

401 EAST 120TH STREET  
NEW YORK, NEW YORK

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## **Remedial Action Work Plan**

NYSDEC BCP Number: C2XXXX  
NYSDEC Spill No. 1503447  
NYC VCP Project Number 15CVCP130M

**Prepared For:**

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**November 2015**

FINAL REMEDIAL ACTION WORK PLAN

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## LIST OF ACRONYMS

<b>Acronym</b>	<b>Definition</b>
AST	Aboveground Storage Tank
CAMP	Community Air Monitoring Plan
C&D	Construction & Demolition
CEQR	City Environmental Quality Review
CFR	Code of Federal Regulations
CHASP	Construction Health and Safety Plan
CO	Certificate of Occupancy
CPC	City Planning Commission
DSNY	Department of Sanitation
“E”	E-Designation
EAS	Environmental Assessment Statement
EIS	Environmental Impact Statement
ESA	Environmental Site Assessment
EC/IC	Engineering Control and Institutional Control
ELAP	Environmental Laboratory Accreditation Program
FDNY	New York City Fire Department
GPR	Ground Penetrating Radar
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations Emergency Response
IDW	Investigation Derived Waste
Notice - NNO	Notice of No Objection
Notice - NTP	Notice To Proceed
Notice - NOS	Notice Of Satisfaction
Notice - FNOS	Final Notice of Satisfaction
NYC BSA	New York City Board of Standards and Appeals
NYC DCP	New York City Department of City Planning
NYC DEP	New York City Department of Environmental Protection
NYC DOB	New York City Department of Buildings
NYC DOF	New York City Department of Finance

<b>Acronym</b>	<b>Definition</b>
NYC HPD	New York City Housing Preservation and Development
NYCRR	New York Codes Rules and Regulations
NYC OER	New York City Office of Environmental Remediation
NYS DEC	New York State Department of Environmental Conservation
NYS DEC DER	New York State Department of Environmental Conservation Division of Environmental Remediation
NYS DEC PBS	New York State Department of Environmental Conservation Petroleum Bulk Storage
NYS DOH	New York State Department of Health
NYS DOT	New York State Department of Transportation
OSHA	United States Occupational Health and Safety Administration
PAHs	Polycyclic Aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
PE	Professional Engineer
PID	Photo Ionization Detector
PM	Particulate Matter
QEP	Qualified Environmental Professional
RA	Register Architect
RAWP	Remedial Action Work Plan
RCA	Recycled Concrete Aggregate
FER	Final Engineering Report
RD	Restrictive Declaration
RI	Remedial Investigation
SCOs	Soil Cleanup Objectives
SCG	Standards, Criteria and Guidance
SMP	Site Management Plan
SPDES	State Pollutant Discharge Elimination System
SSDS	Sub-Slab Depressurization System
SVOCs	Semi-Volatile Organic Compounds
USCS	Unified Soil Classification System
<b>Acronym</b>	<b>Definition</b>
USGS	United States Geological Survey
UST	Underground Storage Tank
TAL	Target Analyte List
TCL	Target Compound List
TCO	Temporary Certificate of Occupancy
VB	Vapor Barrier
VOCs	Volatile Organic Compounds

## CERTIFICATION

I, Wenqing Fang, certify that I am currently a NYS registered professional engineer and that this Remedial Action Work Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

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

095477  
NYS Professional Engineer #

11.17.2015  
Date

  
Signature

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



## EXECUTIVE SUMMARY

ACACIA Gardens Housing Development Fund Corporation is working with the New York City Office of Environmental Remediation (OER) in the Voluntary Cleanup Program (VCP) and with NYS Department of Environmental Conservation (NYSDEC) in the New York State Brownfield Cleanup Program to investigate and remediate a 39,000-square foot site located at 401 East 120<sup>th</sup> Street in New York, New York. A remedial investigation (RI) was performed to compile and evaluate data and information necessary to develop this Remedial Action Work Plan (RAWP). The remedial action described in this document provides for the protection of public health and the environment consistent with the intended property use, complies with applicable environmental standards, criteria and guidance and conforms with applicable laws and regulations.

### Site Description/Physical Setting/Site History

The Site is located at 401 East 120<sup>th</sup> Street in the East Harlem section in borough of New York, New York and is identified as the western portion of Block 1808 and Lot 8 on the New York City Tax Map. **Figure 2** shows the Site location. The Site is approximately 39,000 square feet and is bounded by 15-story apartment buildings to the north; East 120<sup>th</sup> Street followed by numerous commercial retail, offices, institutional and residential buildings to the south; commercial buildings on the remainder of Lot 8 followed by a 15-story apartment building to the east; and 1<sup>st</sup> Avenue followed by John S. Roberts Junior High School to the west. A map of the site boundary is shown in **Figure 1**.

Currently, the Site is used as school/offices/multi-uses and contains an approximately 4,480-square foot, one 1-story building, with a crawl space. The remainder of the Site consists of an asphalt-paved parking lot. A survey of the Site is presented in **Figure 3**.

The Site is located within an urban area that is primarily characterized by institutional, commercial-retail and residential use. Current uses of the adjoining properties were observed as follows:

**North** – To the north and northeast of the Site are 15-story apartment buildings.

**South** – The Site is bordered to the south by East 120<sup>th</sup> Street followed by numerous commercial retail, commercial-office, institutional, and residential buildings along East 120<sup>th</sup> Street.

**East** – The Site is bordered to the east by commercial buildings on the remainder of Lot 8 followed by a 15-story apartment building.

**West** - The Site is bordered to the west by 1st Avenue, and beyond by John S. Roberts Junior High School (2351 1st Avenue).

According to OER's online SPEED application, there are no hospitals or schools (other than the school to the west) within a 500-foot radius. A day care facility (Please Avenue Day Care Center, 451 East 120<sup>th</sup> Street) is located approximately 250 feet northeast of the site.

**Figure 4** shows the surrounding land usage.

### **Summary of Proposed Redevelopment Plan**

The proposed future use of the Site will consist of one (1) 179-unit mixed use building and an asphalt-paved parking lot. Layout of the proposed site development is presented in **Figure 5** and **Appendix A**. The current zoning designation is R7-2. The proposed use is R7-2 and R7X w/ C1-5.

The proposed 12-story building is intended mainly for residential uses with mixed commercial uses on the first floor. It does not include any basement. It includes a total of 184,611 square feet for residential uses, 5,450 for commercial, 3,920 square feet for community facility, and 11,503 square feet for parking. All commercial, community facility and parking space will be on the first floor.

The proposed building will cover a footprint of 27,554 square feet. The remainder of the Site will consist of an asphalt-paved parking lot. There will be no landscape areas at the Site. The proposed site re-development plan will require the demolition of the 1-story building with a footprint of 4,482 square feet. No soil excavation is required for site re-development.

The remedial action contemplated under this RAWP may be implemented independently of the proposed redevelopment plan.

### **Summary of Past Site Uses and Areas of Concern**

Based on the previous Phase I ESA, prepared by ATC Associated Inc. dated September 3, 2008, the following is a brief summary of the Site history:

Prior to 1940, the Site has been utilized for residential, commercial, stone yard (1896), lumber yard (1911), coal yard (1911), school (1923) and gasoline station (1938).

From 1941 to 1980, the Site has been utilized for residential, commercial, school and gasoline station.

From 1981 to present, the Site has been utilized for institutional and commercial uses.

Areas of Concern generally include areas where existing or former activities are known or suspected to have resulted in generation, manufacture, refinement, transport, storage, handling, treatment, discharge, release and/or disposal of contaminated media.

The AOCs identified for this site include:

1. Former gasoline station on the southwestern corner of the Site.
2. Potential presence of fuel oil USTs to the west of the existing building.
3. Potential presence of historic fill material.

A Phase II ESA was performed by Cider Environmental in March 2015. This Phase II ESA identified the following results:

1. Based on the findings of this Phase II Investigation, it is concluded that the historic operation of gasoline filling station and the historic fill observed throughout the Site have impacted the environmental quality of the Site. Specifically, the sub-surface soil was impacted by elevated metals and SVOCs. In the immediately vicinity of the former gasoline station, the subsurface soil exhibited toxicity characteristics of hazardous material.
2. Five (5) underground storage tanks (USTs) have been identified on the southwestern corner of the Site.
3. Groundwater appears to be less impacted. Most of the gasoline related compounds were not detected at levels warranting aggressive groundwater remediation.
4. Soil vapor investigation detected several gasoline and chlorinated solvents related compounds. It is expected that sub-slab depressurization system (SSDS) and vapor barrier system will be required for the proposed site redevelopment.

**Summary of Work Performed under the Remedial Investigation** On April 29, 2015, Cider Environmental performed an additional Remedial Investigation per NYC OER requirements. The follow work was performed as part of the March 2015 Phase II and April 2015 Remedial Investigation:

1. Installed eight (8) soil borings, and collected sixteen (16) soil samples for chemical analysis from the soil borings to evaluate soil quality;
2. Installed four (4) temporary groundwater monitoring wells and collected five (5) groundwater samples (one via existing monitoring well) for chemical analysis to evaluate groundwater quality;
3. Installed three (3) soil vapor probes and collected three (3) samples for chemical analysis.

### **Summary of Findings of Remedial Investigation**

1. Elevation of the property ranges from 8 to 10 feet.
2. Depth to groundwater ranges from 6 to 8 feet at the Site.
3. Groundwater flow is generally from West to East beneath the Site.
4. Depth to bedrock is unknown but greater than 15 feet at the Site.
5. The stratigraphy of the site, from the surface down, consists of 2-5 feet of urban fill material underlain by at least 10 feet of well drained, medium to fine brown sand with some gravel.
6. Soil/fill samples collected during the March 2015 Phase II and April 2015 Remedial Investigation were compared to New York State Department of Environmental Conservation (NYSDEC) Part 375 Table 375-6.8 Unrestricted Use and Restricted Residential Use Soil Cleanup Objectives (SCOs). The volatile organic compounds acetone (130 micrograms per kilogram [ $\mu\text{g}/\text{Kg}$ ]) and total xylenes (390  $\mu\text{g}/\text{Kg}$ ) were detected above Unrestricted Use SCOs in the deep (6-8 foot) interval collected at SB-1 and n-propylbenzene (5,600  $\mu\text{g}/\text{Kg}$ ) was detected above Unrestricted Use SCOs in the deep (6-8 foot) interval collected at SB-2. Several other petroleum-related VOCs were detected in the deep interval collected at SB-1 but at concentrations below the Unrestricted Use SCOs. The following semivolatile organic compounds (SVOCs) were

detected within the shallow (0-2 foot interval) soil samples at concentrations above the Restricted Residential Use SCOs: benzo-a-anthracene (maximum [max] 10,000 ug/Kg), benzo-a-pyrene (max 7,300 ug/Kg), benzo-b-fluoranthene (max 11,000 ug/Kg), chrysene (max 8,700 ug/Kg), and indeno (1,2,3-cd) pyrene (max 520 ug/Kg). The pesticides 4,4-DDD (130 ug/Kg), 4,4-DDE (9.8 ug/Kg), and 4,4-DDT (max 13 ug/Kg) were detected in two shallow (0-2 foot interval) soil samples and one deep (6-8 foot interval) soil samples above Unrestricted Use SCOs. The metals barium (max 1,780 mg/Kg), lead (max 3,900 mg/Kg), and mercury (1.45 mg/Kg) were detected above Restricted Residential Use SCOs. The maximum barium and lead concentrations were detected in the deep (6-8 foot interval) soil sample at SB-1, which represents a hotspot. Copper, nickel, and zinc were also detected in several samples above Unrestricted Use SCOs but below Restricted Residential Use SCOs. No PCBs were detected in any of the samples.

7. Groundwater samples collected during the March 2015 Phase II and April 2015 Remedial Investigation were compared to the NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards (GQS) for Class GA (drinking water). The VOCs isopropylbenzene (100 µg/L), n-butylbenzene (27 µg/L), p-isopropyltoluene (160 µg/L), and sec-butylbenzene (52 µg/L) were detected above GQS in one sample (GW-1). The following SVOCs were detected in nearly all of the samples at concentrations above the GQS: benzo(a)anthracene (max 0.18 µg/L), benzo(a)pyrene (max 0.19 µg/L), benzo(b)fluoranthene (max 0.32 µg/L), benzo(k)fluoranthene (max 0.11 µg/L), chrysene (max 0.24 µg/L), and indeno(1,2,3-cd)pyrene (max 0.15 µg/L). Nearly all of the maximum exceedances were detected at GW-6. The metals aluminum, arsenic, barium, beryllium, chromium, copper, iron, lead, magnesium, manganese, nickel, selenium, and sodium were detected at concentrations above the GQS in the unfiltered samples; however, only aluminum (max 0.479 mg/L), iron (max 1.66 mg/L), magnesium (max 69.7 mg/L), manganese (max 5.11 mg/L), and sodium (max 239 mg/L) were detected at concentrations above the GQS in the filtered samples. No PCBs were detected. One pesticide, dieldrin, was detected but at a concentration not exceeding the GQS.
8. Soil vapor samples collected during the March 2015 Phase II and April 2015 Remedial Investigation were compared to the New York State Department of Health (NYSDOH) Final Guidance on Soil Vapor Intrusion (October 2006) Matrix 1 and Matrix 2 values.

The samples indicated the presence of petroleum related VOCs and chlorinated VOCs. Petroleum-related VOCs (BTEX) were detected at a maximum concentration of 1,020 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) in SG-1. Overall the highest reported concentration was for acetone ( $1,620 \mu\text{g}/\text{m}^3$ ), heptane ( $1,040 \mu\text{g}/\text{m}^3$ ), toluene ( $1,020 \mu\text{g}/\text{m}^3$ ), hexane ( $905 \mu\text{g}/\text{m}^3$ ), cyclohexane ( $894 \mu\text{g}/\text{m}^3$ ), tetrahydrofuran ( $410 \mu\text{g}/\text{m}^3$ ), propylene ( $359 \mu\text{g}/\text{m}^3$ ), and isopropylbenzene ( $358 \mu\text{g}/\text{m}^3$ ). The highest BTEX and maximum overall concentrations were detected in SG-1. Additional exceedances of other compounds at this location may not have been detected due to the elevated reporting limit of  $200 \mu\text{g}/\text{m}^3$ . 1,1,1-trichloroethane (TCA) and trichloroethene (TCE) were not detected in any of the samples. Carbon tetrachloride was detected within two of the three soil vapor samples at a maximum concentration of  $0.51 \mu\text{g}/\text{m}^3$ , and tetrachloroethene (PCE) was detected in two of the three soil vapor samples at a maximum concentration of  $4.26 \mu\text{g}/\text{m}^3$ . The carbon tetrachloride and PCE concentrations are below the monitoring level ranges established within the NYSDOH Final Guidance on Soil Vapor Intrusion.

9. Due to the encountered contaminated soil and groundwater, the NYS DEC was contacted, and the Spill No. 1503447 was assigned to the site on 6/29/2015.

### **Qualitative Human Health Exposure Assessment**

The qualitative exposure assessment identified potential completed routes of exposure to construction workers and remediation workers through inhalation, ingestion and dermal contact of petroleum compounds and heavy metals during excavation activities. The Health and Safety Plan prepared for the site identifies such exposures and provides instructions for on-site workers to minimize potential exposure.

No potential environmental impacts through the groundwater to surface water discharge were identified.

### **Summary of the Remedial Action**

The proposed remedial action achieves protection of public health and the environment for the intended use of the property. The proposed remedial action achieves all of the remedial action objectives established for the project and addresses applicable standards, criterion, and guidance; is effective in both the short-term and long-term and reduces mobility, toxicity and volume of contaminants; is cost effective and implementable; and uses standards methods that are well established in the industry.

The proposed remedial action will consist of:

1. Performance of all required NYC VCP Citizen Participation activities according to an approved Citizen Participation Plan.
2. Performance of a Community Air Monitoring Program for particulates and volatile organic carbon compounds.
3. Establishment of Site Specific (Track 4) Soil Cleanup Objectives (SCOs).
4. Site mobilization involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas.
5. Completion of a Waste Characterization Study prior to excavation activities. Waste characterization soil samples will be collected at a frequency dictated by disposal facility(s).
6. Excavation and removal of soil/fill exceeding Site Specific (Track 4) SCOs. The entire footprint of the Site will be excavated to a depth of approximately 2 feet below grade. The southwestern portion of property, where the former gasoline station was located, will be excavated to the depth of 8 feet below grade for UST removal. Approximately 150 tons of petroleum impacted soil/fill and 3,550 tons of historic fill (a total of 3,700 tons) will be removed from the Site and properly disposed at an appropriately licensed or permitted facility.
7. Screening of excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a PID. Appropriate segregation of excavated media on-Site.
8. Management of excavated materials including temporarily stockpiling and segregating in accordance with defined material types and to prevent co-mingling of contaminated material and non-contaminated materials.
9. Removal of six known 550-gallon USTs from the southwestern portion of the Site. Removal of other unknown USTs that are encountered during soil/fill removal actions. Registration of tanks and reporting of new petroleum spills associated with UST's and appropriate closure of these petroleum spills in compliance with applicable local, State and Federal laws and regulations.
10. Collection and analysis of end-point samples to determine the performance of the remedy with respect to attainment of Site Specific Track 4 SCOs.

11. Spill No. 1503447 will be closed following tanks removal and associated contaminated soil removal per NYSDEC requirements. Groundwater treatment and long term monitoring, if required by NYSDEC will be performed per NYSDEC approval. A spill closure report will be prepared and submitted to NYSDEC.
12. Collection and analysis of end-point samples to determine the performance of the remedy with respect to attainment of Site Specific Track 4 SCOs.
13. Transportation and off-Site disposal of all soil/fill material at licensed or permitted facilities in accordance with applicable laws and regulations for handling, transport, and disposal, and this plan. Sampling and analysis of excavated media as required by disposal facilities. Appropriate segregation of excavated media on-Site.
14. Placement of demarcation layer in areas used (11,500 sf) for parking.
15. Construction of an engineered composite cover consisting of a six-inch thick concrete building slab with a 12-inch clean granular sub-base beneath all building areas.
16. Installation of a vapor barrier system consisting of vapor barrier beneath the building slab to mitigate soil vapor migration into the building. The vapor barrier system will consist of a 20-mil vapor barrier, Vaporblock<sup>®</sup> Plus VBP20 by Raven Industries, or similar, below the slab throughout the full building area. All welds, seams and penetrations will be properly sealed to prevent preferential pathways for vapor migration.
17. Installation of a sub-slab depressurization system (SSDS) consisting of a network of horizontal pipe set in the middle of a gas permeable layer immediately beneath the building slab and vapor barrier system. The horizontal piping will consist of fabric wrapped, perforated schedule 40 4-inch PVC pipe connected to a 4-inch steel riser pipes that penetrate the slab and travel through the building to the roof. The gas permeable layer will consist of a 12-inch thick layer of 3/4-inch bluestone. The pipes will be finished at the roof line with rain caps to prevent rain infiltration. The sub-slab depressurization system is an Engineering Control for the remedial action. The remedial engineer will certify in the FER that the sub-slab depressurization system was designed and properly installed to establish a vacuum in the gas permeable layer and a negative (decreasing outward) pressure gradient across the building slab to prevent vapor migration into the building.
18. Import of materials to be used for backfill and cover in compliance with this plan and in accordance with applicable laws and regulations.

19. Performance of all activities required for the remedial action, including acquisition of required permits and attainment of pretreatment requirements, in compliance with applicable laws and regulations.
20. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations.
21. Submission of a Final Engineering Report (FER) that describes the remedial activities, certifies that the remedial requirements have been achieved, defines the Site boundaries, lists any changes from this RAWP.
22. Submission of an approved Site Management Plan (SMP) in the FER for long-term management of residual contamination, including plans for operation, maintenance, monitoring, inspection and certification of Engineering and Institutional Controls and reporting at a specified frequency.
23. Recording of a Declaration of Covenants and Restrictions that includes a listing of Engineering Controls and Institutional Controls and a requirement that management of these controls must be in compliance with an approved SMP. Institutional Controls will include prohibition of the following: (1) vegetable gardening and farming; (2) use of groundwater without treatment rendering it safe for the intended use; (3) disturbance of residual contaminated material unless it is conducted in accordance with the SMP; and (4) higher level of land usage without OER-approval.

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

## **1.0 REMEDIAL ACTION WORK PLAN INTRODUCTION/ PROJECT BACKGROUND**

ACACIA Gardens Housing Development Fund Corporation is working with the New York City Office of Environmental Remediation (OER) in the Voluntary Cleanup Program (VCP) and with NYS Department of Environmental Conservation (NYSDEC) in the New York State Brownfield Cleanup Program to investigate and remediate a property located at 401 East 120<sup>th</sup> Street, in the East Harlem section of New York, New York (the “Site”). A Remedial Investigation (RI) was performed to compile and evaluate data and information necessary to develop this Remedial Action Work Plan (RAWP) in a manner that will render the Site protective of public health and the environment consistent with the contemplated end use. This RAWP establishes remedial action objectives, provides a remedial alternatives analysis that includes consideration of a permanent cleanup, and provides a description of the selected remedial action. The remedy described in this document is consistent with the procedures defined in DER-10. The remedial action described in this document provides for the protection of public health and the environment, and complies with applicable environmental standards, criteria and guidance and applicable laws and regulations. The NYSDEC and New York State Department of Health (NYSDOH) have determined that this Site does not pose a significant threat to human health and the environment. The RI for this Site did not identify fish and wildlife resources.

A formal Remedial Design document will not be prepared.

### **1.1 SITE LOCATION AND DESCRIPTION**

The Site is located at 401 East 120<sup>th</sup> Street in the East Harlem section in borough of New York, New York and is identified as the western portion of Block 1808 and Lot 8 on the New York City Tax Map. **Figure 2** shows the Site location. The Site is approximately 39,000 square feet and is bounded by 15-story apartment buildings to the north; East 120<sup>th</sup> Street followed by numerous commercial retail, offices, institutional and residential buildings to the south; commercial buildings on the remainder of Lot 8 followed by a 15-story apartment building to the east; and 1<sup>st</sup> Avenue followed by John S. Roberts Junior High School to the west. A map of the site boundary is shown in **Figure 1**.

Currently, the Site is used as school/offices/multi-uses and contains an approximately 4,480-square foot, 1-story building. The remainder of the Site consists of an asphalt-paved parking lot. A survey of the Site is presented in **Figure 3**.

## **1.2 CONTEMPLATED REDEVELOPMENT PLAN**

The proposed future use of the Site will consist of one (1) 179-unit mixed use building and an asphalt-paved parking lot. Layout of the proposed site development is presented in **Appendix A**. The current zoning designation is R7-2. The proposed use is R7-2 and R7X w/ C1-5.

The proposed 12-story building is intended mainly for residential uses with mixed commercial uses on the first floor. It does not include any basement. It includes a total of 184,611 square feet for residential uses, 5,450 for commercial, 3,920 square feet for community facility, and 11,503 square feet for parking. All commercial, community facility and parking space will be on the first floor.

The proposed building will cover a footprint of 27,554 square feet. The remainder of the Site will consist of an asphalt-paved parking lot. There will be no landscape areas at the Site. The proposed site re-development plan will require the demolition of the one 1-story building with a footprint of 4,482 square feet. No soil excavation is required for site re-development.

The remedial action contemplated under this RAWP may be implemented independently of the proposed redevelopment plan.

## **1.3 DESCRIPTION OF SURROUNDING PROPERTY**

The Site is located within an urban area that is primarily characterized by institutional, commercial-retail and residential use. Current uses of the adjoining properties were observed as follows:

**North** – To the north and northeast of the Site are 15-story apartment buildings.

**South** – The Site is bordered to the south by East 120th Street followed by numerous commercial retail, commercial-office, institutional, and residential buildings along East 120th Street.

**East** – The Site is bordered to the east by commercial buildings on the remainder of Lot 8 followed by a 15-story apartment building.

**West** - The Site is bordered to the west by 1st Avenue, and beyond by John S. Roberts Junior High School (2351 1st Avenue).

According to OER's online SPEED application, there are no hospitals or schools (other than the school to the west) within a 500-foot radius. A day care facility (Please Avenue Day Care Center, 451 East 120<sup>th</sup> Street) is located approximately 250 feet northeast of the site.

**Figure 4** shows the surrounding land usage..

#### **1.4 ENVIRONMENTAL INVESTIGATION REPORTS**

The following environmental work plans and reports were developed for the Site:

Phase I ESA, prepared by ATC Associated Inc. dated September 3, 2008  
Phase II Investigation Report, March 2015, prepared by Cider Environmental  
Remedial Investigation Report, June 2015, prepared by Cider Environmental.

## **2.0 DESCRIPTION OF REMEDIAL INVESTIGATION FINDINGS**

A remedial investigation was performed and the results are documented in a companion document called “Remedial Investigation Report, 401 East 120<sup>th</sup> Street”, dated July 2015 (RIR).

### **2.1 SUMMARY OF REMEDIAL INVESTIGATIONS PERFORMED**

The following environmental work plans and reports were developed for the Site:

Remedial Investigation Report, July 2015, prepared by Cider Environmental.

The following work was performed as part of the April 2015 Remedial Investigation:

1. Installed eight (8) soil borings, and collected sixteen (16) soil samples for chemical analysis from the soil borings to evaluate soil quality;
2. Installed four (4) temporary groundwater monitoring wells and collected five (5) groundwater samples (one via existing monitoring well) for chemical analysis to evaluate groundwater quality;
3. Installed three (3) soil vapor probes and collected three (3) samples for chemical analysis.

### **2.2 SIGNIFICANT THREAT**

The NYSDEC and NYSDOH will determine if this Site poses a significant threat to human health and the environment. Notice of that determination will be provided for public review.

### **2.3 SITE HISTORY**

Site history is documented in a Phase I Environmental Site Assessment report prepared by ATC Associated Inc. dated September 3, 2008, the following is a brief summary of the Site history: Prior to 1940, the Site has been utilized for residential, commercial, stone yard (1896), lumber yard (1911), coal yard (1911), school (1923) and gasoline station (1938). From 1941 to 1980, the Site has been utilized for residential, commercial, school and gasoline station. From 1981 to present, the Site has been utilized for institutional and commercial uses.

### **2.4 GEOLOGICAL CONDITIONS**

According to the United States Geological Survey (USGS) 7.5-Minute Quadrangle, *Central Park, NY-NJ* dated 1967; revised 1979, the elevation of the Site is approximately nine feet above mean sea level. The area surrounding the Site indicates topography that slopes to the east-southeast.

The Site area is underlain by approximately 20 to 40 feet of unconsolidated clays, silts, sands, and gravels, based on a report published by the USGS. These materials were deposited directly by glacial activity as glacial till or as glaciofluvial deposits. Bedrock underlies the unconsolidated material and consists of a coarsely crystalline material, which has been subjected to a high degree of metamorphism.

According to the United States Department of Agriculture Soil Conservation Service, soil at the Site is classified as Urban Land. This designation applies to areas where at least 85 percent of the surface is covered by an impermeable surface such as asphalt, buildings, and roads.

Based on the surface topography at the Site, groundwater flow is assumed to be to the east towards the East River. Estimated groundwater levels and/or flow direction may vary due to seasonal fluctuations in precipitation, local usage demands, geology, underground structures, or dewatering operations. There are no surface water bodies or streams at the Site. The East River is located approximately 2,250 feet to the east.

## **2.5 CONTAMINATION CONDITIONS**

### **2.5.1 Conceptual Model of Site Contamination**

The Site is covered by a two to five feet layer of urban fill materials, which may have originally been sourced from impacted locations. Site was operated as a gas station and has five underground storage tanks. Soil, as well as groundwater and soil vapor, may have been impacted by historical commercial use of the Site. Contaminants in fill, or soil contamination from historical Site uses, may contribute to groundwater and/or soil vapor contamination.

### **2.5.2 Description of Areas of Concern**

Based on the previous Phase I ESA, prepared by ATC Associated Inc. dated September 3, 2008, the following is a brief summary of the Site history:

Prior to 1940, the Site has been utilized for residential, commercial, stone yard (1896), lumber yard (1911), coal yard (1911), school (1923) and gasoline station (1938).

From 1941 to 1980, the Site has been utilized for residential, commercial, school and gasoline station.

From 1981 to present, the Site has been utilized for institutional and commercial uses.

The AOCs identified for this site include:

1. Former gasoline station on the southwestern corner of the Site.
2. Potential presence of fuel oil USTs to the west of the existing building.
3. Presence of historic fill material.

### **2.5.3 Identification of Standards, Criteria and Guidance**

The following standards, criteria and guidance (SCG) were referenced during Site Characterizations and Remedial Investigations:

- 6 NYCRR Part 175 - Special Licenses and Permits--Definitions and Uniform Procedures
- 6 NYCRR Part 182 - Endangered & Threatened Species of Fish & Wildlife
- 6 NYCRR Part 371 - Identification and Listing of Hazardous Wastes
- 6 NYCRR Part 375 – Environmental Remediation Programs;
- 6 NYCRR Part 608 - Use and Protection of Waters
- 6 NYCRR Part 661 - Tidal Wetlands - Land Use Regulations
- 6 NYCRR Part 663 - Freshwater Wetlands Maps and Classification
- 6 NYCRR Part 703, New York State Groundwater Quality Standards;
- 6 NYCRR Parts 700-706 - Water Quality Standards
- 29 CFR Part 1910.120 - Hazardous Waste Operations and Emergency Response
- NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation;
- NYSDEC Ambient Water Quality Standards and Guidance Values – TOGS 1.1.1;
- NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York
- NYSDOH Generic Community Air Monitoring Plan
- NYSDEC STARS #1 - Petroleum-Contaminated Soil Guidance Policy
- NYSDEC SPOTS #14 - Site Assessments at Bulk Storage Facilities
- NYSDEC Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites

### **2.5.4 Summary of Findings of Remedial Investigation**

- Elevation of the property ranges from 8 to 10 feet.
- Depth to groundwater ranges from 6 to 8 feet at the Site.
- Groundwater flow is generally from West to East beneath the Site.
- Depth to bedrock is unknown but greater than 15 feet at the Site.

- The stratigraphy of the site, from the surface down, consists of 2-5 feet of urban fill material underlain by at least 10 feet of well drained, medium to fine brown sand with some gravel.

### **2.5.5 Soil/Fill Contamination**

Soil/fill samples collected during the March 2015 Phase II and April 2015 Remedial Investigation were compared to New York State Department of Environmental Conservation (NYSDEC) Part 375 Table 375-6.8 Unrestricted Use and Restricted Residential Use Soil Cleanup Objectives (SCOs). The volatile organic compounds acetone (130 micrograms per kilogram [ $\mu\text{g}/\text{Kg}$ ]) and total xylenes (390  $\mu\text{g}/\text{Kg}$ ) were detected above Unrestricted Use SCOs in the deep (6-8 foot) interval collected at SB-1 and n-propylbenzene (5,600  $\mu\text{g}/\text{Kg}$ ) was detected above Unrestricted Use SCOs in the deep (6-8 foot) interval collected at SB-2. Several other petroleum-related VOCs were detected in the deep interval collected at SB-1 but at concentrations below the Unrestricted Use SCOs. The following semivolatile organic compounds (SVOCs) were detected within the shallow soil (0-2 foot interval) soil samples at concentrations above the Restricted Residential Use SCOs: benzo-a-anthracene (maximum [max] 10,000  $\mu\text{g}/\text{Kg}$ ), benzo-a-pyrene (max 7,300  $\mu\text{g}/\text{Kg}$ ), benzo-b-fluoranthene (max 11,000  $\mu\text{g}/\text{Kg}$ ), chrysene (max 8,700  $\mu\text{g}/\text{Kg}$ ), and indeno (1,2,3-cd) pyrene (max 520  $\mu\text{g}/\text{Kg}$ ). The pesticides 4,4-DDD (130  $\mu\text{g}/\text{Kg}$ ), 4,4-DDE (9.8  $\mu\text{g}/\text{Kg}$ ), and 4,4-DDT (max 13  $\mu\text{g}/\text{Kg}$ ) were detected in two shallow (0-2 foot interval) soil samples and one deep (6-8 foot interval) soil samples above Unrestricted Use SCOs. The metals barium (max 1,780  $\text{mg}/\text{Kg}$ ), lead (max 3,900  $\text{mg}/\text{Kg}$ ), and mercury (1.45  $\text{mg}/\text{Kg}$ ) were detected above Restricted Residential Use SCOs. The maximum barium and lead concentrations were detected in the deep (6-8 foot interval) soil sample at SB-1, which represents a hotspot. Copper, nickel, and zinc were also detected in several samples above Unrestricted Use SCOs but below Restricted Residential Use SCOs. No PCBs were detected in any of the samples.

A summary table of data for chemical analyses performed on soil samples is included in Table 1 through Table 8. Figure 6 shows the location and posts the values for soil/fill that exceed the UUSCOs and RRSCOs.

### **2.5.6 Groundwater Contamination**

Groundwater samples collected during the March 2015 Phase II and April 2015 Remedial Investigation were compared to the NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards (GQS) for Class GA (drinking water). The

VOCs isopropylbenzene (100 µg/L), n-butylbenzene (27 µg/L), p-isopropyltoluene (160 µg/L), and sec-butylbenzene (52 µg/L) were detected above GQS in one sample (GW-1). The following SVOCs were detected in nearly all of the samples at concentrations above the GQS: benzo(a)anthracene (max 0.18 µg/L), benzo(a)pyrene (max 0.19 µg/L), benzo(b)fluoranthene (max 0.32 µg/L), benzo(k)fluoranthene (max 0.11 µg/L), chrysene (max 0.24 µg/L), and indeno(1,2,3-cd)pyrene (max 0.15 µg/L). Nearly all of the maximum exceedances were detected at GW-6. The metals aluminum, arsenic, barium, beryllium, chromium, copper, iron, lead, magnesium, manganese, nickel, selenium, and sodium were detected at concentrations above the GQS in the unfiltered samples; however, only aluminum (max 0.479 mg/L), iron (max 1.66 mg/L), magnesium (max 69.7 mg/L), manganese (max 5.11 mg/L), and sodium (max 239 mg/L) were detected at concentrations above the GQS in the filtered samples. No PCBs were detected. One pesticide, dieldrin, was detected but at a concentration not exceeding the GQS.

A summary table of data for chemical analyses performed on groundwater samples is included in **Table 9** through **Table 13**. Exceedance of applicable groundwater standards are shown. **Figure 7** shows the location and posts the values for groundwater that exceed the AWQS.

### **2.5.7 Soil Vapor Contamination**

Soil vapor samples collected during the March 2015 Phase II and April 2015 Remedial Investigation were compared to the New York State Department of Health (NYSDOH) Final Guidance on Soil Vapor Intrusion (October 2006) Matrix 1 and Matrix 2 values. The samples indicated the presence of petroleum related VOCs and chlorinated VOCs. Petroleum-related VOCs (BTEX) were detected at a maximum concentration of 1,020 micrograms per cubic meter (µg/m<sup>3</sup>) in SG-1. Overall the highest reported concentration was for acetone (1,620 µg/m<sup>3</sup>), heptane (1,040 µg/m<sup>3</sup>), toluene (1,020 µg/m<sup>3</sup>), hexane (905 µg/m<sup>3</sup>), cyclohexane (894 µg/m<sup>3</sup>), tetrahydrofuran (410 µg/m<sup>3</sup>), propylene (359 µg/m<sup>3</sup>), and isopropylbenzene (358 µg/m<sup>3</sup>). The highest BTEX and maximum overall concentrations were detected in SG-1. Additional exceedances of other compounds at this location may not have been detected due to the elevated reporting limit of 200 µg/m<sup>3</sup>. 1,1,1-trichloroethane (TCA) and trichloroethene (TCE) were not detected in any of the samples. Carbon tetrachloride was detected within two of the three soil vapor samples at a maximum concentration of 0.51 µg/m<sup>3</sup>, and tetrachloroethene (PCE) was detected in two of the three soil vapor samples at a maximum concentration of 4.26 µg/m<sup>3</sup>. The carbon tetrachloride and PCE concentrations are below the monitoring level ranges established within the NYSDOH Final Guidance on Soil Vapor Intrusion.

A summary table of data for chemical analyses performed on soil vapor samples is included in **Table 14. Figure 8** shows the location and posts the values for soil vapor samples with detected concentrations.

## **2.6 ENVIRONMENTAL AND PUBLIC HEALTH ASSESSMENTS**

### **2.6.1 Qualitative Human Health Exposure Assessment**

An exposure assessment was conducted to qualitatively assess the potential impacts of known environmental contaminants associated with the Site on human health, with attention to all possible exposure pathways (i.e. ingestion, inhalation and direct contact). Both current (existing conditions) and future use (proposed restricted-residential or mixed restricted-residential/commercial use) scenarios were considered. Contaminants were assessed relative to specific impacted media.

The primary contaminants of concern at the Site are SVOCs and metals in surface soils to depths of upto six feet. Site groundwater identified petroleum related VOC and SVOC compounds at elevated concentrations. On-site workers (or trespassers) present during remediation and/or future development activities are the most likely receptor population.

The following section evaluates the elements associated with exposure pathways, and describes how each of these elements pertains to the Site. For all media, the implementation of a HASP and a CAMP will mitigate possible impacts to both on-site and off-site receptor populations. Any on-site or off-site development activities that involve disturbance, exposure or contact with contaminated soil, soil vapor or groundwater will require monitoring and mitigation plans to address potential direct contact with media, dust generation and contaminant migration.

#### **Soil**

Direct contact, ingestion and/or inhalation (of particulate matter) are the primary exposure pathways for contaminated subsurface soils. People can come into contact if they participate in ground-intrusive work at the Site, or are exposed to dust generated during construction activities, which disturb contaminated soil. Within excavation areas, the potential for contact is generally a concern for work conducted at depths less than 8 feet. Outside of excavation activities, there are no likely exposures to contaminated soil.

The potential exists for low-level soil and groundwater contamination to remain at on-site areas after remediation and development activities. All potential exposure pathways (direct contact, ingestion or inhalation) will likely be mitigated as subsurface soils would have been

remediated and/or access to subsurface soils would be limited by paved areas and building foundations.

