	100	26.3	34.1	98.9	24.3	65.6	0.52	36.7	12.1	22.9	1	28.7	27.3

Sample ID	PART 375 SCOS		MW-1 (12-14)		MW-1 (17-20)		MW-2 (12-14)		MW-2 (20-22)		MW-3 (12.5-14.5)		MW-3 (17-20)		MW-4 (12-14)		MW-4 (16-18)		MW-5 (12-14)		MW-5 (16-18)	
Sampling Date	PGW	RRU	11/18/2019		11/18/2019		11/18/2019		11/18/2019		11/18/2019		11/18/2019		11/19/2019		11/19/2019		11/19/2019		11/19/2019	
Units			mg/kg																			
COMPOUND			R	Q	R	Q	R	Q	R	Q	R	Q	R	Q	R	Q	R	Q	R	Q	R	Q
Ethyl Benzene	1	41	0.0052	U	8.8	D	0.5	U	13.7	JD	0.005	U	5.6		0.29	J	9		1.1	U	15.1	
m/p-Xylenes	1.6	100	0.0104	U	20.6	D	1	U	12	JD	0.0099	U	16.9		1.6	U	15.3		2.1	U	1.3	
o-Xylene	1.6	100	0.0052	U	0.005	U	0.5	U	0.0058	U	0.005	U	5.3	U	0.78	U	5.1	U	1.1	U	12.8	
n-propylbenzene	3.9	100	0.14		46.3	D	0.5	U	58.6	D	0.0013	J	48.8		1.6		32.5		1.1	U	32.3	D
1,3,5-Trimethylbenzene	8.4	52	0.0636		64.3	D	0.5	U	130	D	0.0044	J	138		0.78	U	75.6		1.1	U	80	D
tert-Butylbenzene	5.9	100	0.0988		0.12		0.5	U	0.0787		0.005	U	5.8		1.6		3.1	J	1.1	U	3.3	
1,2,4-Trimethylbenzene	3.6	52	47.8	D	298	D	0.5	U	393	D	0.0076		468	D	2.8		277	D	1.1	U	232	D
sec-Butylbenzene	11	100	9.8	D	29	D	0.5	U	0.16		0.0017	J	40.1		4.3		21.4		1.1	U	15.1	
n-Butylbenzene	12	100	11.2	D	35.7	D	0.5	U	0.13		0.0023	J	39		0.78	U	26.1		1.1	U	21.2	D

VOC compounds identified in any sample at a concentration greater than its respective PGW included

TABLE 3

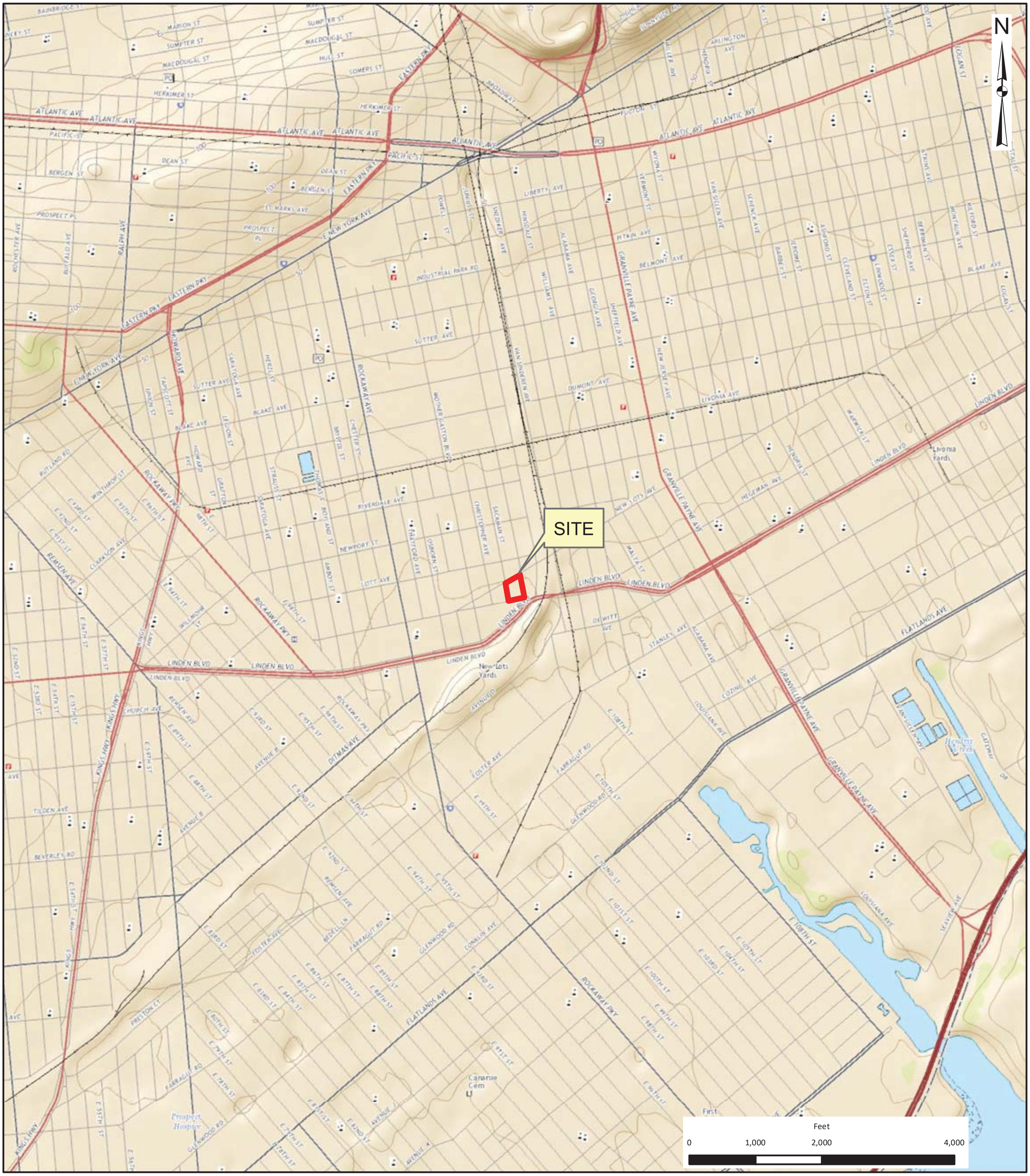
Groundwater Sample Exceedances of TOGS 1.1.1 AWQS

Ebenezer Plaza 1 (BCP Site C224240)

Brooklyn, New York

GROUNDWATER	AWQS	On-site Wells			Off-site Wells	
Compound		MW-1	MW-2	MW-3	MW-4	MW-5
Tetrachloroethene	0.7		1.6	1.3	2.8	1.1
ethylbenzene	5	10.4	110	160	210	88
m/p Xylene	5	22	120	140	250	49.6
0-Xylene	5	2.7	1.4	110	22	40.5
Isopropylbenzene	5	280	300	200	170	94.8
n-propylbenzene	5	520	610	360	340	170
1,3,5 Trimethylbenzene	5		530	170	570	310
tert-butylbenzene	5	37.9	52.4	23.8	20.1	13.9
1,2,4 Trimethylbenzene	5	790	2700	2000	2500	1200
sec-butylbenzene	5	160	260	99.3	87.6	52.4
n-butylbenzene	5	77.6	240	77.4	99.2	49.6
TOTAL VOCS		1900.6	4925.4	3341.8	4271.7	2069.9
reuslts in µg/l						
AWQS per TOGS 111						

FIGURES



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Phone: (518) 812-0513

Ebenezer Plaza 1

Figure 1: Site Location Map

672 Powell Street, Brooklyn, NY

Source: US Topo. 2013 - USGSTopo (MapServer) Layer: USGS TNM Topo Base Map. Accessed 8 February 2017

Drawn:	STF
Date:	2/8/2017
Scale:	1 inch equals 2,000 feet
Project:	20918.06
Figure:	1

Document Path: Z:\projects\20900-20999\20918.05 Ebenezer-Procida\GIS\Maps\Ebenezer1-East\East-SiteLocationMap.mxd

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BRONX, NEW YORK 10469
Ph. (646) 773–4588
Ph. (917) 54–8174
FAX (718) 231–2067

NOTE: I

1). PREMISES SHOWN HEREON IS DESINATED ZONE "X" AND IS NOT LOCATED IN AN AREA OF MINIMAL FLOOD HAZARD AREA AS PER (FIRM) -FLOOD INSURANCE RATE MAP NUMBER 360497021F, COMMUNITY PANEL No. DATED SEPTEMBER 05, 2007.

2). AREA OF LOT No.1, BLOCK No.3862 .AREA= 55,067.75 SQ. FT.

NOTE II:

THIS SURVEY WAS PREPARED IN ACCORDANCE WITH THE CURRENT "CODE OF PRACTICE" OF THE NEW YORK STATE ASSOCIATION OF PROFESSIONAL LAND SURVEYORS (N.Y.S.A.P.L.S.) ALL CERTIFICATIONS HEREON SHALL RUN ONLY TO PERSONS, NAMED HEREON, FOR WHOM THIS SURVEY WAS PREPARED. AND, ON THEIR BEHALF TO ANY, TITLE COMPANY, GOVERNMENT AGENCY OR LENDING INSTITUTION NAMED HEREON.
SAID CERTIFICATIONS ARE NOT TRANSFEREABLE TO ADDITIONAL INSTITUTIONS OR SUBSEQUENT OWNERS.
ANY ALTERATION OR ADDITION TO THIS SURVEY IS A VIOLATION OF SECTION 7209 OF THE NEW YORK STATE EDUCATION LAW, EXCEPT AS PER SECTION 7209 SUB-SECTION 2.

ALL CERTIFICATIONS HEREON ARE VALID FOR THIS MAP AND COPIES THEREOF ONLY IF SAID MAP OR COPIES BEAR THE IMPRESSED SEAL OF THE SURVEYOR WHOSE SIGNATURE APPEARS HEREON

LEGAL DESCRIPTION

Block 3862 Lot No.1

ALL that certain plot, piece or parcel of land situate, lying and being in the Borough of Brooklyn, County of Kings, City and State of New York, bounded and described as follows:

BEGINNING at the corner formed by the intersection of the easterly side of Sackman Street with the southerly side of New Lots Avenue;

THENCE northeasterly along the southeasterly side of New Lots Avenue, 211.94 feet to the corner formed by the southeasterly side of New Lots Avenue with the westerly side of Powell Street;

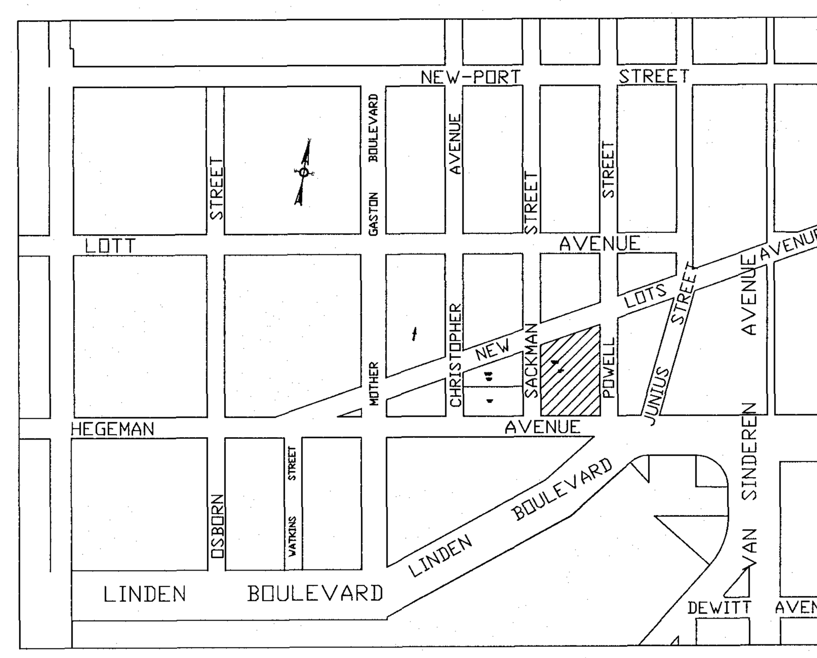
THENCE southerly along the westerly side of Powell Street, 310.42 feet Surv. (310.45 Deed) (310.43' B.F.S. MAP No.47) to the corner formed by the westerly side of Powell Street with the northerly side of Hegeman Avenue;

THENCE westerly along the northerly side of Hegeman Avenue, 200.00 feet to the corner formed by the intersection of the northerly side of Hegeman Avenue with the easterly side of Sackman Street;

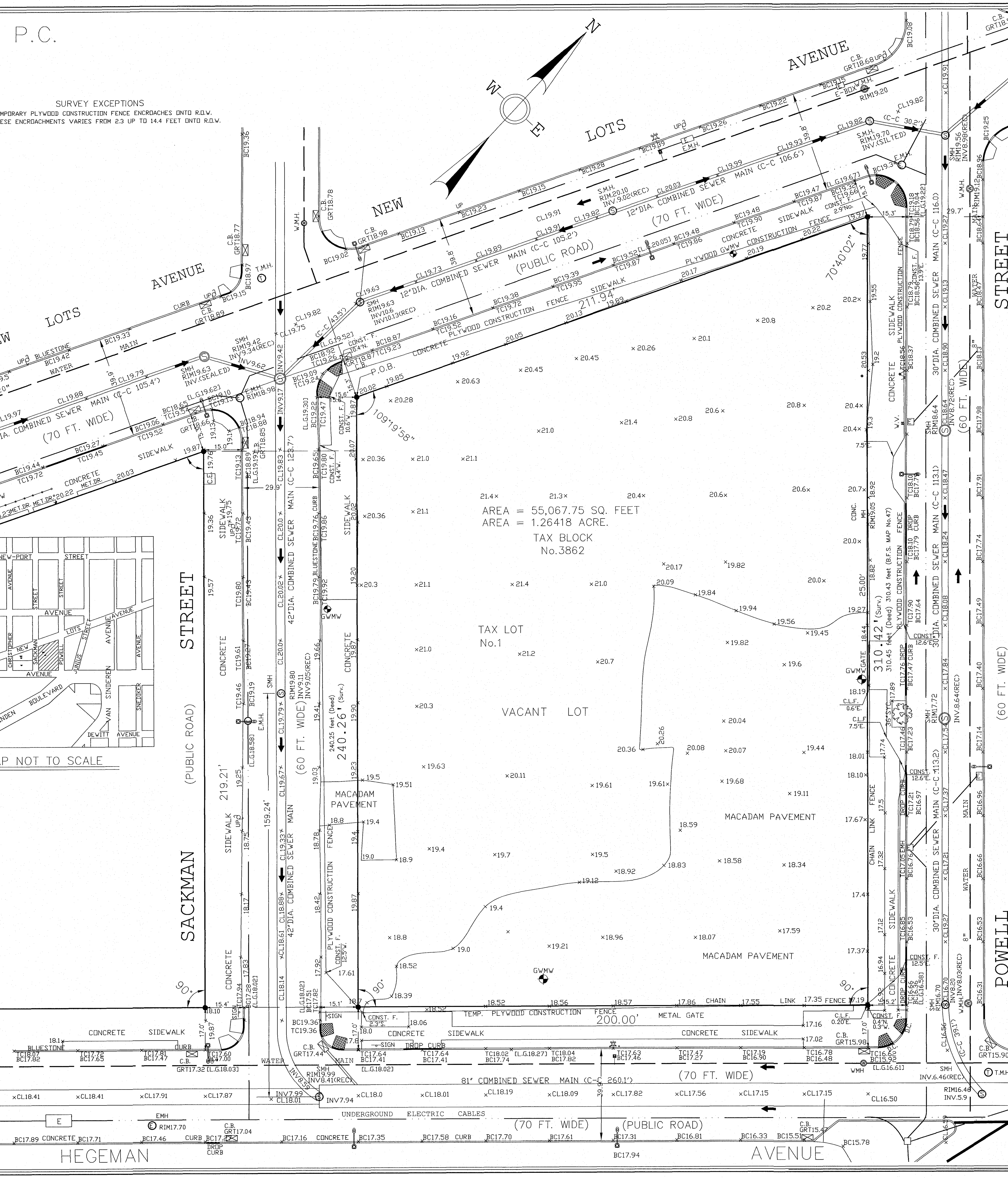
THENCE northerly along the easterly side of Sackman Street, 240.26 feet (Surv.) 240.25 feet (Deed) to the southeasterly side of New Lots Avenue at the point or place of BEGINNING.

THE PROPERTY DESCRIBED HEREON IS THE SAME AS THE PROPERTY DESCRIBED IN NATIONAL STANDARD ABSTRACT, LLC COMMITMENT No. NAS–330475K WITH AN EFFECTIVE DATE OF MAY 24, 2018 AND THAT ALL EASEMENTS, COVENANTS AND RESTRICTIONS REFERENCED REFERENCED IN SAID TITLE COMMITMENT, AND EASEMENTS WHICH THE UNDERSIGNED HAS BEEN ADVISED OR HAS KNOWLEDGE OF, HAVE BEEN PLOTTED HEREON OR OTHERWISE NOTED AS THEIR EFFECT ON THE SUBJECT PROPERTY.

DESIGNATED AS LOT No.01 BLOCK No.3862
AS SHOWN ON THE OFFICIAL TAX MAP OF
THE BOROUGH OF BROOKLYN, KINGS COUNTY, CITY AND
STATE OF NEW YORK.



LOCATION MAP NOT TO SCALE



NOTE III:

1. The information depicted on this map represents the results of surveys made on the dates indicated and can only be considered as indicating the general conditions existing at the time.
2. All elevations refer to NAVD– 1988 ADJUSTMENT
3. TC38.53 Denotes Top Of Curb elevations in feet.
3a. 23.16 Denotes spot elevations in feet.
3b. (BC123.5) Denotes Bottom of Curb elevations in feet.
4. Field data collected using conventional survey methods.
5. Equipment used: Topcon GPT 3000 Total Station .
6. This is to certify that there are no visible streams or natural water courses across the property as shown on this survey.
7. The Underground Utility Information Shown Hereon Is One Of Several Possible Interpretations Of The Record Data As Provided By The Respective Utility Companies. The Location And Depth Of All Underground Utilities Must Be Verified With The Respective Utility Company Prior To Any Design And Construction Or Excavation.

8.There are no observable evidence of cemeteries , graves or burial grounds.on subject property.

9. SUBJECT PROPERTY: a). TAX LOT No.01 IN BLOCK No.3862 IS LOCATED IN M1–1 ZONE ON ZONING MAP No.17D

10. THERE ARE NO VISIBLE EASEMENTS OR RIGHT OF WAY OF WHICH THE UNDERSIGN HAS BEEN ADVISED.
11. THERE ARE OBSERVABLE, ABOVE GROUND ENCROACHMENTS (a) BY THE IMPROVEMENT ON THE SUBJECT PROPERTY UPON ADJOINING STREETS OR ALLEYS.
(b) BY THE IMPROVEMENT ON THE ADJOINING PROPERTIES, STREETS OR ALLEYS, UPON THE SUBJECT POPERTY.
12. THE SUBJECT PROPERTY HAS ACCESS TO AND FROM HEGEMAN AVEENUE, POWELL STREET, SACKMAN STREET AND NEW LOTS AVENUE FOUR DULY DEDICATED AND ACCEPTED PUBLIC STREETS.
13. THE SUBJECT PROPERTY DOES NOT SERVE ANY ADJOINING PROPERTY FOR DRAINAGE, UTILITY OR INGRESS OR EGRESS.
14. THE RECORD DESCRIPTION OF THE SUBJECT PROPERTY FORM A MATHEMATICALLY CLOSED FIGURE WITHIN+/– 0.10 FOOT.
14A THERE ARE NO GAPS OR GORES WITHIN ANY PORTION OF SUBJECT PROPERTY.
15. THERE ARE NO OBSERVED EVIDENCE OR RECORD OF ANY PARTY WALL ADJACENT TO SUBJECT PROPERTY
16. THERE ARE NO OBSERVED EVIDENCE OF CURRENT EARTH MOVING WORK, BUILDING CONSTRUCTION OR BUILDING ADDITIONS.
17. THERE IS NO PROPOSED CHANGES IN THE RIGHT OF WAY LINES. ADJACENT TO OR AFFECTING SUBJECT PROPERTY
18. THERE IS NO EVIDENCE OF SUBJECT PROPERTY USED AS SOLID WASTE DUMP, SUMP OR LANDFILL
19. THERE IS NO EVIDENCE OF WATERCOURSE OR WETLANDS ON OR ACROSS SUBJECT PROPERTY
20. THERE IS NO IMPROVEMENTS WITHIN ANY OFFSITE EASEMENTS OR SERVITUDES BENEFITING THE SURVEYED PROPERTY THAT AE DISCLOSED IN ANY RECORD DOCUMENTS PROVIDED TO US.

JOB # F15–113_ALT_BLY_47

TITLE No.NSA–330475K

ALTA / NSPS
Land Title Survey
OF
PROPERTY BELONGING
TO
EBENEZER PLAZA OWNER LLC
KNOWN AS
672 POWELL STREET
BOROUGH OF BROOKLYN
SITUATE IN THE
CITY AND
STATE OF NEW YORK.

SURVEYORS CERTIFICATE

I HEREBY CERTIFY TO EBENEZER PLAZA OWNER LLC,
EBENEZER DEVELOPMENT LLC,
HP EBENEZER PLAZA HOUSING DEVELOPMENT FUND COMPANY, INC.
CHURCH OF GOD OF EAST FLATBUSH
HOUSING PARTNERSHIP DEVELOPMENT CORPORATION, ISAOA,
NYC PARTNERSHIP HOUSING DEVELOPMENT FUND COMPANY, INC.
THE CITY OF NEW YORK, acting by and through its DEPARTMENT OF HOUSING PRESERVATION AND DEVELOPMENT, ISAOA,
NEW YORK CITY HOUSING DEVELOPMENT CORPORATION, ISAOA,
NATIONAL EQUITY FUND, INC., ISAOA
NEF ASSIGNMENT CORPORATION, AN ILLINOIS NOT–FOR PROFIT CORPORATION
COLUMN FINANCIAL, INC., A DELAWARE CORPORATION, ISAOA
BANK OF AMERICA, ISAOA
NATIONAL STANDARD ABSTRACT LLC.
OLD REPUBLIC NATIONAL TITLE INSURANCE COMPANY AND TO THEIR RESPECTIVE SUCCESSORS AND OR ASSIGNS, AS THEIR INTEREST MAY APPEAR THAT:

" I MADE AN ON THE GROUND SURVEY PER RECORD DESCRIPTION OF THE LAND SHOWN HEREON LOCATED IN THE BOROUGH OF THE BRONX, CITY AND STATE OF NEW YORK ON JULY 17, 2015; AND THAT IT AND THIS MAP WAS MADE IN ACCORDANCE WITH THE HUD SURVEY INSTRUCTIONS AND REPORT, HUD 92457M, AND THE REQUIREMENTS FOR AN ALTA/NSPS LAND TITLE SURVEY, AS DEFINED IN THE 2016 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/NSPS LAND TITLE SURVEYS.

TO THE BEST OF MY KNOWLEDGE, BELIEF AND INFORMATION, EXCEPT AS SHOWN HEREON: THERE ARE NO ENCROACHMENTS EITHER WAY ACROSS PROPERTY LINES; TITLE LINES AND LINES OF ACTUAL POSSESSION ARE THE SAME; AND THE PREMISES ARE FREE OF ANY 100/500 YEAR RETURN FREQUENCY FLOOD HAZARD, AND SUCH FLOOD FREE CONDITIONS IS SHOWN ON THE FEDERAL FLOOD INSURANCE RATE MAP, COMMUNITY PANEL No.3604970217F."

THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2016 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/ NSPS LAND TITLE SURVEYS,
JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, AND INCLUDES ITEM 2,3,4,5,6A,6B,7A,7B–1,8,9,10,10B,11A,11B,12,13,14,15,16,17 & 20 OF TABLE A THEREOF.

THE FIELDWORK WAS COMPLETED ON JULY 17, 2015
DATE MAP DRAFTED : AUGUST 04, 2015
DATE MAP UPDATE : MARCH 29, 2016
DATE MAP UPDATE : APRIL 04, 2016
DATE MAP UPDATE : AUGUST 17, 2016
DATE MAP UPDATE : AUGUST 29, 2016
DATE MAP UPDATE : OCTOBER 01, 2016
DATE MAP UPDATE : JULY 07, 2017
ADDITIONAL FIELDWORK COMPLETED ON OCTOBER 19, 2017
DATE MAP UPDATE : OCTOBER 28, 2017
ADDITIONAL FIELDWORK COMPLETED ON JUNE 01, 2018
DATE MAP UPDATE : JUNE 05, 2018
DATE MAP UPDATE : JUNE 19, 2018
DATE MAP UPDATE : JUNE 20, 2018

LEGEND

FIRE HYDRANT
DRAIN MANHOLE
WATER MANHOLE
SEWER MANHOLE
CATCH BASIN
GAS VALVE
WATER VALVE
PEDESTRIAN RAMP
STREET LIGHT — L.P.
UTILITY POLE
TREE/DIA./NAME — 16"SYC.
TOP OF CURB ELEVATION — TCXXX
BOT. OF CURB ELEVATION — BCXXX
SPOT ELEVATION — ELXXX
LEGAL GRADE — [L.G.XXXX]
LEGAL GRADE — [L.G.XXXX]
DROP CURB
UNDERGROUND ELECTRIC CABLE
ELECTRIC BOX
TRAFFIC SIGN — SIGN
GAS MAIN
WATER MAIN
SEWER MAIN
CABLE TV

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

Signature:

DATE: JUNE 19, 2018

NAME : NEVILLE V. RAMSAY

STATE OF NEW YORK NEVILLE V. RAMSAY 050294-1 LICENSED LAND SURVEYOR

Registration No: 050294–1

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North Country Office:
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Phone: (518) 812-0513

Ebenizer Plaza 1

Figure 3: Tax Map
Hegeman and New Lots Avenues
Borough of Brooklyn, Kings County, New York

Source: NYS Department of Transportation 2008 Roads dataset;
NYC.gov Digital Tax Map Service, Accessed 10/6/2017

Drawn:	STF
Date:	10/12/2017
Scale:	1 inch equals 100 feet
Project:	20918.06
Figure:	3

Document Path: Z:\projects\20900-20999\20918.05 Ebenezer-Procida\GIS\maps\ebenezer1-east\East-taxmap.mxd

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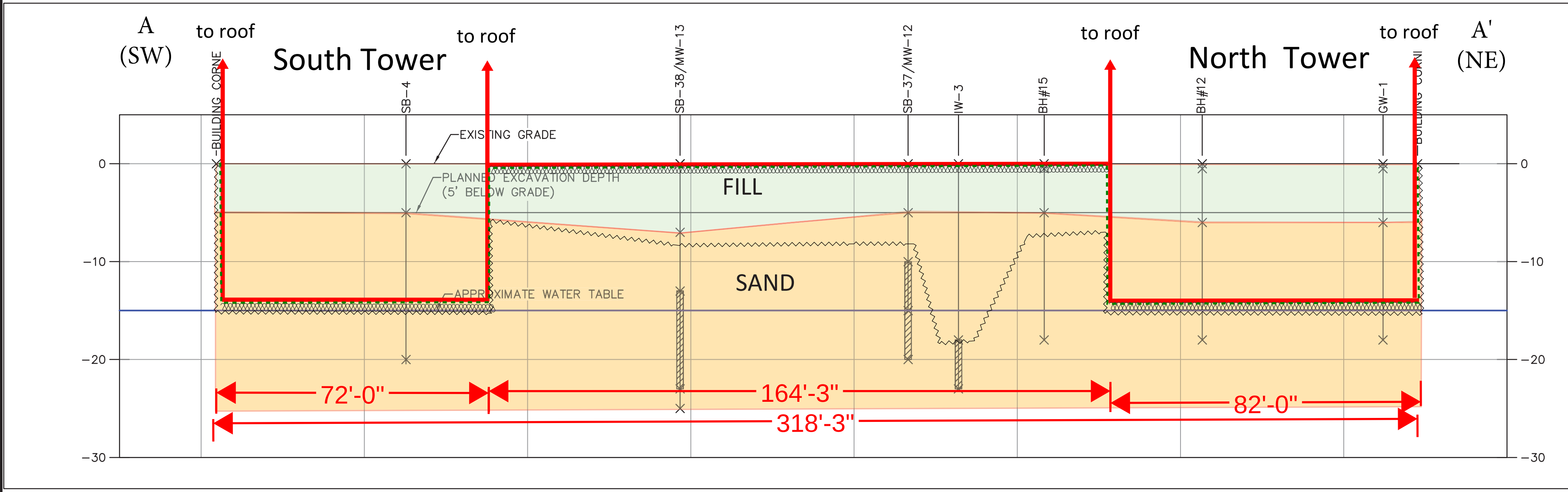
Ebenezer Plaza 1

Figure 4: Cross Section Transects
672 Powell Street, Brooklyn, NY

Source: NYS Department of Transportation 2008 Roads Dataset
NYS Office of Technology 2018 Orthophoto Imagery

Drawn:	BWF
Date:	8/13/2019
Scale:	1 inch equals 73 feet
Project:	20918.09
Figure:	2

Document Path: Z:\projects\20900-20999\20918.06 EP-1\SMP-Site Management Plan\GIS\Figure 2_Site Bondary and Layout.mxd



limits of excavated soils

SSDS

VBS

New Structures

40'-0"

scale

Vx = 2.5:1

Drawing Name: Z:\projects\20900-20999\20918.05 Ebenezer-Procida\GIS\Ebenezer 1.dwg Date Printed: Nov 18, 2016, 4:49pm

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Tennessee Office: 3200 West End Avenue, Suite 500, Nashville, Tennessee 37203, Phone: (615) 783-1628

☐ North Country Office: 375 Bay Road, Queensbury, New York 12804, Phone: (518) 812-0513

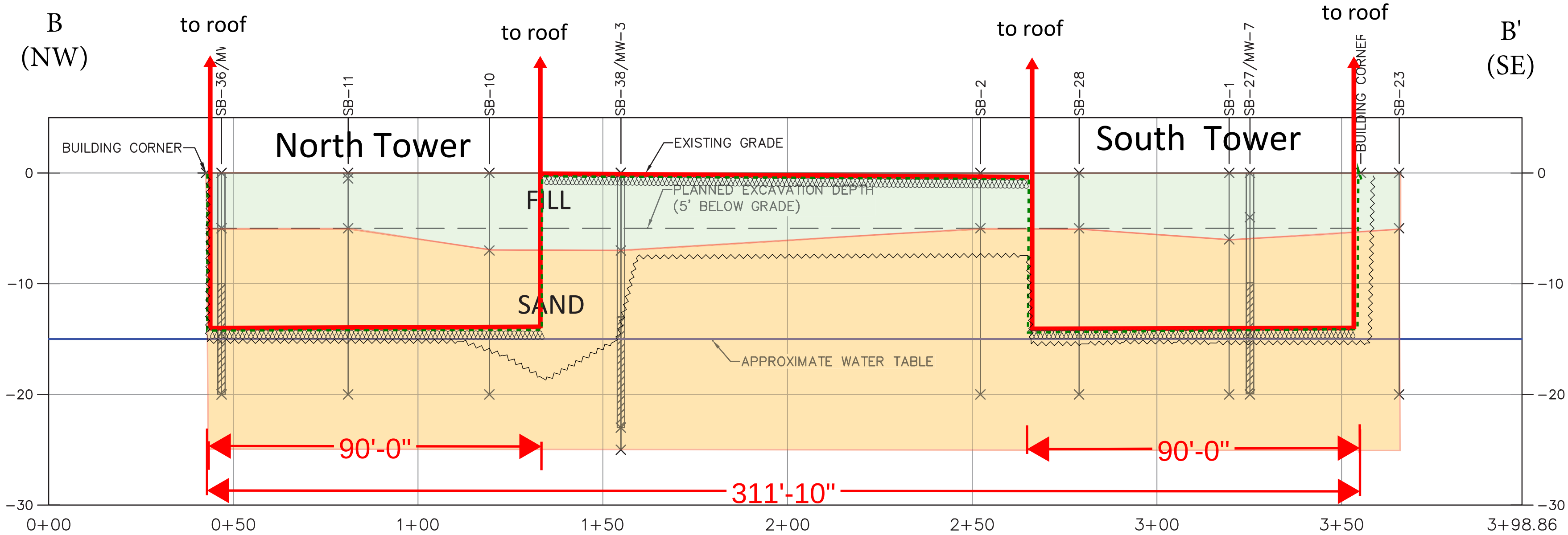
☐ Central NY Office: 721 East Genesee Street, Syracuse, New York 13210, Phone: (315) 251-1013

EBENEZER PLAZA 1

Figure 4a: CROSS SECTION A-A'

BOROUGH OF BROOKLYN, KINGS COUNTY, NEW YORK

designed	checked
LEG	WGO
date	scale
11/16/16	AS SHOWN
project no.	
20918.05	
sheet no.	
Figure 4a	



limits of excavated soils

SSDS

VBS

New Structures

40'-0"

scale

Vx = 2.5:1

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- [ ] North Country Office: 375 Bay Road, Queensbury, New York 12804, Phone: (518) 812-0513
- [ ] Central NY Office: 721 East Genesee Street, Syracuse, New York 13210, Phone: (315) 251-1013

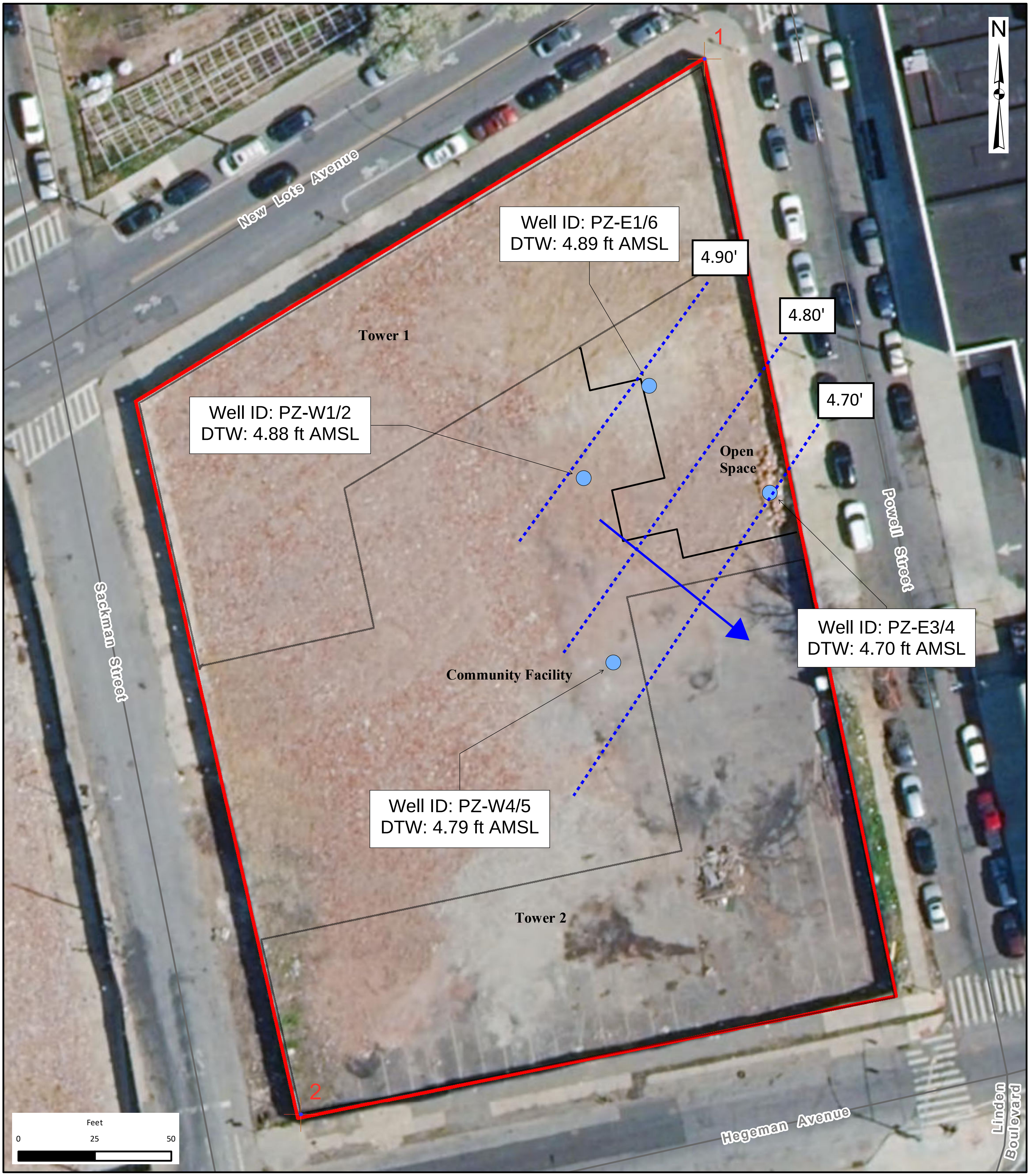
EBENEZER PLAZA 1

Figure 4b:
CROSS SECTION
B-B'

BOROUGH OF BROOKLYN, KINGS COUNTY, NEW YORK

designed	checked
LEG	WGO
date 11/16/16	scale AS SHOWN
project no. 20918.05	
sheet no. Figure 4b	

Drawing Name: Z:\projects\20900-20999\20918.05 Ebenezer-Procida\GIS\Ebenezer 1.dwg Date Printed: Nov 18, 2016, 4:46pm



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Phone: (518) 812-0513

Ebenezer Plaza 1

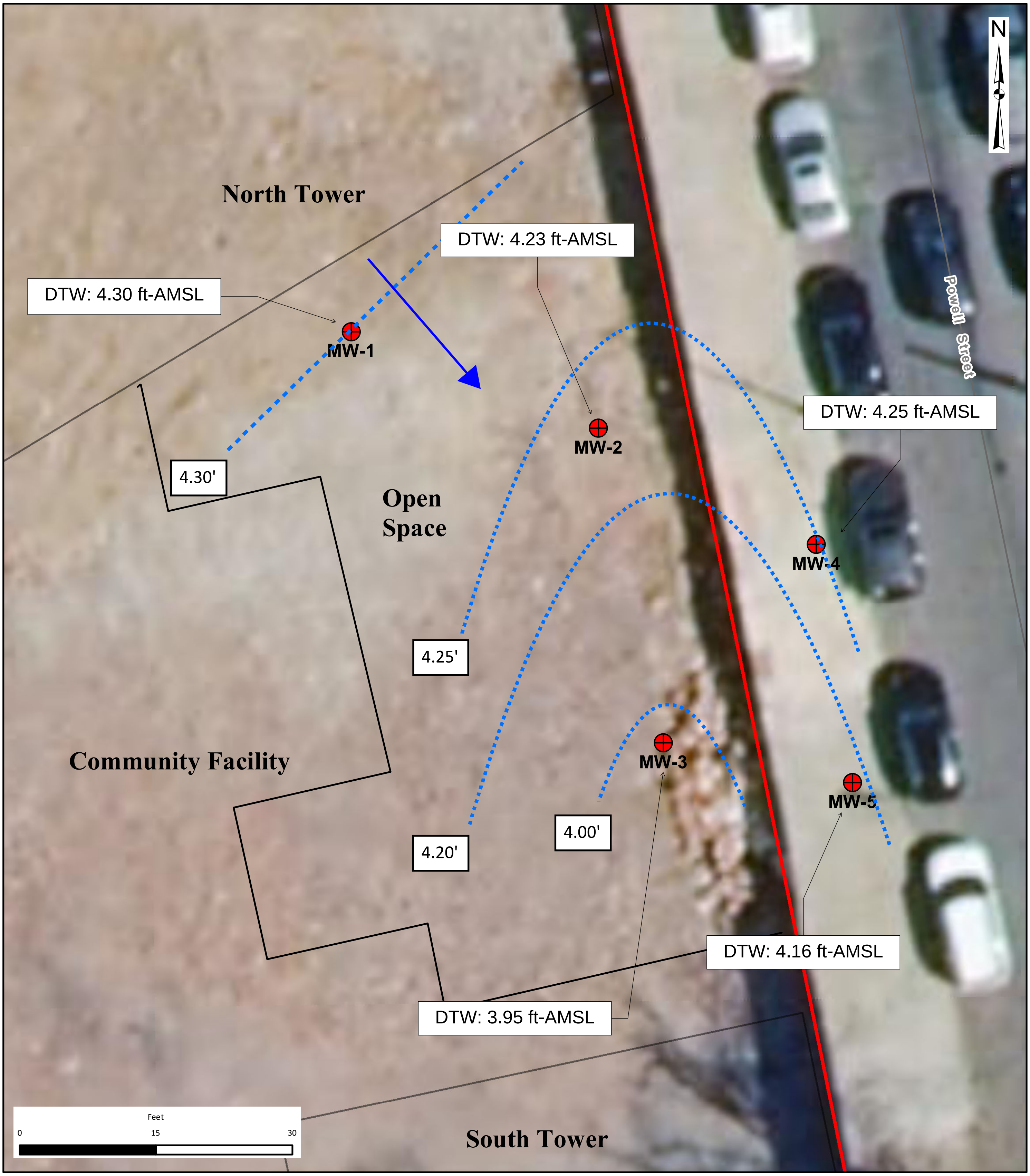
Figure 5: Groundwater Contour Map (May 20, 2019)

672 Powell Street, Brooklyn, NY

Source: NYS Department of Transportation 2008 Roads Dataset
NYS Office of Technology 2018 Orthophoto Imagery

Drawn:	BWF
Date:	8/13/2019
Scale:	1 inch equals 43 feet
Project:	20918.07
Figure:	5

Document Path: Z:\projects\20900-20999\20918.06 EP-1\SMP-Site Management Plan\GIS\Figure 5_GW Contour.mxd



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Phone: (518) 273-0055

North Country Office:
375 Bay Road, Queensbury, NY 12804
Phone: (518) 812-0513

Ebenezer Plaza 1 - BCP No. 224240

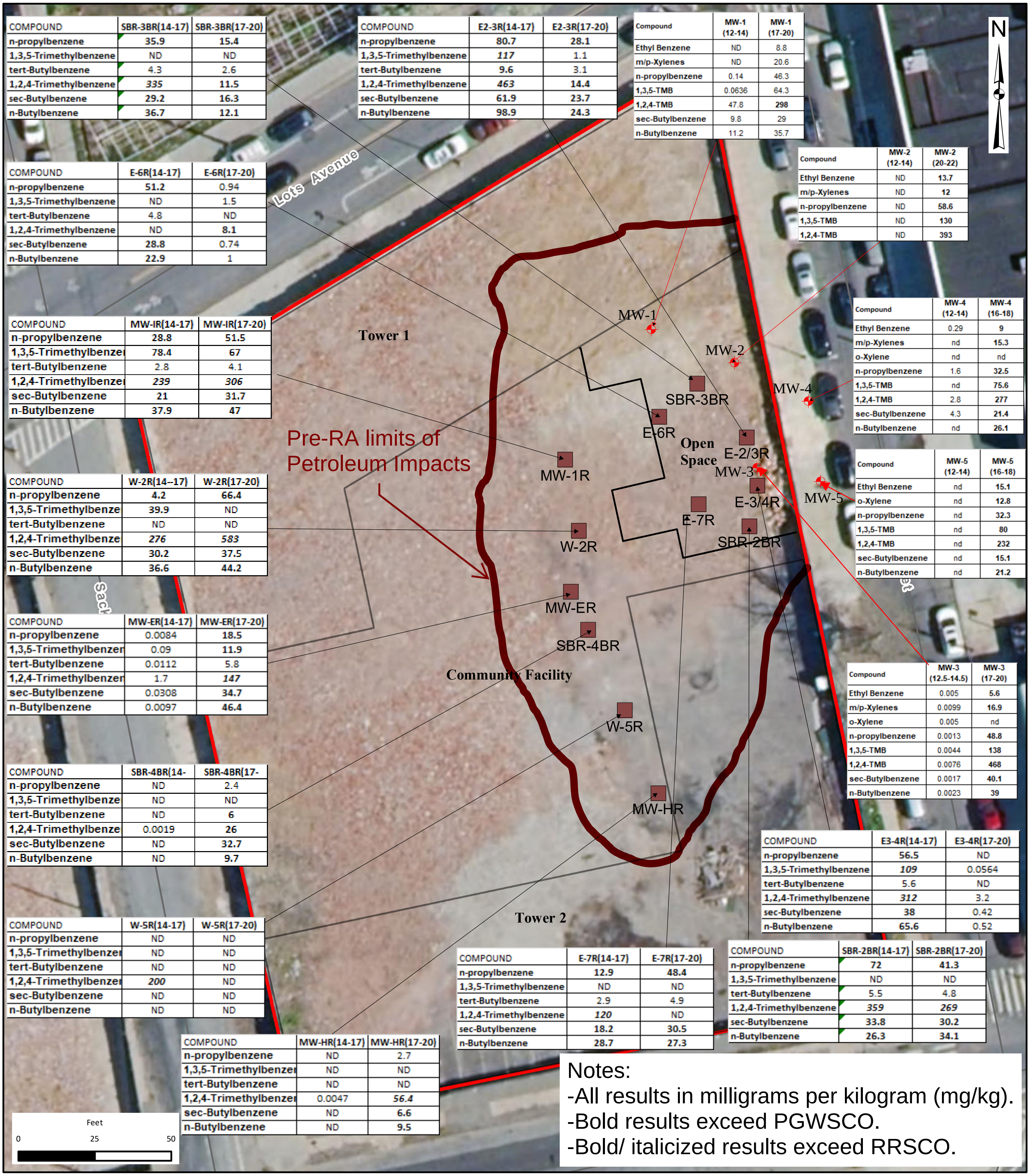
Figure 5b: Well Location and Groundwater Contour Map, November 2019

672 Powell Street, Brooklyn, NY

Source: NYS Department of Transportation 2008 Roads Dataset
NYS Office of Technology 2018 Orthophoto Imagery

Drawn:	BWF
Date:	12/2/2019
Scale:	1 inch equals 15 feet
Project:	20918.06
Figure:	5b

Document Path: Z:\projects\20900-20999\20918.06 EP-1\SMP-Site Management Plan\GIS\Figure 5b_GW Contour-November 2019.mxd



COMPOUND	SBR-3BR(14-17)	SBR-3BR(17-20)
n-propylbenzene	**35.9**	**15.4**
1,3,5-Trimethylbenzene	ND	ND
tert-Butylbenzene	4.3	2.6
1,2,4-Trimethylbenzene	***335***	**11.5**
sec-Butylbenzene	**29.2**	**16.3**
n-Butylbenzene	**36.7**	**12.1**

COMPOUND	E2-3R(14-17)	E2-3R(17-20)
n-propylbenzene	**80.7**	**28.1**
1,3,5-Trimethylbenzene	***117***	1.1
tert-Butylbenzene	**9.6**	3.1
1,2,4-Trimethylbenzene	***463***	**14.4**
sec-Butylbenzene	**61.9**	**23.7**
n-Butylbenzene	**98.9**	**24.3**

Compound	MW-1 (12-14)	MW-1 (17-20)
Ethyl Benzene	ND	8.8
m/p-Xylenes	ND	20.6
n-propylbenzene	0.14	46.3
1,3,5-TMB	0.0636	64.3
1,2,4-TMB	47.8	**298**
sec-Butylbenzene	9.8	29
n-Butylbenzene	11.2	35.7

Compound	MW-2 (12-14)	MW-2 (20-22)
Ethyl Benzene	ND	**13.7**
m/p-Xylenes	ND	**12**
n-propylbenzene	ND	**58.6**
1,3,5-TMB	ND	**130**
1,2,4-TMB	ND	**393**

COMPOUND	E-6R(14-17)	E-6R(17-20)
n-propylbenzene	**51.2**	0.94
1,3,5-Trimethylbenzene	ND	1.5
tert-Butylbenzene	4.8	ND
1,2,4-Trimethylbenzene	ND	**8.1**
sec-Butylbenzene	**28.8**	0.74
n-Butylbenzene	**22.9**	1

COMPOUND	MW-IR(14-17)	MW-IR(17-20)
n-propylbenzene	**28.8**	**51.5**
1,3,5-Trimethylbenzene	**78.4**	**67**
tert-Butylbenzene	2.8	4.1
1,2,4-Trimethylbenzene	***239***	***306***
sec-Butylbenzene	**21**	**31.7**
n-Butylbenzene	**37.9**	**47**

Compound	MW-4 (12-14)	MW-4 (16-18)
Ethyl Benzene	0.29	**9**
m/p-Xylenes	nd	**15.3**
o-Xylene	nd	nd
n-propylbenzene	1.6	**32.5**
1,3,5-TMB	nd	**75.6**
1,2,4-TMB	2.8	**277**
sec-Butylbenzene	4.3	**21.4**
n-Butylbenzene	nd	**26.1**

Compound	MW-5 (12-14)	MW-5 (16-18)
Ethyl Benzene	nd	**15.1**
o-Xylene	nd	**12.8**
n-propylbenzene	nd	**32.3**
1,3,5-TMB	nd	**80**
1,2,4-TMB	nd	**232**
sec-Butylbenzene	nd	**15.1**
n-Butylbenzene	nd	**21.2**

COMPOUND	W-2R(14--17)	W-2R(17-20)
n-propylbenzene	4.2	**66.4**
1,3,5-Trimethylbenzene	**39.9**	ND
tert-Butylbenzene	ND	ND
1,2,4-Trimethylbenzene	***276***	***583***
sec-Butylbenzene	**30.2**	**37.5**
n-Butylbenzene	**36.6**	**44.2**

COMPOUND	MW-ER(14-17)	MW-ER(17-20)
n-propylbenzene	0.0084	**18.5**
1,3,5-Trimethylbenzene	0.09	**11.9**
tert-Butylbenzene	0.0112	5.8
1,2,4-Trimethylbenzene	1.7	***147***
sec-Butylbenzene	0.0308	**34.7**
n-Butylbenzene	0.0097	**46.4**

Compound	MW-3 (12.5-14.5)	MW-3 (17-20)
Ethyl Benzene	0.005	**5.6**
m/p-Xylenes	0.0099	**16.9**
o-Xylene	0.005	nd
n-propylbenzene	0.0013	**48.8**
1,3,5-TMB	0.0044	**138**
1,2,4-TMB	0.0076	**468**
sec-Butylbenzene	0.0017	**40.1**
n-Butylbenzene	0.0023	**39**

COMPOUND	SBR-4BR(14-	SBR-4BR(17-
n-propylbenzene	ND	2.4
1,3,5-Trimethylbenzene	ND	ND
tert-Butylbenzene	ND	6
1,2,4-Trimethylbenzene	0.0019	**26**
sec-Butylbenzene	ND	**32.7**
n-Butylbenzene	ND	**9.7**

COMPOUND	E3-4R(14-17)	E3-4R(17-20)
n-propylbenzene	**56.5**	ND
1,3,5-Trimethylbenzene	***109***	0.0564
tert-Butylbenzene	5.6	ND
1,2,4-Trimethylbenzene	***312***	3.2
sec-Butylbenzene	**38**	0.42
n-Butylbenzene	**65.6**	0.52

COMPOUND	W-5R(14-17)	W-5R(17-20)
n-propylbenzene	ND	ND
1,3,5-Trimethylbenzene	ND	ND
tert-Butylbenzene	ND	ND
1,2,4-Trimethylbenzene	***200***	ND
sec-Butylbenzene	ND	ND
n-Butylbenzene	ND	ND

COMPOUND	E-7R(14-17)	E-7R(17-20)
n-propylbenzene	**12.9**	**48.4**
1,3,5-Trimethylbenzene	ND	ND
tert-Butylbenzene	2.9	4.9
1,2,4-Trimethylbenzene	***120***	ND
sec-Butylbenzene	**18.2**	**30.5**
n-Butylbenzene	**28.7**	**27.3**

COMPOUND	SBR-2BR(14-17)	SBR-2BR(17-20)
n-propylbenzene	**72**	**41.3**
1,3,5-Trimethylbenzene	ND	ND
tert-Butylbenzene	5.5	4.8
1,2,4-Trimethylbenzene	***359***	***269***
sec-Butylbenzene	**33.8**	**30.2**
n-Butylbenzene	**26.3**	**34.1**

COMPOUND	MW-HR(14-17)	MW-HR(17-20)
n-propylbenzene	ND	2.7
1,3,5-Trimethylbenzene	ND	ND
tert-Butylbenzene	ND	ND
1,2,4-Trimethylbenzene	0.0047	***56.4***
sec-Butylbenzene	ND	**6.6**
n-Butylbenzene	ND	**9.5**

Notes:
-All results in milligrams per kilogram (mg/kg).
-Bold results exceed PGWSCO.
-Bold/ italicized results exceed RRSCO.

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Ebenezer Plaza 1

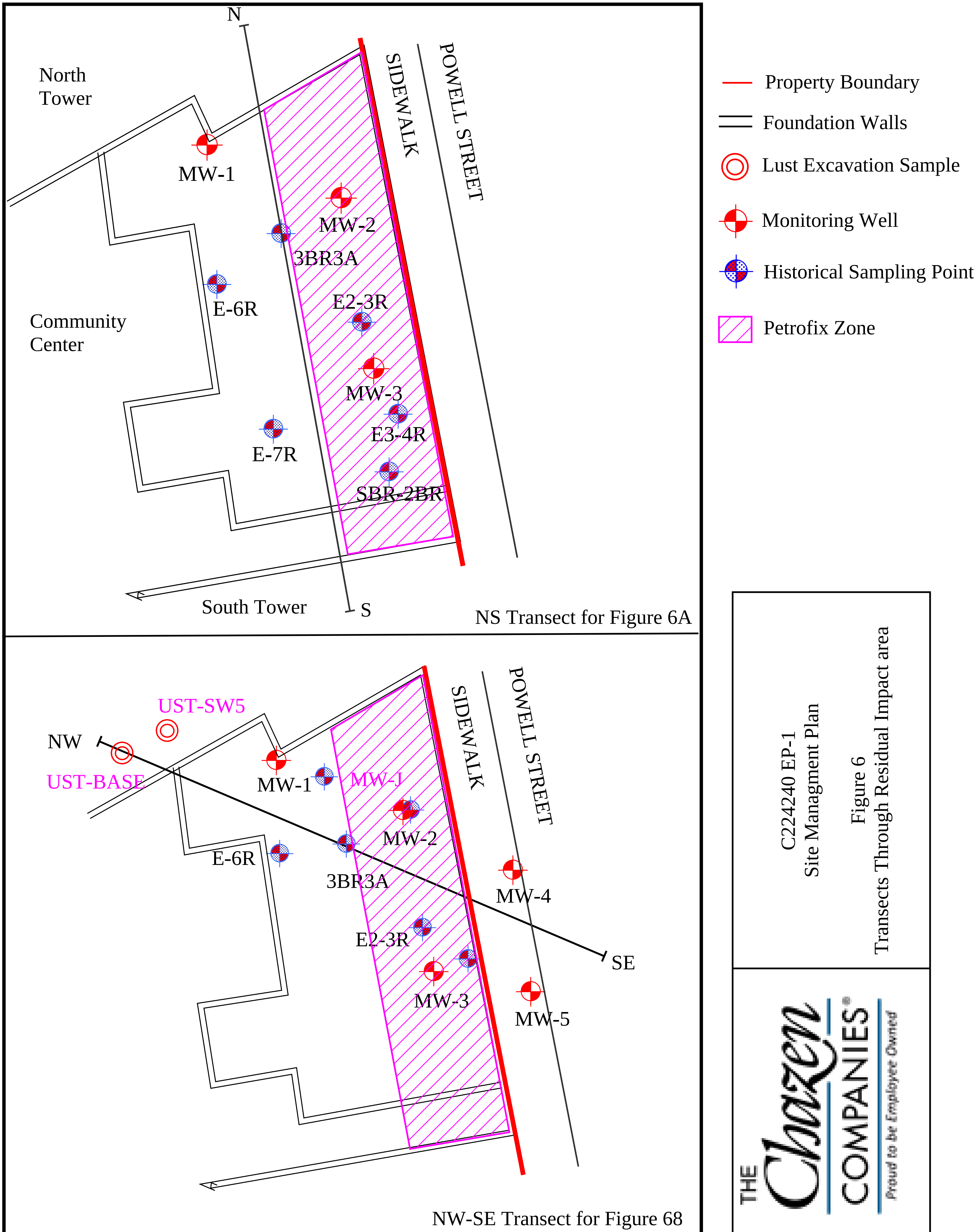
Figure 6: Post 2019 ISCO Soil Sample Locations with Remaining RRSCO and PGWSCO Exceedances (May 20, 2019)

672 Powell Street, Brooklyn, NY

Source: NYS Department of Transportation 2008 Roads Dataset
NYS Office of Technology 2018 Orthophoto Imagery

Drawn:	BWF
Date:	8/13/2019
Scale:	1 inch equals 43 feet
Project:	20918.07
Figure:	6

Document Path: Z:\projects\20900-20999\20918.06 EP-1\SMP-Site Management Plan\GIS\Figure 6_Soil Exceedances.mxd



C224240 EP-1
Site Managment Plan

Figure 6
Transects Through Residual Impact area

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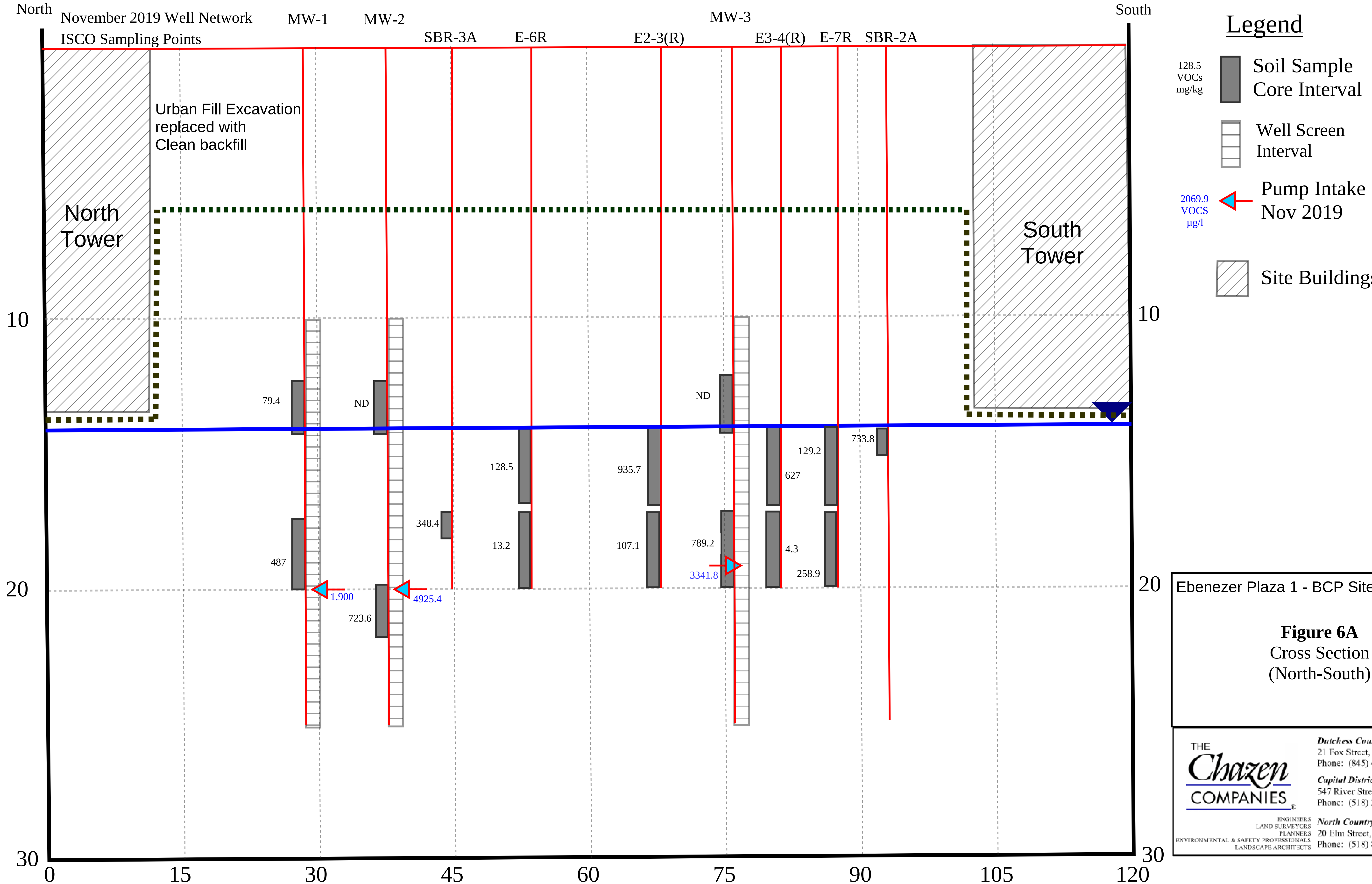

Ebenezer Plaza 1 - BCP Site No. C224240

Figure 6A
Cross Section
(North-South)

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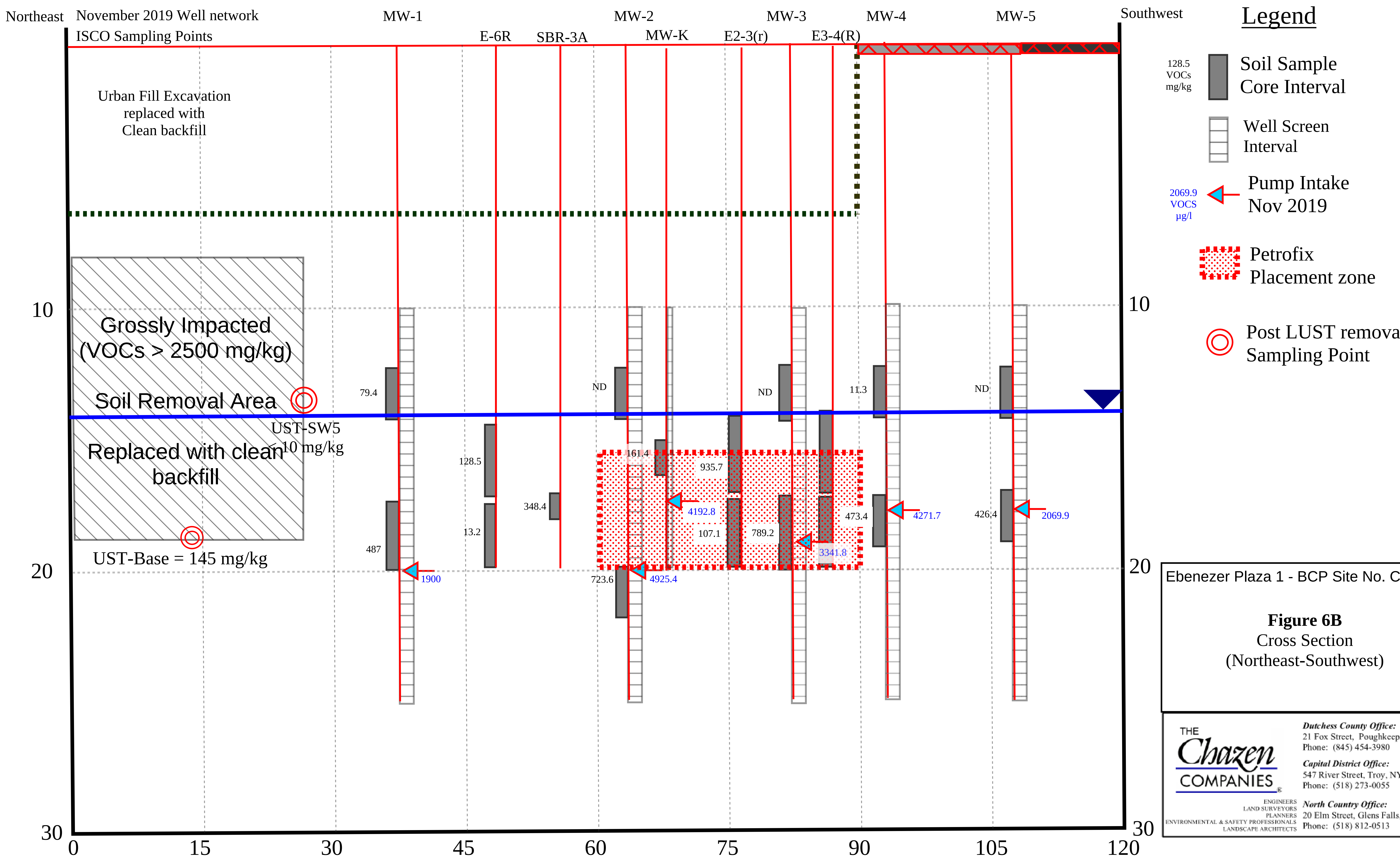

Ebenezer Plaza 1 - BCP Site No. C224240

Figure 6B
Cross Section
(Northeast-Southwest)

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North Country Office:
20 Elm Street, Glens Falls, NY 12801
Phone: (518) 812-0513

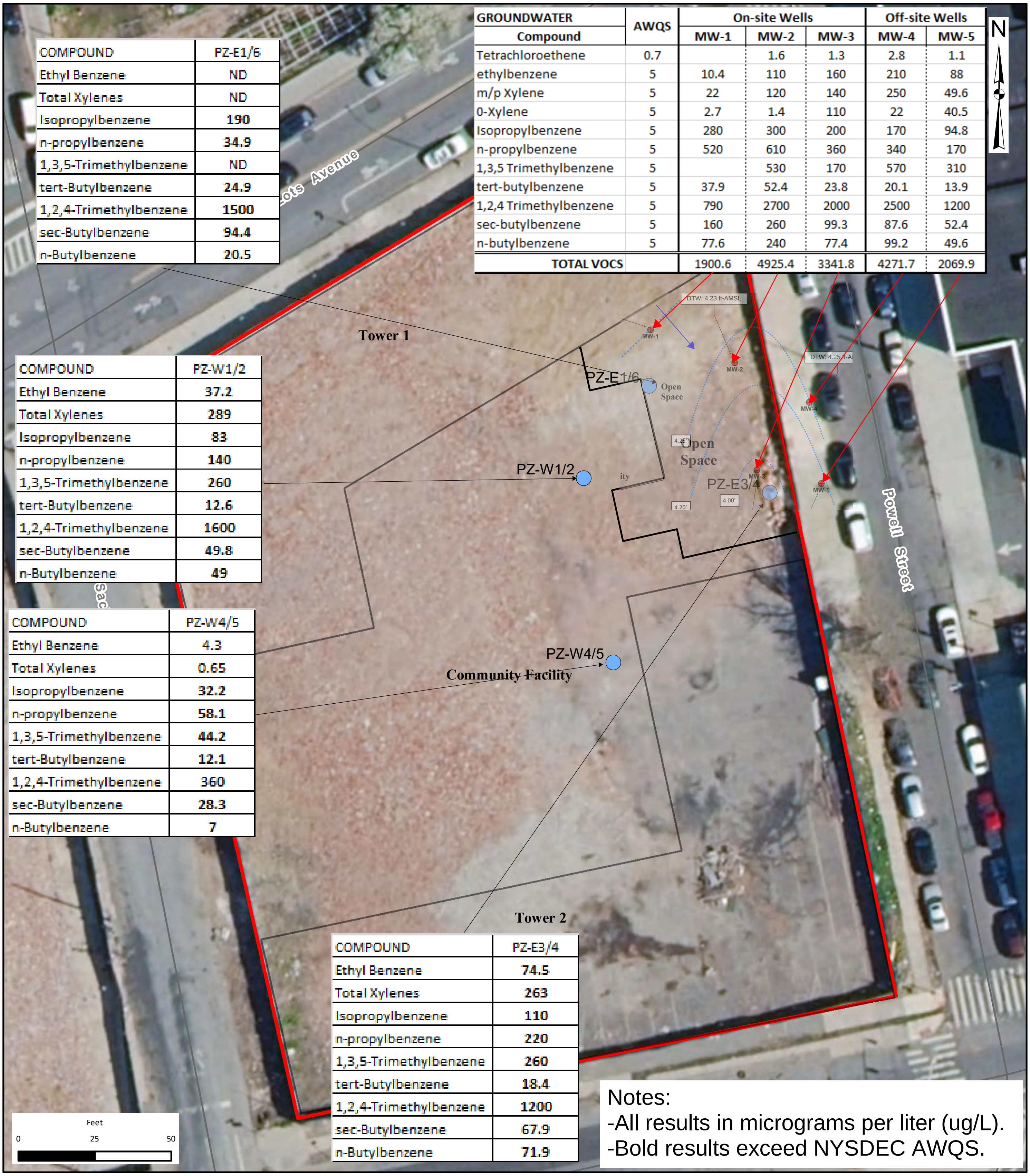
GROUNDWATER Compound	AWQS	On-site Wells MW-1	On-site Wells MW-2	On-site Wells MW-3	Off-site Wells MW-4	Off-site Wells MW-5
Tetrachloroethene	0.7		1.6	1.3	2.8	1.1
ethylbenzene	5	10.4	110	160	210	88
m/p Xylene	5	22	120	140	250	49.6
0-Xylene	5	2.7	1.4	110	22	40.5
Isopropylbenzene	5	280	300	200	170	94.8
n-propylbenzene	5	520	610	360	340	170
1,3,5 Trimethylbenzene	5		530	170	570	310
tert-butylbenzene	5	37.9	52.4	23.8	20.1	13.9
1,2,4 Trimethylbenzene	5	790	2700	2000	2500	1200
sec-butylbenzene	5	160	260	99.3	87.6	52.4
n-butylbenzene	5	77.6	240	77.4	99.2	49.6
TOTAL VOCS		1900.6	4925.4	3341.8	4271.7	2069.9

COMPOUND	PZ-E1/6
Ethyl Benzene	ND
Total Xylenes	ND
Isopropylbenzene	**190**
n-propylbenzene	**34.9**
1,3,5-Trimethylbenzene	ND
tert-Butylbenzene	**24.9**
1,2,4-Trimethylbenzene	**1500**
sec-Butylbenzene	**94.4**
n-Butylbenzene	**20.5**

COMPOUND	PZ-W1/2
Ethyl Benzene	**37.2**
Total Xylenes	**289**
Isopropylbenzene	**83**
n-propylbenzene	**140**
1,3,5-Trimethylbenzene	**260**
tert-Butylbenzene	**12.6**
1,2,4-Trimethylbenzene	**1600**
sec-Butylbenzene	**49.8**
n-Butylbenzene	**49**

COMPOUND	PZ-W4/5
Ethyl Benzene	4.3
Total Xylenes	0.65
Isopropylbenzene	**32.2**
n-propylbenzene	**58.1**
1,3,5-Trimethylbenzene	**44.2**
tert-Butylbenzene	**12.1**
1,2,4-Trimethylbenzene	**360**
sec-Butylbenzene	**28.3**
n-Butylbenzene	**7**

COMPOUND	PZ-E3/4
Ethyl Benzene	**74.5**
Total Xylenes	**263**
Isopropylbenzene	**110**
n-propylbenzene	**220**
1,3,5-Trimethylbenzene	**260**
tert-Butylbenzene	**18.4**
1,2,4-Trimethylbenzene	**1200**
sec-Butylbenzene	**67.9**
n-Butylbenzene	**71.9**



Notes:
-All results in micrograms per liter (ug/L).
-Bold results exceed NYSDEC AWQS.

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Ebenezer Plaza 1

Figure 7 Residual Groundwater Exceedances
May 2019 and November 2019 Data

672 Powell Street, Brooklyn, NY

Source: NYS Department of Transportation 2008 Roads Dataset
NYS Office of Technology 2018 Orthophoto Imagery

Drawn: BWF
Date: 8/13/2019
Scale: 1 inch equals 43 feet
Project: 20918.07
Figure: 7

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Ebenezer Plaza 1

Figure 8: Engineering Control Locations

672 Powell Street, Brooklyn, NY

Source: NYS Department of Transportation 2008 Roads Dataset
NYS Office of Technology 2018 Orthophoto Imagery

Drawn:	BWF
Date:	8/13/2019
Scale:	1 inch equals 43 feet
Project:	20918.09
Figure:	8

Document Path: Z:\projects\20900-20999\20918.06 EP-1\SMP-Site Management Plan\GIS\Figure 8_Engineering Control locations.mxd

Appendix A

Environmental Easements

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Office of the General Counsel
625 Broadway, 14th Floor, Albany, New York 12233-1500
P: (518) 402-9185 | F: (518) 402-9018
www.dec.ny.gov

October 17, 2019

SENT VIA CERTIFIED MAIL
RETURN RECEIPT REQUESTED
AND ELECTRONIC MAIL daustin@goldsteinhall.com

Darryl Austin, Esq.
Goldstein Hall Attorneys at Law
80 Broad Street, Suite 303
New York, NY 10004

RE: Environmental Easement Package
Site Name: Ebenezer Plaza 1
Site No.: C224240

Dear Mr. Austin:

Enclosed, please find two fully executed Environmental Easement, TP-584 and NYC-RPT tax forms referencing the site located at 94 New Lots Ave, Brooklyn, County of Kings, New York.