### **Soil Vapor**

Potential exposure pathways include vapor intrusion within the structures and at off-site properties, and direct contact and/or inhalation of contaminated soil vapor generated during soil excavation or remedial construction. A CAMP would be implemented at the Site (and, as required, at off-site areas) to monitor air quality and minimize potential exposures to vapors for both construction works and the public.

The potential for on-site and off-site exposure to soil vapor is expected to decrease after excavation of surficial soils and removal of underground storage tanks and associated contaminated soils. Post-remediation sampling results will document contaminant levels in remaining media and installation of the Sub Slab Depressurization System will mitigate soil vapor intrusion.

### **Groundwater**

Direct contact and/or ingestion are the primary exposure pathways for contaminated groundwater. Impacted groundwater is not being used for drinking water (or any other purposes) at the Site or at off-site areas, as the area is served by the public water supply. No known private wells exist in the vicinity of the Site. People can come into contact if they participate in ground-intrusive work at the Site. The potential for contact is generally a concern for work conducted at depths approaching the groundwater elevation (approximately 6 to 8 feet bsg).

#### **2.6.2 Significant Threat**

The significant threat determination will be made by NYSDEC and NYSDOH. Notice of that determination will be provided for public review.

#### **2.6.3 Fish & Wildlife Remedial Impact Analysis**

The groundwater chemistry and surface water discharge pathway was evaluated. Based on the low concentration of VOCs and other contaminants in groundwater at the site and the long distance to surface water, there are no expected impacts to surface water from contaminants migrating beneath the site.

### **2.7 INTERIM REMEDIAL ACTION**

No Interim Remedial Measures (IRMs) have been performed at the Site.

## **2.8 REMEDIAL ACTION OBJECTIVES**

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

### **Soil**

- Prevent direct contact with contaminated soil.
- Prevent exposure to contaminants volatilizing from contaminated soil.
- Prevent migration of contaminants that would result in groundwater or surface water contamination.

### **Groundwater**

- Remove contaminant sources causing impact to groundwater.
- Prevent direct exposure to contaminated groundwater.
- Prevent exposure to contaminants volatilizing from contaminated groundwater.

### **Soil Vapor**

- Prevent exposure to contaminants in soil vapor.
- Prevent migration of soil vapor into dwelling and other occupied structures.

### **3.0 DESCRIPTION OF REMEDIAL ACTION PLAN**

This section includes a description of the remedial alternatives and provides a comparison and evaluation of the alternatives in terms of required threshold and balancing criteria. As required, a Track 1 Unrestricted Use scenario is evaluated for the remedial action. In addition, a Track 4 Site Specific scenario in the event that Track 1 cannot be met.

The goal of the remedy selection process is to select a remedy that is protective of human health and the environment taking into consideration the current, intended and reasonably anticipated future use of the property. The remedy selection process begins by establishing RAOs for media in which chemical constituents were found in exceedance of applicable standards, criteria and guidance values (SCGs). Remedial alternatives are then developed and evaluated based on the following nine criteria plus sustainability:

#### **Threshold Criteria**

- Protection of human health and the environment;

#### **Balancing Criteria**

- Compliance with SCGs;
- Short-term effectiveness and impacts;
- Long-term effectiveness and permanence;
- Reduction of toxicity, mobility, or volume of contaminated material;
- Implementability;
- Cost effectiveness;
- Community Acceptance; and
- Land use

### **3.1 SUMMARY OF REMEDIAL ALTERNATIVES**

#### **3.1.1 Proposed Remedial Alternatives**

##### **Alternative 1:**

- Selection of Track 1 Unrestricted Use SCOs as defined in NYSDEC 6NYCRR Part 375-6.8 (a).
- Removal of all soil/fill exceeding Track 1 Unrestricted Use SCOs throughout the Site and confirmation that Track 1 Unrestricted Use SCOs have been achieved with post-excavation endpoint sampling. If soil/fill containing analytes at concentrations above

Unrestricted Use SCOs is still present at the base of the excavation after removal of all soil required for construction of the new building's slab level is complete, additional excavation would be performed to ensure complete removal of soil that does not meet Track 1 Unrestricted Use SCOs.

- No Engineering or Institutional Controls are required for a Track 1 cleanup. However, a concrete slab covering the entire Site, and a water proofing membrane/vapor barrier would be installed as part of standard building development and are not considered components of the remedy. Additional soil vapor management would include installation of a sub-slab depressurization system (SSDS) underneath the new slab to prevent exposure from soil vapor in the future.

**Alternative 2:**

- Establishment of Site Specific Use (Track 4) SCOs.
- Removal of all soil/fill exceeding Track 4 Site-Specific SCOs and confirmation that Track 4 Site-Specific SCOs have been achieved with post-excavation end point sampling. Based on the results of the Remedial Investigation, it is expected that this alternative would be achieved by excavating soil from around and below the underground storage tanks in the area of the former gas station to a depth of about 8 feet. As part of development, soil beneath most of the site will be removed to a depth of 2 feet. If soil/fill containing analytes at concentrations above Track 4 Site-Specific SCOs is still present at the base of the excavation, additional excavation would be performed to meet Track 4 Site-Specific SCOs.
- Placement of a composite cover system over the entire Site to prevent exposure to remaining soil/fill;
- Installation of a vapor barrier system beneath the building slab to prevent potential exposures from soil vapor;
- Installation of a Sub Slab Depressurization System (SSDS);
- Establishment of use restrictions including prohibitions on the use of groundwater from the Site; prohibitions of restricted Site uses, such as farming or vegetable gardening, to prevent future exposure pathways; and prohibition of a higher level of land use without OER approval;
- Establishment of an approved Site Management Plan (SMP) to ensure long-term management of these Engineering and Institutional Controls including the performance of periodic inspections and certification that the controls are performing as they were

intended. The SMP will note that the property owner and property owner's successors and assigns must comply with the approved SMP; and

- The property will obtain an environmental easement registered with the county clerk to ensure that future owners of the Site continue to comply with the SMP, as required.

### **3.1.2 Evaluation of Threshold Criteria**

#### **Protection of Public Health and the Environment**

This criterion is an evaluation of the remedy's ability to protect public health and the environment, and an assessment of how risks posed through each existing or potential pathway of exposure are eliminated, reduced or controlled through removal, treatment, and implementation of Engineering Controls or Institutional Controls. Protection of public health and the environment must be achieved for all approved remedial actions.

Alternative 1 would be protective of human health and the environment by removing all soil/fill exceeding Track 1 Unrestricted Use SCO's and groundwater protection standards, thus eliminating potential for direct contact with contaminated soil/fill once construction is complete and eliminating the risk of contaminants leaching into groundwater.

Alternative 2 would achieve comparable protections of human health and the environment by excavation and removal of most of the historic fill at the Site and by ensuring that remaining soil/fill on-Site meets Track 4 Site-Specific SCO's, as well as by placement of Institutional and Engineering Controls, including a composite cover system. The composite cover system would prevent direct contact with any remaining on-Site soil/fill. Implementing Institutional Controls including a Site Management Plan, and the environmental easement on the property would ensure that the composite cover system remains intact and protective of public health. Establishment of Track 4 Site-Specific SCO's would minimize the risk of contamination leaching into groundwater.

For both Alternatives, potential exposure to contaminated soils or groundwater during construction would be minimized by implementing a Construction Health and Safety Plan, an approved Soil/Materials Management Plan and Community Air Monitoring Plan (CAMP). Potential contact with contaminated groundwater would be prevented as its use is prohibited by city laws and regulations. Potential future migration of off-Site soil vapors into the new building would be prevented by installing a vapor barrier below the building slab.

### **3.1.3 Evaluation of Balancing Criteria**

#### **Compliance with Standards, Criteria and Guidance (SCGs)**

This evaluation criterion assesses the ability of the alternative to achieve applicable standards, criteria and guidance. Principal SCGs that are applicable, relevant and appropriate for evaluating the alternatives for remediation of this BCP site include the following:

- 29 CFR Part 1910.120 - Hazardous Waste Operations and Emergency Response
- 10 NYCRR Part 67 – Lead
- 6 NYCRR Part 371 - Identification and Listing of Hazardous Wastes (November 1998)
- 6 NYCRR Part 372 - Hazardous Waste Manifest System and Related Standards for Generators, Transporters and Facilities (November 1998)
- 6 NYCRR Subpart 374-1 - Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities (November 1998)
- 6 NYCRR Part 375 - 6 NYCRR Part 375 Environmental Remediation Programs Subparts 375-1, 375-3 and 375-6 (December 2006)
- 6 NYCRR Part 376 - Land Disposal Restrictions
- 6 NYCRR Part 608 - Use and Protection of Waters
- 6 NYCRR Parts 700-706 - Water Quality Standards (June 1998)
- 6 NYCRR Part 750 through 758 - Implementation of NPDES Program in NYS (“SPDES Regulations”)
- 6 NYCRR Part 375-6 Soil Cleanup Objectives
- New York State Groundwater Quality Standards – 6 NYCRR Part 703;
- NYSDEC Ambient Water Quality Standards and Guidance Values – TOGS 1.1.1;
- NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation - May 2010;
- NYSDEC Draft Brownfield Cleanup Program Guide – May 2004;
- New York State Department of Health (NYSDOH) Generic Community Air Monitoring Plan
- NYS Waste Transporter Permits – 6 NYCRR Part 364;
- NYS Solid Waste Management Requirements – 6 NYCRR Part 360 and Part 364.
- TAGM 4059 - Making Changes To Selected Remedies (May 1998)
- STARS #1 - Petroleum-Contaminated Soil Guidance Policy
- TAGM 3028 - "Contained In" Criteria for Environmental Media: Soil Action Levels (August 1997)

- DER-10, Technical Guidance for Site Investigation and Remediation, May 2010
- DER-23 / Citizen Participation Handbook for Remedial Programs, January 2010
- OSWER Directive 9200.4-17 - Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites (November 1997)

Additional regulations and guidance are applicable, relevant, and appropriate to the remedial alternatives and will be complied in connection with implementation of the remedial program; however, the list above is intended to represent the principal SCGs which should be considered in evaluating the remedial alternatives for the BCP site.

Conformance with the appropriate standards for remediation of contaminated soil is an important criterion in evaluating the remedial alternatives for the BCP site. Presently, in New York State 6 NYCRR Part 375 establishes the primary SCGs associated with remediation of contaminated soil at sites which are in the BCP. If proposing remediation pursuant to a Track other than Track 1 (Unrestricted Use), 6 NYCRR Part 375 requires evaluation of at least one remedial alternative pursuant to Track I (Unrestricted Use) and one other alternative developed by the applicant for the proposed use of the BCP site. The proposed remedial alternatives have been prepared in conformance with this requirement.

Alternative 1 would achieve compliance with the remedial goals, chemical-specific SCGs and RAOs for soil through removal of soil to achieve Track 1 Unrestricted Use SCO's and Protection of Groundwater SCO's. Compliance with SCGs for soil vapor would also be achieved by installing a waterproofing/vapor barrier system below the new building's slab as part of development. In addition, the 1<sup>st</sup> floor of the building will contain a parking garage with high volume air exchange that conforms to the NYC Building Code.

Alternative 2 would achieve compliance with the remedial goals, chemical-specific SCG's and RAOs for soil through removal of soil to meet Track 4 Site-Specific SCO's. Compliance with SCG's for soil vapor would also be achieved by installing a waterproofing/vapor barrier system below the new building's slab. A Site Management Plan would ensure that these controls remained protective for the long term. In addition, the 1<sup>st</sup> floor of the building will contain a parking garage with high volume air exchange that conforms to the NYC Building Code and will mediate any potential accumulation of soil vapors inside the building. For Alternatives 2,

Institutional Controls, including an environmental easement prohibiting any higher use of the Site and continuing the E-designation on the property, would be put in place.

Health and safety measures contained in the CHASP and Community Air Monitoring Plan (CAMP) will be implemented during Site redevelopment under this RAWP. For both Alternatives, focused attention on means and methods employed during the remedial action would ensure that handling and management of contaminated material would be in compliance with applicable SCGs. These measures will protect on-site workers and the surrounding community from exposure to Site-related contaminants.

### **Short-Term Effectiveness and Impacts**

This evaluation criterion assesses the effects of the alternative during the construction and implementation phase until remedial action objectives are met. Under this criterion, alternatives are evaluated with respect to their short term effects during the remedial action on public health and the environment during implementation of the remedial action, including protection of the community, protection of onsite workers and environmental impacts.

Alternative 1 would have significantly higher short-term effectiveness during implementation, as greater amounts of historic fill material would be excavated for off site disposal. Both alternatives would result in short-term dust generation impacts associated with excavation, handling, load out of materials, and truck traffic. Short-term impacts could potentially be higher for Alternative 1 since excavation of greater amounts of historical fill material would take place. However, focused attention to means and methods during a Track 1 removal action, including community air monitoring and appropriate truck routing, would minimize the overall impact of these activities.

An additional short-term adverse impact and risks to the community associated with both remedial alternatives is increased truck traffic. Truck traffic will be routed on the most direct course using major thoroughfares where possible and flag persons will be used to protect pedestrians at Site entrances and exits.

The potential adverse impact to the community, workers and the environment for both alternatives would be minimized through implementation of control plans including a Construction Health and Safety Plan, a Community Air Monitoring Plan (CAMP) and a

Soil/Materials Management Plan (SMMP), during all on-Site soil disturbance activities and would minimize the release of contaminants into the environment. Both alternatives provide short-term effectiveness in protecting the surrounding community by decreasing the risk of contact with on-Site contaminants. Construction workers operating under appropriate management procedures and a Construction Health and Safety Plan (CHASP) would provide protection from on-Site contaminants by using personal protective equipment would be worn consistent with the documented risks within the respective work zones.

### **Long-Term Effectiveness and Permanence**

This evaluation criterion addresses the results of a remedial action in terms of its permanence and quantity/nature of waste or residual contamination remaining at the Site after response objectives have been met, such as permanence of the remedial alternative, magnitude of remaining contamination, adequacy of controls including the adequacy and suitability of Engineering Controls/Institutional Controls (ECs/ICs) that may be used to manage contaminant residuals that remain at the Site and assessment of containment systems and ICs that are designed to eliminate exposures to contaminants, and long-term reliability of ECs.

Alternative 1 would achieve long-term effectiveness and permanence related to on-Site contamination by permanently removing all impacted soil/fill above Track 1 Unrestricted Use SCO's. Removal of on-Site contaminant sources would also prevent future groundwater contamination.

Alternative 2 would provide long-term effectiveness by removing most on-Site contamination, attaining Protection of Groundwater SCOs and Track 4 Site-Specific SCOs; installing a composite cover system across the Site; maintaining use restrictions; establishing an SMP to ensure long-term management of ICs and ECs; and the environmental easement and maintaining registration as an E-designated property will memorialize these controls for the long term. The SMP would ensure long-term effectiveness of all ECs and ICs by requiring periodic inspection and certification that these controls and restrictions continue to be in place and are functioning as they were intended, assuring that protections designed into the remedy continue to provide the required level of protection.

### **Reduction of Toxicity, Mobility, or Volume of Contaminated Material**

This evaluation criterion assesses the remedial alternative's use of remedial technologies that permanently and significantly reduce toxicity, mobility, or volume of contaminants as their principal element. The following is the hierarchy of source removal and control measures that are to be used to remediate a Site, ranked from most preferable to least preferable: removal and/or treatment, containment, elimination of exposure and treatment of source at the point of exposure. It is preferred to use treatment or removal to eliminate contaminants at a Site, reduce the total mass of toxic contaminants, cause irreversible reduction in contaminants mobility, or reduce of total volume of contaminated media.

Alternative 1 would permanently eliminate the toxicity, mobility, and volume of contaminants from on-Site soil by removing all soil in excess of Track 1 Unrestricted Use SCO's.

Alternative 2 would remove most of the historic fill at the Site, and all remaining on-Site soil/fill beneath the new building will meet Track 4 Site-Specific SCO's.

Alternative 1 would remove a greater total mass of contaminants from the Site. The removal of soil to 2 feet for the new development in both scenarios would lessen the difference in contaminant mass removal between these two alternatives.

### **Implementability**

This evaluation criterion addresses the technical and administrative feasibility of implementing an alternative and the availability of various services and materials required during its implementation, including technical feasibility of construction and operation, reliability of the selected technology, ease of undertaking remedial action, monitoring considerations, administrative feasibility (e.g. obtaining permits for remedial activities), and availability of services and materials.

The techniques, materials and equipment to implement both Alternatives 1 and 2 are readily available and have been proven to be effective in remediating the contaminants present on the Site. They use standard equipment and technologies that are well established in the industry. The reliability of each remedy is also high. There are no special difficulties associated with any of the activities proposed.

### **Cost Effectiveness**

This evaluation criterion addresses the cost of alternatives, including capital costs (such as construction costs, equipment costs, and disposal costs, engineering expenses) and site management costs (costs incurred after remedial construction is complete) necessary to ensure the continued effectiveness of a remedial action.

Since historic fill at the Site was only found to extend to a depth of up to 2-5 feet below grade during the RI, and the new building requires excavation of the entire Site to a depth of 2 feet, the costs associated with both Alternative 1 and Alternative 2 will likely be comparable. Costs associated with Alternative 1 would be higher than Alternative 2 since soil with analytes above Track 1 Unrestricted Use SCOs is encountered below the excavation depth required for development. Additional costs would include installation of additional shoring/underpinning, disposal of additional soil, and import of clean soil for backfill. However, long-term costs for Alternative 2 are likely higher than Alternative 1 based on implementation of a Site Management Plan as part of Alternative 2.

The remedial plan would couple the remedial action with the redevelopment of the Site, lowering total costs. The remedial plan will also consider the selection of the most appropriate disposal facilities to reduce transportation and disposal costs during cleanup and redevelopment of the Site.

Cost estimates for each Remedial Alternative are included as **Appendix F**.

### **Community Acceptance**

This evaluation criterion addresses community opinion and support for the remedial action.

Observations here will be supplemented by public comment received on the RAWP.

This RAWP will be subject to a public review under the NYS BCP and will provide the opportunity for detailed public input on the remedial alternatives and the selected remedy. This public comment will be considered by NYSDEC prior to approval of this plan. The Citizen Participation Plan for the project is provided in **Appendix E**. Observations here will be supplemented by public comment received on the RAWP. Under both alternatives, the overall goals of the remedial program, to protect public health and the environment and eliminate potential contaminant exposures, have been broadly supported by citizens in NYC communities.

### **Land Use**

This evaluation criterion addresses the proposed use of the property. This evaluation has considered reasonably anticipated future uses of the Site and takes into account: current use and

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

The current, intended, and reasonably anticipated future land use of the Site and its surroundings are compatible with the selected remedy of soil remediation. The proposed future use of the Site includes a 12-story building to provide 179 dwelling units and commercial establishments and community facilities at grade. Following remediation, the Site will meet either Track 1 Unrestricted Use or Track 4 Site-Specific SCOs, both of which are protective of public health and the environment for its planned residential use. The proposed use is compliant with the property's zoning and is consistent with recent development patterns. The areas surrounding the site is urban and consists of predominantly mixed residential and commercial buildings in zoning districts designated for commercial and residential uses. The development would remediate a parking lot and provide a modern residential building. The proposed development would clean up the property and make it safer, create new employment opportunities, living space for affordable and supportive housing and associated societal benefits to the community, and other economic benefits from land revitalization.

Temporary short-term project impacts are being mitigated through site management controls and truck traffic controls during remediation activities. Following remediation, the Site will meet either Track 1 Unrestricted Use SCOs or Track 4 Site-Specific SCOs, both of which are protective of public health and the environmental for its planned use.

The Site is not in close proximity to important cultural resources, including federal or state historic or heritage sites or Native American religious sites, natural resources, waterways, wildlife refuges, wetlands, or critical habitats of endangered or threatened species. The Site is located in an urban area and not in proximity to fish or wildlife and neither alternative would result in any potential exposure pathways of contaminant migration affecting fish or wildlife.

The remedial action is also protective of groundwater natural resources. The Site does not lie in a Federal Emergency Management Agency (FEMA)-designated flood plain. Both alternatives are equally protective of natural resources and cultural resources. Improvements in the current environmental condition of the property achieved by both alternatives considered in this plan are consistent with the City's goals for cleanup of contaminated land.

### **Sustainability of the Remedial Action**

This criterion evaluates the overall sustainability of the remedial action alternatives and the degree to which sustainable means are employed to implement the remedial action including those that take into consideration NYC's sustainability goals defined in OneNYC. Sustainability goals may include: maximizing the recycling and reuse of non-virgin materials; reducing the consumption of virgin and non-renewable resources; minimizing energy consumption and greenhouse gas emissions; improving energy efficiency; and promotion of the use of native vegetation and enhancing biodiversity during landscaping associated with Site development.

While Alternative 2 would potentially result in lower energy usage based on reducing the volume of material transported off-Site, both remedial alternatives are comparable with respect to the opportunity to achieve sustainable remedial action. The remedial plan for either alternative would take into consideration the shortest trucking routes during off-Site disposal of historic fill and other soils, which would reduce greenhouse gas emissions and conserve energy used to fuel trucks. The New York City Clean Soil Bank program is available for reuse of any clean native soils under either alternative.

### **3.2 SELECTION OF THE PREFERRED REMEDY**

The preferred remedy for the site is Alternative 2, a Track 4 remedy. Data generated during the site investigation support the conclusion that Alternative 1 Unrestricted Use SCOs is not achievable.

The Alternative 2 remedy would remove all soil/fill exceeding Track 4 Site Specific Use SCOs throughout the Site, which would be confirmed with post-excavation sampling. If soil/fill containing analytes at concentrations above Track 4 Site Specific Use SCOs is still present at the base or walls of the excavation after removal of all soil required for construction of the new building's slab are complete, additional excavation would be performed to ensure complete removal of soil/ fill that does not meet Track 4 Site Specific Use SCOs.

Engineering Controls are required for a Track 4 cleanup. A concrete slab covering the entire site and vapor barrier/waterproofing membrane would be installed as part of standard building development and are not considered part of the remedy. Additional soil vapor management would include a SSDS to address soil vapor contamination.

Use restrictions will be imposed on the site (including prohibitions on any use higher than Restricted Residential, e.g. the use of groundwater from the Site; prohibitions of restricted Site uses, such as farming or vegetable gardening, to prevent future exposure pathways; and prohibition of a higher level of land use without NYSDEC approval). The property would receive an environmental easement registered with the county clerk memorializing institutional controls. The Site would continue to be encumbered with an E-designation for hazardous material.

The following land use factor evaluation examines whether the selected alternative is acceptable based on the following criteria (below) as required by Article 27, Title 14 of the Environmental Conservation Law 27-1415.

### **3.2.1 Zoning**

The proposed future use of the Site will consist of one (1) 179-unit mixed use building. Layout of the proposed site development is presented in **Figure 5** and **Appendix A**. The current zoning designation is R7-2. The proposed use is R7-2 and R7X w/ C1-5. The implementation of Alternative 2 and the proposed final use are consistent with existing zoning for the property.

### **3.2.2 Citizen Participation**

This RAWP will be subject to a public review under the NYS BCP and will provide the opportunity for detailed public input on the remedial alternatives and the selected remedy. This public comment will be considered by NYSDEC prior to approval of this plan. The Citizen Participation Plan for the project is provided in **Appendix E**. Observations here will be supplemented by public comment received on the RAWP. Under Alternative 2, the overall goals of the remedial program, to protect public health and the environment and eliminate potential contaminant exposures, have been broadly supported by citizens in NYC communities.

### **3.2.3 Surrounding Property Uses**

### **3.2.4 Environmental Justice Concerns**

Implementation of Alternative 2 would clean up the property and make it safer, create new employment opportunities, living space for affordable and supportive housing and associated societal benefits to the community, and other economic benefits from land revitalization.

### **3.2.5 Land Use Designations**

The areas surrounding the site are comprised primarily of multi-family residential and commercial properties. The proposed use resulting from the implementation of Alternative 2 is consistent with these land uses.

### **3.2.6 Population growth patterns**

Implementation of Alternative 2 and the proposed use is compliant with the property's zoning and is consistent with recent development patterns.

### **3.2.7 Accessibility to Existing Infrastructure**

The site has ready access to NYC infrastructure including roads, mass transit and public utilities. Implementation of Alternative 2 is compatible with current and future access and utilization of existing infrastructure.

### **3.2.8 Proximity to Cultural Resources**

The Site is located is not in proximity to any significant cultural resources.

### **3.2.9 Proximity to Natural Resources**

The Site is located in an urban area and is not in proximity to significant natural resources. Implementation of Alternative 2 would not result in any potential exposure pathways of contaminant migration affecting fish or wildlife.

### **3.2.10 Off-Site Groundwater Impacts**

Alternative 2 is protective of groundwater natural resources. There are no known uses of groundwater in the vicinity of the Site.

### **3.2.11 Proximity to Floodplains**

The Site is located within 100-year flood zone.

### **3.2.12 Geography and Geology of the Site**

According to the United States Geological Survey (USGS) 7.5-Minute Quadrangle, *Central Park, NY-NJ* dated 1967; revised 1979, the elevation of the Site is approximately nine feet above

mean sea level. The area surrounding the Site indicates topography that slopes to the east-southeast.

The Site area is underlain by approximately 20 to 40 feet of unconsolidated clays, silts, sands, and gravels, based on a report published by the USGS. These materials were deposited directly by glacial activity as glacial till or as glaciofluvial deposits. Bedrock underlies the unconsolidated material and consists of a coarsely crystalline material, which has been subjected to a high degree of metamorphism.

According to the United States Department of Agriculture Soil Conservation Service, soil at the Site is classified as Urban Land. This designation applies to areas where at least 85 percent of the surface is covered by an impermeable surface such as asphalt, buildings, and roads.

Based on the surface topography at the Site, groundwater flow is assumed to be to the east towards the East River. Estimated groundwater levels and/or flow direction may vary due to seasonal fluctuations in precipitation, local usage demands, geology, underground structures, or dewatering operations. There are no surface water bodies or streams at the Site. The East River is located approximately 2,250 feet to the east.

### **3.2.13 Current Institutional Controls**

The site is currently encumbered with an E-designation for Hazardous Materials. This designation would remain in place by New York City Building's Department.

### **3.2.14 Sustainability of the Remedial Action**

The remedial plan would take into consideration the shortest trucking routes during off-Site disposal of historic fill and other soils, which would reduce greenhouse gas emissions and conserve energy used to fuel trucks. The New York City Clean Soil Bank program is available for reuse of any clean native soils.

### **3.3 SUMMARY OF SELECTED REMEDIAL ACTIONS**

The preferred remedial action alternative is Alternative 2, the Track 4 remedial action. The preferred remedial action achieves protection of public health and the environment for the intended use of the property. The preferred remedial action will achieve all of the remedial action objectives established for the project and addresses applicable SCGs. The preferred remedial action is effective in both the short-term and long-term and reduces mobility, toxicity and volume of contaminants. The preferred remedial action alternative is cost effective and implementable and uses standards methods that are well established in the industry.

The proposed remedial action will consist of:

1. Performance of all required NYS VCP Citizen Participation activities according to an approved Citizen Participation Plan.
2. Performance of a Community Air Monitoring Program for particulates and volatile organic carbon compounds.
3. Establishment of Site Specific (Track 4) Soil Cleanup Objectives (SCOs).
4. Site mobilization involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas.
5. Completion of a Waste Characterization Study prior to excavation activities. Waste characterization soil samples will be collected at a frequency dictated by disposal facility(s).
6. Excavation and removal of soil/fill exceeding Site Specific (Track 4) SCOs. The entire footprint of the Site will be excavated to a depth of approximately 2 feet below grade. The southwestern portion of property, where the former gasoline station located, will be excavated to the depth of 8 feet below grade for UST removal. Approximately 150 tons of petroleum impacted soil/fill and 3,550 tons of historic fill (a total of 3,700 tons) will be removed from the Site and properly disposed at an appropriately licensed or permitted facility.
7. Screening of excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a PID. Appropriate segregation of excavated media on-Site.

8. Management of excavated materials including temporarily stockpiling and segregating in accordance with defined material types and to prevent co-mingling of contaminated material and non-contaminated materials.
9. Removal of six 550-gallon USTs from the southwestern portion of the Site. Removal of all UST's that are encountered during soil/fill removal actions. Registration of tanks and reporting of any petroleum spills associated with UST's and appropriate closure of these petroleum spills in compliance with applicable local, State and Federal laws and regulations.
10. Collection and analysis of end-point samples to determine the performance of the remedy with respect to attainment of Site Specific Track 4 SCOs.
11. Spill NO. 1503447 will be closed following tanks removal and associated contaminated soil removal per NYSDEC requirements. Groundwater treatment and long term monitoring, if required by NYSDEC will be performed per NYSDEC approval. A spill closure report will be prepared and submitted to NYSDEC.
12. Transportation and off-Site disposal of all soil/fill material at licensed or permitted facilities in accordance with applicable laws and regulations for handling, transport, and disposal, and this plan. Sampling and analysis of excavated media as required by disposal facilities. Appropriate segregation of excavated media on-Site.
13. Construction of an engineered composite cover consisting of a six-inch thick concrete building slab with a 12-inch clean granular sub-base beneath all building areas.
14. Placement of demarcation layer in areas used (11,500 sf) for parking.
15. Installation of a vapor barrier system consisting of vapor barrier beneath the building slab to mitigate soil vapor migration into the building. The vapor barrier system will consist of a 20-mil vapor barrier, Vaporblock<sup>®</sup> Plus VBP20 by Raven Industries, or similar, below the slab throughout the full building area. All welds, seams and penetrations will be properly sealed to prevent preferential pathways for vapor migration.
16. Installation of a sub-slab depressurization system (SSDS) consisting of a network of horizontal pipe set in the middle of a gas permeable layer immediately beneath the building slab and vapor barrier system. The horizontal piping will consist of fabric wrapped, perforated schedule 40 4-inch PVC pipe connected to a 4-inch steel riser pipes that penetrate the slab and travel through the building to the roof. The gas permeable layer will consist of a 12-inch thick layer of 3/4-inch bluestone. The pipes will be finished at the roof line with rain caps to prevent rain infiltration. The sub-slab depressurization system is an Engineering Control for the remedial action. The remedial

engineer will certify in the FER that the sub-slab depressurization system was designed and properly installed to establish a vacuum in the gas permeable layer and a negative (decreasing outward) pressure gradient across the building slab to prevent vapor migration into the building.

17. Import of materials to be used for backfill and cover in compliance with this plan and in accordance with applicable laws and regulations.
18. Performance of all activities required for the remedial action, including acquisition of required permits and attainment of pretreatment requirements, in compliance with applicable laws and regulations.
19. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations.
20. Submission of a Final Engineering Report (FER) that describes the remedial activities, certifies that the remedial requirements have been achieved, defines the Site boundaries, lists any changes from this RAWP.
21. Submission of an approved Site Management Plan (SMP) in the FER for long-term management of residual contamination, including plans for operation, maintenance, monitoring, inspection and certification of Engineering and Institutional Controls and reporting at a specified frequency.
22. Recording of a Declaration of Covenants and Restrictions that includes a listing of Engineering Controls and Institutional Controls and a requirement that management of these controls must be in compliance with an approved SMP. Institutional Controls will include prohibition of the following: (1) vegetable gardening and farming; (2) use of groundwater without treatment rendering it safe for the intended use; (3) disturbance of residual contaminated material unless it is conducted in accordance with the SMP; and (4) higher level of land usage without OER-approval.

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

### 3.4 SOIL CLEANUP OBJECTIVES AND SOIL/ FILL MANAGEMENT

Site Specific Track 4 SCOs are proposed for this project and SCO's are:

<u>Contaminant</u>	<u>Site-Specific SCO's</u>
Total SVOCs	250 ppm
Lead	1,200 ppm
Mercury	2 ppm
Barium	800 ppm
All metals	Protection of groundwater standards

Soil and materials management on-Site and off-Site, including excavation, handling and disposal, will be conducted in accordance with the Soil/Materials Management Plan in Section 5.4. Discrete contaminant sources (such as hotspots) identified during the remedial action will be identified by GPS or surveyed. This information will be provided in the Remedial Action Report.

#### Soil/Fill Excavation and Removal

The location of planned excavations is shown in **Figure 10**. The total quantity of soil/fill expected to be excavated and disposed off-Site is 3,700 tons. Due to the presence of a 4 feet crawl space, no additional excavation will be performed within the footprint of the existing gym. The dimension of the existing gym is approximately 4,500 square feet.

Description	Area (sq ft)	Excavation Depth (ft)	Petroleum Impacted Soil to be Removed		Urban Fill to be Removed	
			Volume (cubic yard)	Tonnage (ton)	Volume (cubic yard)	Tonnage (ton)
Building Footprint (Excluding Existing Gym)	27,500	2	0	0	2,037	3,056
Existing Gym	4,500	NA	0	0	0	0
UST Removal	500	8	100	150	100	150
Future Parking Lot	3,000	2	0	0	222	333
<b>Total</b>			<b>100</b>	<b>150</b>	<b>2,359</b>	<b>3,539</b>

For each disposal facilities to be used in the remedial action, a letter from the developer/QEP to the receiving facility requesting approval for disposal and a letter back to the developer/QEP

providing approval for disposal will be submitted to NYSDEC prior to any transport and disposal of soil at a facility.

Disposal facilities will be reported to NYSDEC when they are identified and prior to the start of remedial action.

### **End-point Sampling**

End-point samples will be analyzed for compounds and elements as described below utilizing the following methodology:

- Volatile organic compounds by EPA Method 8260;
- Semi-volatile organic compounds by EPA Method 8270;
- Target Analyte List metals; and
- Pesticides/PCBs by EPA Method 8081/8082.

New York State ELAP certified labs will be used for all end-point sample analyses. Labs performing end-point sample analyses will be reported in the FER. The FER will provide a tabular and map summary of all end-point sample results and will include all data including non-detects and applicable standards and/or guidance values.

### **Confirmation End-point Sampling**

Removal actions for development purposes under this plan will be performed in conjunction with confirmation end-point soil sampling. Confirmation samples will be collected as described in DER-10 at locations to be determined by NYSDEC. To evaluate attainment of Track 4 SCOs, analytes will include those for which SCOs have been developed, including SVOCs, lead, mercury and barium, according to analytical methods described above. If Track 1 Unrestricted Use SCOs are pursued, samples will be analyzed for VOCs, SVOCs, pesticides, PCBs and metals according to analytical methods described above.

### **Hotspot End-point Sampling**

Endpoint samples will be collected from the sidewalls and base of UST excavation on the southwestern portion of the Site. End point samples will be analyzed for SCO trigger parameters.

For any hotspots identified during this remedial program, including any hotspots identified during the remedial action, hotspot removal actions will be performed to ensure that hot-spots are fully removed and end point samples will be collected at the frequency specified in DER-10.

### **Quality Assurance/Quality Control**

One duplicate soil sample for each of 20 samples collected will be analyzed to maintain property quality assurance and quality control (QA/QC) and detect any lab artifacts. One duplicate sample will be collected during the endpoint sampling for this project. The duplicate sample will be analyzed for the same parameters as the endpoint samples.

### **Import of Soils**

Import of soils onto the property will be performed in conformance with the Soil/Materials Management Plan in Section 5.4. Imported soil will meet the lower of:

- Track 1 Unrestricted Use SCO's, and
- Groundwater Protection Standards in Part 375-6.8.

The estimated quantity of soil to be imported into the Site for backfill and cover soil is 2,000 tons.

### **Reuse of Onsite Soils**

Soil reuse is not planned on this project.

## **4.0 REMEDIAL ACTION PROGRAM**

### **4.1 GOVERNING DOCUMENTS**

All remedial work performed under this plan will be in full compliance with the governing documents described in this section of the RAWP.

#### **4.1.1 Site Specific Health & Safety Plan (HASP)**

All remedial work performed under this plan will be in full compliance with governmental requirements, including Site and worker safety requirements mandated by Federal OSHA. The Volunteer and associated parties preparing the remedial documents submitted to the State and those performing the construction work, are completely responsible for the preparation of an appropriate Health and Safety Plan and for the appropriate performance of work according to that plan and applicable laws.

The Health and Safety Plan (HASP) and requirements defined in this Remedial Action Work Plan pertain to all remedial and invasive work performed at the Site until the issuance of a Certificate of Completion. A copy of the HASP is provided as **Appendix B**.

The site-specific HASP will be reviewed with Site personnel and appropriate sub-contractors prior to the initiation of fieldwork. All proposed work will be performed in “Level D” personal protective equipment unless field condition warrant additional protection.

The Site Safety Coordinator will be Cider Environmental unless otherwise specified (and approved) by the NYSDEC. A resume will be provided to NYSDEC prior to the start of remedial construction.

Confined space entry will comply with all OSHA requirements to address the potential risk posed by combustible and toxic gasses. Potential confined spaces on this project include utility trenches and other excavation areas.

#### **4.1.2 Quality Assurance Project Plan (QAPP)**

A QAPP, detailing procedures necessary to generate data of sufficient quality and quantity to represent successful performance of the Remedial Action at the Site, has been provided as

**Appendix J** of this report. The QAPP includes a Sampling and Analysis Plan (SAP), detailing sampling and analysis of all media (endpoint samples, waste characterization samples, fill and soil cover samples, etc.), and which identifies methods for sample collection and handling.

#### **4.1.3 Soil/Materials Management Plan (SoMP)**

All soil removal will follow the SoMP plan as specified in Section 5.4, below. The SoMP includes detailed plans for managing all soils/materials that are disturbed at the Site, including excavation, handling, storage, transport and disposal, and includes all controls that will be applied to these efforts to assure effective, nuisance-free performance in compliance with all applicable Federal, State and local laws and regulations.

All contaminant source removal areas will be surveyed at the completion of excavation. This information will be provided on maps in the FER.

#### **4.1.4 Storm-Water Pollution Prevention Plan (SWPPP)**

The Volunteer is responsible for ensuring that a storm water pollution prevention plan (SWPPP) will be prepared for the Site prior to demolition and soil removal activities. The plan will address requirements of New York State Storm-Water Management Regulations including physical methods to control and/or divert surface water flows and to limit the potential for erosion and migration of Site soils, via wind or water, and will accommodate the construction sequencing and staging areas. The erosion and sediment controls will be in conformance with requirements presented in the New York State Guidelines for Urban Erosion and Sediment Control.

#### **4.1.5 Community Air Monitoring Plan (CAMP)**

The NYSDOH Generic CAMP (provided in **Appendix K**) will be initiated during all ground intrusive activities, and during any other fieldwork that is reasonably likely to generate significant dust or vapors from known or suspected contaminated soils. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pit excavation or trenching, and the installation of soil borings or monitoring wells. The implementation of the CAMP will document the presence or absence of VOCs and dust in the air surrounding the work zone, which may migrate off-site due to fieldwork activities. This plan provides guidance on the need for implementing more stringent dust and emission controls based on air quality data.

Mitigation measures may include reducing the surface area of contaminated soil being disturbed at one time, watering exposed soils to reduce fugitive dust and odors, or stopping excavation activities. Dust suppression activities will be conducted during construction activities that will disturb on-site soils and may include misting, reduction in soil movement, or cessation of excavation.

Real-time air monitoring for VOCs and particulate levels at the perimeter of the exclusion zone or work area will be performed. Periodic monitoring for VOCs will be performed 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, for instance, will 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. Depending upon the proximity of potentially exposed individuals, continuous monitoring may be performed 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.

Exceedances of action levels observed during performance of the CAMP will be reported to the NYSDEC Project Manager and included in the Daily Report.

### **VOC Monitoring, Response Levels, and Actions**

VOCs will be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis during invasive work. Upwind concentrations will be measured at the start of each workday and periodically thereafter to establish background conditions. The monitoring work will be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment will be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment will be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

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 will be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities will resume with continued monitoring.

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 will be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities will resume provided that the total organic vapor level 200 feet downwind of the 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.

If the organic vapor level is above 25 ppm at the perimeter of the work area, activities will be shut down.

All 15-minute readings must be recorded and be available for NYSDEC personnel to review. Instantaneous readings, if any, used for decision purposes will also be recorded.

### **Particulate Monitoring, Response Levels, and Actions**

Particulate concentrations will be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring will be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment will 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.

If the downwind PM-10 particulate level is 100 micrograms per cubic meter ( $\text{mcg}/\text{m}^3$ ) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques will be employed. Work will continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed  $150 \text{ mcg}/\text{m}^3$  above the upwind level and provided that no visible dust is migrating from the work area.

If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m<sup>3</sup> above the upwind level, work will be stopped and a re-evaluation of activities initiated. Work will resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m<sup>3</sup> of the upwind level and in preventing visible dust migration.

All readings will be recorded and will be available for NYSDEC personnel to review.

#### **4.1.6 Contractors Site Operations Plan (SOP)**

The Remedial Engineer has reviewed all plans and submittals for this remedial project (including those listed above and contractor and sub-contractor document submittals) and confirms that they are in compliance with this RAWP. The Remedial Engineer is responsible to ensure that all later document submittals for this remedial project, including contractor and sub-contractor document submittals, are in compliance with this RAWP. All remedial documents will be submitted to NYSDEC and NYSDOH in a timely manner and prior to the start of work.

#### **4.1.7 Citizen Participation Plan**

A Citizen Participation Plan (CPP) including an overview of the VCP program, background of the Site, a summary of the investigative findings for the Site, and citizen participation activities is included as **Appendix E**.

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

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

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

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

**New York Public Library**  
125<sup>th</sup> Street Branch,  
224 E 125<sup>th</sup> Street  
New York, NY 10035  
Call for hours: (212) 534-5050

**NYSDEC, Region 2 Office**  
47-40 21st Street  
Long Island City, NY 11101  
Call in advance: (718) 482-4900

## **4.2 GENERAL REMEDIAL CONSTRUCTION INFORMATION**

### **4.2.1 Project Organization**

Principal personnel who will participate in the remedial action include Sr. Consultant James Cressy, Sr. Geologist Shuangtao Zhang, and Sr. Engineer Wenqing Fang. The Professional Engineer (PE) and Qualified Environmental Professionals (QEP) for this project are Mr. Wenqing Fang, P.E., and Mr. James Cressy, QEP.

Resumes of key personnel involved in the Remedial Action are included in **Appendix H**.

### **4.2.2 Remedial Engineer and Qualified Environmental Professional Remedial Engineer**

The Remedial Engineer for this project will be Wenqing Fang, P.E. The Remedial Engineer is a registered professional engineer licensed by the State of New York. The Remedial Engineer will have primary direct responsibility for implementation of the remedial program for the 413 East 130<sup>th</sup> Street Site (NYSDEC Site No. C2XXXX). The Remedial Engineer will certify in the Final Engineering Report that the remedial activities were observed by qualified environmental professionals under her supervision and that the remediation requirements set forth in the Remedial Action Work Plan and any other relevant provisions of ECL 27-1419 have been achieved in full conformance with that Plan. Other Remedial Engineer certification requirements are listed later in this RAWP.

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

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

The Remedial Engineer will provide the certifications listed in Section 11.2 in the Final Engineering Report.

### **Qualified Environmental Professional**

The Qualified Environmental Professional (QEP) for this project will be James Cressy. The QEP will oversee environmental remedial activities on the Site, document the proper removal of contaminated soils, collect waste characterization as well as site integrity samples, inspect and certify the proper importation of approval fill soils, and assist the Remedial Engineer in the preparation of documents including the FER, the SMP, and periodic status reports.

### **4.2.3 Remedial Action Construction Schedule**

A schedule for performance of the remedial work is provided in Section 12.

### **4.2.4 Work Hours**

The hours for operation of remedial construction will be from 7 a.m. to 3 p.m. These hours conform to the New York City Department of Buildings construction code requirements or according to specific variances issued by that agency. NYSDEC will be notified by the Volunteer of any variances issued by the Department of Buildings. No remedial work will be conducted on the weekend (Saturday or Sunday) unless expressly permitted by NYSDEC. NYSDEC reserves the right to deny alternate remedial construction hours.

### **4.2.5 Site Security**

Site access will be controlled by a gated entrance into the fenced property.

### **4.2.6 Traffic Control**

Traffic control will be provided by the contractor during equipment entrance and egress from the Site. Trucks will follow the approved truck route in Section 5.4.4. Drivers of trucks leaving the Site with soil/fill will be instructed to proceed without stopping in the vicinity of the site to prevent neighborhood impacts. The planned route on local roads for trucks leaving the site is presented on **Figure 15**.

#### **4.2.7 Contingency Plan**

If unknown conditions are encountered on-site during sub-grade removal (e.g., discovery of a previously unidentified UST), the Contingency Plan (provided in Section 5.5) and all applicable NYSDEC guidelines will be followed to address the condition(s).

#### **4.2.8 Worker Training and Monitoring**

The Volunteer is responsible for insuring that all Site contractors provide their workers with applicable training (i.e. HAZWOPER, site safety training and medical monitoring, as necessary).

#### **4.2.9 Agency Approvals**

The Volunteer has addressed all SEQRA requirements for this Site. All permits or government approvals required for remedial construction have been, or will be, obtained prior to the start of remedial construction. Acceptance of this RAWP by NYSDEC does not constitute satisfaction of these requirements and will not be a substitute for any required permit.

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

#### **4.2.10 NYSDEC BCP Signage**

A project sign will be erected at the main entrance to the Site prior to the start of any remedial activities. The sign will indicate that the project is being performed under the New York State Brownfield Cleanup Program. The sign will meet the detailed specifications provided by the NYSDEC Project Manager and contained in **Appendix I**.

#### **4.2.11 Pre-Construction Meeting with NYSDEC**

A pre-construction meeting among NYSDEC, the Volunteer, the RE and QEP, and the General Contractor will take place prior to the start of remedial construction activities.

#### **4.2.12 Emergency Contact Information**

An emergency contact list with names and telephone numbers that will define the specific project contacts for use by NYSDEC and NYSDOH in the case of a day or night emergency is provided below.

**Table: Emergency Contact Information**

<b>Emergency Contact</b>	<b>Phone Number</b>
<b>EMERGENCY</b>	<b>911</b>
Hospital: Metropolitan Hospital Center	(212) 423-6262
Police Department	(212) 860-6511 or 911
Fire Department	(718) 999-2000 or 911
Site Health and Safety Officer,	TBD
Remedial Engineer,	TBD
NYSDEC Project Manager,	TBD
NYSDOH Project Manager,	TBD
Construction Manager	TBD

#### **4.2.13 Remedial Action Costs**

The total estimated cost of the Remedial Action is \$701,790. An itemized and detailed summary of estimated costs for all remedial activity is attached as **Appendix F**. This will be revised based on actual costs and submitted as an Appendix to the Final Engineering Report.

### **4.3 SITE PREPARATION**

#### **4.3.1 Agency Notification and Mobilization**

##### **Notifications**

The NYSDEC and OER will be notified in writing at least five (5) business days prior to the initiation of any of the on-site work and during the course of the fieldwork. Changes to fieldwork scheduling will be provided via facsimile transmission and/or email. All applicable local agencies will also be notified prior to the initiation of site work. NYSDEC will have the opportunity to participate in all remediation project status meetings (adequate notice of these meetings will be provided).

Prior to the implementation of any ground intrusive activities, a request for a complete utility markout of the subject property will be submitted as required by New York State Department of Labor regulations. Confirmation of underground utility locations will be secured, and a field check of the utility markout will be conducted prior to the initiation of work. Any utilities on the Site will be protected (as necessary) by the contractor or Volunteer.

##### **Site Mobilization**

Mobilization will be conducted as necessary for each phase of work at the Site. Mobilization includes field personnel orientation, equipment mobilization (including securing all sampling equipment needed for the field investigation), marking/staking sampling locations and utility mark-outs. Each field team member will attend an orientation meeting to become familiar with the general operation of the Site, health and safety requirements, and field procedures. Site mobilization will be conducted in a manner such that erosion and sedimentation control, utility marker and easement layout, and other site preparation tasks are fully instituted before construction begins.

#### **4.3.2 Erosion and Sedimentation Controls**

This section describes preventative measures that will be taken to protect the Site from soil erosion and sedimentation during remedial activities. A final ESCP, reflecting final Site development plans and any approved modifications to the scope of remedial work, will be submitted to the NYSDEC for review and approval prior to the start of construction activities.

The final ESCP will include the following elements:

- A location map including the proximity of the Site to relevant off-site features;
- An Existing Conditions Site Plan;
- A grading plan and construction timetable including finished elevations and addressing the sequencing of the project; and,
- The location and type of all erosion and sediment control measures (e.g., silt fence, hay bale checks, stabilized construction entrance, etc.) and sequencing of the measures, if needed.

The Site remediation will occur in such a way as to permit on-site stormwater to remain on the Site.

#### **4.3.3 Stabilized Construction Entrance(s)**

Steps will be taken to ensure that trucks departing the site will not track soil, fill or debris off-Site. Such actions may include use of cleaned asphalt or concrete roads or use of stone or other aggregate-based egress paths between the truck inspection station and the property exit.

Measures will be taken to ensure that adjacent roadways will be kept clean of project related soils, fill and debris.

#### **4.3.4 Utility Marker and Easements Layout**

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

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

#### **4.3.5 Sheeting and Shoring**

Appropriate management of structural stability of on-Site or off-Site structures during on-Site activities include excavation is the sole responsibility of the Volunteer and its contractors. The Volunteer and its contractors are solely responsible for safe execution of all invasive and other work performed under this Plan. The Volunteer and its contractors must obtain any local, State or Federal permits or approvals that may be required to perform work under this Plan. Further, the Volunteer and its contractors are solely responsible for the implementation of all required, appropriate, or necessary health and safety measures during performance of work under the approved Plan.

#### **4.3.6 Equipment and Material Staging**

Equipment and materials will be stored and staged in a manner that complies with applicable laws and regulations. Specific Site areas will be designated for the staging of equipment and materials. Staging areas will be located and managed such that: a) non-contaminated materials do not contact or become intermixed with contaminated materials; and, b) the likelihood of worker and/or visitor exposures to contaminated media is minimized.

### **4.3.7 Decontamination Area**

Decontamination of field equipment will be conducted to prevent Site cross-contamination, minimize the potential for off-site contamination and to reduce exposures to contaminated media. All decontamination activities will be documented in field logbooks.

Trucks and other heavy equipment remaining on-site will be brushed to remove easily accessible gross accumulations of soil at the end of each work day, and prior to moving between excavation areas or moving toward the Site exit. A dedicated decontamination area will be provided as part of the erosion and sedimentation control for vehicles exiting the Site, and will be designed such that there is continuity between the equipment wash area and the clean egress path. Heavy equipment will be brushed and sprayed with high-pressure water and/or steam to remove soil adhering to surfaces (including wheels and vehicle undercarriages), prior to exiting the Site.

Any non-disposable sampling equipment or personal protective equipment requiring decontamination will be conducted on a decontamination line setup on plastic sheeting, proceeding from dirty to clean. All items (disassembled as needed) will be washed/brushed thoroughly in an Alconox (or similar) solution, then rinsed with clean water (and/or nitric acid and methanol, as appropriate) per established USEPA decontamination protocols. All down-hole gauging and pumping equipment will be allowed to run fully submerged in both soapy and clean water. Rinse blanks will be collected as per the requirements of the QAPP.

Equipment known or suspected to be impacted by petroleum or solvent contamination, grossly contaminated media or materials subject to conditions specified in the Contingency Plan (Section 5.5), will be decontaminated on an engineered pad designed to capture and contain wash water, which will be containerized and characterized prior to off-site disposal at a permitted facility. Based on known contaminant conditions, decontamination rinse water generated during other decontamination activities will be allowed to infiltrate into on-site soils, either directly to the surface (for minor quantities of water that are not likely to exhibit sheet flow) or to the subsurface via engineered discharge pits.

### **4.3.8 Site Fencing**

Site fencing (6 feet in height minimum with a locking gate) will be installed as part of Site preparation, as necessary.

### **4.3.9 Demobilization**

Demobilization will include:

- As necessary, restoration of temporary access areas and areas that may have been disturbed to accommodate support areas (e.g., staging areas, decontamination areas, storage areas, temporary water management areas, and access area);
- Removal of sediment from erosion control measures and truck wash and disposal of materials in accordance with applicable laws and regulations;
- Equipment decontamination, and;
- General refuse disposal.

Equipment will be decontaminated and demobilized at the completion of all field activities.

Investigation equipment and large equipment (e.g., soil excavators) will be washed at the truck inspection station as necessary. In addition, all investigation and remediation derived waste will be appropriately disposed.

### **4.3.10 Well Decommissioning**

Any existing monitoring wells located within construction areas will be properly decommissioned according to technical guidance provided in NYSDEC CP-43: Groundwater Monitoring Well Decommissioning Policy. The monitoring well casing will be exposed to a depth corresponding to the depth of planned excavation in the immediate vicinity of the well, the exposed casing will be cut off at the level of the excavation floor and the remaining subsurface portion of the casing will be grouted in-place, as per CP-43 Section 6.0.

## **4.4 REPORTING**

All daily and monthly Reports will be included in the Final Engineering Report.

### **4.4.1 Daily Reports**

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

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

- A summary of CAMP finding, including excursions;
- An explanation of notable Site conditions.

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

Daily Reports will include a description of daily activities keyed to an alpha-numeric map for the Site that identifies work areas. These reports will include a summary of air sampling results, odor and dust problems and corrective actions, and all complaints received from the public. A Site map that shows a predefined alpha-numeric grid for use in identifying locations described in reports submitted to NYSDEC is attached in **Figure 14**.

The NYSDEC assigned project number will appear on all reports.

#### **4.4.2 Monthly Reports**

Monthly reports prepared in accordance with DER-10 Section 5.7(b) will be submitted to NYSDEC and NYSDOH Project Managers within one week following the end of the month of the reporting period and will include, at a minimum:

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

### **4.4.3 Other Reporting**

Photographs will be taken of all remedial activities and submitted to NYSDEC in digital (JPEG) format. Photos will illustrate all remedial program elements and will be of acceptable quality. Representative photos of the Site prior to any Remedial Actions will be provided.

Representative photos will be provided of each contaminant source, source area and Site structures before, during and after remediation. Photos will be included in the daily reports as needed, and a comprehensive collection of photos will be included in the Final Engineering Report.

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

### **4.4.4 Complaint Management Plan**

All complaints from citizens will be promptly reported to NYSDEC. Complaints will be addressed and outcomes will also be reported to NYSDEC in daily reports. Notices to NYSDEC will include the nature of the complaint, the party providing the complaint, and the actions taken to resolve any problems.

Any complaints from the public regarding nuisances or other Site conditions will be handled as follows:

- Information from the person making the complaint (name, phone number, address, etc.) will be obtained, if possible, so follow-up can be completed.
- The nature of the complaint as well as the date, time, and weather conditions will be noted.
- The complaint will be addressed by on-site personnel.
- The person logging the complaint will be re-contacted (if contact information was provided), so that the resolution of the complaint can be documented.
- In the event that the complaint cannot be resolved, the NYSDEC project manager will be contacted in writing.

### **4.4.5 Deviations from the Remedial Action Work Plan**

All changes to the RAWP will be reported to the NYSDEC Project Manager and will be documented in daily reports and reported in the FER. The process to be followed if there are any

deviations from the RAWP will include a request for approval for the change from NYSDEC noting the following:

- Reasons for deviating from the approved RAWP;
- Effect of the deviations on overall remedy; and
- Determination that the remedial action with the deviation(s) is protective of public health and the environment.

Notification will be provided to the NYSDEC by telephone for conditions requiring immediate action (e.g., conditions judged to be a danger to on-site personnel or the surrounding community).

#### **4.5 SITE MANAGEMENT PLAN**

A Track 4 remedial action is proposed and Site Management is required. Site Management will be the last phase of remediation. Site Management will begin with the approval of the Remedial Action Report and issuance of the Certificate of Completion (COC) for the Remedial Action.

The Site Management Plan (SMP) describes appropriate methods and procedures to ensure implementation of all ECs and ICs that are required by this RAWP. The Site Management Plan is submitted as part of the FER but will be written in a manner that allows its use as an independent document. Site Management continues until terminated in writing by NYSDEC. The property owner is responsible to ensure that all Site Management responsibilities defined in the Site Management Plan are implemented.

The SMP will provide a detailed description of the procedures required to manage residual soil/fill left in place following completion of the remedial action in accordance with the Brownfield Cleanup Agreement with NYSDEC. This includes a plan for: (1) implementation of EC's and ICs; (2) operation and maintenance of EC's; (3) inspection and certification of IC's and EC's.

Site management activities and EC/IC certification will be scheduled by NYSDEC on a periodic basis to be established in the FER and the SMP and will be subject to review and modification by NYSDEC.

## **4.6 QUALITATIVE HUMAN HEALTH EXPOSURE ASSESSMENT**

The objective of the qualitative exposure assessment is to identify potential receptors and pathways for human exposure to the contaminants of concern (COC) that are present at, or migrating from, the Site. The identification of exposure pathways describes the route that the COC takes to travel from the source to the receptor. An identified pathway indicates that the potential for exposure exists; it does not imply that exposures actually occur.

Data and information reported in the Remedial Investigation Report (RIR) are sufficient to complete a Qualitative Human Health Exposure Assessment (QHHEA) for this project. As part of the BCP process, a QHHEA was performed to determine whether the Site poses an existing or future health hazard to the Site's exposed or potentially exposed population. The sampling data from the RI were evaluated to determine whether there is any health risk under current and future conditions by characterizing the exposure setting, identifying exposure pathways, and evaluating contaminant fate and transport. This QHHEA was prepared in accordance with **Appendix G** and Section 3.3 (b) 8 of the NYSDEC Draft DER-10 Technical Guidance for Site Investigation and Remediation.

### **Known and Potential Contaminant Sources**

Based on the results of the RIR, the contaminants of concern are:

#### **Soil**

- Multiple SVOCs, including benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene and indeno(1,2,3-cd)Pyrene, were detected in shallow soils (0-2 ft bgs) at concentrations exceeding the Track 2 Restricted Residential Use SCOs.
- Metals including barium, lead and mercury exceeded Restricted Residential Use SCOs.

#### **Groundwater**

- Four (4) VOC, isopropylbenzene (100 µg/L), n-butylbenzene (27 µg/L), n-propylbenzene (160 µg/L), and sec-butylbenzene (52 µg/L) exceeded AWQS.
- Six (6) SVOC, benzo(a)anthracene (max 0.18 µg/L), benzo(a)pyrene (max 0.19 µg/L), benzo(b)fluoranthene (max 0.32 µg/L), benzo(k)fluoranthene (max 0.11 µg/L), chrysene (max 0.24 µg/L), and indeno(1,2,3-cd)pyrene (max 0.15 µg/L).exceeded AWQS.

- Five (5) inorganic analytes, aluminum, iron, magnesium, manganese and sodium, exceeded AWQS in the filtered groundwater samples.

### **Soil Vapor**

- Petroleum-related VOCs were detected at elevated concentrations. BTEX compounds were detected at a maximum concentration of 1,020 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) at SG-1. Other compounds detected at elevated concentrations at this location include heptane ( $1,040 \mu\text{g}/\text{m}^3$ ), toluene ( $1,020 \mu\text{g}/\text{m}^3$ ), hexane ( $905 \mu\text{g}/\text{m}^3$ ), cyclohexane ( $894 \mu\text{g}/\text{m}^3$ ), tetrahydrofuran ( $410 \mu\text{g}/\text{m}^3$ ), propylene ( $359 \mu\text{g}/\text{m}^3$ ), and isopropylbenzene ( $358 \mu\text{g}/\text{m}^3$ ). Chlorinated solvents were detected at low levels.

### **Nature, Extent, Fate and Transport of Contaminants**

Soil: the subsurface soil was impacted by elevated levels of metals and SVOCs. The impact appears to be concentrated in the shallow soil/fill (0-5 feet). In the immediately vicinity of the former gasoline station, the subsurface soil exhibited toxicity characteristics of hazardous material, and the impact appears to be deeper (6-8 feet).

Groundwater: Groundwater appears to be less impacted. Most of the gasoline related compounds were detected in the immediate vicinity of the former gasoline station. The COC levels are low, and does not have much down-gradient impact. The potential of off-site impact is minimum.

Soil Vapor: Soil vapor investigation detected several gasoline and chlorinated solvents related compounds. Gasoline related compounds were at detected in the immediate vicinity of the former gasoline station.

### **Receptor Populations**

On-Site Receptors: The site is currently includes a one 1-story building and a parking lot. Onsite receptors are limited to building users, trespassers, site representatives and visitors to the property. During construction, potential on-site receptors include construction workers, site representatives, and visitors. Under proposed future conditions, potential on-site receptors include adult and child building residents, workers and visitors.

Off-Site Receptors: Potential off-site receptors within a 500 foot radius of the Site include adult and child residents; commercial and construction workers; pedestrians; and trespassers based on the following land uses within 500 feet of the Site:

- Commercial Businesses – existing and future
- Residential Buildings – existing and future
- Building Construction/ Renovation – existing and future
- Pedestrians, Trespassers, Cyclists – existing and future
- Schools – existing and future

### **Potential Routes of Exposure**

Three potential primary routes exist by which chemicals can enter the body: ingestion, inhalation, and dermal absorption. Exposure can occur based on the following potential media:

- Ingestion of groundwater or fill/ soil;
- Inhalation of vapors or particulates; and
- Dermal absorption of groundwater or fill/ soil.

### **Potential Exposure Points**

*Current Conditions:* The site is currently capped with asphalt and concrete slab (beneath the 1-story building), and there are no potential exposure pathways from ingestion or dermal absorption of soil/ fill. Inhalation is possible due to soil vapor intrusion into the existing building. Groundwater is not exposed at the site. The site is served by the public water supply and groundwater is not used at the site for potable supply and there is no potential for exposure.

*Construction/ Remediation Conditions:* During the remedial action, onsite workers will come into direct contact with surface and subsurface soils as a result of on-Site construction and excavation activities. On-Site construction workers potentially could ingest, inhale or have dermal contact with exposed impacted soil and fill. Similarly, off-Site receptors could be exposed to dust and vapors from on-Site activities. Due to the depth of groundwater, direct contact with groundwater is not expected, with the exception of the UST removal. During construction, on-Site and off-Site exposures to contaminated dust from on-Site will be addressed

through the Soil/Materials Management Plan, dust controls, and through the implementation of the Community Air-Monitoring Program and a Construction Health and Safety Plan.

*Proposed Future Conditions:* Under future remediated conditions, all soils in excess of Track 1 SCOs will be removed. The site will be fully capped, preventing potential direct exposure to soil and groundwater remaining in place, and engineering controls (vapor barrier/SSDS/garage) will prevent any potential exposure due to inhalation by preventing soil vapor intrusion. The site is served by the public water supply, and groundwater is not used at the site. There are no plausible off-site pathways for oral, inhalation, or dermal exposure to contaminants derived from the site.

**Overall Human Health Exposure Assessment**

There are potential complete exposure pathways for the current site condition. There are potential complete exposure pathways that requires mitigation during implementation of the remedy. There are no complete exposure pathways under future conditions after the site is developed. This assessment takes into consideration the reasonably anticipated use of the site, which includes a residential structure, site-wide surface cover, and a subsurface vapor barrier system for the building. Under current conditions, on-Site exposure pathways exist for those with access to the Site and trespassers. During remedial construction, on-Site and off-Site exposures to contaminated dust from historic fill material will be addressed through dust controls, and through the implementation of the Community Air Monitoring Program, the Soil/Materials Management Plan, and a Construction Health and Safety Plan. Potential post-construction use of groundwater is not considered an option because groundwater in this area of New York City is not used as a potable water source. There are no surface waters in close proximity to the Site that could be impacted or threatened.

<b>Environmental Media &amp; Exposure Route</b>	<b>Human Exposure Assessment for Proposed Remedial Action</b>
Direct contact with surface and subsurface soils	<ul style="list-style-type: none"> <li>• There is not direct contact because all soils in excess of Track 4 SCO's will be removed from the site</li> </ul>
Ingestion of groundwater	<ul style="list-style-type: none"> <li>• The area is served by an upstate water</li> </ul>

	<p>supply and groundwater is not being used for potable water supply.</p> <p>Groundwater use for potable supply onsite is prohibited by municipal law.</p>
Direct contact with groundwater	<ul style="list-style-type: none"> <li>• All soils in excess of Track 4 SCO's and Groundwater Protection Standards will be removed from the site.</li> </ul> <p>Groundwater is not impacted by site conditions.</p>
Direct contact with soil vapor	<ul style="list-style-type: none"> <li>• Contact with impacted soil vapor will be prevented by a soil vapor barrier</li> <li>• Contact with soil vapor will be prevented with a soil vapor barrier and a sub slab depressurization system.</li> </ul>

## **5.0 REMEDIAL ACTION: MATERIAL REMOVAL FROM SITE**

### **5.1 SOIL CLEANUP OBJECTIVES**

The Soil Cleanup Objectives for this Site are Restricted Residential Use SCOs.

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

**Tables 1** through **8** in summarize all soil samples that exceed the SCOs proposed for this Remedial Action. A spider map that shows all soil samples that exceed the SCOs proposed for this Remedial Action is shown in **Figure 6**.

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

### **5.2 REMEDIAL PERFORMANCE EVALUATION (POST EXCAVATION Hotspot END-POINT SAMPLING)**

#### **5.2.1 End-Point Sampling Frequency**

At a minimum, one soil sample will be collected at all hotspots for from each 30 feet of wall (minimum of one sample per wall) and one sample will be collected from every 900 square feet of floor (minimum of one sample per floor). In addition, post construction end point samples will be collected from the base of the completed excavation. Samples will only be collected where soil remains at the conclusion of construction excavations, i.e. no samples will be collected from locations where the excavation terminates at bedrock. An Endpoint Sample Location Map is included as **Figure 9**.

#### **5.2.2 Methodology**

Underlying and surrounding soils will be visually inspected and screened with the PID after the removal of all soils necessary for construction.

Soil samples will be collected using decontaminated stainless steel trowels and dedicated, disposable latex gloves. Samples will be place in pre-cleaned jars provided by the laboratory. After sample collection, the sample containers will be placed in a cooler prior to overnight

transport to a NYSDOH-certified laboratory for analysis. Appropriate chain of custody procedures will be followed.

### **5.2.3 Reporting of Results**

#### **5.2.4 QA/QC**

Quality Assurance / Quality Control protocols are fully specified in the QAPP (**Appendix J**).

QA/QC methodology includes the following:

- One duplicate sample for every 20 samples collected will be submitted to the approved laboratory for analysis of the same parameters.
- Collected endpoint samples will be appropriately packaged, placed in coolers and transferred under proper Chain of Custody to the analytical laboratory. Samples will be containerized in appropriate laboratory provided glassware and shipped in plastic coolers. Samples will be preserved through the use of ice or “cold-packs” to maintain a temperature of 4° C.
- Dedicated disposable sampling materials will be used for the collection endpoint samples, eliminating the need to prepare field equipment (rinsate) blanks. However, if non-disposable equipment is used, (stainless steel scoop, etc.) field rinsate blanks will be prepared at the rate of 1 for every eight samples collected.

#### **5.2.5 DUSR**

Complete laboratory data packages will provided to an independent, third-party data validator.

A summary of the findings in the Data Usability Summary Reports (DUSRs) will be provided in the FER.

#### **5.2.6 Reporting of End-Point Data in FER**

Chemical analysis of end-point and contingency samples will be conducted by a NYSDOH ELAP certified laboratory. The FER will provide all end-point sample results and exceedances of SCOs.

### **5.3 ESTIMATED MATERIAL REMOVAL QUANTITIES**

The estimated quantity of soil/fill to be removed from the Site is 2,500 cubic yards. The estimated quantity of clean fill to be imported to the Site is 500 cubic yards. The need for

relocation of soils on-site will be determined during construction and in consultation with the NYSDEC.

## **5.4 SOIL/MATERIALS MANAGEMENT PLAN**

### **5.4.1 Soil Screening Methods**

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

Grossly contaminated soil will be identified by the presence of: non-aqueous phase liquids (NAPL); visual indications of staining, discoloration or the presence of other obvious signs of contamination; noticeable odors associated with petroleum, solvents or other chemicals; and/or elevated PID readings compared to background levels.

Soil screening will be used to establish temporary excavation end-points by: 1) establishing the absence of soil exhibiting significant field evidence of contamination (grossly contaminated media) or debris materials likely to be associated with contaminants of concern (e.g., urban fill); and, 2) identifying the presence of non-disturbed native soils. The use of direct-reading hand-held screening devices (e.g., PID) will be employed, as appropriate, to determine likely excavation boundaries; final endpoints, however, will only be established through laboratory analysis of confirmatory samples.

All primary contaminant sources (including but not limited to tanks and hotspots) identified during Site Characterization, Remedial Investigation, and Remedial Action will be surveyed by a surveyor licensed to practice in the State of New York. This information will be provided on maps in the Final Engineering Report.

Screening will be performed by qualified environmental professionals. Resumes will be provided for all personnel responsible for field screening (i.e. those representing the Remedial

Engineer) of invasive work for unknown contaminant sources during remediation and development work.

#### **5.4.2 Stockpile Methods**

All stockpile activities will be compliant with applicable laws and regulations. Soil stockpile areas will be appropriately graded to control run-off in accordance with applicable laws and regulations and will be located in areas not subject to flooding or excessive sheet flow during storm events. Material to be stockpiled will be placed within an area designed and constructed to contain the materials from all sides and prevent runoff and dispersion. Stockpiles of excavated soils and other materials shall be located at least of 50 feet from the property boundaries, where possible.

Excavated soil from suspected areas of contamination (e.g., hot spots, USTs, drains, etc.) will be stockpiled separately and will be segregated from clean soil and construction materials. Stockpiles will be used only when necessary and will be removed as soon as practicable.

Excavated soils will be stockpiled on, at minimum, double layers of 8-mil minimum sheeting. 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 NYSDEC.

Soil stockpiles will be continuously encircled with silt fences. Hay bales (or equivalent) will be used as needed near catch basins, surface waters and other discharge points.

Water will be available on-site at suitable supply and pressure for use in dust control.

#### **5.4.3 Materials Excavation and Load Out**

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

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

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

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

A truck wash will be operated on-Site. The Remedial Engineer will be responsible for ensuring that all outbound trucks will be washed at the truck wash before leaving the Site until the remedial construction is complete.

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

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

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

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

Each hotspot and structure to be remediated (USTs, vaults and associated piping, transformers, etc.) will be removed and end-point remedial performance sampling completed before excavations related to Site development commence proximal to the hotspot or structure. Development-related grading cuts and fills will not be performed without NYSDEC approval and will not interfere with, or otherwise impair or compromise, the performance of remediation required by this plan.

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

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

#### **5.4.4 Materials Transport Off-Site**

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

Truck transport routes are as follows: north along Third Avenue to I-95. All trucks loaded with Site materials will exit the vicinity of the Site using only these approved truck routes.

Proposed in-bound and out-bound truck routes to the Site are shown in **Figure 16**. This is the most appropriate route and takes into account: (a) limiting transport through residential areas and past sensitive sites; (b) use of city mapped truck routes; (c) prohibiting off-Site queuing of trucks entering the facility; (d) limiting total distance to major highways; (e) promoting safety in access to highways; and (f) overall safety in transport.

Trucks will be prohibited from stopping and idling in the neighborhood outside the project Site. Egress points for truck and equipment transport from the Site will be kept clean of dirt and other materials during Site remediation and development.

Queuing of trucks will be performed on-Site in order to minimize off-Site disturbance. Off-Site queuing will be prohibited.

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. All trucks will be washed prior to leaving the Site. Truck wash waters will be collected and disposed of off-Site in an appropriate manner.

#### **5.4.5 Materials Disposal Off-Site**

Waste disposal locations, to be established at a later date, will be reported to the NYSDEC Project Manager prior to the start of remedial excavation. A sample Non-Hazardous Soil Disposal manifest is included as **Appendix C**.

The total quantity of material expected to be disposed off-Site (excluding debris from building demolition) is anticipated to be approximately 2,500 cubic yards (or 3,700 tons). It is anticipated that the excavated material will be comprised of two waste streams including: poor quality urban fill (2,400 cubic yards) and petroleum impacted soil/fill (100 cubic yard). Several separate disposal facilities may be secured (as warranted), based on the expected composition of known contaminated soils. Information from the disposal facilities will be sent to the NYSDEC before the initiation of soil removal at the Site.

All soil/fill/solid waste excavated and removed from the Site will be treated as contaminated and regulated material and will be disposed in accordance with all local, State (including 6NYCRR Part 360) and Federal regulations. If disposal of soil/fill from this Site is proposed for unregulated disposal (i.e. clean soil removed for development purposes), a formal request with an associated plan will be made to NYSDEC's Project Manager. Unregulated off-Site management of materials from this Site is prohibited without formal NYSDEC approval. Material that does not meet Track 1 unrestricted SCOs is prohibited from being taken to a New York State recycling facility (6NYCRR Part 360-16 Registration Facility).

The following documentation will be obtained and reported by the Remedial Engineer for each disposal location used in this project to fully demonstrate and document that the disposal of

material derived from the Site conforms with all applicable laws: (1) a letter from the Remedial Engineer or BCP Volunteer to the receiving facility describing the material to be disposed and requesting formal written acceptance of the material. This letter will state that material to be disposed is contaminated material generated at an environmental remediation Site in New York State. The letter will provide the project identity and the name and phone number of the Remedial Engineer. The letter will include as an attachment a summary of all chemical data for the material being transported (including Site Characterization data); and (2) a letter from all receiving facilities stating it is in receipt of the correspondence (above) and is approved to accept the material. These documents will be included in the FER.

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

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

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

The Final Engineering Report will include an accounting of the destination of all material removed from the Site during this Remedial Action, including excavated soil, contaminated soil,

historic fill, solid waste, and hazardous waste, non-regulated material, and fluids.

Documentation associated with disposal of all material must also include records and approvals for receipt of the material. This information will also be presented in a tabular form in the FER. Bill of Lading system or equivalent will be used for off-Site movement of non-hazardous wastes and contaminated soils. This information will be reported in the Final Engineering Report. Hazardous wastes derived from on-Site will be stored, transported, and disposed of in full compliance with applicable local, State, and Federal regulations.

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

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

#### **5.4.6 Materials Reuse On-Site**

Soil and fill that is derived from the property that meets the soil cleanup objectives established in this plan may be reused on-Site. "Reuse on-Site" means material that is excavated during the remedy or development, does not leave the property, and is relocated within the same property and on comparable soil/fill material, and addressed pursuant to Engineering Controls. The Remedial Engineer will ensure that procedures defined for materials reuse in this RAWP are followed and that unacceptable material will not remain on-Site.

Acceptable demolition material proposed for reuse on-Site, if any, will be sampled for asbestos. Concrete crushing or processing on-Site is prohibited.

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

Contaminated on-Site material, including historic fill and contaminated soil, removed for grading or other purposes will not be reused within a cover soil layer, within landscaping berms, or as backfill for subsurface utility lines. This will be expressed in the final SMP.

#### **5.4.7 Fluids Management**

The proposed maximum depth of excavation (14 feet bsg) will be across the entire area of the proposed structure. The known groundwater elevation (15 feet bsg) is below this proposed maximum depth and it is not anticipated that significant quantities of groundwater requiring management will be generated during Site development. Existing data support the conclusion that site groundwater is not significantly contaminated and, in the absence of overt evidence of contamination, any encountered groundwater will be managed on-site.

If any additional laboratory analysis of groundwater documents significant groundwater contamination (as determined in consultation with NYSDEC), or if fieldwork observations of encountered groundwater document any overt signs of contamination (e.g., strong odors, presence of free product, etc.), then dewatered fluids will not be recharged back to the land surface or subsurface of the Site and all dewatering fluids will be managed off-Site.