Once the Environmental Easements are recorded, the local municipality will need to be notified via Certified Mail, Return Receipt Requested.

Please return a copy of the recorded easements marked by the County Clerk's Office with the date and location of recording, and a certified copy of the municipal notice. The information from the recorded easement and notices are necessary to process the Certificate of Completion.

If you have any further questions or concerns relating to this matter, please contact our office at (518) 408-0409.

Sincerely,

Jennifer Andaloro

Jennifer Andaloro, Esq.
Section Chief A
Remediation Bureau

ec: B. Burns, Esq., NYSDEC

ENVIRONMENTAL EASEMENT GRANTED PURSUANT TO ARTICLE 71, TITLE 36 OF THE NEW YORK STATE ENVIRONMENTAL CONSERVATION LAW

THIS INDENTURE made this 11th day of October, 2019 between Owner(s) HP Ebenezer 1B Housing Development Fund Company, Inc., a not-for-profit corporation organized and existing under Article XI of the New York Private Housing Finance Law (the "Grantor Fee Owner") having an office at 253 West 35th Street, 3rd Floor, New York, New York 10001, and Ebenezer Plaza Owner Phase 1B LLC, a New York limited liability company (the "Grantor Beneficial Owner), having an office at c/o Procida Development Group LLC, 456 East 173rd Street, Bronx, New York 10457 (collectively, the "Grantor"), and The People of the State of New York (the "Grantee."), acting through their Commissioner of the Department of Environmental Conservation (the "Commissioner", or "NYSDEC" or "Department" as the context requires) with its headquarters located at 625 Broadway, Albany, New York 12233,

WHEREAS, the Legislature of the State of New York has declared that it is in the public interest to encourage the remediation of abandoned and likely contaminated properties ("sites") that threaten the health and vitality of the communities they burden while at the same time ensuring the protection of public health and the environment; and

WHEREAS, the Legislature of the State of New York has declared that it is in the public interest to establish within the Department a statutory environmental remediation program that includes the use of Environmental Easements as an enforceable means of ensuring the performance of operation, maintenance, and/or monitoring requirements and the restriction of future uses of the land, when an environmental remediation project leaves residual contamination at levels that have been determined to be safe for a specific use, but not all uses, or which includes engineered structures that must be maintained or protected against damage to perform properly and be effective, or which requires groundwater use or soil management restrictions; and

WHEREAS, the Legislature of the State of New York has declared that Environmental Easement shall mean an interest in real property, created under and subject to the provisions of Article 71, Title 36 of the New York State Environmental Conservation Law ("ECL") which contains a use restriction and/or a prohibition on the use of land in a manner inconsistent with engineering controls which are intended to ensure the long term effectiveness of a site remedial program or eliminate potential exposure pathways to hazardous waste or petroleum; and

WHEREAS, Grantor Fee Owner, is the owner of real property located at the address of 672 Powell Street (a/k/a 96 New Lots Avenue) in the City of New York, County of Kings and State of New York, known and designated on the tax map of the New York City Department of Finance as tax map parcel number: Block 3862 Lots 1001, 1002 and 1004 (f/k/a Lot 1), being the same as the property conveyed to Grantor Fee Owner by deed dated June 27, 2019 and recorded in the City Register of the City of New York as CRFN # 2019000223122. The property subject to this Environmental Easement (the "Controlled Property") comprises approximately 1.26418 +/- acres, and is hereinafter more fully described in the Land Title Survey dated June 19, 2018 and last revised January 24, 2019 prepared by Neville V. Ramsay, L.L.S. of Ramsay Land Surveying, last revised January 24, 2019 prepared by Neville V. Ramsay, L.L.S. of Ramsay Land Surveying, P.C., which will be attached to the Site Management Plan. The Controlled Property description is set forth in and attached hereto as Schedule A; and

WHEREAS, Grantor Beneficial Owner, is the owner of the beneficial interest in the Controlled Property being the same as a portion of that beneficial interest conveyed to Grantor Beneficial Owner by means of a Declaration of Interest and Nominee Agreement dated June 27, 2019 and recorded in the City Register of the City of New York as CRFN # 2019000223130; and

WHEREAS, the Department accepts this Environmental Easement in order to ensure the protection of public health and the environment and to achieve the requirements for remediation established for the Controlled Property until such time as this Environmental Easement is extinguished pursuant to ECL Article 71, Title 36; and

NOW THEREFORE, in consideration of the mutual covenants contained herein and the terms and conditions of Brownfield Cleanup Agreement Index Number: C224240-10-16 as amended July 17, 2019, Grantor conveys to Grantee a permanent Environmental Easement pursuant to ECL Article 71, Title 36 in, on, over, under, and upon the Controlled Property as more fully described herein ("Environmental Easement").

1. Purposes. Grantor and Grantee acknowledge that the Purposes of this Environmental Easement are: to convey to Grantee real property rights and interests that will run with the land in perpetuity in order to provide an effective and enforceable means of encouraging the reuse and redevelopment of this Controlled Property at a level that has been determined to be safe for a specific use while ensuring the performance of operation, maintenance, and/or monitoring requirements; and to ensure the restriction of future uses of the land that are inconsistent with the above-stated purpose.

2. Institutional and Engineering Controls. The controls and requirements listed in the Department approved Site Management Plan ("SMP") including any and all Department approved amendments to the SMP are incorporated into and made part of this Environmental Easement. These controls and requirements apply to the use of the Controlled Property, run with the land, are binding on the Grantor and the Grantor's successors and assigns, and are enforceable in law or equity against any owner of the Controlled Property, any lessees and any person using the Controlled Property.

A. (1) The Controlled Property may be used for:

Restricted Residential as described in 6 NYCRR Part 375-1.8(g)(2)(ii), Commercial as described in 6 NYCRR Part 375-1.8(g)(2)(iii) and Industrial as described in 6 NYCRR Part 375-1.8(g)(2)(iv)

(2) All Engineering Controls must be operated and maintained as specified in the Site Management Plan (SMP);

(3) All Engineering Controls must be inspected at a frequency and in a manner defined in the SMP;

(4) The use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the NYSDOH or the New York City Department of Health and Mental Hygiene to render it safe for use as drinking water or for industrial purposes, and the user must first notify and obtain written approval to do so from the Department;

(5) Groundwater and other environmental or public health monitoring must be performed as defined in the SMP;

(6) Data and information pertinent to Site Management of the Controlled Property must be reported at the frequency and in a manner defined in the SMP;

(7) All future activities on the property that will disturb remaining contaminated material must be conducted in accordance with the SMP;

(8) Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in the SMP;

(9) Operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical components of the remedy shall be performed as defined in the SMP;

(10) Access to the site must be provided to agents, employees or other representatives of the State of New York with reasonable prior notice to the property owner to assure compliance with the restrictions identified by this Environmental Easement.

B. The Controlled Property shall not be used for Residential purposes as defined in 6NYCRR 375-1.8(g)(2)(i), and the above-stated engineering controls may not be discontinued without an amendment or extinguishment of this Environmental Easement.

C. The SMP describes obligations that the Grantor assumes on behalf of Grantor, its successors and assigns. The Grantor's assumption of the obligations contained in the SMP which may include sampling, monitoring, and/or operating a treatment system, and providing certified reports to the NYSDEC, is and remains a fundamental element of the Department's determination that the Controlled Property is safe for a specific use, but not all uses. The SMP may be modified in accordance with the Department's statutory and regulatory authority. The Grantor and all successors and assigns, assume the burden of complying with the SMP and obtaining an up-to-date version of the SMP from:

Site Control Section
Division of Environmental Remediation
NYSDEC
625 Broadway
Albany, New York 12233
Phone: (518) 402-9553

D. Grantor must provide all persons who acquire any interest in the Controlled

Property a true and complete copy of the SMP that the Department approves for the Controlled Property and all Department-approved amendments to that SMP.

E. Grantor covenants and agrees that until such time as the Environmental Easement is extinguished in accordance with the requirements of ECL Article 71, Title 36 of the ECL, the property deed and all subsequent instruments of conveyance relating to the Controlled Property shall state in at least fifteen-point bold-faced type:

This property is subject to an Environmental Easement held by the New York State Department of Environmental Conservation pursuant to Title 36 of Article 71 of the Environmental Conservation Law.

F. Grantor covenants and agrees that this Environmental Easement shall be incorporated in full or by reference in any leases, licenses, or other instruments granting a right to use the Controlled Property.

G. Grantor covenants and agrees that it shall, at such time as NYSDEC may require, submit to NYSDEC a written statement by an expert the NYSDEC may find acceptable certifying under penalty of perjury, in such form and manner as the Department may require, that:

(1) the inspection of the site to confirm the effectiveness of the institutional and engineering controls required by the remedial program was performed under the direction of the individual set forth at 6 NYCRR Part 375-1.8(h)(3).

(2) the institutional controls and/or engineering controls employed at such site:

(i) are in-place;

(ii) are unchanged from the previous certification, or that any identified changes to the controls employed were approved by the NYSDEC and that all controls are in the Department-approved format; and

(iii) that nothing has occurred that would impair the ability of such control to protect the public health and environment;

(3) the owner will continue to allow access to such real property to evaluate the continued maintenance of such controls;

(4) nothing has occurred that would constitute a violation or failure to comply with any site management plan for such controls;

(5) the report and all attachments were prepared under the direction of, and reviewed by, the party making the certification;

(6) to the best of his/her knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program, and generally accepted engineering practices; and

(7) the information presented is accurate and complete.

3. Right to Enter and Inspect. Grantee, its agents, employees, or other representatives of the

State may enter and inspect the Controlled Property in a reasonable manner and at reasonable times to assure compliance with the above-stated restrictions.

4. Reserved Grantor's Rights. Grantor reserves for itself, its assigns, representatives, and successors in interest with respect to the Property, all rights as fee owner of the Property, including:

A. Use of the Controlled Property for all purposes not inconsistent with, or limited by the terms of this Environmental Easement;

B. The right to give, sell, assign, or otherwise transfer part or all of the underlying fee interest to the Controlled Property, subject and subordinate to this Environmental Easement;

5. Enforcement

A. This Environmental Easement is enforceable in law or equity in perpetuity by Grantor, Grantee, or any affected local government, as defined in ECL Section 71-3603, against the owner of the Property, any lessees, and any person using the land. Enforcement shall not be defeated because of any subsequent adverse possession, laches, estoppel, or waiver. It is not a defense in any action to enforce this Environmental Easement that: it is not appurtenant to an interest in real property; it is not of a character that has been recognized traditionally at common law; it imposes a negative burden; it imposes affirmative obligations upon the owner of any interest in the burdened property; the benefit does not touch or concern real property; there is no privity of estate or of contract; or it imposes an unreasonable restraint on alienation.

B. If any person violates this Environmental Easement, the Grantee may revoke the Certificate of Completion with respect to the Controlled Property.

C. Grantee shall notify Grantor of a breach or suspected breach of any of the terms of this Environmental Easement. Such notice shall set forth how Grantor can cure such breach or suspected breach and give Grantor a reasonable amount of time from the date of receipt of notice in which to cure. At the expiration of such period of time to cure, or any extensions granted by Grantee, the Grantee shall notify Grantor of any failure to adequately cure the breach or suspected breach, and Grantee may take any other appropriate action reasonably necessary to remedy any breach of this Environmental Easement, including the commencement of any proceedings in accordance with applicable law.

D. The failure of Grantee to enforce any of the terms contained herein shall not be deemed a waiver of any such term nor bar any enforcement rights.

6. Notice. Whenever notice to the Grantee (other than the annual certification) or approval from the Grantee is required, the Party providing such notice or seeking such approval shall identify the Controlled Property by referencing the following information:

County, NYSDEC Site Number, NYSDEC Brownfield Cleanup Agreement, State Assistance Contract or Order Number, and the County tax map number or the Liber and Page or computerized system identification number.

Parties shall address correspondence to:

Site Number: C224240
Office of General Counsel
NYSDEC
625 Broadway
Albany New York 12233-5500

With a copy to:

Site Control Section
Division of Environmental Remediation
NYSDEC
625 Broadway
Albany, NY 12233

All notices and correspondence shall be delivered by hand, by registered mail or by Certified mail and return receipt requested. The Parties may provide for other means of receiving and communicating notices and responses to requests for approval.

7. Recordation. Grantor shall record this instrument, within thirty (30) days of execution of this instrument by the Commissioner or her/his authorized representative in the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

8. Amendment. Any amendment to this Environmental Easement may only be executed by the Commissioner of the New York State Department of Environmental Conservation or the Commissioner's Designee, and filed with the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

9. Extinguishment. This Environmental Easement may be extinguished only by a release by the Commissioner of the New York State Department of Environmental Conservation, or the Commissioner's Designee, and filed with the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

10. Joint Obligation. If there are two or more parties identified as Grantor herein, the obligations imposed by this instrument upon them shall be joint and several.

11. Consistency with the SMP. To the extent there is any conflict or inconsistency between the terms of this Environmental Easement and the SMP, regarding matters specifically addressed by the SMP, the terms of the SMP will control.

Remainder of Page Intentionally Left Blank

IN WITNESS WHEREOF, Grantor Fee Owner has caused this instrument to be signed in its name.

HP Ebenezer 1B Housing Development Fund Company, Inc.:

By: ______________________

Print Name: Daniel M. Cohen

Title: Vice Pres. Date: 9/18/19

Grantor's Acknowledgment

STATE OF NEW YORK)
) ss:
COUNTY OF New York)

On the 18th day of September, in the year 20 19, before me, the undersigned, personally appeared Daniel M. Cohen, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument.

____
Notary Public - State of New York

MILEIKA BETHANCOURT
NOTARY PUBLIC, STATE OF NEW YORK
No. 01BE6220876
Qualified In Kings County
Commission Expires 04-19-2022

IN WITNESS WHEREOF, Grantor Beneficial Owner has caused this instrument to be signed in its name.

Ebenezer Plaza Owner Phase 1B LLC:

By: ______________________

Print Name: Mario Procida

Title: Manager Date: 9-9-19

Grantor's Acknowledgment

STATE OF NEW YORK NY)
) ss:
COUNTY OF BX)

On the 9 day of Sept, in the year 2019, before me, the undersigned, personally appeared Mario Procida, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument.

Deborah Santoni
Notary Public - State of New York

DEBORAH SANTONI
NOTARY PUBLIC, STATE OF NEW YORK
Registration No. 01SA6362728
Qualified in Bronx County
My Commission Expires October 29, 2022

THIS ENVIRONMENTAL EASEMENT IS HEREBY ACCEPTED BY THE PEOPLE OF THE STATE OF NEW YORK, Acting By and Through the Department of Environmental Conservation as Designee of the Commissioner,

By: ______________________________
Michael J. Ryan, Director
Division of Environmental Remediation

Grantee's Acknowledgment

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

On the 11th day of October, in the year 2019, before me, the undersigned, personally appeared Michael J. Ryan, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/ executed the same in his/her/ capacity as Designee of the Commissioner of the State of New York Department of Environmental Conservation, and that by his/her/ signature on the instrument, the individual, or the person upon behalf of which the individual acted, executed the instrument.

____
Notary Public - State of New York

David J. Chiusano
Notary Public, State of New York
No. 01CH5032146
Qualified in Schenectady County
Commission Expires August 22, 2022

SCHEDULE "A" PROPERTY DESCRIPTION

The Condominium Units (hereinafter called the "Units") in the building (hereinafter called the "Building") known as Ebenezer Plaza Condominium and by the street address 672 Powell Street/96 New Lots Avenue, Borough of Brooklyn, County of Kings, City and State of New York, said Units being designated and described as Residential Unit 1 North, Community Facility Unit 2 North and Commercial Unit 4 North in that certain Declaration, dated as of 2/6/19 pursuant to Article 9-B of the Real Property Law of the State of New York establishing condominium ownership of the Building and the land upon which the Building is situate (hereinafter called the "Land", which Land is more particularly described below), which declaration was recorded in the Office of the City Register of The City of New York (the "City Register's Office") on 5/23/19 as CRFN 2019000163520 (which declaration and any amendments thereto, are hereinafter collectively called the "Declaration"). The Units is also designated as Tax Lot 1001, 1002, 1004 Block 3862 of the Borough of Kings on the Tax Map of the Tax Map Unit, Land Records Division, NYC Department of Finance and on the Floor Plans of the Building certified by L. Bradford Perkins on 4/22/19 and filed with the Tax Map Unit, Land Records Division, NYC Department of Finance on 5/13/19 as Condominium Plan No. 4563 and also recorded in the City Register's Office on 5/23/19 as CRFN 2019000163521.

TOGETHER with (i) an undivided 32.74% interest as to Residential Unit North, 0.87% interest as to Community Facility Unit North and 2.73% as to Commercial Unit, respectively, in the General Common Elements (as defined in the Declaration), and (ii) as to the Residential Unit North, an interest in the Limited Common Elements North (as provided in and as defined in the Declaration).

The Land is more particularly described as follows:

ALL that certain plot piece or parcel of land, situate, lying and being in the Borough of Brooklyn, County of Kings, City and State of New York, bounded and described as follows:

BEGINNING at the corner formed by the intersection of the easterly side of Sackman Street with the southeasterly side of New Lots Avenue;

THENCE northeasterly along the southeasterly side of New Lots Avenue, 211.94 feet to the corner formed by the southeasterly side of New Lots Avenue with the westerly side of Powell Street;

THENCE southerly along the westerly side of Powell Street, 310.45 feet (deed) 310.42 feet (survey) 310.43 feet (B.F.S. No 47) to the corner formed by the westerly side of Powell Street with the northerly side of Hegeman Avenue;

THENCE westerly along the northerly side of Hegeman Avenue, 200.00 feet to the corner formed by the intersection of the northerly side of Hegeman Avenue with the easterly side of Sackman Street;

THENCE northerly along the easterly side of Sackman Street, 240.26 feet (Actual) 240.25 feet (Deed) to the southeasterly side of New Lots Avenue at the point or place of BEGINNING.

Containing an area of approximately 55,067.75 square feet or 1.26418 acres more or less.

TP-584-NYC (7/19)

Department of Taxation and Finance

Combined Real Estate Transfer Tax Return, Credit Line Mortgage Certificate, and Certification of Exemption from the Payment of Estimated Personal Income Tax for the Conveyance of Real Property Located in New York City

Recording office time stamp

See Form TP-584-NYC-I, Instructions for Form TP-584-NYC, before completing this form. Print or type.

Schedule A – Information relating to conveyance

Grantor/Transferor

☐ Individual ☑ Corporation ☐ Partnership ☐ Estate/Trust ☐ Single member LLC ☐ Other

Name *(if individual, last, first, middle initial)* (☑ *mark an X if more than one grantor*)	HP EBENEZER 1B HDFC, INC.
Social Security number	
Mailing address	253 WEST 35TH STREET, 3RD FLOOR
Social Security number	
City	NEW YORK
State	NY
ZIP code	10001
EIN	82 2232286
Single member's name if grantor is a single member LLC *(see instructions)*	
Single member EIN or SSN	

Grantee/Transferee

☐ Individual ☐ Corporation ☐ Partnership ☐ Estate/Trust ☐ Single member LLC ☑ Other

Name *(if individual, last, first, middle initial)* (☐ *mark an X if more than one grantee*)	THE PEOPLE OF THE STATE OF NEW YORK
Social Security number	
Mailing address	625 BROADWAY
Social Security number	
City	ALBANY
State	NY
ZIP code	12233
EIN	14 6013200
Single member's name if grantee is a single member LLC *(see instructions)*	
Single member EIN or SSN	

Location and description of property conveyed

Tax map designation – Section, block & lot *(include dots and dashes)*	SWIS code (six digits)	Street address	City, town, or village	County
3 - 3862 - 1001	650000	96 NEW LOTS AVE Unit 1	NEW YORK	BROOKLYN / KINGS

Type of property conveyed *(mark an X in applicable box)*

1 ☐ One- to three-family house
2 ☐ Residential cooperative
3 ☐ Residential condominium
4 ☐ Vacant land
5 ☐ Commercial/Industrial
6 ☐ Apartment building
7 ☐ Office building
8 ☑ Other MULTIPLE PROPERTIES

Date of conveyance: 10 / 11 / 2019 (month / day / year)

☐ Contract executed on or before April 1, 2019 *(see instructions)*

Percentage of real property conveyed which is residential real property ______% *(see instructions)*

Condition of conveyance *(mark all that apply)*

a. ☐ Conveyance of fee interest

b. ☐ Acquisition of a controlling interest (state percentage acquired ______%)

c. ☐ Transfer of a controlling interest (state percentage transferred ______%)

d. ☐ Conveyance to cooperative housing corporation

e. ☐ Conveyance pursuant to or in lieu of foreclosure or enforcement of security interest *(attach Form TP-584.1, Schedule E)*

f. ☐ Conveyance which consists of a mere change of identity or form of ownership or organization *(attach Form TP-584.1, Schedule F)*

g. ☐ Conveyance for which credit for tax previously paid will be claimed *(attach Form TP-584.1, Schedule G)*

h. ☐ Conveyance of cooperative apartment(s)

i. ☐ Syndication

j. ☐ Conveyance of air rights or development rights

k. ☐ Contract assignment

l. ☐ Option assignment or surrender

m. ☐ Leasehold assignment or surrender

n. ☐ Leasehold grant

o. ☑ Conveyance of an easement

p. ☐ Conveyance for which exemption from transfer tax claimed *(complete Schedule B, Part 4)*

q. ☐ Conveyance of property partly within and partly outside the state

r. ☐ Conveyance pursuant to divorce or separation

s. ☐ Other *(describe)* ______

For recording officer's use	Amount received	Date received	Transaction number
	Schedule B, Part 1 $		
	Schedule B, Part 2 $		
	Schedule B, Part 3 $		

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TP - 584 Location and description of property conveyed

ATTACHMENT

Tax map designation Section	Block	Lot	Address	City/village	Town	County
3	3862	1002	96 NEW LOTS AVE Unit 2	NEW YORK		BROOKLYN / KINGS
3	3862	1004	96 NEW LOTS AVE Unit 4	NEW YORK		BROOKLYN / KINGS

Schedule B – Real estate transfer tax return (Tax Law, Article 31)

Part 1 – Computation of tax due *(in addition to the tax on line 4, you must compute the tax on lines 5a and 5b, if applicable)*

1	Enter amount of consideration for the conveyance *(if you are claiming a total exemption from tax, mark the exemption claimed box, enter consideration and proceed to Part 4)* ☐ **Exemption claimed**	1.	0 00
2	Continuing lien deduction *(see instructions if property is taken subject to mortgage or lien)*	2.	0 00
3	Taxable consideration *(subtract line 2 from line 1)*	3.	0 00
4	Tax: $2 for each $500, or fractional part thereof, of consideration on line 3	4.	0 00
5a	Tax: $1.25 for each $500, or fractional part thereof, of consideration for the conveyance of residential real property located in New York City if the amount on line 3 is $3 million or more *(see instructions)*	5a.	0 00
5b	Tax: $1.25 for each $500, or fractional part thereof, of consideration for the conveyance of property located in New York City other than residential real property, if the amount on line 1 is $2 million or more *(see instructions)*	5b.	0 00
6	Total before credit(s) claimed *(add lines 4, 5a, and 5b)*	6.	0 00
7	Amount of credit claimed for tax previously paid *(see instructions and attach Form TP-584.1, Schedule G)*	7.	0 00
8	Total tax due* *(subtract line 7 from line 6)*	8.	0 00

Part 2 – Computation of additional tax due on the conveyance of residential real property for $1 million or more *(see instructions)*

1	Enter amount of consideration for conveyance *(from Part 1, line 1)*	1.	
2	Taxable consideration *(multiply line 1 by the percentage of the premises which is residential real property, as shown in Schedule A)*	2.	
3	Total additional transfer tax due* *(multiply line 2 by 1% (.01))*	3.	0 00

Part 3 – Computation of supplemental tax due on the conveyance of residential real property, or interest therein, located in New York City, for $2 million or more *(see instructions)*

1	Enter amount of consideration for conveyance *(from Part 1, line 1)*	1.	
2	Taxable consideration *(multiply line 1 by the percentage of the premises which is residential real property, as shown in Schedule A)*	2.	
3	Total supplemental transfer tax due* *(multiply line 2 by tax rate, see instruction for rates)*	3.	0 00

*** The total tax (from Part 1, line 8; Part 2, line 3; and Part 3, line 3 above) is due within 15 days from the date of conveyance.**

Part 4 – Explanation of exemption claimed on Part 1, line 1 *(mark any boxes that apply)*

The conveyance of real property is exempt from the real estate transfer tax for the following reason:

a. Conveyance is to the United Nations, the United States of America, New York State, or any of their instrumentalities, agencies, or political subdivisions (or any public corporation, including a public corporation created pursuant to agreement or compact with another state or Canada) ..... a ☐

b. Conveyance is to secure a debt or other obligation ..... b ☐

c. Conveyance is without additional consideration to confirm, correct, modify, or supplement a prior conveyance ..... c ☐

d. Conveyance of real property is without consideration and not in connection with a sale, including conveyances conveying realty as bona fide gifts ..... d ☐

e. Conveyance is given in connection with a tax sale ..... e ☐

f. Conveyance is a mere change of identity or form of ownership or organization where there is no change in beneficial ownership. (This exemption cannot be claimed for a conveyance to a cooperative housing corporation of real property comprising the cooperative dwelling or dwellings.) Attach Form TP-584.1, Schedule F ..... f ☐

g. Conveyance consists of deed of partition ..... g ☐

h. Conveyance is given pursuant to the federal Bankruptcy Act ..... h ☐

i. Conveyance consists of the execution of a contract to sell real property, without the use or occupancy of such property, or the granting of an option to purchase real property, without the use or occupancy of such property ..... i ☐

j. Conveyance of an option or contract to purchase real property with the use or occupancy of such property where the consideration is less than $200,000 and such property was used solely by the grantor as the grantor's personal residence and consists of a one-, two-, or three-family house, an individual residential condominium unit, or the sale of stock in a cooperative housing corporation in connection with the grant or transfer of a proprietary leasehold covering an individual residential cooperative apartment ..... j ☐

k. Conveyance is not a conveyance within the meaning of Tax Law, Article 31, § 1401(e) *(attach documents supporting such claim)* ..... k ☐

Schedule C – Credit Line Mortgage Certificate (Tax Law, Article 11)

Complete the following only if the interest being transferred is a fee simple interest.
I (we) certify that: *(mark an X in the appropriate box)*

1. ☐ The real property being sold or transferred is not subject to an outstanding credit line mortgage.

2. ☐ The real property being sold or transferred is subject to an outstanding credit line mortgage. However, an exemption from the tax is claimed for the following reason:
   - a ☐ The transfer of real property is a transfer of a fee simple interest to a person or persons who held a fee simple interest in the real property (whether as a joint tenant, a tenant in common or otherwise) immediately before the transfer.
   - b ☐ The transfer of real property is (A) to a person or persons related by blood, marriage or adoption to the original obligor or to one or more of the original obligors or (B) to a person or entity where 50% or more of the beneficial interest in such real property after the transfer is held by the transferor or such related person or persons (as in the case of a transfer to a trustee for the benefit of a minor or the transfer to a trust for the benefit of the transferor).
   - c ☐ The transfer of real property is a transfer to a trustee in bankruptcy, a receiver, assignee, or other officer of a court.
   - d ☐ The maximum principal amount secured by the credit line mortgage is $3,000,000 or more, and the real property being sold or transferred is **not** principally improved nor will it be improved by a one- to six-family owner-occupied residence or dwelling.

     Note: for purposes of determining whether the maximum principal amount secured is $3,000,000 or more as described above, the amounts secured by two or more credit line mortgages may be aggregated under certain circumstances. See TSB-M-96(6)-R for more information regarding these aggregation requirements.
   - e ☐ Other *(attach detailed explanation)*.

3. ☐ The real property being transferred is presently subject to an outstanding credit line mortgage. However, no tax is due for the following reason:
   - a ☐ A certificate of discharge of the credit line mortgage is being offered at the time of recording the deed.
   - b ☐ A check has been drawn payable for transmission to the credit line mortgagee or his agent for the balance due, and a satisfaction of such mortgage will be recorded as soon as it is available.

4. ☐ The real property being transferred is subject to an outstanding credit line mortgage recorded in ______________ (insert liber and page or reel or other identification of the mortgage). The maximum principal amount of debt or obligation secured by the mortgage is ______________. No exemption from tax is claimed and the tax of ______________ is being paid herewith. *(Make check payable to county clerk where deed will be recorded or, if the recording is to take place in New York City but not in Richmond County, make check payable to the **NYC Department of Finance.**)*

Signature (both the grantor(s) and grantee(s) must sign)

The undersigned certify that the above information contained in schedules A, B, and C, including any return, certification, schedule, or attachment, is to the best of his/her knowledge, true and complete, and authorize the person(s) submitting such form on their behalf to receive a copy for purposes of recording the deed or other instrument effecting the conveyance.

HP Ebenezer 1B HDFC, Inc.		[signature]	NYSDEC Attorney
Grantor signature	Title	Grantee signature	Title
By [signature] DANIEL MARKS COHEN VICE PRESIDENT			
Grantor signature	Title	Grantee signature	Title

Reminder: Did you complete all of the required information in Schedules A, B, and C? Are you required to complete Schedule D? If you marked *e*, *f*, or *g* in Schedule A, did you complete Form TP-584.1? If the contract was executed prior to April 1, 2019, did you attach the necessary verification? Have you attached your check(s) made payable to the county clerk where recording will take place or, if the recording is in the New York City boroughs of Manhattan, Bronx, Brooklyn, or Queens, to the ***NYC Department of Finance***? If no recording is required, send this return and your check(s), made payable to the ***NYS Department of Taxation and Finance***, directly to the NYS Tax Department, RETT Return Processing, PO Box 5045, Albany NY 12205-0045. If not using U.S. Mail, see Publication 55, *Designated Private Delivery Services.*

Signature (both the grantor(s) and grantee(s) must sign)

The undersigned certify that the above information contained in schedules A, B, and C, including any return, certification, schedule, or attachment, is to the best of his/her knowledge, true and complete, and authorize the person(s) submitting such form on their behalf to receive a copy for purposes of recording the deed or other instrument effecting the conveyance.

HP Ebenezer 1B HDFC, Inc.		Jennifer Andaloro	NYSDEC Attorney
Grantor signature	Title	Grantee signature	Title
By:			
Grantor signature	Title	Grantee signature	Title

DANIEL MARKS COHEN
VICE PRESIDENT

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Schedule D – Certification of exemption from the payment of estimated personal income tax (Tax Law, Article 22, § 663)

Complete the following only if a fee simple interest or a cooperative unit is being transferred by an individual or estate or trust.

If the property is being conveyed by a referee pursuant to a foreclosure proceeding, proceed to Part 2, mark the second box under *Exemptions for nonresident transferor(s)/seller(s)*, and sign at bottom.

Part 1 – New York State residents

If you are a New York State resident transferor(s)/seller(s) listed in Form TP-584-NYC, Schedule A (or an attachment to Form TP-584-NYC), you must sign the certification below. If one or more transferors/sellers of the real property or cooperative unit is a resident of New York State, **each** resident transferor/seller must sign in the space provided. If more space is needed, photocopy this Schedule D and submit as many schedules as necessary to accommodate all resident transferors/sellers.

Certification of resident transferor(s)/seller(s)

This is to certify that at the time of the sale or transfer of the real property or cooperative unit, the transferor(s)/seller(s) as signed below was a resident of New York State, and therefore is not required to pay estimated personal income tax under Tax Law, § 663(a) upon the sale or transfer of this real property or cooperative unit.

Signature	Print full name	Date
Signature	Print full name	Date
Signature	Print full name	Date
Signature	Print full name	Date

Note: A resident of New York State may still be required to pay estimated tax under Tax Law, § 685(c), but not as a condition of recording a deed.

Part 2 – Nonresidents of New York State

If you are a nonresident of New York State listed as a transferor/seller in Form TP-584-NYC, Schedule A (or an attachment to Form TP-584-NYC) but are not required to pay estimated personal income tax because one of the exemptions below applies under Tax Law, § 663(c), mark the box of the appropriate exemption below. If any one of the exemptions below applies to the transferor(s)/seller(s), that transferor(s)/seller(s) is not required to pay estimated personal income tax to New York State under Tax Law, § 663. **Each** nonresident transferor/seller who qualifies under one of the exemptions below must sign in the space provided. If more space is needed, photocopy this Schedule D and submit as many schedules as necessary to accommodate all nonresident transferors/sellers.

If none of these exemption statements apply, you must complete Form IT-2663, *Nonresident Real Property Estimated Income Tax Payment Form*, or Form IT-2664, *Nonresident Cooperative Unit Estimated Income Tax Payment Form*. For more information, see *Payment of estimated personal income tax*, on Form TP-584-NYC-I, page 1.

Exemption for nonresident transferor(s)/seller(s)

This is to certify that at the time of the sale or transfer of the real property or cooperative unit, the transferor(s)/seller(s) (grantor) of this real property or cooperative unit was a nonresident of New York State, but is not required to pay estimated personal income tax under Tax Law, § 663 due to one of the following exemptions:

- ☐ The real property or cooperative unit being sold or transferred qualifies in total as the transferor's/seller's principal residence (within the meaning of Internal Revenue Code, section 121) from ________ (Date) to ________ (Date) *(see instructions)*.
- ☐ The transferor/seller is a mortgagor conveying the mortgaged property to a mortgagee in foreclosure, or in lieu of foreclosure with no additional consideration.
- ☐ The transferor or transferee is an agency or authority of the United States of America, an agency or authority of the state of New York, the Federal National Mortgage Association, the Federal Home Loan Mortgage Corporation, the Government National Mortgage Association, or a private mortgage insurance company.

Signature	Print full name	Date
Signature	Print full name	Date
Signature	Print full name	Date
Signature	Print full name	Date

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Certification of resident transferor(s)/seller(s)

This is to certify that at the time of the sale or transfer of the real property or cooperative unit, the transferor(s)/seller(s) as signed below was a resident of New York State, and therefore is not required to pay estimated personal income tax under Tax Law, section 663(a) upon the sale or transfer of this real property or cooperative unit.

Signature	Print full name	Date
Signature	Print full name	Date
Signature	Print full name	Date
Signature	Print full name	Date

Exemption for nonresident transferor(s)/seller(s)

This is to certify that at the time of the sale or transfer of the real property or cooperative unit, the transferor(s)/seller(s) (grantor) of this real property or cooperative unit was a nonresident of New York State, but is not required to pay estimated personal income tax under Tax Law, section 663 due to one of the following exemptions:

- ☐ The real property or cooperative unit being sold or transferred qualifies in total as the transferor's/seller's principal residence (within the meaning of Internal Revenue Code, section 121) from ________ to ________ *(see instructions)*.
  (Date) (Date)

- ☐ The transferor/seller is a mortgagor conveying the mortgaged property to a mortgagee in foreclosure, or in lieu of foreclosure with no additional consideration.

- ☐ The transferor or transferee is an agency or authority of the United States of America, an agency or authority of the state of New York, the Federal National Mortgage Association, the Federal Home Loan Mortgage Corporation, the Government National Mortgage Association, or a private mortgage insurance company.

Signature	Print full name	Date
Signature	Print full name	Date
Signature	Print full name	Date
Signature	Print full name	Date

1

TP-584

TRANSFERS INVOLVING MULTIPLE GRANTORS AND/OR GRANTEES

NOTE If additional space is needed, attach copies of this schedule or an addendum listing all of the information required below.

Grantor/Transferor

☐ Individual
☐ Corporation
☐ Partnership
☐ Estate/Trust
☐ Single member LLC
☑ Other

Name *(if individual, last, first, middle initial)* EBENEZER PLAZA OWNER PHASE 1B LLC			Social security number
Mailing address C/O: PROCIDA DEVELOPMENT GROUP LLC 456 EAST 173RD STREET			Social security number
City BRONX	State NY	ZIP code 10457	Federal EIN 99 | 9999999
Country			
Single member's name if grantor/grantee is a single member LLC			Single member EIN or SSN

☐ Individual
☐ Corporation
☐ Partnership
☐ Estate/Trust
☐ Single member LLC
☐ Other

Name *(if individual, last, first, middle initial)*			Social security number
Mailing address			Social security number
City	State	ZIP code	Federal EIN
Country			
Single member's name if grantor/grantee is a single member LLC			Single member EIN or SSN

☐ Individual
☐ Corporation
☐ Partnership
☐ Estate/Trust
☐ Single member LLC
☐ Other

Name *(if individual, last, first, middle initial)*			Social security number
Mailing address			Social security number
City	State	ZIP code	Federal EIN
Country			
Single member's name if grantor/grantee is a single member LLC			Single member EIN or SSN

☐ Individual
☐ Corporation
☐ Partnership
☐ Estate/Trust
☐ Single member LLC
☐ Other

Name *(if individual, last, first, middle initial)*			Social security number
Mailing address			Social security number
City	State	ZIP code	Federal EIN
Country			
Single member's name if grantor/grantee is a single member LLC			Single member EIN or SSN

☐ Individual
☐ Corporation
☐ Partnership
☐ Estate/Trust
☐ Single member LLC
☐ Other

Name *(if individual, last, first, middle initial)*			Social security number
Mailing address			Social security number
City	State	ZIP code	Federal EIN
Country			
Single member's name if grantor/grantee is a single member LLC			Single member EIN or SSN

NEW YORK STATE

Department of Taxation and Finance

Real Estate Transfer Tax Return Schedule of Apportionment

For office use only

Attach this form to Form TP-584-NYC for the conveyance of multiple real properties located in New York City (NYC).

Print or type

Name of Grantor *(as shown on Form TP-584-NYC)* HP EBENEZER 1B HDFC, INC.	Grantor's Social Security number or EIN ~~81-3591579~~ 83-2232286
Name of Grantee *(as shown on Form TP-584-NYC)* THE PEOPLE OF THE STATE OF NEW YORK	Grantee's Social Security number or EIN 14-6013200
Location of property conveyed *(as shown on Form TP-584-NYC; if multiple locations, list full address on each line in Schedule A, B, and C, column A)* 96 NEW LOTS AVE Unit 1 BROOKLYN NEW YORK	

Number of residential real properties located in NYC being conveyed	Number of real properties located in NYC other than residential real property being conveyed	Number of real properties located outside of NYC being conveyed	Total number of real properties being conveyed
0	3	0	3

Schedule A – Computation of additional base tax (Form TP-584-NYC, Schedule B, Part 1, lines 5a and 5b)

A Location of each real property located in NYC conveyed (if multiple units located in the same building list each unit separately)	B Portion of consideration (from Form TP-584-NYC, Schedule B, Part 1, line 1) allocated to each property	C Tax: $1.25 for each $500, or fractional part thereof, on each part thereof, on each residential property where the consideration in column B is $3 million or more	D Tax: $1.25 for each $500, or fractional part thereof, on other than residential property where the consideration in column B is $2 million or more
3 - 3862 - 1001 Unit 1	0.00	0.00	0.00
3 - 3862 - 1002 Unit 2	0.00	0.00	0.00
3 - 3862 - 1004 Unit 4	0.00	0.00	0.00
Total of column C. Enter here and on Form TP-584-NYC, Schedule B, Part 1, line 5a.		$0.00	
Total of column D. Enter here and on Form TP-584-NYC, Schedule B, Part 1, line 5b.			$0.00

Schedule B – Computation of additional tax (Form TP-584-NYC, Schedule B, Part 2, line 3)

A Location of each real property conveyed (if multiple units located in the same building list each unit separately)	B Portion of consideration (from Form TP-584-NYC, Schedule B, Part 1, line 1) allocated to each property	C Percentage of each premises which is residential real property	D Multiply the amount shown in column B by the percentage shown in column C.	E If consideration shown in column B is $1 million or more, multiply column D by 1% (.01)
3 - 3862 - 1001 Unit 1	0.00	0%	0.00	0.00
3 - 3862 - 1002 Unit 2	0.00	0%	0.00	0.00
3 - 3862 - 1004 Unit 4	0.00	0%	0.00	0.00
Total of column E. Enter here and on Form TP-584-NYC, Schedule B, Part 2, line 3.				$0.00

Schedule C – Computation of supplemental tax (Form TP-584-NYC, Schedule B, part 3, line 3)

A Location of each real property located in NYC conveyed (if multiple units located in the same building list each unit separately)	B Portion of consideration (from Form TP-584-NYC, Schedule B, Part 1, line 1) allocated to each property	C Percentage of each premises which is residential real property	D Multiply the amount shown in column B by the percentage shown in column C.	E If consideration shown in column B is $2 million or more, multiply column D by the applicable supplemental tax rate that corresponds with the consideration shown in column B
3 - 3862 - 1001 Unit 1	0.00	0%	0.00	0.00
3 - 3862 - 1002 Unit 2	0.00	0%	0.00	0.00
3 - 3862 - 1004 Unit 4	0.00	0%	0.00	0.00
Total of column E. Enter here and on Form TP-584-NYC, Schedule B, Part 3, line 3.				$0.00

NEW YORK CITY DEPARTMENT OF FINANCE
NYC - RPT
Department of Finance

REAL PROPERTY TRANSFER TAX RETURN

(Pursuant to Title 11, Chapter 21, NYC Administrative Code)

▲ DO NOT WRITE IN THIS SPACE ▲
FOR OFFICE USE ONLY

GRANTOR

● Name HP EBENEZER 1B HDFC, INC.

● Grantor is a(n): (check one) ☐ individual ☐ partnership ☑ corporation ☐ single member LLC ☐ multiple member LLC (see instructions) ☐ other ____

Telephone Number

● Permanent mailing address after transfer (number and street) 253 WEST 35TH STREET, 3RD FLOOR

● City and State NEW YORK, NY

Zip Code 10001

● Single member's name if grantor is a single member LLC

SOCIAL SECURITY NUMBER

OR

EMPLOYER IDENTIFICATION NUMBER 82 - 2232286

SINGLE MEMBER EIN OR SSN

GRANTEE

● Name THE PEOPLE OF THE STATE OF NEW YORK

● Grantee is a(n): (check one) ☐ individual ☐ partnership ☐ corporation ☐ single member LLC ☐ multiple member LLC (see instructions) ☑ other NYSDEC

Telephone Number

● Permanent mailing address after transfer (number and street) 625 BROADWAY

● City and State ALBANY, NY

Zip Code 12233

● Single member's name if grantee is a single member LLC

SOCIAL SECURITY NUMBER

OR

EMPLOYER IDENTIFICATION NUMBER 14 - 6013200

SINGLE MEMBER EIN OR SSN

PROPERTY LOCATION

LIST EACH LOT SEPARATELY. ATTACH A RIDER IF ADDITIONAL SPACE IS REQUIRED

● Address (number and street)	Apt. No.	Borough	Block	Lot	# of Floors	Square Feet	● Assessed Value of Property
96 NEW LOTS AVE	1	BROOKLYN	3862	1001	0	89,115	1.00
96 NEW LOTS AVE	2	BROOKLYN	3862	1002	0	2,357	1.00

See Attachment for additional BBL

● DATE OF TRANSFER TO GRANTEE: 10/11/2019

● PERCENTAGE OF INTEREST TRANSFERRED: 100 %

CONDITION OF TRANSFER. See Instructions

● Check (✓) all of the conditions that apply and fill out the appropriate schedules of this return. Additionally, Schedules1 and 2 **must** be completed for all transfers.

a. ☐..... Arms length transfer
b. ☐..... Transfer in exercise of option to purchase
c. ☐..... Transfer from cooperative sponsor to cooperative corporation
d. ☐..... Transfer by referee or receiver (complete Schedule A)
e. ☐..... Transfer pursuant to marital settlement agreement or divorce decree (complete Schedule I)
f. ☐..... Deed in lieu of foreclosure (complete Schedule C)
g. ☐..... Transfer pursuant to liquidation of an entity (complete Schedule D)
h. ☐..... Transfer from principal to agent, dummy, strawman or conduit or vice-versa (complete Schedule E)
i. ☐..... Transfer pursuant to trust agreement or will (attach a copy of trust agreement or will)
j. ☐..... Gift transfer not subject to indebtedness
k. ☐..... Gift transfer subject to indebtedness
l. ☐..... Transfer to a business entity in exchange for an interest in the business entity (complete Schedule F)
m. ☐..... Transfer to a governmental body
n. ☐..... Correction deed
o. ☐..... Transfer by or to a tax exempt organization (complete Schedule G)
p. ☐..... Transfer of property partly within and partly without NYC
q. ☐..... Transfer of successful bid pursuant to foreclosure
r. ☐..... Transfer by borrower solely as security for a debt or a transfer by lender solely to return such security
s. ☐..... Transfer wholly or partly exempt as a mere change of identity or form of ownership. Complete Schedule M)
t. ☐..... Transfer to a REIT or to a corporation or partnership controlled by a REIT. (Complete Schedule R)
u. ☐..... Other transfer in connection with financing (describe): ____
v. ☐..... A grant or assignment of a leasehold interest in a tax-free NY area
w. ☐..... Transfer to an HDFC or an entity controlled by an HDFC. (Complete Schedule L)
x. ....Reserved
y. ....Reserved
z. ☑..... Other (describe) ENVIRONMENTAL EASEMENT

PROPERTY LOCATION

ATTACHMENT

Address (number and street)	Apt. No.	Borough	Block	Lot	# of Floors	Square Feet	Assessed Value of Property
96 NEW LOTS AVE	4	BROOKLYN	3862	1004	0	7,440	1.00

● TYPE OF PROPERTY (✓)	
a. ☐	1-3 family house
b. ☐	Individual residential condominium unit
c. ☐	Individual cooperative apartment
d. ☐	Commercial condominium unit
e. ☐	Commercial cooperative
f. ☐	Apartment building
g. ☐	Office building
h. ☐	Industrial building
i. ☐	Utility
j. ☑	OTHER. (describe): MULTIPLE PROPERTIES

● TYPE OF INTEREST (✓)

Check box at LEFT if you intend to record a document related to this transfer. Check box at RIGHT if you do not intend to record a document related to this transfer.

	REC.		NON REC.
a.	☐	Fee	☑
b.	☐	Leasehold Grant	☐
c.	☐	Leasehold Assignment or Surrender	☐
d.	☐	Easement	☐
e.	☐	Subterranean Rights	☐
f.	☐	Development Rights	☐
g.	☐	Stock	☐
h.	☐	Partnership Interest	☐
i.	☐	OTHER. (describe):	☐

SCHEDULE 1 - DETAILS OF CONSIDERATION

COMPLETE THIS SCHEDULE FOR ALL TRANSFERS AFTER COMPLETING THE APPROPRIATE SCHEDULES ON PAGES 5 THROUGH 12. ENTER "ZERO" ON LINE 11 IF THE TRANSFER REPORTED WAS WITHOUT CONSIDERATION.

1. Cash	● 1.	0	00
2. Purchase money mortgage	● 2.	0	00
3. Unpaid principal of pre-existing mortgage(s)	● 3.	0	00
4. Accrued interest on pre-existing mortgage(s)	● 4.	0	00
5. Accrued real estate taxes	● 5.	0	00
6. Amounts of other liens on property	● 6.	0	00
7. Value of shares of stock or of partnership interest received	● 7.	0	00
8. Value of real or personal property received in exchange	● 8.	0	00
9. Amount of Real Property Transfer Tax and/or other taxes or expenses of the grantor which are paid by the grantee	● 9.	0	00
10. Other (describe):	● 10.	0	00
11. **TOTAL CONSIDERATION** (add lines 1 through 10 - must equal amount entered on line 1 of Schedule 2) (see instructions)	● 11.	$ 0	00

See instructions for special rules relating to transfers of cooperative units, liquidations, marital settlements and transfers of property to a business entity in return for an interest in the entity.

SCHEDULE 2 - COMPUTATION OF TAX

A. Payment	Pay amount shown on line 15 - *See Instructions*	Payment Enclosed	
1. Total Consideration (from line 11, above)	● 1.	0	00
2. Excludable liens (see instructions)	● 2.	0	00
3. Consideration (line 1 less line 2)	● 3.	0	00
4. Tax Rate (see instructions)	● 4.	0	%
5. HDFC Exemption (see Schedule L, line 15)	● 5.	0	00
6. Consideration less HDFC Exemption (line 3 less line 5)	● 6.	0	00
7. Percentage change in beneficial ownership (see instructions)	● 7.	100	%
8 Taxable consideration (multiply line 6 by line 7)	● 8.	0	00
9. Tax (multiply line 8 by line 4)	● 9.	0	00
10. Credit (see instructions)	● 10.	0	00
11. Transfer tax previously paid (see Schedule L, line 18)	● 11.	0	00
12. Tax due (line 9 less line 10 and 11) (if the result is negative, enter zero)	● 12.	0	00
13. Interest (see instructions)	● 13.	0	00
14. Penalty (see instructions)	● 14.	0	00
15. **Total Tax Due** (add lines 12, 13 and 14)	● 15.	$ 0	00

201907090014110103

SCHEDULE 3 - TRANSFERS INVOLVING MULTIPLE GRANTORS AND/OR GRANTEES

NOTE If additional space is needed, attach copies of this schedule or an addendum listing all of the information required below.

GRANTOR(S)

- Name: EBENEZER PLAZA OWNER PHASE 1B LLC
- Grantor is a(n): (check one) ☐ individual ☐ partnership ☐ corporation ☐ single member LLC ☑ multiple member LLC ☐ other______
- Telephone Number:
- Permanent mailing address after transfer (number and street): C/O: PROCIDA DEVELOPMENT GROUP LLC 456 EAST 173RD STREET
- City and State: BRONX, NY
- Zip Code: 10457
- Single member's name if grantor is a single member LLC:

SOCIAL SECURITY NUMBER: ___ - __ - ____

OR

EMPLOYER IDENTIFICATION NUMBER: 99 - 9999999

SINGLE MEMBER EIN OR SSN:

- Name:
- Grantor is a(n): (check one) ☐ individual ☐ partnership ☐ corporation ☐ single member LLC ☐ multiple member LLC ☐ other______
- Telephone Number:
- Permanent mailing address after transfer (number and street):
- City and State:
- Zip Code:
- Single member's name if grantor is a single member LLC:

SOCIAL SECURITY NUMBER: ___ - __ - ____

OR

EMPLOYER IDENTIFICATION NUMBER: __ - _______

SINGLE MEMBER EIN OR SSN:

GRANTEE(S)

- Name:
- Grantee is a(n): (check one) ☐ individual ☐ partnership ☐ corporation ☐ single member LLC ☐ multiple member LLC ☐ other______
- Telephone Number:
- Permanent mailing address after transfer (number and street):
- City and State:
- Zip Code:
- Single member's name if grantee is a single member LLC:

SOCIAL SECURITY NUMBER: ___ - __ - ____

OR

EMPLOYER IDENTIFICATION NUMBER: __ - _______

SINGLE MEMBER EIN OR SSN:

- Name:
- Grantee is a(n): (check one) ☐ individual ☐ partnership ☐ corporation ☐ single member LLC ☐ multiple member LLC ☐ other______
- Telephone Number:
- Permanent mailing address after transfer (number and street):
- City and State:
- Zip Code:
- Single member's name if grantee is a single member LLC:

SOCIAL SECURITY NUMBER: ___ - __ - ____

OR

EMPLOYER IDENTIFICATION NUMBER: __ - _______

SINGLE MEMBER EIN OR SSN:

GRANTOR'S ATTORNEY ▼

Name of Attorney		Telephone Number ( )
Address (number and street)	City and State	Zip Code
EMPLOYER IDENTIFICATION NUMBER [ ] - [ ] OR	SOCIAL SECURITY NUMBER [ ] - [ ] - [ ]	

GRANTEE'S ATTORNEY ▼

Name of Attorney		Telephone Number ( )
Address (number and street)	City and State	Zip Code
EMPLOYER IDENTIFICATION NUMBER [ ] - [ ] OR	SOCIAL SECURITY NUMBER [ ] - [ ] - [ ]	

CERTIFICATION ▼

I swear or affirm that this return, including any accompanying schedules, affidavits and attachments, has been examined by me and is, to the best of my knowledge, a true and complete return made in good faith, pursuant to Title 11, Chapter 21 of the Administrative Code and the regulations issued thereunder.

GRANTOR

Sworn to and subscribed to

before me on this 4th day

of October, 2019.

Signature of Notary

(Notary's stamp or seal)

MILEIKA BETHANCOURT
NOTARY PUBLIC, STATE OF NEW YORK
No. 01BE6220876
Qualified In Kings County
Commission Expires 04-19-2022

81-3591579
EMPLOYER IDENTIFICATION NUMBER OR SOCIAL SECURITY NUMBER

HP EBENEZER 1B HDFC, INC.
Name of Grantor

By:
Signature of Grantor

DANIEL MARKS COHEN
VICE PRESIDENT

GRANTEE

Sworn to and subscribed to

before me on this 9th day

of October, 2019.

Signature of Notary

(Notary's stamp or seal)

COLLEEN A. McCARTHY
Notary Public, State of New York
Qualified In Albany County
No. 02MC5046480
Commission Expires July 17, 2021

14-6013200
EMPLOYER IDENTIFICATION NUMBER OR SOCIAL SECURITY NUMBER

THE PEOPLE OF THE STATE OF NEW YORK
Name of Grantee

Signature of Grantee

CERTIFICATION

I swear or affirm that this return, including any accompanying schedules, affidavits and attachments, has been examined by me and is, to the best of myknowledge, a true and complete return made in good faith, pursuant to Title 11, Chapter 21 of the Administrative Code and the regulations issued thereunder.

GRANTORS

EIN/SSN	Name of Grantor	Signature of Grantor
99-9999999	EBENEZER PLAZA OWNER PHASE 1B LLC	

GRANTEES

EIN/SSN	Name of Grantee	Signature of Grantee

2019070900141101

ENVIRONMENTAL EASEMENT GRANTED PURSUANT TO ARTICLE 71, TITLE 36 OF THE NEW YORK STATE ENVIRONMENTAL CONSERVATION LAW

THIS INDENTURE made this 11th day of October, 2019, between Owner(s) HP Ebenezer Plaza Housing Development Fund Company, Inc., a not-for-profit corporation organized and existing under Article XI of the New York Private Housing Finance Law (the "Grantor Fee Owner") having an office at c/o Housing Partnership Development Corporation, 253 West 35th Street, 3rd Floor, New York, New York 10001, and Ebenezer Plaza Owner LLC, a New York limited liability company (the "Grantor Beneficial Owner), having an office at 253 West 35th Street, 3rd Floor, New York, New York 10001 (collectively, the "Grantor"), and The People of the State of New York (the "Grantee."), acting through their Commissioner of the Department of Environmental Conservation (the "Commissioner", or "NYSDEC" or "Department" as the context requires) with its headquarters located at 625 Broadway, Albany, New York 12233,

WHEREAS, the Legislature of the State of New York has declared that it is in the public interest to encourage the remediation of abandoned and likely contaminated properties ("sites") that threaten the health and vitality of the communities they burden while at the same time ensuring the protection of public health and the environment; and

WHEREAS, the Legislature of the State of New York has declared that it is in the public interest to establish within the Department a statutory environmental remediation program that includes the use of Environmental Easements as an enforceable means of ensuring the performance of operation, maintenance, and/or monitoring requirements and the restriction of future uses of the land, when an environmental remediation project leaves residual contamination at levels that have been determined to be safe for a specific use, but not all uses, or which includes engineered structures that must be maintained or protected against damage to perform properly and be effective, or which requires groundwater use or soil management restrictions; and

WHEREAS, the Legislature of the State of New York has declared that Environmental Easement shall mean an interest in real property, created under and subject to the provisions of Article 71, Title 36 of the New York State Environmental Conservation Law ("ECL") which contains a use restriction and/or a prohibition on the use of land in a manner inconsistent with engineering controls which are intended to ensure the long term effectiveness of a site remedial program or eliminate potential exposure pathways to hazardous waste or petroleum; and

WHEREAS, Grantor Fee Owner, is the owner of real property located at the address of 672 Powell Street (a/k/a 96 New Lots Avenue and 94/118 New Lots Avenue) in the City of New York, County of Kings and State of New York, known and designated on the tax map of the New York City Department of Finance as tax map parcel number: Block 3862 Lots 1003 and 1005 (f/k/a Lot 1), being a portion of the property conveyed to Grantor Fee Owner by deed dated June 22, 2018 and recorded in the City Register of the City of New York as CRFN # 2018000233770. The property subject to this Environmental Easement (the "Controlled Property") comprises approximately 1.26418 +/- acres, and is hereinafter more fully described in the Land Title Survey dated June 19, 2018 and last revised January 24, 2019 prepared by Neville V. Ramsay, L.L.S. of Ramsay Land Surveying, P.C., which will be attached to the Site Management Plan. The Controlled Property description is set forth in and attached hereto as Schedule A; and

WHEREAS, Grantor Beneficial Owner, is the owner of the beneficial interest in the Controlled Property being the same as a portion of that beneficial interest conveyed to Grantor Beneficial Owner by means of a Declaration of Interest and Nominee Agreement dated June 22, 2018 and recorded in the City Register of the City of New York as CRFN # 2018000233769; and

WHEREAS, the Department accepts this Environmental Easement in order to ensure the protection of public health and the environment and to achieve the requirements for remediation established for the Controlled Property until such time as this Environmental Easement is extinguished pursuant to ECL Article 71, Title 36; and

NOW THEREFORE, in consideration of the mutual covenants contained herein and the terms and conditions of Brownfield Cleanup Agreement Index Number: C224240-10-16 as amended July 17, 2019, Grantor conveys to Grantee a permanent Environmental Easement pursuant to ECL Article 71, Title 36 in, on, over, under, and upon the Controlled Property as more fully described herein ("Environmental Easement").

1. Purposes. Grantor and Grantee acknowledge that the Purposes of this Environmental Easement are: to convey to Grantee real property rights and interests that will run with the land in perpetuity in order to provide an effective and enforceable means of encouraging the reuse and redevelopment of this Controlled Property at a level that has been determined to be safe for a specific use while ensuring the performance of operation, maintenance, and/or monitoring requirements; and to ensure the restriction of future uses of the land that are inconsistent with the above-stated purpose.

2. Institutional and Engineering Controls. The controls and requirements listed in the Department approved Site Management Plan ("SMP") including any and all Department approved amendments to the SMP are incorporated into and made part of this Environmental Easement. These controls and requirements apply to the use of the Controlled Property, run with the land, are binding on the Grantor and the Grantor's successors and assigns, and are enforceable in law or equity against any owner of the Controlled Property, any lessees and any person using the Controlled Property.

A. (1) The Controlled Property may be used for:

Restricted Residential as described in 6 NYCRR Part 375-1.8(g)(2)(ii), Commercial as described in 6 NYCRR Part 375-1.8(g)(2)(iii) and Industrial as described in 6 NYCRR Part 375-1.8(g)(2)(iv)

(2) All Engineering Controls must be operated and maintained as specified in the Site Management Plan (SMP);

(3) All Engineering Controls must be inspected at a frequency and in a manner defined in the SMP;

(4) The use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the NYSDOH or the New York City Department of Health and Mental Hygiene to render it safe for use as drinking water or for industrial purposes, and the user must first notify and obtain written approval to do so from the Department;

(5) Groundwater and other environmental or public health monitoring must be performed as defined in the SMP;

(6) Data and information pertinent to Site Management of the Controlled Property must be reported at the frequency and in a manner defined in the SMP;

(7) All future activities on the property that will disturb remaining contaminated material must be conducted in accordance with the SMP;

(8) Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in the SMP;

(9) Operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical components of the remedy shall be performed as defined in the SMP;

(10) Access to the site must be provided to agents, employees or other representatives of the State of New York with reasonable prior notice to the property owner to assure compliance with the restrictions identified by this Environmental Easement.

B. The Controlled Property shall not be used for Residential purposes as defined in 6NYCRR 375-1.8(g)(2)(i), and the above-stated engineering controls may not be discontinued without an amendment or extinguishment of this Environmental Easement.

C. The SMP describes obligations that the Grantor assumes on behalf of Grantor, its successors and assigns. The Grantor's assumption of the obligations contained in the SMP which may include sampling, monitoring, and/or operating a treatment system, and providing certified reports to the NYSDEC, is and remains a fundamental element of the Department's determination that the Controlled Property is safe for a specific use, but not all uses. The SMP may be modified in accordance with the Department's statutory and regulatory authority. The Grantor and all successors and assigns, assume the burden of complying with the SMP and obtaining an up-to-date version of the SMP from:

Site Control Section
Division of Environmental Remediation
NYSDEC
625 Broadway
Albany, New York 12233
Phone: (518) 402-9553

D. Grantor must provide all persons who acquire any interest in the Controlled

Property a true and complete copy of the SMP that the Department approves for the Controlled Property and all Department-approved amendments to that SMP.

E. Grantor covenants and agrees that until such time as the Environmental Easement is extinguished in accordance with the requirements of ECL Article 71, Title 36 of the ECL, the property deed and all subsequent instruments of conveyance relating to the Controlled Property shall state in at least fifteen-point bold-faced type:

This property is subject to an Environmental Easement held by the New York State Department of Environmental Conservation pursuant to Title 36 of Article 71 of the Environmental Conservation Law.

F. Grantor covenants and agrees that this Environmental Easement shall be incorporated in full or by reference in any leases, licenses, or other instruments granting a right to use the Controlled Property.

G. Grantor covenants and agrees that it shall, at such time as NYSDEC may require, submit to NYSDEC a written statement by an expert the NYSDEC may find acceptable certifying under penalty of perjury, in such form and manner as the Department may require, that:

(1) the inspection of the site to confirm the effectiveness of the institutional and engineering controls required by the remedial program was performed under the direction of the individual set forth at 6 NYCRR Part 375-1.8(h)(3).

(2) the institutional controls and/or engineering controls employed at such site:

(i) are in-place;

(ii) are unchanged from the previous certification, or that any identified changes to the controls employed were approved by the NYSDEC and that all controls are in the Department-approved format; and

(iii) that nothing has occurred that would impair the ability of such control to protect the public health and environment;

(3) the owner will continue to allow access to such real property to evaluate the continued maintenance of such controls;

(4) nothing has occurred that would constitute a violation or failure to comply with any site management plan for such controls;

(5) the report and all attachments were prepared under the direction of, and reviewed by, the party making the certification;

(6) to the best of his/her knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program, and generally accepted engineering practices; and

(7) the information presented is accurate and complete.

3. Right to Enter and Inspect. Grantee, its agents, employees, or other representatives of the

State may enter and inspect the Controlled Property in a reasonable manner and at reasonable times to assure compliance with the above-stated restrictions.

4. Reserved Grantor's Rights. Grantor reserves for itself, its assigns, representatives, and successors in interest with respect to the Property, all rights as fee owner of the Property, including:

A. Use of the Controlled Property for all purposes not inconsistent with, or limited by the terms of this Environmental Easement;

B. The right to give, sell, assign, or otherwise transfer part or all of the underlying fee interest to the Controlled Property, subject and subordinate to this Environmental Easement;

5. Enforcement

A. This Environmental Easement is enforceable in law or equity in perpetuity by Grantor, Grantee, or any affected local government, as defined in ECL Section 71-3603, against the owner of the Property, any lessees, and any person using the land. Enforcement shall not be defeated because of any subsequent adverse possession, laches, estoppel, or waiver. It is not a defense in any action to enforce this Environmental Easement that: it is not appurtenant to an interest in real property; it is not of a character that has been recognized traditionally at common law; it imposes a negative burden; it imposes affirmative obligations upon the owner of any interest in the burdened property; the benefit does not touch or concern real property; there is no privity of estate or of contract; or it imposes an unreasonable restraint on alienation.

B. If any person violates this Environmental Easement, the Grantee may revoke the Certificate of Completion with respect to the Controlled Property.

C. Grantee shall notify Grantor of a breach or suspected breach of any of the terms of this Environmental Easement. Such notice shall set forth how Grantor can cure such breach or suspected breach and give Grantor a reasonable amount of time from the date of receipt of notice in which to cure. At the expiration of such period of time to cure, or any extensions granted by Grantee, the Grantee shall notify Grantor of any failure to adequately cure the breach or suspected breach, and Grantee may take any other appropriate action reasonably necessary to remedy any breach of this Environmental Easement, including the commencement of any proceedings in accordance with applicable law.

D. The failure of Grantee to enforce any of the terms contained herein shall not be deemed a waiver of any such term nor bar any enforcement rights.

6. Notice. Whenever notice to the Grantee (other than the annual certification) or approval from the Grantee is required, the Party providing such notice or seeking such approval shall identify the Controlled Property by referencing the following information:

County, NYSDEC Site Number, NYSDEC Brownfield Cleanup Agreement, State Assistance Contract or Order Number, and the County tax map number or the Liber and Page or computerized system identification number.

Parties shall address correspondence to:	Site Number: C224240 Office of General Counsel NYSDEC 625 Broadway Albany New York 12233-5500
With a copy to:	Site Control Section Division of Environmental Remediation NYSDEC 625 Broadway Albany, NY 12233

All notices and correspondence shall be delivered by hand, by registered mail or by Certified mail and return receipt requested. The Parties may provide for other means of receiving and communicating notices and responses to requests for approval.

7. Recordation. Grantor shall record this instrument, within thirty (30) days of execution of this instrument by the Commissioner or her/his authorized representative in the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

8. Amendment. Any amendment to this Environmental Easement may only be executed by the Commissioner of the New York State Department of Environmental Conservation or the Commissioner's Designee, and filed with the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

9. Extinguishment. This Environmental Easement may be extinguished only by a release by the Commissioner of the New York State Department of Environmental Conservation, or the Commissioner's Designee, and filed with the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

10. Joint Obligation. If there are two or more parties identified as Grantor herein, the obligations imposed by this instrument upon them shall be joint and several.

11. Consistency with the SMP. To the extent there is any conflict or inconsistency between the terms of this Environmental Easement and the SMP, regarding matters specifically addressed by the SMP, the terms of the SMP will control.

Remainder of Page Intentionally Left Blank

IN WITNESS WHEREOF, Grantor Fee Owner has caused this instrument to be signed in its name.

HP Ebenezer Plaza Housing Development Fund Company, Inc.:

By: ______________________

Print Name: Daniel M. Cohen

Title: Vice Pres. Date: 9/18/19

Grantor's Acknowledgment

STATE OF NEW YORK)
) ss:
COUNTY OF New York)

On the 18th day of September, in the year 20 19, before me, the undersigned, personally appeared Daniel M. Cohen, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument.

____
Notary Public - State of New York

MILEIKA BETHANCOURT
NOTARY PUBLIC, STATE OF NEW YORK
No. 01BE6220876
Qualified in Kings County
Commission Expires 04-19-2022

IN WITNESS WHEREOF, Grantor Beneficial Owner has caused this instrument to be signed in its name.

Ebenezer Plaza Owner LLC:

By: ______________________________

Print Name: Mario Procida

Title: Manager Date: 9-9-19

Grantor's Acknowledgment

STATE OF NEW YORK)
) ss:
COUNTY OF)

On the 9 day of Sept, in the year 20 19, before me, the undersigned, personally appeared Mario Procida, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument.

Deborah Santoni
Notary Public - State of New York

DEBORAH SANTONI
NOTARY PUBLIC, STATE OF NEW YORK
Qualified in Bronx County
My Commission Expires October 20, 2022

THIS ENVIRONMENTAL EASEMENT IS HEREBY ACCEPTED BY THE PEOPLE OF THE STATE OF NEW YORK, Acting By and Through the Department of Environmental Conservation as Designee of the Commissioner,

By: ______________________
Michael J. Ryan, Director
Division of Environmental Remediation

Grantee's Acknowledgment

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

On the 11th day of October, in the year 2019 before me, the undersigned, personally appeared Michael J. Ryan, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/ executed the same in his/her/ capacity as Designee of the Commissioner of the State of New York Department of Environmental Conservation, and that by his/her/ signature on the instrument, the individual, or the person upon behalf of which the individual acted, executed the instrument.

____
Notary Public - State of New York

David J. Chiusano
Notary Public, State of New York
No. 01CH5032146
Qualified in Schenectady County
Commission Expires August 22, 2022

SCHEDULE "A" PROPERTY DESCRIPTION

The Condominium Units (hereinafter called the "Units") in the building (hereinafter called the "Building") known as Ebenezer Plaza Condominium and by the street address 96 New Lots Avenue, Borough of Brooklyn, County of Kings, City and State of New York, said Units being designated and described as Unit 3 or Residential Unit South and Unit 5 or Community Facility Unit South, in that certain Declaration, dated as of February 6, 2019 made pursuant to Article 9-B of the Real Property Law of the State of New York establishing condominium ownership of the Building and the land upon which the Building is situate (hereinafter called the "Land", which Land is more particularly described below), which Declaration was recorded in the Office of the City Register of The City of New York (the "City Register's Office") on May 23, 2019 as CRFN 2019000163520, as amended by First Amendment to the Declaration of the Ebenezer Plaza Condominium dated June 7, 2019 and recorded in the City Register's Office on June 7, 2019 as CRFN 2019000179407 (which declaration and any amendments thereto, are hereinafter collectively called the "Declaration"). The Units are also designated as Tax Lot 1003 and 1005 in Block 3862 of the Borough of Kings on the Tax Map of the Tax Map Unit, Land Records Division, NYC Department of Finance and on the Floor Plans of the Building certified by L. Bradford Perkins on April 22, 2019 and filed with the Tax Map Unit, Land Records Division, NYC Department of Finance on May 13, 2019 as Condominium Plan No. 4563 and also recorded in the City Register's Office on May 23, 2019 as CRFN 2019000163521. TOGETHER with (i) an undivided 48.66% interest as to Residential Unit South and 15.00% interest as to Community Facility Unit South, respectively, in the General Common Elements (as defined in the Declaration), and (ii) as to the Residential Unit South, an interest in the Limited Common Elements South (as provided in and as defined in the Declaration).

The Land is more particularly described as follows:

ALL that certain plot piece or parcel of land, situate, lying and being in the Borough of Brooklyn, County of Kings, City and State of New York, bounded and described as follows:

BEGINNING at the corner formed by the intersection of the easterly side of Sackman Street with the southeasterly side of New Lots Avenue;

THENCE northeasterly along the southeasterly side of New Lots Avenue, 211.94 feet to the corner formed by the southeasterly side of New Lots Avenue with the westerly side of Powell Street;

THENCE southerly along the westerly side of Powell Street, 310.45 feet (deed) 310.42 feet (survey) 310.43 feet (B.F.S. No 47) to the corner formed by the westerly side of Powell Street with the northerly side of Hegeman Avenue;

THENCE westerly along the northerly side of Hegeman Avenue, 200.00 feet to the corner formed by the intersection of the northerly side of Hegeman Avenue with the easterly side of Sackman Street;

THENCE northerly along the easterly side of Sackman Street, 240.26 feet (Actual) 240.25 feet (Deed) to the southeasterly side of New Lots Avenue at the point or place of BEGINNING.

Containing an area of approximately 55,067.75 square feet or 1.26418 acres more or less.

TP-584-NYC (7/19)

Department of Taxation and Finance

NEW YORK STATE

Combined Real Estate Transfer Tax Return, Credit Line Mortgage Certificate, and Certification of Exemption from the Payment of Estimated Personal Income Tax for the Conveyance of Real Property Located in New York City

Recording office time stamp

See Form TP-584-NYC-I, Instructions for Form TP-584-NYC, *before completing this form. Print or type.*

Schedule A – Information relating to conveyance

Grantor/Transferor

☐ Individual
☑ Corporation
☐ Partnership
☐ Estate/Trust
☐ Single member LLC
☐ Other

Name *(if individual, last, first, middle initial)* (☑ *mark an X if more than one grantor)*: HP EBENEZER PLAZA HDFC, INC.