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

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

#### **5.4.8 Demarcation**

After the completion of soil removal and any other invasive remedial activities and prior to backfilling, the top of the residual soil/fill will be defined by one of three methods: (1) placement of a demarcation layer. The demarcation layer will consist of geosynthetic fencing or equivalent material to be placed on the surface of residual soil/fill to provide an observable reference layer. A description or map of the approximate depth of the demarcation layer will be provided in the FER; or (2) a land survey of the top elevation of residual soil/fill before the placement of cover

soils, pavement and associated sub-soils, or other materials or structures; or, (3) all materials beneath the approved cover will be considered impacted and subject to site management after the remedy is complete. Demarcation may be established by one or any combination of these three methods. As appropriate, a map showing the method of demarcation for the Site and all associated documentation will be presented in the FER. This demarcation will constitute the top of the 'Residuals Management Zone', the zone that requires adherence to special conditions for disturbance of contaminated residual soils defined in the SMP.

#### **5.4.9 Backfill from Off-Site Sources**

In the event that clean soil is imported to the site for construction purposes, the following protocols for the management and handling of such materials are included as a contingency.

The imported uncontaminated, clean soil cover will be from an approved source/facility and will be evaluated by the Remedial Engineer/QEP to ensure that:

- A segregated stockpile is properly maintained at the source and will not be comingled with any other material prior to importing and grading the clean soil material at the Site;
- Material does not include any prohibited material (e.g., solid waste, including construction and demolition material);
- Screening for evidence of contamination by visual, olfactory and PID soil screening practices prior to testing at the source as well as upon importing to the Site for grading is completed; and
- A grab sample (for VOCs) and a maximum five-part composite sample will be collected from the segregated stockpile at the source, with sampling frequency and laboratory analyses conforming to the requirements specified in DER-10 5.4(e), including soil analysis for the following parameters:

TCL VOCs by EPA Method 8260C

TCL SVOCs by EPA Method 8270D

TCL Pesticides by EPA Method 8081B

TCL PCBs by EPA Method 8082A

TAL Metals by EPA Method 6010C/7471B

Upon receipt of the segregated stockpile analytical results collected at the source, a Clean Soil Sampling Report will be submitted to DEC for review/approval prior to importing. The report will include the following:

- Summary of number of samples collected and analyzed, tabulated data and comparison to the selected Site Use SCOs;
- Analytical data sheets and chain of custody documentation;
- Summary of the weight and volume of imported material;
- Photographs from the segregated stockpile at the source with sample point locations identified;
- An affidavit from the source/facility on company letterhead stating that the segregated stockpile of the weight and volume of material to be imported has been properly maintained at the source and complies with the requirements listed above; and
- A copy of source/facility NYSDEC permit;

The following documentation will be presented in the FER:

- Copies of purchase invoices;
- Truck transportation slips from the source to the Site;
- Confirmation of the weight and volume of NYSDEC approved clean soil imported;
- Site plan depicting all areas where the NYSDEC approved clean soil cover has been placed.

All materials proposed for import onto the Site will be approved by the Remedial Engineer and will be in compliance with provisions in this RAWP prior to receipt at the Site.

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

The Final Engineering Report will include the following certification by the Remedial Engineer:

“I certify that all import of soils from off-Site, including source evaluation, approval and

sampling, has been performed in a manner that is consistent with the methodology defined in the Remedial Action Work Plan”.

All imported soils will meet NYSDEC approved backfill or cover soil quality objectives for this Site. These NYSDEC approved backfill or cover soil quality objectives are the lower of the protection of groundwater or the protection of public health soil cleanup objectives for Restricted Residential Use as set forth in Table 375-6.8(b) of 6 NYCRR Part 375. Non-compliant soils will not be imported onto the Site without prior approval by NYSDEC. Nothing in the approved Remedial Action Work Plan or its approval by NYSDEC should be construed as an approval for this purpose.

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

Solid waste will not be imported onto the Site.

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

#### **1.4.10 Stormwater Pollution Prevention**

An ESCP that conforms to the requirements of the NYSDEC Division of Water guidelines and NYS regulations will be developed by the Contractor and approved by the RE. This plan will be provided to the NYSDEC prior to any remedial or development construction activities.

Silt fencing or hay bales will be installed around the entire perimeter of the remedial construction area and be inspected once a week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by NYSDEC. All necessary repairs shall be made immediately.

Accumulated sediments will be removed as required to keep the barrier and hay bale check functional. All undercutting or erosion of the silt fence toe anchor shall be repaired immediately

with appropriate backfill materials. Manufacturer's recommendations will be followed for replacing silt fencing damaged due to weathering.

Erosion and sediment control measures identified in the RAWP shall be observed to ensure that they are operating correctly. Where discharge locations or points are accessible, they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters.

#### **5.4.11 Community Air Monitoring Plan**

A CAMP will be implemented during all ground intrusive activities. Exceedances observed in the CAMP will be reported to NYSDEC and NYSDOH Project Managers and included in the Daily Report.

#### **5.4.12 Odor, Dust and Nuisance Control Plan**

Suppression of odors, dust and other nuisance conditions will be conducted during all invasive work performed during construction activities. The Final Engineering Report will include the following certification by the Remedial Engineer: "I certify that all invasive work during the remediation and all invasive development work were conducted in accordance with dust and odor suppression methodology defined in the Remedial Action Work Plan."

##### **Odor Control Plan**

This odor control plan is capable of controlling emissions of nuisance odors off-Site. Specific odor control methods to be used on a routine basis will include minimizing the generation of vapors and/or odors. 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 all other complaints about the project. Implementation of all odor controls, including the halt of work, will be the responsibility of the Volunteer's Remedial Engineer, who is responsible for certifying the Final Engineering Report.

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

excavations with tarps and other covers; and (c) using foams to cover exposed odorous soils. If odors develop and cannot be otherwise controlled, additional means to eliminate odor nuisances will include: (d) direct load-out of soils to trucks for off-Site disposal; (e) use of chemical odorants in spray or misting systems; and, (f) use of staff to monitor odors in surrounding neighborhoods.

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

### **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 or other equivalent equipment for road wetting capable of spraying water directly onto off-road areas including excavations and stockpiles (water will be available on-site at suitable supply and pressure for use in dust control if a dedicated water truck is not utilized).
- 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 spraying.
- Materials will be hauled in properly tarped containers or vehicles, which will travel at restricted speeds while on-site.

All reasonable attempts will be made to keep visible and/or fugitive dust to a minimum and adhere to particulate emissions limits identified in the CAMP.

## **Other Nuisances**

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

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

## **5.5 CONTINGENCY PLAN**

This contingency plan is developed for the remedial construction to address the discovery of unknown structures or contaminated media during excavation. Identification of unknown contamination source areas during invasive Site work will be promptly communicated to NYSDEC's Project Manager. Petroleum spills will be reported to the NYSDEC Spill Hotline. These findings will be included in the daily report. If previously unidentified contaminant sources are found during on-Site remedial excavation or development-related excavation, sampling will be performed on contaminated source material and surrounding soils and reported to NYSDEC. Chemical analytical testing will be performed for TCL volatiles and semi-volatiles, pesticides/PCBs, and TAL metals, as appropriate.

This section describes actions that must occur upon the discovery of previously unknown contaminated material(s), USTs, demolition debris or other unknown unidentifiable material that requires special handling. On-site personnel should be prepared to respond appropriately if the following previously unknown materials are encountered (if encountered, this material could result in a recommendation from the Remedial Engineer/QEP for an immediate, temporary shutdown of construction activities):

- Previously unknown tanks (including drums) containing a liquid product that is not likely to be water and is likely to present a threat to worker health or safety;
- Previously unknown demolition debris, which could contain significant quantities of asbestos, the disturbance of which is determined, based on field observations, to violate or likely to violate Federal, State, or local asbestos regulations; and,
- Material which cannot be readily identified.

### **5.5.1 Procedures for Encountered Underground Storage Tanks**

Closure of any encountered USTs at the Site will be in accordance with the requirements of DER-10, Section 5.5. Any encountered, previously unknown USTs will be visually inspected to determine if liquids are present in the tank. Significant quantities of liquid remaining in the tanks will be drummed on the Site or removed by a properly licensed disposal company and the particular product (e.g., fuel oil, diesel, etc.) will be identified prior to off-site disposal at a permitted facility. All encountered USTs will be disposed of pursuant to applicable Petroleum Bulk Storage (PBS) and hazardous waste regulations.

### **5.5.2 Procedures for Encountered Demolition Debris**

To the extent practical, all clearly identifiable material suspected of containing asbestos will be removed from the waste stream and handled separately (if encountered). The Remedial Engineer/QEP will recommend that asbestos material visible in the waste stream be separated and analyzed to determine the percent of asbestos present. All applicable Federal, State and local asbestos handling regulations will be followed.

Depending on the amount of asbestos material identified in the waste stream, the Remedial Engineer/QEP may recommend to the Volunteer's Representative that a licensed and accredited asbestos inspector be retained to manage the handling and disposition of asbestos material. Approval to retain an asbestos inspector will be made by the Volunteer's Representative. Samples will be collected by a properly licensed asbestos inspector and submitted to a NYSDOH ELAP- certified laboratory for analysis, depending on the amount and type of material encountered.

Minor amounts of asbestos may be removed from the waste stream and disposed of in accordance with applicable State and local asbestos remediation requirements. An asbestos abatement firm will be retained to properly handle and remove minor amounts of asbestos. The presence of significant quantities of asbestos will result in a temporary shutdown of the Site.

### **5.5.3 Procedures for Encountered Unknown Material**

Material which cannot be readily identified but which is considered, based on field observations, to be material that needs further investigation before disposal will be properly stockpiled (as per the SoMP) in an area separate from all other stockpiled material.

### **5.5.4 Screening and Laboratory Analysis**

Unknown material will be screened with a photo-ionization detector (PID) and all recorded levels will be documented. Samples will be collected and analyzed to identify the compounds present and to assist in determining appropriate disposal practices. Until determined by laboratory analysis otherwise, this material will be considered a hazardous substance. Specific materials known to require sampling and analysis prior to final disposition include all building components and debris containing painted surfaces and/or caulk. A plan to describe the handling and disposal of such materials will be submitted to NYSDEC for review and approval.

If previously unknown underground tanks or other previously unidentified contaminant sources are found during on-site remedial excavation or development related construction, sampling will be performed on product, sediment, and surrounding soils, etc. Chemical analytical work will be for full scan parameters (TAL metals, TCL volatiles and semi-volatiles, TCL pesticides, and PCBs). These analyses will not be limited to CP-51 petroleum list parameters where tanks are identified without prior approval by NYSDEC. Analyses will not be otherwise limited without NYSDEC approval.

## **6.0 RESIDUAL CONTAMINATION TO REMAIN ON-SITE**

The intent of the chosen remedy is to remove contaminated material sufficient to achieve Site Specific Track 4 SCOs. Since residual contaminated soil (i.e. soil with contaminant concentrations above Unrestricted Use SCOs) may exist beneath the Site after the remedy is complete, use restrictions will be required to protect human health and the environment. The chosen remedy will therefore require Institutional Controls (ICs). The Track 4 remedy will be implemented and will require implementation of ICs and Engineering Controls (ECs). These ECs and ICs are described hereafter. If required, long-term management of ECs of residual contamination will be executed under a Site specific SMP that will be developed and included in the FER.

ECs would be implemented to protect public health and the environment by appropriately managing residual contamination. The Controlled Property (the Site) will have two or three primary EC systems. These are: (1) a composite cover system consisting of the concrete building slab (2) a 20 mil vapor barrier beneath the slab (3) a SSDS.

The FER will report residual contamination on the Site in tables and maps. This will include presentation of exceedances of both Track 1 and Track 2 SCOs.

## **7.0 INSTITUTIONAL CONTROLS**

After the Track 4 remedy is complete, the Site will have residual contamination remaining in place (i.e. soils with contaminant concentrations above Unrestricted Use SCOs). ICs for the residual contamination have been incorporated into the remedy as a contingency to render the overall Site remedy protective of public health and the environment. To ensure continual and proper management of residual contamination in perpetuity a Site-specific Environmental Easement will be recorded with New York County to provide an enforceable means of ensuring the continual and proper management of residual contamination and protection of public health and the environment in perpetuity or until released in writing by NYSDEC (the site will continue to be encumbered with an E-designation for hazardous materials). It requires that the grantor of the Environmental Easement and the grantor's successors and assigns adhere to all Institutional Controls (ICs) placed on this Site by this NYSDEC-approved remedy.

The Environmental Easement will provide restrictions on Site usage and mandate operation, maintenance, monitoring and reporting measures for all ECs and ICs. A SMP will be prepared describing appropriate methods and procedures to ensure compliance with all ICs and ECs that are required by the Environmental Easement. Once the SMP has been approved by the NYSDEC, compliance with the SMP is required by the grantor of the Environmental Easement and grantor's successors and assigns.

Institutional Controls would be implemented in accordance with a Site Management Plan included in the Final Engineering Report (FER). Institutional Controls would be:

- Registration of an environmental easement with the County Clerk. The easement will include a description of all ECs and ICs, will summarize the requirements of the SMP, and will note that the property owner and property owner's successors and assigns must comply with the DCR and the approved SMP. The recorded easement will be submitted in the Final Engineering Report. The easement will be recorded prior to NYSDEC issuance of the Notice of Completion; Submittal of a SMP in the FER for approval by NYSDEC that provides procedures for appropriate operation, maintenance, inspection, and certification of ECs and IC's. SMP will require that the property owner and property

owner's successors and assigns will submit to NYSDEC a periodic written statement that certifies that: (1) controls employed at the Site are unchanged from the previous certification or that any changes to the controls were approved by NYSDEC; and, (2) nothing has occurred that impairs the ability of the controls to protect public health and environment or that constitute a violation or failure to comply with the SMP. NYSDEC retains the right to enter the Site in order to evaluate the continued maintenance of any controls. This certification shall be submitted at a frequency to be determine by NYSDEC in the SMP;

- Vegetable gardens and farming on the Site are prohibited in contact with residual soil materials;
- Use of groundwater underlying the Site is prohibited without treatment rendering it safe for its intended use;
- All future activities on the Site that will disturb residual material must be conducted pursuant to the soil management provisions in an approved SMP;
- The Site will be used for mixed residential and commercial uses and will not be used for a higher level of use without prior approval by NYSDEC.

## **7.1 ENVIRONMENTAL EASEMENT**

An Environmental Easement, as defined in Article 71 Title 36 of the Environmental Conservation Law, is required when residual contamination is left on-Site after the Remedial Action is complete. As part of this remedy, an Environmental Easement approved by NYSDEC will be filed and recorded with the Bronx County Office of the City Register. The Environmental Easement will be submitted as part of the Final Engineering Report.

The Environmental Easement renders the Site a Controlled Property. The Environmental Easement must be recorded with the Bronx County Office of the City Register before the Certificate of Completion can be issued by NYSDEC. A series of Institutional Controls are required under this remedy to prevent future exposure to residual contamination by controlling disturbances of the subsurface soil and restricting the use of the Site to Restricted Residential

Use only. These Institutional Controls are requirements or restrictions placed on the Site that are listed in, and required by, the Environmental Easement.

The Controlled Property (Site) will also have a series of Institutional Controls in the form of Site restrictions and requirements. The Site restrictions that apply to the Controlled Property are:

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

## **8.0 ENGINEERING CONTROLS**

The remedial action will achieve Track 4 Site Specific Use SCOs and Engineering Controls are required. This Site has three Engineering Controls as:

- (1) Composite Cover System
- (2) Soil Vapor Barrier System
- (3) Sub-Slab Depressurization System

### **8.1 COMPOSITE COVER SYSTEM**

Since a Track 4 remedy for the site is implemented, exposure to residual contaminated soils in excess of Track 2 Restricted Residential SCO's will be prevented by an engineered, composite cover system that will be built on the Site. This composite cover system will be comprised of 6 inches of reinforced concrete slab underlain by 12 inches of clean sub-base material in building areas; and 6 inches of concrete slab underlain by 6 inches of clean sub-base material in parking areas.

**Figure 11** shows the typical design for each remedial cover type used on this Site and the location of each cover type built at the Site. The composite cover system will be a permanent engineering control. The system will be inspected and its performance certified at specified intervals as required by this RAWP and the Site Management Plan. A Soil and Materials Management Plan will be included in the Site Management Plan and will outline the procedures to be followed in the event that the composite cover system and underlying residual soil/fill is disturbed after the remedial action is complete. Maintenance of this composite cover system will be described in the Site Management Plan in the Final Engineering Report.

Maintenance of this composite cover system will be described in the SMP in the FER.

### **8.2 SOIL VAPOR BARRIER SYSTEM**

Migration of soil vapor from onsite or offsite sources into the building will be mitigated with a combination of building slab and vapor barrier. The vapor barrier system will consist of a 20-mil Vaporblock<sup>®</sup> Plus VBP20 by Raven Industries, or similar, below the slab throughout the full

building area. All welds, seams and penetrations will be properly sealed to prevent preferential pathways for vapor migration.

The vapor barrier will extend throughout the area occupied by the footprint of the new building and will be installed in accordance with manufacturer specifications.

A plan view showing the location of the proposed vapor barrier system is provided in **Figure 11**. Typical design sections for the vapor barrier on slab and sidewalls are provided in **Figure 12**. Product specification sheets are provided in **Appendix D**. The Remedial Action Report will include as-built drawings and diagrams; manufacturer documentation; and photographs.

The Vapor Barrier System is a permanent engineering control and will be inspected and its performance certified at specified intervals as required by this RAWP and the Site Management Plan. A Soil and Materials Management Plan will be included in the Site Management Plan and will outline the procedures to be followed in the event that the composite cover system and underlying vapor barrier system is disturbed after the remedial action is complete. Maintenance of these systems will be described in the Site Management Plan in the Final Engineering Report.

### **8.3 SUB-SLAB DEPRESSURIZATION SYSTEM**

Migration of soil vapor into the building will be mitigated with the construction of a Sub-Slab Depressurization System (SSDS). A SSDS system will be installed at the site as an Engineering Control. The horizontal piping will consist of fabric wrapped, perforated schedule 40 4-inch PVC pipe connected to a 4-inch steel riser pipes that penetrate the slab and travel through the building to the roof. The gas permeable layer will consist of a 12-inch thick layer of 3/4-inch bluestone. The pipe will be finished at the roof line with rain caps to prevent rain infiltration. The sub-slab depressurization system is an Engineering Control for the remedial action.

The SSDS is a permanent engineering control. The system will be inspected and its performance certified at specified intervals as required by this RAWP and the Site Management Plan. Maintenance of this SSDS will be described in the Site Management Plan in the Final Engineering Report. The location and layout of the SSDS is shown in **Figure 13**. A typical

section of the system is shown in **Figure 13**. The RE will provide a design plan for the SSDS for review and approval by NYSDEC and NYSDOH.

## **9.0 FINAL ENGINEERING REPORT**

A Final Engineering Report (FER) will be submitted to NYSDEC following implementation of the Remedial Action defined in this RAWP.

### **9.1 FER ELEMENTS**

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

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

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

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

The FER will provide a thorough summary of all residual contamination left on the Site after the remedy is complete. Residual contamination includes all contamination that exceeds the Track 1

Unrestricted Use SCO in 6NYCRR Part 375-6. A table that shows exceedances from Track 1 Unrestricted SCOs for all soil/fill remaining at the Site after the Remedial Action and a map that shows the location and summarizes exceedances from Track 1 Unrestricted SCOs for all soil/fill remaining at the Site after the Remedial Action will be included in the FER.

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

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

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

## **9.2 SITE MANAGEMENT PLAN**

If the Track 4 remedy is implemented, a SMP will be required. Its implementation will be the last phase of remediation and begins with the approval of the Final Engineering Report and issuance of the Certificate of Completion (COC) for the Remedial Action. The SMP is submitted as part of the FER but will be written in a manner that allows its removal and use as a complete and independent document. Site Management continues in perpetuity or until released in writing by NYSDEC. The property owner is responsible to ensure that all Site Management responsibilities defined in the Environmental Easement and the SMP are performed.

The SMP is intended to provide a detailed description of the procedures required to manage residual contamination left in place at the Site following completion of the Remedial Action in accordance with the BCA with the NYSDEC. This includes: (1) development, implementation, and management of all Engineering and Institutional Controls; (2) development and

implementation of monitoring systems and a Monitoring Plan; (3) development of a plan to operate and maintain any treatment, collection, containment, or recovery systems (including, where appropriate, preparation of an Operation and Maintenance Manual); (4) submittal of Site Management Reports, performance of inspections and certification of results, and demonstration of proper communication of Site information to NYSDEC; and (5) defining criteria for termination of treatment system operation.

To address these needs, this SMP will include four plans: (1) an Engineering and Institutional Control Plan for implementation and management of EC/ICs; (2) a Monitoring Plan for implementation of Site Monitoring; (3) an Operation and Maintenance Plan for the SSDS; and (4) a Site Management Reporting Plan for submittal of data, information, recommendations, and certifications to NYSDEC. The SMP will be prepared in accordance with the requirements in NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation and the guidelines provided by NYSDEC.

Site management activities, reporting, and EC/IC certification will be scheduled on a certification period basis. The certification period will be [annually]. The SMP will be based on a calendar year and will be due for submission to NYSDEC by March 1 of the year following the reporting period.

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

### **9.3 CERTIFICATIONS**

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

I, Wenqing Fang, am currently a registered professional engineer licensed by the State of New York. I had primary direct responsibility for implementation of the remedial program for the 401 East 120<sup>th</sup> Street Site (NYSDEC Site No. **C2XXXX**).

I certify that the Site description presented in this FER is identical to the Site descriptions presented in the Environmental Easement, the Site Management Plan, and the Brownfield Cleanup Agreement for 3475 Third Avenue and related amendments.

I certify that the Remedial Action Work Plan dated October 2015 and approved by the NYSDEC were implemented and that all requirements in those documents have been substantively complied with.

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

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

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

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

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

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

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

## **10.0 FINAL ENGINEERING REPORT**

A Final Engineering Report (FER) will be submitted to NYSDEC following implementation of the remedial action defined in this RAWP.

The FER will document that the remedial work required under this RAWP has been completed and has been performed in compliance with this plan. The FER will include:

- Information required by this RAWP;
- Text description with thorough detail of all engineering and institutional controls (if Track 1 remedial action is not achieved)
- As-built drawings for all constructed remedial elements;
- Manifests for all soil or fill disposal;
- Photographic documentation of remedial work performed under this remedy;
- Site Management Plan (if Track 1 remedial action is not achieved);
- Description of any changes in the remedial action from the elements provided in this RAWP and associated design documents;
- Tabular summary of all end point sampling results (including all soil test results from the remedial investigation for soil that will remain on site) and all soil/fill waste characterization results, QA/QC results for end-point sampling, and other sampling and chemical analysis performed as part of the remedial action;
- Test results or other evidence demonstrating that remedial systems are functioning properly;
- Account of the source area locations and characteristics of all soil or fill material removed from the Site including a map showing the location of these excavations and hotspots, tanks or other contaminant source areas;
- Full accounting of the disposal destination of all contaminated material removed from the Site. Documentation associated with disposal of all material will include transportation and disposal records, and letters approving receipt of the material;
- Account of the origin and required chemical quality testing for material imported onto the Site;
- The RAWP and Remedial Investigation Report will be included as appendices to the FER;

- Reports and supporting material will be submitted in digital form and final PDF's will include bookmarks for each appendix;
- Environmental easement.

## **Final Engineering Report Certification**

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

*I \_\_\_\_\_ certify that I am currently a NYS registered professional engineer and that this Final Engineering Report 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) and that all activities were performed in full accordance with the DER-approved work plan and any DER-approved modifications.*

NYS Professional Engineer #

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature

## 11.0 SCHEDULE

The table below presents a schedule for the proposed remedial action and reporting. If the schedule for remediation and development activities changes, it will be updated and submitted to NYSDEC. Currently, a seven month remediation period is anticipated.

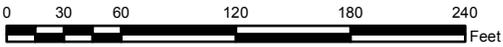
<b>Schedule Milestone</b>	<b>Weeks from Remedial Action Start</b>	<b>Duration (weeks)</b>
NYSDEC Approval of RAWP	0	6
Fact Sheet 2 announcing start of remedy	8	2
Mobilization	10	2
Remedial Excavation	16	6
Demobilization	18	2
Environmental easement	22	4
Submit Final Engineering Report	28	6

## **FIGURES**

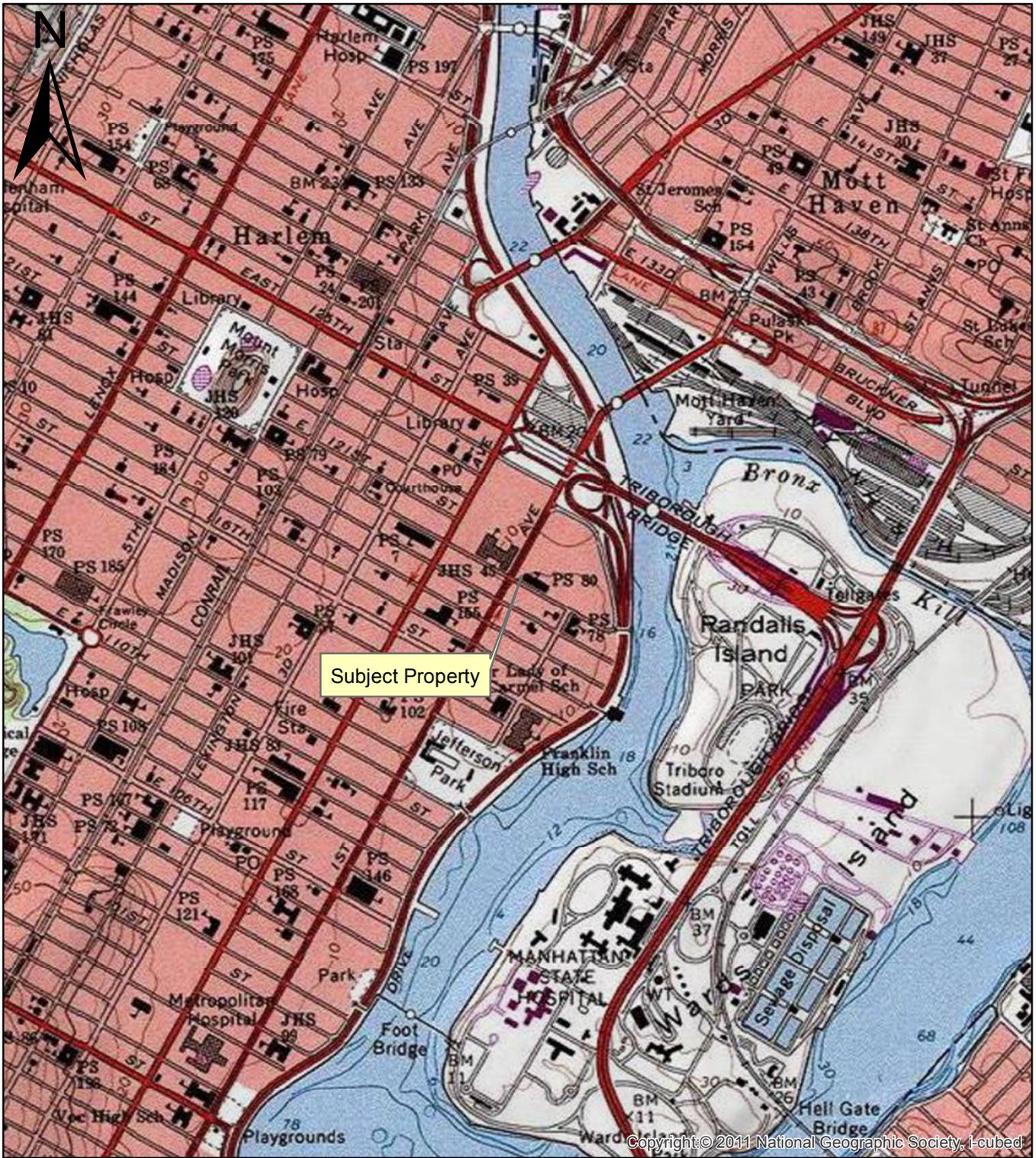


Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

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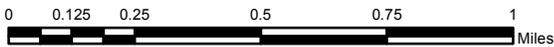


TITLE		SITE MAP		Figure No.
				01
PROJECT		413 East 120th Street New York, NY		Project No.
				2014-142
	DESIGN	WF	7-7-2015	
	CHECK			
	REVIEW			



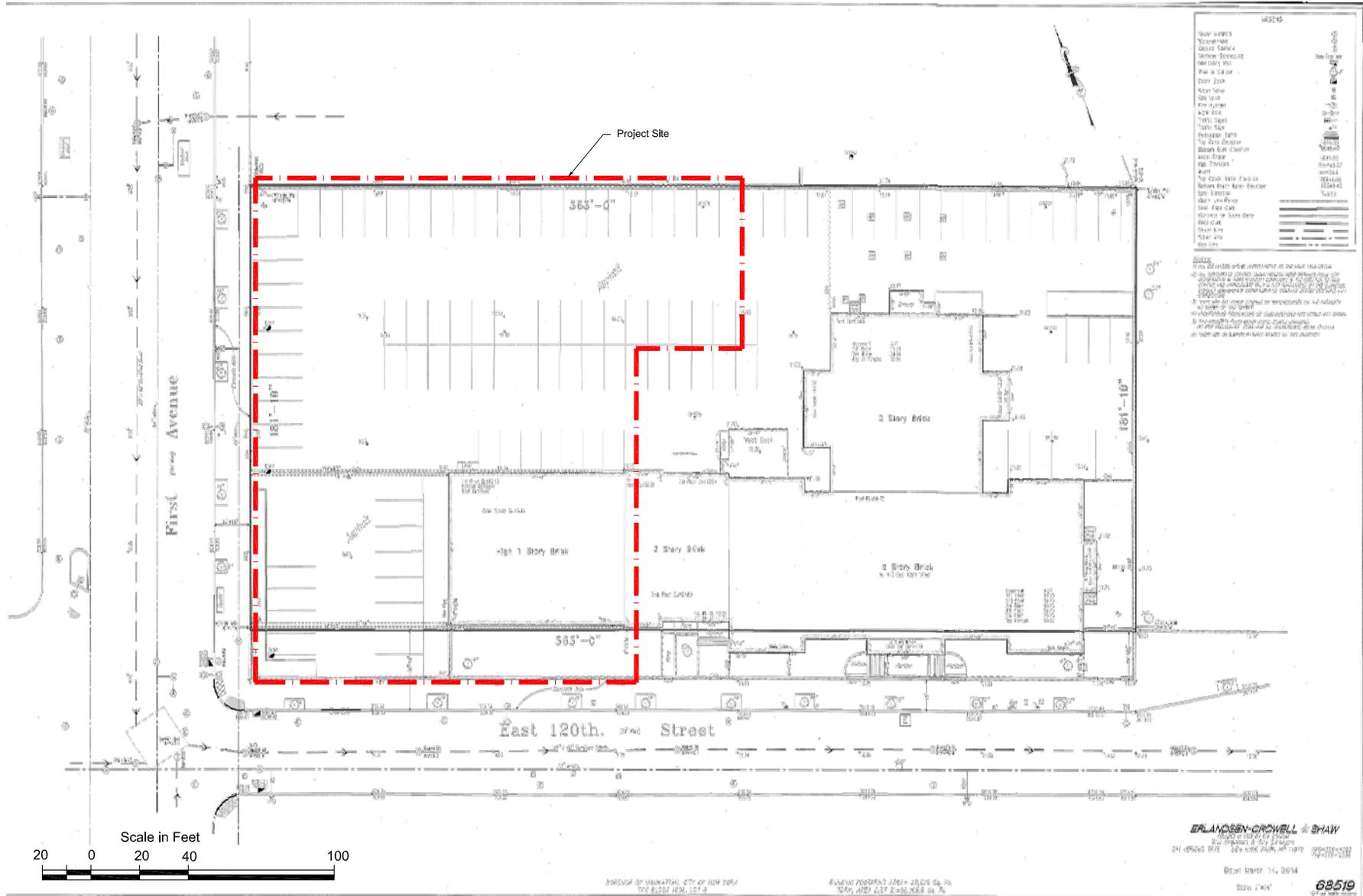
USGS 7.5 Minute Quadrangle Topographic Map (2011)

SCALE: 1:24,000



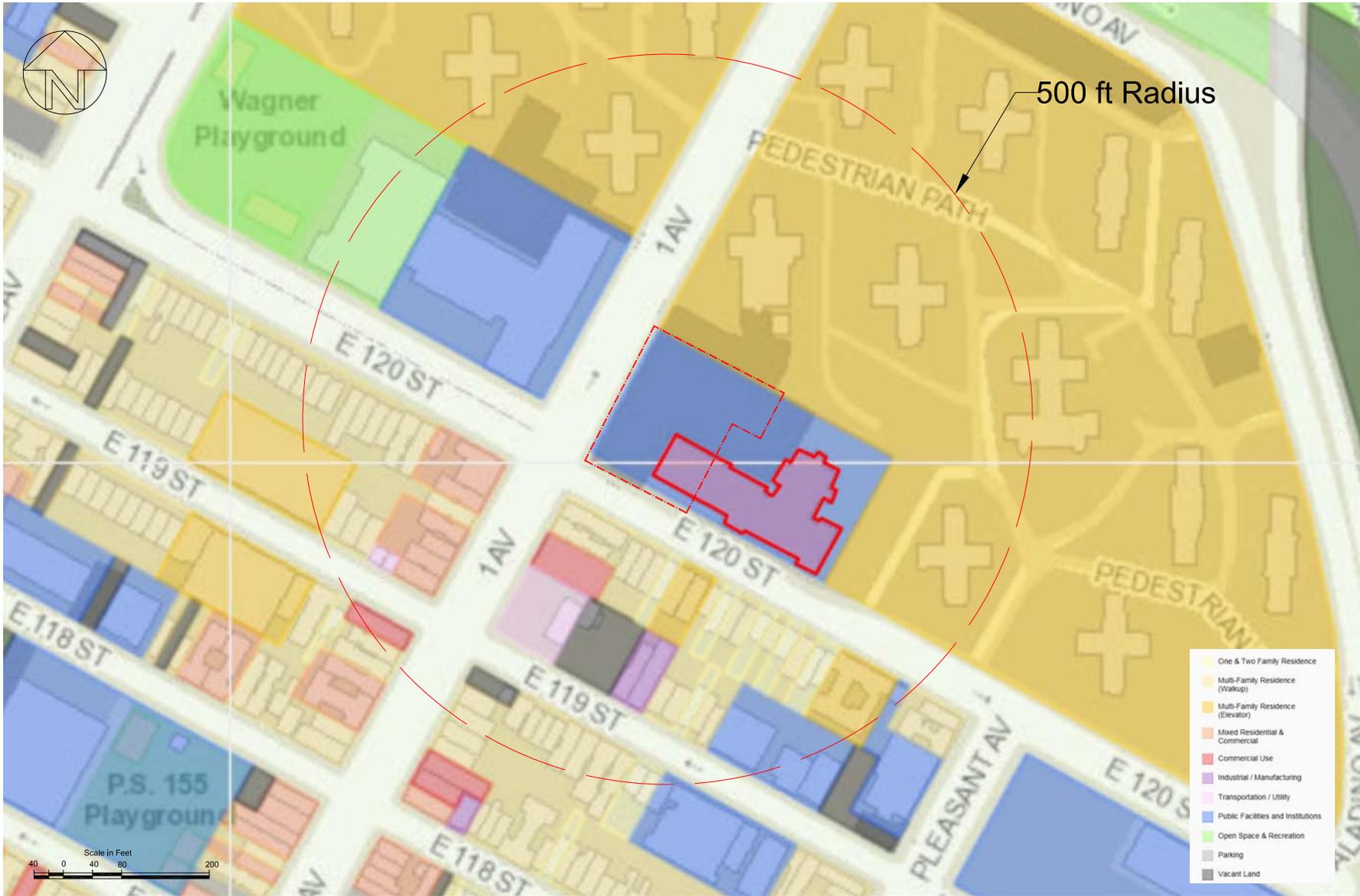
Copyright © 2011 National Geographic Society, iCubed

TITLE	SITE LOCATION MAP		Figure No.
			02
PROJECT	413 East 120th Street New York, NY		Project No.
			2014-142
	DESIGN	WF	12-4-2014
	CHECK		
	REVIEW		



TITLE:		Site Survey	
401 East 120th Street, New York, New York			
DRAWN BY:	WF	REVISED BY:	
CHECKED BY:	JC	REVISED DATE:	PROJECT No. 2014-142
DATE:	7-23-2015	APPROVED BY:	FIGURE No. 03
SCALE:	1" = 20'	FILE NAME:	





TITLE:		Surrounding Land Use Map	
		401 East 120th Street, New York, New York	
DRAWN BY:	WF	REVISED BY:	
CHECKED BY:	JC	REVISED DATE:	
DATE:	7-23-2015	APPROVED BY:	
SCALE:	1" = 200'	FILE NAME:	
		PROJECT No.	2014-142
		FIGURE No.	04



NEW MIXED USE BUILDING FOR ACACIA

413 East 120th Street  
New York, NY 10035

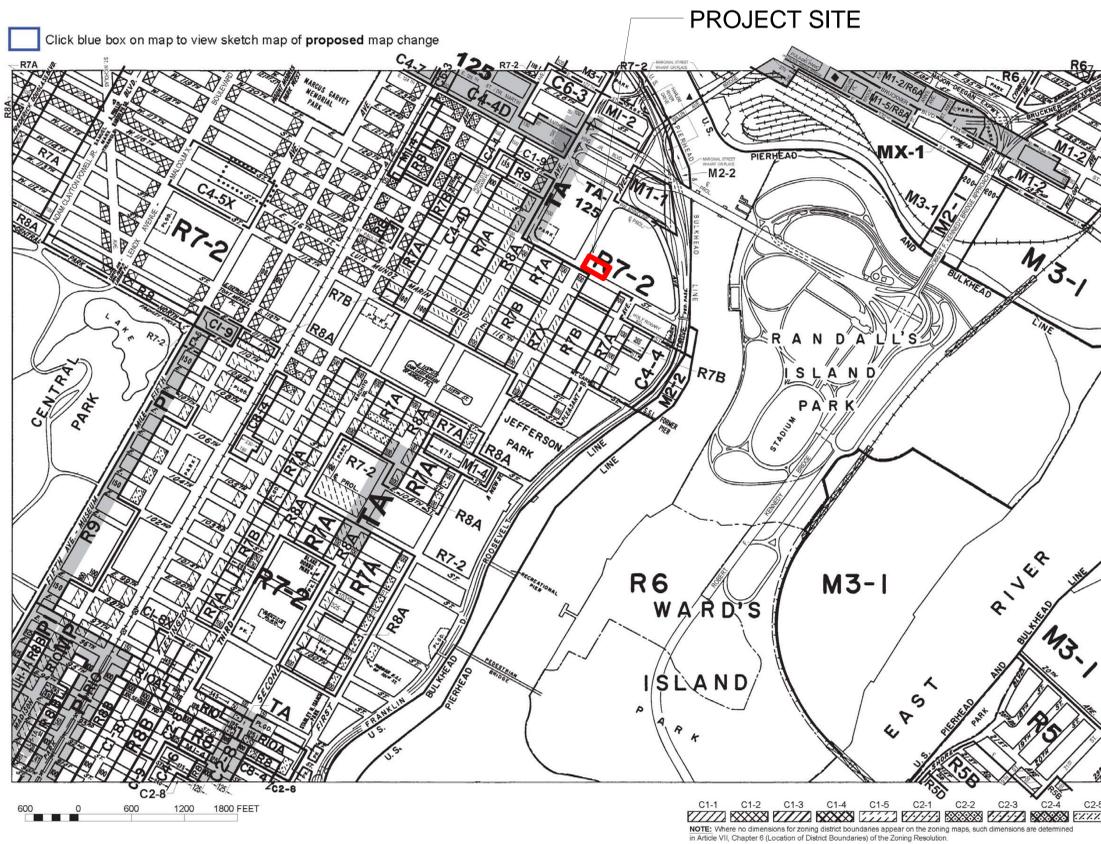


BLOCK: 1808 LOT: 8  
NYCDOB#:



Key Plan:  
Issued:

NUMBER	DATE	DESCRIPTION
1	04.15.14	BLDS SUBMISSION
2	08.26.14	BLDS SUBMISSION
3	09.04.14	BLDS SUBMISSION
4	02.06.15	DOB SUBMISSION



**ZONING MAP**  
THE NEW YORK CITY PLANNING COMMISSION

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

**R** - RESIDENTIAL DISTRICT  
**C** - COMMERCIAL DISTRICT  
**M** - MANUFACTURING DISTRICT

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

**AREA(S) REZONED**

**Effective Date(s) of Rezoning:**  
08-17-2011 C 110243 ZMM

**Special Requirements:**  
For a list of lots subject to CEQR environmental requirements, see APPENDIX C.  
For a list of lots subject to "D" restrictive declarations, see APPENDIX D.  
For Inclusionary Housing designated areas on this map, see APPENDIX F.

**CITY MAP CHANGE(S):**  
◆ AS CORRECTED 05-15-2012  
▲ 5-05-2012 C 100385 MMM

**MAP KEY**

5c	6a	6c
5d	<b>6b</b>	6d
8c	9a	9c

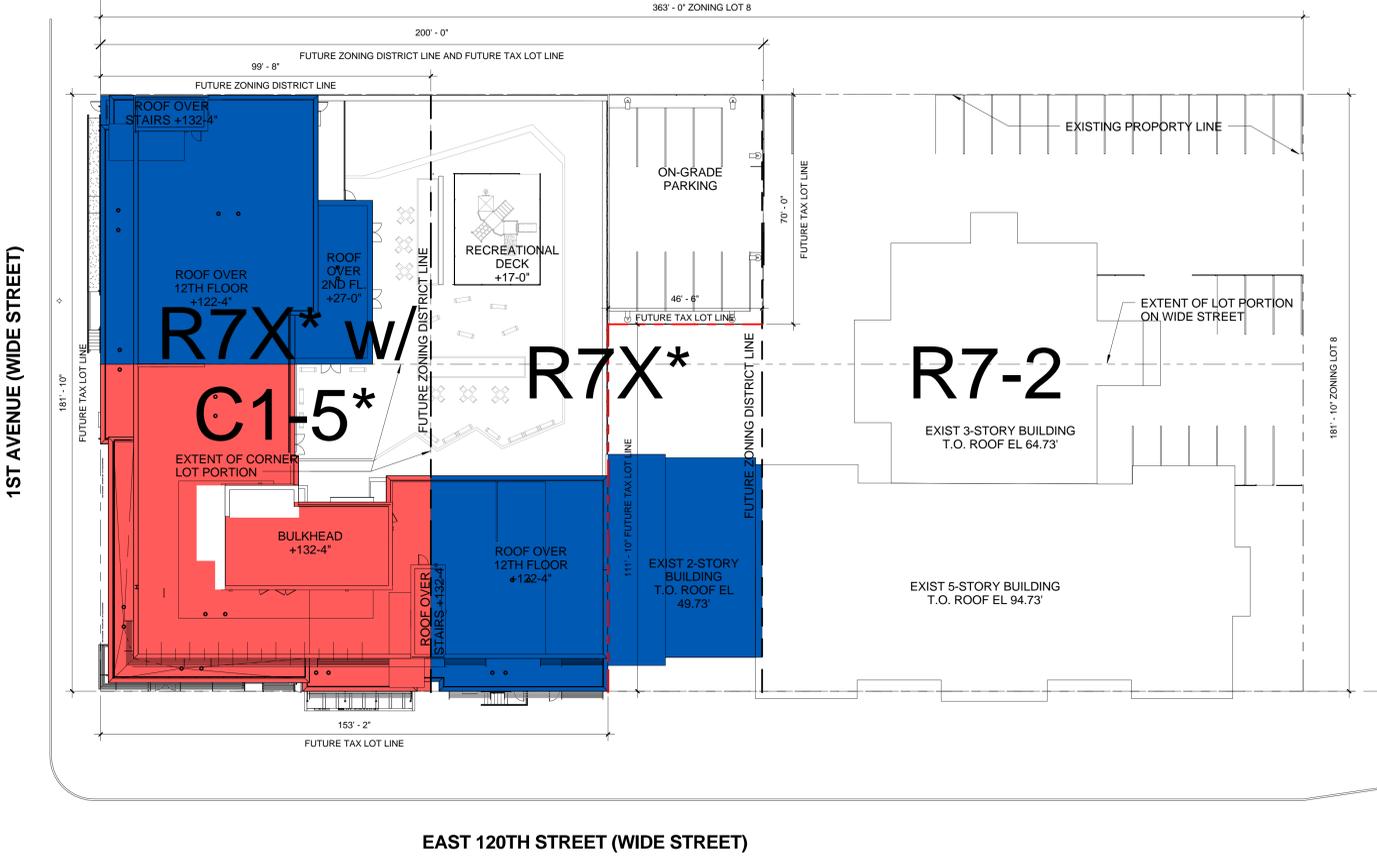
© Copyrighted by the City of New York

BUILDING SUMMARY

Floor	Height	Residential	Commercial	Comm Facility	Parking	Gross FA	QH Deductions	Mech Deductions	Residential ZFA	Commercial ZFA	Comm Facility ZFA	Total Zoning FA	0 BR	1 BR	2 BR	3 BR	Total DU
1	1.0	6,881	5,450	3,920	11,503	27,554	0	-13,414	4,770	5,450	3,920	14,140	0	0	0	0	0
2	16.0	17,722				17,722	-2,756	-495	14,471			14,471	3	4	8	0	15
3	38.0	16,782				16,782	-743	-495	15,544			15,544	3	4	10	0	17
4	39.3	16,782				16,782	-743	-495	15,544			15,544	3	4	10	0	17
5	44.7	16,782				16,782	-743	-495	15,544			15,544	3	4	10	0	17
6	54.0	16,782				16,782	-743	-495	15,544			15,544	3	4	10	0	17
7	63.3	16,782				16,782	-743	-495	15,544			15,544	3	4	10	0	17
8	72.7	16,782				16,782	-743	-495	15,544			15,544	3	4	10	0	17
9	82.7	14,868				14,868	-743	-495	13,630			13,630	4	5	7	0	16
10	82.0	14,868				14,868	-743	-495	13,630			13,630	4	5	7	0	16
11	102.0	13,884				13,884	-743	-495	12,646			12,646	4	5	5	1	15
12	112.0	13,884				13,884	-743	-495	12,646			12,646	4	5	5	1	15
R	122.0	2,012				2,012		-2,012				0					
<b>Total</b>		<b>184,611</b>	<b>5,450</b>	<b>3,920</b>	<b>11,503</b>	<b>205,484</b>		<b>-20,871</b>	<b>165,057</b>	<b>5,450</b>	<b>3,920</b>	<b>174,427</b>	<b>37</b>	<b>48</b>	<b>92</b>	<b>2</b>	<b>179</b>

ZONING ANALYSIS

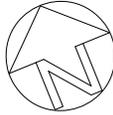
Site Description	Lot Portion to be Developed RX			Total Zoning Lot	Lot Portion Existing to Remain R7-2 (Wide Street)		Lot Portion Existing to Remain R7-2 (Narrow Street)		Total Zoning Lot	
	Lot Portion RX w/ C1-5	Lot Portion RX Only	Total RX Lot Portion		Lot Portion R7-2	Lot Portion R7-2	R7-2, RX w/ C1-5 Overlay	Proposed		
Total Lot Area (363 ft wide x 181.83 ft deep)	18,183	18,183	36,366	66,004	16,300	13,338	66,004			
<b>Uses</b>	<b>Permitted</b>	<b>Existing to Remain</b>	<b>Proposed</b>	<b>Total Lot to be Developed</b>	<b>Required / Permitted</b>	<b>Existing to Remain</b>	<b>Required / Permitted</b>	<b>Existing to Remain</b>	<b>Required / Permitted</b>	<b>Proposed</b>
23-10 Residential	1-4, 5, 6	4	2, 4, 6	2, 4, 6	1, 2, 3, 4	4	1, 2, 3, 4	4	1-4, 5, 6	2, 4, 6
23-11 Residential										
23-12 Residential										
<b>Max FAR (Quality Housing)</b>										
23-145 Residential Portion	5.00	0.00	4.54	4.54	4.00	0.00	3.44	0.00	4.44	2.50
24-11 Community Facility	5.00	0.17	0.11	0.28	6.50	3.54	6.50	0.48	5.67	1.13
33-121 Commercial Portion	2.00	0.00	0.15	0.15	0.00	0.00	0.00	0.00	0.55	0.08
24-161 Total	5.00	0.17	4.80	4.97	6.50	3.54	6.50	0.48	5.67	3.71
<b>Max Allowable FA</b>										
23-145 Residential Portion [sq ft]	191,830	0	165,057	165,057	65,200	0	45,884	0	292,914	165,057
24-11 Community Facility [sq ft]	191,830	6,259	3,920	10,179	105,950	57,766	86,899	6,408	374,479	74,353
33-121 Commercial Portion [sq ft]	36,366	0	5,450	5,450	0	0	0	0	36,366	5,450
24-161 Max Allowable Building FA [sq ft]	191,830	6,259	174,427	190,686	105,950	57,766	86,899	6,408	374,479	244,866
<b>Max Lot Coverage (Quality Housing)</b>										
Corner Lot Portion		10,000		10,000	0		0		10,000	
Interior Lot Portion		26,366		26,366	16,300		13,338		56,004	
23-145 Interior Lot [%]	70	10.8	47.7	58.4	65	77.5	65	16.0	68.3	53.9
24-11 Corner Lot [%]	80	0.0	80.0	80.0					80.0	80.0
77-24 Interior Lot [%]	18,456	3,841	12,567	15,408	10,595	12,630	8,670	2,138	37,721	30,174
Corner Lot [%]	8,000	0	7,996	7,996					8,000	7,996
<b>Max Density</b>										
23-22 Gross Area per Dwelling Unit	680				680		680			
35-40 Max Allowable Dwelling Units	267	0	179	179	96	0	67	0	431	179
<b>Yard Regulations</b>										
23-45 Front Yards [ft]	Not required	0	0	0.33	Not required	0	Not required	N/A		comply
23-46(c) Side Yards [ft]	Not required, min 8 ft if provided	0	0	0	Not required, min 8 ft if provided	15.5	Not required, min 8 ft if provided	52		comply
36-52 Rear Yards [ft]	Not required	120	None	0	Not required	N/A	Not required	43		comply
<b>Street Wall / Height / Setback (Quality Housing)</b>										
23-63(a) Street Wall Regulations apply.	yes	N/A	comply		yes	Non-Compliant	yes	N/A	yes	
35-24(b) Min Base Height [ft]	60	N/A	82.67		40	Non-Compliant	40	N/A	60	
Max Base Height [ft]	85	N/A	82.67		65	Non-Compliant	60	N/A	85	
23-633 Min Setback above Max Base Height [ft]	10	N/A	10		10	Non-Compliant	10	N/A	10	New Development complies
23-621 Max Dormer Width 1st Ave at 10th Floor Level (total length of floor below max base height: 179.83 ft) [ft]	77.33	N/A	75.50						77.33	New Development complies
36-24 Max Dormer Width E 120th St at 10th Floor Level (total length of floor below max base height: 152.83 ft) [ft]	65.72	N/A	61.00						156.09	
Max Building Height [ft]	125	N/A	122.00		80	Non-Compliant	75	85	125	
<b>Parking Regulations</b>										
25-25(c) Residential for Low Income Tenants [% of DU]	15	0	15	15	15		15		15	15
25-31 Community Facility [% of spaces]	none required	0	0	0	none required	14	none required	14	none required	14
36-21 Commercial Parking [% of spaces]	varies per use	0	0	0	varies per use		varies per use		varies per use	0
36-232 Total [% of spaces]	27		27	27					27	41
<b>Notes</b>										
1	Per 22-14, the number of persons employed in central office functions shall not exceed 50, and the amount of floor area used for central office functions shall not exceed 25% of the total FA, up to 25,000 sf.									
2	Per 77-24, adjusted lot coverage may be located anywhere provided that the percentage of lot coverage of any portion of the zoning lot within one district does not exceed the max lot coverage for that district, or the adjusted lot coverage, whichever is greater.									



ZONING ANALYSIS

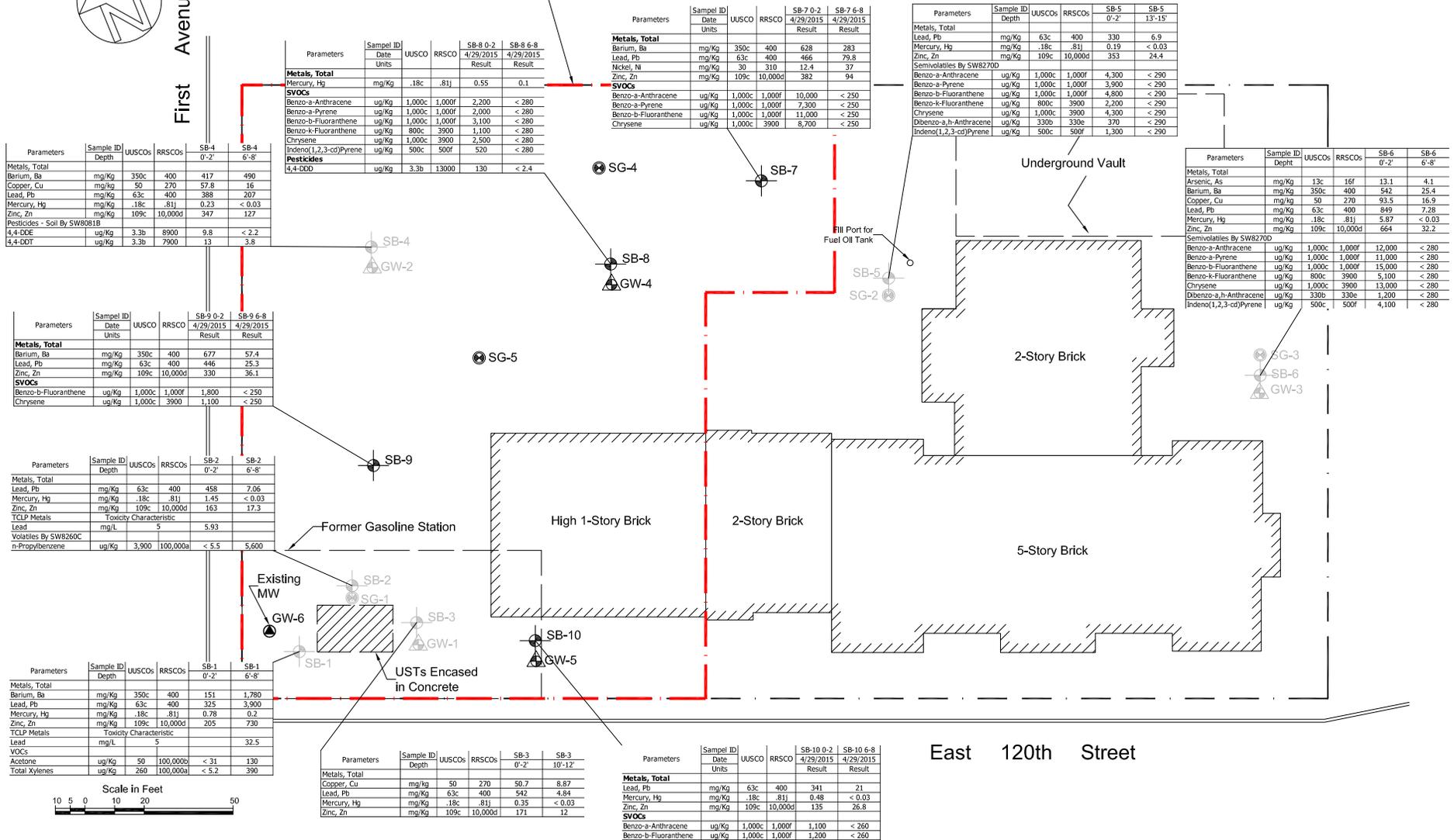
SEAL & SIGNATURE: \_\_\_\_\_ PROJECT No: 14002  
DRAWING BY: Author  
CHK BY: Checker  
DWG No: Z-001.00  
SCALE: 3/8" = 1'-0" 5 OF

Figure 4: Site Redevelopment Plan



First Avenue

Proposed Building Boundary



Parameters	Sample ID	UUSCO	RRSCO	SB-8 0-2		SB-8 6-8	
				4/29/2015	4/29/2015	Result	Result
<b>Metals, Total</b>							
Mercury, Hg	mg/Kg .18c	.81j		0.55	0.1		
<b>SVOCs</b>							
Benzo-a-Anthracene	ug/Kg 1,000c	1,000f		2,200	< 280		
Benzo-a-Pyrene	ug/Kg 1,000c	1,000f		2,000	< 280		
Benzo-b-Fluoranthene	ug/Kg 1,000c	1,000f		3,100	< 280		
Benzo-k-Fluoranthene	ug/Kg 800c	3900		1,100	< 280		
Chrysene	ug/Kg 1,000c	3900		2,500	< 280		
Indeno(1,2,3-cd)Pyrene	ug/Kg 500c	500f		520	< 280		
<b>Pesticides</b>							
4,4-DDD	ug/Kg 3.3b	13000		130	< 2.4		

Parameters	Sample ID	Date	UUSCO	RRSCO	SB-7 0-2		SB-7 6-8	
					4/29/2015	4/29/2015	Result	Result
<b>Metals, Total</b>								
Barium, Ba	mg/Kg 350c		400	628	283			
Lead, Pb	mg/Kg 63c		400	466	79.8			
Nickel, Ni	mg/Kg 30		310	12.4	37			
Zinc, Zn	mg/Kg 109c		10,000d	382	94			
<b>SVOCs</b>								
Benzo-a-Anthracene	ug/Kg 1,000c	1,000f		10,000	< 250			
Benzo-a-Pyrene	ug/Kg 1,000c	1,000f		7,300	< 250			
Benzo-b-Fluoranthene	ug/Kg 1,000c	1,000f		11,000	< 250			
Chrysene	ug/Kg 1,000c	3900		6,700	< 250			

Parameters	Sample ID	Depth	UUSCOs	RRSCO	SB-5		SB-5	
					0'-2'	13'-15'	Result	Result
<b>Metals, Total</b>								
Lead, Pb	mg/Kg 63c		400	330	6.9			
Mercury, Hg	mg/Kg .18c		.81j	0.19	< 0.03			
Zinc, Zn	mg/Kg 109c		10,000d	353	24.4			
<b>Semivolatiles By SW8270D</b>								
Benzo-a-Anthracene	ug/Kg 1,000c	1,000f		4,300	< 290			
Benzo-a-Pyrene	ug/Kg 1,000c	1,000f		3,900	< 290			
Benzo-b-Fluoranthene	ug/Kg 1,000c	1,000f		4,800	< 290			
Benzo-k-Fluoranthene	ug/Kg 800c	3900		2,200	< 290			
Chrysene	ug/Kg 1,000c	3900		4,300	< 290			
Dibenzo-a,h-Anthracene	ug/Kg 330c	330c		370	< 290			
Indeno(1,2,3-cd)Pyrene	ug/Kg 500c	500f		1,300	< 290			

Parameters	Sample ID	Depth	UUSCOs	RRSCO	SB-6		SB-6	
					0'-2'	6'-8'	Result	Result
<b>Metals, Total</b>								
Arsenic, As	mg/Kg 13c		16f	13.1	4.1			
Barium, Ba	mg/Kg 350c		400	542	25.4			
Copper, Cu	mg/Kg 50		270	93.5	16.9			
Lead, Pb	mg/Kg 63c		400	849	7.28			
Mercury, Hg	mg/Kg .18c		.81j	5.87	< 0.03			
Zinc, Zn	mg/Kg 109c		10,000d	664	32.2			
<b>Semivolatiles By SW8270D</b>								
Benzo-a-Anthracene	ug/Kg 1,000c	1,000f		12,000	< 280			
Benzo-a-Pyrene	ug/Kg 1,000c	1,000f		11,000	< 280			
Benzo-b-Fluoranthene	ug/Kg 1,000c	1,000f		15,000	< 280			
Benzo-k-Fluoranthene	ug/Kg 800c	3900		5,100	< 280			
Chrysene	ug/Kg 1,000c	3900		13,000	< 280			
Dibenzo-a,h-Anthracene	ug/Kg 330c	330c		1,200	< 280			
Indeno(1,2,3-cd)Pyrene	ug/Kg 500c	500f		4,100	< 280			

Parameters	Sample ID	Depth	UUSCOs	RRSCO	SB-4		SB-4	
					0'-2'	6'-8'	Result	Result
<b>Metals, Total</b>								
Barium, Ba	mg/Kg 350c		400	417	490			
Copper, Cu	mg/Kg 50		270	57.8	16			
Lead, Pb	mg/Kg 63c		400	388	207			
Mercury, Hg	mg/Kg .18c		.81j	0.23	< 0.03			
Zinc, Zn	mg/Kg 109c		10,000d	347	127			
<b>Pesticides - Soil By SW8081B</b>								
4,4-DDE	ug/Kg 3.3b		8900	9.8	< 2.2			
4,4-DDT	ug/Kg 3.3b		7900	13	3.8			

Parameters	Sample ID	Date	UUSCO	RRSCO	SB-9 0-2		SB-9 6-8	
					4/29/2015	4/29/2015	Result	Result
<b>Metals, Total</b>								
Barium, Ba	mg/Kg 350c		400	677	57.4			
Lead, Pb	mg/Kg 63c		400	446	25.3			
Zinc, Zn	mg/Kg 109c		10,000d	330	36.1			
<b>SVOCs</b>								
Benzo-b-Fluoranthene	ug/Kg 1,000c	1,000f		1,800	< 250			
Chrysene	ug/Kg 1,000c	3900		1,100	< 250			

Parameters	Sample ID	Depth	UUSCOs	RRSCO	SB-2		SB-2	
					0'-2'	6'-8'	Result	Result
<b>Metals, Total</b>								
Lead, Pb	mg/Kg 63c		400	458	7.06			
Mercury, Hg	mg/Kg .18c		.81j	1.45	< 0.03			
Zinc, Zn	mg/Kg 109c		10,000d	163	17.3			
<b>TCLP Metals</b>								
Lead	mg/L		5	5.93				
<b>Volatiles By SW8260C</b>								
n-Propylbenzene	ug/Kg 3,900		100,000a	< 5.5	5,600			

Parameters	Sample ID	Depth	UUSCOs	RRSCO	SB-1		SB-1	
					0'-2'	6'-8'	Result	Result
<b>Metals, Total</b>								
Barium, Ba	mg/Kg 350c		400	151	1,780			
Lead, Pb	mg/Kg 63c		400	325	3,900			
Mercury, Hg	mg/Kg .18c		.81j	0.78	0.2			
Zinc, Zn	mg/Kg 109c		10,000d	205	730			
<b>TCLP Metals</b>								
Lead	mg/L		5		32.5			
<b>VOCs</b>								
Acetone	ug/Kg 50		100,000b	< 31	130			
Total Xylenes	ug/Kg 260		100,000a	< 5.2	390			

Parameters	Sample ID	Depth	UUSCOs	RRSCO	SB-3		SB-3	
					0'-2'	10'-12'	Result	Result
<b>Metals, Total</b>								
Copper, Cu	mg/Kg 50		270	50.7	8.87			
Lead, Pb	mg/Kg 63c		400	542	4.84			
Mercury, Hg	mg/Kg .18c		.81j	0.35	< 0.03			
Zinc, Zn	mg/Kg 109c		10,000d	171	12			
<b>SVOCs</b>								
Benzo-a-Anthracene	ug/Kg 1,000c	1,000f		1,100	< 260			
Benzo-b-Fluoranthene	ug/Kg 1,000c	1,000f		1,200	< 260			

Parameters	Sample ID	Date	UUSCO	RRSCO	SB-10 0-2		SB-10 6-8	
					4/29/2015	4/29/2015	Result	Result
<b>Metals, Total</b>								
Lead, Pb	mg/Kg 63c		400	341	21			
Mercury, Hg	mg/Kg .18c		.81j	0.48	< 0.03			
Zinc, Zn	mg/Kg 109c		10,000d	135	26.8			
<b>SVOCs</b>								
Benzo-a-Anthracene	ug/Kg 1,000c	1,000f		1,100	< 260			
Benzo-b-Fluoranthene	ug/Kg 1,000c	1,000f		1,200	< 260			



Note:

Sampling locations in gray were installed and sampled during the previous Phase II ESA, performed by Cider Environmental in March 2015.

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**Legend**

- ⊙ Monitoring Well
- ⊕ Groundwater Sampling Point
- ⊕ Soil Sampling Point
- ⊕ Soil Vapor Sampling Point
- ⊕ Cesspool/ Overflow
- ⊕ Dry Well
- ⊕ Catch Basin
- ⊕ Sanitary Vent

**TITLE:** Exceedances of Soil  
401 East 120th Street, New York, New York

DRAWN BY: WF	REVISED BY:	PROJECT No. 2014-142
CHECKED BY: JC	REVISED DATE:	FIGURE No. 06
DATE: 3-28-2015	APPROVED BY:	
SCALE: 1" = 50'	FILE NAME:	

Tel: (811) 614-4000 Fax: (811) 965-7972  
www.CiderEnvironmental.com  
6268 Jericho Turnpike, Suite 12, Commack, NY 11725



First Avenue

Parameters	Unit	AWQS	GW-2
<b>Metals, Total</b>			
Aluminum (Dissolved)	mg/L	0.1	0.241
Sodium (Dissolved)	mg/L	20	136
<b>SVOCS</b>			
Benzo-a-Anthracene	ug/L	0.002	0.18
Benzo-b-Fluoranthene	ug/L	0.002	0.28
Benzo-k-Fluoranthene	ug/L	0.002	0.11
Chrysene	ug/L	0.002	0.18
Indeno(1,2,3-cd)Pyrene	ug/L	0.002	0.09

Parameters	Sample ID	GW-4
	Date	4/29/2015
	Units	Result
<b>Metals, Total</b>		
Magnesium (Dissolved)	mg/L	35 69.7
Manganese (Dissolved)	mg/L	0.3 5.11
Sodium (Dissolved)	mg/L	20 103
<b>SVOCS</b>		
Benzo(a)anthracene	ug/L	0.002 0.04
Benzo(a)pyrene	ug/L	MDL 0.03
Benzo(b)fluoranthene	ug/L	0.002 0.04
Chrysene	ug/L	0.002 0.03

Parameters	Unit	AWQS	GW-3
<b>Metals, Total</b>			
Manganese (Dissolved)	mg/L	0.3	0.587
Sodium (Dissolved)	mg/L	20	74.9
<b>SVOCS</b>			
Benzo-a-Anthracene	ug/L	0.002	0.03
Benzo-b-Fluoranthene	ug/L	0.002	0.02

Parameters	Sample ID	GW-6
	Date	4/29/2015
	Units	Result
<b>Metals, Total</b>		
Manganese (Dissolved)	mg/L	0.3 1.98
Sodium (Dissolved)	mg/L	20 239
<b>SVOCS</b>		
Benzo(a)anthracene	ug/L	0.002 0.16
Benzo(a)pyrene	ug/L	MDL 0.19
Benzo(b)fluoranthene	ug/L	0.002 0.32
Benzo(k)fluoranthene	ug/L	0.002 0.11
Chrysene	ug/L	0.002 0.24
Indeno(1,2,3-cd)pyrene	ug/L	0.002 0.15

Parameters	Unit	AWQS	GW-1
<b>Metals, Total</b>			
Aluminum (Dissolved)	mg/L	0.1	0.479
Iron (Dissolved)	mg/L	0.3	1.29
Manganese (Dissolved)	mg/L	0.3	1.94
Sodium (Dissolved)	mg/L	20	97.3
<b>VOCs</b>			
Isopropylbenzene	ug/L	5	100
n-Butylbenzene	ug/L	5	27
n-Propylbenzene	ug/L	5	160
sec-Butylbenzene	ug/L	5	52
<b>SVOCS</b>			
Benzo-a-Anthracene	ug/L	0.002	0.09
Benzo-b-Fluoranthene	ug/L	0.002	0.08
Benzo-k-Fluoranthene	ug/L	0.002	0.03
Chrysene	ug/L	0.002	0.09
Indeno(1,2,3-cd)Pyrene	ug/L	0.002	0.03

Parameters	Sample ID	GW-5
	Date	4/29/2015
	Units	Result
<b>Metals, Total</b>		
Aluminum	mg/Kg	
Aluminum (Dissolved)	mg/L	0.1 0.107
Iron (Dissolved)	mg/L	0.3 1.66
Magnesium (Dissolved)	mg/L	35 43.1
Manganese (Dissolved)	mg/L	0.3 2.5
Sodium (Dissolved)	mg/L	20 35.5
<b>SVOCS</b>		
Benzo(a)anthracene	ug/L	0.002 0.04
Benzo(a)pyrene	ug/L	MDL 0.03
Benzo(b)fluoranthene	ug/L	0.002 0.04
Chrysene	ug/L	0.002 0.04
Indeno(1,2,3-cd)pyrene	ug/L	0.002 0.02



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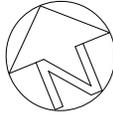
**Legend**

- ⊙ Monitoring Well
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TITLE: Exceedances of Groundwater			
401 East 120th Street, New York, New York			
DRAWN BY:	WF	REVISED BY:	
CHECKED BY:	JC	REVISED DATE:	
DATE:	3-28-2015	APPROVED BY:	
SCALE:	1" = 50'	FILE NAME:	
		PROJECT No.	2014-142
		FIGURE No.	07

Tel: (831) 614-0300 Fax: (831) 963-7972  
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6268 Jericho Turnpike, Suite 12, Commack, NY 11725

Note:  
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First Avenue

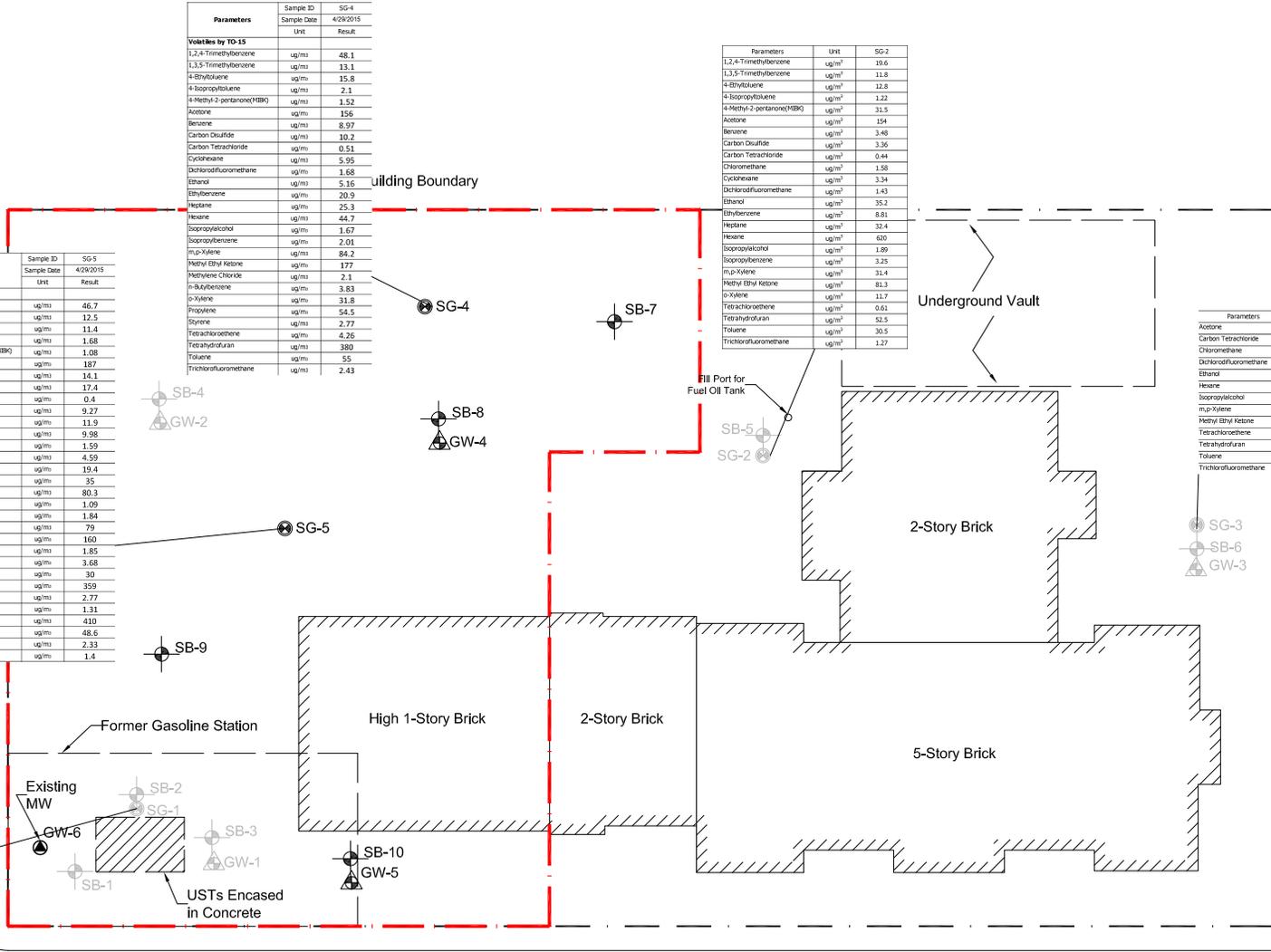
Parameters	Sample ID	SG-5
Unit	Sample Date	Result
<b>Volatiles by TO-15</b>		
1,2,4-Trimethylbenzene	ug/m3	46.7
1,3,5-Trimethylbenzene	ug/m3	12.5
4-Ethyltoluene	ug/m3	11.4
4-Isopropyltoluene	ug/m3	1.68
4-Methyl-2-pentanone(MIBK)	ug/m3	1.08
Acetone	ug/m3	187
Benzene	ug/m3	14.1
Carbon Dioxide	ug/m3	17.4
Carbon Tetrachloride	ug/m3	0.4
Chloroform	ug/m3	9.27
Chloromethane	ug/m3	11.9
Cyclohexane	ug/m3	9.98
Dichlorodifluoromethane	ug/m3	1.59
Ethanol	ug/m3	4.59
Ethylbenzene	ug/m3	19.4
Heptane	ug/m3	35
Hexane	ug/m3	80.3
Isopropylalcohol	ug/m3	1.09
Isopropylbenzene	ug/m3	1.84
m,p-Xylene	ug/m3	79
Methyl Ethyl Ketone	ug/m3	160
Methylene Chloride	ug/m3	1.85
n-Butylbenzene	ug/m3	3.68
o-Xylene	ug/m3	30
Propylene	ug/m3	359
Styrene	ug/m3	2.77
Tetrachloroethene	ug/m3	1.31
Tetrahydrofuran	ug/m3	410
Toluene	ug/m3	48.6
Trichlorofluoromethane	ug/m3	2.33
Vinyl Chloride	ug/m3	1.4

Parameters	Sample ID	SG-4
Unit	Sample Date	Result
<b>Volatiles by TO-15</b>		
1,2,4-Trimethylbenzene	ug/m3	48.1
1,3,5-Trimethylbenzene	ug/m3	13.1
4-Ethyltoluene	ug/m3	15.8
4-Isopropyltoluene	ug/m3	2.1
4-Methyl-2-pentanone(MIBK)	ug/m3	1.52
Acetone	ug/m3	156
Benzene	ug/m3	8.97
Carbon Dioxide	ug/m3	10.2
Carbon Tetrachloride	ug/m3	0.51
Cyclohexane	ug/m3	5.95
Dichlorodifluoromethane	ug/m3	1.88
Ethanol	ug/m3	5.16
Ethylbenzene	ug/m3	20.9
Heptane	ug/m3	25.3
Hexane	ug/m3	44.7
Isopropylalcohol	ug/m3	1.67
Isopropylbenzene	ug/m3	2.01
m,p-Xylene	ug/m3	84.2
Methyl Ethyl Ketone	ug/m3	177
Methylene Chloride	ug/m3	2.1
n-Butylbenzene	ug/m3	3.83
o-Xylene	ug/m3	31.8
Propylene	ug/m3	54.5
Styrene	ug/m3	2.77
Tetrachloroethene	ug/m3	4.26
Tetrahydrofuran	ug/m3	380
Toluene	ug/m3	55
Trichlorofluoromethane	ug/m3	2.43

Parameters	Unit	SG-2
1,2,4-Trimethylbenzene	ug/m3	19.6
1,3,5-Trimethylbenzene	ug/m3	11.8
4-Ethyltoluene	ug/m3	12.8
4-Isopropyltoluene	ug/m3	1.22
4-Methyl-2-pentanone(MIBK)	ug/m3	31.5
Acetone	ug/m3	154
Benzene	ug/m3	3.48
Carbon Dioxide	ug/m3	3.36
Carbon Tetrachloride	ug/m3	0.44
Chloromethane	ug/m3	1.58
Cyclohexane	ug/m3	3.34
Dichlorodifluoromethane	ug/m3	1.43
Ethanol	ug/m3	35.2
Ethylbenzene	ug/m3	8.81
Heptane	ug/m3	32.4
Hexane	ug/m3	620
Isopropylalcohol	ug/m3	1.89
Isopropylbenzene	ug/m3	3.25
m,p-Xylene	ug/m3	31.4
Methyl Ethyl Ketone	ug/m3	81.3
o-Xylene	ug/m3	11.7
Tetrachloroethene	ug/m3	0.61
Tetrahydrofuran	ug/m3	52.5
Toluene	ug/m3	30.5
Trichlorofluoromethane	ug/m3	1.27

Parameters	Unit	SG-3
Acetone	ug/m3	16.0
Carbon Tetrachloride	ug/m3	0.99
Chloromethane	ug/m3	1.50
Dichlorodifluoromethane	ug/m3	2.19
Ethanol	ug/m3	21.8
Hexane	ug/m3	2.78
Isopropylalcohol	ug/m3	1.82
m,p-Xylene	ug/m3	1.21
Methyl Ethyl Ketone	ug/m3	4.24
Tetrachloroethene	ug/m3	0.49
Tetrahydrofuran	ug/m3	5.57
Toluene	ug/m3	1.63
Trichlorofluoromethane	ug/m3	1.41

Parameters	Unit	SG-1
Acetone	ug/m3	1620
Cyclohexane	ug/m3	894
Heptane	ug/m3	1040
Hexane	ug/m3	905
Isopropylbenzene	ug/m3	358
Toluene	ug/m3	1020



East 120th Street

Note:  
Sampling locations in gray were installed and sampled during the previous Phase II ESA, performed by Cider Environmental in March 2015.