Social Security number:

Mailing address: C/O: HOUSING PARTNERSHIP DEVELOPMENT CORPORATION 253 WEST 35TH STREET, 3RD FLOOR

Social Security number:

City: NEW YORK | State: NY | ZIP code: 10001 | EIN: 81 | 3591579

Single member's name if grantor is a single member LLC *(see instructions)*:

Single member EIN or SSN:

Grantee/Transferee

☐ Individual
☐ Corporation
☐ Partnership
☐ Estate/Trust
☐ Single member LLC
☑ Other

Name *(if individual, last, first, middle initial)* (☐ *mark an X if more than one grantee)*: THE PEOPLE OF THE STATE OF NEW YORK

Social Security number:

Mailing address: 625 BROADWAY

Social Security number:

City: ALBANY | State: NY | ZIP code: 12233 | EIN: 14 | 6013200

Single member's name if grantee is a single member LLC *(see instructions)*:

Single member EIN or SSN:

Location and description of property conveyed

Tax map designation – Section, block & lot *(include dots and dashes)*	SWIS code (six digits)	Street address	City, town, or village	County
3 - 3862 - 1003	650000	672 POWELL STREET Unit 3	NEW YORK	BROOKLYN / KINGS

Type of property conveyed *(mark an X in applicable box)*

1 ☐ One- to three-family house
2 ☐ Residential cooperative
3 ☐ Residential condominium
4 ☐ Vacant land
5 ☐ Commercial/Industrial
6 ☐ Apartment building
7 ☐ Office building
8 ☑ Other MULTIPLE PROPERTIES

Date of conveyance: 10 | 11 | 2019 (month, day, year)

☐ Contract executed on or before April 1, 2019 *(see instructions)*

Percentage of real property conveyed which is residential real property ________ % *(see instructions)*

Condition of conveyance *(mark all that apply)*

a. ☐ Conveyance of fee interest

b. ☐ Acquisition of a controlling interest (state percentage acquired ________%)

c. ☐ Transfer of a controlling interest (state percentage transferred ________%)

d. ☐ Conveyance to cooperative housing corporation

e. ☐ Conveyance pursuant to or in lieu of foreclosure or enforcement of security interest *(attach Form TP-584.1, Schedule E)*

f. ☐ Conveyance which consists of a mere change of identity or form of ownership or organization *(attach Form TP-584.1, Schedule F)*

g. ☐ Conveyance for which credit for tax previously paid will be claimed *(attach Form TP-584.1, Schedule G)*

h. ☐ Conveyance of cooperative apartment(s)

i. ☐ Syndication

j. ☐ Conveyance of air rights or development rights

k. ☐ Contract assignment

l. ☐ Option assignment or surrender

m. ☐ Leasehold assignment or surrender

n. ☐ Leasehold grant

o. ☑ Conveyance of an easement

p. ☐ Conveyance for which exemption from transfer tax claimed *(complete Schedule B, Part 4)*

q. ☐ Conveyance of property partly within and partly outside the state

r. ☐ Conveyance pursuant to divorce or separation

s. ☐ Other *(describe)* ________

For recording officer's use	Amount received	Date received	Transaction number
	Schedule B, Part 1 $		
	Schedule B, Part 2 $		
	Schedule B, Part 3 $		

2019100200037301O1

TP - 584 Location and description of property conveyed

ATTACHMENT

Tax map designation Section	Block	Lot	Address	City/village	Town	County
3	3862	1005	672 POWELL STREET Unit 5	NEW YORK		BROOKLYN / KINGS

2019100200037301001

Schedule B – Real estate transfer tax return (Tax Law, Article 31)

Part 1 – Computation of tax due *(in addition to the tax on line 4, you must compute the tax on lines 5a and 5b, if applicable)*

1 Enter amount of consideration for the conveyance *(if you are claiming a total exemption from tax, mark the exemption claimed box, enter consideration and proceed to Part 4)* ☐ **Exemption claimed**	**1.**	0	00
2 Continuing lien deduction *(see instructions if property is taken subject to mortgage or lien)*	**2.**	0	00
3 Taxable consideration *(subtract line 2 from line 1)*	**3.**	0	00
4 Tax: $2 for each $500, or fractional part thereof, of consideration on line 3	**4.**	0	00
5a Tax: $1.25 for each $500, or fractional part thereof, of consideration for the conveyance of residential real property located in New York City if the amount on line 3 is $3 million or more *(see instructions)*	**5a.**	0	00
5b Tax: $1.25 for each $500, or fractional part thereof, of consideration for the conveyance of property located in New York City other than residential real property, if the amount on line 1 is $2 million or more *(see instructions)*	**5b.**	0	00
6 Total before credit(s) claimed *(add lines 4, 5a, and 5b)*	**6.**	0	00
7 Amount of credit claimed for tax previously paid *(see instructions and attach Form TP-584.1, Schedule G)*	**7.**	0	00
8 Total tax due* *(subtract line 7 from line 6)*	**8.**	0	00

Part 2 – Computation of additional tax due on the conveyance of residential real property for $1 million or more *(see instructions)*

1 Enter amount of consideration for conveyance *(from Part 1, line 1)*	**1.**		
2 Taxable consideration *(multiply line 1 by the percentage of the premises which is residential real property, as shown in Schedule A)*	**2.**		
3 Total additional transfer tax due* *(multiply line 2 by 1% (.01))*	**3.**	0	00

Part 3 – Computation of supplemental tax due on the conveyance of residential real property, or interest therein, located in New York City, for $2 million or more *(see instructions)*

1 Enter amount of consideration for conveyance *(from Part 1, line 1)*	**1.**		
2 Taxable consideration *(multiply line 1 by the percentage of the premises which is residential real property, as shown in Schedule A)*	**2.**		
3 Total supplemental transfer tax due* *(multiply line 2 by tax rate, see instruction for rates)*	**3.**	0	00

*** The total tax (from Part 1, line 8; Part 2, line 3; and Part 3, line 3 above) is due within 15 days from the date of conveyance.**

Part 4 – Explanation of exemption claimed on Part 1, line 1 *(mark any boxes that apply)*

The conveyance of real property is exempt from the real estate transfer tax for the following reason:

a. Conveyance is to the United Nations, the United States of America, New York State, or any of their instrumentalities, agencies, or political subdivisions (or any public corporation, including a public corporation created pursuant to agreement or compact with another state or Canada) ... a ☐

b. Conveyance is to secure a debt or other obligation ... b ☐

c. Conveyance is without additional consideration to confirm, correct, modify, or supplement a prior conveyance ... c ☐

d. Conveyance of real property is without consideration and not in connection with a sale, including conveyances conveying realty as bona fide gifts ... d ☐

e. Conveyance is given in connection with a tax sale ... e ☐

f. Conveyance is a mere change of identity or form of ownership or organization where there is no change in beneficial ownership. (This exemption cannot be claimed for a conveyance to a cooperative housing corporation of real property comprising the cooperative dwelling or dwellings.) Attach Form TP-584.1, Schedule F ... f ☐

g. Conveyance consists of deed of partition ... g ☐

h. Conveyance is given pursuant to the federal Bankruptcy Act ... h ☐

i. Conveyance consists of the execution of a contract to sell real property, without the use or occupancy of such property, or the granting of an option to purchase real property, without the use or occupancy of such property ... i ☐

j. Conveyance of an option or contract to purchase real property with the use or occupancy of such property where the consideration is less than $200,000 and such property was used solely by the grantor as the grantor's personal residence and consists of a one-, two-, or three-family house, an individual residential condominium unit, or the sale of stock in a cooperative housing corporation in connection with the grant or transfer of a proprietary leasehold covering an individual residential cooperative apartment ... j ☐

k. Conveyance is not a conveyance within the meaning of Tax Law, Article 31, § 1401(e) *(attach documents supporting such claim)* ... k ☐

Schedule C – Credit Line Mortgage Certificate (Tax Law, Article 11)

Complete the following only if the interest being transferred is a fee simple interest.
I (we) certify that: *(mark an **X** in the appropriate box)*

1. ☐ The real property being sold or transferred is not subject to an outstanding credit line mortgage.

2. ☐ The real property being sold or transferred is subject to an outstanding credit line mortgage. However, an exemption from the tax is claimed for the following reason:

   a ☐ The transfer of real property is a transfer of a fee simple interest to a person or persons who held a fee simple interest in the real property (whether as a joint tenant, a tenant in common or otherwise) immediately before the transfer.

   b ☐ The transfer of real property is (A) to a person or persons related by blood, marriage or adoption to the original obligor or to one or more of the original obligors or (B) to a person or entity where 50% or more of the beneficial interest in such real property after the transfer is held by the transferor or such related person or persons (as in the case of a transfer to a trustee for the benefit of a minor or the transfer to a trust for the benefit of the transferor).

   c ☐ The transfer of real property is a transfer to a trustee in bankruptcy, a receiver, assignee, or other officer of a court.

   d ☐ The maximum principal amount secured by the credit line mortgage is $3,000,000 or more, and the real property being sold or transferred is **not** principally improved nor will it be improved by a one- to six-family owner-occupied residence or dwelling.

   Note: for purposes of determining whether the maximum principal amount secured is $3,000,000 or more as described above, the amounts secured by two or more credit line mortgages may be aggregated under certain circumstances. See TSB-M-96(6)-R for more information regarding these aggregation requirements.

   e ☐ Other *(attach detailed explanation).*

3. ☐ The real property being transferred is presently subject to an outstanding credit line mortgage. However, no tax is due for the following reason:

   a ☐ A certificate of discharge of the credit line mortgage is being offered at the time of recording the deed.

   b ☐ A check has been drawn payable for transmission to the credit line mortgagee or his agent for the balance due, and a satisfaction of such mortgage will be recorded as soon as it is available.

4. ☐ The real property being transferred is subject to an outstanding credit line mortgage recorded in _______________ (insert liber and page or reel or other identification of the mortgage). The maximum principal amount of debt or obligation secured by the mortgage is _______________. No exemption from tax is claimed and the tax of _______________ is being paid herewith. *(Make check payable to county clerk where deed will be recorded or, if the recording is to take place in New York City but not in Richmond County, make check payable to the **NYC Department of Finance.**)*

Signature (both the grantor(s) and grantee(s) must sign)

The undersigned certify that the above information contained in schedules A, B, and C, including any return, certification, schedule, or attachment, is to the best of his/her knowledge, true and complete, and authorize the person(s) submitting such form on their behalf to receive a copy for purposes of recording the deed or other instrument effecting the conveyance.

HP Ebenezer P... HDFC, Inc.

By [signature] Grantor signature | Title | [signature] Grantee signature | NYSDEC Attorney Title

DANIEL MARKS COHEN
VICE PRESIDENT

________ Grantor signature | Title | Grantee signature | Title

Reminder: Did you complete all of the required information in Schedules A, B, and C? Are you required to complete Schedule D? If you marked *e*, *f*, or *g* in Schedule A, did you complete Form TP-584.1? If the contract was executed prior to April 1, 2019, did you attach the necessary verification? Have you attached your check(s) made payable to the county clerk where recording will take place or, if the recording is in the New York City boroughs of Manhattan, Bronx, Brooklyn, or Queens, to the ***NYC Department of Finance***? If no recording is required, send this return and your check(s), made payable to the ***NYS Department of Taxation and Finance,*** directly to the NYS Tax Department, RETT Return Processing, PO Box 5045, Albany NY 12205-0045. If not using U.S. Mail, see Publication 55, *Designated Private Delivery Services.*

Signature (both the grantor(s) and grantee(s) must sign)

The undersigned certify that the above information contained in schedules A, B, and C, including any return, certification, schedule, or attachment, is to the best of his/her knowledge, true and complete, and authorize the person(s) submitting such form on their behalf to receive a copy for purposes of recording the deed or other instrument effecting the conveyance.

HP Ebenezer Plaza HDFC, Inc

Grantor signature	Title	Grantee signature	Title
By			NYSDEC Attorney
Grantor signature	Title	Grantee signature	Title

DANIEL MARKS COHEN
VICE PRESIDENT

2019100200037301

Schedule D – Certification of exemption from the payment of estimated personal income tax (Tax Law, Article 22, § 663)

Complete the following only if a fee simple interest or a cooperative unit is being transferred by an individual or estate or trust.

If the property is being conveyed by a referee pursuant to a foreclosure proceeding, proceed to Part 2, mark the second box under *Exemptions for nonresident transferor(s)/seller(s)*, and sign at bottom.

Part 1 – New York State residents

If you are a New York State resident transferor(s)/seller(s) listed in Form TP-584-NYC, Schedule A (or an attachment to Form TP-584-NYC), you must sign the certification below. If one or more transferors/sellers of the real property or cooperative unit is a resident of New York State, **each** resident transferor/seller must sign in the space provided. If more space is needed, photocopy this Schedule D and submit as many schedules as necessary to accommodate all resident transferors/sellers.

Certification of resident transferor(s)/seller(s)

This is to certify that at the time of the sale or transfer of the real property or cooperative unit, the transferor(s)/seller(s) as signed below was a resident of New York State, and therefore is not required to pay estimated personal income tax under Tax Law, § 663(a) upon the sale or transfer of this real property or cooperative unit.

Signature	Print full name	Date
Signature	Print full name	Date
Signature	Print full name	Date
Signature	Print full name	Date

Note: A resident of New York State may still be required to pay estimated tax under Tax Law, § 685(c), but not as a condition of recording a deed.

Part 2 – Nonresidents of New York State

If you are a nonresident of New York State listed as a transferor/seller in Form TP-584-NYC, Schedule A (or an attachment to Form TP-584-NYC) but are not required to pay estimated personal income tax because one of the exemptions below applies under Tax Law, § 663(c), mark the box of the appropriate exemption below. If any one of the exemptions below applies to the transferor(s)/seller(s), that transferor(s)/seller(s) is not required to pay estimated personal income tax to New York State under Tax Law, § 663. **Each** nonresident transferor/seller who qualifies under one of the exemptions below must sign in the space provided. If more space is needed, photocopy this Schedule D and submit as many schedules as necessary to accommodate all nonresident transferors/sellers.

If none of these exemption statements apply, you must complete Form IT-2663, *Nonresident Real Property Estimated Income Tax Payment Form*, or Form IT-2664, *Nonresident Cooperative Unit Estimated Income Tax Payment Form*. For more information, see *Payment of estimated personal income tax*, on Form TP-584-NYC-I, page 1.

Exemption for nonresident transferor(s)/seller(s)

This is to certify that at the time of the sale or transfer of the real property or cooperative unit, the transferor(s)/seller(s) (grantor) of this real property or cooperative unit was a nonresident of New York State, but is not required to pay estimated personal income tax under Tax Law, § 663 due to one of the following exemptions:

☐ The real property or cooperative unit being sold or transferred qualifies in total as the transferor's/seller's principal residence (within the meaning of Internal Revenue Code, section 121) from ________ (Date) to ________ (Date) *(see instructions)*.

☐ The transferor/seller is a mortgagor conveying the mortgaged property to a mortgagee in foreclosure, or in lieu of foreclosure with no additional consideration.

☐ The transferor or transferee is an agency or authority of the United States of America, an agency or authority of the state of New York, the Federal National Mortgage Association, the Federal Home Loan Mortgage Corporation, the Government National Mortgage Association, or a private mortgage insurance company.

Signature	Print full name	Date
Signature	Print full name	Date
Signature	Print full name	Date
Signature	Print full name	Date

Certification of resident transferor(s)/seller(s)

This is to certify that at the time of the sale or transfer of the real property or cooperative unit, the transferor(s)/seller(s) as signed below was a resident of New York State, and therefore is not required to pay estimated personal income tax under Tax Law, section 663(a) upon the sale or transfer of this real property or cooperative unit.

Signature	Print full name	Date
Signature	Print full name	Date
Signature	Print full name	Date
Signature	Print full name	Date

Exemption for nonresident transferor(s)/seller(s)

This is to certify that at the time of the sale or transfer of the real property or cooperative unit, the transferor(s)/seller(s) (grantor) of this real property or cooperative unit was a nonresident of New York State, but is not required to pay estimated personal income tax under Tax Law, section 663 due to one of the following exemptions:

- ☐ The real property or cooperative unit being sold or transferred qualifies in total as the transferor's/seller's principal residence (within the meaning of Internal Revenue Code, section 121) from ________ (Date) to________ (Date) *(see instructions).*
- ☐ The transferor/seller is a mortgagor conveying the mortgaged property to a mortgagee in foreclosure, or in lieu of foreclosure with no additional consideration.
- ☐ The transferor or transferee is an agency or authority of the United States of America, an agency or authority of the state of New York, the Federal National Mortgage Association, the Federal Home Loan Mortgage Corporation, the Government National Mortgage Association, or a private mortgage insurance company.

Signature	Print full name	Date
Signature	Print full name	Date
Signature	Print full name	Date
Signature	Print full name	Date

TRANSFERS INVOLVING MULTIPLE GRANTORS AND/OR GRANTEES

NOTE If additional space is needed, attach copies of this schedule or an addendum listing all of the information required below.

Grantor/Transferor

- ☐ Individual
- ☐ Corporation
- ☐ Partnership
- ☐ Estate/Trust
- ☐ Single member LLC
- ☑ Other

Name *(if individual, last, first, middle initial)* EBENEZER PLAZA OWNER LLC			Social security number
Mailing address C/O: PROCIDA DEVELOPMENT GROUP LLC 456 EAST 173RD STREET			Social security number
City BRONX	State NY	ZIP code 10457	Federal EIN 81 1883022
Country			
Single member's name if grantor/grantee is a single member LLC			Single member EIN or SSN

- ☐ Individual
- ☐ Corporation
- ☐ Partnership
- ☐ Estate/Trust
- ☐ Single member LLC
- ☐ Other

Name *(if individual, last, first, middle initial)*			Social security number
Mailing address			Social security number
City	State	ZIP code	Federal EIN
Country			
Single member's name if grantor/grantee is a single member LLC			Single member EIN or SSN

- ☐ Individual
- ☐ Corporation
- ☐ Partnership
- ☐ Estate/Trust
- ☐ Single member LLC
- ☐ Other

Name *(if individual, last, first, middle initial)*			Social security number
Mailing address			Social security number
City	State	ZIP code	Federal EIN
Country			
Single member's name if grantor/grantee is a single member LLC			Single member EIN or SSN

- ☐ Individual
- ☐ Corporation
- ☐ Partnership
- ☐ Estate/Trust
- ☐ Single member LLC
- ☐ Other

Name *(if individual, last, first, middle initial)*			Social security number
Mailing address			Social security number
City	State	ZIP code	Federal EIN
Country			
Single member's name if grantor/grantee is a single member LLC			Single member EIN or SSN

- ☐ Individual
- ☐ Corporation
- ☐ Partnership
- ☐ Estate/Trust
- ☐ Single member LLC
- ☐ Other

Name *(if individual, last, first, middle initial)*			Social security number
Mailing address			Social security number
City	State	ZIP code	Federal EIN
Country			
Single member's name if grantor/grantee is a single member LLC			Single member EIN or SSN

NEW YORK STATE

Department of Taxation and Finance

Real Estate Transfer Tax Return Schedule of Apportionment

For office use only

Attach this form to Form TP-584-NYC for the conveyance of multiple real properties located in New York City (NYC).

Print or type

Name of Grantor *(as shown on Form TP-584-NYC)*	Grantor's Social Security number or EIN
HP EBENEZER PLAZA HDFC, INC.	81-3591579
Name of Grantee *(as shown on Form TP-584-NYC)*	Grantee's Social Security number or EIN
THE PEOPLE OF THE STATE OF NEW YORK	14-6013200

Location of property conveyed *(as shown on Form TP-584-NYC; if multiple locations, list full address on each line in Schedule A, B, and C, column A)*
672 POWELL STREET Unit 3 BROOKLYN NEW YORK

Number of residential real properties located in NYC being conveyed	Number of real properties located in NYC other than residential real property being conveyed	Number of real properties located outside of NYC being conveyed	Total number of real properties being conveyed
0	2	0	2

Schedule A – Computation of additional base tax (Form TP-584-NYC, Schedule B, Part 1, lines 5a and 5b)

A Location of each real property located in NYC conveyed (if multiple units located in the same building list each unit separately)	B Portion of consideration (from Form TP-584-NYC, Schedule B, Part 1, line 1) allocated to each property	C Tax: $1.25 for each $500, or fractional part thereof, on each part thereof, on each residential property where the consideration in column B is $3 million or more	D Tax: $1.25 for each $500, or fractional part thereof, on other than residential property where the consideration in column B is $2 million or more
3 - 3862 - 1003 Unit 3	0.00	0.00	0.00
3 - 3862 - 1005 Unit 5	0.00	0.00	0.00
Total of column C. Enter here and on Form TP-584-NYC, Schedule B, Part 1, line 5a.		$0.00	
Total of column D. Enter here and on Form TP-584-NYC, Schedule B, Part 1, line 5b.			$0.00

Schedule B – Computation of additional tax (Form TP-584-NYC, Schedule B, Part 2, line 3)

A Location of each real property conveyed (if multiple units located in the same building list each unit separately)	B Portion of consideration (from Form TP-584-NYC, Schedule B, Part 1, line 1) allocated to each property	C Percentage of each premises which is residential real property	D Multiply the amount shown in column B by the percentage shown in column C.	E If consideration shown in column B is $1 million or more, multiply column D by 1% (.01)
3 - 3862 - 1003 Unit 3	0.00	0%	0.00	0.00
3 - 3862 - 1005 Unit 5	0.00	0%	0.00	0.00
Total of column E. Enter here and on Form TP-584-NYC, Schedule B, Part 2, line 3.				$0.00

Schedule C – Computation of supplemental tax (Form TP-584-NYC, Schedule B, part 3, line 3)

A Location of each real property located in NYC conveyed (if multiple units located in the same building list each unit separately)	B Portion of consideration (from Form TP-584-NYC, Schedule B, Part 1, line 1) allocated to each property	C Percentage of each premises which is residential real property	D Multiply the amount shown in column B by the percentage shown in column C.	E If consideration shown in column B is $2 million or more, multiply column D by the applicable supplemental tax rate that corresponds with the consideration shown in column B
3 - 3862 - 1003 Unit 3	0.00	0%	0.00	0.00
3 - 3862 - 1005 Unit 5	0.00	0%	0.00	0.00
Total of column E. Enter here and on Form TP-584-NYC, Schedule B, Part 3, line 3.				$0.00

NEW YORK CITY DEPARTMENT OF FINANCE
NYC - RPT
Department of Finance

REAL PROPERTY TRANSFER TAX RETURN

(Pursuant to Title 11, Chapter 21, NYC Administrative Code)

▲ DO NOT WRITE IN THIS SPACE ▲
FOR OFFICE USE ONLY

GRANTOR

● Name HP EBENEZER PLAZA HDFC, INC.

● Grantor is a(n): (check one) ☐ individual ☐ partnership ☑ corporation ☐ single member LLC ☐ multiple member LLC (see instructions) ☐ other________

Telephone Number

● Permanent mailing address after transfer (number and street) C/O: HOUSING PARTNERSHIP DEVELOPMENT CORPORATION 253 WEST 35TH STREET, 3RD FLOOR

● City and State NEW YORK, NY

Zip Code 10001

● Single member's name if grantor is a single member LLC

SOCIAL SECURITY NUMBER

OR

EMPLOYER IDENTIFICATION NUMBER 81 - 3591579

SINGLE MEMBER EIN OR SSN

GRANTEE

● Name THE PEOPLE OF THE STATE OF NEW YORK

● Grantee is a(n): (check one) ☐ individual ☐ partnership ☐ corporation ☐ single member LLC ☐ multiple member LLC (see instructions) ☑ other NYSDEC

Telephone Number

● Permanent mailing address after transfer (number and street) 625 BROADWAY

● City and State ALBANY, NY

Zip Code 12233

● Single member's name if grantee is a single member LLC

SOCIAL SECURITY NUMBER

OR

EMPLOYER IDENTIFICATION NUMBER 14 - 6013200

SINGLE MEMBER EIN OR SSN

PROPERTY LOCATION

LIST EACH LOT SEPARATELY. ATTACH A RIDER IF ADDITIONAL SPACE IS REQUIRED

● Address (number and street)	Apt. No.	Borough	Block	Lot	# of Floors	Square Feet	● Assessed Value of Property
672 POWELL STREET	3	BROOKLYN	3862	1003	11	305,524	1.00
672 POWELL STREET	5	BROOKLYN	3862	1005	11	305,524	1.00

● DATE OF TRANSFER TO GRANTEE: 10/11/2019.

● PERCENTAGE OF INTEREST TRANSFERRED: 100 %

CONDITION OF TRANSFER. See Instructions

● Check (✓) all of the conditions that apply and fill out the appropriate schedules of this return. Additionally, Schedules1 and 2 must be completed for all transfers.

a. ☐ ..... Arms length transfer
b. ☐ ..... Transfer in exercise of option to purchase
c. ☐ ..... Transfer from cooperative sponsor to cooperative corporation
d. ☐ ..... Transfer by referee or receiver (complete Schedule A)
e. ☐ ..... Transfer pursuant to marital settlement agreement or divorce decree (complete Schedule I)
f. ☐ ..... Deed in lieu of foreclosure (complete Schedule C)
g. ☐ ..... Transfer pursuant to liquidation of an entity (complete Schedule D)
h. ☐ ..... Transfer from principal to agent, dummy, strawman or conduit or vice-versa (complete Schedule E)
i. ☐ ..... Transfer pursuant to trust agreement or will (attach a copy of trust agreement or will)
j. ☐ ..... Gift transfer not subject to indebtedness
k. ☐ ..... Gift transfer subject to indebtedness
l. ☐ ..... Transfer to a business entity in exchange for an interest in the business entity (complete Schedule F)
m. ☐ ..... Transfer to a governmental body
n. ☐ ..... Correction deed
o. ☐ ..... Transfer by or to a tax exempt organization (complete Schedule G)
p. ☐ ..... Transfer of property partly within and partly without NYC
q. ☐ ..... Transfer of successful bid pursuant to foreclosure
r. ☐ ..... Transfer by borrower solely as security for a debt or a transfer by lender solely to return such security
s. ☐ ..... Transfer wholly or partly exempt as a mere change of identity or form of ownership. Complete Schedule M)
t. ☐ ..... Transfer to a REIT or to a corporation or partnership controlled by a REIT. (Complete Schedule R)
u. ☐ ..... Other transfer in connection with financing (describe): ________
v. ☐ ..... A grant or assignment of a leasehold interest in a tax-free NY area
w. ☐ ..... Transfer to an HDFC or an entity controlled by an HDFC. (Complete Schedule L)
x. ....Reserved
y. ....Reserved
z. ☑ ..... Other (describe) ENVIRONMENT EASEMENT

NYC-RPT - Rev. 03.24.2017

2019100200037101 01

● TYPE OF PROPERTY (✓)	
a. ☐	1-3 family house
b. ☐	Individual residential condominium unit
c. ☐	Individual cooperative apartment
d. ☐	Commercial condominium unit
e. ☐	Commercial cooperative
f. ☐	Apartment building
g. ☐	Office building
h. ☐	Industrial building
i. ☐	Utility
j. ☑	OTHER. (describe): MULTIPLE PROPERTIES

● TYPE OF INTEREST (✓)

Check box at LEFT if you intend to record a document related to this transfer. Check box at RIGHT if you do not intend to record a document related to this transfer.

	REC.		NON REC.
a.	☐	Fee	☑
b.	☐	Leasehold Grant	☐
c.	☐	Leasehold Assignment or Surrender	☐
d.	☐	Easement	☐
e.	☐	Subterranean Rights	☐
f.	☐	Development Rights	☐
g.	☐	Stock	☐
h.	☐	Partnership Interest	☐
i.	☐	OTHER. (describe):	☐

SCHEDULE 1 - DETAILS OF CONSIDERATION

COMPLETE THIS SCHEDULE FOR ALL TRANSFERS AFTER COMPLETING THE APPROPRIATE SCHEDULES ON PAGES 5 THROUGH 12. ENTER "ZERO" ON LINE 11 IF THE TRANSFER REPORTED WAS WITHOUT CONSIDERATION.

1.	Cash	● 1.	0 00
2.	Purchase money mortgage	● 2.	0 00
3.	Unpaid principal of pre-existing mortgage(s)	● 3.	0 00
4.	Accrued interest on pre-existing mortgage(s)	● 4.	0 00
5.	Accrued real estate taxes	● 5.	0 00
6.	Amounts of other liens on property	● 6.	0 00
7.	Value of shares of stock or of partnership interest received	● 7.	0 00
8.	Value of real or personal property received in exchange	● 8.	0 00
9.	Amount of Real Property Transfer Tax and/or other taxes or expenses of the grantor which are paid by the grantee	● 9.	0 00
10.	Other (describe):	● 10.	0 00
11.	**TOTAL CONSIDERATION** (add lines 1 through 10 - must equal amount entered on line 1 of Schedule 2) (see instructions)	● 11.	$ 0 00

See instructions for special rules relating to transfers of cooperative units, liquidations, marital settlements and transfers of property to a business entity in return for an interest in the entity.

SCHEDULE 2 - COMPUTATION OF TAX

A. Payment - Tax amount shown on line 15. See instructions

Payment Enclosed

1.	Total Consideration (from line 11, above)	● 1.	0 00
2.	Excludable liens (see instructions)	● 2.	0 00
3.	Consideration (line 1 less line 2)	● 3.	0 00
4.	Tax Rate (see instructions)	● 4.	0 %
5.	HDFC Exemption (see Schedule L, line 15)	● 5.	0 00
6.	Consideration less HDFC Exemption (line 3 less line 5)	● 6.	0 00
7.	Percentage change in beneficial ownership (see instructions)	● 7.	100 %
8	Taxable consideration (multiply line 6 by line 7)	● 8.	0 00
9.	Tax (multiply line 8 by line 4)	● 9.	0 00
10.	Credit (see instructions)	● 10.	0 00
11.	Transfer tax previously paid (see Schedule L, line 18)	● 11.	0 00
12.	Tax due (line 9 less line 10 and 11) (if the result is negative, enter zero)	● 12.	0 00
13.	Interest (see instructions)	● 13.	0 00
14.	Penalty (see instructions)	● 14.	0 00
15.	**Total Tax Due** (add lines 12, 13 and 14)	● 15.	$ 0 00

201910020003710101

SCHEDULE 3 - TRANSFERS INVOLVING MULTIPLE GRANTORS AND/OR GRANTEES

NOTE: If additional space is needed, attach copies of this schedule or an addendum listing all of the information required below.

GRANTORS

- Name: EBENEZER PLAZA OWNER LLC
- Grantor is a(n): (check one) ☐ individual ☐ partnership ☐ corporation ☐ single member LLC ☑ multiple member LLC ☐ other
- Telephone Number:
- Permanent mailing address after transfer (number and street): C/O: PROCIDA DEVELOPMENT GROUP LLC 456 EAST 173RD STREET
- City and State: BRONX, NY
- Zip Code: 10457
- Single member's name if grantor is a single member LLC:
- SOCIAL SECURITY NUMBER:
- OR
- EMPLOYER IDENTIFICATION NUMBER: 81 - 1883022
- SINGLE MEMBER EIN OR SSN:

- Name:
- Grantor is a(n): (check one) ☐ individual ☐ partnership ☐ corporation ☐ single member LLC ☐ multiple member LLC ☐ other
- Telephone Number:
- Permanent mailing address after transfer (number and street):
- City and State:
- Zip Code:
- Single member's name if grantor is a single member LLC:
- SOCIAL SECURITY NUMBER:
- OR
- EMPLOYER IDENTIFICATION NUMBER:
- SINGLE MEMBER EIN OR SSN:

GRANTEES

- Name:
- Grantee is a(n): (check one) ☐ individual ☐ partnership ☐ corporation ☐ single member LLC ☐ multiple member LLC ☐ other
- Telephone Number:
- Permanent mailing address after transfer (number and street):
- City and State:
- Zip Code:
- Single member's name if grantee is a single member LLC:
- SOCIAL SECURITY NUMBER:
- OR
- EMPLOYER IDENTIFICATION NUMBER:
- SINGLE MEMBER EIN OR SSN:

- Name:
- Grantee is a(n): (check one) ☐ individual ☐ partnership ☐ corporation ☐ single member LLC ☐ multiple member LLC ☐ other
- Telephone Number:
- Permanent mailing address after transfer (number and street):
- City and State:
- Zip Code:
- Single member's name if grantee is a single member LLC:
- SOCIAL SECURITY NUMBER:
- OR
- EMPLOYER IDENTIFICATION NUMBER:
- SINGLE MEMBER EIN OR SSN:

GRANTOR'S ATTORNEY ▼

Name of Attorney		Telephone Number
		( )
Address (number and street)	City and State	Zip Code

EMPLOYER IDENTIFICATION NUMBER - OR SOCIAL SECURITY NUMBER - -

GRANTEE'S ATTORNEY ▼

Name of Attorney		Telephone Number
		( )
Address (number and street)	City and State	Zip Code

EMPLOYER IDENTIFICATION NUMBER - OR SOCIAL SECURITY NUMBER - -

CERTIFICATION ▼

I swear or affirm that this return, including any accompanying schedules, affidavits and attachments, has been examined by me and is, to the best of my knowledge, a true and complete return made in good faith, pursuant to Title 11, Chapter 21 of the Administrative Code and the regulations issued thereunder.

GRANTOR

Sworn to and subscribed to before me on this 4th day of October, 2019.

Signature of Notary

(Notary's stamp or seal)

MILEIKA BETHANCOURT
NOTARY PUBLIC, STATE OF NEW YORK
No. 01BE6220876
Qualified in Kings County
Commission Expires 04-19-2022

81-3591579
EMPLOYER IDENTIFICATION NUMBER OR SOCIAL SECURITY NUMBER

HP EBENEZER PLAZA HDFC, INC.
Name of Grantor

By:
Signature of Grantor

DANIEL MARKS COHEN
VICE PRESIDENT

GRANTEE

Sworn to and subscribed to before me on this 9th day of October, 2019.

Cristin M Clarke
Signature of Notary

(Notary's stamp or seal)

CRISTIN M. CLARKE, ESQ.
NOTARY PUBLIC - STATE OF NEW YORK
NO. 02CL6056390
QUALIFIED IN SARATOGA COUNTY
COMMISSION EXPIRES MARCH 19, 2023

14-6013200
EMPLOYER IDENTIFICATION NUMBER OR SOCIAL SECURITY NUMBER

THE PEOPLE OF THE STATE OF NEW YORK
Name of Grantee

Signature of Grantee

2019100200037101

CERTIFICATION

I swear or affirm that this return, including any accompanying schedules, affidavits and attachments, has been examined by me and is, to the best of myknowledge, a true and complete return made in good faith, pursuant to Title 11, Chapter 21 of the Administrative Code and the regulations issued thereunder.

GRANTORS

EIN/SSN	Name of Grantor	Signature of Grantor
81-1883022	EBENEZER PLAZA OWNER LLC	

GRANTEES

EIN/SSN	Name of Grantee	Signature of Grantee

2019100200037101

Appendix B: List of Site Contacts

APPENDIX B – LIST OF SITE CONTACTS

Name	**Phone/Email Address**
Site Owner: Peter Procida Procida Development Group	718-299-7000 x211 pprocida@procidacompanies.com
Qualified Environmental Professional: Kevin McGrath, PG, CPG The Chazen Companies	518-266-7370 kmcgrath@chazencompanies.com
NYSDEC DER Project Manager: Aaron Fischer	518-402-9767 aaron.fischer@dec.ny.gov
NYSDEC Section Chief: Heidi Dudek	518-402-9768 heidi.dudek@dec.ny.gov
NYSDEC Director, Remedial Bureau B: Gerard Burke	518-402-9768 gerard.burke@dec.ny.gov
Remedial Party Attorney: Dean Sommer Young/Sommer LLC Attorneys at Law	518-438-9907 x 236 dsommer@youngsommer.com

Appendix C: Excavation Work Plan

APPENDIX C - EXCAVATION WORK PLAN (EWP)

B-1 NOTIFICATION

At least 15 days prior to the start of any activity that is anticipated to encounter remaining contamination, the site owner or their representative will notify the NYSDEC. Table 1 includes contact information for the above notification. The information on this table will be updated as necessary to provide accurate contact information.

Table 1: Notifications*

Aaron Fischer (NYSDEC Project Manager)	Phone: 518-402-9767 Email: aaron.fischer@dec.ny.gov
Sally Dewes (NYSDEC Section Chief)	Phone: 518-402-9768 Email: sally.dewes@dec.ny.gov
Gerard Burke (NYSDEC DER Bureau B Director)	Phone: 518-402-9768 Email: gerard.burke@dec.ny.gov

* Note: Notifications are subject to change and will be updated as necessary.

This notification will include:

- A detailed description of the work to be performed, including the location and areal extent of excavation, plans/drawings for site re-grading, intrusive elements or utilities to be installed below the soil cover, estimated volumes of contaminated soil to be excavated and any work that may impact an engineering control;
- A summary of environmental conditions anticipated to be encountered in the work areas, including the nature and concentration levels of contaminants of concern, potential presence of grossly contaminated media, and plans for any pre-construction sampling;
- A schedule for the work, detailing the start and completion of all intrusive work;
- A summary of the applicable components of this EWP;
- A statement that the work will be performed in compliance with this EWP and 29 CFR 1910.120;

- A copy of the contractor's health and safety plan (HASP), in electronic format, if it differs from the HASP provided in **Appendix F** of this SMP;
- Identification of disposal facilities for potential waste streams; and
- Identification of sources of any anticipated backfill, along with all required chemical testing results.

B-2 SOIL SCREENING METHODS

Visual, olfactory and instrument-based (e.g. photoionization detector) soil screening will be performed by a qualified environmental professional during all excavations into known or potentially contaminated material (remaining contamination). Soil screening will be performed when invasive work is done and will include all excavation and invasive work performed during development, such as excavations for foundations and utility work, after issuance of the COC.

Soils will be segregated based on previous environmental data and screening results into material that requires off-site disposal and material that requires testing to determine if the material can be reused on-site as soil beneath a cover or if the material can be used as cover soil. Further discussion of off-site disposal of materials and on-site reuse is provided in Section B-4 of this Appendix.

B-3 SOIL STAGING METHODS

Soil stockpiles will be continuously encircled with a berm and/or silt fence. Hay bales will be used as needed near catch basins, and other discharge points.

Stockpiles will be kept covered at all times with appropriately anchored tarps. Stockpiles will be routinely inspected and damaged tarp covers will be promptly replaced.

Stockpiles will be inspected at a minimum once each week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the site and available for inspection by the NYSDEC.

B-4 MATERIALS EXCAVATION AND LOAD-OUT

A qualified environmental professional or person under their supervision will oversee all invasive work and the excavation and load-out of all excavated material.

The owner of the property and remedial party (if applicable) and its contractors are responsible for safe execution of all invasive and other work performed under this Plan.

The presence of utilities and easements on the Site will be investigated by the qualified environmental professional. It will be determined whether a risk or impediment to the planned work under this SMP is posed by utilities or easements on the site.

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

A truck wash will be operated on-site, as appropriate. The qualified environmental professional will be responsible for ensuring that all outbound trucks will be washed at the truck wash before leaving the site until the activities performed under this section are complete Truck wash waters will be collected and disposed of off-site in an appropriate manner.

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

The qualified environmental professional will be responsible for ensuring that all egress points for truck and equipment transport from the site are clean of dirt and other materials derived from the site during intrusive excavation activities. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to site-derived materials.

B-5 MATERIALS TRANSPORT OFF-SITE

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

Material transported by trucks exiting the site will be secured with tight-fitting covers. Loose-fitting canvas-type truck covers will be prohibited. If loads contain wet material capable of producing free liquid, truck liners will be used. Trucks will be prohibited from stopping and idling in the neighborhood outside the project site.

The Site is located in a developed commercial/ industrial area that regularly receives truck traffic. The Site is situated along Linden Boulevard and the Van Wick Expressway corridor. As such, truck transport routes are anticipated to be on these main roads commonly used for trucks and will limit transport through residential areas and past sensitive sites. Therefore, no specific truck routes are warranted.

Egress points for truck and equipment transport from the Site will be kept clean of dirt and other materials during Site remediation and development.

B-6 MATERIALS DISPOSAL OFF-SITE

All soil/ fill/ solid waste excavated and removed from the source and plume areas of the Site will be treated as contaminated and regulated material and will be transported and disposed in accordance with all local, State (including 6NYCRR Part 360) and Federal regulations. If disposal of soil/fill from this Site is proposed for unregulated off-site disposal (i.e. clean soil removed for development purposes), a formal request with an associated plan will be made to the NYSDEC. Unregulated off-site management of materials from this site will not occur without formal NYSDEC approval.

Off-site disposal locations for excavated soils will be identified in the pre-excavation notification. This will include estimated quantities and a breakdown by class of disposal facility if appropriate, i.e. hazardous waste disposal facility, solid waste landfill, petroleum treatment facility, C/D recycling facility, etc. Actual disposal quantities and associated documentation will be reported to the NYSDEC in the Periodic Review Report. This documentation will include: waste profiles, test results, facility acceptance letters, manifests, bills of lading and facility receipts.

Non-hazardous historic fill and contaminated soils taken off-site will be handled, at minimum, as a Municipal Solid Waste per 6 NYCRR Part 360-1.2. Material that does not meet Unrestricted SCOs is prohibited from being taken to a New York State recycling facility (6NYCRR Part 360-16 Registration Facility).

B-7 MATERIALS REUSE ON-SITE

Chemical criteria for on-Site re-use of material have been approved by NYSDEC and consist of Target A Compound List (TCL) of VOCs via EPA Method 8260. Consistent with DER-10: soil that meets the Unrestricted Use SCOs can be reused without restrictions both on and off-site, soil that meets the Restricted Residential Use SCOs can be reused on the site in the general area that they were excavated from. No saturated soil will be used in the unsaturated zone.

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

Any demolition material proposed for reuse on-site will be sampled for asbestos and the results will be reported to the NYSDEC for acceptance. Concrete crushing or processing on-site will not be performed without prior NYSDEC approval. Organic matter (wood, roots, stumps, etc.) or other solid waste derived from clearing and grubbing of the site will not be reused on-site.

B-8 FLUIDS MANAGEMENT

All liquids to be removed from the site, including but not limited to, excavation dewatering, decontamination waters and groundwater monitoring well purge and development waters, will be handled, transported and disposed in accordance with applicable local, State, and Federal regulations. Dewatering, purge and development fluids will not be recharged back to the land surface or subsurface of the site, and will be managed off-site, unless prior approval is obtained from NYSDEC.

Discharge of water generated during large-scale construction activities to surface waters (i.e. a local pond, stream or river) will be performed in accordance with state and low law under a SPDES permit.

B-9 COVER SYSTEM RESTORATION

After the completion of soil removal and any other invasive activities the cover system will be restored in a manner that complies with the decision document. The existing cover system is comprised of a minimum of 24 inches of clean soil, asphalt pavement, concrete covered sidewalks and concrete building. A demarcation layer, consisting of orange snow fencing material will be placed to provide a visual reference to the top of the remaining contamination zone, the zone that requires adherence to special conditions for disturbance of remaining contaminated soils defined in this SMP. If the type of cover system changes from that which exists prior to the excavation (i.e., a soil cover is replaced by asphalt), this will constitute a modification of the cover element of the remedy and the upper surface of the remaining contamination. A figure showing the modified surface will be included in the subsequent Periodic Review Report and in an updated SMP.

B-10 BACKFILL FROM OFF-SITE SOURCES

All materials proposed for import onto the Site will be approved by the qualified environmental professional and will be in compliance with provisions in this SMP prior to receipt at the site. A Request to Import/Reuse Fill or Soil form, which can be found at http://www.dec.ny.gov/regulations/67386.html, will be prepared and submitted to the NYSDEC project manager allowing a minimum of 5 business days for review.

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

All imported soils will meet the backfill and cover soil quality standards established in 6NYCRR 375-6.7(d). Soils that meet 'exempt' fill requirements under 6 NYCRR Part 360, but do not meet backfill or cover soil objectives for this site, will not be imported onto the site without prior approval by NYSDEC. Solid waste will not be imported onto the site.

Trucks entering the site with imported soils will be securely covered with tight fitting covers. Imported soils will be stockpiled separately from excavated materials and covered to prevent dust releases.

B-11 STORMWATER POLLUTION PREVENTION

Future development plans and activities will be based on actual planned projects, and any legally required Stormwater Pollution Prevention Plan (SWPPP) will be implemented. The SWPPP will conform to the requirements of NYSDEC Division of Water Guidelines and NYS regulations.

B-12 EXCAVATION CONTINGENCY PLAN

If underground tanks or other previously unidentified contaminant sources are found during post-remedial subsurface excavations or development related construction, excavation activities will be suspended until sufficient equipment is mobilized to address the condition.

Sampling will be performed on product, sediment and surrounding soils, etc. as necessary to determine the nature of the material and proper disposal method. Chemical analysis will be performed for a full list of analytes (TAL metals; TCL volatiles and semi-volatiles, TCL pesticides and PCBs), unless the site history and previous sampling results provide a sufficient justification to limit the list of analytes. In this case, a reduced list of analytes will be proposed to the NYSDEC for approval prior to sampling.

Identification of unknown or unexpected contaminated media identified by screening during invasive site work will be promptly communicated by phone to NYSDEC's Project Manager. Reportable quantities of petroleum product will also be reported to the NYSDEC spills hotline. These findings will be also included in the Periodic Review Reports prepared pursuant to Section 5 of the SMP.

B-13 COMMUNITY AIR MONITORING PLAN

Community air monitoring will be performed in accordance with the Site Health and Safety Plan (Section 6.0 Air Monitoring) and CAMP, both in **Appendix F** of the SMP. Exceedances of action levels listed in the CAMP will be reported to NYSDEC and NYSDOH Project Managers.

B-14 ODOR CONTROL PLAN

This odor control plan is capable of controlling emissions of nuisance odors off-site and on-site, for residents or tenants on the property. Specific odor control methods to be used on a routine basis will include limiting exposed soil area, covering exposed soil, the application of odor control foam or other products applies directly to the exposed soil, or odor neutralizing. If nuisance odors are identified at the site boundary, or if odor complaints are received, work will be halted and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. NYSDEC and NYSDOH will be notified of all odor events and of any other complaints about the project. Implementation of all odor controls, including the halt of work, is the responsibility of the remedial party's Remediation Engineer, and any measures that are implemented will be discussed in the Periodic Review Report.

All necessary means will be employed to prevent on- and off-site nuisances. At a minimum, these measures will include: (a) limiting the area of open excavations and size of soil stockpiles; (b) shrouding open excavations with tarps and other covers; and (c) using foams to cover exposed odorous soils. If odors develop and cannot be otherwise controlled, additional means to eliminate odor nuisances will include: (d) direct load-out of soils to trucks for off-site disposal; (e) use of chemical odorants in spray or misting systems; and, (f) use of staff to monitor odors in surrounding neighborhoods.

If nuisance odors develop during intrusive work that cannot be corrected, or where the control of nuisance odors cannot otherwise be achieved due to on-site conditions or close proximity to sensitive receptors, odor control will be achieved by sheltering the excavation and handling areas in a temporary containment structure equipped with appropriate air venting/filtering systems.

B-15 DUST CONTROL PLAN

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

- Dust suppression will be achieved through the use of a dedicated on-site water truck for road wetting. The truck will be equipped with a water cannon capable of spraying water directly onto off-road areas including excavations and stockpiles.
- Clearing and grubbing of larger sites will be done in stages to limit the area of exposed, unvegetated soils vulnerable to dust production.
- Gravel will be used on roadways to provide a clean and dust-free road surface.
- On-site roads will be limited in total area to minimize the area required for water truck sprinkling.

Appendix D: Soil Borings

Historical Logs

TEST BORING AND WELL LOG

THE Chazen COMPANIES

21 Fox Street
Poughkeepsie, NY
12601

PROJECT: Linden Plaza Phase II ESA
LOCATION: Hegeman and New Lots Aves, Brooklyn, NY
CLIENT: Church of God of East Flatbush
PROJECT NO.: 20918.00 Task 0200

Test Boring No.: **SB-1**
Total Depth: 20 ft.

Contractor:	Aquifer Drilling and Testing	**Start Date:**	12/22/2009	**Northing:**	
Drill Rig:	Geoprobe®	**Finish Date:**	12/22/2009	**Easting:**	
Driller:	Andrea Babel	**El. Datum:**		**Longitude:**	
Inspector:	Dan Michaud	**G.S. Elevation:**		**Latitude:**	

Borehole Dia.:	2.125	in.
Depth to Water:	NA	ft.
Depth to Rock:	NA	ft.
Depth of Well:	NA	ft.

Depth *(Feet)*	Elevation *(Feet)*	Casing Data	Sample No.	Groundwater	Recovery *(Inches)*	PID *(ppm)*	Group Symbol	Stratum and Field Descriptions:
					48	0.3		48" Black SILT and SAND fill soils; dry. NOSOC
1	-1							
2	-2							
3	-3							
4	-4							
5	-5							
					48	0.3		12" SAA
6	-6							
								36" Orange-brown fine-medium SAND; dry. NOSOC
7	-7							
8	-8							
9	-9							
10	-10							
					60	0.4		60" Orange fine-medium SAND, dry. NOSOC
11	-11							
12	-12							
13	-13							
14	-14							
15	-15							
				▼	60	3		60" Fine-med. Brown SAND; wet.
16	-16							Last 12" Black, slight odor.
17	-17							
18	-18							
19	-19							
20	-20							EOB at 20'. Refusal not encountered

Well Diagram

Field Notes, Well Notes, Comments:

Well Type:
Temporary Monitoring

Finish Type: PVC

1" diameter; 0.010-slot PVC Screen (10 -- 20 feet bgs)

STANDARD NOTES: 1. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.
2. Samples classified in accordance with ASTM D-2488 unless otherwise noted.
3. Test Boring Log Page 1: 0 - 20 feet Each subsequent page: Additional 25 feet.

DRILLING INFORMATION

Method: Direct Push

	Casing	Sample	Core
Type:			
Diam.:			
Weight:			
Fall:			

ADDITIONAL NOTES:

1) SAA = Same As Above
2) NOSOC = No Obvious Signs of Contamination
3) EOB = End of Boring
4) PID #2 used, calibrated with Isobutylene gas prior to use

TEST BORING AND WELL LOG

THE Chazen COMPANIES	21 Fox Street Poughkeepsie, NY 12601	**PROJECT:** Linden Plaza Phase II ESA **LOCATION:** Hegeman and New Lots Aves, Brooklyn, NY **CLIENT:** Church of God of East Flatbush **PROJECT NO.:** 20918.00 Task 0200	**Test Boring No.:** SB-2 **Total Depth:** 20 ft.

Contractor: Aquifer Drilling and Testing **Drill Rig:** Geoprobe® **Driller:** Andrea Babel **Inspector:** Dan Michaud	**Start Date:** 12/21/2009 **Finish Date:** 12/21/2009 **El. Datum:** **G.S. Elevation:**	**Northing:** **Easting:** **Longitude:** **Latitude:**	**Borehole Dia.:** 2.125 in. **Depth to Water:** NA ft. **Depth to Rock:** NA ft. **Depth of Well:** NA ft.

Depth (Feet)	Elevation (Feet)	Casing Data	Sample No.	Groundwater	Recovery (Inches)	PID (ppm)	Group Symbol	Stratum and Field Descriptions:	Well Diagram	Field Notes, Well Notes, Comments:
					30	32		30" Black silty SAND, some fill; dry. NOSOC		
1	-1									Well Type: Temporary Monitoring
2	-2									Finish Type: PVC
3	-3									
4	-4									
5	-5									
					48	2		48' Brown medium SAND, some silt; dry. NOSOC		
6	-6									
7	-7									
8	-8									
9	-9									
10	-10									
					48	0		48" Light brown fine to medium SAND; dry. NOSOC		
11	-11									
12	-12									
13	-13									
14	-14									
15	-15									
				▼	60	0		60" Light brown fine-medium SAND; wet. NOSOC		
16	-16									
17	-17									1" diameter; 0.010-slot PVC Screen (10 -- 20 feet bgs)
18	-18									
19	-19									
20	-20							EOB at 20'. Refusal not encountered		

STANDARD NOTES: 1. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.
2. Samples classified in accordance with ASTM D-2488 unless otherwise noted.
3. Test Boring Log Page 1: 0 - 20 feet Each subsequent page: Additional 25 feet.

DRILLING INFORMATION

Method: Direct Push

	Casing	Sample	Core
Type:			
Diam.:			
Weight:			
Fall:			

ADDITIONAL NOTES:

1) SAA = Same As Above
2) NOSOC = No Obvious Signs of Contamination
3) EOB = End of Boring
4) PID #2 used, calibrated with Isobutylene gas prior to use

TEST BORING AND WELL LOG

THE Chazen COMPANIES
21 Fox Street
Poughkeepsie, NY
12601

PROJECT: Linden Plaza Phase II ESA
LOCATION: Hegeman and New Lots Aves, Brooklyn, NY
CLIENT: Church of God of East Flatbush
PROJECT NO.: 20918.00 Task 0200

Test Boring No.: **SB-4**
Total Depth: 20 ft.

Contractor: Aquifer Drilling and Testing
Drill Rig: Geoprobe®
Driller: Andrea Babel
Inspector: Dan Michaud

Start Date: 12/22/2009
Finish Date: 12/22/2009
El. Datum:
G.S. Elevation:

Northing:
Easting:
Longitude:
Latitude:

Borehole Dia.: 2.125 in.
Depth to Water: NA ft.
Depth to Rock: NA ft.
Depth of Well: NA ft.

Depth (Feet)	Elevation (Feet)	Casing Data	Sample No.	Groundwater	Recovery (Inches)	PID (ppm)	Group Symbol	Stratum and Field Descriptions:	Well Diagram	Field Notes, Well Notes, Comments:
					36	1.1		36: Black/orange silty SAND, dry; NOSOC		
1	-1									Well Type: Temporary Monitoring
2	-2									Finish Type: PVC
3	-3									
4	-4									
5	-5									
					36	1.3		36" Orange silty SAND becoming medium SAND at bottom, dry; NOSOC		
6	-6									
7	-7									
8	-8									
9	-9									
10	-10									
					30	1.5		30" Fine to medium orange SAND, dry; NOSOC		
11	-11									
12	-12									
13	-13									
14	-14									
15	-15									
				▼	48	0.2		48" fine-medium orange SAND, wet; NOSOC		
16	-16									
17	-17									1" diameter; 0.010-slot PVC Screen (10 -- 20 feet bgs)
18	-18									
19	-19									
20	-20							EOB at 20'. Refusal not encountered		

STANDARD NOTES: 1. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.
2. Samples classified in accordance with ASTM D-2488 unless otherwise noted.
3. Test Boring Log Page 1: 0 - 20 feet Each subsequent page: Additional 25 feet.

ADDITIONAL NOTES:
1) SAA = Same As Above
2) NOSOC = No Obvious Signs of Contamination
3) EOB = End of Boring
4) PID #2 used, calibrated with Isobutylene gas prior to use.

DRILLING INFORMATION
Method: Direct Push

	Casing	Sample	Core
Type:			
Diam.:			
Weight:			
Fall:			

TEST BORING AND WELL LOG

THE Chazen COMPANIES
21 Fox Street
Poughkeepsie, NY
12601

PROJECT: Church of God - Linden Plaza
LOCATION: Hegeman and New Lots Avenues, Brooklyn, NY
CLIENT: The Church of God of East Flatbush
PROJECT NO.: 20918.01

Test Boring No.: **SB-23**
Total Depth: 20 ft.

Contractor:	Aquifer Drilling and Testing	**Start Date:**	11/15/2011	**Northing:**	---
Drill Rig:	Geoprobe 6620 DT	**Finish Date:**	11/15/2011	**Easting:**	---
Driller:	Andrea Larkin	**El. Datum:**	N/A	**Longitude:**	---
Inspector:	Scott Dietzel	**G.S. Elevation:**	0.00	**Latitude:**	---

Borehole Dia.:	2.25	in.
Depth to Water:	14	ft.
Depth to Rock:	N/A	ft.
Depth of Well:	N/A	ft.

Depth (Feet)	Elevation (Feet)	Casing Data	Sample No.	Sample Data	Recovery (Inches)	PID (ppm)	Group Symbol	Stratum and Field Descriptions:	Well Diagram	Field Notes, Well Notes, Comments:
								Vac-tron utility cleanance to 5 feet below ground surface (bgs)		No well installed.
1	-1									
2	-2									
3	-3									
4	-4									
5	-5		1		43	0	SP	Light brown medium SAND, some fine sand, trace coarse sand		No odor, No staining
6	-6									
7	-7									
8	-8									
9	-9									
10	-10		2		44	0	SP	Same as above (SAA)		
11	-11									
12	-12									
13	-13									
14	-14							wet		
15	-15		3		40	0.6	SP	SAA		
16	-16							stained black, hydrocarbon odor		
17	-17									
18	-18									
19	-19									
								Exploration terminated at 20 ft. bgs		

STANDARD NOTES: 1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.
2. Test Boring Log Page 1: 0 - 20 feet Each subsequent page: Additional 25 feet.

ADDITIONAL NOTES:
Collected 15-20 ft. interval sample at 1018.

DRILLING INFORMATION
Method: Direct push

	Casing	Sample	Core
Type:			
Diam.:			
Weight:			
Fall:			

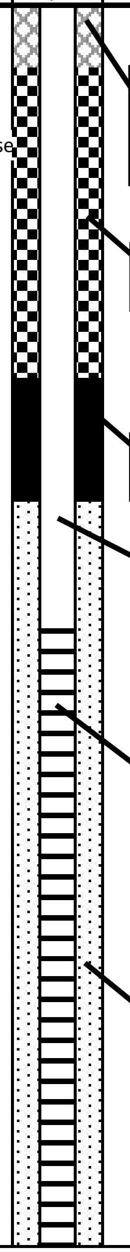
TEST BORING AND WELL LOG

THE Chazen COMPANIES	21 Fox Street Poughkeepsie, NY 12601	**PROJECT:** Church of God - Linden Plaza **LOCATION:** Hegeman and New Lots Avenues, Brooklyn, NY **CLIENT:** The Church of God of East Flatbush **PROJECT NO.:** 20918.01	**Test Boring No.:** SB-27 **Total Depth:** 20 ft.

Contractor: Aquifer Drilling and Testing	**Start Date:** 11/15/2011	**Northing:** ---	**Borehole Dia.:** 2.25 in.
Drill Rig: Geoprobe 6620 DT	**Finish Date:** 11/15/2011	**Easting:** ---	**Depth to Water:** 15 ft.
Driller: Andrea Larkin	**El. Datum:** N/A	**Longitude:** ---	**Depth to Rock:** N/A ft.
Inspector: Scott Dietzel	**G.S. Elevation:** 0.00	**Latitude:** ---	**Depth of Well:** 20 ft.

Depth (Feet)	Elevation (Feet)	Casing Data	Sample No.	Sample Data	Recovery (Inches)	PID (ppm)	Group Symbol	Stratum and Field Descriptions:
0			1		41	4	SP	3-inches Asphalt
								2-feet sandy FILL, brown, some brick fragments
1	-1							
2	-2					4	SP	Orange-brown SAND, mostly medium sand, some fine sand, trace coarse sand
3	-3							
4	-4							
5	-5		2		41	4	SP	Same as above (SAA) grades to light brown
6	-6							
7	-7							
8	-8							
9	-9							
10	-10		3		46	3.8	SP	SAA, no odor, no staining
11	-11							
12	-12							
13	-13							
14	-14							
15	-15		4		36	3	SP	SAA, wet,
16	-16							grades to gray (stained), slight hydrocarbon odor
17	-17							
18	-18							
19	-19							
								Exploration terminated at 20 ft. bgs

Well Diagram



Field Notes, Well Notes, Comments:

MW-7 Installed

Concrete surrounding protective steel

Native material

Bentonite clay

solid schedule 40

slotted schedule 40 PVC well screen pipe

No. 2 sand

STANDARD NOTES: 1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.
2. Test Boring Log Page 1: 0 - 20 feet Each subsequent page: Additional 25 feet.

DRILLING INFORMATION

Method: Direct push

	Casing	Sample	Core
Type:			
Diam.:			
Weight:			
Fall:			

ADDITIONAL NOTES:

Collected 15-20 ft. interval sample at 1430.

Background PID readings of 4 ppm possibly due to adjacent paint shop

TEST BORING AND WELL LOG

THE Chazen COMPANIES
21 Fox Street
Poughkeepsie, NY
12601

PROJECT: Church of God - Linden Plaza
LOCATION: Hegeman and New Lots Avenues, Brooklyn, NY
CLIENT: The Church of God of East Flatbush
PROJECT NO.: 20918.01

Test Boring No.: **SB-28**
Total Depth: 20 ft.

Contractor:	Aquifer Drilling and Testing	**Start Date:**	11/15/2011	**Northing:**	---
Drill Rig:	Geoprobe 6620 DT	**Finish Date:**	11/15/2011	**Easting:**	---
Driller:	Andrea Larkin	**El. Datum:**	N/A	**Longitude:**	---
Inspector:	Scott Dietzel	**G.S. Elevation:**	0.00	**Latitude:**	---

Borehole Dia.:	2.25	in.
Depth to Water:	15	ft.
Depth to Rock:	N/A	ft.
Depth of Well:	N/A	ft.

Depth (Feet)	Elevation (Feet)	Casing Data	Sample No.	Sample Data	Recovery (Inches)	PID (ppm)	Group Symbol	Stratum and Field Descriptions:	Well Diagram	Field Notes, Well Notes, Comments:
			1		24	2.1		4-inches Asphalt		No well installed.
								Silty gravel FILL		
1	-1						SP	Orange brown, fine SAND, some silt		
2	-2									
3	-3									
4	-4									
5	-5		2		36	2.8	SP	Orange brown fine SAND, some medium sand		No odor, No staining
6	-6							grades to light brown sand, mostly medium sand, some fine sand, trace coarse sand		
7	-7									
8	-8									
9	-9									
10	-10		3		48	2.6	SP	Same as above (SAA)		No odor, No staining
11	-11									
12	-12									
13	-13									
14	-14							banded sediment layers		
15	-15		4		42	423	SP	SAA		
16	-16							grades to gray (Stained), hydrocarbon odor		
17	-17									
18	-18									
19	-19									
								Exploration terminated at 20 ft. bgs		

STANDARD NOTES: 1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.
2. Test Boring Log Page 1: 0 - 20 feet Each subsequent page: Additional 25 feet.

ADDITIONAL NOTES:
Collected 15-20 ft. interval sample at 1450.

DRILLING INFORMATION
Method: Direct push

	Casing	Sample	Core
Type:			
Diam.:			
Weight:			
Fall:			

TEST BORING AND WELL LOG

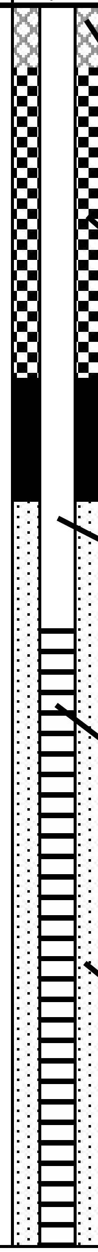
THE Chazen COMPANIES
21 Fox Street
Poughkeepsie, NY
12601

PROJECT: Church of God - Linden Plaza
LOCATION: Hegeman and New Lots Avenues, Brooklyn, NY
CLIENT: The Church of God of East Flatbush
PROJECT NO.: 20918.01

Test Boring No.: **SB-36**
Total Depth: 20 ft.

Contractor: Aquifer Drilling and Testing	**Start Date:** 11/16/2011	**Northing:** ---	**Borehole Dia.:** 2.25 in.
Drill Rig: Geoprobe 6620 DT	**Finish Date:** 11/16/2011	**Easting:** ---	**Depth to Water:** 14 ft.
Driller: Andrea Larkin	**El. Datum:** N/A	**Longitude:** ---	**Depth to Rock:** N/A ft.
Inspector: Scott Dietzel	**G.S. Elevation:** 0.00	**Latitude:** ---	**Depth of Well:** 20 ft.

Depth (Feet)	Elevation (Feet)	Casing Data	Sample No.	Sample Data	Recovery (Inches)	PID (ppm)	Group Symbol	Stratum and Field Descriptions:	Field Notes, Well Notes, Comments:
								Vac-tron utility cleanance to 5 feet below ground surface (bgs)	MW-11 Installed
1	-1								
2	-2								Concrete surrounding protective steel
3	-3								
4	-4								Native material
5	-5		1		30	0.6	SP	Light brown SAND, mostly medium sand, some fine sand, trace coarse sand, no staining, no odor	
6	-6								
7	-7								Bentonite clay
8	-8								
9	-9								solid schedule 40
10	-10		2		42	19.2	SP	Same as above (SAA)	
11	-11								
12	-12								slotted schedule 40 PVC well screen pipe
13	-13								
14	-14								
15	-15		3		41	1.4	SP	SAA, wet	
16	-16								No. 2 sand
17	-17					806			
18	-18								
19	-19								
								Exploration terminated at 20 ft. bgs	



STANDARD NOTES: 1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.
2. Test Boring Log Page 1: 0 - 20 feet Each subsequent page: Additional 25 feet.

ADDITIONAL NOTES:
Collected 13-15 ft. interval sample at 1450.

DRILLING INFORMATION
Method: Direct push

	Casing	Sample	Core
Type:			
Diam.:			
Weight:			
Fall:			

TEST BORING AND WELL LOG

THE Chazen COMPANIES 21 Fox Street Poughkeepsie, NY 12601	**PROJECT:** Church of God - Linden Plaza **LOCATION:** Hegeman and New Lots Avenues, Brooklyn, NY **CLIENT:** The Church of God of East Flatbush **PROJECT NO.:** 20918.01		**Test Boring No.:** **SB-37** **Total Depth:** 20 ft.
Contractor: Aquifer Drilling and Testing **Drill Rig:** Geoprobe 6620 DT **Driller:** Andrea Larkin **Inspector:** Scott Dietzel	**Start Date:** 11/16/2011 **Finish Date:** 11/16/2011 **El. Datum:** N/A **G.S. Elevation:** 0.00	**Northing:** --- **Easting:** --- **Longitude:** --- **Latitude:** ---	**Borehole Dia.:** 2.25 in. **Depth to Water:** 15 ft. **Depth to Rock:** N/A ft. **Depth of Well:** 20 ft.

Depth (Feet)	Elevation (Feet)	Casing Data	Sample No.	Sample Data	Recovery (Inches)	PID (ppm)	Group Symbol	Stratum and Field Descriptions:	Well Diagram	Field Notes, Well Notes, Comments:
								Hand cleared to 3 feet below ground surface (bgs)		MW-12 Installed
1	-1									
2	-2									Concrete surrounding protective steel
3	-3									
4	-4									Native material
5	-5		1		20	374	SP	Orange-brown SAND, mostly medium sand, some fine sand, trace coarse sand		
6	-6									
7	-7									Bentonite clay
8	-8									
9	-9									solid schedule 40
10	-10		2		41	181	SP	Same as above (SAA)		
11	-11									
12	-12									slotted schedule 40 PVC well screen pipe
13	-13									
14	-14									
15	-15		3		43	1317	SP	SAA, wet		
16	-16									No. 2 sand
17	-17							Stained gray, strong odor		
18	-18									
19	-19									
								Exploration terminated at 20 ft. bgs		

STANDARD NOTES: 1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.
2. Test Boring Log Page 1: 0 - 20 feet Each subsequent page: Additional 25 feet.

ADDITIONAL NOTES:
Collected 0-2 ft. interval sample at 1510.
Collected 17-20 ft. interval sample at 1530.

DRILLING INFORMATION
Method: Direct push

	Casing	Sample	Core
Type:			
Diam.:			
Weight:			
Fall:			

TEST BORING AND WELL LOG

THE Chazen COMPANIES
21 Fox Street
Poughkeepsie, NY
12601

PROJECT: Church of God - Linden Plaza
LOCATION: Hegeman and New Lots Avenues, Brooklyn, NY
CLIENT: The Church of God of East Flatbush
PROJECT NO.: 20918.01

Test Boring No.: **SB-38**
Total Depth: 25 ft.

Contractor: Aquifer Drilling and Testing	**Start Date:** 11/17/2011	**Northing:** ---	**Borehole Dia.:** 2.25 in.
Drill Rig: Geoprobe 6610DT	**Finish Date:** 11/17/2011	**Easting:** ---	**Depth to Water:** 17 ft.
Driller: Andrea Larkin	**El. Datum:** N/A	**Longitude:** ---	**Depth to Rock:** N/A ft.
Inspector: Scott Dietzel	**G.S. Elevation:** 0.00	**Latitude:** ---	**Depth of Well:** 23 ft.

Depth *(Feet)*	Elevation *(Feet)*	Casing Data	Sample No.	Sample Data	Recovery *(Inches)*	PID *(ppm)*	Group Symbol	Stratum and Field Descriptions:	Field Notes, Well Notes, Comments:
			1		24	0.4		Concrete slab	MW-13 Installed
								Sand, silt, gravel FILL	
1	-1								Concrete surrounding protective steel
2	-2								
3	-3								
4	-4							Brown, silty fine sand FILL	Native material
5	-5		2		28	0.8	SP	Same as above (SAA)	
6	-6								
7	-7								
8	-8								
9	-9								solid schedule 40
10	-10		3		43	0	SP	Orange-brown SAND, mostly medium sand, some fine sand, trace coarse sand, loose	
11	-11								Bentonite clay
12	-12								
13	-13							grades to light brown	
14	-14								slotted schedule 40 PVC well screen pipe
15	-15		4		36	0	SP	SAA, wet	
16	-16								No. 2 sand
17	-17								
18	-18								
19	-19								

Well Diagram

STANDARD NOTES: 1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.
2. Test Boring Log Page 1: 0 - 20 feet Each subsequent page: Additional 25 feet.

ADDITIONAL NOTES:

DRILLING INFORMATION

Method: Direct push

	Casing	Sample	Core
Type:			
Diam.:			
Weight:			
Fall:			

TEST BORING AND WELL LOG

THE Chazen COMPANIES	21 Fox Street Poughkeepsie, NY 12601	PROJECT: Church of God - Linden Plaza LOCATION: Hegeman and New Lots Avenues, Brooklyn, NY CLIENT: The Church of God of East Flatbush PROJECT NO.: 20918.01	Test Boring No.: SB-38 Total Depth: 25 ft.

Depth (Feet)	Elevation (Feet)	Casing Data	Sample No.	Sample Data	Recovery (Inches)	PID (ppm)	Group Symbol	Stratum and Field Descriptions:	Well Diagram	Field Notes, Well Notes, Comments:
			5		60	0	SP	SAA		
21	-21									
22	-22									
23	-23							3-inch silt layer, light brown		
24	-24									
25	-25							Exploration terminated at 25 ft. bgs		
26	-26									
27	-27									
28	-28									
29	-29									
30	-30									
31	-31									
32	-32									
33	-33									
34	-34									
35	-35									
36	-36									
37	-37									
38	-38									
39	-39									
40	-40									
41	-41									
42	-42									
43	-43									
44	-44									

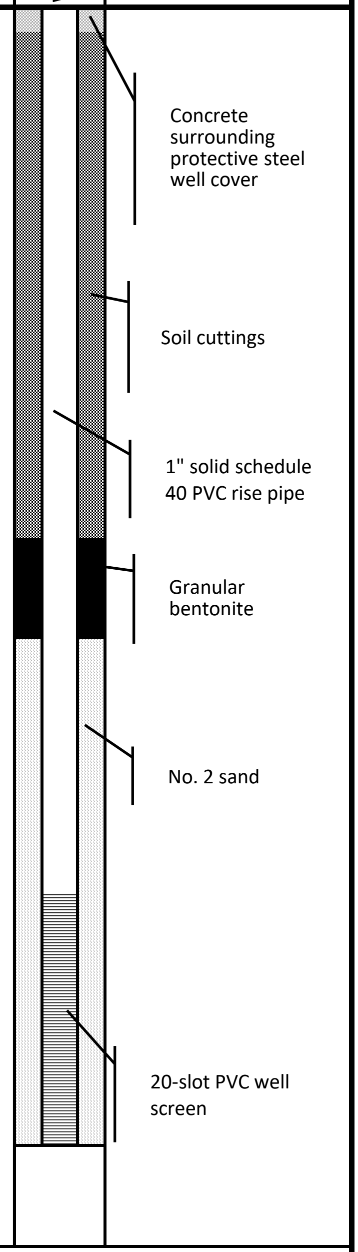
ADDITIONAL NOTES:

TEST BORING AND WELL LOG

THE Chazen COMPANIES 21 Fox Street Poughkeepsie, NY 12601	**PROJECT:** Church of God - Linden Plaza **LOCATION:** Hegeman and New Lots Avenues, Brooklyn, NY **CLIENT:** The Church of God of East Flatbush **PROJECT NO.:** 20918.01	**Test Boring No.:** IW-3 **Total Depth:** 23 ft.
Contractor: Aquifer Drilling and Testing **Drill Rig:** Geoprobe 6610 DT **Driller:** Andrea Larkin **Inspector:** Will Olsen	**Start Date:** 10/15/2013 **Northing:** --- **Finish Date:** 10/15/2013 **Easting:** --- **El. Datum:** N/A **Longitude:** --- **G.S. Elevation:** 0.00 **Latitude:** ---	**Borehole Dia.:** 6.5 in. **Depth to Water:** 15 ft. **Depth to Rock:** >23 ft. **Depth of Well:** 23 ft.

Depth *(Feet)*	Elevation *(Feet)*	Casing Data	Sample No.	Sample Data	Recovery *(Inches)*	PID *(ppm)*	Group Symbol	Stratum and Field Descriptions:
1	-1							No samples collected. Auger cuttings placed in sealed drum.
2	-2							
3	-3							
4	-4							
5	-5							
6	-6							
7	-7							
8	-8							
9	-9							
10	-10							
11	-11							
12	-12							
13	-13							
14	-14							
15	-15							
16	-16							
17	-17							
18	-18							
19	-19							
20	-20							
21	-21							
22	-22							
23	-23							
24	-24							
25	-25							

Well Diagram / **Field Notes, Well Notes, Comments:**



STANDARD NOTES: 1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.

ADDITIONAL NOTES:

DRILLING INFORMATION

Method: 3 1/4" HAS

	Casing	Sample	Core
Type:			
Diam.:			
Weight:			
Fall:			

DEC Spill Number: 09-06674 Project Location: 650 Powell Avenue Brooklyn, NY Boring Number: BH#12 Project: Linden Plaza Boring Method: Geoprobe Slide Hammer	Date Started: 3/5/10 Date Completed: 3/5/10 Depth to Water: 15' -16' Operator: Josh Falk **NOTES: Interior**
Eastern Environmental Solutions, Inc. ***258 Line Road Manorville, NY 11949***	

Depth in ft.	PID	Recovery in in	USC CODE	Observations/Stratum/Field Descriptions
1-2	20	--------	SP	Tan sand, some very fine to coarse; some orange,
2-4	34	--------	SP	Light tan to darker tan, silty to medium
4-6	49		SP	Medium, dark, orange and tan sand
6-8	60	--------	SP	Light to tan, fine to medium sand
8-10	100	--------	SP	Tan to dark, fine to medium
10-12	198	--------	SP	Tan to dark, fine to medium
12-14	294	--------	SP	Tan to dark, fine to medium
14-16	415		SP	Groundwater encountered Tan to dark, fine to medium
16-18	512	--------	SP	Tan to dark, fine to medium
18-20		--------		
20-22		--------		
22-24		--------		
24-26				
26-28		--------		
28-30		--------		

DEC Spill Number: 09-06674 Project Location: 650 Powell Avenue Brooklyn, NY Boring Number: BH#15 Project: Linden Plaza Boring Method: Geoprobe Slide Hammer	Date Started: 3/10/10 Date Completed: 3/10/10 Depth to Water: 15' -16' Operator: Josh Falk **NOTES: Interior**
Eastern Environmental Solutions, Inc. ***258 Line Road Manorville, NY 11949***	

Depth in ft.	PID	Recovery in in	USC CODE	Observations/Stratum/Field Descriptions
1-2	0	--------	SP	Dark and tan sand
2-4	0	--------	SP	Medium to dark sand, some orange with silt
4-6	0		SP	Medium, dark, orange and tan sand
6-8	0	--------	SP	Dark and tan, fine to coarse sand
8-10	0	--------	SP	Dark fine to coarse sand
10-12	48	--------	SP	Dark fine to coarse sand
12-14	8	--------	SP	Dark fine to coarse sand
14-16	119		SP	Groundwater encountered Tan and dark fine to coarse sand
16-18	131	--------	SP	Tan and dark fine to coarse sand
18-20		--------		
20-22		--------		
22-24		--------		
24-26				
26-28		--------		
28-30		--------		

DEC Spill Number: 09-06674

Project Location: 650 Powell Avenue
Brooklyn, NY

Boring Number: GW#1
Project: Linden Plaza

Boring Method: Geoprobe 6620

Eastern Environmental Solutions, Inc.
258 Line Road Manorville, NY 11949

Date Started: 3/15/10 Date Completed: 3/15/10

Depth to Water: 15' -16'

Operator: Josh Falk

NOTES: Exterior

Depth in ft	PID	Recovery in in	USC CODE	Observations/Stratum/Field Descriptions
1-2	8	--------	SP	Fine to coarse, light tan sand
2-4	10	--------	SP	Light tan to darker tan sand
4-6	13		SP	Tan, medium, dark, orange and tan sand
6-8	13	--------	SP	Tan, medium, dark, orange and tan sand
8-10	16	--------	SP	Tan, medium, dark, orange and tan sand
10-12	19	--------	SP	Dark, coarse tan sand
12-14	27	--------	SP	Tan to dark, fine to medium
14-16	27		SP	Groundwater encountered Tan to dark, fine to medium
16-18	27	--------	SP	Tan to dark, fine to medium
18-20		--------		
20-22		--------		
22-24		--------		
24-26				
26-28		--------		
28-30		--------		

THE Chazen COMPANIES 21 Fox Street Poughkeepsie, NY 12601 Phn: (845) 454-3980 Fax: (845) 454-4026	PROJECT: EP 1- POST ISCO LOCATION: CLIENT: PROJECT NO.: 20918.08		Test Boring No.: E2-3R Total Depth: 20 ft.
Contractor: Associated Drill Rig: 7822 DT Driller: Ryan Geologist: Eric Orlowski, PG	Start Date: 5/20/19 Finish Date: El. Datum: G.S. Elevation:	Northing: na Easting: na Longitude: na Latitude: na	Borehole Dia.: in. Water Depth: ft. Rock Depth: ft. Well Depth: ft.

Depth (Ft)	Elevation (Ft)	Casing Blows	Sample No.	PID (ppm)	Recovery(in)	Groundwater	Group Symbol	Stratum and Field Descriptions:	Well Diagram	Field Notes, Well Notes, Comments:
			1		44			Brown f-m sand, tr concrete, tr brick, tr rock frags, dry to moist		
1				0.4						
2										
3										
4				1.3						
5			2	1.6	40			Brown f-m sand, dry to moist		
6										
7										
8										
9				21.5						
10			3		41			29" SAA, moist, slight odor		
11				64.5				12" grey f-m sand, strong odor, wet		
12										
13										SAMPLES
14				1100		▼				(14-~~17~~) 1125 (17-20) 1130
15			4					Grey to grey-brown f-m sand, wet, strong odor.		
16				1100						
17										
18										
19				1000						
20										

METHODS: HSA- Hollow Stem Auger, RWH- Rotary Wash, SSA- Solid Stem Auger, CPT- Cone Penetrometer

SAMPLE TYPES: AS-Auger, WS-Wash, SS-Split Spoon, RC-Rock Core, GS-Grab, ST-Shelby Tube, PS-Piston

STANDARD NOTES:
1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.
2. Test Boring Log Page 1: 0 - 20 feet. Each subsequent page: Additional 20 feet.
3. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.

ADDITIONAL NOTES:
1. NOSOI-No obvious sign of impacts
2. saa - same as above
3 bgs - below ground surface
4. TGSP - Temporary Groundwater Sampling Point

DRILLING INFORMATION

Method: Direct Push

Method:

	Casing	Sample	Core
Type:			
Diam.:			
Weight:			
Fall:			

THE Chazen COMPANIES	21 Fox Street Poughkeepsie, NY 12601 Phn: (845) 454-3980 Fax: (845) 454-4026	PROJECT: EP1- POST ISCO LOCATION: CLIENT: PROJECT NO.: 20918.08	Test Boring No.: E3-4R Total Depth: 20 ft.
Contractor: Associated Drill Rig: 7822DT Driller: Ryan Geologist: Eric Orlowski, PG	Start Date: 5/20/2019 Finish Date: El. Datum: G.S. Elevation:	Northing: na Easting: na Longitude: na Latitude: na	Borehole Dia.: in. Water Depth: ft. Rock Depth: ft. Well Depth: ft.

Depth (Ft)	Elevation (Ft)	Casing Blows	Sample No.	PID (ppm)	Recovery(in)	Groundwater	Group Symbol	Stratum and Field Descriptions:	Well Diagram	Field Notes, Well Notes, Comments:
0			1		31			Brown f->m sand, tr concrete, tr brick, tr rock frags, dry to moist		
1				0.1						
5			2		34			14" SAA, dry to moist 20" brown f->m sand, dry to moist		
6				1.2						
10			3		28			13" brown f->m sand, moist to wet, faint odor 15" grey-brown f->m sand, wet, strong odor		
11				26.5						
12.5				390		▼				Samples
14				1175						14-17 (1025) 17-20 (1030)
15			4		37			Grey-brown f->m sand, strong to moderate odor, wet		
16				990						
18				400						
19				285						
20										

METHODS: HSA- Hollow Stem Auger, RWH- Rotary Wash, SSA- Solid Stem Auger, CPT- Cone Penetrometer

SAMPLE TYPES: AS-Auger, WS-Wash, SS-Split Spoon, RC-Rock Core, GS-Grab, ST-Shelby Tube, PS-Piston

STANDARD NOTES:
1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.
2. Test Boring Log Page 1: 0 - 20 feet. Each subsequent page: Additional 20 feet.
3. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.

ADDITIONAL NOTES:
1. NOSOI-No obvious sign of impacts
2. saa - same as above
3 bgs - below ground surface
4. TGSP - Temporary Groundwater Sampling Point

DRILLING INFORMATION

Method: Direct Push

Method:

	Casing	Sample	Core
Type:			
Diam.:			
Weight:			
Fall:			

THE Chazen COMPANIES

21 Fox Street
Poughkeepsie, NY 12601
Phn: (845) 454-3980
Fax: (845) 454-4026

PROJECT: EP1 Post ISCO			Test Boring No.: E-6R
LOCATION:			
CLIENT:			
PROJECT NO.:			Total Depth: ft.
Contractor: Associated Environmental	Start Date: 5/20/19	Northing: na	Borehole Dia.: in.
Drill Rig: 7822 DT	Finish Date:	Easting: na	Water Depth: ft.
Driller: Eddie	El. Datum:	Longitude: na	Rock Depth: ft.
Geologist: Eric Orlowski, PG	G.S. Elevation:	Latitude: na	Well Depth: ft.

Depth (Ft)	Elevation (Ft)	Casing Blows	Sample No.	PID (ppm)	Recovery (in)	Groundwater	Group Symbol	Stratum and Field Descriptions:	Well Diagram	Field Notes, Well Notes, Comments:
0			1		30"			Br. F-M sands; trace angular gravel; Dry. NOSOI		
3				0						
5			2		12"			SAA. NOSOI		
8				0						
10			3		12"			Br. F-M sands; Moderate HC odor Moist.		
14				80		▼				Samples 1245 (14-17) 1250 (17-20)
15			4		30"			Br. F-M sands; Strong HC odor; wet.		
16				275						
18				1460						
20				1700						

METHODS: HSA- Hollow Stem Auger, RWH- Rotary Wash, SSA- Solid Stem Auger, CPT- Cone Penetrometer

SAMPLE TYPES: AS-Auger, WS-Wash, SS-Split Spoon, RC-Rock Core, GS-Grab, ST-Shelby Tube, PS-Piston

STANDARD NOTES:
1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.
2. Test Boring Log Page 1: 0 - 20 feet. Each subsequent page: Additional 20 feet.
3. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.

ADDITIONAL NOTES:
1. NOSOI-No obvious sign of impacts
2. saa - same as above
3. bgs - below ground surface
4. TGSP - Temporary Groundwater Sampling Point

DRILLING INFORMATION

Method: Direct Push
Method:

	Casing	Sample	Core
Type:			
Diam.:			
Weight:			
Fall:			

THE Chazen COMPANIES	21 Fox Street Poughkeepsie, NY 12601 Phn: (845) 454-3980 Fax: (845) 454-4026	PROJECT: EP1 - POST ISCO LOCATION: CLIENT: PROJECT NO.: 20918.08	Test Boring No.: E-7R

Contractor: Associated Drill Rig: GeoProbe 7822DT Driller: Ryan Geologist: Eric Orlowski, PG	Start Date: 5/20/2019 Finish Date: El. Datum: G.S. Elevation:	Northing: na Easting: na Longitude: na Latitude: na	Total Depth: ft. Borehole Dia.: in. Water Depth: ft. Rock Depth: ft. Well Depth: ft.

Depth (Ft)	Elevation (Ft)	Casing Blows	Sample No.	PID (ppm)	Recovery(in)	Groundwater	Group Symbol	Stratum and Field Descriptions:	Well Diagram	Field Notes, Well Notes, Comments:
0			1		30			Brown f→m sand, tr brick, tr concrete, tr. rock frags/angular gravel, dry to moist		
1				0						
2										
3										
4										
5			2		40			10" SAA, dry to moist		
6								30" brown f→m sand, moist		
7				0						
8										
9										
10			3		41			20" SAA, moist to wet, slight odor		
11				40				2" black f→m sand, strong odor		
12				550				18" brown f→m sand, strong odor		
13						▼				Samples 14-17 (0900) 17-20 (0905)
14				710						
15			4		40			20" SAA		
16				300				6" black f→m sand, strong odor		
17								14" brown f→m sand, moderate odor		
18				620						
19										
20				205						

METHODS: HSA- Hollow Stem Auger, RWH- Rotary Wash, SSA- Solid Stem Auger, CPT- Cone Penetrometer

SAMPLE TYPES: AS-Auger, WS-Wash, SS-Split Spoon, RC-Rock Core, GS-Grab, ST-Shelby Tube, PS-Piston

STANDARD NOTES:
1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.
2. Test Boring Log Page 1: 0 - 20 feet. Each subsequent page: Additional 20 feet.
3. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.

ADDITIONAL NOTES:
1. NOSOI-No obvious sign of impacts
2. saa - same as above
3. bgs - below ground surface
4. TGSP - Temporary Groundwater Sampling Point

DRILLING INFORMATION

Method: Direct Push

Method:

	Casing	Sample	Core
Type:			
Diam.:			
Weight:			
Fall:			

MS/MSD

THE Chazen COMPANIES
21 Fox Street
Poughkeepsie, NY 12601
Phn: (845) 454-3980
Fax: (845) 454-4026

PROJECT: EP-1 Post ISCO			Test Boring No.: MW-ER
LOCATION:			
CLIENT:			
PROJECT NO.: 20918.08			Total Depth: 20 ft.
Contractor: Associated Environmental	Start Date: 5/20/19	Northing: na	Borehole Dia.: in.
Drill Rig: 7822 DT	Finish Date: " "	Easting: na	Water Depth: ft.
Driller: Eddie	El. Datum:	Longitude: na	Rock Depth: ft.
Geologist: Eric Orlowski, PG	G.S. Elevation:	Latitude: na	Well Depth: ft.

Depth (Ft)	Elevation (Ft)	Casing Blows	Sample No.	PID (ppm)	Recovery(in)	Groundwater	Group Symbol	Stratum and Field Descriptions:	Well Diagram	Field Notes, Well Notes, Comments:
0			1		24"			Br. F-m Sands; trace gravel; ~~fine~~ Dry - NOSOI		
3				0						
5			2		36"			SAA. Moist. NOSOI		
7.5				0						
10			3	3.4	36"			18" SAA. 18". Lt. Grey F-M sands. Moist. Strong HC odor.		
11.5				684						Samples
13				1134		▼				14-17 (1150) MS (1155) MSD (1200) 17-20 (1205)
15			4	1327	36"			18" Lt. Grey; F-m Sands; wet. strong HC odor. 6" Black, F-M sands; wet; strong HC odor. 12" Br.; F-m Sands; wet; slight HC odor.		
16				1287						
17				1126						
18				88.4						
20				234						

METHODS: **HSA**- Hollow Stem Auger, **RWH**- Rotary Wash, **SSA**- Solid Stem Auger, **CPT**- Cone Penetrometer

SAMPLE TYPES: **AS**-Auger, **WS**-Wash, **SS**-Split Spoon, **RC**-Rock Core, **GS**-Grab, **ST**-Shelby Tube, **PS**-Piston

STANDARD NOTES:
1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.
2. Test Boring Log Page 1: 0 - 20 feet. Each subsequent page: Additional 20 feet.
3. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.

ADDITIONAL NOTES:
1. **NOSOI-No obvious sign of impacts**
2. **saa - same as above**
3. **bgs - below ground surface**
4. **TGSP - Temporary Groundwater Sampling Point**

DRILLING INFORMATION

Method: Direct Push
Method:

	Casing	Sample	Core
Type:			
Diam.:			
Weight:			
Fall:			

THE Chazen COMPANIES

21 Fox Street
Poughkeepsie, NY 12601
Phn: (845) 454-3980
Fax: (845) 454-4026

PROJECT: EP1 - POST ISCO			Test Boring No.: MW-HR
LOCATION:			
CLIENT:			
PROJECT NO.: 20918.08			Total Depth: 20 ft.
Contractor: Associated	Start Date: 5/20/2019	Northing: na	Borehole Dia.: in.
Drill Rig: 7822 DT	Finish Date:	Easting: na	Water Depth: ft.
Driller: Eddie	El. Datum:	Longitude: na	Rock Depth: ft.
Geologist: Eric Orlowski, PG	G.S. Elevation:	Latitude: na	Well Depth: ft.

Depth (Ft)	Elevation (Ft)	Casing Blows	Sample No.	PID (ppm)	Recovery(in)	Groundwater	Group Symbol	Stratum and Field Descriptions:	Well Diagram	Field Notes, Well Notes, Comments:
0			1		24			Brown f→m sands, tr concrete, tr brick, tr rock frags/gravel, dry to moist		
1				0.5						
2										
3										
4										
5			2		16			8" SAA		
6								8" brown f→m sand, dry to moist		
7				0.6						
8										
9										
10			3		34			20" SAA, moist to wet, slight odor		
11				27.5						
12				175				14" grey f→m sand, wet, moderate odor		
13						▼				
14				135						Samples (14-17) 1250 (17-20) 1255
15			4		32					
16				320				Grey-brown to brown f→m sand, wet, strong grading to slight odor		
17										
18				65						
19				20						
20										

METHODS: HSA- Hollow Stem Auger, RWH- Rotary Wash, SSA- Solid Stem Auger, CPT- Cone Penetrometer

SAMPLE TYPES: AS-Auger, WS-Wash, SS-Split Spoon, RC-Rock Core, GS-Grab, ST-Shelby Tube, PS-Piston

STANDARD NOTES:
1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.
2. Test Boring Log Page 1: 0 - 20 feet. Each subsequent page: Additional 20 feet.
3. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.

ADDITIONAL NOTES:
1. NOSOI-No obvious sign of impacts
2. saa - same as above
3. bgs - below ground surface
4. TGSP - Temporary Groundwater Sampling Point

DRILLING INFORMATION

Method: Direct Push
Method:

	Casing	Sample	Core
Type:			
Diam.:			
Weight:			
Fall:			

THE Chazen COMPANIES

21 Fox Street
Poughkeepsie, NY 12601
Phn: (845) 454-3980
Fax: (845) 454-4026

PROJECT: EP-1 Post-ISCO
LOCATION:
CLIENT:
PROJECT NO.: 20518.08

Test Boring No.: MW-IR

Contractor: Associated Env. Services	Start Date: 5/20/19	Northing: na	Total Depth: ft.
Drill Rig:	Finish Date: "	Easting: na	Borehole Dia.: in.
Driller: 7822 DT / Eddie.	El. Datum:	Longitude: na	Water Depth: ft.
Geologist: Eric Orlowski, PG	G.S. Elevation:	Latitude: na	Rock Depth: ft.
			Well Depth: ft.

Depth (Ft)	Elevation (Ft)	Casing Blows	Sample No.	PID (ppm)	Recovery(in)	Groundwater	Group Symbol	Stratum and Field Descriptions:	Well Diagram	Field Notes, Well Notes, Comments:
0-5					24"			Brown f-m sands, trace brick; rock frag/ angular gravel, Dry, NOSOI		
5-10				0.3 (8); 0.1 (10)	36"			SAA: Dry to Moist 12" 24 Brown f-m sands, moist. NOSOI		
10-15				7.2 (12); 1849 (14)	36"	▼ (13)		16" SAA Moist slight odor, moist. 20" black f-m sand strong HC odor moist ⇒ wet.		Sample. 14-17' (0945) 17-20' (0950)
15-20				945 (15); 864 (17); 886 (18); 775 (20)	36			30" SAA. Wet:		EP1-MW-IR (14-17) (17-20)

METHODS: HSA- Hollow Stem Auger, RWH- Rotary Wash, SSA- Solid Stem Auger, CPT- Cone Penetrometer

SAMPLE TYPES: AS-Auger, WS-Wash, SS-Split Spoon, RC-Rock Core, GS-Grab, ST-Shelby Tube, PS-Piston

STANDARD NOTES:
1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.
2. Test Boring Log Page 1: 0 - 20 feet. Each subsequent page: Additional 20 feet.
3. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.

ADDITIONAL NOTES:
1. NOSOI-No obvious sign of impacts
2. saa - same as above
3 bgs - below ground surface
4. TGSP - Temporary Groundwater Sampling Point

DRILLING INFORMATION

Method: Direct Push
Method:

	Casing	Sample	Core
Type:			
Diam.:			
Weight:			
Fall:			

THE Chazen COMPANIES
21 Fox Street
Poughkeepsie, NY 12601
Phn: (845) 454-3980
Fax: (845) 454-4026

PROJECT: EP1 - POST ISCO
LOCATION:
CLIENT:
PROJECT NO.: 20918.08

Test Boring No.: SBR-2BR
Total Depth: 20 ft.

Contractor: Associated
Drill Rig: Geoprobe 7822DT
Driller: Ryan
Geologist: Eric Orlowski, PG

Start Date: 5/20/2019
Finish Date:
El. Datum:
G.S. Elevation:

Northing: na
Easting: na
Longitude: na
Latitude: na

Borehole Dia.: in.
Water Depth: ft.
Rock Depth: ft.
Well Depth: ft.

Depth (Ft)	Elevation (Ft)	Casing Blows	Sample No.	PID (ppm)	Recovery (in)	Groundwater	Group Symbol	Stratum and Field Descriptions:	Well Diagram	Field Notes, Well Notes, Comments:
0			1		16			Brown f→m sand, tr. brick, tr. concrete, tr. rock frags/sm gravel, dry to moist		
1										
2				0.2						
3										
4										
5			2		13			SAA		
6										
7				1.7						
8										
9										
10			3		35			16" brown f→m sand		
11				26.2				19" grey f→m sand, strong odor		
12				690						
13						▼				Samples
14				1875						14-17 (935)
15			4		56			Grey-brown f→m sand, strong odor		17-20 (950)
16				940						FD-02 (17-20)
17										
18				960						
19										
20				195						

METHODS: HSA- Hollow Stem Auger, RWH- Rotary Wash, SSA- Solid Stem Auger, CPT- Cone Penetrometer

SAMPLE TYPES: AS-Auger, WS-Wash, SS-Split Spoon, RC-Rock Core, GS-Grab, ST-Shelby Tube, PS-Piston

STANDARD NOTES:
1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.
2. Test Boring Log Page 1: 0 - 20 feet. Each subsequent page: Additional 20 feet.
3. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.

ADDITIONAL NOTES:
1. NOSOI-No obvious sign of impacts
2. saa - same as above
3 bgs - below ground surface
4. TGSP - Temporary Groundwater Sampling Point

DRILLING INFORMATION
Method: Direct Push
Method:

	Casing	Sample	Core
Type:			
Diam.:			
Weight:			
Fall:			

THE Chazen COMPANIES	21 Fox Street, Poughkeepsie, NY 12601, Phn: (845) 454-3980, Fax: (845) 454-4026	PROJECT: EP1 - POST ISCO	Test Boring No.: SBR-3BR
		LOCATION:	
		CLIENT:	
		PROJECT NO.: 20918.08	Total Depth: 20 ft.

Contractor: Associated	Start Date: 5/20/2019	Northing: na	Borehole Dia.: in.
Drill Rig: 7822-DT	Finish Date:	Easting: na	Water Depth: ft.
Driller: Ryan	El. Datum:	Longitude: na	Rock Depth: ft.
Geologist: Eric Orlowski, PG	G.S. Elevation:	Latitude: na	Well Depth: ft.

Depth (Ft)	Elevation (Ft)	Casing Blows	Sample No.	PID (ppm)	Recovery(in)	Groundwater	Group Symbol	Stratum and Field Descriptions:	Well Diagram	Field Notes, Well Notes, Comments:
0			1	↑	36			Brown f->m sand, tr concrete, tr brick, tr. gravel/rock frags.		
1				1.3						
2										
3										
4				↓						
5			2	29.5	46			12" SAA, dry to moist 34" brown f->m sand, dry to moist		
6										
7										
8										
9				210						
10			3	650	49			31" SAA, moist to wet, slight odor		
11										
12				790						
13						▼		18" grey f->m sand, wet, strong odor		Samples (14-17) 1205 (17-20) 1210
14				1005						
15			4	750	91			Grey-brown to grey f->m sand, wet, strong odor		
16										
17										
18				800						
19				650						
20										

METHODS: HSA- Hollow Stem Auger, RWH- Rotary Wash, SSA- Solid Stem Auger, CPT- Cone Penetrometer

SAMPLE TYPES: AS-Auger, WS-Wash, SS-Split Spoon, RC-Rock Core, GS-Grab, ST-Shelby Tube, PS-Piston

STANDARD NOTES:
1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.
2. Test Boring Log Page 1: 0 - 20 feet. Each subsequent page: Additional 20 feet.
3. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.

ADDITIONAL NOTES:
1. NOSOI-No obvious sign of impacts
2. saa - same as above
3. bgs - below ground surface
4. TGSP - Temporary Groundwater Sampling Point

DRILLING INFORMATION

Method: Direct Push

Method:

	Casing	Sample	Core
Type:			
Diam.:			
Weight:			
Fall:			

THE Chazen COMPANIES

21 Fox Street
Poughkeepsie, NY 12601
Phn: (845) 454-3980
Fax: (845) 454-4026

PROJECT: EP-1 Post ISCO
LOCATION:
CLIENT:
PROJECT NO.: 20918.08

Test Boring No.: SBR-4BR

Contractor: Associated Environmental
Drill Rig: 7822DT
Driller: Eddie.
Geologist: Eric Orlowski, PG

Start Date: 5/20/18
Finish Date: " "
El. Datum:
G.S. Elevation:

Northing: na
Easting: na
Longitude: na
Latitude: na

Total Depth: ft.
Borehole Dia.: in.
Water Depth: ft.
Rock Depth: ft.
Well Depth: ft.

Depth (Ft)	Elevation (Ft)	Casing Blows	Sample No.	PID (ppm)	Recovery(in)	Groundwater	Group Symbol	Stratum and Field Descriptions:	Well Diagram	Field Notes, Well Notes, Comments:
0			1	↑	18			Br. F-M sands; trace gravel; Dry; NO SOI		
1										
2				0						
3										
4				↓						
5			2	↑	36			12" SAA.		
6								24" Br. F-M sands; Moist NO SOI		
7				0						
8										
9				↓						
10			3	0	30			12" SAA. Moderat HC. Moist		
11								18". Lt. Gray/Bl. F-M sands. HC odor; Moist.		
12				452						EP1-SBR-4BR
13										
14				1161		▽				Samples
15			4	1302.	36			SAA (18"). Wet. Strong. HC odor.		(14-17')-1040
16				435						(17-20')-1045
17										
18				79.1						
19										
20				81.9						

METHODS: HSA- Hollow Stem Auger, RWH- Rotary Wash, SSA- Solid Stem Auger, CPT- Cone Penetrometer
SAMPLE TYPES: AS-Auger, WS-Wash, SS-Split Spoon, RC-Rock Core, GS-Grab, ST-Shelby Tube, PS-Piston

STANDARD NOTES:
1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.
2. Test Boring Log Page 1: 0 - 20 feet. Each subsequent page: Additional 20 feet.
3. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.

ADDITIONAL NOTES:
1. NOSOI-No obvious sign of impacts
2. saa - same as above
3. bgs - below ground surface
4. TGSP - Temporary Groundwater Sampling Point

DRILLING INFORMATION
Method: Direct Push
Method:

	Casing	Sample	Core
Type:			
Diam.:			
Weight:			
Fall:			

THE Chazen COMPANIES	21 Fox Street Poughkeepsie, NY 12601 Phn: (845) 454-3980 Fax: (845) 454-4026	PROJECT: EPI-Post ISCO LOCATION: CLIENT: PROJECT NO.: 20918.68	Test Boring No.: W-2R Total Depth: ft.
Contractor: Associated Environmental Drill Rig: 7822DT Geoprobe Driller: Eddie Geologist: Eric Orlowski, PG	Start Date: 5/28/19 Finish Date: " El. Datum: G.S. Elevation:	Northing: na Easting: na Longitude: na Latitude: na	Borehole Dia.: in. Water Depth: ft. Rock Depth: ft. Well Depth: ft.

Depth (Ft)	Elevation (Ft)	Casing Blows	Sample No.	PID (ppm)	Recovery(in)	Groundwater	Group Symbol	Stratum and Field Descriptions:	Well Diagram	Field Notes, Well Notes, Comments:
1			1	↑	18"			Brown F-M sands, Frac/angular rock trace; s gravel; Dry. NOSOI		
2										
3				0						
4				↓						
5			2	↑	34			6" SAA. Dry 30" Br. F-M sands; moist. Nosoi		
6										
7				0						
8										
9				↓						
10			3	57	30"			12" SAA. Moderate HC odor. 18" ~~SAA~~ Strong HC odor. Lt. Gray/Bl. F-M sands; Moist => wet.		
11										
12				451						EPI-W-2R
13						▽				
14				864						Samples
15			4	1702	18			SAA (18"); wet.		14-17' (1010)
16										17-20 (1015)
17										
18				1950						
19										
20				2401						

METHODS: HSA- Hollow Stem Auger, RWH- Rotary Wash, SSA- Solid Stem Auger, CPT- Cone Penetrometer

SAMPLE TYPES: AS-Auger, WS-Wash, SS-Split Spoon, RC-Rock Core, GS-Grab, ST-Shelby Tube, PS-Piston

STANDARD NOTES:
1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.
2. Test Boring Log Page 1: 0 - 20 feet. Each subsequent page: Additional 20 feet.
3. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.

ADDITIONAL NOTES:
1. NOSOI-No obvious sign of impacts
2. saa - same as above
3 bgs - below ground surface
4. TGSP - Temporary Groundwater Sampling Point

DRILLING INFORMATION

Method: Direct Push

Method:

	Casing	Sample	Core
Type:			
Diam.:			
Weight:			
Fall:			

THE Chazen COMPANIES	21 Fox Street, Poughkeepsie, NY 12601, Phn: (845) 454-3980, Fax: (845) 454-4026	PROJECT: EP-1 Post ISCO	Test Boring No.: W-5R
		LOCATION:	
		CLIENT:	
		PROJECT NO.: 20918.08	Total Depth: ft.

Contractor: Associated Environmental	Start Date: 5/20/19	Northing: na	Borehole Dia.: in.
Drill Rig: 7822 DT	Finish Date: "	Easting: na	Water Depth: ft.
Driller: Eddie	El. Datum:	Longitude: na	Rock Depth: ft.
Geologist: Eric Orlowski, PG	G.S. Elevation:	Latitude: na	Well Depth: ft.

Depth (Ft)	Elevation (Ft)	Casing Blows	Sample No.	PID (ppm)	Recovery(in)	Groundwater	Group Symbol	Stratum and Field Descriptions:	Well Diagram	Field Notes, Well Notes, Comments:
0			1	↑	30"			Br. F-M Sands; trace gravel & rock frag. Dry, NOSOI.		
5			2	0	24"			Br. F-M Sands. Dry → Moist; NOSOI		
10			3	↓	36"			12" SAA. Moist. 24" Lt. Grey Black, F-M sands. Slight to strong HC odor, wet.		
11				29.1						
12				1485		▼				
13				11.75						
14				837						Sample Times
15			4		36"			Br. F-M sands; slight HC odor, wet.		14-17' (1340)
16				21.5						17-20' (1345)
17				3.4						
18				4.2						
19				4.3						
20										

METHODS: HSA- Hollow Stem Auger, RWH- Rotary Wash, SSA- Solid Stem Auger, CPT- Cone Penetrometer

SAMPLE TYPES: AS-Auger, WS-Wash, SS-Split Spoon, RC-Rock Core, GS-Grab, ST-Shelby Tube, PS-Piston

STANDARD NOTES:
1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.
2. Test Boring Log Page 1: 0 - 20 feet. Each subsequent page: Additional 20 feet.
3. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.

ADDITIONAL NOTES:
1. NOSOI-No obvious sign of impacts
2. saa - same as above
3 bgs - below ground surface
4. TGSP - Temporary Groundwater Sampling Point

DRILLING INFORMATION

Method: Direct Push

Method:

	Casing	Sample	Core
Type:			
Diam.:			
Weight:			
Fall:			

Monitoring Well Network

THE Chazen COMPANIES

21 Fox Street
Poughkeepsie, NY 12601
Phn: (845) 454-3980
Fax: (845) 454-4026

PROJECT: Ebenezer Plaza - 1
LOCATION: 94 New Lots Ave. Brooklyn, NY
CLIENT: Procida Development Group
PROJECT NO.: 20918.06/ 1100

Test Boring No.: **MW-1**

Contractor: Associated Env. Svcs.	**Start Date:** 11/18/2019	**Northing:** na	**Total Depth:**	25	ft.
Drill Rig: GeoProbe 7822DT	**Finish Date:** 11/19/2019	**Easting:** na	**Borehole Dia.:**	2	in.
Driller: Randy and Eddie	**El. Datum:**	**Longitude:** na	**Water Depth:**	14.5	ft.
Geologist: B.Fields	**G.S. Elevation:**	**Latitude:** na	**Rock Depth:**	-	ft.
			Well Depth:	24.5	ft.

Depth (Ft)	Elevation (Ft)	Casing Blows	Sample No.	PID (ppm)	Recovery(in)	Groundwater	Group Symbol	Stratum and Field Descriptions:	Field Notes, Well Notes, Comments:
0-5			1	0.0	24			Br., f-m sands, tr. brick, tr. concrete, tr. angular rock/gravel, dry to moist, NOSOI.	8" Flush Mount Well Vault 1ft^2 concrete pad 0-3 ft. bgs Portland Bentonite 3-5.5 ft. bgs clean backfill 5.5-6.5 ft. bgs Bentonite Plug 6.5-24.5 ft. bgs Sand Filter Pack
5-10			2	0.0	30			10" SAA. NOSOI; 20" Br. F-m sands, moist. NOSOI.	0-9.5 ft. bgs 2" 0.010 PVC Well Screen 9.5-24.5 ft. bgs 2" Solid PVC Well Riser.
10-15			3	208 (12); 960 (13); 1,365 (14); 1461 (15)	40	▼ (14.5)		Br., f-m sands, moist to wet, strong hydrocarbon odor.	Samples MW-1 (12-14') @ 0810 MW-1 (17-20') @ 0820
15-20			4	1217 (17.5); 1184 (18.5); 1323 (19.5)	36			SAA, wet, strong hydrocarbon odor.	
20-25			5	745 (21); 519 (22.5); 490 (23.5); 315 (24.5)	36			SAA, Strong hydrocarbon odor.	

METHODS: HSA- Hollow Stem Auger, RWH- Rotary Wash, SSA- Solid Stem Auger, CPT- Cone Penetrometer

SAMPLE TYPES: AS-Auger, WS-Wash, SS-Split Spoon, RC-Rock Core, GS-Grab, ST-Shelby Tube, PS-Piston

STANDARD NOTES:
1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.
2. Test Boring Log Page 1: 0 - 20 feet. Each subsequent page: Additional 20 feet.
3. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.

ADDITIONAL NOTES:
1. **NOSOI-No obvious sign of impacts**
2. **saa - same as above**
3. **bgs - below ground surface**

DRILLING INFORMATION

Method: HSA
Method: Dual Tube

	Casing	Sample	Core
Type:			
Diam.:			
Weight:			
Fall:			

THE Chazen COMPANIES

21 Fox Street
Poughkeepsie, NY 12601
Phn: (845) 454-3980
Fax: (845) 454-4026

PROJECT: Ebenezer Plaza - 1
LOCATION: 94 New Lots Ave. Brooklyn, NY
CLIENT: Procida Development Group
PROJECT NO.: 20918.06/ 1100

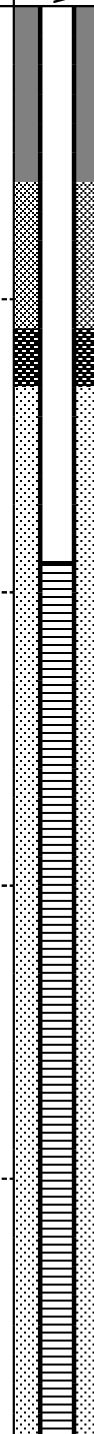
Test Boring No.: **MW-2**

Contractor:	Associated Env. Svcs.	**Start Date:**	11/18/2019	**Northing:**	na
Drill Rig:	GeoProbe 7822DT	**Finish Date:**	11/19/2019	**Easting:**	na
Driller:	Randy and Eddie	**El. Datum:**		**Longitude:**	na
Geologist:	B.Fields	**G.S. Elevation:**		**Latitude:**	na

Total Depth:	25	ft.
Borehole Dia.:	2	in.
Water Depth:	14.5	ft.
Rock Depth:	-	ft.
Well Depth:	24.5	ft.

Depth (Ft)	Elevation (Ft)	Casing Blows	Sample No.	PID (ppm)	Recovery(in)	Groundwater	Group Symbol	Stratum and Field Descriptions:
0-5			1	0.0	48			Br., f-m sands, tr. brick, tr. concrete, tr. angular rock/gravel, dry to moist, NOSOI.
5-10			2	0.0	36			12" SAA. NOSOI; 24" Br. f-m sands, moist. NOSOI.
10-15			3	0.0, 9.1, 10.5, 219, 860	48	▼ (14.5)		36" SAA, moist to wet, slight hydrocarbon odor; 12" strong hydrocarbon odor, wet.
15-20			4	1217, 1190, 1,780, 1,821	36			Black staining, f-m sands, wet, strong hydrocarbon odor.
20-25			5	1,910, 2,060, 1,749, 1,515, 1,670	36			24" SAA, Strong hydrocarbon odor. 12" Br., f-m sands, strong hydrocarbon odor.

Well Diagram



Field Notes, Well Notes, Comments:

8" Flush Mount Well Vault
1ft^2 concrete pad
0-3 ft. bgs
Portland Bentonite
3-5.5 ft. bgs
clean backfill
5.5-6.5 ft. bgs
Bentonite Plug
6.5-24.5 ft. bgs
Sand Filter Pack
0-9.5 ft. bgs
2" 0.010 PVC Well Screen
9.5-24.5 ft. bgs
2" Solid PVC Well Riser.

Samples
MW-2 (12-14') @ 1040

MW-2 (20-22') @ 1050

METHODS: **HSA**- Hollow Stem Auger, **RWH**- Rotary Wash, **SSA**- Solid Stem Auger, **CPT**- Cone Penetrometer

SAMPLE TYPES: **AS**-Auger, **WS**-Wash, **SS**-Split Spoon, **RC**-Rock Core, **GS**-Grab, **ST**-Shelby Tube, **PS**-Piston

STANDARD NOTES:
1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.
2. Test Boring Log Page 1: 0 - 20 feet. Each subsequent page: Additional 20 feet.
3. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.

ADDITIONAL NOTES:
1. **NOSOI-No obvious sign of impacts**
2. **saa - same as above**
3 **bgs - below ground surface**

DRILLING INFORMATION

Method: HSA
Method: Dual Tube

	Casing	Sample	Core
Type:			
Diam.:			
Weight:			
Fall:			

THE Chazen COMPANIES

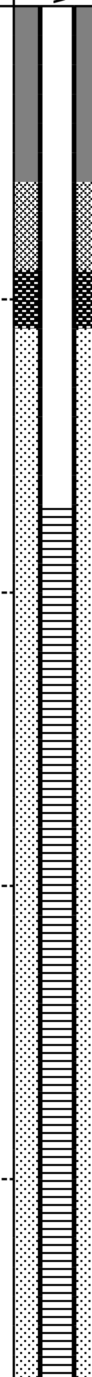
21 Fox Street
Poughkeepsie, NY 12601
Phn: (845) 454-3980
Fax: (845) 454-4026

PROJECT:	Ebenezer Plaza - 1	**Test Boring No.:**	**MW-3**
LOCATION:	94 New Lots Ave. Brooklyn, NY		
CLIENT:	Procida Development Group		
PROJECT NO.:	20918.06/ 1100	**Total Depth:**	25 ft.

Contractor:	Associated Env. Svcs.	**Start Date:**	11/18/2019	**Northing:**	na	**Borehole Dia.:**	2 in.
Drill Rig:	GeoProbe 7822DT	**Finish Date:**	11/19/2019	**Easting:**	na	**Water Depth:**	15 ft.
Driller:	Randy and Eddie	**El. Datum:**		**Longitude:**	na	**Rock Depth:**	- ft.
Geologist:	B.Fields	**G.S. Elevation:**		**Latitude:**	na	**Well Depth:**	23.5 ft.

Depth (Ft)	Elevation (Ft)	Casing Blows	Sample No.	PID (ppm)	Recovery(in)	Groundwater	Group Symbol	Stratum and Field Descriptions:
0			1		48			
2.5				0.0				12" Br., f-m sands, tr. brick, tr. concrete, tr. angular rock/gravel, dry to moist, NOSOI. 36" br., f-m sands, dry to moist, NOSOI.
5			2		36			
7				0.0				SAA. NOSOI.
9.5				3.5				
10			3		36			
10.5				0.0				
12								SAA, slight hydrocarbon odor, moist.
12.5				59				
13.5				61				
14.5				115		▼		
15			4		30			
17				2022				Black staining, f-m sands, tr. gravel, wet, strong hydrocarbon odor.
19				1846				
20			5		30			
21				1107				
22.5				1,749				20" SAA, Strong hydrocarbon odor. 10" Br., f-m sands, strong hydrocarbon odor.
24				41.4				
25								

Well Diagram



Field Notes, Well Notes, Comments:

8" Flush Mount Well Vault
1ft^2 concrete pad
0-3 ft. bgs
Portland Bentonite
3-4.5 ft. bgs
clean backfill
4.5-5.5 ft. bgs
Bentonite Plug
5.5-23.5 ft. bgs
Sand Filter Pack
0-8.5 ft. bgs
2" 0.010 PVC Well Screen
8.5-23.5 ft. bgs
2" Solid PVC Well Riser.

Samples
MW-3 (12.5-14.5') @ 1240

MW-3 (17-20') @ 1250

METHODS: **HSA**- Hollow Stem Auger, **RWH**- Rotary Wash, **SSA**- Solid Stem Auger, **CPT**- Cone Penetrometer

SAMPLE TYPES: **AS**-Auger, **WS**-Wash, **SS**-Split Spoon, **RC**-Rock Core, **GS**-Grab, **ST**-Shelby Tube, **PS**-Piston

STANDARD NOTES:
1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.
2. Test Boring Log Page 1: 0 - 20 feet. Each subsequent page: Additional 20 feet.
3. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.

ADDITIONAL NOTES:
1. **NOSOI-No obvious sign of impacts**
2. **saa - same as above**
3 **bgs - below ground surface**

DRILLING INFORMATION

Method: HSA
Method: Dual Tube

	Casing	Sample	Core
Type:			
Diam.:			
Weight:			
Fall:			

THE Chazen COMPANIES
21 Fox Street
Poughkeepsie, NY 12601
Phn: (845) 454-3980
Fax: (845) 454-4026

PROJECT: Ebenezer Plaza - 1
LOCATION: 94 New Lots Ave. Brooklyn, NY
CLIENT: Procida Development Group
PROJECT NO.: 20918.06/ 1100

Test Boring No.: **MW-4**

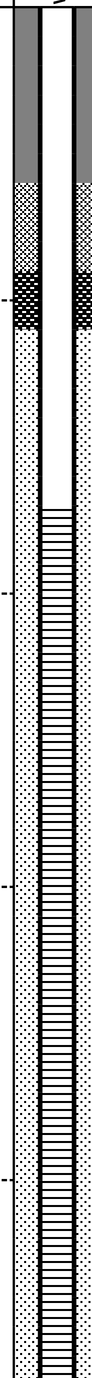
Contractor:	Associated Env. Svcs.	**Start Date:**	11/19/2019	**Northing:**	na
Drill Rig:	GeoProbe 7822DT	**Finish Date:**	11/19/2019	**Easting:**	na
Driller:	Randy and Eddie	**El. Datum:**		**Longitude:**	na
Geologist:	B.Fields	**G.S. Elevation:**		**Latitude:**	na

Total Depth:	25	ft.
Borehole Dia.:	2	in.
Water Depth:	15	ft.
Rock Depth:	-	ft.
Well Depth:	23.5	ft.

Depth (Ft)	Elevation (Ft)	Casing Blows	Sample No.	PID (ppm)	Recovery(in)	Groundwater	Group Symbol
0–0.5			1		12		
3.5–4				0.9			
4.5–5				1.5			
5–5.5			2		60		
5.5–6				1.0			
6.5–7				1.7			
7.5–8				1.9			
8.5–9				3.3			
9.5–10				2.8			
10–10.5			3		48		
10.5–11				29.9			
11.5–12				11.8			
12.5–13				1046			
13.5–14				1,156			
14–14.5						▼	
14.5–15				1322			
15–15.5			4		48		
15.5–16				1532			
16.5–17				2823			
17.5–18				1982			
18.5–19				976			
19.5–20				381			
20–20.5			5		24		
21–21.5				1107			
22.5–23				308			
23.5–24				315			
24.5–25				245			

Depth (Ft)	Stratum and Field Descriptions:
0–5	No recovery (0-4 ft. bgs) due to hand clearing. 12" Br., f-m sands, dry to moist, NOSOI.
5–10	SAA. NOSOI.
10–15	36" SAA, slight hydrocarbon odor, moist; 12" Black staining, f-m sands, strong hydrocarbon odor, moist to wet.
15–20	Black staining, f-m sands, strong hydrocarbon odor, wer.
20–25	Br., f-m sands, st rong hydrocarbon odor, wet.

Well Diagram



Field Notes, Well Notes, Comments:

8" Flush Mount Well Vault
1ft^2 concrete pad
0-3 ft. bgs
Portland Bentonite
3-4.5 ft. bgs
clean backfill
4.5-5.5 ft. bgs
Bentonite Plug
5.5-23.5 ft. bgs
Sand Filter Pack
0-8.5 ft. bgs
2" 0.010 PVC Well Screen
8.5-23.5 ft. bgs
2" Solid PVC Well Riser.

Samples
MW-4 (12-14') @ 0815

MW-4 (16-18') @ 0835

QA/QC Sample
MS/MSD @ 12-14'
MW-4 (MS) @ 0820
MW-4 (MSD) @ 0825

METHODS: HSA- Hollow Stem Auger, RWH- Rotary Wash, SSA- Solid Stem Auger, CPT- Cone Penetrometer
SAMPLE TYPES: AS-Auger, WS-Wash, SS-Split Spoon, RC-Rock Core, GS-Grab, ST-Shelby Tube, PS-Piston
STANDARD NOTES:
1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.
2. Test Boring Log Page 1: 0 - 20 feet. Each subsequent page: Additional 20 feet.
3. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.

ADDITIONAL NOTES:
1. **NOSOI-No obvious sign of impacts**
2. **saa - same as above**
3 **bgs - below ground surface**

DRILLING INFORMATION
Method: HSA
Method: Dual Tube

	Casing	Sample	Core
Type:			
Diam.:			
Weight:			
Fall:			

THE Chazen COMPANIES

21 Fox Street
Poughkeepsie, NY 12601
Phn: (845) 454-3980
Fax: (845) 454-4026

PROJECT: Ebenezer Plaza - 1
LOCATION: 94 New Lots Ave. Brooklyn, NY
CLIENT: Procida Development Group
PROJECT NO.: 20918.06/ 1100

Test Boring No.: MW-5

Contractor:	Associated Env. Svcs.	**Start Date:**	11/19/2019	**Northing:**	na
Drill Rig:	GeoProbe 7822DT	**Finish Date:**	11/19/2019	**Easting:**	na
Driller:	Randy and Eddie	**El. Datum:**		**Longitude:**	na
Geologist:	B.Fields	**G.S. Elevation:**		**Latitude:**	na

Total Depth:	25	ft.
Borehole Dia.:	2	in.
Water Depth:	14.5	ft.
Rock Depth:	-	ft.
Well Depth:	24.5	ft.

Depth (Ft)	Elevation (Ft)	Casing Blows	Sample No.	PID (ppm)	Recovery(in)	Groundwater	Group Symbol
			1		0		
1							
2							
3							
4							
5			2	1.8	60		
6							
				3.5			
7							
				4.3			
8							
				1.2			
9							
				2.1			
10			3		48		
				11.4			
11							
				6.6			
12							
				68.5			
13							
				172			
14						▼	
				1484			
15			4		48		
				1033			
16							
				1255			
17							
				859			
18							
				135			
19							
				84			
20			5		48		
				239			
21							
				112			
22							
				98			
23							
				114			
24							
				121			
25							

Stratum and Field Descriptions:

No recovery. Hand cleared to 5 ft. bgs.

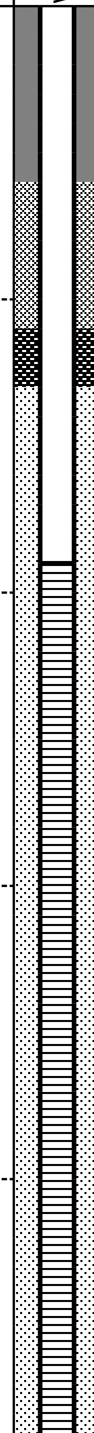
Lt. br., f-m sands, moist, NOSOI.

36" SAA, slight hydrocarbon odor, moist to wet; 12" black staining, f-m sands, strong hydrocarbon odor, wet.

36" black staining, f-m sands, strong hydrocarbon odor, wet; 12" br., f-m sands, strong hydrocarbon odor, wet.

SAA, Strong hydrocarbon odor.

Well Diagram



Field Notes, Well Notes, Comments:

8" Flush Mount Well Vault
1ft^2 concrete pad
0-3 ft. bgs
Portland Bentonite
3-5.5 ft. bgs
clean backfill
5.5-6.5 ft. bgs
Bentonite Plug
6.5-24.5 ft. bgs
Sand Filter Pack
0-9.5 ft. bgs
2" 0.010 PVC Well Screen
9.5-24.5 ft. bgs
2" Solid PVC Well Riser.

Samples
MW-5 (12-14') @ 1040

MW-5 (16-18') @ 1045

QA/QC Samples
Field Duplicate
FD_111919 @ 1050

Equipment Blank
EB_Soil_111919 @ 1110

Trip Blank @ 15:45

METHODS: **HSA**- Hollow Stem Auger, **RWH**- Rotary Wash, **SSA**- Solid Stem Auger, **CPT**- Cone Penetrometer
SAMPLE TYPES: **AS**-Auger, **WS**-Wash, **SS**-Split Spoon, **RC**-Rock Core, **GS**-Grab, **ST**-Shelby Tube, **PS**-Piston
STANDARD 1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.
NOTES: 2. Test Boring Log Page 1: 0 - 20 feet. Each subsequent page: Additional 20 feet.
3. Refer to the "Interpretation of Subsurface Logs" for additional symbology and abbreviation definitions.

ADDITIONAL NOTES:
1. **NOSOI-No obvious sign of impacts**
2. **saa - same as above**
3 **bgs - below ground surface**

DRILLING INFORMATION
Method: HSA
Method: Dual Tube

	Casing	Sample	Core
Type:			
Diam.:			
Weight:			
Fall:			

Appendix E: RAWP

Remedial Action Work Plan

Ebenezer Plaza 1
Brownfield Cleanup Program

NYSDEC Site No. C224240

94 New Lots Avenue

Brooklyn, Kings County, New York

March 8, 2018 Final
May 9, 2018 Amended Draft
June 12, 2018 Final

THE Chazen COMPANIES®
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Engineers
Land Surveyors
Planners
Environmental & Safety Professionals
Landscape Architects

Prepared for:
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Remedial Action Work Plan

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I Kevin P. McGrath certify that I am currently a Qualified Environmental Professional as defined in 6 NYCRR Part 375 and that this Report was prepared in accordance with all applicable statues and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10) and that all activities were performed in full accordance with the DER-approved work plan and any DER-approved modifications.

Kevin P. McGrath, PG, CPG

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Kevin P. McGrath, PG, CPG

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EXECUTIVE SUMMARY

The Chazen Companies (Chazen), on behalf of BCP Volunteer Ebenezer Plaza Owner, LLC have prepared this Remedial Action Work Plan (RAWP) for submission to the New York State Department of environmental Conservation (NYSDEC) to satisfy the requirements of the New York State Brownfields Cleanup Program (BCP) for Site No. C224240. This RAWP was prepared in accordance with NYSDEC DER-10 guidance and specifies the activities that will be undertaken during Site preparation and development to mitigate contaminant impacts identified at the Ebenezer Plaza 1 Site (hereinafter referred to as the "Site") located at 94 New Lots Avenue in Brooklyn, New York. This RAWP considers the future planned Site use and is based upon the findings presented in Chazen's *Remedial Investigation Report* (RIR) dated June 2017 and *December 2017 Supplemental Investigation Report* (SIR) dated January 16, 2018. The proposed remedy is intended be protective of public health and the environment by mitigating the historic environmental impacts documented in the RIR.

The proposed remedial actions are intended to be protective of public health by mitigating exposures to contaminants consistent with the proposed future use of the Site. The planned future Site use includes development that meets NYSDEC Part 375 Restricted-residential land use criteria. Consequently, a Track 2 (NYSDEC Part 375 Restricted-Residential Soil Cleanup Objectives [RRUSCOs]) will be used as the primary remedial action objective (RAO) for soil. However, the proposed remedy may not fully mitigate groundwater impacts or fully eliminate the potential for off-site migration of impacted groundwater, therefore, an overall Track 4 clean-up will be achieved. Additionally, Protection of Groundwater Soil Cleanup Objectives (PGWSCOs) will be used as the RAO for soil in select areas of the Site beyond the anticipated construction excavation limits.

The Site is a 1.26-acre currently zoned M1-1: Manufacturing District. It is located in a dense urban area with highly diverse uses including a multiple commercial Sites including a plaza, community garden, residences, surface railway and railyard, a community center, recreation park and fields, a nursing home, and commercial warehouses. Former Site uses included used car sales, auto repair, auto wrecking, dry cleaning, a coal and coke distribution business, and a gasoline filling station. Historic mapping indicates vehicle repair garages on Site as early as 1928, with a dry cleaner and gasoline filling station on the eastern Site area prior to 1980.

Site buildings were demolished during 2017 leaving behind approximately two feet of brick rubble. Preparation of the Site for new construction requires the removal of the rubble, then the excavation, at a minimum, of 40 to 45 percent of the Site area to a depth of 6.5- feet below ground surface (bgs) with the remaining area excavated to approximately 14 feet bgs or greater to accommodate basement areas. The excavation will be conducted in phases, beginning with the removal of the first 6.5-feet of soil across the Site. The volume equivalent of the entire Site to a depth of 6.5 feet is approximately 13,250 cubic yards (yd^3). The excavation will be extended vertically, as necessary and as practical to meet the RRUSCOs and PGWSCOs, based on field screening and endpoint soil sampling results.

Field screening of soil during all remedial excavation work will be performed by a qualified environmental professional or geologist, and will include visual and olfactory assessments of potential impacts, screening for VOCs using a photo-ionization detector (PID), and screening for lead impacts using an x-ray fluorescence (XRF) analyzer using established methods. A representative number of confirmatory samples will be taken at the excavation limits for laboratory analysis to confirm the RRUSCOs are achieved. These samples will also quantify the magnitude of Site contaminants left in place.

To the extent practical, excavated soils will be directly loaded into trucks or roll-off containers for transport to a pre-approved waste disposal facility. Direct loading eliminates the need for the temporary stockpiling and associated management of soils on Site.

After soil removal and post-excavation sampling confirms achievement of the soil clean-up objectives, a new multi-story affordable housing complex will be constructed on the Site with a sub-slab depressurization system (SSDS) to protect future occupants from potential soil vapors. The remedial efforts, new construction, and vapor mitigation system(s) will be protective of human health and the environment from residual environmental impacts for the life of the buildings.

1.0 INTRODUCTION

This RAWP describes the remedial activities that will be implemented to allow the redevelopment of the Site. The Site is identified as NYS BCP number C224240 and is comprised of one city block of developed land bounded in the Brownsville section of Brooklyn, Kings County, New York. The Site is bounded by New Lots Avenue, Sackman Street, Powell Street, and Hegeman Avenue. The Site is approximately 55,500 square feet and was previously occupied by seven one to three story structures constructed circa 1930 with a total footprint of 32,250 square feet; these structures were demolished during 2017. The Site is currently an open area predominantly covered with two feet of brick rubble and portions of the original blacktop surface

Site preparation and remedial action plans for the Site include the demolition of all existing structures, removal of all blacktop, concrete, and floor slabs, shallow excavation and removal of on-Site soils across the entire property, followed by the redevelopment of the property by the construction of a new multi-story affordable housing complex with street-level retail spaces and a church. Based on the June 2017 RIR and December 2017 SIR, shallow soils are expected to consist primarily of urban fill impacted with volatile organic compounds (VOCs), chlorinated volatile organic compounds (CVOCS), semi-volatile organics compounds (SVOCs) and metals (arsenic, barium, cadmium, copper, and lead).

VOCs, CVOCs, and perfluorinated compounds (PFCs) were also identified in the groundwater. Concentrations of VOCs, CVOCs, and PFCs greater than applicable Standards, Criteria, and Guidance were reported in property boundary wells. Historical on-site releases of VOCs and CVOCs have occurred and may have migrated off-site.

PFCs were identified in on-site groundwater at concentrations slightly greater than the current applicable health risk guidance values. No historical usage of PFCs are known to have occurred on-site although evidence of an historical fire in one of the former tenant spaces was identified in the Site history. However, PFCs were also identified on an adjacent property to the west that is cross gradient from the Site at close to the same concentrations suggesting that PFCs may be a pass-through issue related to some up gradient condition. The results are inconclusive.

The proposed remedial actions are intended to be protective of public health by mitigating exposures to contaminants consistent with the proposed future use of the Site. The planned future Site use includes development that meets NYSDEC Part 375 Restricted Residential Use criteria. A Track 2 (NYSDEC Part 375-6.8(b)) clean-up will be used as the remedial action objective (RAO) for soil. However, the proposed remedy does not mitigate groundwater impacts or fully eliminate the potential for off-site migration of impacted groundwater; consequently, an overall Track 4 clean-up will be achieved.

Attainment of the RAO will be demonstrated by field screening and post-excavation confirmatory laboratory analysis of samples and/or the use of engineering and administrative controls to prevent direct contact with residual impacted materials.

1.1 Site Description

A detailed description of historical background information including the Site history and uses, area geology and hydrogeology, evaluation of impacts, delineation of areas of concern, and assessment of remedial options, are included RIR (**Appendix A1**) and SIR (**Appendix A2**). A brief summary follows:

1.1.1 Site Location

The Site is a 1.26-acre currently zoned M1-1: Manufacturing District. It is located in a dense urban area with highly diverse uses including multiple commercial Sites including a plaza, community garden, residences, surface railway and railyard, a community center, recreation park and fields, a nursing home, and commercial warehouses. A Site Location Map is attached as **Figure 1.** The Site and surrounding areas are shown on an orthophotograph included as **Figure 2**. A copy of the NYC digital tax map is included as **Figure 3**.

1.1.2 Property Uses

The Site is currently an open, fenced-in area being prepared for redevelopment. Former commercial site structures were demolished in 2017. As of December 2017, the Site was covered with brick rubble and portions of the existing blacktop.

1.1.2.1 Past Property Uses

Former Site uses included a used-car auto dealership with an automotive storage yard, auto repair and maintenance shops, auto wrecking, dry cleaning, a coal and coke distribution business, a church, a newspaper distributor, a cabinet installation company, and a gasoline filling station. Historic mapping indicates vehicle repair garages on Site as early as 1928, with a dry cleaner and gasoline filling station on the eastern Site area prior to 1980.

1.1.2.2 Current Property Use

The Site is currently a vacant parcel. All previously existing above grade structures/parking lots, driveways, and walkways have been removed in preparation for remedial action.

1.1.2.2 Proposed Future Property Uses

Conceptual redevelopment plans for the Site includes the construction of a new multi-story affordable housing complex, with street-level retail spaces and a church.

1.1.3 Environmental Setting

This section provides information on the Site geology, soils, hydrogeology, and surface water resources.

1.1.3.1 Geology

Site soils consist of variable thicknesses of miscellaneous urban fill overlying a relatively well sorted fluvial sand deposit. As of December 2017, the existing grade across the majority of the Site had been raised by approximately one to two feet by a layer of brick-rubble from recent building demolition activity.

- The urban fill consists of a black and/or blackish orange silty-Sand with variable amounts of broken brick, concrete, and asphalt. The fill ranges from less than 1 foot to an observed maximum of 13.5-feet in thickness.
- The sand is characterized as mostly medium-sized, with lesser but varying amounts of fine and coarse-sized sand. Borings completed at the Site did not encounter bedrock at depths up to 25 to 27 feet.

The Surficial Geologic Map of New York (Lower Hudson Sheet, 1989) identifies the native soils as glacially derived outwash sand and gravel. The Geologic Map of New York (Lower Hudson Sheet, 1970), indicates that bedrock is greater than 200 feet below grade and likely to be significantly deeper (up to 2,000 feet below grade).

Available soil boring logs are included in the attached RIR and SIR, and stratigraphic cross-sections (referenced on **Figure 4a**) describing subsurface conditions are provided as **Figure 7a and 7b**. .

1.1.3.2 Hydrogeology

Groundwater is at approximately 15 feet below grade across the Site with minimal seasonal variation. The hydraulic conductivity of the native soils is unknown but expected to range from at 10^{-2} to 10^{-3} cm/sec based on grain size distribution. Consequently, groundwater flows slowly at less than 16 feet per year towards the southeast under the observed on-site hydraulic gradient of 0.0016 ft/ft.

1.1.3.3. Surface Water Resources

No surface water bodies are present on the Site. The nearest surface water body is Fresh Creek, a tidal tributary to Jamaica Bay, located approximately 4,000 feet southeast of the Site.

1.1.4 Environmental History

Multiple previous investigations, underground storage tank closures, and limited remedial actions have been conducted on the Site. These are summarized in the February 2017 Remedial Investigation Report prepared by Chazen**.**

1.2 Nature and Extent of Contamination

The RIR prepared by Chazen in June 2017 is provided in **Appendix A1**. The investigation objective was to gather data to assess soil and groundwater quality, delineate the nature and extent of contaminant impacts for use in a fate and transport assessment, and gather additional geologic and groundwater information for use in evaluating appropriate remedial methods and designing a remedial action. Investigation objectives were met through the collection and laboratory analysis of soil and groundwater samples. Limited in-situ chemical oxidation (ISCO) remedial measures were also implemented to address impacted groundwater areas.

The SIR report prepared by Chazen is provided in **Appendix A2**. Expanding upon the Site data record, the investigation objectives were to further delineate soil impacted by VOCs in a known groundwater plume area, verify native soils were not impacted by metals in the overlying urban fill, and provide a site-wide baseline assessment of soil vapor quality.

The results summarized in the RIR and SIR indicate metals, petroleum-range VOCs and SVOCs, and CVOCs are the contaminants of concern (COCs) for the Site:

- Metal impacts (arsenic, barium, cadmium, copper, and/or lead) were detected in near-surface, urban fill soils at four locations that exceeded RRUSCOs. Significant metal concentrations were not detected in the underlying sand, indicating the identified metal impacts are presumably confined to the urban fill which is found throughout the Site.

- Petroleum-range VOC impacts were found in soils at and just below the water table in a limited area within the eastern half and north-central part of the Site. These impacts are related to Spill No. 09-06674, the source of which is located at the former 650 Powell Street building location. While most VOCs were reported below RRUSCOs, trimethylbenzene exceeded this SCO at four locations downgradient of the spill. The December 2017 SIR confirmed the extent of these impacts and identified VOCs exceeded PGWSCOs in nine locations.

- Dissolved-phase petroleum-range VOCs exceeding standards are present within a plume area beneath the eastern half of the Site, with the highest total VOC concentrations found near and downgradient of Spill No. 09-06674. As of 2016, total reported VOC concentrations ranged from 4 µg/L to 1,103 µg/L within the estimated plume area.

- CVOCs were found in soil vapor throughout the Site with total concentrations ranging from 10.63 $\mu g/m^3$ to 17,897 $\mu g/m^3$. The distribution of CVOCs in the soil vapor suggests a relatively small and concentrated pocket of CVOCs exists in soil within the southwestern quadrant of the Site.

Maps of the soil sampling locations and the results that exceed RRUSCOS and PGWSCOs listed in 6 NYCRR Part 375-6.8(b) are included as **Figure 4a** and **Figure 4b**, respectively. Groundwater sampling locations and results that exceed Part 703 groundwater standards in are shown on included as **Figure 5**. Soil vapor sampling locations and the distribution of total CVOC concentrations are provided in **Figure 6**.

2.0 REMEDIAL ACTION ALTERNATIVES

2.1 Remedial Goals and Remedial Action Objectives

Remedial Action Objectives (RAOs) are medium-specific objectives for the protection of public health and the environment and are developed based on contaminant-specific standards, criteria, and guidance (SCGs) established by NYSDEC and/or New York State Department of Health (NYSDOH).

Soil

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil.
- Prevent inhalation exposure to contaminants volatilizing from soil

RAOs for Environmental Protection

- Prevent migration of contaminants that would result in (include all appropriate media: groundwater, surface water, or sediment) contamination.
- Prevent impacts to biota from ingestion/direct contact with soil causing toxicity or impacts from bioaccumulation through the terrestrial food chain

Groundwater

RAOs for Public Health Protection

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

RAOs for Environmental Protection

- Restore ground water aquifer to pre-disposal/pre-release conditions, to the extent practicable.
- Prevent the discharge of contaminants to surface water (if appropriate add: and sediment).
- Remove the source of ground or surface water contamination.

The intent of the remedial action for the Site is to protect human health and the environment through administrative or engineering controls that will mitigate residual impacts and prevent exposure to affected Site soil vapor, soil and groundwater to the extent feasible consistent with DER-10. The overall goal is to attain a minimum Track 4 clean-up of the Site.

The remedial action objectives will be attained utilizing a presumptive remedy for the Site that includes:

- Removal of all on-Site soils from grade to a minimum of two feet below the final grade elevations of planned building floor slabs with confirmatory sampling;
- Removal of all on-Site soils that exhibit hazardous characteristics (none have been identified, but if discovered they will also be removed);
- Removal of identified “hot-spots” or those discovered during the excavation/removal process that are below the base of planned excavations that exceed RRSCOs;
- In-situ treatment of delineated on-Site soil at or below the water table that exceed PGWSCOs through direct chemical oxidation;
- Installation of site-wide composite cover system (clean-fill and/or concrete slabs;
- Administrative controls the prevent the extraction and/or use of on-site groundwater; and,
- Installation of an active Vapor Mitigation System (SSDS) beneath all new building floor slabs.

As defined in NYSDEC DER-10 (Section 4.0), remedial alternatives are evaluated based on the following criteria:

a) Overall Protection of Public Health and the Environment: This criterion evaluates exposure and residual risks to human health and the environment during or subsequent to implementation of the alternative.

b) Compliance with SCGs: This criterion evaluates whether the remedial alternative will ultimately result in compliance with SCGs, to the extent practicable.

c) Long-Term Effectiveness and Permanence: This criterion evaluates if the remedy is effective in the long-term after implementation (e.g., potential rebound). In the event that residual impacts will remain as part of the alternative, then the risks and adequacy/reliability of the controls are also evaluated.

d) Reduction of Toxicity, Mobility, or Volume with Treatment: This criterion evaluates the reduction of contaminant toxicity, mobility or volume as a result of the remedial alternative. In addition, the reversibility of the contaminant destruction or treatment is evaluated.

e) Short-Term Effectives: This criterion evaluates if the remedial alternative protects the community, workers and the environment during implementation.

f) Implementability: This criterion evaluates the remedial alternative based on its suitability to the Site-specific conditions, and availability of services and materials that will be required.

g) Cost: This criterion evaluates the capital, operation, maintenance, and monitoring costs for the remedial alternative. The estimated costs are presented on a present worth basis.

h) Community Acceptance: This criterion takes into account concerns of the community regarding the proposed remedy. Any public comments and overall public perception are addressed as part of the criterion.

i) Land Use: This criterion evaluates the proposed remedial approach against the current, intended, and reasonably anticipated future use of the land and its surroundings.

2.2 Analysis of Alternatives

Based on the findings of the Remedial Investigation Report, an AA was performed to assess reasonable and appropriate Site remediation options and to select an appropriate alternative for mitigation the Site and to provide for the contemplated redevelopment use of the Site. Two alternatives determined to be relevant were considered and evaluated. These are summarized as follows and the selected alternative is identified.

Alternative 1
No Further Action

Under the No Further Action (NFA) alternative, no additional remedial actions, institutional, or engineering controls would be implemented.

No further action would leave the Site in its current condition with the identified potential exposures to impacts from on-Site soil, groundwater, and soil vapor.

This alternative was considered as a baseline in the assessment process, and will not selected because it is not protective of human health or the environment and does not meet the remedial goals and objectives. Therefore, it is not evaluated further.

Alternative 2
Excavation and Disposal of Impacted Soil, New Construction with Sub-slab Depressurization System (SSDS); monitoring compliance with environmental easement and SMP requirements

Under Alternative 2, Site buildings would be demolished, and soil not meeting RRUSCOs would be excavated and disposed off-Site. Soils at or below the water table that do not meet the PGWSCOs will be treated in-place through direct chemical oxidation. The entire Site will be capped w impermeable concrete floor slabs with an engineered sub-slab depressurization system. An environmental easement would be issued as an institutional control to restrict Site use options (e.g., restricted-residential use, no groundwater usage).

This alternative is the best alternative because it is protective of human health or the environment, meets the remedial goals and objectives, is consistent with the planned redevelopment of the Site, and is economically feasible.

The analysis of this alternative is presented below.

Overall Protection of Human Health and the Environment

Selecting this alternative would be protective of human health and the environment and would meet the RAOs. The soil removal and in-situ treatment action would prevent potential contact with soil contamination, and the selected vapor mitigation system would prevent the exposure of future Site occupants to residual VOC vapor present beneath the building foundation.

This alternative is expected to be consistent with the planned future use of the Site for both residential and commercial activities.

Compliance with Standards, Criteria and Guidance

Under this alternative, the Site would comply with the SCGs as the SSDS would mitigate potential exposure to remaining impacted soil vapor.

Long-term Effectiveness and Permanence

The vapor mitigation system would be effective in the long term, as exposures would be prevented. The 2013-2015 ISCO groundwater treatments significantly reduced VOC concentrations in the subsurface, which decreases the potential for residual VOCs to volatilize and collect in vapor beneath the building foundation. The vapor mitigation system would reduce potential exposures to sub-slab vapor.

This alternative satisfies the RAOs. An environmental easement and Site Management Plan (SMP) would be issued with institutional controls to restrict Site use options (e.g., restricted-residential use, no groundwater usage) and activities in the impact area (e.g., soil management plan for future excavation work).

Reduction of Toxicity, Mobility, and Volume with Treatment

The physical removal of soils will reduce the volume of Site impacts associated with toxicity and mobility of contaminants at the Site. Remaining VOC impacts are expected to attenuate naturally over time.

Short-Term Impact and Effectiveness

This alternative would be immediately effective as the concrete slab-on grade floors and SSDS would prevent exposure to Site soils and to VOC-impacted soil vapor. This alternative would be implemented coincident with Site redevelopment activities, and would be effective in achieving the Site RAOs. The vapor mitigation system would remain in place for the life of the building.

Implementability

The soil removal action and SSDS alternative is technically feasible as it would be easily implementable. It would include the physical removal of impacted soil, one engineering control, and institutional controls (environmental easement, SMP). The environmental easement required to leave residual contamination in place at concentrations greater than Unrestricted Use SCOs would include a land use restriction (e.g., restricted-residential use), groundwater use restrictions, and compliance with an approved SMP. There would be no difficulties in securing personnel, materials, equipment or access to implement and maintain this alternative.

Cost Effectiveness

This alternative would be the most cost-effective alternative relative to the planned future use of the Site.

Land Use

The vapor mitigation alternative is consistent with the planned future use of the Site for residences on the second floor and commercial uses, as exposure to the remaining subsurface contamination would be reduced.

The SSDS would be considered an engineering control operating through the life of the property and an environmental easement would be issued as an institutional control identifying Site use restrictions and activities in the impacted areas (e.g., soil management plan for future excavation work).

Community Acceptance

Community views on the RAWP will be obtained during the public comment period, and will be addressed when the RAWP is finalized. Community acceptance will be evaluated as part of the RAWP process. It is expected that the planned future use of the Site would be highly beneficial to the local community and easily gain acceptance.

2.3 Selected Remedial Action Option

Based on the information available and presented above, the recommended remedy is Alternative 2 - Excavation and Disposal of Impacted Soil, New Construction with Vapor Mitigation System.

3.0 REMEDIAL MEASURES WORK PLAN

The remedial work performed at the Site shall be conducted in accordance with the procedures described below and the appended Health and Safety Plan (HASP), Community Air Monitoring Plan (CAMP), Field Sampling Plan (FSP), and Quality Assurance Project Plan (QAPP).

3.1 Site Preparation

Mobilization for the remedial action would include, underground utility clearances, placement of necessary construction fencing, traffic controls, support equipment and/or structures, temporary utility installation/connections, and any or all other non-intrusive activities necessary to secure the work zone(s), required permits, and prepare the site.