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**Legend**

- ⊙ Monitoring Well
- ⊙ Groundwater Sampling Point
- ⊙ Soil Sampling Point
- ⊙ Soil Vapor Sampling Point
- ⊙ Cesspool/ Overflow
- ⊙ Dry Well
- ⊙ Catch Basin
- ⊙ Sanitary Vent

**TITLE: Exceedances of Soil Vapor**

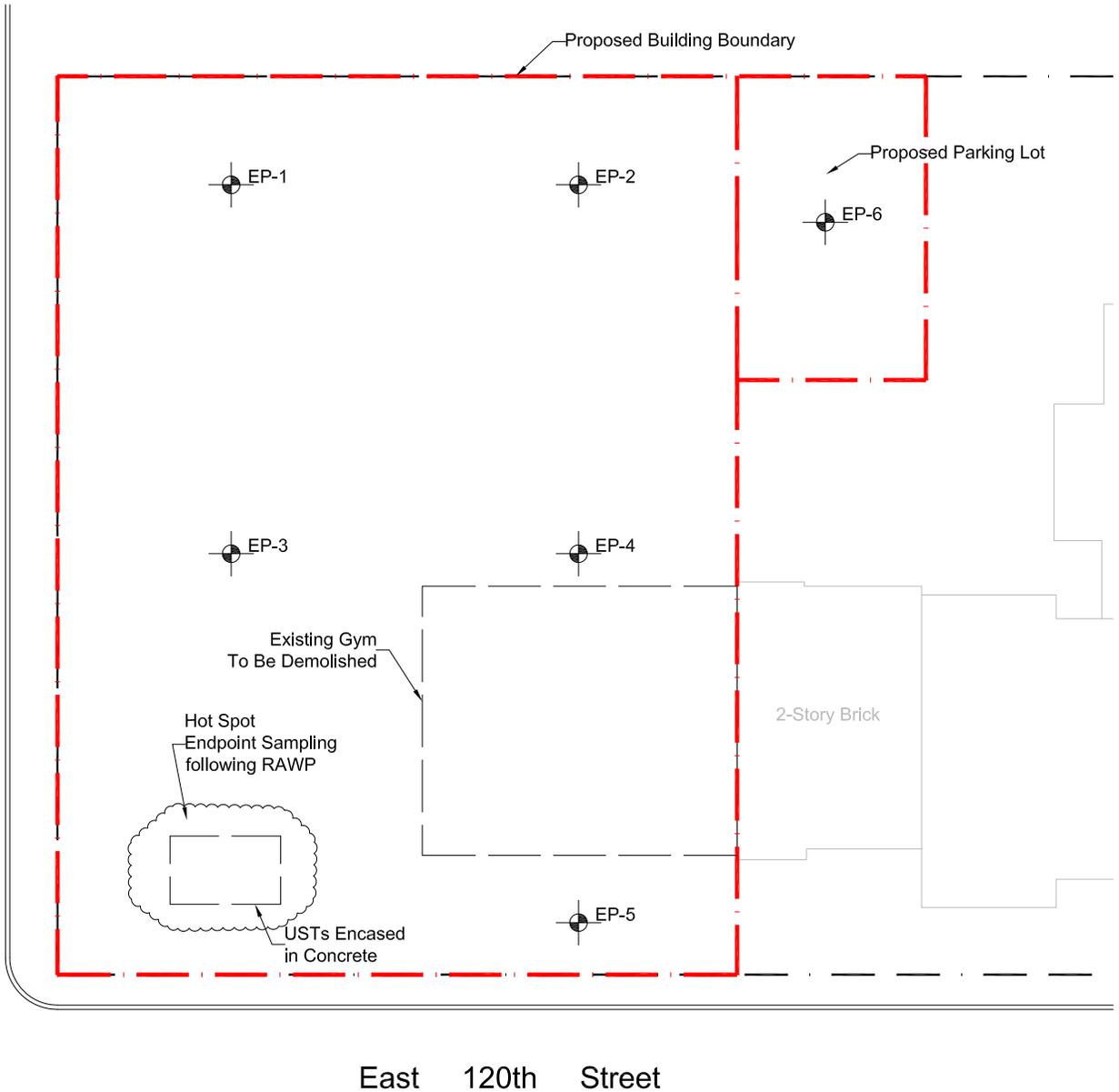
401 East 120th Street, New York, New York

DRAWN BY: WF	REVISED BY:	PROJECT No. 2014-142
CHECKED BY: JC	REVISED DATE:	FIGURE No. 08
DATE: 3-28-2015	APPROVED BY:	
SCALE: 1" = 50'	FILE NAME:	

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First Avenue



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**Legend**

⊕ Endpoint Sample

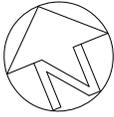
**TITLE:** Endpoint Sample Location Map  
401 East 120th Street, New York, New York

DRAWN BY:	WF	REVISED BY:	
CHECKED BY:	JC	REVISED DATE:	
DATE:	7-23-2015	APPROVED BY:	
SCALE:	1" = 40'	FILE NAME:	

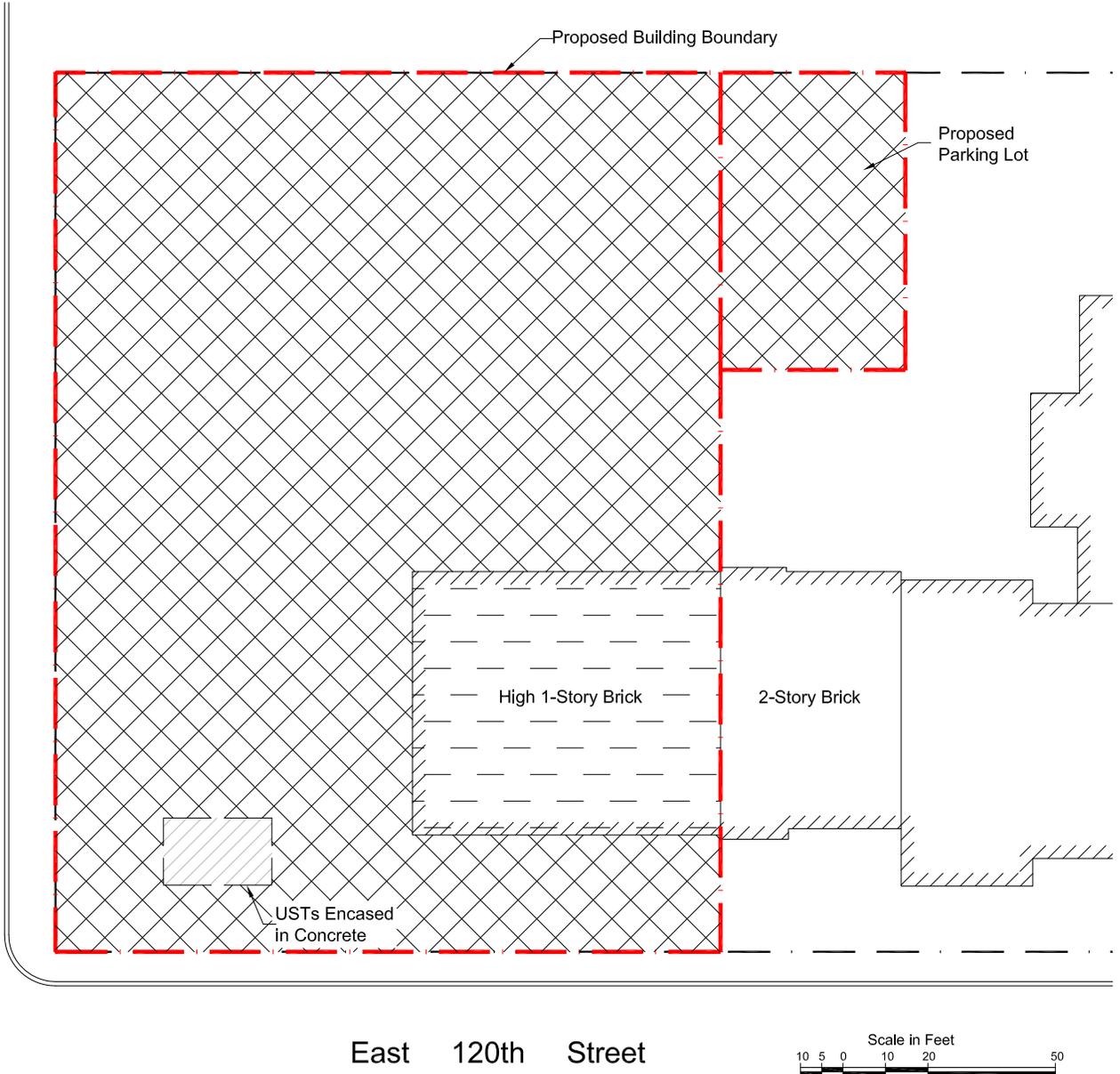
PROJECT No.  
2014-142  
PLATE No.  
09



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First Avenue



East 120th Street



Description	Area (sq ft)	Excavation Depth (ft)	Petroleum Impacted Soil to be Removed		Urban Fill to be Removed	
			Volume (cubic yard)	Tonnage (ton)	Volume (cubic yard)	Tonnage (ton)
Building Footprint (Excluding Existing Gym)	27,500	2	0	0	2,037	3,056
Existing Gym	4,500	NA	0	0	0	0
UST Removal	500	8	100	150	100	150
Future Parking Lot	3,000	2	0	0	222	333
<b>Total</b>			<b>100</b>	<b>150</b>	<b>2,359</b>	<b>3,539</b>

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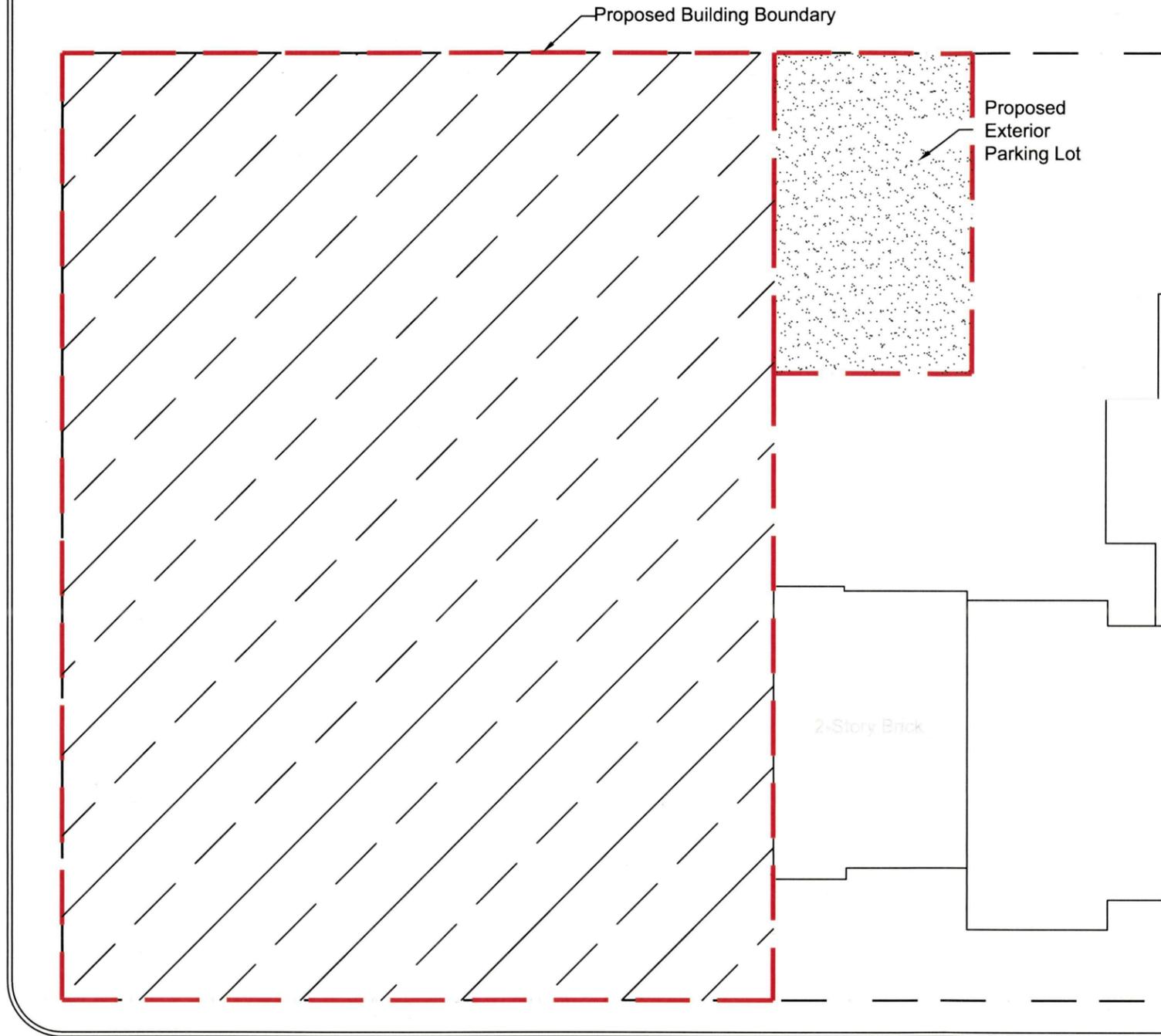
Legend	
	Excavation to 2 feet Below Existing Grade
	UST Excavation, presumably to 8 feet Below Existing Grade
	Existing Gym with 4 ft Crawl Space

TITLE: Site Excavation Map			
401 East 120th Street, New York, New York			
DRAWN BY:	WF	REVISED BY:	
CHECKED BY:	JC	REVISED DATE:	
DATE:	11-16-2015	APPROVED BY:	
SCALE:	1" = 40'	FILE NAME:	
		PROJECT No.	2014-142
		PLATE No.	10

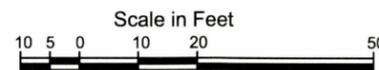
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First Avenue



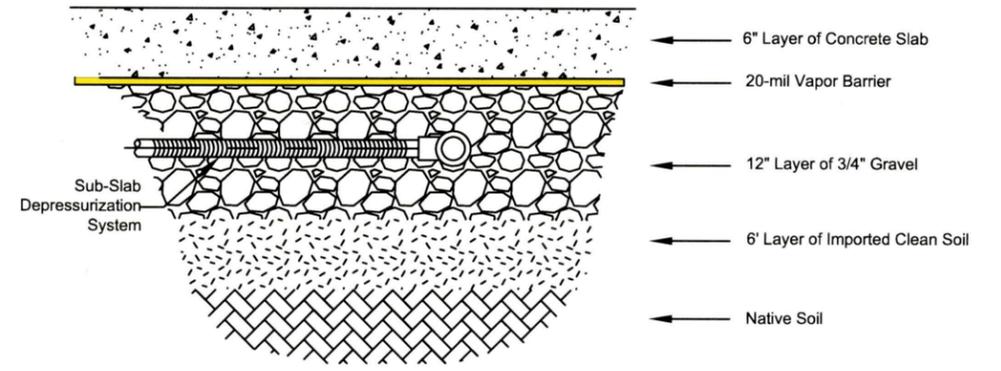
East 120th Street



Legend

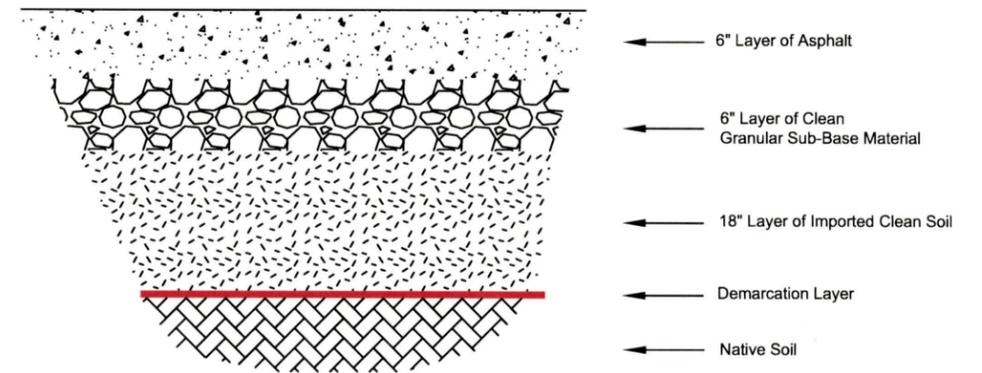
-  Cover System Beneath Building Slab
-  Cover System Beneath Exterior Parking Lot

Typical Cover System Layout Below Building Slab



N.T.S.

Typical Cover System Layout Below Exterior Parking Lot



N.T.S.

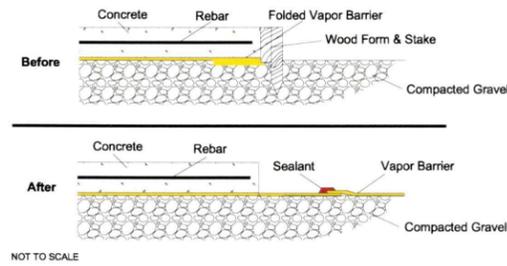


TITLE: Side-Wide Cover System Plan			
401 East 120th Street, New York, New York			
DRAWN BY: WF	REVISED BY:	PROJECT No. 2014-142	
CHECKED BY: JC	REVISED DATE:	FIGURE No. 11	
DATE: 11-17-2015	APPROVED BY:		
SCALE: N. T. S.	FILE NAME:		

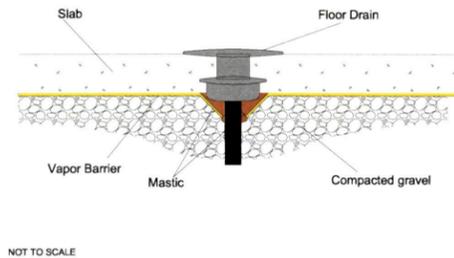
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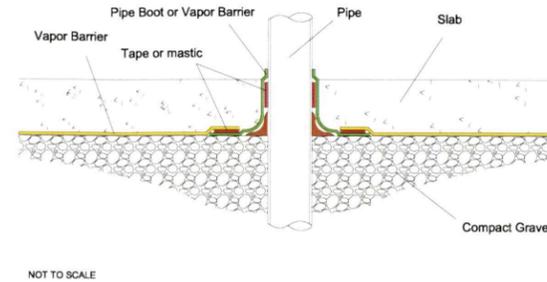
**Construction Joint Application for Large Slabs Placed in Stages**



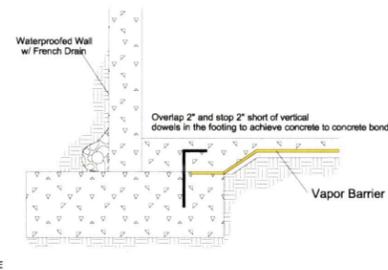
**Membrane Interaction with Floor Drain**



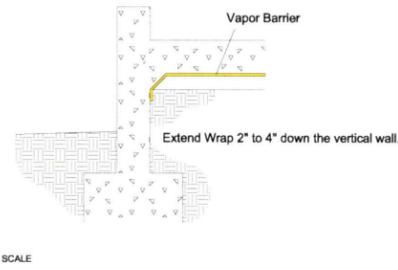
**Membrane Interaction with Pipe Penetration**



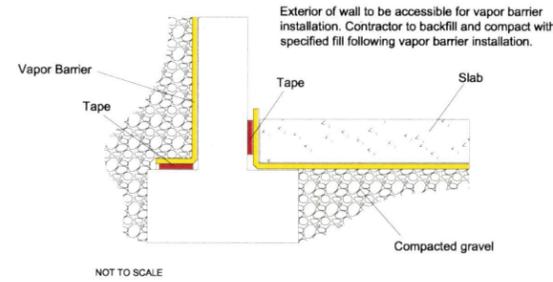
**Membrane Termination Onto Footing just Short of Rebar Dowels**



**Membrane Termination Onto Below Slab Wall Footing**

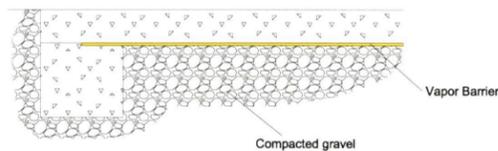


**Membrane Termination Onto Outside Cellar Wall Footing**

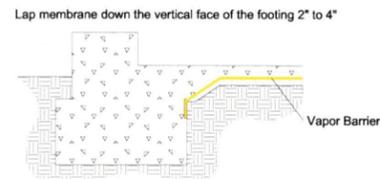


**Membrane Termination Between Footer and Slab Needing Concrete Bond**

\*Overlap the vapor barrier as far as necessary to ensure that it remains sandwiched between the slab and footer during construction, but not so far that it prohibits adequate bonding of concrete to concrete.



**Membrane Termination Onto Exterior Wall Footing**



**VAPOR BARRIER CONSTRUCTION NOTES:**

- Vapor barrier membrane to be approved by the project design engineer. Membrane shall at a minimum be a Class A Vapor Barrier (ASTM E 1745) and with a minimum thickness of 20 mils. The slab-side of the membrane shall have qualities to allow bonding with the poured concrete. In no case shall membrane contain recycled plastic product or have a permeance of greater than 0.04 Perms. Manufacturers samples and cut sheets shall be submitted to the design engineer for approval prior to delivery to site.
- Vapor barrier materials to be stored in a clean, dry area or per manufacturer's instructions. Materials to be protected during handling and installation to prevent damage.
- Prepare subsoil as specified by project architect, geotechnical engineer or structural engineer, or in accordance with ACI 302.1R-04 Section 4.1 Install vapor retarder membrane over leveled and compacted 3/4" 2B pea gravel, or an equivalent approved by design engineer. Gravel to be no more than 1-inch in diameter, with no sharp aggregate or projections. Do not begin installation until unacceptable conditions have been corrected.
- Installation shall be in accordance with manufacturer's instructions, ASTM E 1643-98 (2005), best industry practices, and all applicable federal, state, and local codes. Membrane to be unrolled with the longest dimension parallel to the direction of the pour. Membrane to be installed with smooth side facing down and concrete-bonding side facing up. Succeeding sheets should be accurately positioned to overlap the adjacent sheet by a minimum of 6 inches. Lap membrane over footings and seal to foundation wall. Ensure there are no discontinuities in vapor retarder at seams and penetrations. Laps to be sealed with double-sided asphaltic tape, mastic or equivalent sealant with permeance of 0.3 perms or less approved by the design engineer. Ensure membrane surfaces to receive sealant are clean and dry.
- Protect membrane from damage during installation of reinforcing steel and utilities, and during placement of concrete slab.
- No penetrations shall be made except for reinforcing steel, foundations/pile caps, and permanent utilities. Vapor barrier to be inspected for holes or other damage. Small holes to be patched with mastic or approved equivalent, or per manufacturer's instructions. Larger holes to be patched with additional cut-out sections of membrane and sealed on all four sides, or per manufacturer's instructions. All allowed penetrations shall be sealed per manufacturer's instructions. Design engineer must be allowed to inspect final installation prior to pouring slab with sufficient lead-time for the contractor to implement required changes.
- Place concrete within 30 days of vapor barrier installation.

New York State Professional Engineer STAMP:

**STATE OF NEW YORK**  
**WENQING FANG**  
**LICENSED PROFESSIONAL ENGINEER**  
 095477

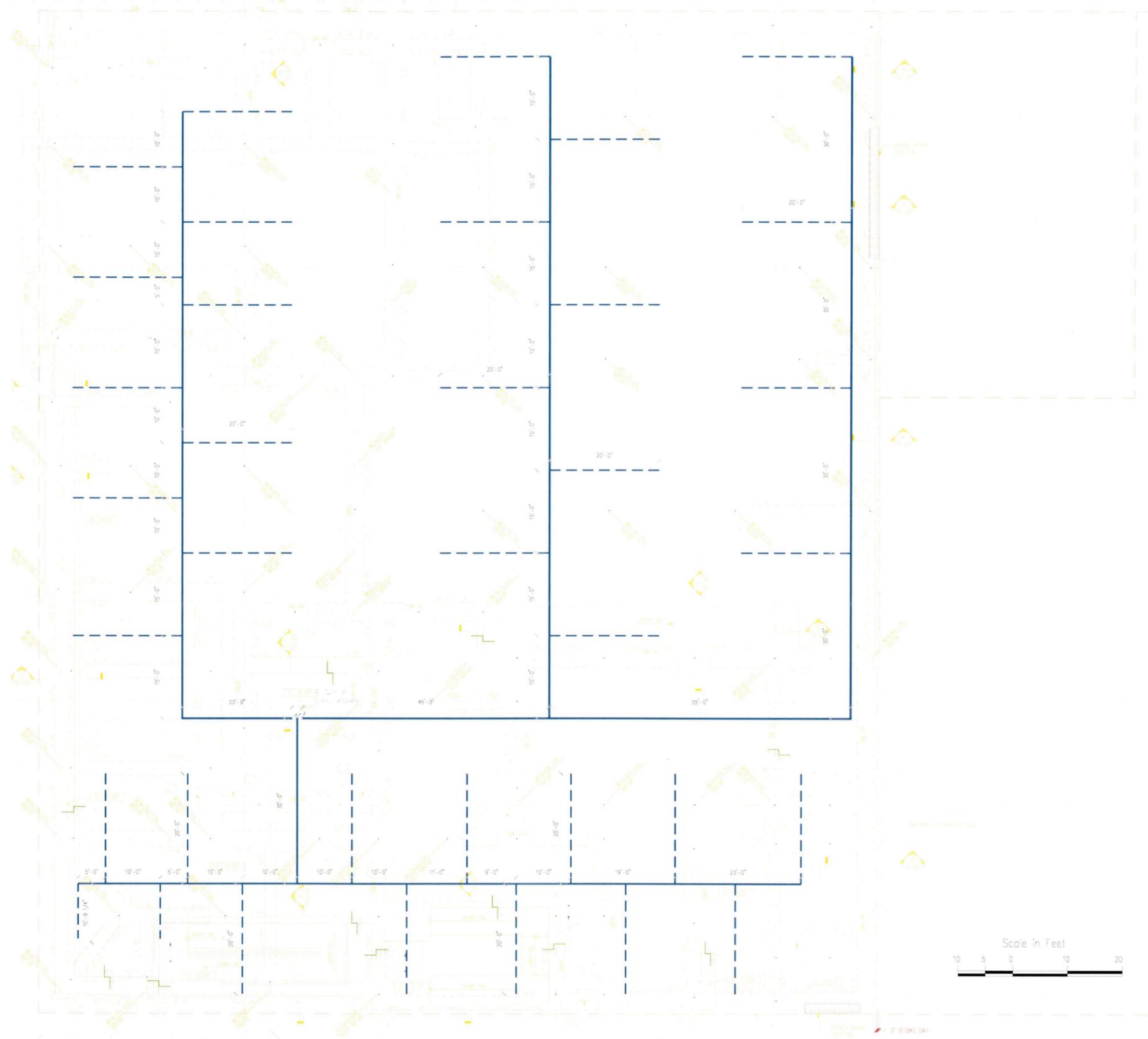
TITLE: Vapor Barrier Diagram

401 East 120th Street, New York, New York

DRAWN BY: WF	REVISED BY:	PROJECT No. 2014-142
CHECKED BY: JC	REVISED DATE:	FIGURE No. 12
DATE: 11-2-2015	APPROVED BY:	
SCALE: N. T. S.	FILE NAME:	

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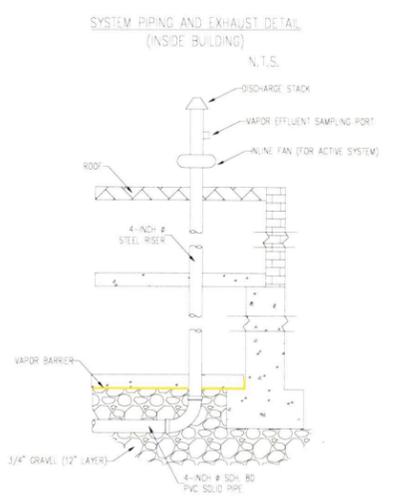
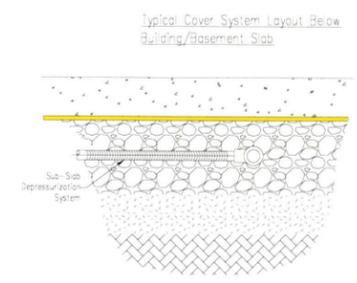
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**Legend**

- SCH. 80 Ø 3-INCH PVC SCREEN
- SCH. 80 Ø 4-INCH PVC SOLID PIPE

Note:  
Base map dated 7/17/2015 provided by  
Magnusson Architecture and Planning PC



**SUB-MEMBRANE DEPRESSURIZATION SYSTEM CONSTRUCTION NOTES:**

1. PROPOSED LOCATIONS OF DEPRESSURIZATION SYSTEM RISER PIPES TO BE VERIFIED BY ARCHITECT.
2. PREPARE SUBSOIL AS SPECIFIED BY PROJECT GEOTECHNICAL OR STRUCTURAL ENGINEER, OR IN ACCORDANCE WITH ACI 302.1R-04 SECTION 4.1. PLACE, LEVEL, AND COMPACT GRAVEL BED CONSISTING OF CLEAN 3/4-INCH PEA GRAVEL, OR AN EQUIVALENT APPROVED BY THE DESIGN ENGINEER. GRAVEL TO BE NO MORE THAN 1-INCH IN DIAMETER, WITH NO SHARP AGGREGATE. LEVEL GRAVEL BED TO ELEVATION OF BOTTOM OF PVC PIPING TO BE INSTALLED.
3. 3-INCH DIAMETER SCHEDULE 80 SLOTTED PVC SCREEN SHALL BE INSTALLED 6 INCH BENEATH THE BUILDING SLAB. BACKFILL AND COMPACT OVER SUPPORTED SCREEN WITH CLEAN 3/4-INCH PEA GRAVEL. TOTAL DEPTH OF COMPACTED GRAVEL SURROUNDING PIPING SHALL BE MINIMUM 12-INCHES THICK. PVC SCREENS SHALL BE CONNECTED TO 4-INCH DIAMETER SCHEDULE 80 PVC SOLID PIPE AND STEEL RISERS. VAPOR EFFLUENT SAMPLING PORTS SHALL BE INSTALLED ON THE RISERS. THE RISERS SHALL RAISE AT LEAST 3-Feet ABOVE THE ROOF. RAIN CAPS SHALL BE INSTALLED ON THE ROOF AT THE END OF THE RISERS.
4. PVC PIPING TO BE NEW, CLEAN SLOTTED SCREEN AND SOLID PIPE. 20-FOOT LENGTHS OF PIPE SHALL BE USED TO THE EXTENT PRACTICABLE. SCREEN TO BE 40-SLOT (0.040 INCH WIDE SLOTS). STEEL RISER PIPE AND FITTINGS FOR THE VERTICAL STACK TO BE PRIMED AND PAINTED WITH WEATHER RESISTENT PAINT. A MINIMUM OF TWO UNIONS SHALL BE INSTALLED ON THE STACK PIPE TO PROVIDE FOR FUTURE MODIFICATION.
5. PLUMBING, PRIMING, GLUING, PAINTING, FASTENING, AND SUPPORTING PVC AND STEEL PIPES, SCREENS, RISERS, AND FITTINGS TO BE CONDUCTED IN ACCORDANCE WITH EXISTING PROJECT PLANS AND SPECIFICATIONS, INDUSTRY STANDARDS, AND MANUFACTURERS INSTRUCTIONS, UNLESS OTHERWISE APPROVED BY THE PROJECT ENGINEER. THE INSTALLATION SHALL COMPLY WITH ALL FEDERAL, STATE, AND LOCAL CODES.
6. CONTRACTOR SHALL STORE MATERIALS IN A CLEAN AND DRY AREA, AND SHALL PROTECT MATERIALS FROM DAMAGE DURING HANDLING AND INSTALLATION.



New York State Professional Engineer STAMP:		TITLE: Sub-Slab Depressurization System	
		401 East 120th Street, New York, New York	
		DRAWN BY: WF CHECKED BY: JC DATE: 11-17-2015 SCALE: N. T. S.	REVISED BY: REVISED DATE: APPROVED BY: FILE NAME:
		Tel: (631) 616-4000 Fax: (631) 980-7972 www.CiderEnvironmental.com 6268 Jericho Tpke, Suite 12, Commack, NY 11725	

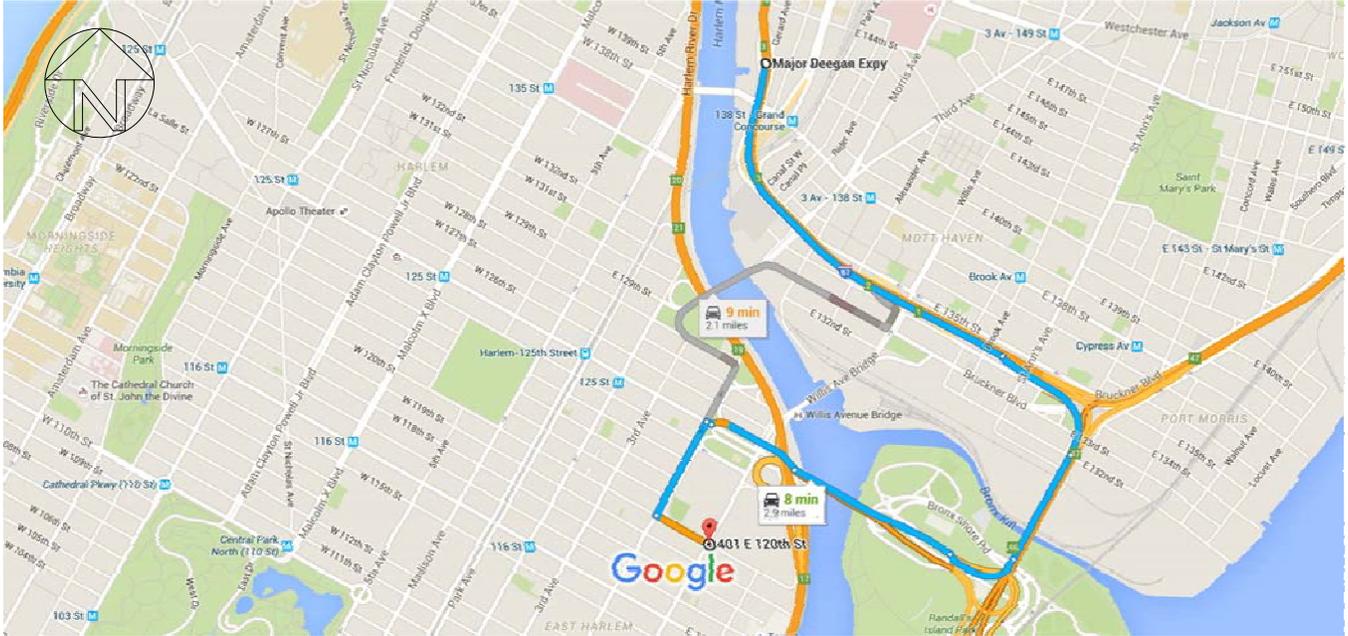


# Truck Route To the Site



**Major Deegan Expy, Bronx, NY 10451 to 401 E 120th St, New York, NY 10035**

**Drive 2.9 miles, 8 min**



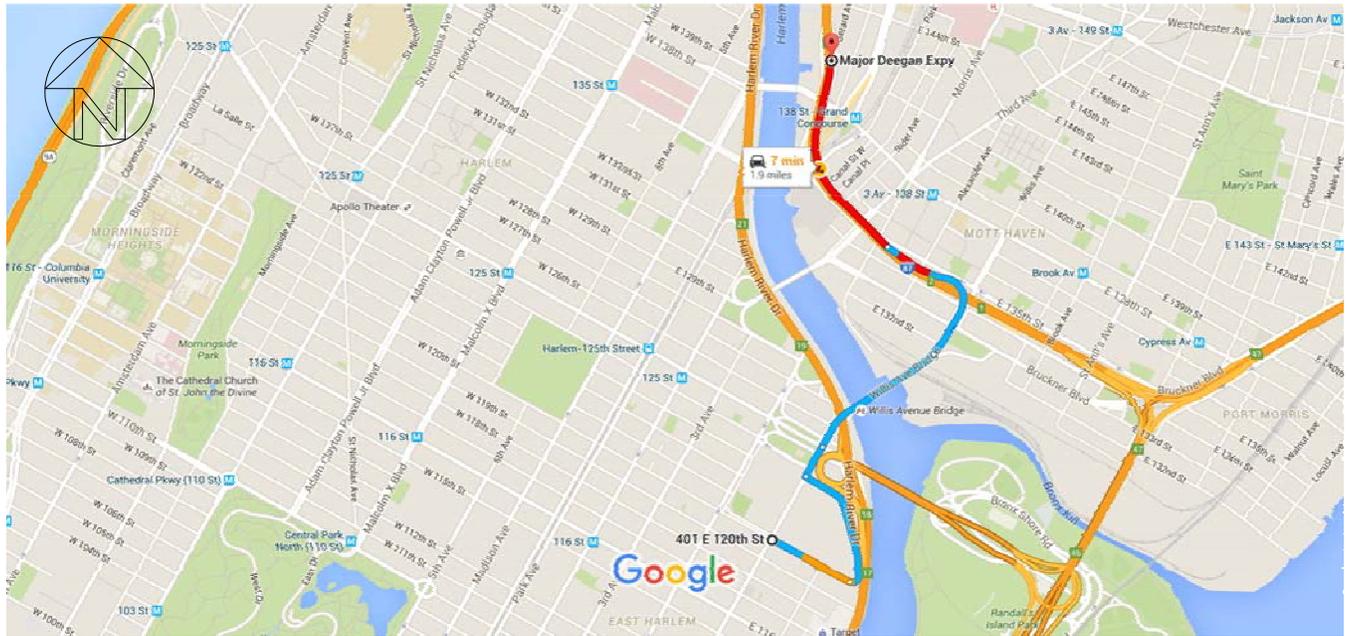
Map data ©2015 Google 1000 ft

# Truck Route From the Site



**401 E 120th St, New York, NY 10035 to Major Deegan Expy, Bronx, NY 10451**

**Drive 1.9 miles, 7 min**



Map data ©2015 Google 1000 ft

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TITLE:		Truck Route Map	
401 East 120th Street, New York, New York			
DRAWN BY:	WF	REVISED BY:	
CHECKED BY:	JC	REVISED DATE:	
DATE:	11-2-2015	APPROVED BY:	
SCALE:	N. T. S.	FILE NAME:	
PROJECT No.		2014-142	
FIGURE No.		15	



## **TABLES**

**Table 1: VOCs in Surface Soils**  
401 East 120th Street, New York, NY

Parameters	SampeI ID	NYCRR 375 Unrestricted Use	NYCRR 375 Restricted- Residential	SB-1	SB-2	SB-3	SB-4	SB-5	SB-6	SB-7	SB-8	SB-9	SB-10	
	Sample Depth			0'-2'	0'-2'	0'-2'	0'-2'	0'-2'	0'-2'	0'-2'	0'-2'	0'-2'	0'-2'	0'-2'
	Sample Date			3/12/2015	3/12/2015	3/12/2015	3/12/2015	3/12/2015	3/12/2015	3/12/2015	4/29/2015	4/29/2015	4/29/2015	4/29/2015
<b>Volatiles By SW8260C</b>														
1,1,1,2-Tetrachloroethane	ug/Kg	NA	NA	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
1,1,1-Trichloroethane	ug/Kg	680	100,000a	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
1,1,2,2-Tetrachloroethane	ug/Kg	NA	NA	< 3.1	< 3.3	< 3.3	< 3.8	< 3.6	< 3.5	< 1.6	< 4.7	< 3.4	< 3.1	
1,1,2-Trichloroethane	ug/Kg	NA	NA	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
1,1-Dichloroethane	ug/Kg	270	26000	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
1,1-Dichloroethene	ug/Kg	330	100,000a	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
1,1-Dichloropropene	ug/Kg	NA	NA	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
1,2,3-Trichlorobenzene	ug/Kg	NA	NA	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
1,2,3-Trichloropropane	ug/Kg	NA	NA	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
1,2,4-Trichlorobenzene	ug/Kg	NA	NA	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
1,2,4-Trimethylbenzene	ug/Kg	3,600	52000	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
1,2-Dibromo-3-Chloropropane	ug/Kg	NA	NA	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
1,2-Dibromoethane	ug/Kg	NA	NA	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
1,2-Dichlorobenzene	ug/Kg	1,100	100,000a	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
1,2-Dichloroethane	ug/Kg	20c	3100	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
1,2-Dichloropropane	ug/Kg	NA	NA	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
1,3,5-Trimethylbenzene	ug/Kg	8,400	52000	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
1,3-Dichlorobenzene	ug/Kg	2,400	49000	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
1,3-Dichloropropane	ug/Kg	NA	NA	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
1,4-Dichlorobenzene	ug/Kg	1,800	13000	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
2,2-Dichloropropane	ug/Kg	NA	NA	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
2-Chlorotoluene	ug/Kg	NA	NA	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
2-Hexanone	ug/Kg	NA	NA	< 26	< 28	< 27	< 31	< 30	< 29	< 13	< 39	< 28	< 26	
2-Isopropyltoluene	ug/Kg	NA	NA	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
4-Chlorotoluene	ug/Kg	NA	NA	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
Methyl Isobutyl Ketone	ug/Kg	NA	NA	< 26	< 28	< 27	< 31	< 30	< 29	< 13	< 39	< 28	< 26	
Acetone	ug/Kg	50	100,000b	< 31	< 33	< 33	< 38	< 36	< 35	< 16	< 47	< 34	< 31	
Acrylonitrile	ug/Kg	NA	NA	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
Benzene	ug/Kg	60	4800	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
Bromobenzene	ug/Kg	NA	NA	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
Bromochloromethane	ug/Kg	NA	NA	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
Bromodichloromethane	ug/Kg	NA	NA	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
Bromoform	ug/Kg	NA	NA	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
Bromomethane	ug/Kg	NA	NA	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
Carbon Disulfide	ug/Kg	NA	NA	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
Carbon Tetrachloride	ug/Kg	760	2400	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
Chlorobenzene	ug/Kg	1,100	100,000a	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
Chloroethane	ug/Kg	NA	NA	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
Chloroform	ug/Kg	370	49000	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
Chloromethane	ug/Kg	NA	NA	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	

**Table 1: VOCs in Surface Soils**  
401 East 120th Street, New York, NY

Parameters	SampeI ID	NYCRR 375 Unrestricted Use	NYCRR 375 Restricted- Residential	SB-1	SB-2	SB-3	SB-4	SB-5	SB-6	SB-7	SB-8	SB-9	SB-10	
	Sample Depth			0'-2'	0'-2'	0'-2'	0'-2'	0'-2'	0'-2'	0'-2'	0'-2'	0'-2'	0'-2'	0'-2'
	Sample Date			3/12/2015	3/12/2015	3/12/2015	3/12/2015	3/12/2015	3/12/2015	3/12/2015	4/29/2015	4/29/2015	4/29/2015	4/29/2015
cis-1,2-Dichloroethene	ug/Kg	250	100,000a	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
cis-1,3-Dichloropropene	ug/Kg	NA	NA	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
Dibromochloromethane	ug/Kg	NA	NA	< 3.1	< 3.3	< 3.3	< 3.8	< 3.6	< 3.5	< 1.6	< 4.7	< 3.4	< 3.1	
Dibromomethane	ug/Kg	NA	NA	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
Dichlorodifluoromethane	ug/Kg	NA	NA	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
Ethylbenzene	ug/Kg	1,000	41000	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
Hexachlorobutadiene	ug/Kg	NA	NA	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
Isopropylbenzene	ug/Kg	NA	NA	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
2-Butanone	ug/Kg	NA	100,000a	< 31	< 33	< 33	< 38	< 36	< 35	< 16	< 47	< 34	< 31	
Methyl Tert-Butyl Ether	ug/Kg	930	100,000a	< 10	< 11	< 11	< 13	< 12	< 12	< 5.3	< 16	< 11	< 10	
Methylene Chloride	ug/Kg	50	100,000a	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
Naphthalene	ug/Kg	12000	100,000a	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
n-Butylbenzene	ug/Kg	12,000	100,000a	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
n-Propylbenzene	ug/Kg	3,900	100,000a	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
p-Isopropyltoluene	ug/Kg	NA	NA	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
sec-Butylbenzene	ug/Kg	11,000	100,000a	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
Styrene	ug/Kg	NA	NA	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
tert-Butylbenzene	ug/Kg	5900	100,000a	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
Tetrachloroethene	ug/Kg	1300	19000	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
Tetrahydrofuran (THF)	ug/Kg	NA	NA	< 10	< 11	< 11	< 13	< 12	< 12	< 5.3	< 16	< 11	< 10	
Toluene	ug/Kg	700	100,000a	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
Total Xylenes	ug/Kg	260	100,000a	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
trans-1,2-Dichloroethene	ug/Kg	190	100,000a	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
trans-1,3-Dichloropropene	ug/Kg	NA	NA	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
trans-1,4-dichloro-2-butene	ug/Kg	NA	NA	< 10	< 11	< 11	< 13	< 12	< 12	< 5.3	< 16	< 11	< 10	
Trichloroethene	ug/Kg	470	21000	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
Trichlorofluoromethane	ug/Kg	NA	NA	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
Trichlorotrifluoroethane	ug/Kg	NA	NA	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	
Vinyl Chloride	ug/Kg	20	900	< 5.2	< 5.5	< 5.4	< 6.3	< 6.1	< 5.8	< 2.6	< 7.9	< 5.6	< 5.2	

Notes:

ug/Kg: microgram per kilogram (ppb)

mg/Kg: miligram per kilogram (ppm)

Analyte detected

Detected at concentration above 6 NYCRR Part 375 Unrestricted Soil Cleanup Objectives

Detected at concentration above 6 NYCRR Part 375 Restricted Residential Soil Cleanup Objectives

Detected at concentration above Maximum Concentration of Contaminants for Toxicity Characteristics

**Table 2: SVOCs in Surface Soil**  
401 East 120th Street, New York, NY

Parameters	Sample ID	NYCRR 375	NYCRR 375	SB-1	SB-2	SB-3	SB-4	SB-5	SB-6	SB-7	SB-8	SB-9	SB-10
	Sample Depth	Unrestricted	Restricted-	0'-2'	0'-2'	0'-2'	0'-2'	0'-2'	0'-2'	0'-2'	0'-2'	0'-2'	0'-2'
	Sample Date	Use	Residential	3/12/2015	3/12/2015	3/12/2015	3/12/2015	3/12/2015	3/12/2015	4/29/2015	4/29/2015	4/29/2015	4/29/2015
<b>Semivolatiles By SW8270D</b>													
1,2,4,5-Tetrachlorobenzene	ug/Kg	NA	NA	< 270	< 260	< 260	< 520	< 260	< 270	< 5000	< 270	< 260	< 260
1,2,4-Trichlorobenzene	ug/Kg	NA	NA	< 270	< 260	< 260	< 520	< 260	< 270	< 5000	< 270	< 260	< 260
1,2-Dichlorobenzene	ug/Kg	1,100	100,000a	< 270	< 260	< 260	< 520	< 260	< 270	< 5000	< 270	< 260	< 260
1,2- Diphenylhydrazine	ug/Kg	NA	NA	< 390	< 370	< 370	< 740	< 370	< 390	< 7200	< 390	< 370	< 370
1,3-Dichlorobenzene	ug/Kg	2,400	49000	< 270	< 260	< 260	< 520	< 260	< 270	< 5000	< 270	< 260	< 260
1,4-Dichlorobenzene	ug/Kg	1,800	13000	< 270	< 260	< 260	< 520	< 260	< 270	< 5000	< 270	< 260	< 260
2,4,5-Trichlorophenol	ug/Kg	NA	NA	< 270	< 260	< 260	< 520	< 260	< 270	< 5000	< 270	< 260	< 260
2,4,6-Trichlorophenol	ug/Kg	NA	NA	< 270	< 260	< 260	< 520	< 260	< 270	< 5000	< 270	< 260	< 260
2,4-Dichlorophenol	ug/Kg	NA	NA	< 270	< 260	< 260	< 520	< 260	< 270	< 5000	< 270	< 260	< 260
2,4-Dimethylphenol	ug/Kg	NA	NA	< 270	< 260	< 260	< 520	< 260	< 270	< 5000	< 270	< 260	< 260
2,4-Dinitrophenol	ug/Kg	NA	NA	< 620	< 590	< 590	< 1200	< 590	< 620	< 11000	< 620	< 590	< 600
2,4-Dinitrotoluene	ug/Kg	NA	NA	< 270	< 260	< 260	< 520	< 260	< 270	< 5000	< 270	< 260	< 260
2,6-Dinitrotoluene	ug/Kg	NA	NA	< 270	< 260	< 260	< 520	< 260	< 270	< 5000	< 270	< 260	< 260
2-Chloronaphthalene	ug/Kg	NA	NA	< 270	< 260	< 260	< 520	< 260	< 270	< 5000	< 270	< 260	< 260
2-Chlorophenol	ug/Kg	NA	NA	< 270	< 260	< 260	< 520	< 260	< 270	< 5000	< 270	< 260	< 260
2-Methylnaphthalene	ug/Kg	NA	NA	< 270	< 260	< 260	< 520	< 260	< 270	< 5000	< 270	< 260	< 260
2-Methylphenol	ug/Kg	330b	100,000a	< 270	< 260	< 260	< 520	< 260	< 270	< 5000	< 270	< 260	< 260
2-Nitroaniline	ug/Kg	NA	NA	< 620	< 590	< 590	< 1200	< 590	< 620	< 11000	< 620	< 590	< 600
2-Nitrophenol	ug/Kg	NA	NA	< 270	< 260	< 260	< 520	< 260	< 270	< 5000	< 270	< 260	< 260
3&4-Methylphenol (m&p-cresol)	ug/Kg	NA	NA	< 390	< 370	< 370	< 740	< 370	< 390	< 7200	< 390	< 370	< 370
3,3-Dichlorobenzidine	ug/Kg	NA	NA	< 270	< 260	< 260	< 520	< 260	< 270	< 5000	< 270	< 260	< 260
3-Nitroaniline	ug/Kg	NA	NA	< 620	< 590	< 590	< 1200	< 590	< 620	< 11000	< 620	< 590	< 600
4,6-Dinitro-2-methylphenol	ug/Kg	NA	NA	< 1100	< 1100	< 1100	< 2200	< 1100	< 1100	< 21000	< 1100	< 1100	< 1100
4-Bromophenyl-phenyl ether	ug/Kg	NA	NA	< 390	< 370	< 370	< 740	< 370	< 390	< 7200	< 390	< 370	< 370
4-Chloro-3-methylphenol	ug/Kg	NA	NA	< 270	< 260	< 260	< 520	< 260	< 270	< 5000	< 270	< 260	< 260
4-Chloroaniline	ug/Kg	NA	NA	< 270	< 260	< 260	< 520	< 260	< 270	< 5000	< 270	< 260	< 260
4-Chlorophenyl phenyl ether	ug/Kg	NA	NA	< 270	< 260	< 260	< 520	< 260	< 270	< 5000	< 270	< 260	< 260
4-Nitroaniline	ug/Kg	NA	NA	< 620	< 590	< 590	< 1200	< 590	< 620	< 11000	< 620	< 590	< 600
4-Nitrophenol	ug/Kg	NA	NA	< 1100	< 1100	< 1100	< 2200	< 1100	< 1100	< 21000	< 1100	< 1100	< 1100
Acenaphthene	ug/Kg	20000	100,000a	< 270	< 260	< 260	< 520	480	760	< 5000	< 270	< 260	< 260
Acenaphthylene	ug/Kg	100,000a	100,000a	< 270	< 260	< 260	< 520	< 260	900	< 5000	< 270	< 260	< 260
Acetophenone	ug/Kg	NA	NA	< 270	< 260	< 260	< 520	< 260	< 270	< 5000	< 270	< 260	< 260
Aniline	ug/Kg	NA	100000	< 1100	< 1100	< 1100	< 2200	< 1100	< 1100	< 21000	< 1100	< 1100	< 1100
Anthracene	ug/Kg	100,000a	100,000a	< 270	< 260	< 260	< 520	1,100	2,300	< 5000	440	< 260	420
Benzo-a-Anthracene	ug/Kg	1,000c	1,000f	< 270	< 260	< 260	600	4,300	12,000	10,000	2,200	870	1,100
Benzidine	ug/Kg	NA	NA	< 460	< 440	< 450	< 890	< 440	< 460	< 8600	< 460	< 440	< 450
Benzo-a-Pyrene	ug/Kg	1,000c	1,000f	< 270	< 260	< 260	620	3,900	11,000	7,300	2,000	840	810
Benzo-b-Fluoranthene	ug/Kg	1,000c	1,000f	< 270	< 260	< 260	910	4,800	15,000	11,000	3,100	1,800	1,200
Benzo-g,h,i-Perylene	ug/Kg	100,000	100,000a	< 270	< 260	< 260	< 520	1,300	4,200	< 5000	590	360	260
Benzo-k-Fluoranthene	ug/Kg	800c	3900	< 270	< 260	< 260	< 520	2,200	5,100	< 5000	1,100	500	430
Benzoic Acid	ug/Kg	NA	NA	< 1100	< 1100	< 1100	< 2200	< 1100	< 1100	< 21000	< 1100	< 1100	< 1100
Butylbenzylphthalate	ug/Kg	NA	NA	< 270	< 260	< 260	< 520	< 260	< 270	< 5000	< 270	< 260	< 260
Bis(2-Chloroethoxy)methane	ug/Kg	NA	NA	< 270	< 260	< 260	< 520	< 260	< 270	< 5000	< 270	< 260	< 260
Bis(2-Chloroethyl)ether	ug/Kg	NA	NA	< 390	< 370	< 370	< 740	< 370	< 390	< 7200	< 390	< 370	< 370
Bis(2-Chloroisopropyl)ether	ug/Kg	NA	NA	< 270	< 260	< 260	< 520	< 260	< 270	< 5000	< 270	< 260	< 260
Bis(2-Ethylhexyl)Phthalate	ug/Kg	NA	NA	< 270	< 260	< 260	< 520	< 260	< 270	< 5000	< 270	< 260	< 260

**Table 2: SVOCs in Surface Soil**  
401 East 120th Street, New York, NY

Parameters	Sample ID	NYCRR 375 Unrestricted Use	NYCRR 375 Restricted- Residential	SB-1	SB-2	SB-3	SB-4	SB-5	SB-6	SB-7	SB-8	SB-9	SB-10	
	Sample Depth			0'-2'	0'-2'	0'-2'	0'-2'	0'-2'	0'-2'	0'-2'	0'-2'	0'-2'	0'-2'	0'-2'
	Sample Date			3/12/2015	3/12/2015	3/12/2015	3/12/2015	3/12/2015	3/12/2015	3/12/2015	4/29/2015	4/29/2015	4/29/2015	4/29/2015
Carbazole	ug/Kg	NA	NA	< 580	< 550	< 560	< 1100	< 550	740	< 11000	< 580	< 550	< 560	
Chrysene	ug/Kg	1,000c	3900	< 270	< 260	< 260	570	4,300	13,000	8,700	2,500	1,100	1,000	
Dibenzo-a,h-Anthracene	ug/Kg	330b	330e	< 270	< 260	< 260	< 520	370	1,200	< 5000	< 270	< 260	< 260	
Dibenzofuran	ug/Kg	7000	59000	< 270	< 260	< 260	< 520	< 260	400	< 5000	< 270	< 260	< 260	
Diethyl Phthalate	ug/Kg	NA	NA	< 270	< 260	< 260	< 520	< 260	< 270	< 5000	< 270	< 260	< 260	
Dimethyl Phthalate	ug/Kg	NA	NA	< 270	< 260	< 260	< 520	< 260	< 270	< 5000	< 270	< 260	< 260	
Di-n-Butyl Phthalate	ug/Kg	NA	NA	< 270	< 260	< 260	< 520	< 260	< 270	< 5000	< 270	< 260	< 260	
Di-n-Octyl Phthalate	ug/Kg	NA	NA	< 270	< 260	< 260	< 520	< 260	< 270	< 5000	< 270	< 260	< 260	
Fluoranthene	ug/Kg	100,000	100,000a	< 270	< 260	< 260	990	5,700	26,000	28,000	3,000	1,200	2,100	
Fluorene	ug/Kg	30000	100,000a	< 270	< 260	< 260	< 520	370	690	< 5000	< 270	< 260	< 260	
Hexachlorobenzene	ug/Kg	330	1200	< 270	< 260	< 260	< 520	< 260	< 270	< 5000	< 270	< 260	< 260	
Hexachlorobutadiene	ug/Kg	NA	NA	< 270	< 260	< 260	< 520	< 260	< 270	< 5000	< 270	< 260	< 260	
Hexachlorocyclopentadiene	ug/Kg	NA	NA	< 270	< 260	< 260	< 520	< 260	< 270	< 5000	< 270	< 260	< 260	
Hexachloroethane	ug/Kg	NA	NA	< 270	< 260	< 260	< 520	< 260	< 270	< 5000	< 270	< 260	< 260	
Indeno(1,2,3-cd)Pyrene	ug/Kg	500c	500f	< 270	< 260	< 260	< 520	1,300	4,100	< 5000	520	310	< 260	
Isophorone	ug/Kg	NA	NA	< 270	< 260	< 260	< 520	< 260	< 270	< 5000	< 270	< 260	< 260	
Naphthalene	ug/Kg	12000	100,000a	< 270	< 260	< 260	< 520	< 260	600	< 5000	< 270	< 260	< 260	
Nitrobenzene	ug/Kg	NA	15000	< 270	< 260	< 260	< 520	< 260	< 270	< 5000	< 270	< 260	< 260	
N-Nitrosodimethylamine	ug/Kg	NA	NA	< 390	< 370	< 370	< 740	< 370	< 390	< 7200	< 390	< 370	< 370	
N-Nitroso-di-n-Propylamine	ug/Kg	NA	NA	< 270	< 260	< 260	< 520	< 260	< 270	< 5000	< 270	< 260	< 260	
N-Nitrosodiphenylamine	ug/Kg	NA	NA	< 390	< 370	< 370	< 740	< 370	< 390	< 7200	< 390	< 370	< 370	
Pentachloronitrobenzene	ug/Kg	NA	NA	< 390	< 370	< 370	< 740	< 370	< 390	< 7200	< 390	< 370	< 370	
Pentachlorophenol	ug/Kg	800b	6700	< 390	< 370	< 370	< 740	< 370	< 390	< 7200	< 390	< 370	< 370	
Phenanthrene	ug/Kg	100,000	100,000a	< 270	< 260	< 260	< 520	5,000	14,000	21,000	2,500	870	2,700	
Phenol	ug/Kg	330b	100,000a	< 270	< 260	< 260	< 520	< 260	< 270	< 5000	< 270	< 260	< 260	
Pyrene	ug/Kg	100,000	100,000a	< 270	< 260	< 260	990	4,600	23,000	23,000	3,100	990	1,600	
Pyridine	ug/Kg	NA	NA	< 390	< 370	< 370	< 740	< 370	< 390	< 7200	< 390	< 370	< 370	

Notes:

ug/Kg: microgram per kilogram (ppb)

mg/Kg: miligram per kilogram (ppm)

Analyte detected

Detected at concentration above 6 NYCRR Part 375 Unrestricted Soil Cleanup Objectives

Detected at concentration above 6 NYCRR Part 375 Restricted Residential Soil Cleanup Objectives

Detected at concentration above Maximum Concentration of Contaminants for Toxicity Characteristics

**Table 3: Pesticides and PCBs in Surface Soils**  
401 East 120th Street, New York, NY

Parameters	Sampe ID	NYCRR 375 Unrestricted Use	NYCRR 375 Restricted- Residential	SB-1	SB-2	SB-3	SB-4	SB-5	SB-6	SB-7	SB-8	SB-9	SB-10	
	Sample Depth			0'-2'	0'-2'	0'-2'	0'-2'	0'-2'	0'-2'	0'-2'	0'-2'	0'-2'	0'-2'	0'-2'
	Sample Date			3/12/2015	3/12/2015	3/12/2015	3/12/2015	3/12/2015	3/12/2015	3/12/2015	4/29/2015	4/29/2015	4/29/2015	4/29/2015
<b>PCBs By SW8082A</b>														
Aroclor 1016	ug/Kg	100	1000	< 380	< 360	< 360	< 370	< 370	< 390	< 370	< 400	< 370	< 370	
Aroclor 1221	ug/Kg			< 380	< 360	< 360	< 370	< 370	< 390	< 370	< 400	< 370	< 370	< 370
Aroclor 1232	ug/Kg			< 380	< 360	< 360	< 370	< 370	< 390	< 370	< 400	< 370	< 370	< 370
Aroclor 1242	ug/Kg			< 380	< 360	< 360	< 370	< 370	< 390	< 370	< 400	< 370	< 370	< 370
Aroclor 1248	ug/Kg			< 380	< 360	< 360	< 370	< 370	< 390	< 370	< 400	< 370	< 370	< 370
Aroclor 1254	ug/Kg			< 380	< 360	< 360	< 370	< 370	< 390	< 370	< 400	< 370	< 370	< 370
Aroclor 1260	ug/Kg			< 380	< 360	< 360	< 370	< 370	< 390	< 370	< 400	< 370	< 370	< 370
PCB-1262	ug/Kg			< 380	< 360	< 360	< 370	< 370	< 390	< 370	< 400	< 370	< 370	< 370
PCB-1268	ug/Kg			< 380	< 360	< 360	< 370	< 370	< 390	< 370	< 400	< 370	< 370	< 370
<b>Pesticides - Soil By SW8081B</b>														
4,4-DDD	ug/Kg	3.3b	13000	< 2.3	< 2.2	< 2.2	< 2.2	< 2.2	< 2.3	< 2.2	130	< 2.2	< 2.2	
4,4-DDE	ug/Kg	3.3b	8900	< 2.3	< 2.2	< 2.2	9.8	< 15	< 25	< 5.0	< 12	< 2.2	< 2.2	
4,4-DDT	ug/Kg	3.3b	7900	< 2.3	< 2.2	< 2.2	13	< 10	< 15	< 2.2	< 12	< 2.2	< 2.2	
alpha-BHC	ug/Kg	20	480	< 7.5	< 7.3	< 7.3	< 7.4	< 7.4	< 7.7	< 7.3	< 40	< 7.4	< 7.5	
a-Chlordane	ug/Kg	NA	NA	<3.8	<3.6	<3.6	<3.7	<3.7	<3.9	< 3.7	< 20	< 3.7	< 3.7	
Aldrin	ug/Kg	5c	97	< 3.8	< 3.6	< 3.6	< 3.7	< 3.7	< 3.9	< 3.7	< 20	< 3.7	< 3.7	
beta-BHC	ug/Kg	36	360	< 7.5	< 7.3	< 7.3	< 7.4	< 7.4	< 7.7	< 7.3	< 40	< 7.4	< 7.5	
Chlordane	ug/Kg	94	4200	< 38	< 36	< 36	< 37	< 37	< 39	< 37	< 200	< 37	< 37	
delta-BHC	ug/Kg	40	100,000a	< 7.5	< 7.3	< 7.3	< 7.4	< 7.4	< 7.7	< 7.3	< 40	< 7.4	< 7.5	
Dieldrin	ug/Kg	5	200	< 3.8	< 3.6	< 3.6	< 3.7	< 3.7	< 3.9	< 3.7	< 20	< 3.7	< 3.7	
Endosulfan I	ug/Kg	2400	24,000i	< 7.5	< 7.3	< 7.3	< 7.4	< 7.4	< 7.7	< 7.3	< 40	< 7.4	< 7.5	
Endosulfan II	ug/Kg	2400	24,000i	< 7.5	< 7.3	< 7.3	< 7.4	< 7.4	< 7.7	< 7.3	< 40	< 7.4	< 7.5	
Endosulfan Sulfate	ug/Kg	2400	24,000i	< 7.5	< 7.3	< 7.3	< 7.4	< 7.4	< 7.7	< 7.3	< 40	< 7.4	< 7.5	
Endrin	ug/Kg	14	11000	< 7.5	< 7.3	< 7.3	< 7.4	< 7.4	< 7.7	< 7.3	< 40	< 7.4	< 7.5	
Endrin Aldehyde	ug/Kg	NA	NA	< 7.5	< 7.3	< 7.3	< 7.4	< 7.4	< 7.7	< 7.3	< 40	< 7.4	< 7.5	
Endrin Ketone	ug/Kg	NA	NA	< 7.5	< 7.3	< 7.3	< 7.4	< 7.4	< 7.7	< 7.3	< 40	< 7.4	< 7.5	
gamma-BHC	ug/Kg	100	1300	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 7.9	< 1.5	< 1.5	
g-Chlordane	ug/Kg	NA	NA	<3.8	<3.6	<3.6	<3.7	<3.7	<3.9	< 3.7	< 20	< 3.7	< 3.7	
Heptachlor	ug/Kg	42	2100	< 7.5	< 7.3	< 7.3	< 7.4	< 7.4	< 7.7	< 7.3	< 40	< 7.4	< 7.5	
Heptachlor Epoxide	ug/Kg	NA	NA	< 7.5	< 7.3	< 7.3	< 7.4	< 7.4	< 7.7	< 7.3	< 40	< 7.4	< 7.5	
Methoxychlor	ug/Kg	NA	NA	< 38	< 36	< 36	< 37	< 37	< 39	< 37	< 200	< 37	< 37	
Toxaphene	ug/Kg	NA	NA	< 150	< 150	< 150	< 150	< 150	< 150	< 150	< 790	< 150	< 150	

Notes:  
ug/Kg: microgram per kilogram (ppb)  
mg/Kg: miligram per kilogram (ppm)

- Analyte detected
- Detected at concentration above 6 NYCRR Part 375 Unrestricted Soil Cleanup Objectives
- Detected at concentration above 6 NYCRR Part 375 Restricted Residential Soil Cleanup Objectives
- Detected at concentration above Maximum Concentration of Contaminants for Toxicity Characteristics

**Table 4: TAL Metals in Surface Soils**  
401 East 120th Street, New York, NY

Parameters	Sampl ID	NYCRR 375 Unrestricted Use	NYCRR 375 Restricted- Residential	SB-1	SB-2	SB-3	SB-4	SB-5	SB-6	SB-7	SB-8	SB-9	SB-10	
	Sample Depth			0'-2'	0'-2'	0'-2'	0'-2'	0'-2'	0'-2'	0'-2'	0'-2'	0'-2'	0'-2'	0'-2'
	Sample Date			3/12/2015	3/12/2015	3/12/2015	3/12/2015	3/12/2015	3/12/2015	3/12/2015	4/29/2015	4/29/2015	4/29/2015	4/29/2015
<b>Metals, Total</b>														
Aluminum, Al	mg/Kg	NA	NA	7,610	6,650	4,310	8,370	8,130	6,390	6,070	7,270	5,630	14,700	
Antimony, Sb	mg/Kg	NA	NA	< 3.6	< 3.4	< 3.6	< 3.7	3.5	< 4.1	< 3.7	< 4.0	< 3.6	< 3.5	
Arsenic, As	mg/Kg	13c	16f	3.5	3.7	4.6	8.4	10.1	13.1	4.9	2.1	5.8	5.6	
Barium, Ba	mg/Kg	350c	400	151	344	314	417	346	542	628	150	677	160	
Beryllium, Be	mg/Kg	7.2	72	0.34	0.39	< 0.29	0.5	0.43	0.37	0.41	0.37	0.3	0.65	
Cadmium, Cd	mg/Kg	2.5c	4.3	< 0.36	< 0.34	< 0.36	0.71	0.77	1.02	0.59	< 0.40	0.44	< 0.35	
Calcium, Ca	mg/Kg	NA	NA	23,800	34,500	83,400	55,900	46,500	45,100	59,400	8,380	65,000	6,830	
Chromium, Cr	mg/Kg	NA	110	13.6	14.4	10.1	18	16.6	17.3	13.3	18.4	22.8	21.9	
Cobalt, Co	mg/Kg	NA	NA	5.76	6.73	4.83	11.4	6.33	6.53	5.6	9.07	5.04	8.67	
Copper, Cu	mg/kg	50	270	24.8	22.1	50.7	57.8	44	93.5	23.7	33.4	19.6	28.6	
Iron, Fe	mg/Kg	NA	NA	12,000	11,900	11,700	28,600	14,100	19,900	13,300	15,600	15,300	20,600	
Lead, Pb	mg/Kg	63c	400	325	458	542	388	330	849	466	60.1	446	341	
Magnesium, Mg	mg/Kg	NA	NA	6,980	16,100	46,500	20,800	3,810	3,900	13,100	5,560	10,500	4,850	
Manganese, Mn	mg/Kg	1,600c	2,000f	228	223	206	352	241	381	444	307	249	402	
Mercury, Hg	mg/Kg	.18c	.81j	0.78	1.45	0.35	0.23	0.19	5.87	0.06	0.55	0.16	0.48	
Nickel, Ni	mg/Kg	30	310	13	14.9	19.1	18	14.9	14.8	12.4	17.2	9.29	18.5	
Potassium, K	mg/Kg	NA	NA	1,510	1,720	1,400	3,600	1,600	1,160	1,870	3,740	1,170	1,630	
Selenium, Se	mg/Kg	3.9c	180	< 1.4	< 1.4	< 1.4	< 1.5	< 1.4	< 1.7	< 1.5	< 1.6	< 1.4	< 1.4	
Silver, Ag	mg/Kg	2	180	< 0.36	< 0.34	< 0.36	< 0.37	< 0.35	< 0.41	< 0.37	< 0.40	< 0.36	< 0.35	
Sodium, Na	mg/Kg	NA	NA	206	226	148	726	356	375	420	232	631	177	
Thallium, Tl	mg/Kg	NA	NA	< 3.2	< 3.0	< 3.2	< 3.3	< 3.2	< 3.7	< 3.3	< 3.6	< 3.2	< 3.2	
Vanadium, V	mg/Kg	NA	NA	18.7	23.7	13.6	31.7	21.1	20.5	20.1	28.6	24.4	28.5	
Zinc, Zn	mg/Kg	109c	10,000d	205	163	171	347	353	664	382	79.7	330	135	
<b>Metals, TCLP</b>		40 CFR 261.24												
TCLP Barium	mg/L		100				0.72		0.48					
TCLP Lead	mg/L		5		5.93	1.61			2.38	1.68	0.23	3.27	1.54	
TCLP Mercury	mg/L		0.2		<0.0002				<0.0002					

Notes:

ug/Kg: microgram per kilogram (ppb)

mg/Kg: miligram per kilogram (ppm)

Analyte detected

Detected at concentration above 6 NYCRR Part 375 Unrestricted Soil Cleanup Objectives

Detected at concentration above 6 NYCRR Part 375 Restricted Residential Soil Cleanup Objectives

Detected at concentration above Maximum Concentration of Contaminants for Toxicity Characteristics

**Table 5: VOCsin Subsurface Soils**  
401 East 120th Street, New York, NY

Parameters	SampeI ID	NYCRR 375 Unrestricted Use	NYCRR 375 Restricted- Residential	SB-1	SB-2	SB-3	SB-4	SB-5	SB-6	SB-7	SB-8	SB-9	SB-10
	Sample Depth			6'-8'	6'-8'	10'-12'	6'-8'	13'-15'	6'-8'	6'-8'	6'-8'	6'-8'	6'-8'
	Sample Date			3/12/2015	3/12/2015	3/12/2015	3/12/2015	3/12/2015	3/12/2015	4/29/2015	4/29/2015	4/29/2015	4/29/2015
<b>Volatiles By SW8260C</b>													
1,1,1,2-Tetrachloroethane	ug/Kg	NA	NA	< 7.7	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
1,1,1-Trichloroethane	ug/Kg	680	100,000a	< 7.7	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
1,1,2,2-Tetrachloroethane	ug/Kg	NA	NA	< 4.6	< 1800	< 1800	< 2.9	< 3.2	< 3.3	< 3.0	< 4.0	< 2.9	< 2.7
1,1,2-Trichloroethane	ug/Kg	NA	NA	< 7.7	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
1,1-Dichloroethane	ug/Kg	270	26000	< 7.7	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
1,1-Dichloroethene	ug/Kg	330	100,000a	< 7.7	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
1,1-Dichloropropene	ug/Kg	NA	NA	< 7.7	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
1,2,3-Trichlorobenzene	ug/Kg	NA	NA	< 7.7	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
1,2,3-Trichloropropane	ug/Kg	NA	NA	< 7.7	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
1,2,4-Trichlorobenzene	ug/Kg	NA	NA	< 7.7	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
1,2,4-Trimethylbenzene	ug/Kg	3,600	52000	430	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
1,2-Dibromo-3-Chloropropane	ug/Kg	NA	NA	< 7.7	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
1,2-Dibromoethane	ug/Kg	NA	NA	< 7.7	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
1,2-Dichlorobenzene	ug/Kg	1,100	100,000a	< 7.7	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
1,2-Dichloroethane	ug/Kg	20c	3100	< 7.7	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
1,2-Dichloropropane	ug/Kg	NA	NA	< 7.7	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
1,3,5-Trimethylbenzene	ug/Kg	8,400	52000	180	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
1,3-Dichlorobenzene	ug/Kg	2,400	49000	< 7.7	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
1,3-Dichloropropane	ug/Kg	NA	NA	< 7.7	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
1,4-Dichlorobenzene	ug/Kg	1,800	13000	< 7.7	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
2,2-Dichloropropane	ug/Kg	NA	NA	< 7.7	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
2-Chlorotoluene	ug/Kg	NA	NA	< 7.7	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
2-Hexanone	ug/Kg	NA	NA	< 39	< 15000	< 15000	< 24	< 27	< 27	< 25	< 34	< 24	< 22
2-Isopropyltoluene	ug/Kg	NA	NA	17	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
4-Chlorotoluene	ug/Kg	NA	NA	< 7.7	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
Methyl Isobutyl Ketone	ug/Kg	NA	NA	< 39	< 15000	< 15000	< 24	< 27	< 27	< 25	< 34	< 24	< 22
Acetone	ug/Kg	50	100,000b	130	< 18000	< 18000	< 29	< 32	< 33	< 30	< 40	< 29	< 27
Acrylonitrile	ug/Kg	NA	NA	< 7.7	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
Benzene	ug/Kg	60	4800	17	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
Bromobenzene	ug/Kg	NA	NA	< 7.7	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
Bromochloromethane	ug/Kg	NA	NA	< 7.7	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
Bromodichloromethane	ug/Kg	NA	NA	< 7.7	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
Bromoform	ug/Kg	NA	NA	< 7.7	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
Bromomethane	ug/Kg	NA	NA	< 7.7	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
Carbon Disulfide	ug/Kg	NA	NA	< 7.7	< 3000	< 3100	< 4.8	6.3	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
Carbon Tetrachloride	ug/Kg	760	2400	< 7.7	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
Chlorobenzene	ug/Kg	1,100	100,000a	< 7.7	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 280	< 280
Chloroethane	ug/Kg	NA	NA	< 7.7	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
Chloroform	ug/Kg	370	49000	< 7.7	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
Chloromethane	ug/Kg	NA	NA	< 7.7	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
cis-1,2-Dichloroethene	ug/Kg	250	100,000a	< 7.7	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
cis-1,3-Dichloropropene	ug/Kg	NA	NA	< 7.7	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
Dibromochloromethane	ug/Kg	NA	NA	< 4.6	< 1800	< 1800	< 2.9	< 3.2	< 3.3	< 3.0	< 4.0	< 2.9	< 2.7