Prior to mobilization, the buildings will be razed including floor slabs and footings that are to be replaced and removed for off-site disposal. A temporary demarcation barrier will be placed on the site and a thin layer of crushed/broken brick from the demolition will be placed on the barrier. The barrier and cover will limit potential exposure to the soils and suppress dust or fugitive VOC emissions during the scheduled delay between demolition activity and commencement of the site remediation.

Site contractors shall ensure excavation or other necessary equipment be free of contamination upon arrival at the Site.

3.1.1 Health and Safety Plan

A Site-Specific Health and Safety Plan (HASP) is provided in **Appendix B.** This HASP is specific to the remediation activities to be performed**.** A detailed Construction HASP for the project will be prepared by the demolition and construction contractor(s) prior to commencing the work. The CHASP will include the attached HASP. The attached plan includes directions to the nearest hospital, identifies Site hazards and potential Site contaminant exposures, and specifies personal protective equipment (PPE) to be used to safeguard against the identified Site hazards.

3.1.2 CAMP Monitoring

The generic New York State Department of Health (NYSDOH) Community Air Monitoring Plan (CAMP) is included in **Appendix C.** The CAMP will be implemented during intrusive activities to protect downwind receptors from potential VOCs and air-born particulates emanating from the Site with the following modifications:

- Air monitoring stations will be established at the Site perimeter and used to collect data during the work day following the commencement of Site excavation work. Monitoring will be performed whenever intrusive activities including load-out of impacted soils is being performed on-site.

- The air monitoring data will be provided to NYSDEC digitally.

3.1.3 Waste Characterization Sampling

Waste characterization profile sampling was performed during the May 2017 supplemental site investigation. The results indicated that no hazardous concentrations or characteristics were present in the on-site soils. Sufficient data is available to characterize the waste streams for off-site disposal. Additional samples may be required during the remedial action based on the requirements of the selected disposal facilities and the quantities of materials generated during the remedial action.

The results of the waste profile sampling are included in the June 2017 investigation report in Appendix A1.

3.2 ISCO INFUSION PROGRAM

The ISCO infusion program will be completed before any excavation is completed. This will allow us to utilize the currently vacant and even surface of the site to simplify the installation and infusion process.

3.2.1 Installations

A total of 71 infusion wells will be installed with a Geoprobe direct push drilling rig. The infusion points will be advanced from grade to the target depth using a blind probe with a sacrificial point. The boring will be converted to infusion points by withdrawing the drive rods and installing a length of 1 inch diameter slotted PVC screen from the water table to final depth with sufficient riser to extend the infusion point to grade. The annular space will be gravity filed to the extent possible with 00 sugar sand to approximately 1 foot below grade and the boring sealed at the surface with a bentonite plug.

The pre-determined locations of the infusion points and the approximate radius of influence of the infusions for each grid point is included in **Figure 8B**. The depth of each infusion well, infusion interval, estimated Total VOCs, quantity of chelated iron, and volume of peroxide is included in the **Table 3.2.1**.

Each infusion point will be equipped at the well head with a tube connection T-joint. 3/8-inch polyvinyl tubing will be used to connect the well to a 55-gallon steel drum fitted with a bottom fitted tube connection and flow control valve. A riser will be added above the T connection to raise the height of the well above the maximum head (height of the drum), and the top of the riser fitted with a floating-ball gas relief valve.

3.2.2 Infusion Process

A premixed saturated solution of approximately 30 gallons per foot of well screen of Ferrous Sulfate Heptahydrate (~2.5 lbs of $FeSO_4$ per gallon of water) will be gravity infused into each infusion point and allowed to disperse into the formation for not less than 72 hours. Then a 10.2% - 10.6% solution of hydrogen peroxide will then be gravity fed into the infusion point(s) at the rate that the formation will accept the material.

A total of 5,000 lbs of Ferrous Sulfate Heptahydrate in 50 pound bag and 20,000 gallons of 34.0% H_2O_2 will be delivered to the site from Astro Chemical Co, Ballston Spa, NY. The pallets of powder will be transferred from the delivery vehicle to locking cargo container staged on-site. The peroxide will be delivered in 365 55-gallon drums poly drums and stored in cargo containers when not in use.

Two 275-gallon trailer mounted poly tanks will be used to mix the solutions for infusion. The materials will be removed from the cargo containers as needed and transferred to the portable storage tanks, and mixed with potable water. Each 50 lb bag of Ferrous Sulfate will be mixed 200 gallons of potable water to create a saturated solution for infusion into the wells. The 34.0% (by weight) peroxide will be pumped directly from the 55-gallon drums to the portable tanks and mixed into 150 gallons of potable water to create 200 gallons of 10.2% peroxide solution for infusion. The premixed trailer mounted infusion tank will be towed around the site to the well heads and the mixture pumped to the delivery drums located at each well head.

Each well will be allowed to receive material at the rate it can accept it. Given the depth to the water table (17 feet) and the height of the delivery drum (35 inches) the gravity feed system will generate 6.5 to 7.5 psi of pressure delivering material at a maximum rate of approximately 0.5 to 1 gallon per minute (or 1 to 3 hours per drum.
Based on the hydraulic conductivity of the soils ($5x10^{-3}$ cm/sec) and the pressure gradient created by the infusion, the peroxide should spread laterally a maximum of 9-11 feet from the infusion points before the peroxide dissipates in 48 hours. The infusion pressure (6.5 - 7.5 psi) should be sufficient to overcome the vented backpressure caused by off-gassing and prevent vapor lock of the feed system.

The infusions will be performed in two stages with 100% of the iron and 70% of the peroxide for each location injected during Stage 1. Once the Stage 1 infusion quantity is complete, the reaction will be allowed to run its course for at least 2 days (by which time 95-99% of the peroxide will have disassociated or reacted). After the minimum two day waiting period, the remaining 30% of the quantity will be infused.

The infusions will commence with the up gradient most area of impact (near the northern property boundary) and proceed down gradient (southward). Using two trailer set-ups to continually feed the delivery drums it is estimated that 3 rows of infusion points (approximately 18 points) can be completed each day. This will allow all of the reactant material for both stages to be infused into the subsurface in a six to eight day period including the two-day gap between the first and second stages.

3.2.3 ISCO Reaction Monitoring

Monitoring of the in-situ reaction dynamics will be performed periodically. The temperature, oxygen content, carbon dioxide content of off gasses and VOC emissions will be collected every 30 minutes for each infusion well receiving peroxide until the in-ground reaction stabilizes (no change in parameters for 90 minutes), and then once per hour until the reaction parameters decline.

The depth to water, and water quality parameters (Temperature, Conductivity, and Dissolved Oxygen) will be monitored in one or more of the newly installed interstitial monitoring wells at least once per hour while peroxide is being infused at any location within 20 feet of the well point.

For all wells located beyond the assumed radius of influence of active infusion points water levels and water quality parameters will be collected not less than twice per day. Additionally, all 8 wells will be gauged and water quality parameters collected twice per day for two days after all infusions have been completed.

During the infusion process, the rate of infusion at each location will be estimated by recording the fluid level and time in each drum at least twice for each drum load. Each drum will be loaded from the drop tank with the flow valve in the off position and the time recorded when the valve is opened. A second measurement will be made before the drum is empty and the time and remaining volume estimate recorded.

3.2.4 ISCO Performance Monitoring

To document the performance of the mitigation effort, soil samples will be collected from eight locations (approximately 1 boring per 2750 ft^2) before and after the infusion events for comparison of the total VOCs in the soils. A total of sixteen soil borings will be advanced from grade to refusal with continuous spoon sampling. Eight borings will be installed before the infusion events and eight approximately collocated borings will be installed after the second infusion event. Soil samples collected before and after the infusion events will be compared to document the effectiveness of the infusions.

The initial 8 boring/sampling locations are included on **Figure 8**. Each of these locations are at the interstices (nodes) of the overlapping radii of influence of the surrounding infusion wells. They represent the locations of the least potential impact on the soil quality from the infusions at the surrounding infusions points. A comparison of the before and after soil sampling results will provide the most conservative evaluation of the effects of the ISCO injections on the soil quality.

At each of these eight boring locations, continuous split spoon samples will be collected with the Geoprobe Macro Core spoon sampler. Cores will be screened a photoionization detector, examined for visual or olfactory evidence of impacts, and a descriptive log prepared for each boring. One soil grab sample will be collected from each boring location for each three-foot of core collected from beneath the water table with Encore or Terra Core sampling devices and submitted at the end of the day for analysis of the ASP TCL List of Volatile Organic Compounds (VOCs) and Total Organic Carbon. The samples will be submitted with full quality control and Category B data deliverables

Each of these eight initial borings will also be converted to a temporary groundwater well and used to monitor the initial water quality, water levels, reaction kinematics, and post-ISCO water quality. One round of groundwater samples will be collected from each of the eight monitoring wells before and after the infusion events. The samples will be collected using low-flow sampling techniques and submitted for analysis of the ASP TCL list of VOCs with full QA/QC sampling and Category B deliverables.

Once the post-isco groundwater sampling has been completed, soil samples will be collected from sixteen new soil borings. One boring will be advanced adjacent to each of the eight wells installed before the injections. These borings will be advanced using the same methods and procedures as the initial borings. Soil sample(s) will be collected from each boring from the same sample interval(s) collected during the initial boring installations using the same methods and procedures and analyzed for the same parameters.

Eight additional post-ISCO borings will be advanced at locations selected in the field based on observations and monitoring during the infusion events. Two borings will be installed within the assumed radius of influence of the four infusion points the demonstrated the lowest rates of acceptance of material. One boring will be installed adjacent to the infusion well, with the second boring located approximately 7 feet away. The borings will be installed with a geoprobe fitted with a large bore piston sampler and discrete depth soil samples collected from the depth of the mid-point of the screen interval of the targeted infusion point.

3.2.5 ISCO Goals and Contingencies

The goal of the ISCO program is to substantially reduce the concentrations of COCs in the residually impacted soils beneath the water table and groundwater impacts. Based on the density of the grid, anticipated overlapping cones of influence of the infusions points, and the stoichiometric balance between the peroxide quantities and the soil and groundwater impacts, we anticipate greater than 90% reduction in total VOCs in the soils and greater than 95% reduction in groundwater impacts.

Due to the limitations inherent in in-situ oxidation, caused by minor variations in soil characteristics such as grain size, density, hydraulic conductivity, chemical concentrations, and organic carbon content it may not be possible to achieve the PGWSCOs for every compound at every location throughout the entire injection grid area. Small isolated pockets of impacts may remain and are addressed by the restriction established in the institutional control.

The results of all 16 post-isco soil samples will be used to calculate the total reduction in contaminant mass and the average concentration of residual soil impacts. The remedial action for the soils beneath the water table will be considered complete with no need for additional monitoring if the average concentration of each reported residual compound is less than their applicable PGWSCO even though some individual compounds at some of these sixteen locations may exceed the PGWSCO for that compound.

No post-isco rebound in the concentration of total VOCs in the soils is expected as no residual free-product remains on-site to impact those material. Whatever reduction in soil impacts realized by the infusions will be permanent.

The permanent reduction in soil impacts will, over time, beneficially effect groundwater water quality. However, some rebound effects are anticipated particularly if residual impacts remain that exceed the PGWSCOs. As a contingency, if the post-ISCO sampling identifies a substantial number of compounds remaining in the soils at one or more locations that exceed their respective PGWSCOs, a final infusion will be performed using with Regenesis slow-release long acting Oxygen Generating Compound (ORC-X®).

The quantity of ORC-X to be infused and the locations/area to be treated will be determined based on the post-Isco sampling event results. If needed the ORC-X infusion event will be performed after the soil excavation and removal action of the urban fill. The ORC-X is needed, some long term monitoring of on-site groundwater may be required to demonstrate its continued effectiveness over time.

3.3 Soil Removal Action

3.3.1 Soil Excavation

Preparation of Site for new construction requires the excavation of 13,260 cubic yards of impacted urban fill, across the entire 55,000 square feet of the property to an average depth of 6.5-feet below ground surface (bgs). The planned excavation areas relative to the Site redevelopment necessary to achieve the RRSCOs are provided as **Figure 7**.

Two excavations will be extended to approximately 14 feet below grade over 31,550 ft^2 to accommodate basement areas. Stratigraphic cross-sections are attached as **Figures 7a and 7b**.

The calculated volume of soil that has to be removed to achieve the RAOs is estimated at 18,000 yd^3, not including anticipated hot spot removals, and includes the following:

- Removal of 13,000 yd^3 of urban fill across the entire Site to achieve the RRUSCOs; and,
- Removal of approximately 500 yd^3 of an isolated pocket of CVOC-impacted soil within the southwestern Site quadrant to achieve the PGWSCOs.

Approximately 10,000 cubic yards of non-impacted soils will also be excavated and removed to achieve final elevation grades necessary for construction. These soils will be tested for chemical and geotechnical suitability as backfill and either reused on site as backfill or removed for off-site disposal.

The excavation will be conducted in phases, beginning with the removal of the urban fill to the base of the fill. To the extent practical, the fill will be excavated and directly loaded for removal and off-site disposal.

Once all impacted urban fill has been removed and confirmed by post-excavation sampling, non-impacted native soils will be removed down to the planned target depths for the planned final grades of the new constructions.

Post excavation soil samples and groundwater samples will be collected and analyzed to document the final soil and water quality at the completion of the excavation. Based on the analytical results, a sustained-release oxidizer agent may be added to the backfill to increase the dissolved oxygen content of the groundwater and stimulate biological degradation of residual impacts to the soil and/or groundwater. The selection and quantities of the materials to be used will be determined and approved by NYSDEC prior to backfilling.

3.3.2 Soil Screening Methods

Field screening of soil during all remedial excavation work will be performed by a qualified environmental professional or geologist, and will include visual and olfactory assessments of potential impacts, screening for VOCs using a photo-ionization detector (PID), and screening for lead impacts using an x-ray fluorescence (XRF) analyzer using established methods.

At a minimum, soils will be screened using an off-set grid spacing of approximately 25 feet. A representative number of confirmatory laboratory samples will be taken at the excavation limit to confirm the RRUSCOs are achieved. These samples will also confirm the magnitude of Site contaminants left in place.

The following conservative field screening thresholds in parts per million (ppm) will be utilized to estimate the excavation endpoint in the field:

Estimated Field Screening Thresholds to achieve RRUSCOs

VOCs – 100 (ppm, PID) Lead – 300 (ppm, XRF)

Weathered petroleum impacts are expected to be encountered. Soils exhibiting significant nuisance characteristics (staining or odors) will also be excavated for disposal regardless of field screening results.

3.3.3 Soil Loading and Transport

To the extent practical, excavated soils will be directly loaded into trucks or roll-off containers for transport to a pre-approved waste disposal facility. Direct loading eliminates the need for the temporary stockpiling and associated management of soils on Site.

Should temporary stockpiling of soils become necessary during the course of the remedy, soil stockpiles will be placed on and covered by sufficiently thick plastic sheeting to suppress dust and prevent infiltration from rainfall. Plastic coverings will be secured with weighted objects as appropriate.

All transport of excavated soils from the Site to the receiving disposal facility will be performed by licensed waste haulers under the provisions of 6 NYCRR Part 364, and any other applicable local and Federal regulations. Waste manifest and weigh ticket documentation will be provided for each soil load and will be included in the Final Engineering Report (FER).

3.3.4 Soil Disposal Facility

The soil disposal facility will be established at a later date and will be reported to the NYSDEC Project Manager. The minimum total quantity of waste soil to be disposed off-site as part of this remedy is approximately 13,500 cubic yards. Additional excavation of soils to be managed under this RAWP is expected but cannot be quantified. Waste characterization sampling will be conducted in accordance with the requirements of the selected disposal facility. The approximate limits and depths of excavations and volumes of impacted soils that must be removed to achieve the RAOs for the proposed clean-up are included as Figure 7.

Non-contaminated soil, as determined by confirmatory sampling, requiring excavation and removal from the Site, but not intended to be disposed at a permitted waste facility, shall be managed according to 6 NYCRR 375 regulations and the sampling requirements listed in Table 4 of the NYSDEC CP-51 Soil Cleanup Guidance document. Excavated soils that meet the restricted residential SCO may be considered for reuse as on-Site fill with approval of the DEC Site manager.

3.3.5 Backfill materials

Documentation of the source of backfill materials to be used on-Site shall be provided in the excavation contractor's material management plan. This plan will be submitted to NYSDEC for approval prior to importing materials to the site.

Gravel, rock, or stone consisting of virgin materials will be used without analytical testing. Finer materials secured from a New York State permitted mine or quarry facility (or equivalent) will also be used without additional testing.

Material secured from a non-permitted borrow source must be sampled and analyzed for chemical composition in according to Table 4 of NYSDEC CP-51 and/or Table 5 of DER-10 to show the quality of imported material is consistent with the RRUSCOs.

Any excess native soils generated on-site from deep excavations (basements, footings, etc.) that were not advanced to remove "hotspots", may be reused on-site to the extent practical. Excess native soils that cannot be reused on-site may be staged for reuse as backfill on the adjacent EP-2 Site (BCP 224241) or transported off-site for disposal.

3.3.6 Monitoring Well Decommissioning

Existing monitoring wells on the Site will be destroyed during Site demolition and excavation activities and therefore will be considered decommissioned at such time.

3.3.7 Water Treatment Contingency

Stormwater will be managed on-Site in open retention pits and allowed to infiltrate into the on-Site soils. If groundwater is encountered during the excavation of basement areas or footers, a skid mounted portable carbon filter system will be utilized to pre-treat the groundwater to remove potential VOCs or SVOCs prior to discharge of the groundwater to retention pits.

In the event that the quantity of storm water or groundwater exceeds the infiltration capacity of the on-Site soils, a temporary sewer discharge permit will be obtained from NYC DEP so that excess quantity can be discharged to the sewers. A permit issued by the local sewer authority would be secured prior to discharging any construction waste water to the sewer system.

3.2.8 Confirmatory Endpoint Sampling

Confirmatory endpoint samples will be collected from the base of the excavation(s) to demonstrate that the remedy has achieved the RRU-SCOs. Confirmation sampling will be completed in general accordance with DER-10 Section 5.4 except as noted.

SIDEWALL SAMPLES

- As the entire property is being excavated to a preset depth, one sidewall sample will be collected near the base of the excavation for each 30 linear feet along the entire 990 foot (33 samples) property boundary cut-wall (if possible). One grab sample and one 5 point composite sample will be collected for each 30 feet of side wall. Grab samples will be analyzed for VOCs by EPA method 8260C. Composite samples will be analyzed for SVOCs by method 8270D and arsenic, barium, cadmium, copper, and lead by EPA method 6010c.

- Additional sidewall samples will be collected from deeper interior excavations advanced to remove hotspots and planned basement areas (estimated to be an additional 10-15 samples)

BASE SAMPLES

Historical and Supplemental sampling indicates that SVOCs and PP-Metals are contained in the shallow urban fill.

- In areas where the urban fill has been completely removed and no deeper "hotspots" were identified and excavated, one grab sample and one 5-point composite sample will be collected for each 2,500 ft^2 of the final excavation footprint. Samples will be collected from the 0 to 6 inch depth interval. VOC samples shall be collected from the 6 to 12 inch depth interval if more than 24 hours has passed following the excavation.

- If urban fill is left in place, or deeper excavations are advanced to remove hotspots, one grab sample and one 5-point composite sample will be collected for each 900 ft^2 of the excavation footprint for those areas only following the same sampling protocol described above.

Additional waste characterization profile samples will be collected during the removal action based on the requirements of the selected disposal facilities. Analysis for additional parameters may be included in the confirmatory sampling based on results of the waste characterization samples. The waste characterization results will be provided to NYSDEC when available.

3.2.9 QA/QC and Data Validation

Sampling will be performed in accordance with the final approved Quality Control Project Plan. A copy of the QAPP is included in **Appendix E**.

Analytical results for soil samples taken at the soil removal limits will include ASP Level B data deliverables for use in the preparation of Data Usability Summary Reports (DUSRs) by a qualified third-party data validator.

3.3 Vapor Mitigation System

New buildings are planned to be constructed over the entire footprint of the Site. Construction design plans shall include installation of a vapor mitigation system (VMS) consisting of a sub-slab depressurization system (SSDS) will be utilized to prevent soil vapors from entering interior building spaces. The design and specifications for the SSDS will be submitted to NYSDEC for review when available.

4.0 OPERATIONS, MONITORING, AND MAINTENANCE

If the ORC-X infusion contingency is implemented after the ISCO program, long-term monitoring of on-site groundwater may be necessary to document that the ISCO/ORC-X infusion program resulted in a permanent beneficial and substantial reduction in groundwater impacts.

The Vapor Mitigation System (VMS) is an engineering control that may require operation, monitoring, or maintenance, depending on the final system design. A VMS that incorporates an active SSDS would require long-term operation, maintenance, and monitoring until proven to be no longer necessary.

The VBS is not considered an engineering control relative to the RAWP but is included to satisfy local building ordinance.

5.0 INSTITUTIONAL AND ENGINEERING CONTROLS

5.1 Institutional Controls

Imposition of institutional controls under the BCP is defined within an approved environmental easement and the SMP. The institutional controls are combined with the engineering controls described in this remedial work plan to constitute the extent of the Site remedial actions under the BCP. The institutional controls imposed on this project include the following:

- Requires the Site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);
- Allows the use and development of the controlled property for restricted-residential and commercial uses provided that the long-term Engineering and Institutional Controls are employed;
- Restricts the use of groundwater underlying the property without necessary water quality treatment for intended use;
- Prohibits agriculture or vegetable gardens on the controlled property;
- Requires that all future activities on the property that will disturb remaining contaminated material must be conducted in accordance with the SMP;
- Requires compliance with a Department-approved environmental easement and Site Management Plan.

5.2 Engineering Controls

A Vapor Mitigation System (VMS) consisting of a sub-slab barrier system and an SSDS will be designed and installed beneath the foundational floor-slabs of the new buildings to be constructed on site. The VMS will mitigate potential exposure to VOCs by preventing soil vapor from migrating into interior building spaces. This remedy will allow for the full use and occupation of the basement and above-grade building levels with no further action. Operation, maintenance, and monitoring of the VMS will be included in the Site Management Plan.

6.0 SCHEDULE

The following tentative schedule presents the time required for each of the major tasks in the RAWP and delivery milestones (events). CAMP monitoring is anticipated for the duration of activity up through removal of the urban fill (and discovered hotspots requiring removal).

The infusions will commence not less than 3 weeks after NYSDEC's final approval of this amended RAWP.

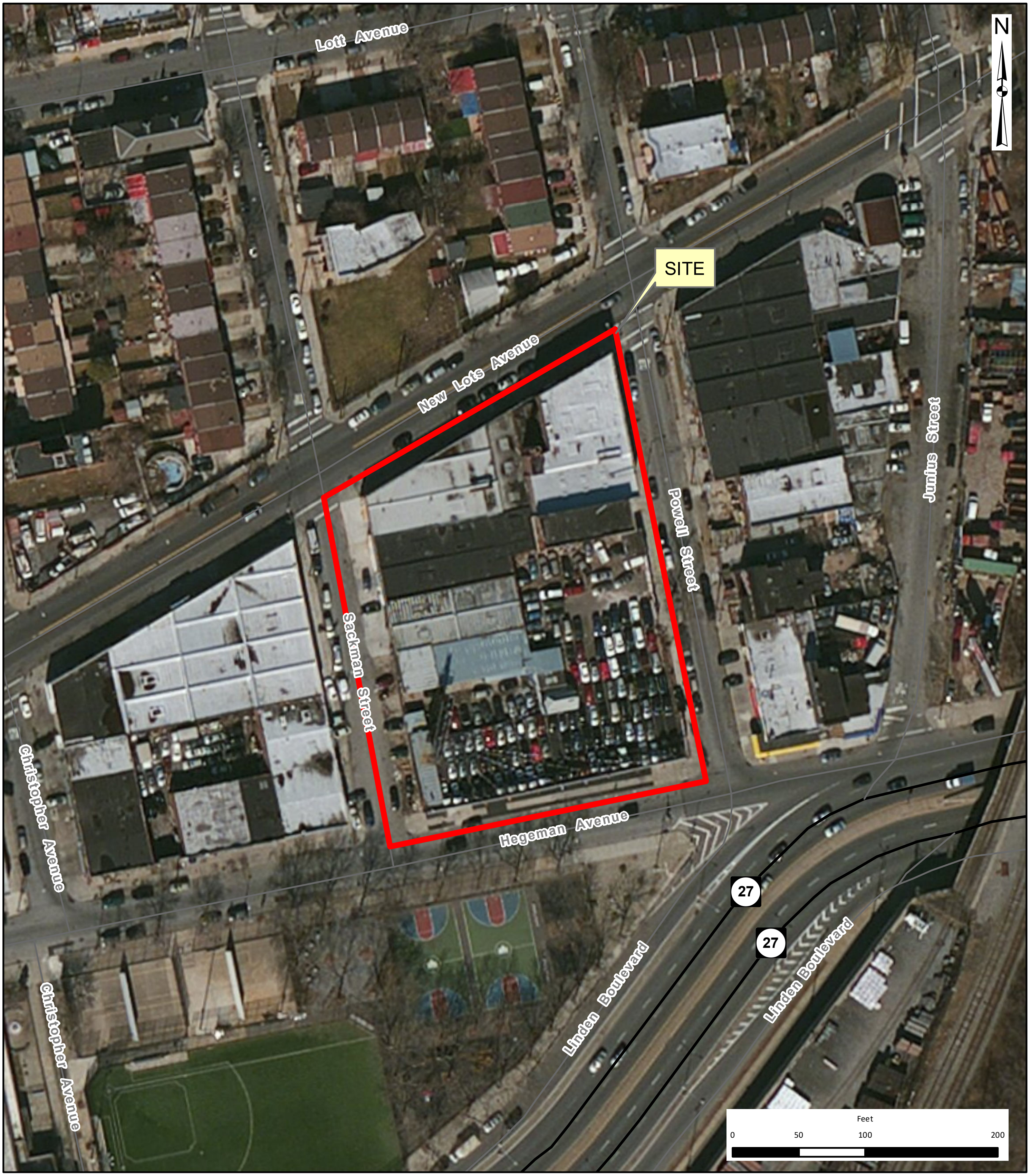
Start	End	Duration	Type	Description
13-Jun-18	3-Jul-18	20	Task	Shoring Installations
9-Jul-18	14-Sep-18	67	Task	Urban Fill Removal
1-Sep-18	14-Sep-18	13	Task	Post-Ex Sampling
-	29-Sep-18	event	**MS**	Post-ex data report
13-Aug-18	28-Aug-18	15	Task	Infusion Grid Installation
20-Aug-18	7-Sep-18	18	Task	Infusions
10-Sep-18	14-Sep-18	5	Task	Post ISCO sampling
	28-Sep-18	event	**MS**	Post ISCO data Report
8-Oct-18	12-Oct-18	5	Task	ORCX Injection Contingency
17-Sep-18	19-Oct-18	32	Task	TOWER A2 basement excavation
5-Nov-18	7-Dec-18	32	Task	TOWER A1 basement excavation
10-Dec-18	25-Jan-19	46.00	Task	Footings and pile placements
8-Feb-19	10-Mar-19	30	Task	SSDS construction/floor slabs
	8-Jun-19	event	MS	FER Draft submittal

Updates to the schedule will be provided as necessary.

Note:

The Tower basement excavations and footing/pile installations are not part of the RAWP but included to provide context for the large gap of time between the ISCO data report and the SSDS installations.

Figures



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Ebenezer Plaza 1

Figure 2: Orthophoto
Hegeman and New Lots Avenues
Borough of Brookly, Kings County, New York

Source: NYS Department of Transportation 2008 Roads dataset;
NYS Department of Technology 2015 orthophoto image.

Drawn:	STF
Date:	2/8/2017
Scale:	1 inch equals 100 feet
Project:	20918.05
Figure:	2

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Figure 3: Tax Map

Hegeman and New Lots Avenues
Borough of Brookly, Kings County, New York

Source: NYS Department of Transportation 2008 Roads dataset;
NYC.gov Digital Tax Map Service, Accessed 10/6/2015

Drawn:	STF
Date:	2/8/2017
Scale:	1 inch equals 100 feet
Project:	20918.05
Figure:	3

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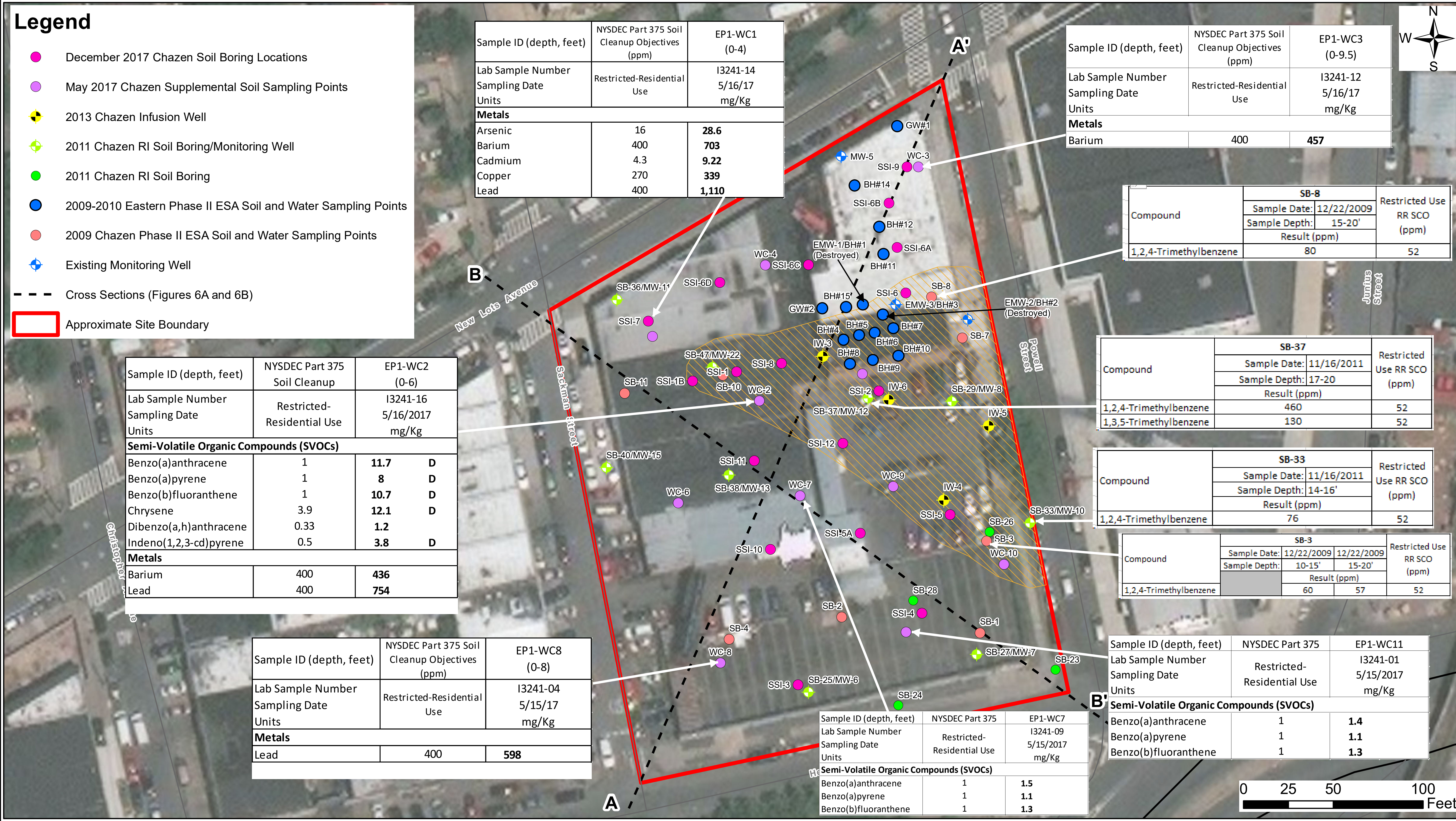

Legend

- December 2017 Chazen Soil Boring Locations
- May 2017 Chazen Supplemental Soil Sampling Points
- 2013 Chazen Infusion Well
- 2011 Chazen RI Soil Boring/Monitoring Well
- 2011 Chazen RI Soil Boring
- 2009-2010 Eastern Phase II ESA Soil and Water Sampling Points
- 2009 Chazen Phase II ESA Soil and Water Sampling Points
- Existing Monitoring Well
- Cross Sections (Figures 6A and 6B)
- Approximate Site Boundary

Sample ID (depth, feet)	NYSDEC Part 375 Soil Cleanup Objectives (ppm)	EP1-WC1 (0-4)
Lab Sample Number Sampling Date Units	Restricted-Residential Use	I3241-14 5/16/17 mg/Kg
Metals		
Arsenic	16	**28.6**
Barium	400	**703**
Cadmium	4.3	**9.22**
Copper	270	**339**
Lead	400	**1,110**

Sample ID (depth, feet)	NYSDEC Part 375 Soil Cleanup Objectives (ppm)	EP1-WC3 (0-9.5)
Lab Sample Number Sampling Date Units	Restricted-Residential Use	I3241-12 5/16/17 mg/Kg
Metals		
Barium	400	**457**

Compound	SB-8	Restricted Use RR SCO (ppm)
	Sample Date: 12/22/2009	
	Sample Depth: 15-20'	
	Result (ppm)	
1,2,4-Trimethylbenzene	80	52

Compound	SB-37	Restricted Use RR SCO (ppm)
	Sample Date: 11/16/2011	
	Sample Depth: 17-20	
	Result (ppm)	
1,2,4-Trimethylbenzene	460	52
1,3,5-Trimethylbenzene	130	52

Compound	SB-33	Restricted Use RR SCO (ppm)
	Sample Date: 11/16/2011	
	Sample Depth: 14-16'	
	Result (ppm)	
1,2,4-Trimethylbenzene	76	52

Compound	SB-3		Restricted Use RR SCO (ppm)
Sample Date:	12/22/2009	12/22/2009	
Sample Depth:	10-15'	15-20'	
	Result (ppm)		
1,2,4-Trimethylbenzene	60	57	52

Sample ID (depth, feet)	NYSDEC Part 375 Soil Cleanup	EP1-WC2 (0-6)	
Lab Sample Number Sampling Date Units	Restricted-Residential Use	I3241-16 5/16/2017 mg/Kg	
Semi-Volatile Organic Compounds (SVOCs)			
Benzo(a)anthracene	1	**11.7**	D
Benzo(a)pyrene	1	**8**	D
Benzo(b)fluoranthene	1	**10.7**	D
Chrysene	3.9	**12.1**	D
Dibenzo(a,h)anthracene	0.33	**1.2**	
Indeno(1,2,3-cd)pyrene	0.5	**3.8**	D
Metals			
Barium	400	**436**	
Lead	400	**754**	

Sample ID (depth, feet)	NYSDEC Part 375 Soil Cleanup Objectives (ppm)	EP1-WC8 (0-8)
Lab Sample Number Sampling Date Units	Restricted-Residential Use	I3241-04 5/15/17 mg/Kg
Metals		
Lead	400	**598**

Sample ID (depth, feet)	NYSDEC Part 375	EP1-WC7
Lab Sample Number Sampling Date Units	Restricted-Residential Use	I3241-09 5/15/2017 mg/Kg
Semi-Volatile Organic Compounds (SVOCs)		
Benzo(a)anthracene	1	**1.5**
Benzo(a)pyrene	1	**1.1**
Benzo(b)fluoranthene	1	**1.3**

Sample ID (depth, feet)	NYSDEC Part 375	EP1-WC11
Lab Sample Number Sampling Date Units	Restricted-Residential Use	I3241-01 5/15/2017 mg/Kg
Semi-Volatile Organic Compounds (SVOCs)		
Benzo(a)anthracene	1	**1.4**
Benzo(a)pyrene	1	**1.1**
Benzo(b)fluoranthene	1	**1.3**

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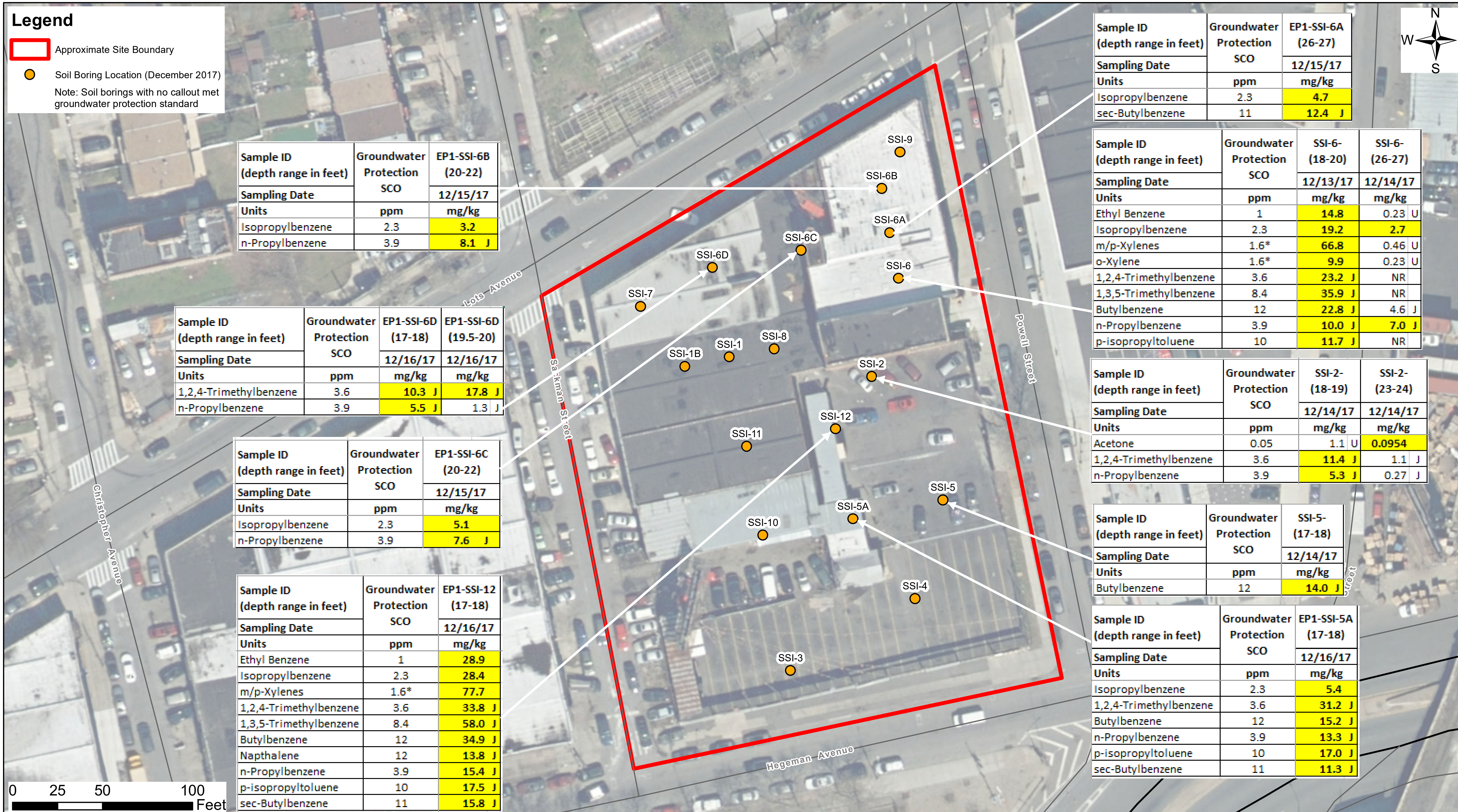
Ebenezer Plaza 1 - BCP Site No. C224240

Figure 4a: Soil Analytical Results Exceeding Restricted-Residential Use SCOs

Hegeman and New Lots Avenues
Borough of Brooklyn, Kings County, New York

Source: NYS Department of Transportation 2008 Roads Dataset; NYS Office of Technology 2015 Orthophoto Imagery

Drawn: AT
Date: 01/30/2018
Scale: 1 inch = 50 feet
Project: 20918.06
Figure: 4a



Sample ID (depth range in feet)	Groundwater Protection SCO	EP1-SSI-6A (26-27)
Sampling Date		12/15/17
Units	ppm	mg/kg
Isopropylbenzene	2.3	4.7
sec-Butylbenzene	11	12.4 J

Sample ID (depth range in feet)	Groundwater Protection SCO	SSI-6- (18-20)	SSI-6- (26-27)
Sampling Date		12/13/17	12/14/17
Units	ppm	mg/kg	mg/kg
Ethyl Benzene	1	14.8	0.23 U
Isopropylbenzene	2.3	19.2	2.7
m/p-Xylenes	1.6*	66.8	0.46 U
o-Xylene	1.6*	9.9	0.23 U
1,2,4-Trimethylbenzene	3.6	23.2 J	NR
1,3,5-Trimethylbenzene	8.4	35.9 J	NR
Butylbenzene	12	22.8 J	4.6 J
n-Propylbenzene	3.9	10.0 J	7.0 J
p-isopropyltoluene	10	11.7 J	NR

Sample ID (depth range in feet)	Groundwater Protection SCO	SSI-2- (18-19)	SSI-2- (23-24)
Sampling Date		12/14/17	12/14/17
Units	ppm	mg/kg	mg/kg
Acetone	0.05	1.1 U	0.0954
1,2,4-Trimethylbenzene	3.6	11.4 J	1.1 J
n-Propylbenzene	3.9	5.3 J	0.27 J

Sample ID (depth range in feet)	Groundwater Protection SCO	SSI-5- (17-18)
Sampling Date		12/14/17
Units	ppm	mg/kg
Butylbenzene	12	14.0 J

Sample ID (depth range in feet)	Groundwater Protection SCO	EP1-SSI-5A (17-18)
Sampling Date		12/16/17
Units	ppm	mg/kg
Isopropylbenzene	2.3	5.4
1,2,4-Trimethylbenzene	3.6	31.2 J
Butylbenzene	12	15.2 J
n-Propylbenzene	3.9	13.3 J
p-isopropyltoluene	10	17.0 J
sec-Butylbenzene	11	11.3 J

Sample ID (depth range in feet)	Groundwater Protection SCO	EP1-SSI-6B (20-22)
Sampling Date		12/15/17
Units	ppm	mg/kg
Isopropylbenzene	2.3	3.2
n-Propylbenzene	3.9	8.1 J

Sample ID (depth range in feet)	Groundwater Protection SCO	EP1-SSI-6D (17-18)	EP1-SSI-6D (19.5-20)
Sampling Date		12/16/17	12/16/17
Units	ppm	mg/kg	mg/kg
1,2,4-Trimethylbenzene	3.6	10.3 J	17.8 J
n-Propylbenzene	3.9	5.5 J	1.3 J

Sample ID (depth range in feet)	Groundwater Protection SCO	EP1-SSI-6C (20-22)
Sampling Date		12/15/17
Units	ppm	mg/kg
Isopropylbenzene	2.3	5.1
n-Propylbenzene	3.9	7.6 J

Sample ID (depth range in feet)	Groundwater Protection SCO	EP1-SSI-12 (17-18)
Sampling Date		12/16/17
Units	ppm	mg/kg
Ethyl Benzene	1	28.9
Isopropylbenzene	2.3	28.4
m/p-Xylenes	1.6*	77.7
1,2,4-Trimethylbenzene	3.6	33.8 J
1,3,5-Trimethylbenzene	8.4	58.0 J
Butylbenzene	12	34.9 J
Napthalene	12	13.8 J
n-Propylbenzene	3.9	15.4 J
p-isopropyltoluene	10	17.5 J
sec-Butylbenzene	11	15.8 J

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Ebenezer Plaza 1 - BCP Site No. C224240

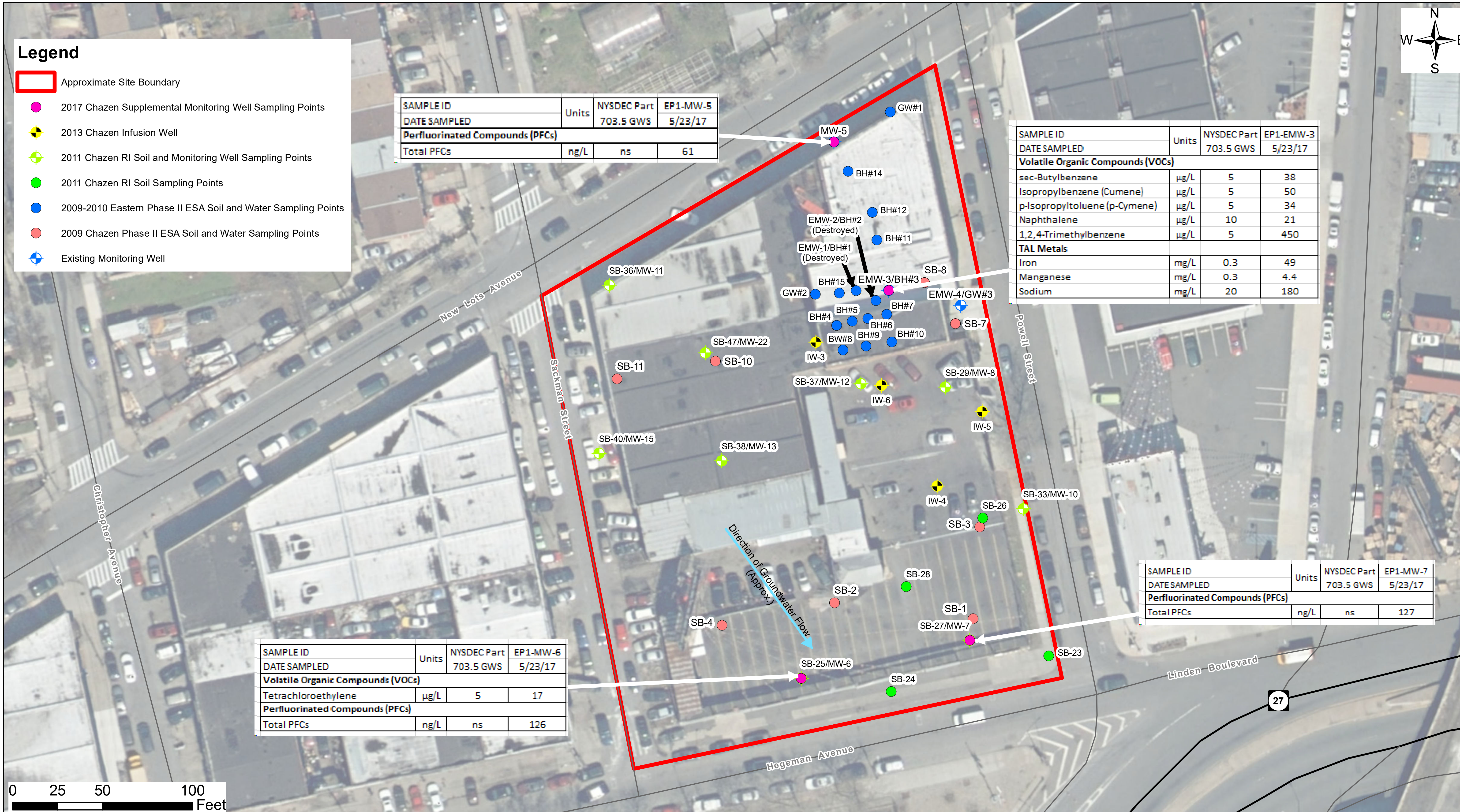
Borough of Brooklyn, Kings County, New York
December 2017 - Supplemental Sampling Investigation

Figure 4b: Soil Sample Locations and Results Exceeding POGSCOs

Source: NYS Department of Transportation 2008 Roads Dataset; NYS Office of Technology 2013 Orthophoto Imagery

Drawn: AT
Date: January 10, 2018
Scale: 1 inch = 50 feet
Project: 20918.06
Figure: 4b

Document Path: Z:\projects\20900-20999\20918.06 EP-1\GIS\Maps\RAWP Revised Figures\Figure4b-SoilExceedingPOGSCO.mxd



SAMPLE ID	Units	NYSDEC Part	EP1-MW-5
DATE SAMPLED		703.5 GWS	5/23/17
Perfluorinated Compounds (PFCs)			
Total PFCs	ng/L	ns	61

SAMPLE ID	Units	NYSDEC Part	EP1-EMW-3
DATE SAMPLED		703.5 GWS	5/23/17
Volatile Organic Compounds (VOCs)			
sec-Butylbenzene	µg/L	5	38
Isopropylbenzene (Cumene)	µg/L	5	50
p-Isopropyltoluene (p-Cymene)	µg/L	5	34
Naphthalene	µg/L	10	21
1,2,4-Trimethylbenzene	µg/L	5	450
TAL Metals			
Iron	mg/L	0.3	49
Manganese	mg/L	0.3	4.4
Sodium	mg/L	20	180

SAMPLE ID	Units	NYSDEC Part	EP1-MW-7
DATE SAMPLED		703.5 GWS	5/23/17
Perfluorinated Compounds (PFCs)			
Total PFCs	ng/L	ns	127

SAMPLE ID	Units	NYSDEC Part	EP1-MW-6
DATE SAMPLED		703.5 GWS	5/23/17
Volatile Organic Compounds (VOCs)			
Tetrachloroethylene	µg/L	5	17
Perfluorinated Compounds (PFCs)			
Total PFCs	ng/L	ns	126

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Ebenezer Plaza 1 - BCP Site No. C224240

Figure 5: Groundwater Sample Locations and Results Exceeding Part 703.5 SCGs

Borough of Brooklyn, Kings County, New York

Source: NYS Department of Transportation 2008 Roads Dataset; NYS Office of Technology 2013 Orthophoto Imagery

Drawn:	AT
Date:	June 26, 2017
Scale:	1 inch = 50 feet
Project:	20918.06
Figure:	5

Document Path: Z:\projects\20900-20999\20918.06 EP-1\GIS\Maps\RAWP Revised Figures\F5-GroundwaterSampleLocations.mxd

Sample ID	EP1-SV-8	
Sampling Date	12/15/2017	
Units	$\mu g/m^3$	
NYSDOH SVI Matrices Compounds		
Carbon Tetrachloride	1.32	
Tetrachloroethene	99.7	
1,1,1-Trichloroethane	0.82	
Methylene Chloride	2.99	
Additional TO-15 CVOCs		
Chloroform	1.42	J
Dichlorodifluoromethane	1.78	J
Trichlorofluoromethane	11.8	
TOTAL CVOCs	**119.8**	

Sample ID	EP1-SV-7	
Sampling Date	12/15/2017	
Units	$\mu g/m^3$	
NYSDOH SVI Matrices Compounds		
Trichloroethene	0.32	
Tetrachloroethene	0.95	
Methylene Chloride	2.95	
Additional TO-15 CVOCs		
1,1,2-Trichlorotrifluoroethane	0.54	J
Chloroform	0.59	J
Chloromethane	0.97	J
Dichlorodifluoromethane	3.02	
Trichlorofluoromethane	1.29	J
TOTAL CVOCs	**10.63**	

Sample ID	EP1-SV-6	
Sampling Date	12/15/2017	
Units	$\mu g/m^3$	
NYSDOH SVI Matrices Compounds		
Carbon Tetrachloride	0.25	
cis-1,2-Dichloroethene	1.23	J
Trichloroethene	8.6	
Vinyl Chloride	2.81	
Tetrachloroethene	881	
1,1,1-Trichloroethane	9.28	
Methylene Chloride	3.82	
Additional TO-15 CVOCs		
Chloroform	2.88	
Chloromethane	0.83	J
Dichlorodifluoromethane	2.57	
Trichlorofluoromethane	17.4	
TOTAL CVOCs	**931**	

Sample ID	EP1-SV-5	
Sampling Date	12/15/2017	
Units	$\mu g/m^3$	
NYSDOH SVI Matrices Compounds		
Carbon Tetrachloride	0.44	
cis-1,2-Dichloroethene	2.18	
Trichloroethene	72.6	
Tetrachloroethene	2,305	
1,1,1-Trichloroethane	0.27	
Methylene Chloride	9.38	
Additional TO-15 CVOCs		
Chloroform	1.47	J
Chloromethane	0.83	J
Dichlorodifluoromethane	2.32	J
Trichlorofluoromethane	10.7	
TOTAL CVOCs	**2,405**	

Sample ID	EP1-SV-4	
Sampling Date	12/15/2017	
Units	$\mu g/m^3$	
NYSDOH SVI Matrices Compounds		
1,1-Dichloroethene	1.03	J
cis-1,2-Dichloroethene	2,220	
Trichloroethene	1,343	
Vinyl Chloride	11.2	
Tetrachloroethene	14,240	
Methylene Chloride	12.5	
Additional TO-15 CVOCs		
Chloroform	6.35	
Dichlorodifluoromethane	1.68	J
trans-1,2-Dichloroethene	59.5	
Trichlorofluoromethane	2.02	J
TOTAL CVOCs	**17,897**	

Sample ID	EP1-SV-9	
Sampling Date	12/15/2017	
Units	$\mu g/m^3$	
NYSDOH SVI Matrices Compounds		
Carbon Tetrachloride	0.63	
Trichloroethene	0.21	
Tetrachloroethene	9.49	
1,1,1-Trichloroethane	0.16	
Methylene Chloride	12.5	
Additional TO-15 CVOCs		
Chloroform	7.81	
Chloromethane	0.52	J
Dichlorodifluoromethane	6.43	
Trichlorofluoromethane	15.2	
TOTAL CVOCs	**53.0**	

Sample ID	EP1-SV-10	
Sampling Date	12/15/2017	
Units	$\mu g/m^3$	
NYSDOH SVI Matrices Compounds		
Carbon Tetrachloride	1.64	
Trichloroethene	1.67	
Tetrachloroethene	222	
Methylene Chloride	1.29	J
Additional TO-15 CVOCs		
1,2-Dichloroethane	1.9	J
Bromodichloromethane	1.27	J
Chloroform	5.37	
Chloromethane	0.39	J
Dichlorodifluoromethane	1.78	J
Trichlorofluoromethane	1.8	J
TOTAL CVOCs	**239**	

Sample ID	EP1-SV-11	
Sampling Date	12/15/2017	
Units	$\mu g/m^3$	
NYSDOH SVI Matrices Compounds		
Tetrachloroethene	48.8	
1,1,1-Trichloroethane	1.64	
Methylene Chloride	3.47	
Additional TO-15 CVOCs		
1,1,2-Trichlorotrifluoroethane	2.07	J
Chloroform	0.88	J
Dichlorodifluoromethane	2.82	
Trichlorofluoromethane	66.9	
TOTAL CVOCs	**126.6**	

Sample ID	EP1-SV-12	
Sampling Date	12/15/2017	
Units	$\mu g/m^3$	
NYSDOH SVI Matrices Compounds		
Carbon Tetrachloride	0.31	
Trichloroethene	0.32	
Tetrachloroethene	383	
Methylene Chloride	22.9	
Additional TO-15 CVOCs		
Dichlorodifluoromethane	3.21	
Trichlorofluoromethane	6.74	
TOTAL CVOCs	**416**	

Sample ID	EP1-SV-1	
Sampling Date	12/15/2017	
Units	$\mu g/m^3$	
NYSDOH SVI Matrices Compounds		
Tetrachloroethene	42.7	
1,1,1-Trichloroethane	0.22	
Methylene Chloride	2.01	
Additional TO-15 CVOCs		
Chloromethane	1.38	
Dichlorodifluoromethane	2.37	J
Trichlorofluoromethane	5	
TOTAL CVOCs	**54**	

Sample ID	EP1-SV-2	
Lab Sample Number	I7005-03	
Sampling Date	12/15/2017	
Units	$\mu g/m^3$	
NYSDOH SVI Matrices Compounds		
Trichloroethene	10.8	
Tetrachloroethene	1,084	
1,1,1-Trichloroethane	0.55	
Methylene Chloride	1.08	J
Additional TO-15 CVOCs		
Bromodichloromethane	1.61	J
Chloroform	183	
Dichlorodifluoromethane	1.34	J
Trichlorofluoromethane	2.19	J
TOTAL CVOCs	**1,285**	

Sample ID	EP1-SV-3	
Sampling Date	12/15/2017	
Units	$\mu g/m^3$	
NYSDOH SVI Matrices Compounds		
Trichloroethene	15.6	
Tetrachloroethene	3,458	
Methylene Chloride	5.91	
Additional TO-15 CVOCs		
Chloromethane	0.45	J
Dichlorodifluoromethane	1.29	J
Trichlorofluoromethane	1.74	J
TOTAL CVOCs	**3,483**	

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Ebenezer Plaza 1 - BCP Site No. C224240
Borough of Brooklyn, Kings County, New York
December 2017 - Supplemental Sampling Investigation

Figure 6: CVOCs in Soil

Source: NYS Department of Transportation 2008 Roads Dataset; NYS Office of Technology 2013 Orthophoto Imagery

Drawn: AT
Date: January 8, 2018
Scale: 1 inch = 50 feet
Project: 20918.06
Figure: 6

Document Path: Z:\projects\20900-20999\20918.06 EP-1\GIS\Maps\RAWP Revised Figures\Figure6-CVOCsSoil.mxd

EXCAVATION PLAN

URBAN FILL > RRSCOs

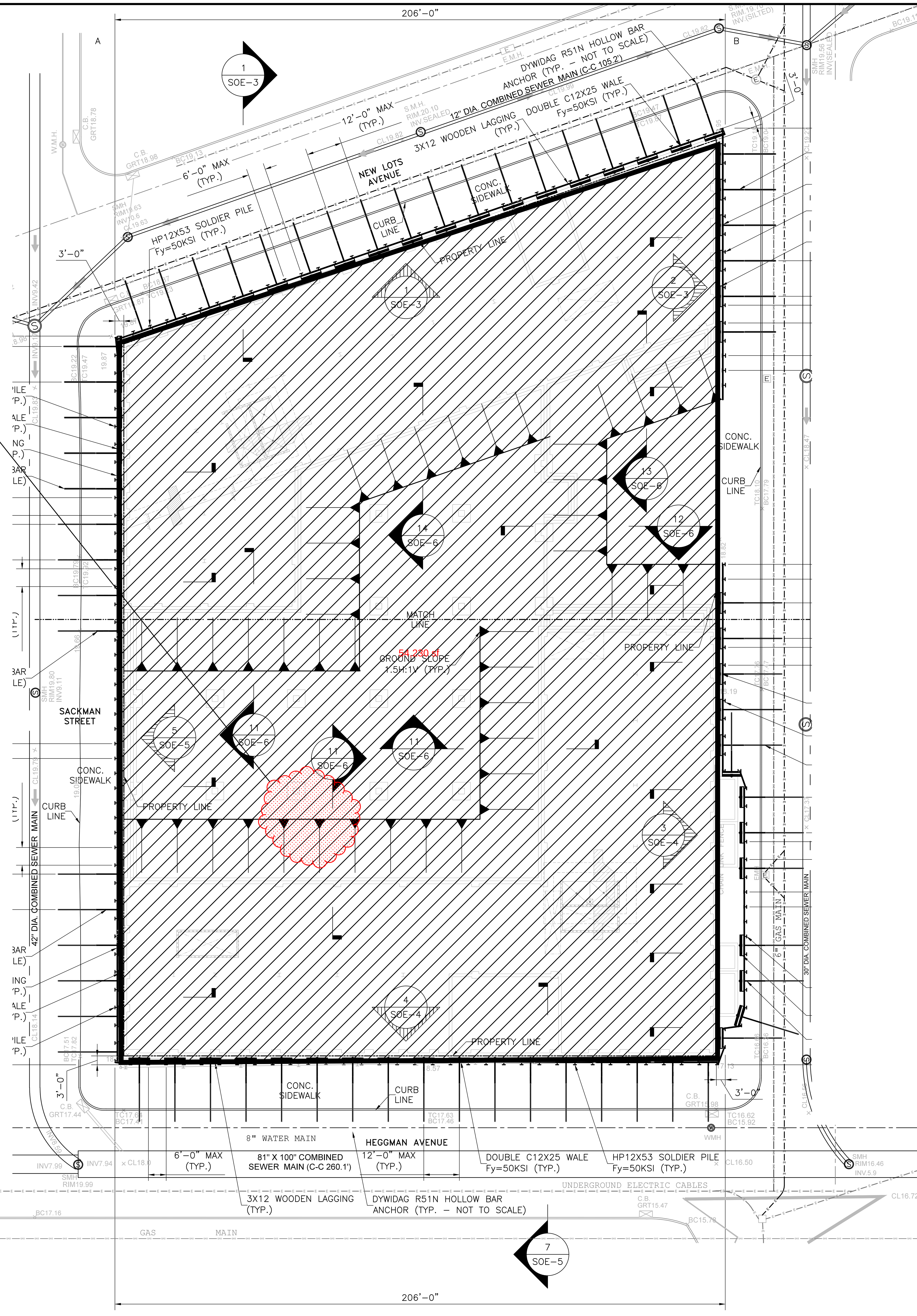
Entire Property = 54,230 ft ^{2}

To 6.5 feet bgs average = 13,055 yd ^{3}

CVOC hot spot removal = ~ 445 yd ^{3}

Total removal to Achieve RAOs = ~13,500 yd^3

CVOC Hot Spot



PLAN VIEW

SCALE: 1" = 20'

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C224240

Revised RAWP

Figure 7

Soil Excavation Limits for RRSCOs

Base map prepared by Pillori Engineering for SOE Plans.

LEGEND

GROUNDWATER LEVEL BEFORE DEWATERING

GROUNDWATER LEVEL AFTER DEWATERING

GROUND SLOPE

PROJECT NAME:

EBENEZER PLAZA
96 NEW LOTS AVENUE
BROOKLYN, NEW YORK

CLIENT NAME:

EBENEZER PLAZA LLC.
c/o PROCIDA DEVELOPMENT GRP.
456 EAST 173RD STREET
BRONX, NEW YORK

GEOTECHNICAL ENGINEER:

PILLORI ASSOCIATES, P.A.
Geotechnical Engineering

71 Route 35, Laurence Harbor, New Jersey 08879, Tel. 732.335.0059 Fax. 732.335.8515
333 Meadowlands Parkway, Suite 102, Secaucus, New Jersey 07094, Tel. 201.558.0065 Fax. 201.558.1427
email : office@pilloriassociates.com

No.	DRAWINGS/REVISIONS	DATE

DRAWING TITLE:

SUPPORT OF EXCAVATION PLAN VIEW

DRAWN :	CHECKED :	REVIEWED :
RM		GP

DATE : 07-25-2017

SCALE : 1" = 20'

JOB NO. : 160611

DRAWING NO. SOE-002.00

SHEET 2 OF 7

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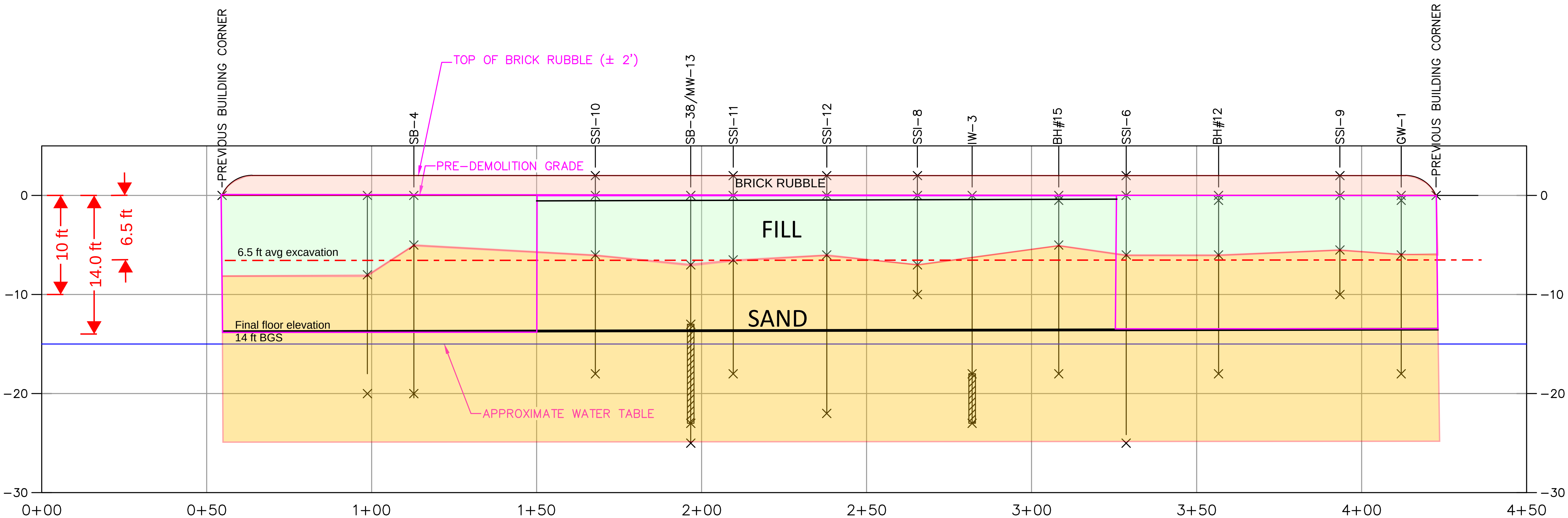

1

STRATIGRAPHIC CROSS-SECTION

SCALE: HORIZONTAL SCALE- 1"=30'
VERTICAL SCALE-1"=10'

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EBENEZER PLAZA 1

STRATIGRAPHIC CROSS-SECTION A-A'

BOROUGH OF BROOKLYN, KINGS COUNTY, NEW YORK

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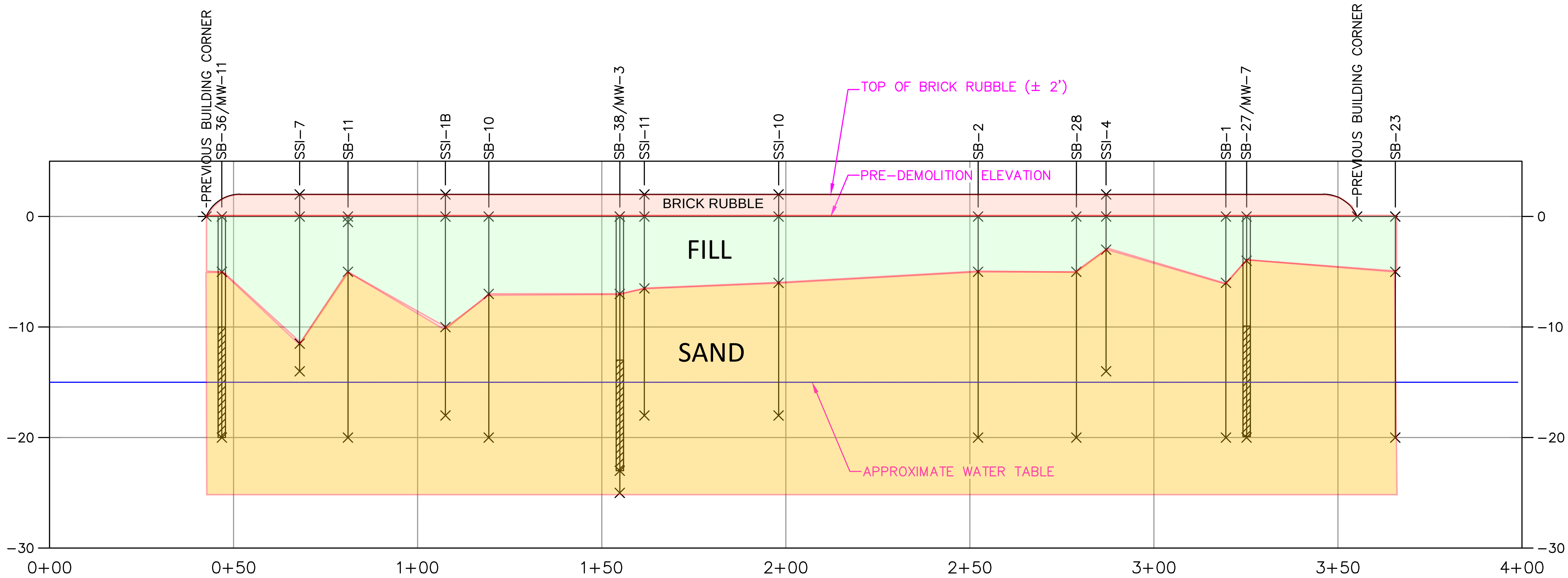
date 1/30/18	scale AS SHOWN
project no. 20918.06	
sheet no. **FIG-7a**	



2

STRATIGRAPHIC CROSS-SECTION

SCALE: HORIZONTAL SCALE– 1"=30'
VERTICAL SCALE–1"=10'

Drawing Name: Z:\projects\20900-20999\20918.05 Ebenezer-Procida\GIS\Ebenezer 1.dwg Date Printed: Jan 30, 2018, 4:53pm

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EBENEZER PLAZA 1

STRATIGRAPHIC CROSS-SECTION B-B'

BOROUGH OF BROOKLYN, KINGS COUNTY, NEW YORK

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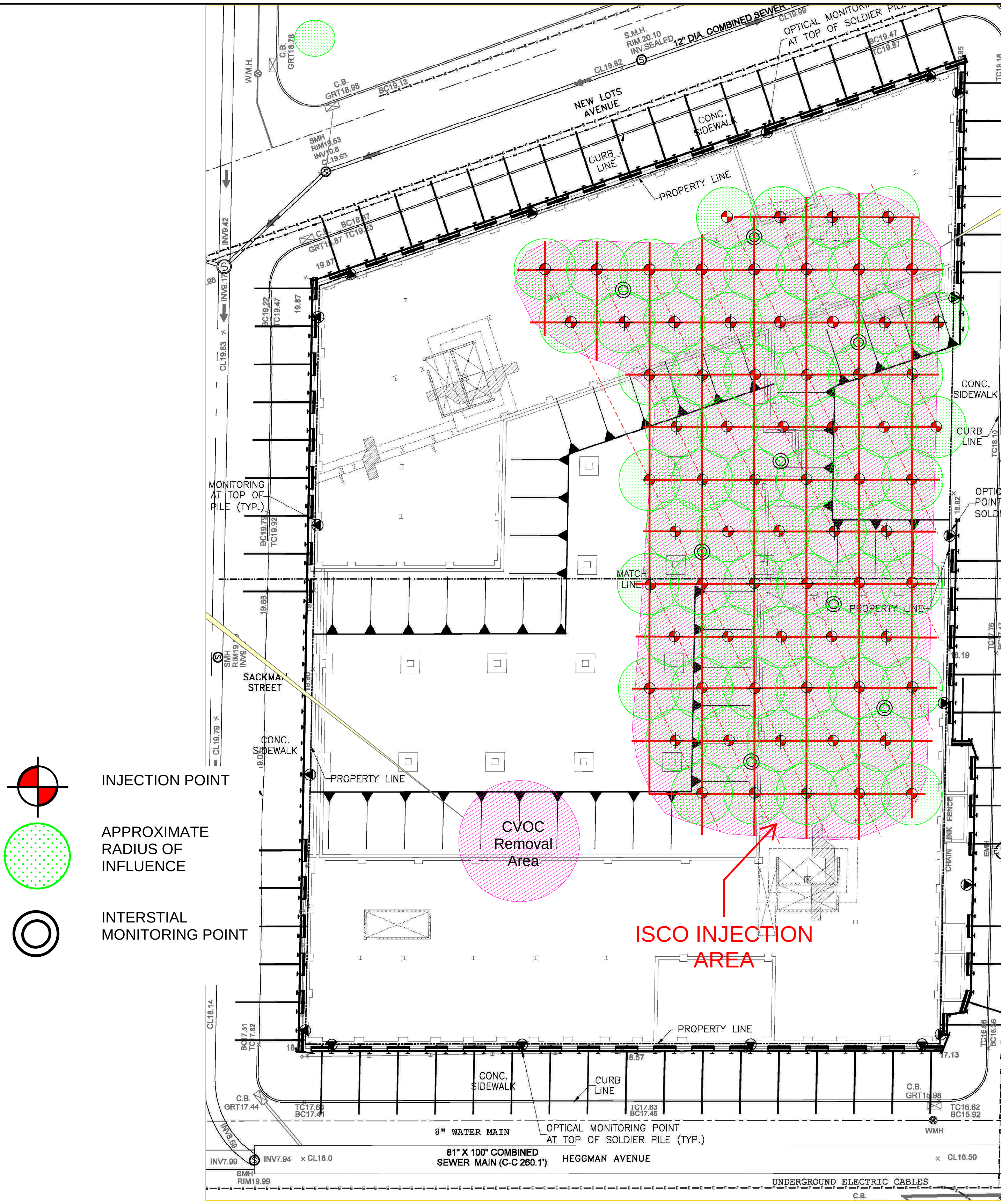
WAC	WO
date	scale
1/30/18	AS SHOWN
project no.	
20918.06	
sheet no.	
FIG-7b	



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EBENZER PLAZA 1 - BCP Site C224240

Figure 8B
ISCO Infusion grid

TABLES

EBENZER PLAZA 1: C224240
RAWP AMENDMENT Table 3.2.1
ISCO INFUSION PROGRAM

Grid Point	Impact Interval (ft bgs)	Approx, Total VOCs (mg/kg)	Boring Depth (ft)	Screen Interval (ft bgs)	Screen Length (feet)	Total 10.2% H_2O_2 (gallons)	H_2O_2 per Foot (gallons)	Stage 1 70% Infusion (gallons)		Stage 2 30% Infusion (gallons)	
1	20-22	30	22	19-22	3	176.1	58.69	123.2	41.1	52.8	17.6
2	20-22	30	22	19-22	3	176.1	58.69	123.2	41.1	52.8	17.6
3	20-22	30	22	19-22	3	176.1	58.69	123.2	41.1	52.8	17.6
4	20-22	30	22	19-22	3	176.1	58.69	123.2	41.1	52.8	17.6
5	17-20	33	20	16-20	4	262.9	65.73	184.1	46.0	78.9	19.7
6	17-20	33	20	16-20	4	262.9	65.73	184.1	46.0	78.9	19.7
7	17-20	33	20	16-20	4	262.9	65.73	184.1	46.0	78.9	19.7
8	20-22	33	22	19-22	3	197.2	65.73	138.0	46.0	59.2	19.7
9	20-22	33	22	19-22	3	197.2	65.73	138.0	46.0	59.2	19.7
10	20-22	33	22	19-22	3	197.2	65.73	138.0	46.0	59.2	19.7
11	20-22	40	22	19-22	3	246.5	82.17	172.5	57.5	73.9	24.6
12	20-22	40	22	19-22	3	246.5	82.17	172.5	57.5	73.9	24.6
13	17-20	33	20	16-20	4	262.9	65.73	184.1	46.0	78.9	19.7
14	17-20	33	20	16-20	4	262.9	65.73	184.1	46.0	78.9	19.7
15	17-20	33	20	16-20	4	262.9	65.73	184.1	46.0	78.9	19.7
16	20-22	33	22	19-22	3	197.2	65.73	138.0	46.0	59.2	19.7
17	20-22	40	22	19-22	3	246.5	82.17	172.5	57.5	73.9	24.6
18	20-27	100	27	19-27	8	1784.2	223.02	1248.9	156.1	535.3	66.9
19	20-27	150	27	19-27	8	2723.2	340.40	1906.3	238.3	817.0	102.1
20	20-27	40	27	19-27	8	657.3	82.17	460.1	57.5	197.2	24.6
21	17-20	33	20	16-20	4	262.9	65.73	184.1	46.0	78.9	19.7
22	17-20	33	20	16-20	4	262.9	65.73	184.1	46.0	78.9	19.7
23	20-22	50	22	19-22	3	316.9	105.64	221.8	73.9	95.1	31.7
24	20-27	100	27	19-27	8	1784.2	223.02	1248.9	156.1	535.3	66.9
25	18-27	250	27	17-27	10	5751.6	575.16	4026.1	402.6	1725.5	172.5
26	20-27	40	27	19-27	8	657.3	82.17	460.1	57.5	197.2	24.6
27	17-20	33	20	16-20	4	262.9	65.73	184.1	46.0	78.9	19.7
28	17-20	40	20	16-20	4	328.7	82.17	230.1	57.5	98.6	24.6
29	17-22	100	22	16-22	6	1338.1	223.02	936.7	156.1	401.4	66.9
30	18-24	150	24	17-24	7	2382.8	340.40	1668.0	238.3	714.8	102.1
31	18-24	80	24	17-24	7	1232.5	176.07	862.7	123.2	369.7	52.8
32	18-24	40	24	17-24	7	575.2	82.17	402.6	57.5	172.5	24.6
33	17-20	33	20	16-20	4	262.9	65.73	184.1	46.0	78.9	19.7
34	17-20	60	20	16-20	4	516.5	129.12	361.5	90.4	154.9	38.7
35	18-24	120	24	17-24	7	1889.8	269.97	1322.9	189.0	566.9	81.0
36	18-24	120	24	17-24	7	1889.8	269.97	1322.9	189.0	566.9	81.0
37	18-24	60	24	17-24	7	903.8	129.12	632.7	90.4	271.1	38.7
38	18-24	33	24	17-24	7	460.1	65.73	322.1	46.0	138.0	19.7
39	17-20	60	20	16-20	4	516.5	129.12	361.5	90.4	154.9	38.7
40	18-24	200	24	17-24	7	3204.5	457.78	2243.1	320.4	961.3	137.3
41	18-24	200	24	17-24	7	3204.5	457.78	2243.1	320.4	961.3	137.3
42	18-24	45	24	17-24	7	657.3	93.90	460.1	65.7	197.2	28.2
43	18-24	33	24	17-24	7	460.1	65.73	322.1	46.0	138.0	19.7
44	17-20	30	20	16-20	4	234.8	58.69	164.3	41.1	70.4	17.6

EBENZER PLAZA 1: C224240
RAWP AMENDMENT Table 3.2.1
ISCO INFUSION PROGRAM

Grid Point	Impact Interval (ft bgs)	Approx, Total VOCs (mg/kg)	Boring Depth (ft)	Screen Interval (ft bgs)	Screen Length (feet)	Total 10.2% H_2O_2 (gallons)	H_2O_2 per Foot (gallons)	Stage 1 70% Infusion (gallons)		Stage 2 30% Infusion (gallons)	
45	17-20	275	20	16-20	4	2535.4	633.85	1774.8	443.7	760.6	190.2
46	17-22	275	22	16-22	6	3803.1	633.85	2662.2	443.7	1140.9	190.2
47	17-22	100	22	16-22	6	1338.1	223.02	936.7	156.1	401.4	66.9
48	18-24	50	24	17-24	7	739.5	105.64	517.6	73.9	221.8	31.7
49	17-20	30	20	16-20	4	234.8	58.69	164.3	41.1	70.4	17.6
50	17-20	60	20	16-20	4	516.5	129.12	361.5	90.4	154.9	38.7
51	17-20	300	20	16-20	4	2770.2	692.54	1939.1	484.8	831.1	207.8
52	17-20	200	20	16-20	4	1831.1	457.78	1281.8	320.4	549.3	137.3
53	17-20	60	20	16-20	4	516.5	129.12	361.5	90.4	154.9	38.7
54	17-20	33	20	16-20	4	262.9	65.73	184.1	46.0	78.9	19.7
55	17-20	60	20	16-20	4	516.5	129.12	361.5	90.4	154.9	38.7
56	17-20	100	20	16-20	4	892.1	223.02	624.5	156.1	267.6	66.9
57	17-20	60	20	16-20	4	516.5	129.12	361.5	90.4	154.9	38.7
58	17-20	100	20	16-20	4	892.1	223.02	624.5	156.1	267.6	66.9
59	17-20	50	20	16-20	4	422.6	105.64	295.8	73.9	126.8	31.7
60	17-20	33	20	16-20	4	262.9	65.73	184.1	46.0	78.9	19.7
61	17-20	60	20	16-20	4	516.5	129.12	361.5	90.4	154.9	38.7
62	17-20	100	20	16-20	4	892.1	223.02	624.5	156.1	267.6	66.9
63	17-20	100	20	16-20	4	892.1	223.02	624.5	156.1	267.6	66.9
64	17-20	33	20	16-20	4	262.9	65.73	184.1	46.0	78.9	19.7
65	17-20	33	20	16-20	4	262.9	65.73	184.1	46.0	78.9	19.7
66	17-20	40	20	16-20	4	328.7	82.17	230.1	57.5	98.6	24.6
67	17-20	40	20	16-20	4	328.7	82.17	230.1	57.5	98.6	24.6
68	17-20	30	20	16-20	4	234.8	58.69	164.3	41.1	70.4	17.6
69	17-20	30	20	16-20	4	234.8	58.69	164.3	41.1	70.4	17.6
70	17-20	30	20	16-20	4	234.8	58.69	164.3	41.1	70.4	17.6
TOTALS			1520	16-27	336	60570.5	180.3	42399.3	126.2	18171.1	54.1

Quantities based on estimated 15 gallons of 10.2% peroxide per yard of impacted soil with average total VOCs of 85 ı
Quantities at each location adjusted for variability in known or estimated concentrations at each location.
Quantites may be adjusted in the field based on observations during drilling and infusion kinematics.

APPENDIX F CAMP & HASP

Appendix 1A
New York State Department of Health
Generic Community Air Monitoring Plan

Overview

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical- specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate DEC/NYSDOH staff.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. "Periodic" monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

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

3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

4. All 15-minute readings must be recorded and be available for State (DEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the

work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

3. All readings must be recorded and be available for State (DEC and NYSDOH) and County Health personnel to review.

December 2009

Appendix 1B
Fugitive Dust and Particulate Monitoring

A program for suppressing fugitive dust and particulate matter monitoring at hazardous waste sites is a responsibility on the remedial party performing the work. These procedures must be incorporated into appropriate intrusive work plans. The following fugitive dust suppression and particulate monitoring program should be employed at sites during construction and other intrusive activities which warrant its use:

1. Reasonable fugitive dust suppression techniques must be employed during all site activities which may generate fugitive dust.

2. Particulate monitoring must be employed during the handling of waste or contaminated soil or when activities on site may generate fugitive dust from exposed waste or contaminated soil. Remedial activities may also include the excavation, grading, or placement of clean fill. These control measures should not be considered necessary for these activities.

3. Particulate monitoring must be performed using real-time particulate monitors and shall monitor particulate matter less than ten microns (PM10) with the following minimum performance standards:

(a) Objects to be measured: Dust, mists or aerosols;
(b) Measurement Ranges: 0.001 to 400 mg/m3 (1 to 400,000 :ug/m3);
(c) Precision (2-sigma) at constant temperature: +/- 10 :g/m3 for one second averaging; and +/- 1.5 g/m3 for sixty second averaging;
(d) Accuracy: +/- 5% of reading +/- precision (Referred to gravimetric calibration with SAE fine test dust (mmd= 2 to 3 :m, g= 2.5, as aerosolized);
(e) Resolution: 0.1% of reading or 1g/m3, whichever is larger;
(f) Particle Size Range of Maximum Response: 0.1-10;
(g) Total Number of Data Points in Memory: 10,000;
(h) Logged Data: Each data point with average concentration, time/date and data point number
(i) Run Summary: overall average, maximum concentrations, time/date of maximum, total number of logged points, start time/date, total elapsed time (run duration), STEL concentration and time/date occurrence, averaging (logging) period, calibration factor, and tag number;
(j) Alarm Averaging Time (user selectable): real-time (1-60 seconds) or STEL (15 minutes), alarms required;
(k) Operating Time: 48 hours (fully charged NiCd battery); continuously with charger;
(l) Operating Temperature: -10 to 50^{o} C (14 to 122^{o} F);
(m) Particulate levels will be monitored upwind and immediately downwind at the working site and integrated over a period not to exceed 15 minutes.

4. In order to ensure the validity of the fugitive dust measurements performed, there must be appropriate Quality Assurance/Quality Control (QA/QC). It is the responsibility of the remedial party to adequately supplement QA/QC Plans to include the following critical features: periodic instrument calibration, operator training, daily instrument performance (span) checks, and a record keeping plan.

5. The action level will be established at 150 ug/m3 (15 minutes average). While conservative,

this short-term interval will provide a real-time assessment of on-site air quality to assure both health and safety. If particulate levels are detected in excess of 150 ug/m3, the upwind background level must be confirmed immediately. If the working site particulate measurement is greater than 100 ug/m3 above the background level, additional dust suppression techniques must be implemented to reduce the generation of fugitive dust and corrective action taken to protect site personnel and reduce the potential for contaminant migration. Corrective measures may include increasing the level of personal protection for on-site personnel and implementing additional dust suppression techniques (see Paragraph 7). Should the action level of 150 ug/m3 continue to be exceeded work must stop and DER must be notified as provided in the site design or remedial work plan. The notification shall include a description of the control measures implemented to prevent further exceedances.

6. It must be recognized that the generation of dust from waste or contaminated soil that migrates off-site, has the potential for transporting contaminants off-site. There may be situations when dust is being generated and leaving the site and the monitoring equipment does not measure PM10 at or above the action level. Since this situation has the potential to allow for the migration of contaminants off-site, it is unacceptable. While it is not practical to quantify total suspended particulates on a real-time basis, it is appropriate to rely on visual observation. If dust is observed leaving the working site, additional dust suppression techniques must be employed. Activities that have a high dusting potential--such as solidification and treatment involving materials like kiln dust and lime--will require the need for special measures to be considered.

7. The following techniques have been shown to be effective for the controlling of the generation and migration of dust during construction activities:

(a) Applying water on haul roads;
(b) Wetting equipment and excavation faces;
(c) Spraying water on buckets during excavation and dumping;
(d) Hauling materials in properly tarped or watertight containers;
(e) Restricting vehicle speeds to 10 mph;
(f) Covering excavated areas and material after excavation activity ceases; and
(g) Reducing the excavation size and/or number of excavations.

Experience has shown that the chance of exceeding the 150ug/m3 action level is remote when the above-mentioned techniques are used. When techniques involving water application are used, care must be taken not to use excess water, which can result in unacceptably wet conditions. Using atomizing sprays will prevent overly wet conditions, conserve water, and provide an effective means of suppressing the fugitive dust.

8. The evaluation of weather conditions is necessary for proper fugitive dust control. When extreme wind conditions make dust control ineffective, as a last resort remedial actions may need to be suspended. There may be situations that require fugitive dust suppression and particulate monitoring requirements with action levels more stringent than those provided above. Under some circumstances, the contaminant concentration and/or toxicity may require additional monitoring to protect site personnel and the public. Additional integrated sampling and chemical analysis of the dust may also be in order. This must be evaluated when a health and safety plan is developed and when appropriate suppression and monitoring requirements are established for protection of health and the environment.

Health and Safety Plan
Ebenezer Plaza 1
Brownfield Cleanup Program
NYSDEC Site No. C224240

94 New Lots Avenue
Brooklyn
Kings County, New York

February 2017

THE Chazen COMPANIES®
Engineers
Environmental Professionals
Land Surveyors
Landscape Architects
Planners

Prepared for:

Ebenezer Plaza Owner, LLC
456 E. 173rd Street
Bronx, NY 10566

New York State Department of Environmental Conservation – Division of Environmental Remediation
625 Broadway
Albany, New York

Prepared by:

Hudson Valley Office:
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21 Fox Street
Poughkeepsie, New York 12601

Capital District Office
(518) 273-0055

North Country Office
(518) 812-0513

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TABLES

1.0 INTRODUCTION AND OBJECTIVES

The Chazen Companies (Chazen) have prepared this Health and Safety Plan (HASP) for employees of Chazen for the Ebenezer Plaza Brownfields Cleanup (BCP) Program Site (herein after referred to as the EP1 Site) located in Brooklyn, Kings County, New York. This HASP is applicable to the Remedial Action Work Plan (RAWP) and has been prepared to specifically address potential hazards associated with the proposed scope of work.

The activities, equipment, and procedures described in this plan are designed to provide personal protection against potential environmental hazards which may be present on the work site. This plan includes delineation of site characteristics; establishes an emergency chain-of-command; details the use of basic safety equipment, personal protective equipment, and air monitoring devices, and describes equipment decontamination procedures.

The objectives of this HASP are to:

- Review the physical, chemical, and biological hazards which may be present during the proposed site investigative activities
- Specify the protective measures necessary to control those hazards
- Define emergency procedures.
- Specify training and medical qualification criteria for personnel.

This HASP must be read and understood by all Chazen personnel who perform field activities at the EP1 Site.

2.0 PROJECT PERSONNEL & EMERGENCY RESPONSE CONTACTS

The personnel and emergency response contacts associated with the proposed scope of work at the site are presented below.

DIAL 911 FOR EMERGENCY IN WESTCHESTER COUNTY

Title/Project Responsibility	Name	Main Phone	Mobile/Other Phone
Project Personnel			
Project Manager	Kevin McGrath	518-266-7370	518-527-7165
Field Operations Leader and on-site Health & Safety Representative	William Olsen Eric Orlowski	845-486-1521 845-486-1520	845-532-0602 518-928-5823
Health & Safety Officer	Kip Score	518-226-0300	518-281-6358
EP1 Site Emergency Contact	Peter Procida	---------	----------
Emergency Personnel – DIAL 911 In Kings County			
Hospital Brookdale University Hospital and Medical Center One Brookdale Plaza Brooklyn, New York (Hospital Route Map Attached On Next Page)		**Emergency-Dial 911**	(718) 240-5000 non-emergency
New York City Fire Department		Dial 911	
New York City Police Department		Dial 911	
NYSDEC Spills Hotline		(800) 457-7362	
NYSDEC Regional Office		(718) 482-4900	
Poison Control Center		(800) 222-1222	
National Response Center		(800) 424-8802	

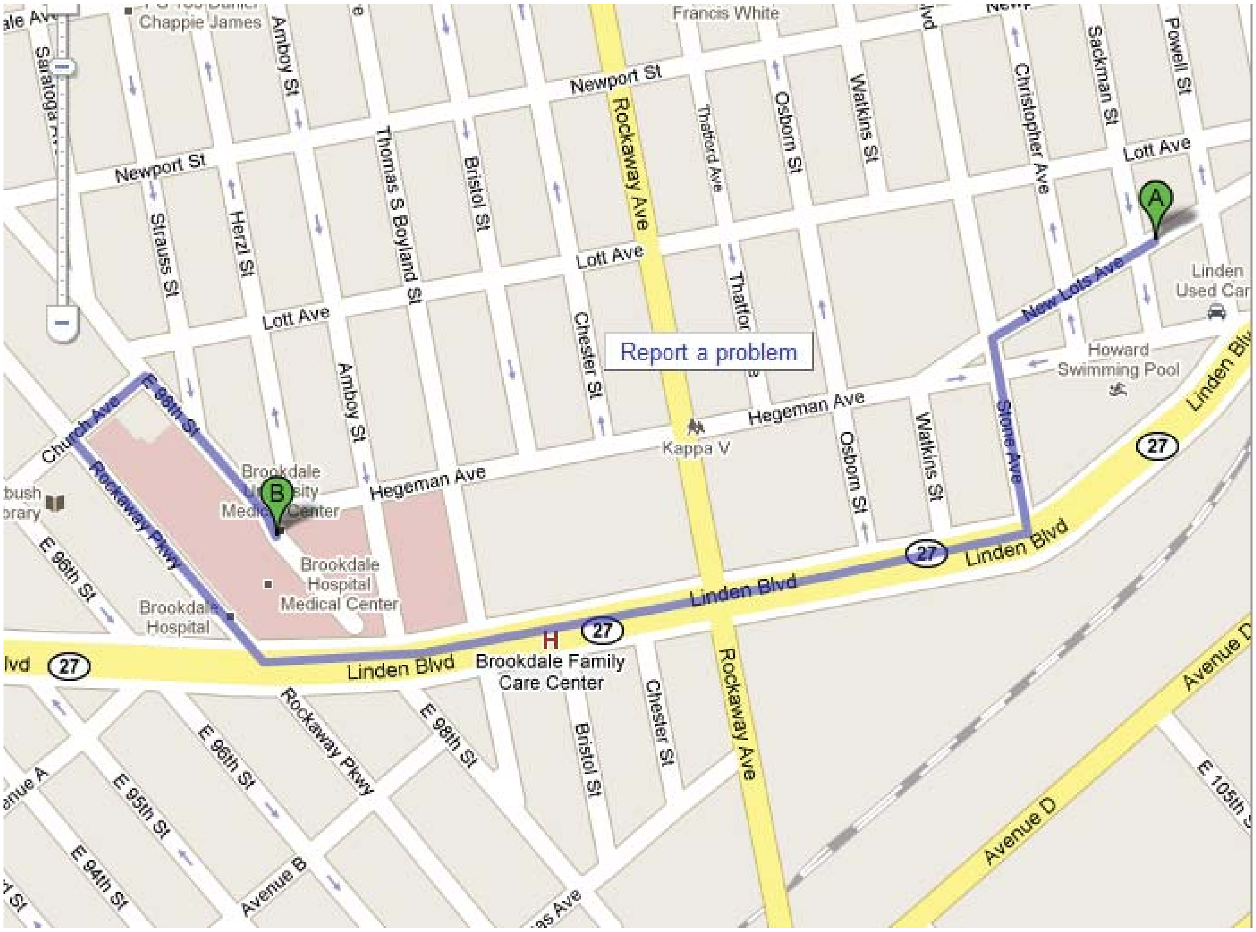
2.1 Hospital Route

Brookvale University Hospital is located approximately 1.1 miles from the EP1 Site. The travel time from the EP1 Site to Brookvale University Hospital is approximately four minutes. Directions are provided below and a route plan map is shown on the following page.

Directions to Brookvale University Hospital:

1.	Head southwest on New Lots Avenue toward Sackman Street	0.1 miles
2.	Turn LEFT at the 3rd cross street onto Mother Gaston Blvd/Stone Avenue.	0.1 miles
3.	Turn RIGHT onto Linden Blvd.	0.5 miles
4.	Turn RIGHT at Rockaway Pkwy.	0.2 miles
5.	Take 1st RIGHT onto Church Avenue.	318 feet
6.	Turn RIGHT at E 98th Street. Hospital will be on right hand side.	0.1 miles
	Total estimated time = 4 minutes	1.1 miles

1. **Hospital Route Map**



3.0 SITE CHARACTERIZATION

3.1 Site Location & Description

The EP1 Site is a 1.26-acre occupied property situated between New Lots Avenue, Sackman Street, Powell Street, and Hegeman Avenue in Brooklyn, Kings County, New York. The Site is currently zoned M1-1: Manufacturing District. The intended future use is mixed-use commercial/residential with a church with retail space at grade and high-rise multi-family affordable housing units above. The site will be rezoned to be consistent with the intended use.

The Site is located in a dense urban area with highly diverse uses. North of New Lots Avenue is a community garden, residences; East of Powel Street is a commercial plaza, Burger King, and the Long Island Railroad right of way with tracks, South of Hegeman Avenue, is a community center and recreation park beyond which is, a rail yard, nursing home, and commercial warehouses; and, west of Sackman Street is the Ebenezer Plaza 2-BCP Site C224241.

Remedial action activities under the BCP will occur after the site buildings have been demolished/removed.

3.2 Historic Site Uses

Former Site uses included used car sales, auto repair, auto wrecking, dry cleaning, a coal and coke distribution business, and a gasoline filling station. Historic mapping indicates vehicle repair garages on Site as early as 1928, with a dry cleaner and gasoline filling station on the eastern site area prior to 1980.

3.3 Proposed Project Scope/Site Investigation Activities

The investigative activities proposed at the site include the following:

- Drilling with Geoprobe rig, and sampling,
- Soil sample screening with PID and XRF spectrometer, and
- Soil sample collection.

4.0 SITE HAZARD EVALUATION AND CONTROL

The potential for exposure to chemical, physical, and mechanical hazards at the EP1 Site is considered to be moderate. Hazards which may be encountered at the EP1 Site are summarized in Table 1. Additional information pertaining to these hazards is provided in later sections of this HASP.

Table 1: Potential Hazards at the Site

Hazard Type	Hazard Anticipated	Associated Investigative Activities	Comments	Hazard Control Methods

Chemical	Chemicals of Concern (COCs) in Soil including VOCs and Metals	Drilling with Geoprobe®, installation of soil borings, soil excavation, soil sample collection, XRF screening, PID headspace screening	Considered minimal	PPE, Training on Identification of COCs Safety Training & Standard Safety Operations
Physical	Slip, Trip & Fall, Heavy machinery	Any site work	Construction and Industrial equipment, irregular surfaces	Safety Training & Standard Safety Operations
Biological	Tick, insect bites, poisonous plants, heat/ cold-related disorders	Any site work	Considered minimal	Safety Training & Standard Safety Operations
Electrical	Working around utilities	Drilling, soil sample collection	Considered minimal to moderate	Utility Mark Out in planned boring locations, Safety Training & Standard Safety Operations

4.1 Hazard Evaluation

4.1.1 Chemical Hazards

Based on available historical information, the primary chemicals of concern (COCs) present in the proposed EP1 Site work areas include VOCs and lead.

Table 2 lists the potential health hazards that may be encountered where these may be encountered in the breathing zone and recommended exposure limits, as well as assessment of all primary exposure routes.

Table 2: COCs & Established Permissible Airborne Exposure Limits

COC	Time Weighted Average Airborne Limits			Short-Term Exposure Limit (ppm)	IDLH (ppm)	Primary Routes Of Exposure On Site
	OSHA PEL	NIOSH REL	ACGIH TLV			
Lead	0.05	0.05	0.05	Not Listed	100 Ca	Inhalation, Dermal
PCE, TCE (VOCs)	100	minimize	na	200	150 ca	Inhalation
Benzene (VOC)	1.0	0.1	0.5	5.0 (1.0 NIOSH)	500 Ca	Inhalation
Ethylbenzene (VOC)	100	100	100	125	800	Inhalation
Toluene (VOC)	200	100	50	150	500	Inhalation
Xylenes (VOC)	100	100	100	150	900	Inhalation

1. Some of the most common VOCs are listed above. A conservative permissible exposure limit of 5 ppm for VOCs will be used in the field as measured continuously using a portable photoionization detector (PID)

2. Air concentrations listed in http://www.cdc.gov/niosh/npg/npgd0368.html, accessed August 14, 2009.

Ca: NIOSH has identified the compounds as a potential occupational carcinogen

C: Ceiling value. Typically a 15-minute TWA that must not be exceeded at any point during the workday

IDLH: Immediately Dangerous to Life & Health

Skin designation indicates the potential for dermal absorption

OSHA PELs are legally enforceable.

RELs and TLVs are published as recommended guidelines

COCs present on the subject property are expected to vary based on location (e.g., source area, soil stockpiles, etc.).

Project investigation activities will involve potential exposure to soil and groundwater. Given the nature of the proposed project activities, the potential for site personnel to encounter the LSS Site COCs during performance of the activities outlined in the Work Plan is considered to be minimal as specified PPE and air monitoring (described later in this plan) will be utilized.

Symptoms of exposure to the COCs are summarized in Table 3.

Table 3: General Signs and Symptoms of Exposure to COCs

Compound	Signs & Symptoms of Exposure
PCE, TCE	Irritation to eyes, skin, and lungs; central nervous system depressant.
Petroleum Hydrocarbons (including SVOCs)	Irritation to eyes, skin, nose, respiratory system; headache, nausea, staggered gait; fatigue, anorexia, lassitude (weakness, exhaustion); dermatitis
Lead	Pain, muscle weakness, abdominal pain, nausea, vomiting, diarrhea, constipation, a metallic taste.
VOCs (general)	Irritation eyes, skin, nose, respiratory system; headache, nausea; fatigue, anorexia

4.1.2 Physical Hazards

Site work which occurs in the vicinity of drilling and/or excavating equipment and machinery presents a general safety hazard. Uneven ground surfaces and the presence of debris on the site presents a concern for slip, trip, and fall incidents.

The potential for heat-related stress during site work exists. Heat stress may occur even in moderate temperatures and may present any or all of the following symptoms:

Heat Rash **–** Result of continuous exposure to hot humid air and chafing clothes. Heat rash is uncomfortable and decreases the ability to tolerate heat.

Heat Cramps **–** Result of the inadequate replacement of body electrolytes lost through perspiration. Sign include severe spasms and pain in the extremities and abdomen.

Heat Exhaustion **–** Result of the increased stress on the vital organs of the body in the effort to meet the body's cooling demands. Signs include shallow breathing, pale, cool, moist skin, profuse sweating, dizziness, and listlessness.

Heat Stroke **–** Result of overworked cooling system. Heat stroke is the most serious form of heat stress. Body surfaces must be cooled and medical help must be obtained immediately to prevent severe injury and/or death. Signs of heat stroke include red, hot, dry skin, absence of perspiration, nausea, dizziness, confusion and strong rapid pulse. Coma and death can result from heat stroke.

The following any or a combination of the following actions can be taken to prevent heat stress:

- Replace body fluids (water and electrolytes) lost through perspiration. Solutions may include a 0.1% salt and water solution or commercial mixes such as Gatorade and Squench. A fluid/electrolyte replacement will be used as necessary to minimize fluid loss.

- Provide cooling devices to aid in the natural body ventilation. Cooling occurs through evaporation of perspiration and limited body contact with heat absorbing protective clothing. Fans and air conditioners can assist in evaporation.

- Provide hose-down mobile shower facilities, where feasible, to cool protective clothing and reduce body temperature.

- Conduct activities early in the morning or evening during very hot weather.

- Provide shelter against heat and direct sunlight to protect personnel.

The potential for cold stress during site work exists. Working outside in cold temperatures presents a concern for cold-related disorders as described below:

***Hypothermia* –** Symptoms of hypothermia include shivering, slurred speech, disorientation, and loss of coordination. Advance stages of hypothermia include feelings of warmth and reckless behavior.

***Frost Bite* –** Symptoms of frostbite include cold feelings, red color to the skin, tingling, swelling, and pain. In advanced stated of frostbite, the skin will appear white in color.

To avoid cold stress, take the following precautions:

- Provide a shelter area where warmth is available.

- Wear thermal clothing applied in layers.

- Remain active in order to maintain blood circulation throughout the body.

- Maintain warm/hot drinks in the support zone.

Physical hazards are anticipated to be a concern for all site activities.

4.1.3 Biological Hazards

It is anticipated that the site field work will be performed in the fall, winter and spring months which presents some potential for biological hazards to be present. Biological hazards include poison ivy, snakes, ticks, mosquitoes, and other pests. Given the developed nature of the site, biological hazards are expected to be low, but may still be present during site activities.

4.1.3.1 Tick-Borne Disease

Ticks can carry a number of diseases. In the United States, these diseases include:

- Lyme Disease

- Ehrlichiosis

- Rocky Mountain Spotted Fever (throughout the United States but most prevalent in the east)

Lyme Disease - The disease commonly occurs in New York State in the spring and summer and is transmitted during extended attachment (minimum 24 hours) of an infected tick. Symptoms of Lyme disease usually emerge approximately two weeks after exposure and may include a rash or a peculiar red spot, like a bull's eye, which expands outward in a circular manner. The victim may have recurring headaches, weakness, a stiff neck, swelling and pain in the joints, and eventually, arthritis.

Ehrlichiosis - The disease also commonly occurs in New York State in the summer and is similarly transmitted by the bite of infected ticks. Symptoms of ehrlichiosis include more immediate muscle aches, fever, joint aches, and flu-like symptoms, but there is typically no skin rash.

Rocky Mountain Spotted Fever (RMSF) - This disease is also transmitted via the extended bite of an infected tick. The tick must be attached 4 to 6 hours before the disease-causing organism (*Rickettsia rickettsii*) becomes reactivated and can infect humans. The primary symptom of RMSF is the sudden appearance of a moderate-to-high fever. The fever may persist for 2 to 3 weeks. The victim may also have a headache, deep muscle pain, and chills. A rash appears on the hands and feet on about the third day and eventually spreads to all parts of the body. For this reason, RMSF may be confused with measles or meningitis. The disease may cause death, if untreated.

4.1.3.2 Other Biological Hazards

Poisonous plants, such as poison ivy and sumac, maybe present on the site and present a hazard for site personnel. Signs and symptoms of exposure to such poisonous plants include itching, burning, redness, rash, blistering and swelling.

Snakes may be present on the site property and present the potential for snake bites. Poisonous snakes are not expected to be present on the site, however, even bites from non-poisonous snakes can cause adverse health symptoms such as redness, swelling, and allergic reaction.

Site personnel may be exposed to mosquitoes and/or black flies during site work. While the presence of mosquitoes and/or black flies is not anticipated to be a significant health and safety concern, bites can cause adverse health symptoms such as redness, swelling, and allergic reaction.

4.1.4 Electrical Hazards

Drill rigs will be used on the site to install soil borings. The presence of overhead utilities and underground obstacles poses a hazard if equipment contacts them. As indicated in Table 1, electrical hazards are considered to be a concern for the installation of borings on the site.

4.1.5 Radiological Hazards

A handheld x-ray fluorescence (XRF) spectrometer will be used to field screen lead content in soil. The Niton Model XL2 GOLDD XRF will be rented by Chazen and maintained by the rental company, EcoRental Solutions. Chazen personnel who operate the XRF have had training in the equipment operation and its safety procedures.

The Niton Model XL2 analyzer contains an x-ray tube which emits radiation only when the user turns the x-ray tube on. When the x-ray tube is on and the shutter is open, as during a measurement, the analyzer emits a directed radiation beam. Reasonable effort will be made to maintain exposures to radiation as far below dose limits as is practical. This is known as the ALARA (As Low as Reasonably Achievable) principle. For any given source of radiation, three factors will help minimize radiation exposure: shorter time, greater distance, and increased shielding. Specific precautions include:

- Avoid holding the front of the analyzer when the x-ray tube is energized and the shutter is open. Never point the instrument at yourself or anyone else when the shutter is open and the x-ray tube is energized. Never look into the path of the primary beam.

- Ensure sample sizes are larger than the XRF's measurement window.

- There are no X-ray tube specific US Department of Transportation (DOT) or International Air Transport Association (IATA) radiation regulations regarding shipping the Niton XL2 analyzer. It is recommended that the analyzer be shipped in its carrying case and an over-pack to protect the sensitive measuring equipment inside the analyzer. The battery pack is disconnected from the analyzer prior to shipment.

- The XRF is secured when not in use.

4.2 Hazard Control

4.2.1 Hazards Associated With Soil Sampling

Soil sampling consists of the installation of soil borings using a hydraulic, direct-push drilling rig or hollow stem auger rig and the collection of soil samples from the soil borings for analysis. The hazards associated with the collection of soil samples are considered to be minimal and include dermal exposure to soil contaminants, inhalation exposure to contaminants, and slip, trip, and fall hazards from scattered debris and irregular walking surfaces.

All drillers must possess required state or local licenses. The driller is responsible for the safe operation of the drill rig. The driller is responsible for providing and following his own HASP, which must be reviewed and approved by Chazen. The driller is responsible for ensuring that the drill rig is in proper condition and is properly used. Rig conditions will be evaluated daily prior to the start of work.

Prior to any subsurface sampling or remedial activities, underground utilities must be located using facility plans and the Dig Safely NY Program (1-800-962-7962). In addition, a utility markout of the planned boring areas is planned. These protective measures will be taken to minimize the potential health and safety risks associated with investigation activities near underground utility lines.

If drilling activities are conducted in the vicinity of overhead power lines, the rig should be positioned such that no part of the drilling rig is within OSHA's maximum clearance values, which are provided in the following table:

Nominal AC Line Volatge (kV)	Minimum Clearance Distance (feet)
Up to 50	10
51 to 200	15

201 to 350	20
351 to 500	25
501 to 750	35
751 to 1,000	45
Over 1,000	Per Utility Owner

To control dermal exposure during soil sampling activities, a minimum of Modified Level D PPE should be worn as described in Section 6.0 of this HASP.

The potential for inhalation exposure to airborne COCs will be evaluated and controlled during site activities as a general safety precaution.

Air monitoring will be performed during site work to evaluate airborne concentrations of VOCs and particulates to which site workers may be exposed. Air monitoring control measures are discussed in Section 6.0 of this HASP. A Community Air Monitoring Program (CAMP) is also required for this site, although the CAMP does not address site health and safety.

General safety precautions will be employed on-site to control for slip, trip, and fall hazards.

4.2.5.1 Biological Hazards

Ticks

The best way to prevent tick borne diseases is to avoid tick bites. Preventative measures to reduce the potential for tick bites include, but are not limited to, the following:

- Where possible, land scheduled for eventual clearing should be cleared of brush and overgrown vegetation in advance of environmental investigation.
- Wearing long pants and long sleeved shirts
- Tucking shirts into pants. Tucking pants into socks or boots, or using tape to close the opening where they meet.
- Using an EPA approved insect repellant or arachnicide (pesticide) which is effective for ticks, such as DEET (N,N-diethyl-m-toluamide) or pyrethrin. Be sure to heed all precautionary information, and be aware that some people are sensitive to these chemicals.
- Wearing light colored clothing so that a tick can be seen more easily.
- Changing clothes when you return from an area where ticks may be located.
- Showering to wash off any loose ticks, followed by self-examination for ticks.
- Throughout the work day, perform Tick Checks and Removal Procedures as follows:
    - Check clothing for ticks. If you find a tick, do a more thorough tick check.

- Inspect parts that bend (back of knee, between fingers and toes, underarms), pressure points where clothing presses against skin (underwear elastic, belts, neck); other common areas (belly button, around or in ear, hairline, and top of head).

- Once indoors, do a final tick check and change clothes.

- If you are in a tick infested area or an area known to have disease carrying ticks, perform checks on a more regular basis

- Remove unattached ticks promptly.

- Remove attached ticks are removed using fine pointed tweezers:

    1. The mouth parts of the tick are grasped with the tweezers as close to the skin as possible

    2. Apply firm steady pressure upward until the tick releases - do not jerk, twist, squash or squeeze the tick

    3. Clean the wound and the tweezers with an antiseptic

Do not use petroleum jelly, nail polish remover, or prick or burn the tick. These actions can cause infected secretions to enter the wound.

<u>Plants</u>

Preventative measures will be implemented to avoid contact with poisonous plants on the site property. These measures will include, but are not limited to, the following activities:

- Wear clothing that covers arms and hands if possible

- Frequently wash exposed skin

- Avoid skin contact with objects or protective clothing that have touched the plants

- Treat every surface that may have touched the plant as contaminated, and practice contamination avoidance

- If skin contact is made, the area should be washed immediately with soap and water and observed for signs of reddening.

<u>Snakes</u>

All personnel walking through vegetated areas must be aware of the potential for encountering snakes. If a snake bite occurs, apply a constriction band and wash the area around the wound to remove any unabsorbed venom.

4.2.5.2 Heat Stress

When feasible, the most stressful site activities should be performed during the coolest parts of the day. Site workers will be instructed to stay hydrated throughout the day. An intake of 5 to 7 ounces of fluids every 15 to 20 minutes is recommended.

Site workers will be monitored for the signs and symptoms of heat stress during work activities. The signs and symptoms of heat stress are dizziness, vomiting, hot, dry skin, rapid heartbeat, throbbing headache, rash, cramps, chest pain, muscle spasms, pain in the hands, feet, or abdomen, loss of coordination, and decreased cognitive ability.

Site workers expressing or demonstrating any of these symptoms will be immediately excused of their duties and instructed to rest in a cool environment. Site work/rest cycles will be determined based on ambient conditions and based on guidance pertaining to heat stress provided by OSHA and NIOSH.

4.2.6 General Health and Safety Controls

4.2.6.1 Communications System

Telephones will be available on site and both on-site and off-site project personnel will be accessible for communication. If there is a lack of cell phone signal at the site, then personnel should locate the closest public payphone prior to work commencement. Personnel should also be trained in the use of standard hand signals for health and safety. Personnel in the work zone will use the following standard hand signals:

- Hand gripping throat ----- Can't breathe
- Grip partner's wrist or both hands around waist ----- Leave area immediately
- Hands on top of head ----- Need assistance
- Thumbs up ----- OK, I am all right, I understand
- Thumbs down ----- No, negative

4.2.6.2 Basic Safety Equipment

Safety equipment will be kept on site for monitoring and responding to emergency situations. Basic safety equipment will include, but is not limited to, the following:

- ABC type fire extinguishers
- First Aid kits
- Air Monitoring Equipment (for particulates and VOCs)
- Reference books containing basic first-aid procedures and information

4.2.6.3 Safe Work Practices

All Chazen personnel and all subcontractors working on site are expected to follow established safe work practices for their specialties (i.e., excavators, surveying, etc.). The need to exercise caution in the performance of specific work tasks is frequently made more acute due to:

- Weather conditions
- Restricted mobility and reduced peripheral vision caused by protective gear
- The need to maintain the integrity of the protective equipment

Work at the LSS Site will be conducted in accordance with established protocols and guidelines for the safety and health of all involved. General safety practices employed at the LSS Site will include but are not limited to the following:

- No smoking, eating, or drinking in an exclusion zone or before personnel decontamination. Ingestion of contaminants is the second most likely means of introducing toxic substances into the body.
- In any unknown situation, always assume the worst conditions and plan responses accordingly.
- Personal protective equipment is never 100% effective, so all personnel must minimize contact with potentially contaminated material. Do not place equipment on potentially contaminated ground. Do not sit or kneel on potentially contaminated material. Avoid standing in or walking through puddles or stained soil.
- Avoid heat and other work stresses related to the wearing of protective equipment and clothing. Work breaks should be scheduled *(and actually taken)* to prevent stress-related accidents or fatigue.
- As often as possible, the handling of contaminated materials should be done remotely. Every effort should be made to identify the contents of containers found on-site before they are handled.
- Personnel must be observant of not only their own immediate surroundings, but also of others.
- Rigorous contingency planning and dissemination of plans to all personnel minimizes the impact of rapidly changing safety protocols in response to changing site conditions.
- Personnel must be aware that chemical contaminants may mimic or enhance symptoms of other illnesses or intoxication. Avoid field work while feeling ill. Company policies prohibit use of alcohol while working.

The site Health and Safety Officer or their designee will maintain project Health and Safety records in a safe and secure manner. Since there is no on-site location to maintain the Health and Safety records, they will be retained in Chazen’s Poughkeepsie office.

5.0 PERSONAL PROTECTIVE EQUIPMENT

Site workers will be provided with the appropriate personal protective equipment (PPE) and will be trained on the use of this equipment. PPE will be selected to provide an appropriate level of protection against known and reasonably anticipated site hazards. Given the available data, the level of PPE selected for the EP1 Site is a modified Level D which will include the items listed in Table 4.

Table 4: Site-Specific PPE Components

Area	PPE Item
Head	Hard Hat (OSHA approved)
Feet	Work Boots (steel-toed, unless conducting electromagnetic survey)
Skin	Nitrile Gloves
Hearing	Ear Plugs/Hearing Protection
Vision	Safety Glasses

The level of PPE should be continually evaluated and will be modified as necessary, depending on site conditions. If upgraded PPE appears necessary, the scope and necessity of work must be examined, and if the exposure cannot be avoided the level of PPE must be upgraded to one of, or a combination of the following levels:

Level C protection consists of:

(a) Full-face air-purifying respirator

(b) Tyvek or Poly-tyvek coveralls

(c) Chemical-resistant gloves taped to coveralls

(d) Chemical-resistant boots taped to coveralls

Level B protection consists of:

(a) Level C protection for the body, plus

(b) Positive pressure Self-contained Breathing Apparatus (SCBA) or a tethered cascade breathing system.

It will be the responsibility of the Health and Safety Officer to insure that all personnel and subcontractors are knowledgeable of the level of personal protection required in all work situations. Further, it is the obligation of the Health and Safety Officer to see that proper equipment is worn and work rules are observed. All subcontractors are responsible for supplying their personnel with the necessary equipment.

6.0 AIR MONITORING

Air monitoring for volatile organic compounds and particulates will be periodically performed in the work area breathing zone during outdoor site activities. Monitoring will be performed with a hand-held PID and particulate meter. Results will be compared to exposure values listed in Table 2 and appropriate responsive action taken, as needed, including moving to upwind locations, reducing scale or pace of work advance, or adjustments of PPE.

Periodic air monitoring will also be conducted as described in the CAMP, to document ambient concentrations of particulates and VOCs at the downwind perimeter of the work zone and at an upwind location.

7.0 TRAINING & MEDICAL SURVEILLANCE

7.1 Personnel Safety Training

As part of Chazen policies and in conformance with OSHA requirements for personnel conducting hazardous waste investigation, or assessments on site where they may be exposed to hazardous wastes, Chazen field personnel working on this site shall have received a minimum of 40 hours of comprehensive health and safety training (29 CFR 1910.120) and an annual 8 hour refresher course.

All workers must recognize and understand the potential hazards to health and safety that are associated with the investigation activities and must be thoroughly familiar with programs and procedures contained in the safety plan.

The objectives of Chazen training program, for employees involved in hazardous site activities are:

- To make workers aware of the potential hazards they may encounter.
- To provide the knowledge and skills necessary to perform the work with minimal risk to the health and safety of the workers.
- To make workers aware of the purpose and limitations of safety equipment.
- To ensure that workers can safely avoid or escape from emergencies.

7.2 Medical Surveillance

All Chazen personnel meeting applicable exposure criteria are currently involved in a medical monitoring program, in accordance with 29 CFR 1910.120.

Based on the proposed scope of work, the potential for exposure to site COCs is considered to be negligible following the heath and safety procedure described herein. Medical monitoring for common COCs is performed as part of the existing Chazen medical monitoring program. Any provisions for alterations to the existing medical surveillance program will be made by the Health & Safety Officer based on the site characterization and job hazard analysis.

8.0 WORKING ZONE

The entire EP1 site is considered the work zone. The EP1 Site investigation work is not expected to be hazardous or to necessitate the establishment of Exclusion, Contamination Reduction, or Support Zones; however, the following sections are provided, should these zones be needed.

8.1 Exclusion Zone

An Exclusion Zone will be established around areas where work activities will occur. The Exclusion Zone will be cordoned off while work is in progress. Entry to and exit from this area will be provided only to those persons directly involved in the work activities and only if the prescribed level of personal protection is worn.

The personnel working in the Exclusion Zone will be the health and safety officer, work crews, and specialized personnel. All personnel within the Exclusion Zone must wear the level of protection required by the site safety plan. All personnel in the Exclusion Zone will be HAZWOPER health and safety trained.

8.2 Contamination Reduction Zone

If needed, a Contamination Reduction Zone (CRZ) will be established at the perimeter of the exclusion zone, where personal decontamination will take place. The CRZ is a transition zone between contaminated and uncontaminated areas of the site.

When personnel, equipment, or materials suspected to be contaminated are taken out of the exclusion zone, they will be properly contained, or decontaminated in the CRZ.

8.3 Support Zone

The Support Zone is considered the area outside the CRZ. The Support Zone will be reserved for the support vehicle and for clean equipment storage. It is separated from the CRZ, and is considered a "Clean" area. Only uncontaminated or decontaminated personnel or materials may enter this zone from the CRZ.

The support vehicle serves as the communications center, clean storage area, and source of emergency assistance for field operations. Certain safety equipment (i.e. fire extinguisher, first aid kit, etc.) are stored in the support vehicle.

9.0 DECONTAMINATION

Use of mechanized equipment (see QAPP) and PPE will serve to minimize worker contact with site contaminants. However, procedures may be necessary to remove and/or minimize contaminants that have accumulated on equipment and personnel.

9.1 Personnel and Equipment Decontamination

All personnel and equipment leaving the work zone must be decontaminated. Decontamination procedures prior to leaving Level "D" areas will consist of brushing loose soil from clothing and equipment, washing equipment and clothing with water and a mild detergent. Disposable gloves, scoops, paper towels and any Tyvek suits will be discarded in trash receptacles provided within these areas. All wastes generated in Level "D" areas will be bagged and disposed of on site without any additional restrictions.

If Level C working conditions are required, a decontamination work area will need to be established. If needed, this will involve establishing a plastic-lined work table, and plastic liner to "catch" wash solutions and contaminated soil. When exiting the work zone, workers will enter the decontamination zone. Instruments, sample containers, and reusable equipment will be placed on a plastic covered table. These items will be cleaned with the appropriate cleaning solutions. The workers will then decontaminate their protective clothing. Disposable items will be discarded in trash receptacles which will be provided within the decontamination area.

10.0 EMERGENCY/CONTINGENCY PLAN

10.1 Personnel Roles, Lines of Authority, and Communication

The Health & Safety Officer (HSO) or the on-site designee is the primary authority for directing site operations under emergency conditions. All Health and Safety related emergency communications both on and off site will be directed through the Health and Safety Officer.

10.2 Site Evacuation

The emergency response capabilities of the local authorities and agencies will be assessed prior to the initiation of work.

Prior to the evacuation of any off site area, the Exclusion Zone and the CRZ will be expanded. Monitoring of the expanded CRZ will be conducted to determine if offsite evacuation is truly necessary.

When the HSO determines that conditions may actually warrant the evacuation of downwind residences and commercial operations, local agencies will be notified and assistance requested. Designated personnel will initiate evacuation of the immediate off site area without delay.

All work crews should be aware of surrounding conditions including the wind conditions while working outdoors. When conditions warrant moving away from a work site, the field crew will relocate up wind. If site access is restricted, or limited in any way, the crew may be instructed by the HSO to evacuate the site rather than move upwind, especially if an upwind withdrawal moves the field crew away from an acceptable escape route.

If conditions warrant a site evacuation, the field crew will proceed upwind of the work site and will notify the HSO or their designated representative. If the decontamination area is upwind and more than 500 feet from the work site, the crew will pass through the decontamination area to remove their outer suits. Following decontamination, the field crew will proceed to the support vehicle and an assessment of the situation will be made by the HSO, or their designated representative. As soon as it is practical, and as additional information about site conditions is received from the field crew, the situation will be communicated to the Health and Safety Supervisor, Health and Safety Manager, the project manager, and if applicable the appropriate local emergency response agencies.

10.3 Emergency Medical Treatment and First Aid

First aid will be available to any person injured. A First Aid Kit will be on hand. The injured person may be transported to a medical center for further examination and treatment. The preferred transport method is a professional emergency transportation service; however, if this option is not readily available or would result in excessive delay, other transport is authorized.

> *Under no circumstances should an injured person transport themselves to a medical facility for treatment, no matter how minor the injury may appear.*

If an injury occurs in the Exclusion Zone, provisions for decontamination of the victim will be made. However, if injuries are deemed life-threatening, then normal decontamination procedures may be dispensed with. In such cases arrangements will be made with the emergency response personnel to provide the necessary containment or decontamination.

10.4 Spill Response

Should an equipment release occur from a vehicle or equipment being used on the LSS Site, the spill will be reported to NYSDEC Spill hotline within 48 hours, unless the spill is

1. Less than 5 gallons,

2. Contained and controlled,

3. Not impacting water or land, AND

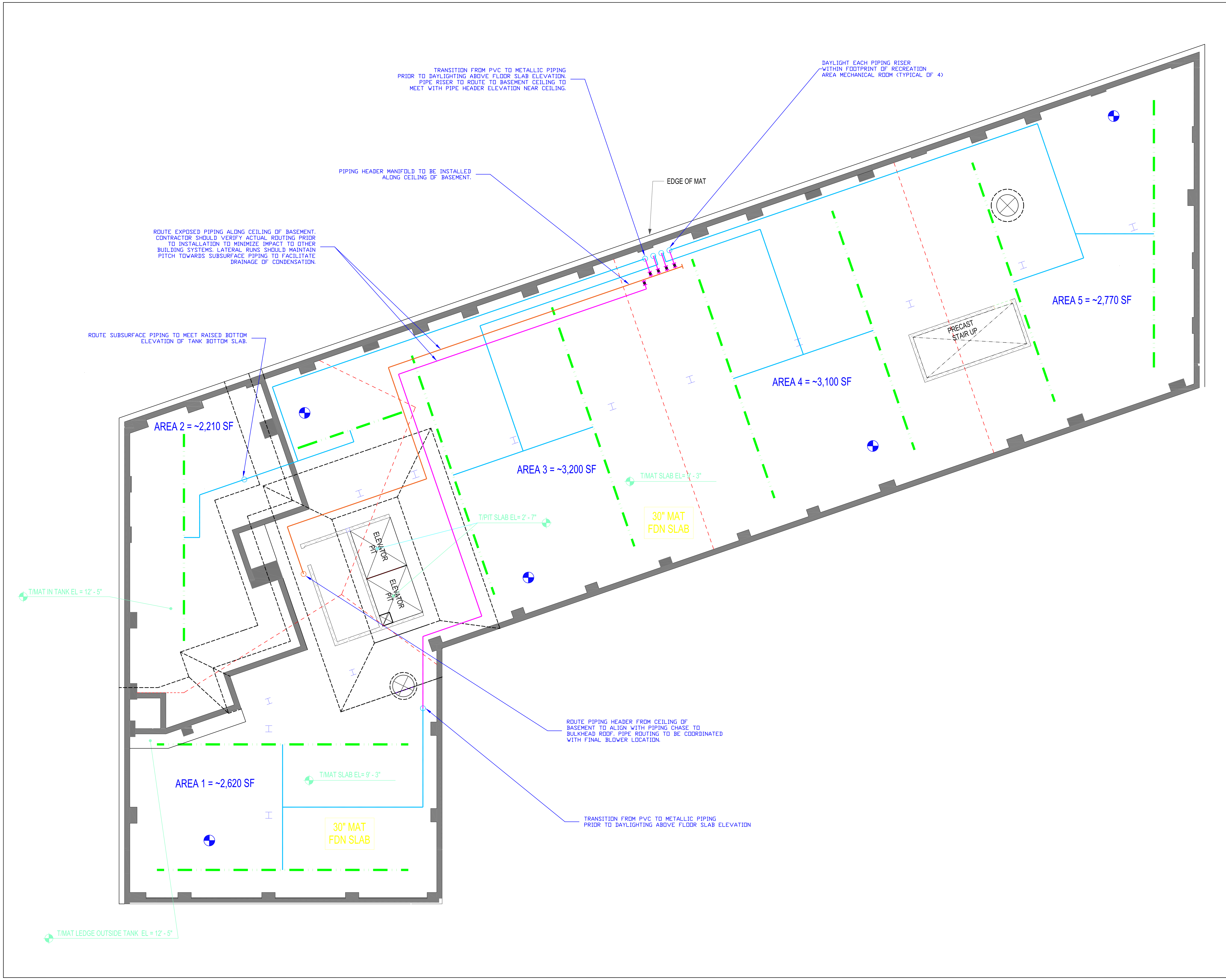
4. Cleaned within 2 hours.

The EP1 Site is not a registered Petroleum Bulk Storage facility.

Appendix G: SSDS Design

O&M Manual for SSDS to be submitted after completion of building construction and system start up tests

Submit as Addendum to SMP when avaiable



GENERAL NOTES

LEGEND

- 4" SLOTTED SCH 40 PVC PIPE
- 4" SCH 40 PVC PIPE (SUBSURFACE)
- 4" DUCTILE IRON PIPE (EXPOSED)
- 6" DUCTILE IRON PIPE (EXPOSED)
- BOUNDARY OF MITIGATION ZONE
- VACUUM MONITORING POINT
- CONTROL VALVE

SCALE

1/8" = 1'-0"

DRAWN/REVISED BY: BS/DK
REVISION DATE: JUNE 11, 2019
REVISION No.: DRAFT

FIGURE:
1

DRAWING TITLE

SSD SYSTEM SUB-SLAB PIPING LAYOUT

PREPARED FOR

PROCIDA CONSTRUCTION CORP.
456 EAST 173RD STREET
BRONX, NY 10457

PROJECT NAME

EBENEZER PLAZA
A1 BUILDING
96 NEW LOTS AVENUE
BROOKLYN, NEW YORK

EnviroTrac
ENVIRONMENTAL SERVICES
5 OLD DOCK ROAD, YAPHANK, NEW YORK 11980
PHONE: (631)924-3001 FAX: (631)924-5001

GENERAL NOTES

LEGEND

- 4" SLOTTED SCH 40 PVC PIPE OR GEOVENT
- 4" SCH 40 PVC PIPE (SUBSURFACE)
- 4" DUCTILE IRON OR SCH 40 BLACK STEEL PIPE (EXPOSED)
- 8" OR DUCTILE IRON OR SCH 40 BLACK STEEL PIPE (EXPOSED)
- BOUNDARY OF MITIGATION ZONE
- VACUUM MONITORING POINT
- CONTROL VALVE

SCALE

1/16" = 1'-0"

DRAWN/REVISED BY: BS/DK
REVISION DATE: AUGUST 16, 2018
REVISION No.:

FIGURE:
1

DRAWING TITLE

SSD SYSTEM SUB-SLAB PIPING LAYOUT

PREPARED FOR

PROCIDA CONSTRUCTION CORP.
456 EAST 173RD STREET
BRONX, NY 10457

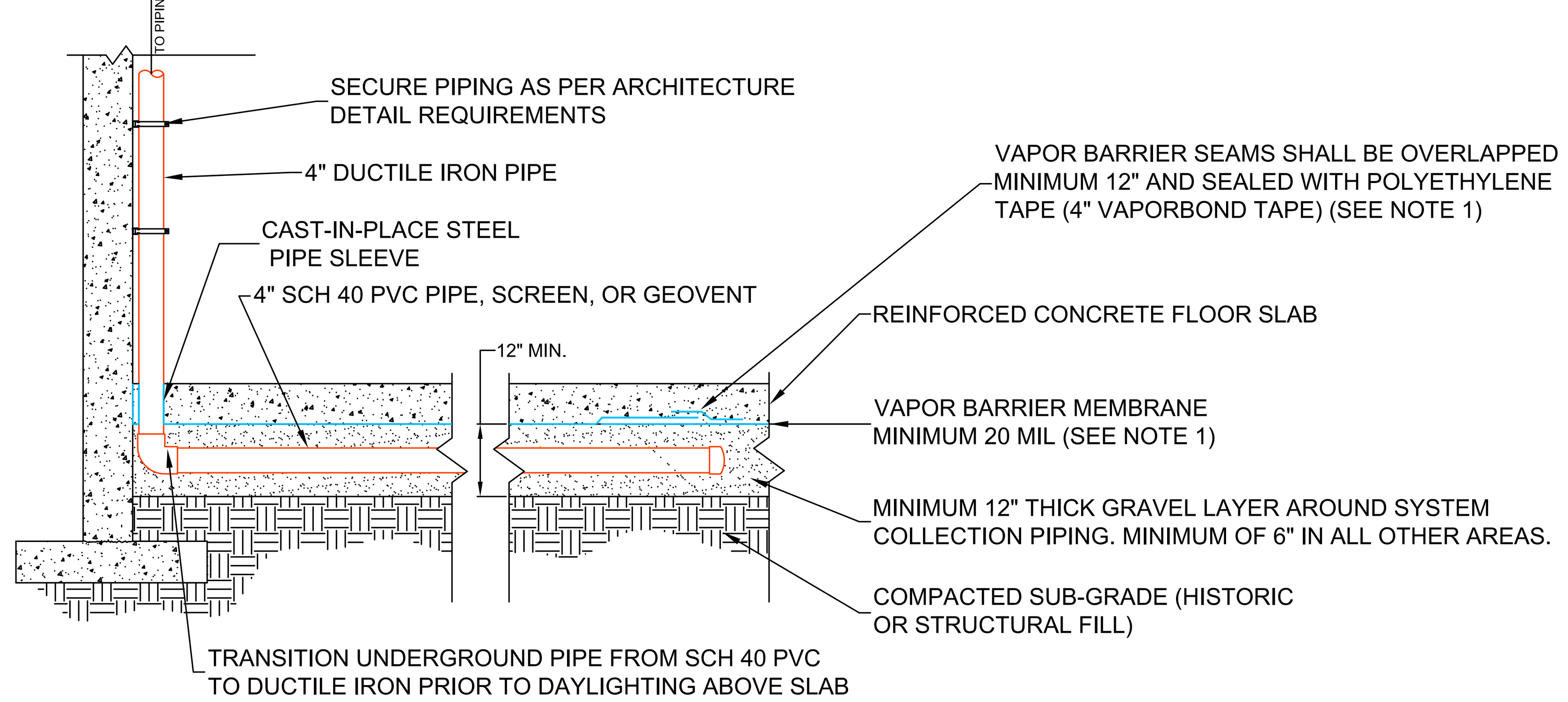
PROJECT NAME

EBENEZER PLAZA
672 POWEL STREET
BROOKLYN, NEW YORK

EnviroTrac
ENVIRONMENTAL SERVICES
5 OLD DOCK ROAD, YAPHANK, NEW YORK 11980
PHONE: (631)924-3001 FAX: (631)924-5001

FLOOR SLAB DETAIL

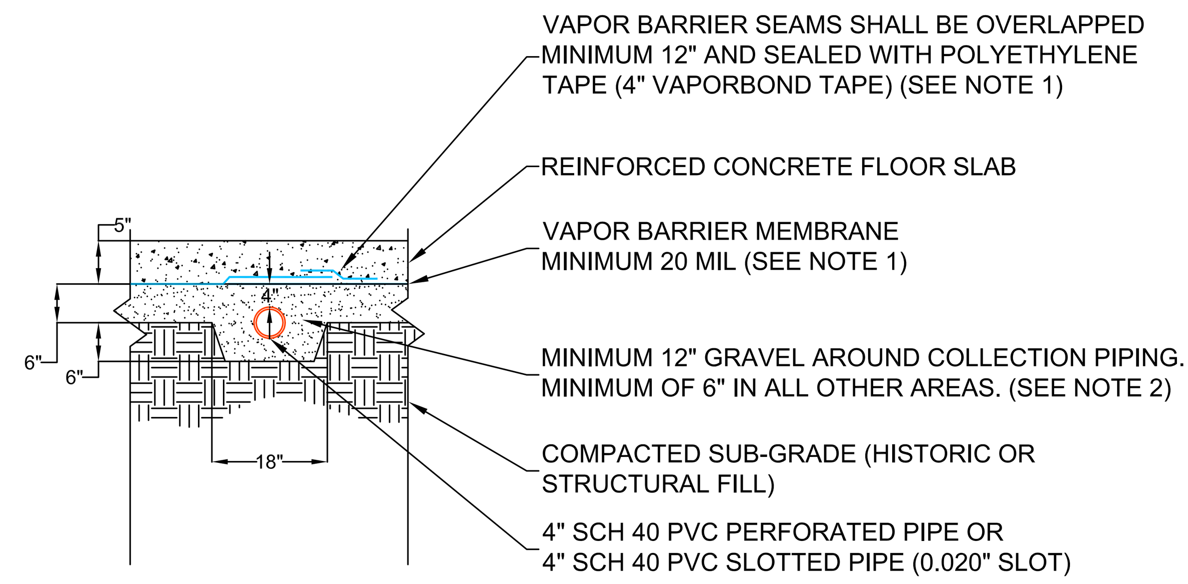
NOT TO SCALE



NOTE: BUILDING DETAILS SHOWN FOR CONCEPTUAL PURPOSES ONLY. NOT TO BE USED FOR STRUCTURAL OR ARCHITECTURAL PURPOSES.

FLOOR SLAB DETAIL A-A'

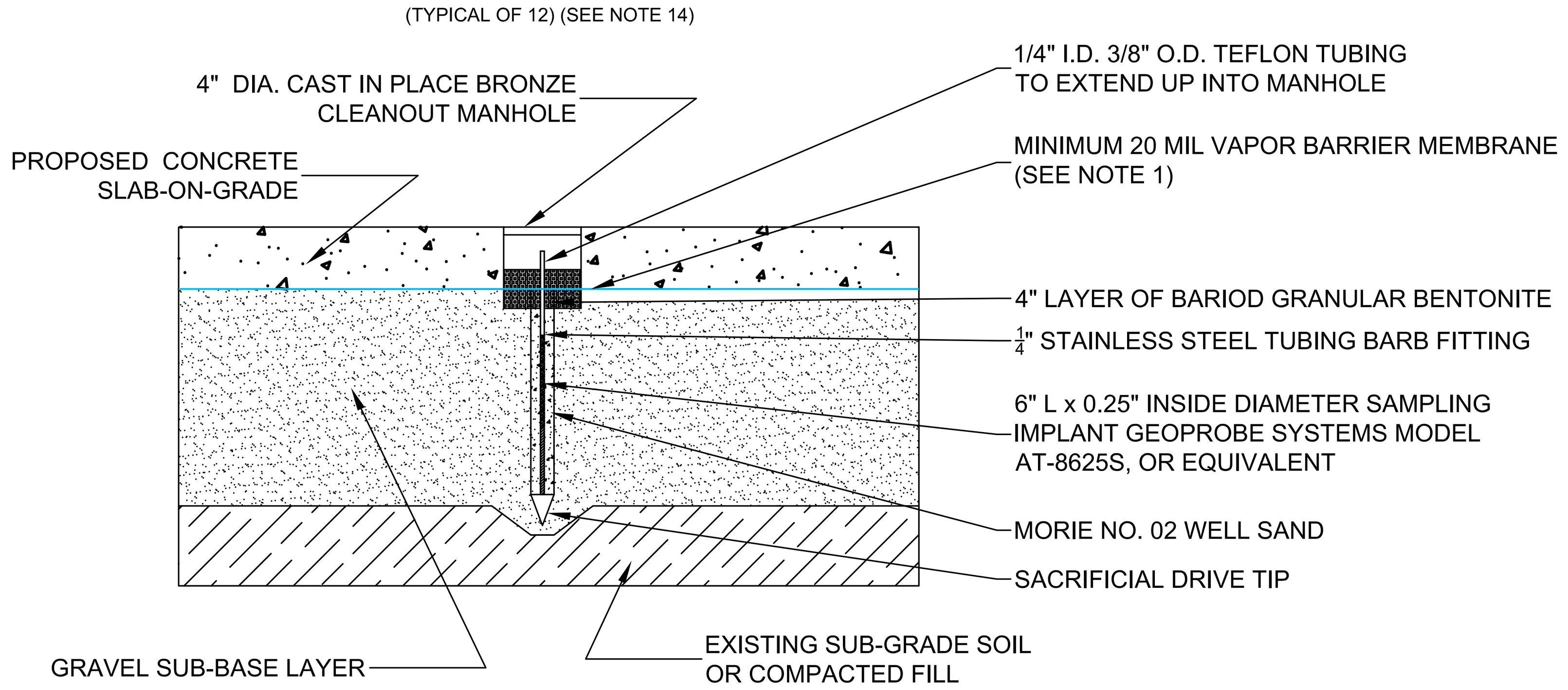
NOT TO SCALE



VAPOR / VACUUM MONITORING POINT

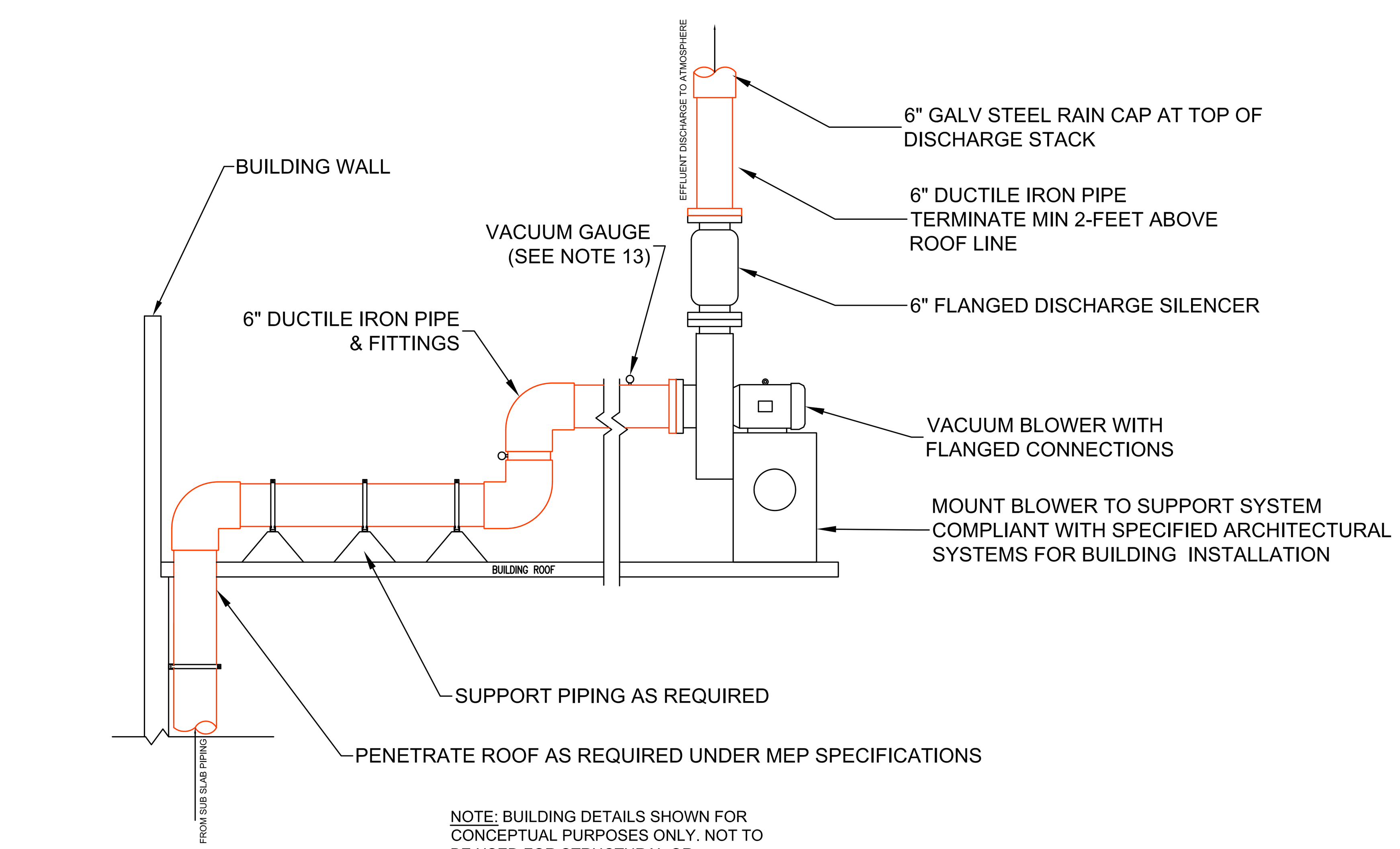
NOT TO SCALE

(TYPICAL OF 12) (SEE NOTE 14)



CONCEPTUAL BLOWER & MECHANICAL ROOM PIPING DETAIL

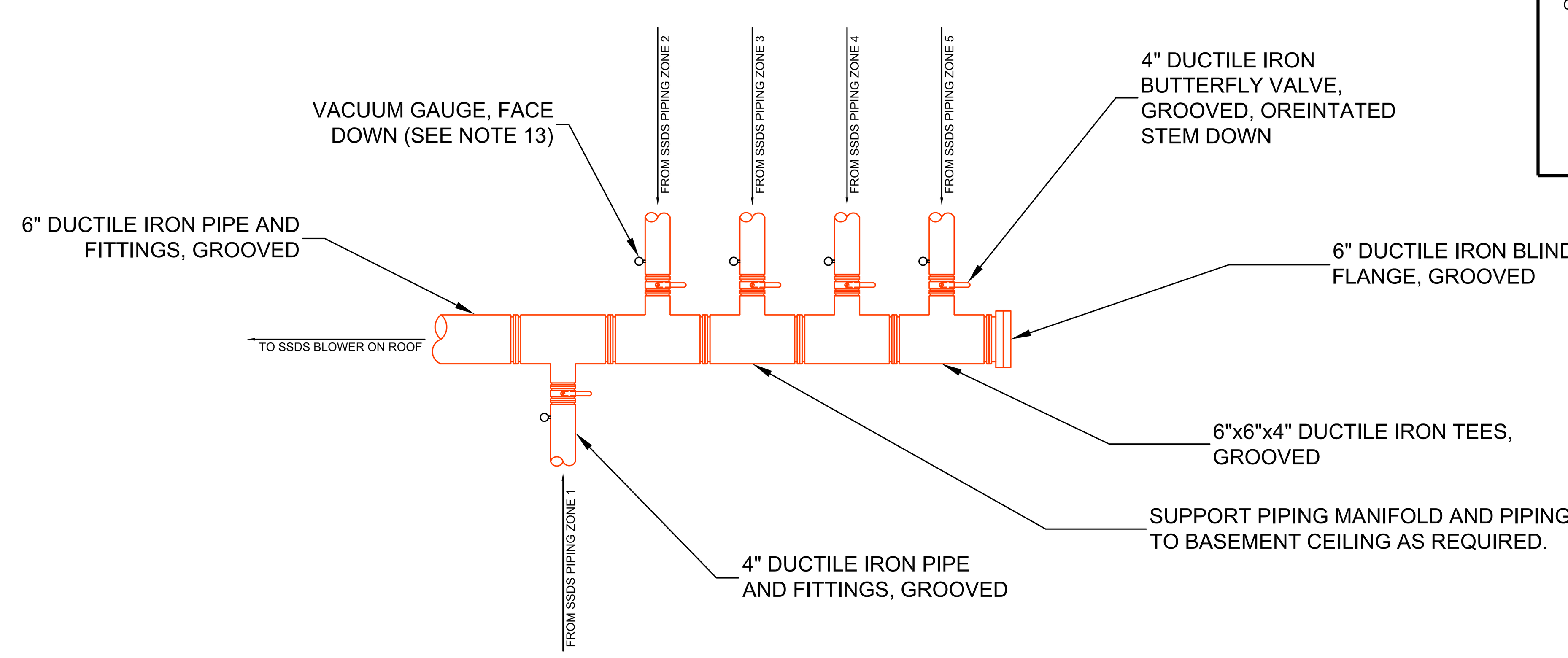
NOT TO SCALE



NOTE: BUILDING DETAILS SHOWN FOR CONCEPTUAL PURPOSES ONLY. NOT TO BE USED FOR STRUCTURAL OR ARCHITECTURAL PURPOSES.

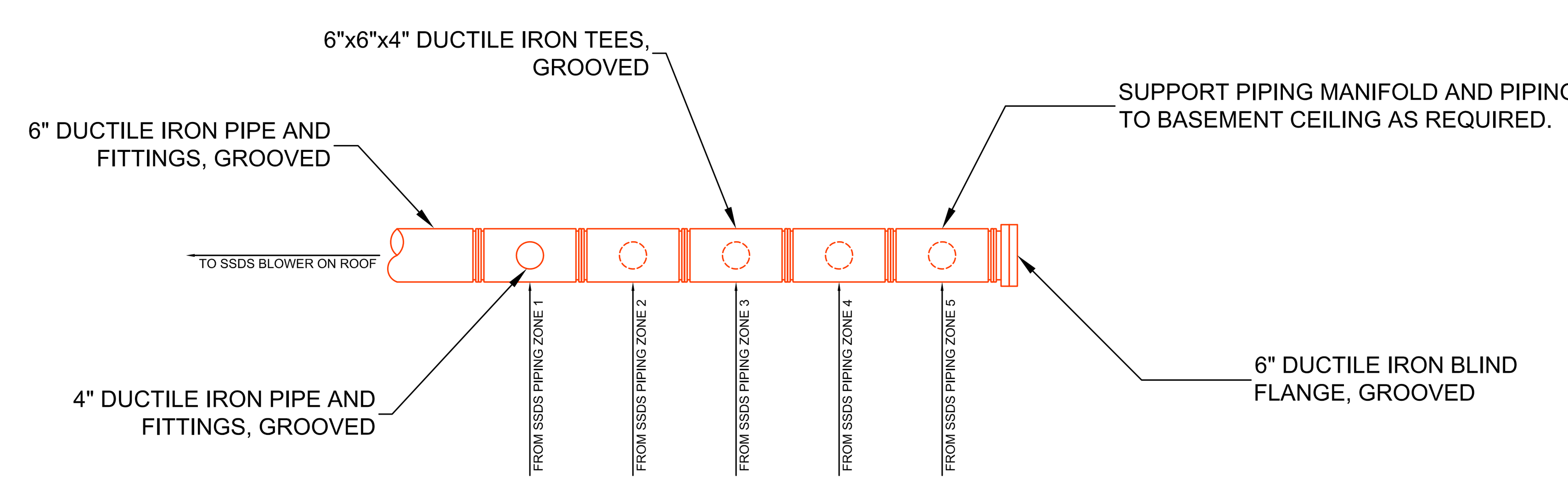
MANIFOLD PIPING DETAIL (PLAN)

NOT TO SCALE



MANIFOLD PIPING DETAIL (ELEVATION)

NOT TO SCALE



GENERAL NOTES

1. VAPOR BARRIER MEMBRANE: A MINIMUM 20-MIL POLYETHYLENE FLEXIBLE SHEETING MATERIAL SHALL BE PLACED ON TOP OF THE GAS PERMEABLE LAYER PRIOR TO POURING THE SLAB OR PLACING THE FLOOR ASSEMBLY. THE SHEETING SHALL COVER THE ENTIRE FLOOR AREA, AND SEPARATE SECTIONS OF SHEETING SHALL BE OVERLAPPED AT MINIMUM OF 3 INCHES AND SEALED WITH 4" TAPE OVER THE TWO OVERLAPPING LAYERS AT THE THE JOINT. THE SHEETING IS TO BE INSTALLED SO THAT IT SHALL FIT TIGHTLY AROUND ANY PIPE, WIRE, OR OTHER PENETRATIONS OF THE MATERIAL. ALL PUNCTURES OR TEARS IN THE MATERIAL SHALL SEALED OR COVERED WITH ADDITIONAL SHEETING. THE VAPOR BARRIER SHALL BE PREFRUFE 300R, MANUFACTURED BY GCP APPLIED TECHNOLOGIES INC., CAMBRIDGE, MASSACHUSETTS, OR EQUAL.

2. GAS PERMEABLE LAYER: A UNIFORM LAYER OF CLEAN AGGREGATE, A MINIMUM OF 12 INCHES THICK AROUND THE VAPOR COLLECTION PIPING AND 6 INCHES THICK UNDER THE SLAB BETWEEN EACH LATERAL COLLECTION PIPE. THE AGGREGATE WILL CONSIST OF MATERIAL THAT WILL PASS THROUGH A 3/4-INCH SIEVE AND BE RETAINED BY A 1/2-INCH SIEVE. THE AGGREGATE WILL SERVE AS A PERMEABLE LAYER THAT WILL ALLOW THE PASSAGE OF ANY POTENTIAL VAPOR TO THE VAPOR COLLECTION PIPING. THE AGGREGATE SHALL BE CLEAN AND FREE OF ANY DEBRIS AND OR ANY OTHER FOREIGN MATERIAL. THE USE OF RECYCLED AGGREGATE OR CLEAN, NEW AGGREGATE IS PERMITTED. AGGREGATE SHALL BE ASTMC-33 SIZE 6.

3. VAPOR COLLECTION PIPING: 4 INCH DIAMETER SCHEDULE 40 PVC PERFORATED OR SLOTTED PIPING SHALL BE USED FOR THE SUBSURFACE HORIZONTAL LEGS TO BE INSTALLED BELOW THE CONCRETE SLAB. IF PIPING IS UTILIZED, A 4" SCHEDULE 40 PVC DOME CAP SHALL BE INSTALLED AT THE END OF EACH LEG.

4. SSD VENT PIPING:
   - 4.1. SUB-SURFACE: 4 INCH DIAMETER SCHEDULE 40 PVC PIPE SHALL BE CONNECTED TO THE VAPOR COLLECTION PIPING VIA A 4-INCH DIAMETER TEE FITTING AND FLEXIBLE CONNECTORS, LOCATED AT THE CENTER POINT OF EACH PIPING LATERAL LEG. EACH LEG OF THE VENT PIPING WILL BE EXTENDED TO A DESIGNATED LOCATION IN THE NEAR VICINITY OF THE PIPING MANIFOLD, LOCATED IN THE NORTH TOWER (BUILDING A1) BASEMENT. ALL PIPE AND FITTING CONNECTIONS SHALL BE EITHER SOLVENT WELD OR THREADED CONNECTIONS.
   - 4.2. ABOVE GRADE PIPING: ALL EXPOSED ABOVE GRADE VENT PIPE SHALL BE DUCTILE IRON PIPE AND FITTINGS. THE PVC SUBSURFACE PIPING SHALL TRANSITION TO DUCTILE IRON PRIOR TO DAYLIGHTING ABOVE THE FINISHED CONCRETE FLOOR ELEVATION. THE USE OF FLANGED, OR GROOVED FITTINGS SHALL BE PERMITTED. THIS PIPING SHALL BE EXTENDED VERTICALLY THOUGH THE NORTH TOWER BASEMENT FLOOR SLAB, WHERE IT WILL JOIN WITH A 6-INCH DIAMETER HEADER. EACH LEG OF THE PIPING MANIFOLD WILL BE EQUIPPED WITH A 4-INCH BUTTERFLY VALVE AND VACUUM GAUGE (SEE NOTE 13) PRIOR TO JOINING WITH THE MAIN HEADER. THE PIPE HEADER WILL ROUTE THROUGH A PIPE CHASE THAT EXTENDS FROM THE BASEMENT TO THE ROOF BULKHEAD OF THE NORTH TOWER. THE PIPING HEADER WILL CONTINUE TO THE INLET OF THE ROOF MOUNTED VACUUM BLOWER. THE EXHAUST PIPING SHALL TERMINATE AT LEAST 2 FEET ABOVE THE SURFACE OF THE ROOF, IN A LOCATION AT LEAST 10 FEET AWAY FROM ANY WINDOW OR OTHER OPENING INTO THE CONDITIONED SPACES OF THE BUILDING THAT IS LESS THAN 2 FEET BELOW THE EXHAUST POINT, AND 10 FEET AWAY FROM ANY ADJOINING OR ADJACENT BUILDING.

5. IN BUILDINGS DESIGNED WITH INTERIOR FOOTINGS OR OTHER BARRIERS TO LATERAL FLOW OF SUB-SLAB SOIL GAS, VENT PIPES SHALL BE INSTALLED IN EACH ISOLATED, NON-CONNECTED FLOOR AREA. IF MULTIPLE VENT POINTS ARE USED IN NON-CONNECTED FLOOR AREAS, VENT PIPES ARE PERMITTED TO BE MANIFOLDED BELOW THE FLOOR SLAB INTO A SINGLE VENT.

6. TO RETARD SOIL GAS ENTRY, LARGE OPENINGS THROUGH CONCRETE SLABS OR OTHER FLOOR ASSEMBLIES IN CONTACT WITH THE SOIL, SUCH AS SPACES AROUND BATHTUB, SHOWER, OR TOILET DRAINS, SHALL BE FILLED OR CLOSED WITH MATERIALS THAT PROVIDE A PERMANENT AIRTIGHT SEAL SUCH AS NON-SHRINK MORTAR, GROUTS, EXPANDING FOAM, OR SIMILAR MATERIAL DESIGN FOR SUCH APPLICATION.

7. TO RETARD SOIL GAS ENTRY, SMALLER GAPS AROUND ALL PIPES, WIRE, OR OTHER OBJECTS THAT PENETRATE THE CONCRETE SLAB OR OTHER FLOOR ASSEMBLY SHALL BE MADE AIRTIGHT WITH AN ELASTOMER JOINT SEALANT OR POLYETHYLENE TAPE, AS DEFINED IN ASTM C920-87, AND APPLIED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

8. TO RETARD SOIL GAS ENTRY ALL CONTROL JOINTS, ISOLATION JOINTS AND ANY OTHER JOINTS IN CONCRETE SLABS OR BETWEEN SLABS AND FOUNDATION WALLS SHALL BE SEALED. A CONTINUOUS FORMED GAP "TOOLED EDGE" WHICH ALLOWS THE APPLICATION OF A SEALANT THAT WILL PROVIDE A CONTINUOUS, AIRTIGHT SEAL SHALL BE CREATED ALONG ALL JOINTS. WHEN THE SLAB HAS CURED, THE GAP WILL BE CLEARED OF ANY LOOSE MATERIAL AND FILLED WITH AN ELASTOMER JOINT SEALANT, AS DEFINED IN ASTM C920-87, AND APPLIED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

9. CONCRETE MASONRY FOUNDATION WALLS BELOW THE GROUND SURFACE SHALL BE CONSTRUCTED TO MINIMIZE THE TRANSPORT OF SOIL GAS FROM THE SOIL TO THE BUILDING. HOLLOW BLOCK MASONRY WALLS SHALL BE SEALED AT THE TOP TO PREVENT THE PASSAGE OF AIR FROM THE INTERIOR OF THE WALL TO THE LIVING SPACE. AT A MINIMUM, ONE COURSE OF SOLID MASONRY, ONE COURSE OF MASONRY GROUTED SOLID, OR A POURED CONCRETE BEAM AT OR ABOVE THE FINISHED GROUND SURFACE LEVEL SHALL BE USED FOR THIS PURPOSE. WHERE A BRICK VENEER OR OTHER MASONRY LEDGE IS INSTALLED, THE COURSE IMMEDIATELY BELOW THAT LEDGE SHALL ALSO BE SEALED.

10. JOINTS, CRACKS, OR OTHER OPENINGS AROUND ALL PENETRATIONS OF BOTH EXTERIOR AND INTERIOR SURFACES OF MASONRY BLOCK WALLS BELOW THE GROUND SURFACE SHALL BE SEALED WITH AN ELASTOMETRIC SEALANT THAT PROVIDES AN AIRTIGHT SEAL. PENETRATIONS OF POURED CONCRETE WALLS SHALL ALSO BE SEALED ON THE EXTERIOR SURFACE. THIS INCLUDES SEALING OF WALL TIE PENETRATIONS.

11. ALL EXPOSED AND VISIBLE INTERIOR SSD VENT PIPES SHALL BE IDENTIFIED WITH AT LEAST ONE LABEL ON EACH FLOOR LEVEL. THE LABEL SHALL READ: "ACTIVE VAPOR MITIGATION SYSTEM".

12. VENTILATION FAN: THE IN-LINE VACUUM BLOWER SHALL BE INSTALLED ALONG THE ROOFTOP BULKHEAD OF THE PROPOSED NORTH TOWER, AS DEPICTED IN THE "CONCEPTUAL BLOWER AND ROOF PIPING DETAIL". PRIOR TO THE FINAL SELECTION OF THE BLOWER PERFORMANCE REQUIREMENTS AND BLOWER MODEL, A PILOT TEST SHALL BE PERFORMED ON THE INSTALLED SSD PIPING NETWORK TO MAKE THIS DETERMINATION. THE FINAL BLOWER SELECTION SHALL BE MADE IN ADHERENCE TO, ALL APPLICABLE DESIGN STANDARDS. THE BLOWER SHALL BE INSTALLED AS PER THE MANUFACTURER'S INSTRUCTIONS. A 208 V, 3-PHASE, ELECTRICAL DISCONNECT SWITCH AND MOTOR CONTROLS SHALL BE INSTALLED BY A LICENSED ELECTRICIAN IN ACCORDANCE WITH ALL APPLICABLE LOCAL ELECTRICAL CODES.

13. SYSTEM INDICATOR: A VACUUM GAUGE SHALL BE INSTALLED 0N EACH LEG OF THE VAPOR VENT PIPING IN ORDER TO PROVIDE A VISUAL INDICATION OF THE SYSTEM OPERATION. THE VACUUM GAUGE SHALL BE INSTALLED AT THE LOWEST ACCESSIBLE LOCATION OF EACH MANIFOLD LEG IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. THE VACUUM GAUGES WILL BE 4" STAINLESS STEEL, ULTRA-LOW VACUUM DIAPHRAGM GAUGES, RATED FOR OUTDOOR USE. THE VACUUM RANGE, MAKE, AND MODEL WILL BE DETERMINED BASED ON THE RESULTS OF THE PILOT STUDY.

14. VACUUM MONITORING POINTS: VACUUM TEST POINTS SHALL BE INSTALLED AT A MINIMUM OF 12 LOCATIONS IN THE CONCRETE SLAB FOR THE PURPOSE OF TESTING THE EFFECTIVENESS OF THE SSD SYSTEM. THE VAPOR MONITORING POINTS SHALL BE DIRECT-PUSH INSTALLED GEOPROBE SYSTEMS SAMPLING IMPLANT MODEL AT-8625S, OR EQUIVALENT, UTILIZING: 6" LONG x 0.25" INNER DIAMETER SAMPLING IMPLANT, 0.25" TEFLON TUBING, MORIE NO. 02 FINE SAND, AND A 3" LAYER OF BARIOD GRANULAR BENTONITE, OR EQUIVALENTS. A 4" DIAMETER SEALED IN PLACE NICKEL SCORIATED CLEANOUT ACCESS MANHOLE WILL BE CAST INTO PLACE DURING THE INSTALLATION OF THE FINISHED FLOOR SLAB. THE CLEANOUT COVERS SHALL BE MODEL CO-2521-4, MANUFACTURED BY ZORN INDUSTRIES, JAMESTOWN, NY, OR EQUAL.

15. ALL COMPONENTS OF THE SUB SLAB DEPRESSURIZATION SYSTEM SHALL BE IN ACCORDANCE WITH ASTM E 1465-08a "STANDARD PRACTICE FOR RADON CONTROL OPTIONS FOR THE DESIGN AND CONSTRUCTION OF NEW LOW-RISE RESIDENTIAL BUILDINGS".

DRAWN/REVISED BY: BS/DK REVISION DATE: JUNE 11, 2019 REVISION No.: DRAFT	FIGURE: 2

DRAWING TITLE

SSD SYSTEM DETAILS

PREPARED FOR

PROCIDA CONSTRUCTION CORP.
456 EAST 173RD STREET
BRONX , NY 10457

PROJECT NAME

EBENEZER PLAZA
A1 BUILDING
96 NEW LOTS AVENUE
BROOKLYN, NEW YORK

EnviroTrac
ENVIRONMENTAL SERVICES
5 OLD DOCK ROAD, YAPHANK, NEW YORK 11980
PHONE: (631)924-3001 FAX: (631)924-5001

Appendix H

Qaulity Assurance Project Plan

Quality Assurance Program Plan
Ebenezer Plaza 1
Brownfield Cleanup Program
NYSDEC Site No. C224240

94 New Lots Avenue
Brooklyn, Kings County, New York

February 2017

Prepared for:

Ebenezer Plaza Owner, LLC
456 E. 173rd Street
Bronx, NY 10566

New York State Department of Environmental-
Division of Environmental Remediation
625 Broadway
Albany, New York 12233

Prepared by:

Hudson Valley Office:
The Chazen Companies
21 Fox Street
Poughkeepsie, New York 12601

TABLE OF CONTENTS

1.0 PROGRAM DESCRIPTION

This Quality Assurance Program Plan (QAPP) describes protocols and procedures necessary to ensure that specific tasks and actions undertaken by The Chazen Companies (Chazen) are planned and executed in a manner consistent with the Quality Assurance (QA) objectives. This QAPP also details responsibilities for compliance with these requirements.

The QAPP provides guidance and specifications for:

- Organizational structure within The Chazen Companies
- A method for determining Data Quality Objectives
- All routine calibration and sampling procedures conducted by The Chazen Companies
- Chain of Custody requirements and Analytical Procedures
- Data Reduction, Validation, and Reporting
- Internal Quality Control and Internal Auditing
- Specific Routines to Assess Data Quality
- Preventative Maintenance
- Performance Reporting

This document will support all applicable work performed by Chazen in the areas of Remedial Investigations, Interim Remedial Measures, Alternatives Analyses, Remedial Design (RD), and long-term environmental monitoring. We note that this QAPP describes numerous investigative techniques and methods, some of which may not be applicable to the Ebenezer Plaza 1 Brownfields Cleanup Project. However, the more expansive list of techniques is included to avoid the need for additional QAPP documentation, should another sampling method be deemed appropriate late in the investigation/remedy.

The format for this QAPP is based on “Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA, Interim Final”, 1988 (EPA/540/G-89/004), “Data Quality Objectives for Remedial Response Activities (Development Process)”, 1987 (EPA/540/G-87/003), and DER-10 “Technical Guidance for Site Investigation and Remediation. The QAPP will also reference all portions of the Work Plan relevant to the particular site.

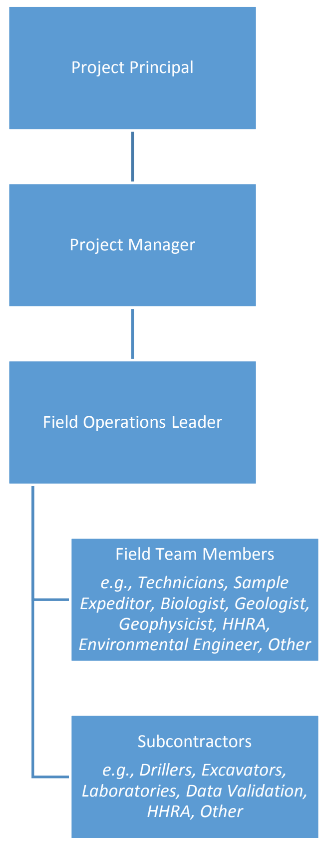
The QAPP is divided into 14 sections as described in the document “Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, Interim Final”, 1988 (EPA/540/G-89/004).

2.0 PROGRAM ORGANIZATION

2.1 Company Organization

The Chazen Companies assigns a specialized team of experts to each project. These individuals act together to meet the needs of the project. Each project is assigned a Project Principal and Project Manager who oversee the components of the project. A typical organization chart is shown below.

Organization Plan



2.2 Specific Responsibilities

Principals: Principals of The Chazen Companies are responsible for establishing a contract for the services to be performed, for committing the corporate resources necessary to conduct the program work activities, and for supplying corporate-level input for problem resolution.

Project Manager: The Project Manager is responsible for the management and quality of the project. The Project Manager is named in the Site Investigation Work Plan and may be the Director of Environmental Services or his/her designee (e.g. Assistant Project Manager). The Project Manager will be responsible for establishing protocols to be used during the investigation and remedial activities, and establishing sampling methods. He/she will provide oversight and technical guidance during field activities and report preparation, maintain quality and consistency, and monitor the overall work progression.

The duties and responsibilities of the Project Manager include:

- General supervision of project execution to ensure that the project objectives are met on schedule and on budget.
- Assisting in project activities.
- Financial management.
- Identifying project staff, equipment, and other resource requirements.
- Conducting project progress meetings with the client and the technical reviewers.
- Final review of project deliverables prior to issue.
- Implementation of subcontracting, as required.

Field Operations Leader: The Field Operations Leader named in the Work Plan is usually an experienced member of the Environmental staff at The Chazen Companies and is responsible for the coordination and execution of the field activities, data reduction, and interpretation. Assigned responsibilities include:

- Organization of personnel, equipment, and materials to meet the objectives of the field tasks.
- Direction of field activities in accordance with the Work Plan and project QAPP.
- Coordination of subcontractor activities including verification and adequacy of subcontractor QA/QC programs.
- Assisting in project activities.
- On-going Quality Control (QC) during performance of work.
- Field and laboratory data reduction and interpretation.
- Execution of corrective actions for identified QA/QC problems.
- Supervision of field team.
- Supervision of deliverable preparation.

Technical Reviewer/Quality Assurance Manager: The Technical Reviewer(s) named in the Work Plan is (are) generally peer reviewers, the Director, or the managing Principal. Technical reviewers review field data and methodology and act as Quality Assurance Managers. The Technical Reviewer(s) will be responsible for the overview of tasks and procedures, which affect the quality of work performed during the investigation. The Technical Reviewer/Quality Assurance Manager is responsible for:

- Verification of the Quality Assurance Program through evaluation and overview of program tasks.
- Identification of problems affecting quality and recommending corrective actions.
- Reporting to the Project Manager on the status and adequacy of the overall QA program.
- Consultation on data analysis and interpretation.
- Technical review of the project.

Field Team Member: Field Team Members involved in the field investigation, geophysical survey, location and elevation survey, or other field activities are responsible for the on-site execution of planned field activities. Field team members named in the Work Plan are assigned responsibilities which may include:

- Completion of all field activities in accordance with the Work Plan.
- Field supervision of subcontractor activities.
- Monitoring of, and adherence to, health and safety requirements in accordance with the HASP during field activities.

2.3 Personnel Qualifications and Training

The Project Manager and the Quality Assurance Manager review the assignment of technical staff and the project management plan with regard to the appropriate qualifications in the technical areas relevant to the Project and any associated QC techniques. Training, if required, is specified and implemented prior to project start-up.

Site-specific training is provided to all members of the field team and includes:

- General briefings covering the QA program and Project plans;
- Detailed briefings on specific methods required by the Work Plan and QAPP;
- Specific briefings on individual QA and QC procedures and activities.

All employees of Chazen involved with hazardous waste investigations or investigations where the potential exists to contact hazardous wastes are required to attend an OSHA-approved 40-hour health and safety course prior to working on hazardous waste sites. In addition, these employees are required to annually attend an 8-hour refresher health and safety course and to participate in a medical surveillance program.

2.4 Analytical Laboratory and Other Support Services

The subcontractors for analytical services will be determined prior to the initiation of the field investigations. Data validation, if required, will be performed by The Chazen Companies or a qualified firm will also be identified.

The responsibility for implementing the laboratory QA Program resides with the laboratory subcontractor's Laboratory Analytical Task Manager. The Laboratory Analytical Task Manager is responsible for the following:

- Supporting the Chazen Project Manager and Quality Assurance Manager.
- Maintaining sufficient instruments, space resources, and personnel to perform the analyses as necessary.
- Handling/receiving samples in a manner consistent with New York State and Federal guidance as outlined in the Work Plan/QAPP.
- Implementing corrective action to account for analytical problems or QC deficiencies.
- Maintaining appropriate instrument controls/calibration.
- Reviewing all sampling and analyses, instrument blanks, sample blanks, and other QA/QC information to ensure that it meets the desired quality standards.
- Providing QA/QC checks at the proper frequency and maintaining an awareness of the laboratory condition to detect conditions which might jeopardize controls of the various analytical systems (e.g.
- improper calibration, improper sample storage conditions, and equipment maintenance intervals).
- Providing in-house QC audit documentation for sample storage, labeling, preservation, transportation, and disposal in accordance with Analytical Services Protocol (ASP).

Consistent with New York State Department of Health's (NYSDOH) discontinuance of the Contract Laboratory Protocol (CLP) accreditation process, dated January 28, 2009, the selected laboratory is not required to be CLP-accredited.

3.0 QUALITY ASSURANCE OBJECTIVES

Quality Assurance (QA) is a management system that ensures that all information, data, and decisions generated during a site investigation or feasibility study are technically sound and properly documented. Quality Control (QC) is the functional mechanism through which the quality assurance objectives are achieved. The overall objective of the QA/QC program is to establish procedures such that data obtained from the field and laboratory analyses are of adequate quality to satisfy the project objectives.

3.1 Data Quality Objectives

Data quality objectives (DQOs) are stated qualitatively and quantitatively, where applicable, in the Work Plan for a site investigation or feasibility study. DQOs specify the required quality of data necessary to support decisions related to the program including site screening, characterization, assessment of health risk, and ultimately, to the remedial actions that may take place on a site.

The basis of DQOs is that the quality of data is dependent upon the intended use of the collected data. DQOs are established based upon site-specific conditions and project objectives and are applicable to all data collection activities.

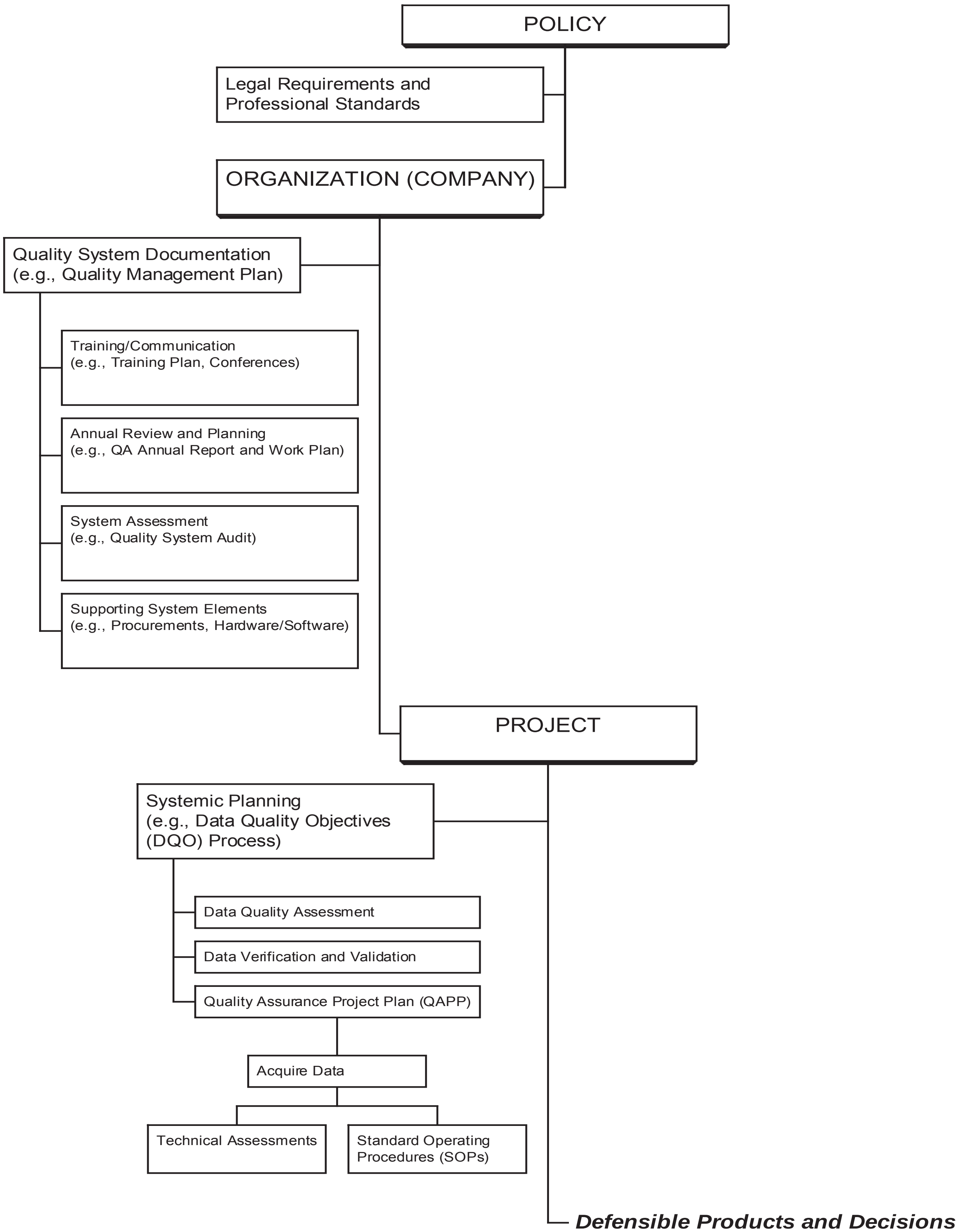
Data quality objectives are developed through an iterative process by which all the DQO elements are continually reviewed and re-evaluated to meet the overall project objectives. This process can be summarized as follows:

<u>Stage 1</u>: Defines the types of decisions which will be made during site remediation by identifying data users, evaluating available data, developing a conceptual model, and specifying goals for the project. Stage 1 results in a specific identification as to why new data are needed.

<u>Stage 2</u>: Identifies the data necessary to meet the objectives established in Stage 1. It also stipulates criteria for determining data adequacy. During Stage 2, sampling approaches and analytical options are evaluated to determine timely or cost-effective approaches.

<u>Stage 3</u>: Is the final design of the data collection program. The design of the data collection program results in the specification of the methods by which acceptable data will be obtained to make decisions.

QUALITY SYSTEM COMPONENTS AND TOOLS



3.2 Data Quality Characteristics

Data quality characteristics will be addressed as they pertain to a proposed investigation. Based on the DQOs selected, data will be assessed and evaluated for:

- Precision
- Accuracy
- Representativeness
- Completeness
- Comparability
- Reporting Limits

The manners in which these characteristics will be assessed and evaluated are described in the following sections.

3.2.1 Precision

Precision measures the reproducibility of measurements under a given set of conditions. Specifically, it is a quantitative measure of the variability of a group of measurements compared to their average value. The duplicate results for each precision check event will be compared to determine the range of the measurements as an indication of the precision associated with the measurement. In addition, the laboratory will analyze matrix spike/matrix spike duplicate samples to monitor the precision of the analytical methods.

Precision will be determined by calculating the relative percent differences (RPD) between the duplicate samples. The RPD for each sample will be calculated using the following equation:

$$\%RPD = \frac{D_1 - D_2}{(D_1 + D_2)/2} \times 100\%$$

where,
RPD Relative Percent Difference
D_1 First Sample Value
D_2 Second Sample Value (duplicate)

The RPD data will be used to evaluate the long term precision of the analytical/measurement methods. The laboratory will also calculate RPD values on the results of the matrix spike/matrix spike duplicate samples. These RPD values will be compared to RPD values provided in the current NYSDEC ASP protocols.

Procedures to be employed to maximize the precision of the data to be collected include:

- written methods and procedures documented in the project QAPP;
- multiple techniques will not be used to generate or collect the same data;
- all sampling and analytical personnel will be trained and required to follow the Work Plan and QAPP procedures;
- the Field Operations Leader will provide oversight during this investigation to monitor the adherence of project staff to these plans.

3.2.2 Accuracy

Accuracy measures the bias in a measurement system and is a determination of the closeness of the measurement to the true value. Sources of error include the physical sampling process, decontamination procedures, sample preservation and handling, homogeneity of the sample matrix, and sample preparation and analysis techniques used by the laboratory. Accuracy will be measured using blank and spike samples. The levels detected in the blanks and the difference between the reported and known concentrations for spikes will be used to assess the accuracy of the results.

The results of sample spiking will be used to calculate the Percent Recovery (%R), which will be used as the quality control Parameter for accuracy evaluation. Percent Recovery is calculated by the following equation:

$$\%R = \frac{ObservedValue}{TheoreticalValue} \times 100\%$$

Surrogate standard determinations will be performed on all samples and blanks. All samples and blanks will be fortified with surrogate spiking compounds before purging or extraction as specified in current USEPA SW-846 protocols.

Procedures employed to maximize the accuracy of the data to be collected include:

- written methods and procedures documented in the project FSP;
- all sampling and analytical personnel will be trained and required to follow the procedures specified in these plans, use of standard methods and known procedures to generate accurate data;
- adherence to strict decontamination procedures of sampling equipment;
- frequent calibration against known standards of field and laboratory equipment.

Calculations performed with analytical data are also checked for accuracy and precision by the Project Manager, Field Operations Leader or their designees, and reviewed by the QAM.

3.2.3 Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represent an analytical result from the matrix being sampled. Representativeness is a qualitative parameter that is most concerned with the proper design of the sampling program.

Procedures employed to maximize the representativeness of the data to be collected include:

- written methods and procedures documented in the project FSP;
- avoiding use of multiple techniques to generate or collect the same data;
- all sampling and analytical personnel to be trained and required to follow the procedures specified in the project plans;
- Field Operations Leader to provide oversight during the investigation to monitor the adherence of project team members to these plans.

In addition, the sampling locations and number of samples to be collected (as specified in a Work Plan) will be selected to provide data representative of the media and potential contaminants of concern at locations where releases would be expected to be detected if present.

3.2.4 Completeness

Completeness is defined as the percentage of data collected judged to be valid and useful to the objectives of the project. Completeness is the amount of valid data obtained from a measurement system expressed as a percentage of the number of valid measurements that should have been (i.e., were planned to be) collected according to the Work Plan. The completeness objective will be 100% valid data for samples collected or analyzed. If this objective cannot be met due to unforeseeable problems, the problems will be addressed in the data usability report. Any data deficiencies will be evaluated in terms of their impact on project goals, and corrective action will be taken, if needed.

Procedures employed to maximize the usefulness and completeness of project data include:

- real-time field screening to focus on potential contaminant source regions;
- soils and groundwater samples for laboratory analysis for confirmation purposes;
- sample handling and shipping procedures which protect samples from breakage;
- communication with the laboratory to ensure their awareness of sample holding times;
- the availability of backup instruments or equipment for field measurements;
- collection of minimum-recommended sample volumes, which frequently include sufficient volume for re-analysis if a problem occurs in the laboratory;
- monitoring of field activities by the Field Operations Leader so as to allow for potential re-sampling or other measures to ensure that the required samples are collected.

3.2.5 Comparability

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared with another. Methods will be employed during this investigation to ensure that the data generated can be compared to other relevant data sets of similar quality. The analytical results of QA/QC samples and internal laboratory QA/QC samples will be reported along with the results of field sample analyses. Standard sample analysis and reporting methods will follow NYSDEC ASP protocols.

3.2.6 Reporting Limits

Formulae for determining the reporting limits specific to each parameter analyzed are provided by the laboratory.

3.3 Quality Assurance Reports

The Quality Assurance Manager will prepare status reports to summarize QA/QC issues related to the collected data. The objective of the status report is to verify that the work being performed on the project adheres to all of the project plans, and that the collected data meet the previously described goals for precision, accuracy, and completeness.

3.4 Problem Resolution

The successful execution of a field investigation requires that a system be in place for reporting and responding to unexpected events as well as correcting problems or mistakes when they occur. The system described below includes internal systems for decreasing the risk of such occurrences and the procedures for reporting such events.

Procedures designed to minimize the possibility of problems throughout this project include:

- The use of standard methods
- Development of written project plans
- Team member supervision and training
- Project meetings
- Clear definition of the project objectives and team member responsibilities

To ensure that the approach to data collection is applied in a uniform manner, all project team members will be trained in the methodologies and procedures detailed in all project documents including the Work Plan, Field Sampling Plan (FSP), QAPP, and Health and Safety Plan (HASP). Copies of these plans will be available to all team members for individual use and reference. In addition, the Project Manager and Field Operations Leader will review these plans with the project team prior to the start of field activities.

Training in the use of the procedures required in the plans will be provided to all designated team members as determined necessary by the Quality Assurance Manager. The Project Manager and/or Field Operations Leader will hold regular project meetings with team members to communicate changes in procedures or scope; to discuss and assign upcoming tasks; to address potential problem areas in tasks yet to be conducted; and to communicate ways that past problems encountered in the project were remedied. These meetings will be scheduled by the Project Manager or Quality Assurance Manager, as necessary, during this investigation.

Should an event occur that cannot be readily resolved or appears to have gone unnoticed, the Project Manager will be notified. The project Quality Assurance Manager and the site owner may also be notified. The notification will include a completed Problem Resolution Form (PRF) (shown below).

PROBLEM RESOLUTION FORM NO.____________________________________

Originator:____Date:_________________

Contract/Task Involved:____

Description of Event:____

Sequence of Response Actions (Date, Person, Action Taken):____________________________________

Description of Final Response:____

Final Response Approved By:____

Project Manager:____Date:_________________

The PRF will be available for use by all project team members. The user of the form will provide a mechanism for reporting and responding to specific events which require a more formal quality control review to ensure proper resolution of the problem.

The Project Manager and/or Quality Assurance Manager will be responsible for ensuring that each issue identified in a PRF is resolved. The Project Manager, after a review of the issue with the Field Operations Leader and Quality Assurance Manager, will work with the Field Operations Leader to assign responsibility for remedying the problem and for establishing procedures, if necessary, to ensure that the problem is not repeated. The steps of the problem resolution process are:

1. Identify and describe the event or problem
2. Investigate and determine the cause
3. Determine a response action to remedy the situation
4. Implement the response action
5. Monitor the effectiveness of the action to verify that the situation has been remedied

The PRF form is designed to document and track the resolution of the event from its initial reporting to the final solution. The form is completed by the person reporting the problem and includes a description of the event, possible cause(s), and recommended solution(s). The form will then be used to document the sequence of events resulting in an effective resolution. Final approval of the response action as described on the PRF will be documented by the signature of the Project Manager and Quality Assurance Manager.

Completed PRFs and copies will be maintained in the field office and in Chazen’s project file for future reference. Copies of PRFs (if utilized) will also be forwarded to the client and to any affected regulatory agency, if warranted.

The analytical laboratory will also use a system for on-the-spot and formal problem resolution procedures. The specific laboratory procedures will be consistent with the requirements of USEPA-SW-846 and are defined in the laboratory's Quality Assurance Program Plan.

3.5 Data Quality Requirements

Site specific data requirements are presented in the Work Plan, FSP, or associated documents for a particular project or investigation. There are five general analytical levels of data quality. These levels are described as follows:

Level I: Field screening utilizing portable instruments. These data may include pH, temperature, and specific conductance measurements of water samples, and ambient air and soil screening measurements with photoionization, flame-ionization, O_2, lower explosive limit (LEL), or other meters.

Level II: Field analyses utilizing more sophisticated portable analytical instruments such as gas chromatograph and x-ray fluorescence (XRF) analyzer. There is a wide range in the quality of data that can be generated. Data quality depends on the use of suitable calibration standards, reference materials, sample preparation equipment, as well as the training of the operator. Results from Level II data are available in real-time or within several hours of sample collection.

Level III: These data include analytical laboratory data utilizing USEPA-approved procedures. All analyses are performed in an off-site analytical laboratory following SW-846 protocols. Level III is characterized by rigorous QA/QC protocols and documentation.

Level IV: Analytical laboratory analysis supported by a rigorous QA program and documentation. These data are typically used for definitive site characterization, risk assessment, engineering alternative selection and design, and litigation activities. Level IV methods may include pre-approved non-standard methods for specific constituents or detection limits. All analyses are performed in an off-site analytical laboratory.

Level V: These data include physical property and engineering material analysis by approved standard or non-standard methods including analysis of non-standard sample matrices (e.g., wastes, biota). All analyses are performed in an off-site laboratory. The following table presents a summary of analytical levels appropriate to data uses.

Summary of Analytical Levels Appropriate to Data Uses

Data Uses	*Analytical Level*	*Type of Analysis*	*Limitations*	*Data Quality*
Site Characterization. Monitoring during implementation.	Level I	Total organic and inorganic vapor detection using portable instruments, Field test kits	Instruments respond to naturally occurring compounds	If instruments are calibrated and data are interpreted correctly, can provide indication of contamination
Site Characterization. Evaluation of alternatives. Engineering design. Monitoring during implementation.	Level II	Variety of organics by GC; Inorganics by AA; XRF Tentative ID; Analyte-specific; Detection limits vary from low ppm to low ppb	Tentative ID Techniques and instruments mostly limited to volatiles, metals	Dependent on QA/QC steps employed. Data typically reported in concentration ranges.
Risk assessment. PRP determination. Site characterization. Evaluation of alternatives. Engineering design. Monitoring during implementation.	Level III	Organics and inorganics using EPA Procedures can be analyte specific RCRA Characteristics tests	Tentative ID in some cases Can provide data of same quality as Levels IV, NS	Less rigorous QA/QC
Risk assessment. PRP determination. Evaluation of alternatives. Engineering design.	Level IV	HSL organics and inorganics by GC/MS; AA; ICP Low ppb detection limits	Tentative identification of non-HSL parameters. Some time may be required for validation of packages	Goal is data of known quality. Rigorous QA/QC.
Risk assessment. PRP determination.	Level V	Non-conventional parameters. Method specific detection limits. Modification of existing methods. Appendix 8 parameters	May require Method Development or Modification. Mechanism to obtain services requires special lead time.	Method specific

Reference: EPA Document No. 540 G-87 003, 1987, “Data Quality Objectives for Remedial Response Activities”

4.0 ENVIRONMENTAL SAMPLING / TESTING PROCEDURES

An essential aspect of any field investigation is assurance that sample collection is conducted in a manner that will provide high-quality, representative data. This section of the QAPP provides a description of sampling techniques, procedures, and equipment used during field sampling programs. These techniques and procedures conform to guidelines outlined in the EPA document “A Compendium of Superfund Field Operations Methods”, and with NYSDEC DER-10.

4.1 Site Specific Sampling and Testing Rationale

The Work Plan provides the sampling rationale for every investigation, including the rationale for the following tasks:

- sampling of environmental media,
- determination of constituents to be measured in each environmental media,
- sampling locations,
- sample depths and types,
- number and frequency of samples to be collected.

The specific details of a field investigation such as sampling locations, target depths, analytical methods, and a reference map are detailed in the project Work Plan.

4.2 Documentation

During the implementation of any investigation, field activities will be documented in field log books. The field log book is a controlled document, which records all major on-site activities during the investigation. The log book is a bound notebook with pages that cannot be removed without cutting or tearing pages. Each page of the log book will be numbered consecutively and signed at the bottom of the page with the signature or initials of the person who completed the page. All entries will be made in ink and errors crossed-out with a single line and initialed and dated.

Field data for all tasks completed during this field program, as well as general observations, pertinent conversations, and unexpected occurrences will be documented in field log books. At a minimum, the following information will be recorded:

- Names of personnel on-site (including all subcontractors);
- Date and time of arrival and departure;
- Daily objectives;
- Site name, location, and project number;
- Field observations;
- Weather conditions;
- Site sketch with description of sampling points;
- Health and Safety monitoring data;
- Field calibration, decontamination procedures, and performance frequency;
- Well bailing or pumping procedure and equipment;
- Well specifics including static water level, depth, and volume of water removed;
- Type and quantity of monitoring well construction materials used;
- Surveying data;
- Sample identification numbers;
- Sample point names and descriptions;
- Sample collection procedures and equipment;
- Sample preservation used;
- References to maps or sketches of the sampling site;
- Results of any field measurements, such as pH, water temperature, specific conductivity, and field screening results;
- Notes on conversations with site personnel, observers, or subcontractors;

- Problems encountered and the manner of their resolution;
- General observations that may support the data; and
- Summary of daily activities completed.

4.3 Pre-Sample Planning

The quality of sample collection is maintained by specifying the technique used for both the medium/matrix to be sampled and the analytes of interest. For example, groundwater samples intended for SVOC analyses are collected in amber glass containers; groundwater samples for VOC analyses are collected in Teflon-capped glass vials with "zero" headspace to minimize diffusive and evaporative losses; and groundwater samples for inorganic analyses are collected in polyethylene bottles. Sample containers provided by the analytical subcontractor are prepared in a manner consistent with USEPA protocol.

Acquisition of environmental samples also requires specialized techniques to preserve sample integrity and to ensure that a representative portion of the source is collected. Media-specific sample collection techniques and sample preservation are specified in the following sections. Field programs are designed and implemented using the EPA's "Compendium of Superfund Methods", NYSDEC Program Policy DER-10, Technical Guidance for Site Investigation and Remediation, and NYSDEC Regulations 6 NYCRR Part 375, Environmental Remediation Programs as primary references.

4.3.1 Sample Labels and Records

Sample labels will be prepared using a pre-determined labeling system. Each sample may require several containers depending on the intended analysis to be performed. At the time the sample is collected, a sample data record sheet and field logbook entries will be completed. The sample documentation may include:

- A plan of the site with the sample location and sample numbers indicated
- A description of the sample site
- Physical descriptors of the sample site, if appropriate (e.g., stream width, groundwater depth, etc.)
- Photographs of the sample site showing the sampling equipment and/or unusual conditions (orientation of photograph must be shown on sketch map, and photo number recorded in field notebook)
- Chain of Custody documentation (see Section 5)

Identification of samples collected during the field investigation may be accomplished using alphanumeric Sample Identification codes indicating sample type, sample identification, depth of sample (if applicable), and designation of duplicate samples. An explanation of a typical Sample Identification codes system for soil, groundwater, and sediment samples is shown below:

Sample Identification Code System

Digits	*Identification*	*Description*	*Code/Example*	
1, 2,3	Site Code	Three letter code to identify the site	LSS	Lower South Street
4,5	Sample Type	Two letter code to identify sample media	SB	Test Boring Soil Sample
			SS	Surface Soil
			BW	Screened-auger Groundwater Sample
			MW	Monitoring Well Groundwater Sample
			SW	Surface Water
			SD	Sediment Sample
			TB	Trip Blank
			EB	Sampler Blank
			SV	Sub-Slab Vapor Sample
			TP	Test Pit Soil
			PW	Test Pit Water
			WT	Waste Sample
			DL	Drum Liquid
			DS	Drum Solids or Sludge
			IA	Indoor Air Sample
			OA	Outdoor Air Sample
			GP	Geoprobe® Soil Sample
			CD	Septic System/Sump Sludge Sample
			CL	Septic System/Sump Catch Basin Liquid Sample
			CB	Catch Basin/Storm Drain Sediment Sample
6, 7, 8	Sample Locator	Three numbers to identify sample site name or location	MW22	Monitoring Well Groundwater Sample from Well 22
9, 10, 11	Depth of Sample Below Reference Surface		SB01(0-2’)	SB samples collected from 0 to 2 feet below ground surface (bgs)
			MW22(25)	MW sample depth is assumed to be the bottom of the well screen measured in feet bgs
			XXX	All samples obtained from drums or containers will be designated XXX
12, 13			XX	Duplicates will periodically be sent to the lab with the XX designation to preserve duplicate anonymity, according to Section 9.2.
			XF	Sample collected for field analysis or future reference
			XD	Duplicate sample (sample locator ID not used for blind field duplicates)
			MS	Matrix spike
			MD	Matrix spike duplicate
			XS	Laboratory split sample

4.3.2 Sample Container Requirements and Sample Preservation

Sample integrity will be maintained by using special containers and preservation methods keyed to both the medium/matrix to be sampled and the analytes. Sample containers and preservation methods specified in NYSDEC protocols are summarized in the table below. Any changes to these protocols required by a Specific project will be detailed in a site-specific Work Plan.

4.3.3 Preparation of Sample Containers

Sample containers will be provided by the laboratory and are prepared according to USEPA protocols. The bottles will be equivalent to I-Chem series 300. QC records for the bottles used will be maintained by the laboratory. The preparatory procedures typically used by the vendor providing the laboratory with sample containers are detailed below.

4.3.3.1 Volatile Organic Analyte (VOA) Containers

(40-mL glass vials and 2-oz or 4-oz glass jars)

1. Wash vials, septa, and closures in hot tap water with laboratory grade non-phosphate detergent.
2. Rinse three times with tap water.
3. Rinse three times with American Society for Testing and Materials (ASTM) Type II water.
4. Oven dry vials, septa, and closures.
5. Remove vials, septa, and closures from oven.
6. Place septa in closures, Teflon side down, and place on vials. The attendant must wear gloves and the vials cannot be removed from the preparation room until sealed.

If sampling for VOCs is needed and will use EPA Method 5035, the disposable transfer tool will be obtained from the laboratory.

4.3.3.2 Semi-Volatile Organic Analyte (SVOA) Containers

(1-liter amber glass bottles and 4-ounce glass jars)

1. Wash containers, closures, and Teflon® liners in hot tap water with laboratory grade non-phosphate detergent.
2. Rinse three times with tap water.
3. Rinse with 1:1 nitric acid.
4. Rinse three times with ASTM Type II water.
5. Rinse with pesticide-grade methylene chloride.
6. Oven dry.
7. Remove containers, closures, and Teflon® liners from oven.
8. Place Teflon liners in closures and place closures on containers. The attendant must wear gloves and the containers cannot be removed from the preparation room until sealed.

4.3.3.3 Metals, PCB, and Pesticide Containers

(1-liter, 500, 250, 120 and 60-milliliter (mL) clear and 1-liter amber polyethylene bottles)

1. Wash bottles, closures, and Teflon® liners with hot tap water and laboratory grade non-phosphate detergent.
2. Rinse three times with tap water.
3. Rinse with 1:1 nitric acid.
4. Rinse three times with ASTM Type II water.
5. Air dry in contaminant-free environment.
6. Place liners in closures and place closures on bottles. The attendant must wear gloves and the bottles cannot be removed from the preparation room until sealed.

4.3.3.4 Sample Preservation

Samples are preserved according to the protocol established for the selected analytical method. Unless the proper sample container preparation and sample preservation measures are taken in the field, sample composition can be altered by contamination, degradation, biological transformation, chemical interactions, and other factors during the time between sample collection and analysis.

Steps to maintain the in-situ characteristics required for analysis may include storage of samples at 4°C, pH adjustment, and chemical fixation. Specific sample and container preservation requirements are detailed in Table 3 above. Where pH adjustment is performed, the pH will be checked in the field with pH paper to ensure the required pH level is achieved. If pre-preserved sample containers are provided by the laboratory, extra preservation material should be available in the field in case it is needed to achieve the target pH.

Table 3 - Summary of Required Containers, Preservation Requirements and Holding Times

Parameter	*Matrix*	*Required Container*	*Minimum Volume* *Required for Analysis*	*Preservation Technique*	*Holding Time (2)*
Volatile Organics (3)	Water	Glass vials with Teflon faced septa and screw cap. (Two 40 ml vials per sample)	50 ml	Cool (4°C) Preserved with acid (HCl to pH<2)	7 days
	Soil	3 EnCore 5 gram samplers OR one set of 4 – 40 mL glass vials with Teflon faced septa. One unpreserved, one with 10 mL methanol and two with 5 mL deionized water and a magnetic stir bar. Each vial must be filled with at least 5 grams of soil.	10 grams	Cool (4°C). Freezing samples can extend holding time; 48 hours unfrozen holding time will be considered cumulative.	48 hours
Semi-Volatiles, Pesticides, PCBs (3), or Total Petroleum Hydrocarbons	Water	1-L Amber glass jar with Teflon lined screw cap.	1,000 ml (1 Liter)	Cool (4°C)	Extraction within 5 days of sampling. Analysis within 40 days of extraction
	Soil	8-oz wide mouth glass jar with Teflon-lined cover	50 grams	Cool (4°C)	Extraction within 5 days of sampling. Analysis within 40 days of extraction
Metals (Total and Dissolved) (1) (4)	Water	Polyethylene bottle (one 1 L bottle)	100 ml	(Dissolved metals only - field filtered using 0.45 micron filter) Cool (4°C) Preserved with acid (HNO_3 to pH<2)	180 days
	Soil	8-oz wide mouth glass jar with Teflon-lined cover	10 grams	Cool (4°C)	180 days
Total Petroleum Hydrocarbons Fingerprint Analysis	Water	Glass jar with Teflon lined screw cap (one 1 L bottle)	1,000 ml (1 Liter)	Cool (4°C)	28 days
	Soil	8-oz wide mouth glass jar with Teflon-lined cover	50 grams	Cool (4°C)	28 days
Total Cyanide	Water	Polyethylene bottle (one 1 L bottle)	100 ml	Cool (4°C) Preserved with base (NaOH to pH>12)	180 days
	Soil	8-oz wide mouth glass jar with Teflon-lined cover	10 grams	Cool (4°C)	12 days
Mercury (Total and Dissolved)	Water	Polyethylene bottle (one 1 L bottle)	100 ml	(Dissolved metals only - field filtered using 0.45 micron filter) Cool (4°C) Preserved with acid (HNO_3 to pH<2)	26 days
	Soil	8-oz wide mouth glass jar with Teflon-lined cover	10 grams	Cool (4°C)	26 days
Biochemical Oxygen Demand	Water	Polyethylene bottle (one 1 L bottle)	100 ml	Cool (4°C)	24 hours
Bicarbonate	Water	Polyethylene bottle (one 1 L bottle)	100 ml	Cool (4°C)	14 days
Carbonate	Water	Polyethylene bottle (one 1 L bottle)	100 ml	Cool (4°C)	14 days
Chemical Oxygen Demand	Water	Polyethylene bottle (one 1 L bottle)	100 ml	Cool (4°C) Preserved with acid (H_2SO_4 to pH<2)	26 days
Chloride	Water	Polyethylene bottle (one 1 L bottle)	100 ml	None Required	26 days
Sulfate	Water	Polyethylene bottle (one 1 L bottle)	100 ml	Cool (4°C)	28 days
Total Dissolved Solids (TDS)	Water	Polyethylene bottle (one 1 L bottle)	100 ml	Cool (4°C)	7 days
Total Suspended Solids (TSS)	Water	Polyethylene bottle (one 1 L bottle)	100 ml	Cool (4°C)	5 days

Reference: EPA Document No. 540 P-87 001, 1987, "A Compendium of Superfund Field Operations Methods"
NOTES: (1) Metals analysis will be conducted on unfiltered samples. If filtered samples are analyzed, unfiltered samples must also be collected and analyzed. If turbidity presents a problem, the samples will be handled according to NYSDEC "Guidelines for Handling Excessively Turbid Samples" following approval by the Division of Hazardous Waste Remediation (DHWR). (2) Holding times are calculated from VTSR (Verified Time at Sample Receipt). Samples must be received by the lab within 48 hours of collection. (3) TCL = Target Compound List. (4) TAL = Target Analyte List.

4.4 Decontamination Procedures

Standardized procedures for decontamination have been established to reduce the likelihood of cross-contamination between samples and sampling locations. Equipment to be decontaminated includes: backhoes, drilling equipment, and sampling equipment.

All decontamination procedures will comply with the personal protection requirements detailed in the site Health & Safety Plan (HASP). Personal protection levels will depend on the nature of the contamination and the specific decontamination method. Specific decontamination methods for exploratory and sampling equipment are described in the following sections.

4.4.1 Heavy Equipment

Heavy equipment such as drill rigs and backhoes may need to be steam cleaned with a portable high pressure steam cleaner upon arrival at the site and prior to demobilization. During the course of investigation activities, it is only necessary to decontaminate equipment that comes in contact with soils and/or groundwater (i.e., drill rods, bits, backhoe bucket, etc.).

Prior to initiation of drilling activities at the site, a temporary steam cleaning area will be established, if necessary, for the decontamination of the drill rig and associated tools and augers. When selecting the steam cleaning location, the following items will be considered:

- Free from traffic;
- Away from any proposed test boring or monitoring well locations;
- Readily accessible to the investigation area; and
- Free of known surficial contamination.

The decontamination area will consist of a controlled area or structure to contain all wash water and eliminate the possibility of drilling equipment coming in contact with the underlying surficial soils and/or pavement during steam cleaning. Site-specific decontamination area construction requirements may be detailed in the Work Plan.

All equipment will be placed on clean pallets or racks prior to and after steam cleaning. Potable water will be used for the steam cleaning activities. The equipment to be steam cleaned includes: drill rods, augers, bits, tools, and split-spoon samplers. Decontamination wastewater and soils will be initially drummed into 55 gallon steel containers or other appropriate holding vessels pending laboratory analyses.

4.4.2 Drilling Equipment

Drilling equipment that is exposed to soil and/or groundwater will be steam cleaned between sampling locations. The purpose of this decontamination is to ensure that potential contaminants are not transferred between sampling locations.

4.4.3 Sampling Equipment

Contaminated tools and sampling equipment will be placed in a plastic pail, tub, or other container with a Liquinox® (or equivalent) soap and water solution. The tools will be brushed off, rinsed, and transferred to a second soap and water solution bath. Tools will be rinsed with potable water and finally rinsed with de-ionized water. Tools such as wrenches, split-spoons, etc., may be decontaminated between exploration locations with a high-pressure steam cleaner instead of washing. Sampling equipment such as reusable bailers or submersible pumps will be wrapped in aluminum foil after cleaning to prevent contamination before their next use. Control and disposal of decontamination fluids are discussed in Section 4.4.4

4.4.4 Control and Disposal of Decontamination Materials

In general, The Chazen Companies is responsible for collecting, controlling, and staging hazardous material generated during field investigations. Disposal arrangements will be made for the client, if required, for particular work assignments. Specific procedures for handling contaminated environmental materials and contaminated personal protective equipment will be presented in the Work Plan and/or the HASP.

Contaminated soil and water will be handled according to NYSDEC DER-10 unless otherwise specified in the Work Plan. These documents describe alternatives for disposal of these materials and requirements for handling.

4.4.4.1 Soil Disposal

NYSDEC DER-10 will be used as guidance for on-site disposal of non-hazardous soils including:

- Backfill inside borehole to within 12 inches of the surface. Soil will not be returned to a boring if it contains free product, non-aqueous phase liquid, or grossly contaminated soil.
- Collect and dispose on-site following characterization and NYSDEC approval.
- Temporarily store on-site prior to off-site disposal.
- Transport from off-site areas that meet Unrestricted Use SCOs to site (without need to manifest or contract with licensed hauler).

Hazardous soils can be sent off site for disposal to a properly permitted treatment, storage, or disposal facility, and non-hazardous soils can be sent to a solid waste management facility. Representative samples of materials will be analyzed for proper classification, treatment, and disposal. Materials will be transported by a licensed hauler and accompanied by the proper manifests.

Disposal alternatives are subject to precautions listed in the NYSDEC DER-10 including the general requirement that the soils "be handled and disposed of in a manner that does not pose a threat to health and the environment". Specific handling and disposal requirements for drill cuttings will be identified by the Field Operations Leader based on field screening and analytical results of drill cutting samples, if applicable.

4.4.4.2 Groundwater Disposal

The control of contaminated groundwater is important to prevent impacts to surficial soils. Alternatives for the disposal of groundwater generated during remedial investigations at hazardous or petroleum impacted sites are provided below:

- On-site disposal of non-impacted groundwater by allowing water to recharge and infiltrate into unpaved ground into the same groundwater unit in a manner which does not result in surface water runoff.
- Transportation off-site to an authorized Resource Conservation and Recovery Act (RCRA) treatment facility;
- Discharge to a sanitary sewer for treatment at a publicly-owned treatment works (POTW);
- On-site treatment and discharge to a storm sewer, receiving stream, or to the ground;
- Transport by truck to a POTW;

In order to determine the proper disposal option for groundwater generated during monitoring well development and purging, the water will be containerized pending the receipt of laboratory analysis. The preferred method of disposal of non-impacted groundwater is to the ground surface away from the well, or if allowed, to a storm sewer or a surface water body. Disposal of impacted or non-impacted water to a POTW or other disposal facility will require authorization from the receiving facility. Overall, handling and disposal of collected groundwater will be identified by the Field Operations Leader and approved by the DEC project manager based on field screening and analytical results of water samples.

4.4.5 Sample Handling/Shipping Areas

Sample containers will be wiped clean at the sample site, taken to the decontamination area to be further cleaned, as necessary, and transferred to a clean carrier. The sample identities will be checked off against the COC record. The samples will then be stored at approximately 4° C in a secure area prior to shipment.

Sample handling areas will be cleaned/wiped down daily. For final cleanup, all equipment will be disassembled and decontaminated. Equipment that cannot be satisfactorily decontaminated will be disposed of.

4.4.6 Monitoring Equipment

When monitoring equipment is used under conditions where contamination is possible, the equipment will be protected from contaminant sources by draping, masking, or otherwise covering as much of the instrument as possible with plastic without hindering the operation of the unit.

Any contaminated equipment will be taken from the source area and the protective coverings removed and disposed of in appropriate containers. Any direct or obvious contamination will be brushed or wiped with a disposable paper wipe. The units will then be dried, checked, and calibrated for subsequent operations.

4.5 Air Monitoring

The air monitoring program is designed to provide the necessary information to ensure the safety of on-site personnel and to evaluate potential increases to air contaminant levels and dispersion patterns during site activities. Air monitoring will be conducted during field activities as detailed in the site-specific HASP and/or Work Plan.

4.5.1 Site Safety Air Monitoring

The required level of personal protection equipment specified in the site-specific HASP will be verified by the results of air quality screening performed on-site during field activities. The screening will be performed using a photoionization detector (PID), which detects and measures concentration levels of total VOCs relative to a reference standard on a real-time basis. The PID lamp sensitivity will be specified in the site-specific HASP based on any information regarding identification of potential contaminants. Most sites will require a PID with a lamp of 10.2 or 11.7 electron volts (eV).

The HASP outlines the air monitoring procedures to be followed during the field investigation. Air monitoring equipment used on site may include a PID, chemical indicator tubes (e.g., Draeger® tubes), percent oxygen/lower explosive limit meter, respirable dust monitor, or a radiation detector.

4.6 Field Screening

Headspace vapor monitoring will be performed as a screening tool for determining the relative concentrations of VOCs in soil samples. A photoionization-detector (PID) will be used. The PID will be calibrated daily in accordance with manufacturer's specifications. Headspace readings will be collected using the static headspace analysis method detailed below:

- Approximately 2 oz. of soil will be collected from each open split-spoon and placed in a dedicated laboratory-cleaned glass jar. Alternatively, soil may be placed in a resealable plastic bag which will be immediately sealed. The mouth of the jar will then be immediately covered with aluminum foil prior to sealing the jar lid to minimize the loss of VOCs. Headspace samples will be collected for each split spoon sample.
- The jar will be shaken to break up the compacted soil or material, and will be placed in a specified location (e.g., field vehicle), out of direct sunlight, for a period of no less than 15 minutes to equilibrate prior to field monitoring.
- Where ambient temperatures are below 0^{o}C, headspace development should be within a heated vehicle or building. Ambient temperature during headspace analysis will be recorded and reported.
- The jar lid will be removed from the jar. Headspace will be monitored within the jar by piercing the aluminum foil with the PID probe. Care will be taken to prevent unnecessary mixing of jar headspace and outside air. Monitoring with the PID will continue for at least 1 minute or until a stable reading is shown. The highest PID concentration observed will be recorded along with the sample interval in the field notebook, and on the Soil Boring Log.

4.7 Test Pitting

Test pits are designed to explore and characterize shallow subsurface soils. Test pits allow observation of large sections of the subsurface and facilitate the collection of soil samples for field screening and laboratory analysis. The locations of test pits will be determined in advance and will be detailed in the Work Plan with the provision that site personnel may modify plans in response to site conditions.

Test pits are generally excavated using a hydraulic backhoe, excavator, or other mechanical equipment with dimensions and capabilities sufficient to complete test pits described in the Work Plan. The depths of test pits and collected soil samples will be determined using a weighted tape measure referenced to the ground surface. During test pitting, samples may be collected from the test pit for geologic characterization, field screening, and laboratory analyses. Samples from the test pits are generally collected from the backhoe bucket.

Field personnel may also enter the test pit to collect samples directly from the sidewalls or bottom of the excavation if the depth is less than four feet. Occupational Health and Safety Administration (OSHA) regulations prohibit entry into test pits greater than four feet deep without adequate shoring or benching of sidewalls. Before entry into any test pit, air monitoring will be conducted in accordance to the site HASP.

Soil samples collected from test pits may be screened with a photoionization detector. If a sample is required, it will be taken from the middle of the backhoe bucket and placed in appropriate containers according to soil sampling procedures outlined in Section 4.3.

Samples may also be placed in an airtight jar or a plastic zip-lock bag and field screened for headspace VOC concentrations as outlined in Section 4.6.1.

Excavated materials may be temporarily stockpiled on plastic sheeting. If hazardous conditions are encountered, the material will be stockpiled to one side, preferably downwind, and away from the edge of the pit to reduce pressure on the pit walls. Materials with different permeabilities (i.e., sand, silt, clay) will normally be segregated during stockpiling to allow for proper replacement during backfilling. Heavily contaminated soils will also be segregated and stockpiled pending laboratory analysis and possible alternative disposal.

In the event that it is necessary to excavate below the water table, groundwater will either be left in the excavation or containerized in a frac tank and evaluated for proper disposal. If drums or other obviously contaminated objects are uncovered, the excavation will be stabilized and further excavation terminated. The field geologist will contact the Project Manager and/or NYSDEC for further directions.

Upon completion of the excavation, the test pit will be backfilled to the ground surface. Prior to backfilling, each test pit may be photographed. During backfilling, materials will be compacted by tamping with the backhoe bucket. The surface will then be graded to the level of the ground surface. At locations where heavily contaminated materials are encountered, clean soil may be utilized for backfill.

The contractor operating the excavator will decontaminate the bucket of the backhoe between excavations using the procedures outlined in Section 4.4.1.

All pertinent information will be documented in a field notebook. A test pit log will also be prepared for each test pit. The test pit log may include a sketch of the test pit, geologic description, and a written summary. Information that may be noted in the log or field notebook includes the following:

- Site name and location;
- Date of excavation;
- Total depth and dimensions of excavation;

- Sample designations and methods of acquisition;
- Soil description;
- Air monitoring levels;
- Field screening results;
- Groundwater seeps or levels; List of photographs taken;
- Date and type of backfill;
- Other pertinent information (waste materials encountered, staining, odor, etc.).

4.7.1 Procedure for Obtaining Soil Samples using a Backhoe

In order to obtain relatively vertical samples from known depths, the backhoe technique is employed. Soil can be excavated and placed in a pile. Upon retrieval of subsurface soil from the backhoe bucket, the contents are examined. The use of the backhoe sampling method allows for direct observation of the stratigraphy.

1. Choose a location from which to obtain a soil sample. Solid covering such as concrete or asphalt must be removed using the backhoe. The operator can then proceed with the excavating.
2. Examine the contents of the backhoe bucket and log, noting the depth from which the sample came.
3. If an individual sample is to be saved for further observation or analyses, place it in a capped glass jar.
4. If the sample desired is a composite sample, place the individual sample in a clean bucket, on a clean piece of plastic or in a plastic zip-lock bag. Add additional samples to the bucket or plastic. After thoroughly mixing all individual samples together, obtain a composite sample and place in a capped glass jar.
5. Clean the bucket with soapy water prior to obtaining the next sample. If samples are to be analyzed for contaminants, properly decontaminate (steam clean) the bucket.
6. Repeat procedure at next location.

4.8 Borings and Environmental Wells

4.8.1 Drilling Methods

Soil borings may be drilled to facilitate collection of subsurface soil samples for geologic classification, chemical analyses, and physical testing. Drill rigs are utilized to advance the borings. The rigs are typically mounted on trucks, all-terrain vehicles, or skids. There are a variety of drilling methods that may be utilized including direct push (e.g. Geoprobe®), hollow-stem auger (HSA), drive and wash, and mud rotary. Each of these methods enables the collection of soil or groundwater samples. Drilling methods also facilitate the installation of monitoring wells to provide hydrogeologic data.

A geologist will observe drilling operations summarizing boring information in a field notebook, taking photographs when appropriate, and collecting samples in accordance with the Field Sampling Plan. A boring log will be prepared that includes: characterization of subsurface materials and geologic conditions, air monitoring readings, field screening readings, pertinent drilling information, and relevant observations (i.e., staining, odor, sheen, etc.). An example of a typical boring and monitor well log is presented below.

Typical Boring Log

THE Chazen COMPANIES	PROJECT: LOCATION: CLIENT: PROJECT NO.:		Test Boring No.: MW-6 Total Depth: ft.
Contractor: Drill Rig: Driller: Inspector:	Start Date: Finish Date: El. Datum: G.S. Elevation:	Northing: Easting: Longitude: Latitude:	Borehole Dia.: in. Depth to Water: ft. Depth to Rock: ft. Depth of Well: ft.

Depth *(Feet)*			Elevation *(Feet)*	Casing Data	Sample No.	Sample Data	Recovery *(Inches)*	PID *(ppm)*	Group Symbol	Stratum and Field Descriptions:	Well Diagram	Field Notes, Well Notes, Comments:
					S1	9	5	0		0-3" Asphalt		
1			*-1*			8				3-6" Gravel road base		
						5				6"-11" Fill - Black, ash, wood, dry, no odor		
2			*-2*			5						
					S2	8	5	0		2'-2'5" Fill - Black ash, wood, gravel, tip of spoon wet, no odor		
3			*-3*			2 4						
						8						
4			*-4*			7						
					S3	6	3	0		4'-4'3" Black, silty CLAY, saturated, no odor		
5			*-5*			3						
						1						
6			*-6*			1						Bentonite:
					S4	3	12	0		6'-6'3" Same as above		Sand:
7			*-7*			8				6'3"-7' Reddish brown, silty CLAY, gravel, saturated, no odor		
						4						
8			*-8*			3						
					S5	4	12	0		8'-9' Dark brown and reddish brown, plastic CLAY, saturated,		
9			*-9*			1				no odor		
						1						
10			*-10*			2						
					S6	2	12	0		10'-11' Dark brown, silty CLAY, moist to wet, no odor		
11			*-11*			3						
						2						
12			*-12*			4						
										Boring terminated at 12 feet below ground surface		
14			*-14*									

ADDITIONAL NOTES:

Drilling methods used during an investigation will be determined in advance and will be detailed in the Work Plan with the provision that the drilling procedure may be modified in response to conditions encountered during drilling. A more detailed discussion of the various drilling methods, sampling procedures, and well installation procedures is provided below.

4.8.1.1 Hollow-Stem Augers

The Hollow Stem Auger (HSA) method utilizes coupled lengths of continuous-flight, hollow steel augers to advance through overburden materials. With this method, drill cuttings rise upward on the flights as the string of augers is rotated.

Typically, $4^1/_4$-inch or $6^1/_4$-inch inner diameter (ID) augers are used for hazardous waste investigations. These produce nominal 8-inch and 10-inch boreholes, respectively.

A center plug equipped with cutting teeth is attached to drilling rods and placed inside the augers to facilitate cutting and to prevent subsurface materials from entering the augers.

When the augers are advanced to the appropriate depth, the center plug is removed to allow for the collection of soil or in situ samples.

The advantage of the HSA method is that limited fluid use is required. In addition, 2-inch ID monitoring wells can be easily installed inside the augers. The limitations of HSA drilling include the inability to advance through very dense materials like rock, cobbles, rubble, etc., or drilling through loose saturated sands and silts which tend to flow around the plug and seize the tooling. Drilling depths are usually limited to the first dense rock layer encountered or by the torque of the machine.

4.8.1.2 Direct Push

Soil probing or "direct push" machines such as the Geoprobe® push tools and sensors into the ground without the use of rotation to remove soil and to make a path for the tool. A Geoprobe® relies on a relatively small amount of static (vehicle) weight combined with a hydraulic hammer as the energy for advancement of a tool string. Probing tools do not remove cuttings from the probe hole but depend on compression of soil or rearrangement of soil particles to permit advancement of the tool string.

Probing tools are advanced as far as possible using only the static weight of the carrier vehicle. Greater depth is achieved using the combined effect of the vehicle weight and hydraulic hammer. Hammering is often required when probing near the ground surface to penetrate hard-packed surface soil and other hard surfaces. The probe is then allowed to penetrate using only static force until refusal is again encountered, at which time the hammer is reapplied. The hammer is applied as required when probing through sands, gravels, high friction clays, tills, fill materials, and surface frost.

A Geoprobe® can be used to drive tools to obtain continuous soil cores or discrete soil samples; obtain groundwater samples or soil gas samples; install permanent sampling implants and air sparging points; set small diameter permanent monitoring wells; or drive a conductivity sensor probe to map subsurface lithology. Soil probing equipment is typically used for site investigations to depths of 30 to 60 feet.

The advantage of using a Geoprobe® versus conventional drilling techniques, are:

- Minimal cuttings are generated. This reduces handling, containing, storing, sampling, analyzing, and disposing of potentially hazardous and contaminated cuttings. This also reduces disposal costs and potential exposure of site workers, facility employees, residents, and surroundings to hazardous contaminants.

- Only a small diameter hole is created. Grouting is less expensive because a small volume of grouting material is required.

- Less obtrusive equipment required. Small, light, probing equipment is used for sample collection which allows the operator to reach many locations not accessible to larger and heavier conventional drilling equipment.

- Minimal physical and chemical disturbance of the sample materials occurs.

- Typical penetration rates are from 5 to 25 feet per minute, although probing time is highly dependent upon soil conditions.

- Sampling time is shorter; therefore, more sample locations can be sampled per day, depending upon soil conditions.

- The unit can sample all subsurface media including soil, groundwater, and soil gas; log soil conductivity and contaminants; grout probe holes; and inject remediation materials.

4.8.2 Subsurface Soil Sampling

4.8.2.1 Hand/Bucket Auger

A hand or bucket auger may be used for collecting shallow subsurface soil samples, usually no deeper than 3 to 4 feet below ground surface, although the achievable depth will be limited by soil type and conditions at the site. A hand or bucket auger may be used for collecting surface soil samples. The following procedure is used when collected soil samples with a hand auger:

1. Using a decontaminated stainless steel auger connected to an extension rod and handle, begin turning the auger clockwise until the auger is full. Remove the auger, empty the soil, and continue auguring until the desired depth is reached.

2. Using a decontaminated or second auger obtain soil from the specified depth interval (24-36”, 36-48”, etc.). The auger used to advance the hole is not suitable for sample collection, as it may be contaminated by the material above it.

3. When sampling at depths deeper than 12 inches, discard ½-inch of material at the top of the auger due to cave in.

4. Transfer soil to a stainless steel mixing bowl. Immediately transfer soil for VOC analysis into sample jar using a stainless steel spoon (unless State requirements specify methanol preservation of samples for VOC analysis).

5. Once a sufficient volume of soil is collected in the mixing bowl, thoroughly homogenize the sample and remove any vegetative material and stones.

6. Transfer the material to the labeled sample containers and place them in sample cooler on ice.

7. Either decontaminate the sampling equipment or place it in a plastic bag for later decontamination.

4.8.2.2 Split-Spoon Sampling

Split-spoon samplers are used to collect soil samples from the bottom of a borehole. The sampler consists of a thick-walled, steel tube that is split lengthwise. It has a cutting shoe attached at the lower end and a check valve at the upper end.

When needed, the split-spoon sampler is attached to drill rods with a threaded adapter. The split-spoon sampler is driven into the ground in accordance with the standard penetration test (ASTM D1586). The standard penetration test (SPT) consists of driving a $1^{3}/_{8}$-inch ID, 2-foot split-spoon 24 inches into the soil using a 140-pound hammer falling 30 inches. The number of blows required to drive the split-spoon each 6 inches is recorded to obtain the SPT-N value, which is defined as the total blows for the penetration from 6 to 18 inches. Often, larger split-spoons are used in order to provide sufficient soil volume when collecting samples for chemical analyses. The size of the split-spoon and the sampling interval are detailed in the FSP.

After the sampler has been retrieved, a field geologist will perform field screening, soil characterization, and sample collection according to the following procedures:

1. The split-spoon will be screened for VOCs immediately upon opening with a total VOC analyzer such as a PID. The instrument will be passed over the sample while slightly disturbing the soil with a sampling trowel or spoon.
2. The soil from the split spoon will be characterized in the field using Modified Burmeister Soil Classification System or the Unified Soil Classification. Physical characteristics such as color, grain size, soil type, texture, consistency, and moisture will be recorded in a field notebook or boring log form.
3. Representative soils will be placed into the appropriate jars for physical and chemical testing. The type and frequency of tests that will be performed are discussed in the FSP. Samples that may be submitted for laboratory analysis will be placed immediately into laboratory-supplied jars with a pre-cleaned stainless steel trowel or spoon. The samples will be labeled with the date and time of sampling, sample identification and site location, then packed for shipment to the laboratory in a cooler with ice. An 8-ounce jar and/or 40-ml vial will also be filled (if specified in the Work Plan) for soil jar headspace tests as detailed in Section 4.6.1.
4. The split-spoon and sampling utensils will be decontaminated between each sample according to the procedures outlined in Section 4.4.3.

4.8.2.3 Geoprobe® Sampling

Macro-Core Soil Samples

The MacroCore® Soil Sampler is a solid barrel, direct push device for collecting continuous core samples of unconsolidated materials at depth. The standard MacroCore® Sampler has an assembled length of approximately 52 inches (1,321 mm) with an outside diameter (OD) of 2.2 inches (56 mm). Collected samples measure up to 1,300 ml in volume in the form of a 1.5-inch by 45-inch (38-mm by 1,143-mm) core contained inside a removable liner. The MacroCore® Sampler may be used in an open-tube or closed-point configuration. It has a removable/replaceable, thin-walled liner tube inserted inside for the purpose of containing and storing soil samples. The standard MacroCore® liner is 1.75-inches OD by 46-inches long (44-mm by 1,169-mm). Liner materials include stainless steel, Teflon®, PVC, and PETG.

To obtain a soil sample, an assembled MacroCore® Soil Sampler is driven one sampling interval into the subsurface and then retrieved using a Geoprobe® soil probing machine. The collected soil core is removed from the sampler inside a liner.

The MacroCore® Soil Sampler is most commonly used as an open-tube sampler. In this configuration, coring starts at the ground surface with a sampler that is open at the leading end. The sampler is driven into the subsurface and then pulled from the ground to retrieve the soil core. In stable soils, an open-tube sampler is advanced back down the same hole to collect the next core.

In unstable soils, which tend to collapse into the core hole, the MacroCore® Sampler can be equipped with a piston rod point assembly. The point fits firmly into the cutting shoe and is held in place by a piston rod and stop-pin. The MacroCore® Piston Rod System prevents collapsed soil from entering the sampler as it is advanced to the bottom of an existing hole, thus ensuring collection of a representative sample.

Loose soils may fall from the bottom of the sampler as it is retrieved from depth. Better recovery is obtained when the core catcher is used with saturated sands and other non-cohesive soils. A core catcher should not be used with tight soils as it may actually inhibit sample recovery.

Large Bore Soil Sampler

The Large Bore (LB) Soil Sampler is a solid-barrel, piston-sealed, direct push device for collecting discrete interval samples of unconsolidated materials at depth. The assembled Large Bore Sampler is approximately 30-inches long with an OD of 1.5-inches. Collected samples measure up to 283-ml in volume in the form of a 1.0-inch by 22-inch core contained inside a removable liner. It has a 1.15-inch OD by 24-inch long removable/replaceable, thin-walled tube liner inserted inside for the purpose of containing and storing soil samples. Liner materials include brass, stainless steel, Teflon®, and clear plastic (cellulose acetate butyrate).

The Large Bore Sampler is used primarily as a discrete interval sampler; that is, for the recovery of a sample at a prescribed depth. In certain circumstances, it is also used for continuous coring.

To obtain a sample, the assembled Large Bore Sampler is connected to the leading end of a Geoprobe® rod and driven into the subsurface using a Geoprobe® Soil Probing Machine. Additional probe rods are connected in succession to advance the sampler to depth. The sampler remains sealed (closed) by a piston tip as it is being driven. The piston is held in place by a reverse-threaded stop-pin at the trailing end of the sampler. When the sampler tip has reached the top of the desired sampling interval, a series of extension rods, sufficient to reach depth, are coupled together and lowered down the inside diameter of the probe rods. The extension rods are then rotated clockwise using a handle. The male threads on the leading end of the extension rods engage the female threads on the top end of the stop-pin, and the pin is removed. After the extension rods and stop-pin have been removed, the tools string is advanced an additional 24 inches. The piston is displaced inside the sampler body by the soil as the sample is cut. To recover the sample, the sampler is retrieved from the hole and the liner containing the soil sample is removed.

4.8.3 Monitoring Well Installation

This section outlines the general procedures for monitoring well installation and typical materials utilized. The number, location, and construction details of monitoring wells will depend on the project objectives and will be discussed in the Work Plan.

4.8.3.1 Well Construction Materials

Well construction materials consist of well screen, riser pipe, sand pack, bentonite seal, cement grout, and protective casing. Specific monitoring well details may be outlined in the Work Plan. Typical well construction specifications are described below.

Well Screen and Riser Pipe

The most common materials used in the construction of monitoring wells are polyvinyl chloride (PVC) and stainless steel. Generally, PVC is used because it is less expensive and non-corrosive. However, PVC may deteriorate as a result of certain compounds. In such cases, stainless steel may be preferred. Riser pipe and well screen is typically 2-inch or 4-inch ID and has flush joint threads.

When PVC is used, wells constructed in unconsolidated materials less than 100 feet deep are constructed with Schedule 40 PVC.

Well screens are used in the construction of monitoring wells to limit sediment from entering the well. Generally, screens are machine slotted at slot sizes of 0.01 inches (10-slot) for fine materials or 0.02 inches (20-slot) for coarse materials such as coarse sand and gravel. The screen slot size should be selected to retain 90 percent of the filter pack material or native aquifer material.

Sand Pack

The sand pack consists of uniformly graded sand. A grade of sand is selected such that it will not to pass the well screen slot size and will exclude the fines from the formation. At least a 2-inch layer of sand will be placed at the bottom of the hole prior to the well installation. Sand will be placed around the well screen to a level of 2 feet above the top of the screen, site conditions permitting. In situations that require a well to straddle a shallow water table, it may be necessary to place less sand above the top of the screen to allow enough space for an adequate bentonite seal.

Bentonite Seal

The bentonite seal may consist of pure Wyoming sodium bentonite chips, pellets, or slurry. A bentonite seal expands by absorbing water, and due to its low permeability, serves to isolate the screened interval from the rest of the borehole. The bentonite seal should be at least 2 feet thick and be placed directly above the sand pack. It may be necessary to install less bentonite for shallow water table wells. Bentonite seals that are placed above the water table should be hydrated with potable water. NYSDEC guidelines specify that bentonite seals must be placed via tremie method. For deeper installations it is often more practical to tremie a bentonite slurry. In such cases, the bentonite slurry may be placed up to the ground surface in place of cement or cement-bentonite grout.

Cement-Bentonite Grout

Grout will be placed from the top of the bentonite seal to the ground surface via the tremie method. Generally, the grout consists of a cement-bentonite mixture. Cement is Portland Type 1, in conformance to ASTM specifications C150. The bentonite is powdered Wyoming sodium bentonite. Cement-bentonite grout typically consists of 94 pounds of cement mixed with 3 to 5 pounds of powdered bentonite and 7 gallons of water or a media approximating this mixture. The purpose of the grout seal is to replace material removed from the borehole during drilling and prevent collapse and subsidence around the well. Pure bentonite slurry may also be used in place of the cement-bentonite grout.

Protective Casings

Protective casings are placed around wells to prevent damage, provide security, and to provide a seal to prevent surface runoff from entering the well. They usually consist of a 4- or 6-inch diameter steel casing with a 2-3 foot stick up above the ground or a manhole road box installed flush to the ground surface (flush-mounted casing). The casings should be watertight and equipped with a locking cover. All protective casings should be labeled with the well identification. A concrete surface seal should be constructed around the protective casing at the ground surface to provide a seal and to divert surface runoff away from the well. All details of well installation will be recorded by the geologist.

4.8.4 Bedrock Monitor Well Installation

Monitor wells will be installed following National Water Well Association protocol and good engineering practices. The on-site geologist will be present during all drilling and monitor well installations to ensure that work progresses in a timely fashion. Continuous sampling of the unconsolidated sediments will be completed using split spoons. These samples will be examined to define the stratigraphy.

The on-site geologist shall log the borehole and provide an interpretation of cores, unconsolidated sediment samples, and drill cuttings. The on-site geologist shall also maintain a log of each boring including:

- Reference point for all depth measurements.
- The depth at which each change of formation occurs.
- Identification and classification of formation materials using Unified Soil Classification system for unconsolidated sediment samples.
- The number, interval, and time of sample collection.
- Identification of the bedrock type, rock quality density (RQD), fracture frequency and weathered zone by the examination of rock cores.
- Description of drilling progress.
- The number and time of each core run.
- Estimated water level, yield, and recovery rate.
- Field-screening PID readings in parts/million of each sample as logged at the time of drilling.

The bedrock monitor well will be installed using the air rotary method. A 4- to 6-inch steel casing will be sealed at least 1-foot into bedrock. The boring will be completed as an open rock well. The well will also be sealed with cement at the ground surface.

4.8.5 Well Development

Monitoring wells are developed in order to restore the natural permeability of the formation adjacent to the borehole; to permit water to flow through the screen easily. Well development removes fine sediment from the formation so, during sampling, water will not be turbid or contain suspended materials that can interfere with chemical analysis.

Shallow wells are generally developed with a bailer, a foot-valve pump, or a submersible pump. Pumping is usually a more efficient method for deeper wells. The selection of the well development methods and equipment will be determined on site by the field personnel based on drilling, well construction, and site-specific geologic information.

Well development will occur after a minimum of 24 hours following construction or after recovery is complete, whichever is later. All equipment that is introduced into the well will be decontaminated according to the procedures discussed in Section 4.4. The general procedures for well development are summarized below:

1. Measure the water level in the well with a water level indicator. The depth to the bottom of the well is measured with a weighted measuring tape.
2. A bailer or other pumping device is lowered to the bottom of the well. The well is surged by the bailer or the pump to agitate and loosen fines in the well screen and sand pack.
3. Groundwater is bailed or pumped from the well. If a pump is used, the pump intake will be periodically placed at different depths throughout the well and within the screen interval during development.
4. Readings of pH, temperature, specific conductance, and turbidity will be collected after each well volume removed or at other intervals depending upon well output and other factors pertinent to sampling.
5. Well development will continue until the field measurements stabilize. Ideally, the well should be developed to 50 Nephelometric Turbidity Units (NTU), if possible. The goal of 50 NTUs may not be practical in formations which contain a lot of silt and clay in which case the well will be developed until the turbidity readings appear to have stabilized.
6. The development tools will be removed from the well and the water level and well bottom will be measured following development.
7. The well will be covered and locked.
8. Purged water will be containerized pending subsequent sampling and handled according to the procedures outlined in Section 4.4.4.
9. All pertinent field data will be recorded on a Field Data Sheet (see Section 4.10).

4.9 Groundwater Sampling

Groundwater samples are collected from monitoring wells for laboratory analysis. The specific number and location of samples, rationale, and parameters to be tested are discussed in the Work Plan or Field Sampling Plan. The equipment and general procedures normally utilized for groundwater sampling are presented below.

4.9.1 Groundwater Sampling Equipment

Monitoring wells will be purged using one of the following pieces of equipment:

- Lubricant-free stainless steel submersible pump with polyethylene or Teflon discharge tubing.
- Peristaltic pump equipped with dedicated polyethylene tubing with or without a foot valve.
- Dedicated Teflon bailer connected to new solid-braid nylon rope.
- Inertial lift pump with dedicated polyethylene valve and tubing.

Project-specific purging methods are outlined in the Work Plan. The selection of a purging method is determined based on the following information:

1) Well depth
2) Static water level
3) Hydraulic conductivity
4) Well diameter
5) Well location

4.9.2 Procedures for Collecting Groundwater Samples

4.9.2.1 Pre-Sampling Activities

Before sampling, the following pre-sampling activities will occur:

- The well will be inspected for integrity and proper identification.
- A sheet of polyethylene will be laid out for placement of monitoring and sampling equipment, as needed.
- If site conditions are unknown, conditions warrant, or project requirements call for VOC monitoring, VOCs will be measured at the rim of the opened well with a PID and recorded in the field logbook.
- After removing the well cap, the water level will be allowed to equilibrate for a minimum of 5 minutes. The static water level in the well will be measured with a water level indicator to the nearest 0.01 feet referenced to a permanent mark on the PVC riser. The probe of the meter will be decontaminated according to the procedures detailed in Section 4.4.
- The volume of water in the well will calculated by the following equation:

  $$V = (\pi) r^2 l (7.48)$$

  where,
  V = volume, in gallons
  π = 3.14
  r = inside radius of well, in feet
  l = height of water in well, in feet
  7.48 = conversion factor for cubic feet to gallons

- If desired, the depth of any non-aqueous phase liquids (NAPLs) will be measured using an interface probe and recorded. If LNAPLs or DNAPLs are detected, the well will not be sampled. A sample of the LNAPLs or DNAPLs present may be obtained using a bailer, if appropriate.

4.9.2.2 Sampling Procedures

Low Flow Sampling:

- Install Pump: Slowly lower the pump, safety cable and tubing into the well to the depth specified for that well. The pump intake should be in the middle or slightly above the middle of the screened interval. Too close to the bottom increases the possibility that solids that have collected in the well over time will be collected in the sample. Too close to the top increases the possibility that water stored in the casing will be included in the sample. Record the depth to which the pump is lowered.

- Measure Water Level: Before starting the pump, measure the water level again with the pump in the well. Leave the water level measuring device in the well.

- Purge Well: Start pumping the well at 100 to 500 milliliters per minute (ml/min). The water level should be monitored approximately every 5 minutes. Ideally, a steady flow rate should be maintained that results in a stabilized water level (drawdown of 0.3 ft or less). Pumping rates should be reduced, if needed, to the minimum capabilities of the pump to ensure stabilization of the water level. Care should be taken to maintain pump suction and to avoid entrainment of air in the tubing. Record each adjustment made to the pumping rate and the water level measured immediately after each adjustment.

- Monitor Indicator Parameters: During purging of the well, monitor and record the field indicator parameters (temperature, specific conductance, and pH) approximately every 5 minutes. The well is considered stabilized and ready for sample collection when the indicator parameters have stabilized for three consecutive readings as follows:

  $\pm$0.1 for pH

  $\pm$3% for temperature

  $\pm$3% for specific conductance (conductivity)

  The pump must not be removed from the well between purging and sampling.

- Sample collection should be directly from the dedicated or disposable tubing, not from the flow-through cell discharge hose.

- Remove pump and tubing: After collecting the samples, the tubing must be properly discarded or dedicated to the well for resampling by hanging the tubing inside the well.

- Close and lock the well.

Sample Collection

All laboratory samples will be placed in containers according to the procedures outlined in Section 4.3.3 of this document. Drums containing purge water will be handled in accordance with Section 4.4.4.

4.10 Sediment and Shallow Soil Sample Collection

Shallow soil samples and sediment samples provide information related to the presence of contamination caused by surface releases. These samples are typically collected utilizing one of the following tools:

- Split-spoon sampler
- Hand augur
- Sampling trowel

Depending on the objectives of the sampling program, either grab samples or composite samples may be collected. Samples can be composited over various depths from one location, or laterally from several locations of the same depth. Composite samples are homogenized in a stainless steel bowl using a stainless steel mixing spoon or trowel. Grab samples to be analyzed for VOCs are collected directly from the sampling implement and are not mixed. Soil samples are placed in the appropriate laboratory jars based on the proposed analytical methods, labeled, and packed for shipment to the laboratory in a cooler with ice.

All sampling equipment will be decontaminated between sample locations according to the procedures outlined in Section 4.4.

A detailed log for each sample will be recorded in a field notebook. This record will include: time and date of sample collection, depth, location, sampler's name, sampling procedures, soil types collected, and all other pertinent observations.

The various methods for obtaining shallow soil and sediment samples are described below. Site-specific sampling objectives and procedures are described in the Work Plan.

Split-Spoon Sampling: Split-spoon samples are collected in accordance with the procedures outlined in Section 4.8.2.2.

Hand Auger Sample Collection: A hand auger is twisted into the ground by hand. The auger is generally advanced in one-half to one-foot intervals to the target depth. Samples are collected by removing the device from the hole and emptying the sample from the bucket auger into a stainless steel bowl. The sample is then homogenized according to the procedure described above. Hand augers generally have a maximum depth range of about five feet, depending on soil type and density, frequency of cobbles, depth to water, and other natural or manmade conditions.

Sampling Trowel: The use of sampling trowels will follow the same procedures as described for hand augers. However, samples are collected by hand with a stainless steel shovel, trowel, or similar instrument. The maximum depth is generally about one to two feet.

4.11 Surface Water Sampling

The procedures for surface water sampling are dependent on the depth of water, flow rate, and analytical parameters of interest. Site-specific sampling locations and methods are presented in the FSP. In general, samples are collected according to the following procedures:

- A clean sample bottle is lowered into the surface water body. Care will be taken to avoid floating debris. Samples from streams are collected with the opening of the sampling vessel facing upstream.
- If a sample collection vessel is required due to depth or flow rate, the vessel will be filled as described above. The appropriate sample container can be filled from the sampling vessel.
- Depending on the parameters being sampled, collect measurements of pH, specific conductance, and temperature from the surface water body. Details of required surface water measurements will be shown in the FSP.
- All pertinent information will be recorded in a field notebook and on a Field Data Sheet.
- The sampling location will be staked and labeled for subsequent field survey, if required by the Work Plan.

4.12 Water Level Measurements

Groundwater level measurements are taken to calculate groundwater elevations so that groundwater contour maps can be constructed. Groundwater contour maps are used to assess flow directions and hydraulic gradients.

Water levels are measured with a water level indicator to the nearest hundredth (0.01) foot. Measurements collected from monitoring wells are taken from the top of well casing. The measurement point is notched or marked indelibly on the casing.

Water levels are measured according to the following procedures:

- Check the well for proper identification.
- Inspect the integrity of the protective casing and surface seal.
- If previous data warrant, or unknown conditions exist, then monitor the ambient air in the breathing zone and at the well head while unlocking and removing the well cover.
- Using a pre-cleaned water level indicator, measure the water level to the nearest hundredth (0.01) foot from the reference mark at the top of the well riser pipe.
- Record the water level measurements in a field notebook and/or on a field data sheet along with the date and time of measurement.
- Decontaminate the water level probe between locations by rinsing it with methanol and deionized water.
- Replace the well cover and lock.

4.13. Ground Penetrating Radar

Ground penetrating radar (GPR) uses high frequency radio waves to investigate shallow geologic features (e.g. depth to the water table or depth to bedrock) and for the detection of buried objects. GPR can provide subsurface information ranging in depth from several tens of feet to inches and is useful for locating subsurface objects, utilities, and geologic interfaces.

Ground penetrating radar operates by transmitting pulses of microwave-range (0.1- to 100-cm wavelength) electromagnetic energy into the ground through an antenna (a.k.a. transducer). Some of the energy is scattered where materials with different dielectric permitivity interface. The rest of the energy passes through the interface and on to the next interface where it may be reflected or pass through to deeper interfaces. The reflected signals are received by a control unit which registers the reflections against two-way travel time in nanoseconds. The control unit typically contains an output display on which the signals are plotted in profile (radargram).

The GPR antenna is pulled slowly along the ground surface radiating energy downward into the subsurface. Reflected energy is gathered at a receiving antenna and variations in the return signal are continuously recorded. These variations are caused by wave reflections from surfaces of materials having different electrical properties. These surfaces may be geologic features (e.g., soil interfaces, changes in moisture content, voids or fractures in bedrock) or indications of human activity (e.g., buried drums, utilities, tanks).

The depth of penetration is highly site-specific and is dependent on the soil types and properties. In general, dry, sandy soils provide better data, while moist, clayey or conductive soils provide poorer results.

4.13.1 Equipment/Instrumentation

The GPR system consists of a control unit, antenna, and a graphic recording device. The antenna transmits electromagnetic pulses of short duration into the ground. Pulses are reflected back to the antenna from the various interfaces within the subsurface. The receiver sends the signal to the control unit for processing and display.

Several manufacturers produce commercially-available GPR systems. For this reason, a detailed description of instrument operation is not practical. The operator should refer to the instrument setup and operations manual to prepare the instrument for a survey. The instrumentation should be selected based on the desired target and actual field conditions. The selection of a transducer frequency will need to balance the desired depth of penetration with resolution.

4.13.2 Field Procedures

The general field procedures for conducting GPR surveys are outlined below:

- Where possible, the instrument is calibrated by burying a metal object at known depth. The instrument is then adjusted so that the readings are consistent with the true depth.

- A grid of parallel lines is established across the investigation area. The size of the grid is dependent upon the project objectives and is detailed in the FSP.

- Data are collected by slowly pulling the antenna along the survey lines. The beginning and end points of each traverse should be surveyed from a known location, which can be recovered at a future date.

4.13.3 Data Analysis

Most modern GPR systems utilize portable digital processors operating on battery (DC) power. Digital processing allows the operator to utilize filtering, stacking, and gain controls as well as manipulate them in the field. Data is typically stored in an unfiltered (raw) form that can be reviewed and processed after the survey is complete.

GPR data are evaluated qualitatively in the field as the survey progresses. Data is displayed on the GPR system and observed in profile as it is collected. Estimates of depth are automatically made by utilizing a velocity conversion factor. The velocity conversion factor is a user-entered estimate of the radar wave propagation rate through the subsurface. It is used to determine distance (depth) from the GPR antenna.

4.13.4 Data Evaluation

The propagation velocity of the EM pulse depends upon the relative dielectric permittivity of the material (e_r) through which the pulse travels. The relative dielectric permittivity is a measure of the degree to which a medium can resist the flow of the EM pulse: the higher the relative permittivity, the lower the resistance to flow, and vice versa. For most earth materials and rocks, the relative dielectric permittivity does not exceed 10 and is always greater than unity, the value for a vacuum. The table below gives typical permittivity values for commonly encountered materials.

Approximate Electromagnetic Properties of Various Materials

Material	*Relative Dielectric Permittivity*	*Pulse Velocity (ns/ft)*
Air	1	1
Freshwater	81	9
Seawater	81	9
Sand (dry)	4 – 6	2.1 – 2.4
Sand (saturated)	30	5.5
Silt (saturated)	10	3.1
Clay (saturated)	8 – 12	2.8 – 3.3
Average "dirt"	16	4
Dry sandy coastal land	10	3.1
Marshy forested flat land	12	3.5
Rich agricultural land	15	3.9
Pastoral land, hilly, forested	13	3.6
Freshwater ice	4	2
Permafrost	4 – 8	2.0 – 2.9
Granite (dry)	5	2.2
Limestone	7 – 9	2.6
Concrete	6.4	2.5
Asphalt	3 – 5	1.7 – 2.5

The dielectric permittivity is related to the propagation velocity by the formula:

$$e_r = \left(\frac{c}{V_m}\right)^2$$

where, "c" is the propagation velocity in free space ($3x10^8$ meters per second or approximately 1 foot per nanosecond) and Vm is the propagation velocity through a material. It follows that

$$(e_r)^{1/2} = \frac{c}{V_m} \quad \text{or} \quad \frac{1}{V_m} = \frac{(e_r)^2}{c}$$

Since c is approximately equal to 1 ft/ns, then

$$1/V_m \approx (e_r)^{1/2} \qquad \text{(Formula 1)}$$

Where units are in ns/ft (one-way travel time).

Formula 1 gives a method for estimating the propagation velocity for a medium (and therefore the depth to a reflecting horizon) if the soil conditions are known. If they are unknown or their properties cannot be estimated accurately enough, a reflector of known depth can often be used to calibrate the GPR recordings to site conditions.

Approximate Depth Ranges for Various Antenna Frequencies

Frequency (MHz)	**Minimum Target Size (m)**	**Approximate depth range (m)***
100	0.1-1	2-15
250	0.05-0.5	1-10
500	0.04	1-5
800	0.02	0.4-2

4.14 Soil Vapor Sampling

Soil vapor sampling will be conducted in accordance with the NYSDOH Guidance for Evaluating Soil Vapor Intrusion, Final October 2006.

Soil vapor samples are collected outside, and not beneath the foundation or slab of a building (addressed separately in section 4.15), to determine whether there is soil vapor contamination, to characterize the nature and extent of soil contamination, and to identify possible sources of contamination. The results are often used to evaluate the potential for current and future human exposures and to determine the effectiveness of measures implemented to remediate contaminated subsurface vapors.

4.14.1 Sample Probe Installation

Samples at depths less than 5 feet below the ground surface (bgs) are prone to negative bias from infiltration of outdoor air and should only be collected when deeper samples are not feasible.

Soil vapor probe installation can be permanent, semi-permanent, or temporary. Permanent probes are preferred for data consistency. Soil probes should be constructed in the same manner at all sampling locations to minimize possible discrepancies. The following procedures should be used when constructing and installing soil probes:

- Direct-push technology is the preferred method of installing sample probes. When necessary, an auger could be used.

- Porous backfill material (i.e. coarse sand, glass beads) should be used to create a sampling zone of 1 to 2 feet in length.
- Implants/probes should be fitted with VOC-inert tubing (i.e. polyethylene, stainless steel, or Teflon®) of the appropriate size (typically $^1/_8$-inch to $^1/_4$-inch diameter) that is of laboratory or food grade quality.
- The probes should be sealed above the sampling zone with bentonite slurry for a minimum distance of 3 feet to prevent outdoor air infiltration. The hole should be filled with clean material.
- For multiple probe depths, the borehole should be grouted with bentonite between probes to create discrete sampling zones.
- For permanent installations, a protective casing should be set around the top of the probe tubing and grouted in place to the top of the bentonite to minimize infiltration of outdoor air, as well as to prevent accidental damage to the probe.

4.14.2 Soil Vapor Sample Collection

Soil vapor samples should be collected in the same manner at all locations to minimize discrepancy and should include the following:

- Samples should be collected a minimum of 24 hours after the installation of permanent probes, and shortly after the installation of temporary probes.
- One to three implant volumes (volume of sample probe and tube) must be purged prior to sample collection.
- Flow rates for purging and collecting must NOT exceed 0.2 liters/minute to minimize outdoor air infiltration.
- Use conventional sampling methods, in an appropriate container that meets the requirements of the sampling and analytical methods and has been certified to be clean by the laboratory.
- Sample size is dependent on the volume needed for laboratory minimum reporting limits.
- Tracer gas (i.e. helium, butane, or sulfur hexafluoride) must be used to verify that outdoor air infiltration is not occurring. Once verified, continued use of the tracer gas may not be necessary. Two approaches can be selected when using a tracer gas:
    - Include the tracer gas in the list of laboratory analytes.
    - Use a portable field monitoring device to analyze the sample for the tracer gas.

4.15 Sub-Slab Vapor Sampling

Sub-slab vapor samples are collected to characterize the nature and extent of soil vapor contamination immediately beneath a building with a basement foundation and/or a slab-on grade. The sample results are used when evaluating current and potential for future human exposures, and site specific attenuation factors (i.e., the ratio of indoor air to sub-slab vapor concentrations). Sub-slab vapor samples are collected after soil vapor characterization and/or other environmental sampling (soil and groundwater characterization). Sub-slab samples are typically collected concurrently with indoor and outdoor samples. However, outside of the heating season, sub-slab vapor samples may be collected independently depending on the sampling objective.

Sub-slab vapor samples and, unless there is an immediate need for sampling, indoor air samples are typically collected during the heating season because soil vapor intrusion is more likely to occur when a building's heating system is in operation and air is being drawn into the building.

4.15.1 Investigation Considerations

Existing environmental data, site background information, and building construction details should be considered when selecting buildings and locations within buildings for sub-slab vapor sampling. At a minimum, these general guidelines should be followed:

- Buildings located above or directly adjacent to known or suspected areas of subsurface VOC contamination should be sampled;
- Buildings in which positive responses with field equipment were obtained should be sampled; and
- Buildings with known or suspected areas of subsurface VOC contamination that are used or occupied by sensitive population groups (i.e. daycares, schools, etc) should be given special consideration for sampling.

Investigations of sub-slab and/or indoor air contamination should proceed outward from known or suspected sources, as necessary, on an aerial basis until potential and human exposures have been adequately addressed. Samples should be collected in a central location away from the foundation footings, and from the soil or aggregate immediately below the basement or slab and the number of samples will depend on the number of slabs.

4.15.2 Sub-Slab Vapor Probe Installation and Sampling

Prior to the installation of the sub-slab vapor probes, the building floor will be inspected within 25 feet of the proposed sampling area and the location of any penetrations such as cracks, floor drains, utility perforations, or sumps will be noted and recorded. The probes will be installed at locations where the potential for ambient air infiltration via floor penetrations is minimal and may be adjusted from the proposed locations based on any floor inspection findings. Sub-slab vapor probe installation can be either permanent, semi-permanent, or temporary. Sub-slab probes should be constructed in the same manner at all sampling locations to minimize possible discrepancies and as described in section 4.14.1 above, Sample Probe Installation)

Sub-slab samples should be collected in the following manner:

- The probes will be purged of 1 to 3 volumes (i.e., the volume of the sample probe and tube) prior to collecting the samples;
- Environmental Protection Agency Method TO-15 will be followed when collecting and analyzing samples;
- The samples will be collected in a 6-liter Summa® canister over a 4- or 8-hour sampling period in order to achieve a detection limit of 0.25 micrograms per cubic meter (ug/m^3);
- The flow rates for both purging and collecting will not exceed 0.2 liters per minute; and
- The Summa® canisters will be certified as clean by the laboratory;
- If possible, samples will be collected over the same period of time as concurrent indoor and outdoor air samples.

The heating systems in each building, if functional, will have been in operation for at least 24-hours prior to and during the sample collection period at a normal indoor temperature typically between 65^0 and 75^0F. Additionally, a pre-sampling building inspection should be performed prior to each sampling event to identify and minimize conditions that may interfere with proposed testing.

4.16 Indoor Air Sampling

Indoor air samples are collected to characterize exposures to air within a building. Like sub-slab vapor sampling, indoor air sampling results are used when evaluating current and the potential for future human exposures, and site-specific attenuation factors. Indoor air samples are collected concurrently with sub-slab vapor and outdoor air samples. Some site-specific situations may warrant indoor air samples without concurrent sub-slab vapor and outdoor air samples. Additionally, Indoor and outdoor air samples may be collected without sub-slab vapor samples when confirming the effectiveness of a mitigation system.

4.16.1 Investigation Considerations

Similar to soil vapor and sub-slab vapor sampling, existing environmental data, site background information, and building construction details should be considered when selecting buildings and locations within buildings for sub-slab vapor sampling. At a minimum, these general guidelines should be followed:

- Where sub-slab vapor samples were collected without indoor air samples, buildings in which elevated concentrations of contaminants were measured in sub-slab vapor samples should be sampled;
- Buildings located above or directly adjacent to known or suspected areas of subsurface VOC contamination should be sampled;
- Buildings in which positive responses with field equipment were obtained should be samples; and
- Buildings with known or suspected areas of subsurface VOC contamination that are used or occupied by sensitive population groups (i.e. daycares, schools, etc) should be given special consideration for sampling.

To characterize contaminant concentration trends and potential exposures, indoor air samples should be collected from:

- The crawlspace area
- Basement (where vapor infiltration is suspected or in a central location) at a height approximately three feet above the floor
- The lowest level living space (in centrally-located, high activity-use areas) at a height of approximately three feet above the floor
- Or if in a commercial setting, from multiple tenant spaces at a height of approximately three feet above the floor

Investigations of indoor air contamination should proceed outward from known or suspected sources, as necessary, on an aerial basis until potential and human exposures have been adequately addressed.

4.16.2 Indoor Air Sampling

During colder months, the heating systems in each building will have been in operation for at least 24-hours, if operable, prior to and during the sample collection period at a normal indoor temperature typically between 65^0 and 75^0F. If possible, a pre-sampling inspection should be preformed.

In general, indoor air samples should be collected in the following manner:

- Sampling duration should reflect the exposure scenario without compromising the detection limit or sample flow collection rate (e.g. an 8 hour sample from a workplace with a single shift versus a 24 hour sample from a workplace with multiple shifts). Samples should be collected for at least one hour. If the goal is to represent an average concentration over a longer period of time, then longer duration sampling periods may be appropriate.

- Personnel should avoid lingering in the immediate area of the sampling device while the samples are being collected

- Sample flow rates must conform to the specifications in the sample collection method, and if possible, be consistent with the flow rates for concurrent outdoor and sub-slab samples;

- Samples must be collected using conventional sampling methods, in an appropriate container which meets the objective of the samples and one that is certified clean by the laboratory.

At sites with tetrachloroethene contamination, passive air monitors that are specifically analyzed for tetrachloroethene (i.e. perc badges) are commonly used to collect indoor and outdoor air samples.

4.17 Outdoor Air

Outdoor air samples are collected to characterize site-specific background outdoor air conditions. Outdoor air sampling results are primarily use when evaluating the extent to which outdoor sources may be influencing indoor air quality. They may also be used in the evaluation of soil vapor results.

Typically, outdoor air samples are collected at each location where an indoor air sample is collected (e.g. near each tenant space sampled). Outdoor samples should be collected in a representative upwind location, away from wind obstructions, and at a height of 3 to 5 feet. A representative sample is one that is not biased towards obvious sources of VOC.

4.17.2 Outdoor Air Sampling

Outdoor air samples must be collected simultaneously with indoor air samples, and may also be collected concurrently with soil vapor samples. Outdoor samples must be collected in the same manner as indoor air samples (see Section 4.16.2 above).

4.18 Vapor Intrusion Assessment Documentation/Considerations

The following should be considered during a soil vapor sampling event and may influence the interpretation of the results:

- If sampling near a building, uses of VOC-containing products during normal operations of the facility should be identified.
- Outdoor sketches, including site, streets, nearby facilities, and outdoor ambient air sample locations (if appropriate) should be drawn.
- Weather conditions should be noted for 24-48 hours prior to sampling events.
- Pertinent observations (odors, field screening readings) should be recorded.
- Use of HVAC systems during sampling (sub-slab and indoor air);
- A floor sketch of each building that includes the floor layout with sample locations, chemical storage areas, garages, doorways, stairways, location of basement sumps or subsurface drains and utility perforations through building foundations, HVAC system air supply and return registers, compass orientation (north), and any other pertinent information;

A sample log sheet should be maintained to include:

- Sample ID
- Sample date and time
- Sampler ID
- Sampling Methods/devices
- Purge volume
- Volume of vapor sample
- For canisters, the vacuum reading before and after sample collection
- Apparent moisture content of sampling zone
- Chain of Custody procedures used to track sample

4.19 Vapor Intrusion QA/QC Precautions and Laboratory Analytical Methods

On the day of sample collection activities, the person collecting the samples should avoid the following: fueling vehicles, use of permanent markers, wearing freshly dry-cleaned clothing, wearing perfumes, and any other activity where the use of VOCs could contaminate the samples. Proposed analytical procedures are identified in the Work Plan. TO-15 for VOCs is the preferred laboratory analytical method.

5.0 DOCUMENTATION / CHAIN OF CUSTODY PROCEDURES

5.1 Chain of Custody

Chain-of-Custody (COC) procedures are followed to insure that sample integrity is maintained throughout the sampling and analysis process and that all samples collected are accounted for at all times. The COC process begins when the sample is collected and carries on throughout the analytical laboratory operations. The field team member responsible for the collection of the samples acts as the initial sample custodian.

A sample is considered “in custody” of an individual if it is either in direct view of, or directly controlled by, that individual. Chain-of-Custody transfer is accomplished when the samples or sealed sample containers are directly transferred from one individual to the next. At the time of transfer, the first individual witnesses the signature of the receiver on the COC record. The objective of the COC program is to ensure that:

- Samples are protected from loss or damage.
- The correct samples are analyzed.
- All samples are uniquely identified.
- Samples are traceable to their records.
- Documentation of sample handling procedures including: sample location, sample number, number of sample containers, and the COC process.
- A signed COC record is included for each sample shipment, documenting contents of the shipment. The COC record indicates the following information:
  - Site name
  - Sample Identification Numbers
  - Date and time of collection
  - Sample type (e.g., groundwater, soil, etc.)
  - Number and type of containers per sampling location
  - Parameters requested for analysis for each container
  - Signature of person(s) involved in the chain-of-possession
  - Description of sample bottles and their condition
  - Problems associated with sample collection (i.e., breakage, no preservatives), if any.
  - Sample Delivery Group (SDG) ID (assigned by the laboratory on receipt of samples). The SDG is a group of up to 20 discrete samples (not including the QA/QC samples) of the same environmental media collected from the same project Site over not more than seven consecutive days and submitted for analysis by the same laboratory analytical methods and procedures. A separate chain-of-custody must be prepared for each day of sampling. If, at the end of a given day you do not have enough samples (20) to complete an SDG and will be returning within the next six days to collect more samples; place a note in the comment section of the COC that says: “Hold SDG open: Additional Samples Pending”. When the SDG is complete, in the comment section of the COC add note: “SDG complete”. If this SDG is the last set of samples from a specific sampling event, also add a note in the comment section that says: “Sampling Complete; no additional sample shipments pending at this time.”

The COC records are printed on triplicate forms. One copy is retained by The Chazen Companies when the samples are taken into custody by either a shipping agency or the lab. A second copy is kept by the analytical lab. The third copy is returned to Chazen with completed lab results.

5.1.1 Sample Tracking

A copy of all COC records is also maintained in a project file. Pertinent COC information is recorded in the file, as well as follow-up correspondence with the laboratory, via telephone or mail, indicating receipt of the samples, breakage, turnaround time, or any problems with the shipment. As analytical data are received, the file is updated to reflect the new information. Turnaround times are compared to protocols to ensure quality control. Missing data or invalid samples are addressed by the Field Operations Leader or the Project Manager.

5.1.2 Laboratory Operations

Specific laboratory Standard Operating Procedures used during the investigation are provided by the selected analytical laboratory. These procedures include sample tracking, methods for collection and handling of laboratory blanks, laboratory duplicates, matrix spikes, laboratory control samples, and surrogates. Maximum/minimum holding times and data reporting procedures are also defined by the laboratory.

5.2 Analytical Sample Shipping

Sample containers are packed in coolers. Bottles are packed tightly in materials such as Styrofoam, vermiculite, and/or “bubble pack” to minimize motion. Ice placed in zip-lock bags and can be added to the cooler to cool the samples to around 4° C. All paperwork is sealed in a separate zip-lock bag and placed in the cooler which is then taped shut. The samples are shipped to the laboratory together with the COC documents.

The standard procedure followed for shipping environmental samples to the analytical laboratory is:

1) Samples are shipped by courier or equivalent overnight delivery service.
2) Samples are shipped to the laboratory within 24 to 48 hours of collection.
3) Prior to leaving the field, the Analytical Lab is notified of the number, type, collection date, and shipment dates for samples. Notification to the Lab also occurs when sample shipments will arrive on a Saturday. This communication is critical to allow the laboratory enough time to prepare for the samples’ arrival.
4) If prompt shipping and laboratory receipt of the samples is not possible, (i.e., Sunday arrival), members of the Field Team are responsible for proper storage of the samples until adequate transportation arrangements can be made.
5) Field Operations Leader or his/her designee ensures that samples collected by the client are entered into the project sample log.

6.0 CALIBRATION PROCEDURES

This section details the calibration and operating procedures for the field and laboratory analytical instruments that will be used during this investigation.

6.1 Field Instruments

Field instrumentation is calibrated according to the manufacturer's instructions to ensure that accurate field data are collected. Each piece of equipment is calibrated daily prior to use or as specified by the manufacturer. More frequent calibration may be performed when accuracy of the equipment becomes suspect or under extreme field conditions. Calibration information is recorded in the same field notebook in which the field instrument readings will be recorded. The recorded calibration includes:

- Name of instrument
- Instrument serial number
- Date of calibration
- Observations and results of calibration
- Calibration gas used, if applicable
- Buffer solutions used, if applicable
- Specific calibration procedures and operating instructions are detailed below.

6.1.1 pH Meters

pH is the measure of the acidity or alkalinity of a solution. It is defined as the negative logarithm of the hydrogen ion activity. Hydrogen ion activity is related to the hydrogen ion concentrations, which in relatively weak solutions are nearly equal. For practical purposes, pH is the measure of the hydrogen ion concentration.

The operation of a pH meter relies on the same principal as many other ion-specific electrodes. Measurement relies on establishment of a potential difference in the response to hydrogen ion concentration across a membrane in the electrode. The membrane is conductive to ionic concentrations, which in combination with a reference electrode (which can be combined into a single "combination" electrode), can generate a potential difference proportional to the hydrogen ion concentration.

Variation in temperature will effect the association of hydrogen and hydroxide ions, which without proper compensation will affect the pH. pH meters have several controls to compensate for the variations between electrodes and the different responses to changes in temperature.

It is very important to obtain a pH measurement as soon as possible after sample collection, since temperature changes, precipitation/dissolution reactions, and sorption of carbon dioxide from the air all affect the pH of a solution.

Because of the great variety of pH meters available, operators should refer to the manufacturer's instruction manual for specific calibration, operation, and troubleshooting procedures for their instrument. The following general procedure is used for measuring pH in the field with a pH meter:

- The pH meter is calibrated at each sample site.
- The instrument and batteries are checked prior to the initiation of the field effort. pH electrodes are kept moist at all times.
- Buffer solutions used for calibration are checked since buffer solutions will degrade upon exposure to the atmosphere.
- Generally, 4.00 and 7.00 pH buffers are selected for calibration.
- All electrolyte solutions within the electrode(s) are filled to their proper levels and no air bubbles are present within the electrode(s).
- The electrodes are immersed in a pH-7 buffer solution.
- The temperature compensator is adjusted to the proper temperature (on models with automatic temperature adjustments, immerse the temperature probe into the buffer solution). Alternatively, the buffer solution may be immersed in the sample and allowed to reach temperature equilibrium before equipment calibration. It is best to maintain buffer solution at or near expected sample temperature before calibration.
- The pH meter is adjusted to read 7.0.
- The electrodes are removed from the buffer and rinsed well with deionized water. The electrodes are immersed in pH-4 (or pH-10 buffer solution) and the slope control is adjusted to read the appropriate pH. To check the calibration, three successive readings are taken, one minute apart, to see that readings are within ±0.1 pH unit.
- The electrodes are immersed in the unknown sample, slowly stirring the probe until the pH stabilizes. Stabilization may take several seconds to minutes. If the pH continues to drift, the sample temperature may not be stable, a chemical reaction (e.g., degassing) may be taking place in the sample, or the meter or electrode may be malfunctioning. This must be clearly noted in the logbook.
- The pH and temperature of the sample are read and recorded. pH is recorded to the nearest 0.1 pH unit.
- The electrodes are rinsed with deionized water.

6.1.2 Specific Conductance Meters

Conductivity is a numerical expression of the ability of a water sample to carry an electric current. This value depends on the total concentration of ionized substances dissolved in the water and the temperature at which the measurement is made. It is important to obtain a specific conductance measurement soon after sample collection since temperature changes, precipitation reactions, and sorption of carbon dioxide from the air affect the specific conductance.

Specific conductance can be used to identify the direction and extent of the migration of contaminants in groundwater and surface water. It can also be used as a measure of subsurface biodegradation or to indicate alternate sources of groundwater contamination.

A conductance cell and a Wheatstone Bridge (for the measurement of potential difference) may be used for measurement of electrical resistance. The ratio of current applied to voltage across the cell may also be used as a measure of conductance. Depending on ionic strength of the aqueous solution to be tested, a potential difference is developed across the cell which can be converted directly or indirectly (depending on instrument type) to a measurement of specific conductance.

Because many conductivity meters are available, operators should refer to the manufacturer's instruction manual for specific calibration, operation, and troubleshooting procedures. The following general procedure is used for obtaining specific conductance measurements:

- The conductivity meter is calibrated at the start of each sampling day or more frequently if deemed necessary.
- Batteries are checked before going into the field.
- The instrument is calibrated using a potassium chloride standard solution by completely immersing the electrode into the solution. The temperature of the calibration solution is checked and the temperature dial is adjusted on the meter (if not self-compensating). Calibration measurements and time are recorded in the field logbook.
- The umho value of the solution is checked in terms of the temperature. The Cell Constants dial is adjusted until the display reads the appropriate value.
- The electrode is rinsed with one or more portions of the sample to be tested.
- The electrode is immersed in the sample and the temperature and the conductivity are measured.
- The results are noted in the field logbook.
- If the specific conductance measurements become erratic, or inspection shows that any platinum black has flaked off the electrode, replatinization of the electrode is necessary. See the manufacturer's instructions for details.

6.1.3 Photoionization Detector

For monitoring total ambient air quality during field activities and for conducting static headspace testing, Chazen uses a MiniRae PID. This instrument measures total VOC concentrations. The operating and calibrating procedures for this instrument follow.

A MiniRAE Model 2000 or 3000 PID (hereafter simply MiniRAE) can be used to detect a variety of trace gases, particularly VOCs. The MiniRAE uses the principle of photoionization to detect and measure the VOC concentrations in the atmosphere or from a sample.

The MiniRAE operates using an electrodeless discharge ultraviolet (UV) lamp as the high-energy photon source. As organic vapors pass by the lamp, they are photo-ionized and the ejected electrons are detected as a current. The PID sensor with a standard 10.6 eV lamp detects a broad range of organic vapors. In principle, any compound with ionization energy lower than that of the lamp photons can be measured.

The following procedure is used for operating and calibrating the MiniRAE 2000:

- Press and hold the MODE key for one second and release to turn on the MiniRAE 2000. The audio buzzer will beep once and the air pump will turn on. The display will show "ON"
- To turn off the MiniRAE 2000, press and hold the MODE key for 5 seconds. The monitor will beep once per second during the power-down and the message "OFF" will flash and the screen will go blank.
- After the monitor is turned on, it runs through the start up menu and then a "READY…" message is displayed. At this point the user can either 1) step through the operation menu or 2) take a measurement.
- In the first menu of the programming mode, the user can calibrate the MiniRAE 2000. The calibration is a two-point process using "fresh air" and the calibration gas (Isobutylene)
- Calibration Process

- Press and hold down both the [N/-] and MODE keys for three seconds to enter the programming mode; the first menu item is "Calibrate/select Gas"
- The Fresh Air calibration determines the zero point of the sensor calibration curve. If a fresh air source from a cylinder or tedlar bag is not available, any clean ambient air without detectable contaminant or a charcoal filter can be used.
- The first menu shows "Fresh Air Cal?"; make sure the instrument is connected to the fresh air source; press the [Y/+] key, the display will show "zero in progress", flowed by "wait.." and a countdown timer; after a pause, the display will show the message "zeroed…reading= x.x. ppm…"; press any key or wait about 20 seconds, the monitor will return back to the submenu.
- For the second point of the sensor calibration, a cylinder of span gas (Isobutylene) fitted with a 500 cc/min. flow limiting regulator is attached to the instrument.
- Press the [Y/+] key at the "Span Cal?" to stat the calibration. The display shows the gas name and the span value of the corresponding gas; the display will show "Apply gas now" at which point the valve will be turned to open the gas supply.
- The display with ask you to wait 30 seconds. When the count down timer reaches 0, the display will show the calibrated value. Turn off the flow to gas and disconnect the span gas. Press any key

- To record measurements
  - Press the [Y/+] key to start a measurement in survey mode
  - Instantaneous readings in ppm are updated every second
  - To stop measurements press the MODE key and the display shows STOP. Press [N/-] to continue measurement

Methods of operation and calibration for the MiniRAE 3000 are similar to those for the MiniRAE 2000. The MiniRAE is calibrated once per day or more frequently, if necessary. The MiniRAE is used to monitor the breathing zone for health and safety precautions or to screen samples by placing the probe near suspected sources of contaminants.

6.1.4 Airborne Particulate Matter Meters

For monitoring airborne particulate matter (i.e., dust) during field activities, Chazen uses an MIE, Inc. Personal Data-logging Real-time Aerosol Monitor (*personal*DataRAM). This instrument provides direct and continuous data measurements and is a high sensitivity nephelometric monitor optimized for the measurement of the respirable fraction of airborne dust emitted from ground intrusive work or work that has the potential to produce dust. The following procedures are used for calibrating and operating the *personal*DataRAM:

- Calibration/Zeroing Process
  - Conduct zeroing in a particle-free environment such as a *personal*DataRAM Z-Pouch, a clean room, a duct or area directly downstream of a HEPA filter, or the MINIRAM Z-Bag. The following instructions are for the Z-Pouch.
  - Wipe the outside surfaces of the instrument to remove as much dust as possible, then in a reasonably clean area, open the zipper of the Z-Pouch and place the unit inside.
  - Open the small nipple of the Z-Pouch and insert the fitting of the hand-pump/in-line filter unit into the nipple. Start pumping the hand-pump until the Z-Pouch begins to bulge slightly.
  - While continuing to pump, press ENTER and keep pumping slowly while ZEROING is displayed for 1.1 minutes followed by CALIBRATION: OK. If screen shows BACKGROUND HIGH or MALFUNCTION, consult instruction manual.

- To set up a run and scroll logging/operating parameters, press NEXT when screen shows READY: NEXT.
- After completing zeroing process, remove the *personal*DataRAM from the Z-Pouch, close the zipper and flatten the Z-Pouch while plugging its nipple to prevent dust contamination in the Z-Pouch.

- Operating Process
  - To enable the logging function, press ENTER when screen shows LOGGING DISABLED.
  - LOG INTRVL 600s indicates that logging is enabled (in this example for 10-minute log period). Press ENTER.
  - At ALARM: OFF press ENTER to toggle through alarm modes.
  - Press NEXT to move through the calibration factor screen and battery charge screen.
  - Press NEXT at CONNECT TO PC, then again to return to ready mode (this will enable data to be downloaded).
  - Press ENTER at LOG INTRVL with TAG # displayed. Concentration screen will be displayed after three seconds. Pressing NEXT will successively scroll to show various run values.
  - Press EXIT to terminate the current run, then ENTER to return to Ready mode.

6.1.5 XRF Analyzer

For field screening of select metals in soil, Chazen uses a Niton XL2 GOLDD, which utilizes a Thermo-Scientific x-ray tube. The operating and calibrating procedures for this instrument follow. See the HASP for information on safely using the XRF.

The following procedure is used for transporting, operating and calibrating the Niton XL2 GOLDD:

- For shipping, the battery pack is disconnected from the analyzer, and then the XRF is shipped in its carrying case and an over-pack to protect the sensitive measuring equipment inside the analyzer. There are no X-ray tube specific US Department of Transportation (DOT) or International Air Transport Association (IATA) radiation regulations regarding shipping the Niton XL2 analyzer.
- After turning on the XRF, wait five minutes for electronics to stabilize.
- From the Main Menu, select the System Check icon the Yes. This will calibrate the XRF and verify that it is operating to specifications.
- Select the Main Range filter which provides optimum sensitivity for manganese (atomic number 25) through bismuth (atomic number 83), which will also capture lead (atomic number 82).
- Set element ranges.
- Place soil sample in a sealable plastic bag to provide an approximately 2-inch-square section. Place the analyzer against the bag so the x-ray beam shutter is covered, then press and hold trigger, and release trigger after analysis. Log results.
- As a QC check, measure the supplied reference calibration check sample at least once per shift. If correct, continue work. If incorrect, redo System Check and re-take the previous two hours of readings.
- If the XRF is lost or stolen, immediately contact Matthew Williams (Chazen) at 518-266-7313 and Eco-Rental Solution (866-843-2165 or 914-400-0324), and the local police (911).

6.2 Laboratory Equipment Calibration

The Laboratory's Project Manager will be responsible for the operation and calibration of laboratory analytical instruments in accordance with the schedules and procedures specified by the NYSDEC ASP (Analytical Services Protocol).

The laboratory calibration procedures are addressed in the QA documents for the laboratory subcontractor.

7.0 ANALYTICAL PROCEDURES

Laboratory analyses will be scheduled based on historic information regarding potentially hazardous material disposal, previous site information, review of data objectives, and NYSDEC criteria. Specific parameters will be outlined in the Work Plan.

7.1 Analytical Laboratory

All sample analyses will be performed by a laboratory certified by the New York State Department of Health (NYSDOH). In order to provide legally defensible data, selected analytical procedures to be used will be in accordance with the most recent NYSDEC ASP. Laboratory analytical parameters will be based on previous site information, as well as data quality objectives and applicable NYSDEC criteria. The sampling program and related analytical methods are documented in the FSP. All samples will be received by the laboratory within 48 hours of collection.

8.0 DATA REDUCTION, VALIDATION, AND REPORTING

Independent third party data validation will be utilized. Data will be validated using the NYSDEC ASP Revision 12/91 and the USEPA Region II Functional Guidelines. The details supporting an independent validator's selection, describing how the individual is independent from the project, will be set forth in the Work Plan or other supplementary documentation.

8.1 Data Reduction

Data reduction is the conversion of raw data into a useful form from which conclusions can be made and presented. Raw data may consist of field data, which are real-time measurements, and technical data, which includes field and laboratory analytical data. Raw field data (e.g. PID readings) will be compared to laboratory analytical results which will be compared to site-specific criteria.

8.2 Data Validation

Data validation is the process of reviewing data and accepting it or rejecting it on the basis of sound criteria.

Records of all data will be maintained, even those judged to be "outlying" or spurious values.

The principle criteria that will be used to validate the integrity of the data during collection and reporting should be modeled from the following EPA guidance documents:

- "National Functional Guidelines for Organics Review", (USEPA, June, 1991)
- "Laboratory Data Validation, Functional Guidelines for Evaluating Inorganic Analyses", (USEPA, October, 1989)
- "NYSDEC ASP Revision 12/91"

8.2.1 Field Data Validation

Field data will be validated at the time of collection by following standard procedures and QC checks and after the data is reduced to review data sets for anomalous values. The objectives of field data validation are as follows:

- Adherence to approved site-specific plans.
- Standard operating procedures are followed.
- Sufficient sample volume is obtained, sample integrity is maintained, all required analyses are conducted, and all applicable field QC samples are provided with each sample set.
- Complete chain-of-custody documentation is maintained throughout the duration of the field effort.
- Maximize data consistency between field personnel by random checks of sampling and field conditions by supervisory personnel.

8.2.2 Laboratory Data Validation

Laboratory data verification will be performed by qualified individuals appointed by the analytical laboratory. Data verification will involve routine audits of the data collection and flow procedures and monitoring GC sample results. Results from the analysis of project and blind audit QC samples will be calculated and evaluated as reported. Immediate corrective action will be taken if these results indicate data quality problems.

An individual independent from the project (i.e., third party data validator) will conduct a data validation of the laboratory data and prepare a Data Usability Summary Report (DUSR). Independent validation will be according to criteria such as:

- Holding times
- Instrument tuning and performance
- Calibration
- Blanks
- Surrogate recoveries
- Matrix spike and matrix spike duplicate recoveries

8.3 Reporting

When required for a project, Category B Deliverables will be supplied for laboratory analysis. Validated field and laboratory data will be presented in a final report in the form of tables and/or figures. Figures may include planimetric maps, cross sections, and contour maps. All supporting data, such as raw field and laboratory analytical data, will be presented as an appendix to the final report. Electronic files may be provided in lieu of hardcopies.

9.0 INTERNAL QUALITY CONTROL PROCEDURES

Quality control (QC) checks will be performed to ensure the collection of representative and valid data. QC checks provide the mechanisms by which the quality assurance objectives are monitored.

9.1 Field Quality Control

Field quality control measures will be conducted in accordance with the NYSDEC RCRA Quality Assurance Project Plan Guidance dated March 29, 1991. The field QC checks that will be used are listed and described as follows.

9.1.1 Documentation

All activities must be properly documented including: sampling procedures, decontamination activities, chain-of-custody procedures, equipment calibration, and justification for all actions taken contrary to the approved QAPP, Work Plan, and FSP.

9.1.2 Blank and Duplicate Samples

Three types of blanks can used during sampling: trip blanks, field blanks and equipment blanks. These are discussed below.

<u>Trip Blanks</u>: Trip blanks are for assessing the potential for contaminating aqueous samples with VOCs during sample shipment. The trip blank consists of a VOC sample container shipped to the site with the other VOC sample containers either filled with reagent water at the lab or filled on-site with reagent water. Trip blanks will be used so as to maintain a 1:20 ratio of blanks to samples or with each shipment, whichever is greater. Non-aqueous samples do not require trip blanks.

<u>Field Duplicates (Replicates)</u>: When required, field duplicates of soil, sediment, and groundwater samples will be submitted for analysis of all site-specific parameters at a rate one every 20 samples collected for analyses. These duplicates are intended to assess the homogeneity of the sampled media and the precision of the sampling protocol. True duplicates of soil, sediment, and solid waste samples; however, are not possible because chemicals are typically not uniformly distributed.

<u>Equipment Blanks</u>: Equipment blanks, sometimes called rinsate blanks, are collected during each field event at a rate of one per day. VOC, SVOC, or inorganics present within or on the sampling apparatus where intimate contact with the sample occurs (i.e., split-spoon, trowel) are assessed by rinsing the sampling apparatus with ASTM Type II water following decontamination. Rinsate blanks are collected directly into the appropriate water container.

<u>Matrix Spike/Matrix Spike Duplicates (MS/MSD)</u>: For some projects, the NYSDEC ASP requires the laboratory to analyze MS/MSDs for organic analyses at a frequency of five percent. To meet this requirement, the Field Operations Leader will select samples for MS/MSD analyses and will provide additional sample volume to the laboratory.

<u>Temperature Blanks</u>: Temperature blanks are for ensuring that the samples have arrived at the lab at 4°C. The lab will check the temperature of the Temp Blank on arrival and write it on the COC when logging in the samples.

9.1.3 Completeness

Completeness of scheduled sample collection is controlled in the field by comparing a pre-sampling inventory with samples actually collected each day. Daily checking of field data sheets and comparison of transport and COC logs provides further control of documentation and completeness.

9.1.4 Field Analytical Quality Control

QC checks are performed on field measurement systems that emulate laboratory measurement systems (e.g., XRF analyzer).

9.2 Laboratory Analytical Quality Control

Data from QC samples (e.g., blanks, spiked samples) will be used as a measure of performance and as an indicator of potential sources of cross-contamination. In some cases, quality control data and records will be submitted to the data validator. Laboratory analytical quality control will be in accordance with the requirements outlined in the NYSDEC RCRA Quality Assurance Project Plan.

10.0 PERFORMANCE AND SYSTEM AUDITS

10.1 Systems Audit

System audits are performed to ensure that the QA/QC procedures are being followed. These audits include a careful evaluation of both field and laboratory control procedures.

Organization and Personnel: The project organization is reviewed for compliance with the proposed organization and for clarity of assigned responsibility. Personnel assigned to the project will be placed so that responsibility, skill, and training of the personnel are properly matched.

Facilities and Equipment: The audit will address whether field equipment and analytical instruments are meeting requirements specified by the project objectives stated in the Work Plan. Equipment and facilities provided for personnel health and safety may also be evaluated. Calibration and documentation procedures for instruments will also be verified.

Analytical Methodology: A review of analytical methodology with regard to the data requirements for the project will be performed. An on-site observation of analyst technique, data reduction, and record keeping may be performed if determined necessary. Periodic review of precision and accuracy of data will be performed.

Sampling and Sample Handling Procedure: An audit of scheduled samples versus samples collected versus samples received for analysis may be performed. Field documentation may be reviewed. If deemed necessary, a site visit will be made to document that designated control procedures are practiced during sampling activities.

Data Handling: During a system audit, the QAM will review data handling procedures with the TLs. Accuracy, consistency, documentation, and appropriate selection of methodologies will be discussed:

10.1.1 Field Systems Audit

Field systems audits are performed by QA personnel to compare field practices with standard procedures. These audits focus on such things as:

- Compliance with Work Plan
- Proper working order of field equipment
- Documentation procedures
- Field team efficiency
- Level of QA conducted by field members
- Proper sample packaging and shipping

10.1.2 Laboratory Systems Audit

Laboratory systems audit are conducted to ensure that measurement systems are properly maintained and used. Laboratory records and procedures may be reviewed for completeness, accuracy, precision, and adherence to prescribed methods.

10.1.3 Field Performance Audits

Field performance audits are conducted by QA personnel on an ongoing basis during a project as field data are generated, reduced, and analyzed. Field performance audits include review of numerical manipulations and review of blank and replicate samples.

10.1.4 Laboratory Performance Audits

Laboratory performance audits may be conducted and may include:

- Verification of written procedures, and analyst’s understanding
- Verification and documentation of procedures and documents
- Periodic unannounced inspections, if warranted
- Review of a portion of all analytical data and calculations

11.0 PREVENTATIVE MAINTENANCE

11.1 Analytical Instrumentation

Preventative maintenance of analytical instrumentation is outlined in the QA documents of the subcontract analytical laboratory.

11.2 Field Instrumentation and Equipment

Preventative maintenance of field instrumentation and equipment includes the following measures:

- The field operations leader shall ensure that all scheduled maintenance occurs as obligated.
- Critical spare parts will be kept in stock.
- Equipment will be cleaned on a daily basis after use.
- Field crews will report on the condition and performance of the equipment after each sampling event.

12.0 DATA MEASUREMENT ASSESSMENT PROCEDURES

The purpose of a data quality assessment is to document that data generated under the program are accurate and consistent with project objectives. The quality of data is assessed based on the precision, accuracy, representativeness, comparability, and completeness of the data that are generated. Data quality assessments are conducted in three phases.

<u>Phase I</u>: Prior to data collection, sampling, and analysis procedures are evaluated in regard to their ability to generate the appropriate, technically acceptable information required to achieve project objectives.

<u>Phase II</u>: During data collection, results will be assessed so that selected procedures are efficient and effective and that the data generated provide sufficient information to achieve project objectives. In general, evaluation of data are based on performance audits, results of duplicate and spiked sample analyses, and review of completeness objectives.

Documentation may include:

- Number and identity of duplicate samples collected
- Number and identity of duplicate, spike, and field blank samples analyzed
- Identification of statistical techniques, if used
- Use of historical data
- Identification of analytical method
- Data validation results

Procedures for assessing precision and accuracy for analytical data are outlined in Section 3.2. Precision is generally expressed as the relative percent difference (RPD) among duplicate analyses. Accuracy is generally expressed as percent recovery. Precision and accuracy of instrumental analysis is further addressed in the NYSDEC ASP and the Laboratory QAPP. It is the laboratory's responsibility to attempt to identify the source of substandard recoveries and take corrective action or document the cause as required by the NYSDEC ASP.

Phase III: Following completion of data collection activities, an assessment of the adequacy of the database generated in regard to completing project objectives is undertaken by the Project Manager and/or the Technical Reviewer. Recommendations for improved QC are developed, if appropriate. If data gaps are identified, additional raw data collection may be recommended to fully support the project findings and recommendations.

13.0 CORRECTIVE ACTIONS

Corrective actions are QA/QC problem-solving measures taken to rectify a laboratory or field measurement system that is out of control. Corrective action is required when potential or existing conditions are identified which may adversely affect the data quality. The need for corrective action may be identified by system or performance audits or by standard QC procedures. The corrective action system will include the following procedures:

The Project Manager is immediately notified of any potential problem with the data quality, and will then evaluate the need for changes in affected procedures and conduct appropriate corrective actions. Potential data quality problems may include:

- Loss of a sample or damaged sample containers.
- Analytical results that are substantially different from those expected.
- Laboratory QC samples that do not attain target performance objectives.
- Events that may require changes in specifications and sampling procedures.

Corrective action related to questionable analytical results or damaged sample containers may include re-sampling and re-analysis, if appropriate. Modification of procedures may be necessary to remedy problems related to unexpected conditions encountered in the field.

14.0 QUALITY ASSURANCE REPORTS TO MANAGEMENT

The Project Manager submits periodic QA reports for appraisal by management, appropriate to their level of responsibility. Reports to management include:

- Periodic assessment of measurement data accuracy, precision, and completeness.
- Results of performance and system audits.
- Significant QA/QC problems and recommended solutions.
- Resolutions of previously stated problems.

14.1 Field Quality Assurance Reports

Periodic status reports describing the progress of the project are submitted periodically to management. These reports include: copies of field notes or daily field progress reports, compiled field data sets, and corrective action documentation. The Project Manager is notified immediately of situations requiring corrective action measures.

14.2 Laboratory Quality Assurance Reports

A project QA report that summarizes QA activities and QC data is issued to the QA Manager and Project Manager. Any laboratory QA situations requiring immediate corrective action is reported to the Project Manager.

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Appendix I: Site Inspection form

THE Chazen COMPANIES®

SITE INSPECTION FORM

Ebenezer Plaza 1 Property
96 New Lots Avenue
Borough of Brooklyn, Kings County, New York
BCP Site C224240

Performed by: ______________________________ Date:_____________ Time:____________

Part 1 - Engineering Controls - Sub-Slab Depressurization System (SSDS) (circle noted condition)

1A - Describe SSDS function: normal | decreased function | non-functioning
explain if not normal:

1B - Is there any damage or defect to the foundation that reduces or has the potential to reduce the effectiveness of the SSDS? (circle one)

No | Yes | If yes, describe needed repairs:

If yes, owner to notify DEC within 48 hours. Attached documentation of notification.

1C - Describe blower conditions:(circle one)	normal	decreased function	non-functioning	
Excess wear:	none	minimal (no change to system function)	non-functioning	
Visual damage:	none	minimal (no change to system function)	non-functioning	
Listen for smooth blower operation:	normal	inconsistent (describe)	non-functioning	
Measure vacuum pressure:	____________________	is it within design parameters?	yes	no
Measure air flow:	____________________	is it within design parameters?	yes	no

1D - Is system functioning as designed to continue to be protective of human health and the environment?

Yes | No | If no, describe needed modifications:

If no, owner to notify DEC within 48 hours. Attach documentation of notification.

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1E - Describe condition of SSDS' Vacuum Monitoring Points.

Vaccum Monitoring Point ID	PID Reading (ppm)	Pressure (IOW)	Condition (circle one)	
Zone 1			Good/Intact	Damaged
Zone 2			Good/Intact	Damaged
Zone 3			Good/Intact	Damaged
Zone 4			Good/Intact	Damaged
Zone 5			Good/Intact	Damaged
Zone 6			Good/Intact	Damaged
Zone 7			Good/Intact	Damaged
Zone 8			Good/Intact	Damaged
Zone 9			Good/Intact	Damaged
Zone 10			Good/Intact	Damaged
Zone 11			Good/Intact	Damaged
Zone 12			Good/Intact	Damaged

Additional Observations/ Notes: ______

Part 2 - Engineering Controls - Cover System (circle noted condition)

2A - Describe Cover Condition: Soil (Courtyard) intact damaged not present

explain if not intact:

Slabs

North Tower: intact damaged not present

South Tower: intact damaged not present

Community Center: intact damaged not present

explain if not intact:

2B - Is system functioning as designed to continue to be protective of human health and the environment?

Yes No

If no, describe needed modifications:

If no, owner to notify DEC within 48 hours. Attach documentation of notification.

2C - Is Site Cover in-tact (per Track 4)? Yes No

If No, explain:

SITE INSPECTION FORM

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Part 3 - Institutional Controls (circle one) **3A** - Site usage:	Residential Other:________________________	Commercial Industrial (inconsistent with Environmental Easement, must be reported to DEC)
3B - Has the site been used for vegetable gardens or farming ? (circle one)	No	Yes, Explain inconsistency with Environmental Easement
3C - Is site water source from a municipal source? (circle one)	Yes	No Explain inconsistency with Environmental Easement
3D - Is site groundwater being used for any purpose? (circle one)	No	Yes, Explain inconsistency with Environmental Easement, or groundwater treatment system implemented
3E - Has contaminated subsurface material been disturbed? (circle one)	No	Yes, explain activities and whether they were performed consistent with the Site Management Plan
3F - Have new buildings been developed in the source or groundwater plume areas? (circle one)	No	Yes, explain how potential impacts were monitored or mitigated

Part 4 - General Site Conditions

4A - Describe changes since last inspection

4B - Describe condition of monitoring wells and note changes or NYSDEC-approved closures since last inspection by entering data in table below (wells in sequence but not listed below were closed or destroyed prior to implementation of the SMP, or were not installed during site boring investigation activities):

Well ID (show on site map)	Intact	Damaged	Closed	Replaced	Explanation

SITE INSPECTION FORM

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Part 5 - Compliance with Excavation Work Plan and Operations & Maintenance Plan
5A - Describe site construction activities that have been conducted since last inspection (see SMP for soil management criteria)
5B - Describe soil excavation and disposition (on site/off site). Map excavation areas and on site placement.

Part 6 - Monitoring Program				
6A - Groundwater sampling event status (for four quarters preceding this inspection)	1st Quarter	for Year ______	was completed on (date):	______________
	2nd Quarter	for Year ______	was completed on (date):	______________
	3rd Quarter	for Year ______	was completed on (date):	______________
	4th Quarter	for Year ______	was completed on (date):	______________
6B - Attach sampling reports for prior four quarterly sampling events.				
6C- DEC determination that monitoring can be terminated (circle one):	not yet requested	requested (date)/pending ____________	granted (date): ___________	

Part 7 - Confirm that site records are up to date			
No	Yes		8A - Are there any changes that need to be documented in site records (e.g., change of ownership, site usage)
No	Yes	NA	8B - Has DEC received 15-day advanced notice of any proposed ground intrusive activities?
No	Yes	NA	8C - Has DEC received notification within 48 hours of any damage or defect to the foundation that reduces or has the potential to reduce the effectiveness of the SSDS?
No	Yes (Attached)		8D - Has site owner or remedial party submitted a written statement to NYSDEC certifying that (1) controls employed at the Controlled Property are unchanged from the previous certification or that any changes to the controls were approved by the NYSDEC; and, (2) nothing has occurred that impairs the ability of the controls to protect public health and environment or that constitute a violation or failure to comply with the SMP?