**Table 5: VOCsin Subsurface Soils**  
401 East 120th Street, New York, NY

Parameters	SampeI ID	NYCRR 375 Unrestricted Use	NYCRR 375 Restricted- Residential	SB-1	SB-2	SB-3	SB-4	SB-5	SB-6	SB-7	SB-8	SB-9	SB-10
	Sample Depth			6'-8'	6'-8'	10'-12'	6'-8'	13'-15'	6'-8'	6'-8'	6'-8'	6'-8'	6'-8'
	Sample Date			3/12/2015	3/12/2015	3/12/2015	3/12/2015	3/12/2015	3/12/2015	4/29/2015	4/29/2015	4/29/2015	4/29/2015
Dibromomethane	ug/Kg	NA	NA	< 7.7	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
Dichlorodifluoromethane	ug/Kg	NA	NA	< 7.7	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
Ethylbenzene	ug/Kg	1,000	41000	78	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
Hexachlorobutadiene	ug/Kg	NA	NA	< 7.7	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
Isopropylbenzene	ug/Kg	NA	NA	47	3,100	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
2-Butanone	ug/Kg	NA	100,000a	< 46	< 18000	< 18000	< 29	< 32	< 33	< 30	< 40	< 29	< 27
Methyl Tert-Butyl Ether	ug/Kg	930	100,000a	< 15	< 6000	< 6200	< 9.7	< 11	< 11	< 10	< 13	< 9.7	< 8.9
Methylene Chloride	ug/Kg	50	100,000a	< 7.7	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
Naphthalene	ug/Kg	12000	100,000a	90	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
n-Butylbenzene	ug/Kg	12,000	100,000a	38	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
n-Propylbenzene	ug/Kg	3,900	100,000a	66	5,600	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
p-Isopropyltoluene	ug/Kg	NA	NA	54	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
sec-Butylbenzene	ug/Kg	11,000	100,000a	39	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
Styrene	ug/Kg	NA	NA	< 7.7	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
tert-Butylbenzene	ug/Kg	5900	100,000a	< 7.7	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
Tetrachloroethene	ug/Kg	1300	19000	< 7.7	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
Tetrahydrofuran (THF)	ug/Kg	NA	NA	< 15	< 6000	< 6200	< 9.7	< 11	< 11	< 10	< 13	< 9.7	< 8.9
Toluene	ug/Kg	700	100,000a	46	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
Total Xylenes	ug/Kg	260	100,000a	390	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
trans-1,2-Dichloroethene	ug/Kg	190	100,000a	< 7.7	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
trans-1,3-Dichloropropene	ug/Kg	NA	NA	< 7.7	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
trans-1,4-dichloro-2-butene	ug/Kg	NA	NA	< 15	< 6000	< 6200	< 9.7	< 11	< 11	< 10	< 13	< 9.7	< 8.9
Trichloroethene	ug/Kg	470	21000	< 7.7	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
Trichlorofluoromethane	ug/Kg	NA	NA	< 7.7	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
Trichlorotrifluoroethane	ug/Kg	NA	NA	< 7.7	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4
Vinyl Chloride	ug/Kg	20	900	< 7.7	< 3000	< 3100	< 4.8	< 5.4	< 5.5	< 5.1	< 6.7	< 4.8	< 4.4

Notes:

ug/Kg: microgram per kilogram (ppb)

mg/Kg: miligram per kilogram (ppm)

Analyte detected

Detected at concentration above 6 NYCRR Part 375 Unrestricted Soil Cleanup Objectives

Detected at concentration above 6 NYCRR Part 375 Restricted Residential Soil Cleanup Objectives

Detected at concentration above Maximum Concentration of Contaminants for Toxicity Characteristics

**Table 6: SVOCs in Subsurface Soils**  
401 East 120th Street, New York, NY

Parameters	SampeI ID	NYCRR 375 Unrestricted Use	NYCRR 375 Restricted- Residential	SB-1	SB-2	SB-3	SB-4	SB-5	SB-6	SB-7	SB-8	SB-9	SB-10
	Sample Depth			6'-8'	6'-8'	10'-12'	6'-8'	13'-15'	6'-8'	6'-8'	6'-8'	6'-8'	6'-8'
	Sample Date			3/12/2015	3/12/2015	3/12/2015	3/12/2015	3/12/2015	3/12/2015	4/29/2015	4/29/2015	4/29/2015	4/29/2015
<b>Semivolatiles By SW8270D</b>													
1,2,4,5-Tetrachlorobenzene	ug/Kg	NA	NA	< 280	< 270	< 280	< 250	< 290	< 280	< 250	< 280	< 250	< 260
1,2,4-Trichlorobenzene	ug/Kg	NA	NA	< 280	< 270	< 280	< 250	< 290	< 280	< 250	< 280	< 250	< 260
1,2-Dichlorobenzene	ug/Kg	1,100	100,000a	< 280	< 270	< 280	< 250	< 290	< 280	< 250	< 280	< 250	< 260
1,2-Diphenylhydrazine	ug/Kg	NA	NA	< 400	< 380	< 400	< 360	< 410	< 400	< 360	< 400	< 360	< 370
1,3-Dichlorobenzene	ug/Kg	2,400	49000	< 280	< 270	< 280	< 250	< 290	< 280	< 250	< 280	< 250	< 260
1,4-Dichlorobenzene	ug/Kg	1,800	13000	< 280	< 270	< 280	< 250	< 290	< 280	< 250	< 280	< 250	< 260
2,4,5-Trichlorophenol	ug/Kg	NA	NA	< 280	< 270	< 280	< 250	< 290	< 280	< 250	< 280	< 250	< 260
2,4,6-Trichlorophenol	ug/Kg	NA	NA	< 280	< 270	< 280	< 250	< 290	< 280	< 250	< 280	< 250	< 260
2,4-Dichlorophenol	ug/Kg	NA	NA	< 280	< 270	< 280	< 250	< 290	< 280	< 250	< 280	< 250	< 260
2,4-Dimethylphenol	ug/Kg	NA	NA	< 280	< 270	< 280	< 250	< 290	< 280	< 250	< 280	< 250	< 260
2,4-Dinitrophenol	ug/Kg	NA	NA	< 650	< 610	< 640	< 580	< 660	< 630	< 570	< 640	< 580	< 600
2,4-Dinitrotoluene	ug/Kg	NA	NA	< 280	< 270	< 280	< 250	< 290	< 280	< 250	< 280	< 250	< 260
2,6-Dinitrotoluene	ug/Kg	NA	NA	< 280	< 270	< 280	< 250	< 290	< 280	< 250	< 280	< 250	< 260
2-Chloronaphthalene	ug/Kg	NA	NA	< 280	< 270	< 280	< 250	< 290	< 280	< 250	< 280	< 250	< 260
2-Chlorophenol	ug/Kg	NA	NA	< 280	< 270	< 280	< 250	< 290	< 280	< 250	< 280	< 250	< 260
2-Methylnaphthalene	ug/Kg	NA	NA	< 280	< 270	< 280	< 250	< 290	< 280	< 250	< 280	< 250	< 260
2-Methylphenol	ug/Kg	330b	100,000a	< 280	< 270	< 280	< 250	< 290	< 280	< 250	< 280	< 250	< 260
2-Nitroaniline	ug/Kg	NA	NA	< 650	< 610	< 640	< 580	< 660	< 630	< 570	< 640	< 580	< 600
2-Nitrophenol	ug/Kg	NA	NA	< 280	< 270	< 280	< 250	< 290	< 280	< 250	< 280	< 250	< 260
3&4-Methylphenol (m&p-cresol)	ug/Kg	NA	NA	< 400	< 380	< 400	< 360	< 410	< 400	< 360	< 400	< 360	< 370
3,3-Dichlorobenzidine	ug/Kg	NA	NA	< 280	< 270	< 280	< 250	< 290	< 280	< 250	< 280	< 250	< 260
3-Nitroaniline	ug/Kg	NA	NA	< 650	< 610	< 640	< 580	< 660	< 630	< 570	< 640	< 580	< 600
4,6-Dinitro-2-methylphenol	ug/Kg	NA	NA	< 1200	< 1100	< 1200	< 1100	< 1200	< 1100	< 1000	< 1200	< 1100	< 1100
4-Bromophenyl-phenyl ether	ug/Kg	NA	NA	< 400	< 380	< 400	< 360	< 410	< 400	< 360	< 400	< 360	< 370
4-Chloro-3-methylphenol	ug/Kg	NA	NA	< 280	< 270	< 280	< 250	< 290	< 280	< 250	< 280	< 250	< 260
4-Chloroaniline	ug/Kg	NA	NA	< 280	< 270	< 280	< 250	< 290	< 280	< 250	< 280	< 250	< 260
4-Chlorophenyl phenyl ether	ug/Kg	NA	NA	< 280	< 270	< 280	< 250	< 290	< 280	< 250	< 280	< 250	< 260
4-Nitroaniline	ug/Kg	NA	NA	< 650	< 610	< 640	< 580	< 660	< 630	< 570	< 640	< 580	< 600
4-Nitrophenol	ug/Kg	NA	NA	< 1200	< 1100	< 1200	< 1100	< 1200	< 1100	< 1000	< 1200	< 1100	< 1100
Acenaphthene	ug/Kg	20000	100,000a	< 280	< 270	< 280	< 250	< 290	< 280	< 250	< 280	< 250	< 260
Acenaphthylene	ug/Kg	100,000a	100,000a	< 280	< 270	< 280	< 250	< 290	< 280	< 250	< 280	< 250	< 260
Acetophenone	ug/Kg	NA	NA	< 280	< 270	< 280	< 250	< 290	< 280	< 250	< 280	< 250	< 260
Aniline	ug/Kg	NA	100000	< 1200	< 1100	< 1200	< 1100	< 1200	< 1100	< 1000	< 1200	< 1100	< 1100
Anthracene	ug/Kg	100,000a	100,000a	< 280	< 270	< 280	< 250	< 290	< 280	< 250	< 280	< 250	< 260
Benzo-a-Anthracene	ug/Kg	1,000c	1,000f	< 280	< 270	< 280	270	< 290	< 280	< 250	< 280	< 250	< 260
Benzbidine	ug/Kg	NA	NA	< 490	< 460	< 480	< 430	< 490	< 470	< 430	< 480	< 440	< 450
Benzo-a-Pyrene	ug/Kg	1,000c	1,000f	< 280	< 270	< 280	310	< 290	< 280	< 250	< 280	< 250	< 260
Benzo-b-Fluoranthene	ug/Kg	1,000c	1,000f	< 280	< 270	< 280	440	< 290	< 280	< 250	< 280	< 250	< 260
Benzo-g,h,i-Perylene	ug/Kg	100,000	100,000a	< 280	< 270	< 280	< 250	< 290	< 280	< 250	< 280	< 250	< 260
Benzo-k-Fluoranthene	ug/Kg	800c	3900	< 280	< 270	< 280	< 250	< 290	< 280	< 250	< 280	< 250	< 260
Benzoic Acid	ug/Kg	NA	NA	< 1200	< 1100	< 1200	< 1100	< 1200	< 1100	< 1000	< 1200	< 1100	< 1100
Butylbenzylphthalate	ug/Kg	NA	NA	< 280	< 270	< 280	< 250	< 290	< 280	< 250	< 280	< 250	< 260
Bis(2-Chloroethoxy)methane	ug/Kg	NA	NA	< 280	< 270	< 280	< 250	< 290	< 280	< 250	< 280	< 250	< 260
Bis(2-Chloroethyl)ether	ug/Kg	NA	NA	< 400	< 380	< 400	< 360	< 410	< 400	< 360	< 400	< 360	< 370
Bis(2-Chloroisopropyl)ether	ug/Kg	NA	NA	< 280	< 270	< 280	< 250	< 290	< 280	< 250	< 280	< 250	< 260
Bis(2-Ethylhexyl)Phthalate	ug/Kg	NA	NA	< 280	< 270	< 280	< 250	< 290	< 280	< 250	< 280	< 250	< 260

**Table 6: SVOCs in Subsurface Soils**  
401 East 120th Street, New York, NY

Parameters	Sample ID	NYCRR 375 Unrestricted Use	NYCRR 375 Restricted- Residential	SB-1	SB-2	SB-3	SB-4	SB-5	SB-6	SB-7	SB-8	SB-9	SB-10
	Sample Depth			6'-8'	6'-8'	10'-12'	6'-8'	13'-15'	6'-8'	6'-8'	6'-8'	6'-8'	6'-8'
	Sample Date			3/12/2015	3/12/2015	3/12/2015	3/12/2015	3/12/2015	3/12/2015	4/29/2015	4/29/2015	4/29/2015	4/29/2015
Carbazole	ug/Kg	NA	NA	< 610	< 570	< 600	< 540	< 610	< 590	< 530	< 600	< 540	< 560
Chrysene	ug/Kg	1,000c	3900	< 280	< 270	< 280	310	< 290	< 280	< 250	< 280	< 250	< 260
Dibenzo-a,h-Anthracene	ug/Kg	330b	330e	< 280	< 270	< 280	< 250	< 290	< 280	< 250	< 280	< 250	< 260
Dibenzofuran	ug/Kg	7000	59000	< 280	< 270	< 280	< 250	< 290	< 280	< 250	< 280	< 250	< 260
Diethyl Phthalate	ug/Kg	NA	NA	< 280	< 270	< 280	< 250	< 290	< 280	< 250	< 280	< 250	< 260
Dimethyl Phthalate	ug/Kg	NA	NA	< 280	< 270	< 280	< 250	< 290	< 280	< 250	< 280	< 250	< 260
Di-n-Butyl Phthalate	ug/Kg	NA	NA	< 280	< 270	< 280	< 250	< 290	< 280	< 250	< 280	< 250	< 260
Di-n-Octyl Phthalate	ug/Kg	NA	NA	< 280	< 270	< 280	< 250	< 290	< 280	< 250	< 280	< 250	< 260
Fluoranthene	ug/Kg	100,000	100,000a	< 280	< 270	< 280	410	< 290	< 280	< 250	< 280	< 250	< 260
Fluorene	ug/Kg	30000	100,000a	< 280	< 270	< 280	< 250	< 290	< 280	< 250	< 280	< 250	< 260
Hexachlorobenzene	ug/Kg	330	1200	< 280	< 270	< 280	< 250	< 290	< 280	< 250	< 280	< 250	< 260
Hexachlorobutadiene	ug/Kg	NA	NA	< 280	< 270	< 280	< 250	< 290	< 280	< 250	< 280	< 250	< 260
Hexachlorocyclopentadiene	ug/Kg	NA	NA	< 280	< 270	< 280	< 250	< 290	< 280	< 250	< 280	< 250	< 260
Hexachloroethane	ug/Kg	NA	NA	< 280	< 270	< 280	< 250	< 290	< 280	< 250	< 280	< 250	< 260
Indeno(1,2,3-cd)Pyrene	ug/Kg	500c	500f	< 280	< 270	< 280	< 250	< 290	< 280	< 250	< 280	< 250	< 260
Isophorone	ug/Kg	NA	NA	< 280	< 270	< 280	< 250	< 290	< 280	< 250	< 280	< 250	< 260
Naphthalene	ug/Kg	12000	100,000a	< 280	< 270	< 280	< 250	< 290	< 280	< 250	< 280	< 250	< 260
Nitrobenzene	ug/Kg	NA	15000	< 280	< 270	< 280	< 250	< 290	< 280	< 250	< 280	< 250	< 260
N-Nitrosodimethylamine	ug/Kg	NA	NA	< 400	< 380	< 400	< 360	< 410	< 400	< 360	< 400	< 360	< 370
N-Nitroso-di-n-Propylamine	ug/Kg	NA	NA	< 280	< 270	< 280	< 250	< 290	< 280	< 250	< 280	< 250	< 260
N-Nitrosodiphenylamine	ug/Kg	NA	NA	< 400	< 380	< 400	< 360	< 410	< 400	< 360	< 400	< 360	< 370
Pentachloronitrobenzene	ug/Kg	NA	NA	< 400	< 380	< 400	< 360	< 410	< 400	< 360	< 400	< 360	< 370
Pentachlorophenol	ug/Kg	800b	6700	< 400	< 380	< 400	< 360	< 410	< 400	< 360	< 400	< 360	< 370
Phenanthrene	ug/Kg	100,000	100,000a	< 280	< 270	< 280	260	< 290	< 280	< 250	< 280	< 250	< 260
Phenol	ug/Kg	330b	100,000a	< 280	< 270	< 280	< 250	< 290	< 280	< 250	< 280	< 250	< 260
Pyrene	ug/Kg	100,000	100,000a	< 280	< 270	< 280	390	< 290	< 280	< 250	< 280	< 250	< 260
Pyridine	ug/Kg	NA	NA	< 400	< 380	< 400	< 360	< 410	< 400	< 360	< 400	< 360	< 370

Notes:

ug/Kg: microgram per kilogram (ppb)

mg/Kg: miligram per kilogram (ppm)

Analyte detected

Detected at concentration above 6 NYCRR Part 375 Unrestricted Soil Cleanup Objectives

Detected at concentration above 6 NYCRR Part 375 Restricted Residential Soil Cleanup Objectives

Detected at concentration above Maximum Concentration of Contaminants for Toxicity Characteristics

**Table 7: Pesticides and PCBs in Subsurface Soils**  
401 East 120th Street, New York, NY

Parameters	Sample ID	NYCRR 375 Unrestricted Use	NYCRR 375 Restricted- Residential	SB-1	SB-2	SB-3	SB-4	SB-5	SB-6	SB-7	SB-8	SB-9	SB-10
	Sample Depth			6'-8'	6'-8'	10'-12'	6'-8'	13'-15'	6'-8'	6'-8'	6'-8'	6'-8'	6'-8'
	Sample Date			3/12/2015	3/12/2015	3/12/2015	3/12/2015	3/12/2015	3/12/2015	4/29/2015	4/29/2015	4/29/2015	4/29/2015
<b>PCBs By SW8082A</b>													
Aroclor 1016	ug/Kg	100	1000	< 410	< 380	< 400	< 370	< 410	< 400	< 350	< 390	< 360	< 380
Aroclor 1221	ug/Kg			< 410	< 380	< 400	< 370	< 410	< 400	< 350	< 390	< 360	< 380
Aroclor 1232	ug/Kg			< 410	< 380	< 400	< 370	< 410	< 400	< 350	< 390	< 360	< 380
Aroclor 1242	ug/Kg			< 410	< 380	< 400	< 370	< 410	< 400	< 350	< 390	< 360	< 380
Aroclor 1248	ug/Kg			< 410	< 380	< 400	< 370	< 410	< 400	< 350	< 390	< 360	< 380
Aroclor 1254	ug/Kg			< 410	< 380	< 400	< 370	< 410	< 400	< 350	< 390	< 360	< 380
Aroclor 1260	ug/Kg			< 410	< 380	< 400	< 370	< 410	< 400	< 350	< 390	< 360	< 380
PCB-1262	ug/Kg			< 410	< 380	< 400	< 370	< 410	< 400	< 350	< 390	< 360	< 380
PCB-1268	ug/Kg			< 410	< 380	< 400	< 370	< 410	< 400	< 350	< 390	< 360	< 380
<b>Pesticides - Soil By SW8081B</b>													
4,4-DDD	ug/Kg	3.3b	13000	< 2.4	< 2.3	< 2.4	< 2.2	< 2.4	< 2.4	< 2.1	< 2.4	< 5.0	< 2.3
4,4-DDE	ug/Kg	3.3b	8900	< 2.4	< 2.3	< 2.4	< 2.2	< 2.4	< 2.4	< 2.1	< 2.4	< 2.2	< 2.3
4,4-DDT	ug/Kg	3.3b	7900	< 2.4	< 2.3	< 2.4	3.8	< 2.4	< 2.4	< 2.1	< 2.4	< 2.2	< 2.3
alpha-BHC	ug/Kg	20	480	< 8.1	< 26	< 7.9	< 7.4	< 8.1	< 7.9	< 7.0	< 7.9	< 7.3	< 7.5
a-Chlordane	ug/Kg	NA	NA	<4.1	<3.8	<4.0	<3.7	<4.1	<4.0	< 3.5	< 3.9	< 3.6	< 3.8
Aldrin	ug/Kg	5c	97	< 4.1	< 3.8	< 4.0	< 3.7	< 4.1	< 4.0	< 3.5	< 3.9	< 3.6	< 3.8
beta-BHC	ug/Kg	36	360	< 8.1	< 7.7	< 7.9	< 7.4	< 8.1	< 7.9	< 7.0	< 7.9	< 7.3	< 7.5
Chlordane	ug/Kg	94	4200	< 41	< 38	< 40	< 37	< 41	< 40	< 35	< 39	< 36	< 38
delta-BHC	ug/Kg	40	100,000a	< 8.1	< 7.7	< 7.9	< 7.4	< 8.1	< 7.9	< 7.0	< 7.9	< 7.3	< 7.5
Dieldrin	ug/Kg	5	200	< 4.1	< 3.8	< 4.0	< 3.7	< 4.1	< 4.0	< 3.5	< 3.9	< 3.6	< 3.8
Endosulfan I	ug/Kg	2400	24,000i	< 8.1	< 7.7	< 7.9	< 7.4	< 8.1	< 7.9	< 7.0	< 7.9	< 7.3	< 7.5
Endosulfan II	ug/Kg	2400	24,000i	< 8.1	< 7.7	< 7.9	< 7.4	< 8.1	< 7.9	< 7.0	< 7.9	< 7.3	< 7.5
Endosulfan Sulfate	ug/Kg	2400	24,000i	< 8.1	< 7.7	< 7.9	< 7.4	< 8.1	< 7.9	< 7.0	< 7.9	< 7.3	< 7.5
Endrin	ug/Kg	14	11000	< 8.1	< 7.7	< 7.9	< 7.4	< 8.1	< 7.9	< 7.0	< 7.9	< 7.3	< 7.5
Endrin Aldehyde	ug/Kg	NA	NA	< 8.1	< 7.7	< 7.9	< 7.4	< 8.1	< 7.9	< 7.0	< 7.9	< 7.3	< 7.5
Endrin Ketone	ug/Kg	NA	NA	< 8.1	< 7.7	< 7.9	< 7.4	< 8.1	< 7.9	< 7.0	< 7.9	< 7.3	< 7.5
gamma-BHC	ug/Kg	100	1300	< 1.6	< 5.0	< 10	< 1.5	< 1.6	< 1.6	< 1.4	< 1.6	< 1.5	< 1.5
g-Chlordane	ug/Kg	NA	NA	<4.1	<3.8	<4.0	<3.7	<4.1	<4.0	< 3.5	< 3.9	< 3.6	< 3.8
Heptachlor	ug/Kg	42	2100	< 8.1	< 7.7	< 7.9	< 7.4	< 8.1	< 7.9	< 7.0	< 7.9	< 7.3	< 7.5
Heptachlor Epoxide	ug/Kg	NA	NA	< 8.1	< 7.7	< 15	< 7.4	< 8.1	< 7.9	< 7.0	< 7.9	< 7.3	< 7.5
Methoxychlor	ug/Kg	NA	NA	< 41	< 38	< 40	< 37	< 41	< 40	< 35	< 39	< 36	< 38
Toxaphene	ug/Kg	NA	NA	< 160	< 150	< 160	< 150	< 160	< 160	< 140	< 160	< 150	< 150

Notes:  
ug/Kg: microgram per kilogram (ppb)  
mg/Kg: miligram per kilogram (ppm)

Analyte detected  
Detected at concentration above 6 NYCRR Part 375 Unrestricted Soil Cleanup Objectives  
Detected at concentration above 6 NYCRR Part 375 Restricted Residential Soil Cleanup Objectives  
Detected at concentration above Maximum Concentration of Contaminants for Toxicity Characteristics

**Table 8: TAL Metals in Subsurface Soils**  
401 East 120th Street, New York, NY

Parameters	Sample ID	NYCRR 375 Unrestricted Use	NYCRR 375 Restricted- Residential	SB-1	SB-2	SB-3	SB-4	SB-5	SB-6	SB-7	SB-8	SB-9	SB-10
	Sample Depth			6'-8'	6'-8'	10'-12'	6'-8'	13'-15'	6'-8'	6'-8'	6'-8'	6'-8'	6'-8'
	Sample Date			3/12/2015	3/12/2015	3/12/2015	3/12/2015	3/12/2015	3/12/2015	4/29/2015	4/29/2015	4/29/2015	4/29/2015
<b>Metals, Total</b>													
Aluminum, Al	mg/Kg	NA	NA	9,560	7,300	4,930	8,520	12,700	8,930	26,700	12,100	5,730	7,200
Antimony, Sb	mg/Kg	NA	NA	< 4.2	< 3.8	< 3.9	20.9	< 4.0	< 4.1	< 3.4	< 3.9	< 3.7	< 3.9
Arsenic, As	mg/Kg	13c	16f	6	1.4	< 0.8	3.6	2.1	4.1	1.9	2.2	1.4	1.4
Barium, Ba	mg/Kg	350c	400	1,780	26.3	41.5	490	28.7	25.4	283	36.8	57.4	28.4
Beryllium, Be	mg/Kg	7.2	72	0.37	0.35	< 0.31	0.34	0.56	0.4	0.57	0.52	< 0.29	0.34
Cadmium, Cd	mg/Kg	2.5c	4.3	< 0.42	< 0.38	< 0.39	< 0.37	< 0.40	< 0.41	< 0.34	< 0.39	< 0.37	< 0.39
Calcium, Ca	mg/Kg	NA	NA	58,500	1,900	914	11,500	348	1,040	15,900	3,890	7,830	19,100
Chromium, Cr	mg/Kg	NA	110	30.6	10.6	10.3	17.9	18.3	11.3	57.7	17.8	11.3	12.1
Cobalt, Co	mg/Kg	NA	NA	6.09	5.23	3.94	6.91	7.05	7.29	19.7	6.15	3.43	5.86
Copper, Cu	mg/kg	50	270	23.4	15.2	8.87	16	10.7	16.9	35.3	15.9	14.1	12.6
Iron, Fe	mg/Kg	NA	NA	19,500	11,000	8,340	12,100	12,900	16,400	39,000	14,800	9,010	11,600
Lead, Pb	mg/Kg	63c	400	3,900	7.06	4.84	207	6.9	7.28	79.8	19.7	25.3	21
Magnesium, Mg	mg/Kg	NA	NA	11,100	2,390	1,570	2,530	2,850	2,910	16,100	4,240	2,670	8,260
Manganese, Mn	mg/Kg	1,600c	2,000f	512	100	345	289	89.4	413	724	166	93.2	229
Mercury, Hg	mg/Kg	.18c	.81j	0.2	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	0.06	0.1	0.13	< 0.03
Nickel, Ni	mg/Kg	30	310	13	13.1	8.35	13.9	12.4	14	37	18	8.85	11.1
Potassium, K	mg/Kg	NA	NA	1,870	1,090	953	936	1,310	1,010	17,100	1,100	1,020	990
Selenium, Se	mg/Kg	3.9c	180	< 1.7	< 1.5	< 1.5	< 1.5	< 1.6	< 1.7	< 1.4	< 1.6	< 1.5	< 1.6
Silver, Ag	mg/Kg	2	180	< 0.42	< 0.38	< 0.39	< 0.37	< 0.40	< 0.41	< 0.34	< 0.39	< 0.37	< 0.39
Sodium, Na	mg/Kg	NA	NA	515	103	96.8	397	589	67.1	1,750	135	156	143
Thallium, Tl	mg/Kg	NA	NA	< 3.8	< 3.4	< 3.5	< 3.4	< 3.6	< 3.7	< 3.1	< 3.5	< 3.3	< 3.6
Vanadium, V	mg/Kg	NA	NA	21	16.6	13.9	19.2	22.2	17.3	74	20.7	13	22.7
Zinc, Zn	mg/Kg	109c	10,000d	730	17.3	12	127	24.4	32.2	94	41.7	36.1	26.8
<b>Metals, TCLP</b>		40 CFR 261.24											
TCLP Barium	mg/L	100		1.06			0.42						
TCLP Lead	mg/L	5		32.5					1.92	< 0.10	0.35	0.16	
TCLP Mercury	mg/L	0.2											

Notes:

ug/Kg: microgram per kilogram (ppb)

mg/Kg: miligram per kilogram (ppm)

Analyte detected

Detected at concentration above 6 NYCRR Part 375 Unrestricted Soil Cleanup Objectives

Detected at concentration above 6 NYCRR Part 375 Restricted Residential Soil Cleanup Objectives

Detected at concentration above Maximum Concentration of Contaminants for Toxicity Characteristics

**Table 9: VOCs in Groundwater**  
401 East 120th Street, New York, NY

Parameters	Sample ID	NYSDEC TOGS 1.1.1. AWOS	GW-1	GW-2	GW-3	GW-4	GW-5	GW-6
	Sample Date		3/12/2015	3/12/2015	3/12/2015	4/29/2015	4/29/2015	4/29/2015
<b>Volatiles By SW8260C</b>								
1,1,1,2-Tetrachloroethane	ug/L	5	< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	ug/L	5	< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	ug/L	5	< 5.0	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,1,2-Trichloroethane	ug/L	1	< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	ug/L	5	< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	ug/L	5	< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	ug/L	5	< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	ug/L	5	< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichloropropane	ug/L	0.04	< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	ug/L	5	< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	ug/L	5	< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	ug/L	0.04	< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromoethane	ug/L	0.0006	< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	ug/L	3	< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	ug/L	0.6	< 6.0	< 0.60	< 0.60	< 0.60	< 0.60	< 0.60
1,2-Dichloropropane	ug/L	1	< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	ug/L	5	< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	ug/L	3	< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	ug/L	5	< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	ug/L	3	< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,2-Dichloropropane	ug/L	5	< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	ug/L	5	< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Hexanone	ug/L	50	< 50	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
2-Isopropyltoluene	ug/L	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	ug/L	5	< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Methyl-2-pentanone	ug/L	NA	< 50	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Acetone	ug/L	50	< 250	< 25	< 25	< 25	< 25	< 25
Acrylonitrile	ug/L	5	< 50	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Benzene	ug/L	1	< 7.0	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70
Bromobenzene	ug/L	5	< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromochloromethane	ug/L	5	< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane	ug/L	50	< 5.0	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bromoform	ug/L	50	< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	ug/L	5	< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Carbon Disulfide	ug/L	60	< 50	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Carbon tetrachloride	ug/L	5	< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	ug/L	5	< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane	ug/L	5	< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroform	ug/L	7	< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloromethane	ug/L	5	< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis-1,2-Dichloroethene	ug/L	5	< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis-1,3-Dichloropropene	ug/L	0.4	< 4.0	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40
Dibromochloromethane	ug/L	50	< 5.0	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dibromomethane	ug/L	5	< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dichlorodifluoromethane	ug/L	5	< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	ug/L	5	< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	ug/L	0.01	< 4.0	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40

**Table 9: VOCs in Groundwater**  
401 East 120th Street, New York, NY

Parameters	Sample ID	NYSDEC TOGS 1.1.1. AWQS	GW-1	GW-2	GW-3	GW-4	GW-5	GW-6
	Sample Date		3/12/2015	3/12/2015	3/12/2015	4/29/2015	4/29/2015	4/29/2015
Isopropylbenzene	ug/L	5	100	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Methyl ethyl ketone	ug/L	50	< 50	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Methyl t-butyl ether (MTBE)	ug/L	10	< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Methylene chloride	ug/L	5	< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Naphthalene	ug/L	10	< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
n-Butylbenzene	ug/L	5	27	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
n-Propylbenzene	ug/L	5	160	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p-Isopropyltoluene	ug/L	5	< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
sec-Butylbenzene	ug/L	5	52	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	ug/L	5	< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
tert-Butylbenzene	ug/L	NA	14	< 1.0	< 1.0	< 1.0	1.8	< 1.0
Tetrachloroethene	ug/L	5	< 10	< 1.0	< 1.0	< 1.0	< 1.0	2.9
Tetrahydrofuran (THF)	ug/L	NA	< 25	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5
Toluene	ug/L	5	< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Xylenes	ug/L	5	< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,2-Dichloroethene	ug/L	5	< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,3-Dichloropropene	ug/L	0.4	< 4.0	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40
trans-1,4-dichloro-2-butene	ug/L	NA	< 50	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Trichloroethene	ug/L	5	< 10	< 1.0	< 1.0	< 1.0	< 1.0	1.4
Trichlorofluoromethane	ug/L	5	< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichlorotrifluoroethane	ug/L	NA	< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl chloride	ug/L	2	< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Notes:

mg/L: miligram per liter (ppm)

ug/L: microgram per liter (ppb)

Analyte detected

Concentration above TOGS 1.1.1 Ambient Water Quality Standard in unfiltered sample

Concentration above TOGS 1.1.1 Ambient Water Quality Standard in filtered sample

**Table 10: SVOCs in Groundwater**  
401 East 120th Street, New York, NY

Parameters	Sample ID	NYSDEC TOGS 1.1.1. AWOS	GW-1	GW-2	GW-3	GW-4	GW-5	GW-6
	Sample Date		3/12/2015	3/12/2015	3/12/2015	4/29/2015	4/29/2015	4/29/2015
<b>Semivolatiles By SW8270D (SIM)</b>								
1,2,4,5-Tetrachlorobenzene	ug/L	NA	< 0.50	< 0.50	< 0.51	< 0.50	< 0.50	< 0.50
2-Methylnaphthalene	ug/L	NA		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Acenaphthene	ug/L	20	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	ug/L	NA	< 0.05	0.07	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	ug/L	50	0.1	0.06	0.03	< 0.02	0.06	0.06
Benzo(a)anthracene	ug/L	0.002	0.09	0.18	0.03	0.04	0.04	0.16
Benzo(a)pyrene	ug/L	MDL	0.06	0.2	< 0.02	0.03	0.03	0.19
Benzo(b)fluoranthene	ug/L	0.002	0.08	0.28	0.02	0.04	0.04	0.32
Benzo(ghi)perylene	ug/L	NA	< 0.50	< 0.50	< 0.51	< 0.50	< 0.50	< 0.50
Benzo(k)fluoranthene	ug/L	0.002	0.03	0.11	< 0.02	< 0.02	< 0.02	0.11
Bis(2-ethylhexyl)phthalate	ug/L	5	0.5	0.64	< 0.51	< 0.50	< 0.50	3.3
Chrysene	ug/L	0.002	0.09	0.18	< 0.02	0.03	0.04	0.24
Dibenz(a,h)anthracene	ug/L	NA	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	ug/L	50	0.22	0.27	< 0.04	0.09	0.12	0.52
Fluorene	ug/L	50	0.38	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Hexachlorobenzene	ug/L	0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04
Hexachlorobutadiene	ug/L	0.01	< 0.50	< 0.50	< 0.51	< 0.50	< 0.50	< 0.50
Hexachloroethane	ug/L	5	< 0.50	< 0.50	< 0.51	< 0.50	< 0.50	< 0.50
Indeno(1,2,3-cd)pyrene	ug/L	0.002	0.03	0.09	< 0.02	< 0.02	0.02	0.15
Naphthalene	ug/L	10	2.9	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Nitrobenzene	ug/L	0.4	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pentachloronitrobenzene	ug/L		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pentachlorophenol	ug/L	NA	< 0.80	< 0.80	< 0.82	< 0.80	< 0.80	< 0.80
Phenanthrene	ug/L	50	0.39	0.14	< 0.05	0.06	0.1	0.17
Pyrene	ug/L	50	0.19	0.24	0.05	0.23	0.11	0.45
Pyridine	ug/L	NA	< 0.50	< 0.50	< 0.51	< 0.50	< 0.50	< 0.50
<b>Semivolatiles By SW8270D</b>								
1,2,4-Trichlorobenzene	ug/L	5	< 5.0	< 5.0	< 5.1	< 5.0	< 5.0	< 5.0
1,2-Dichlorobenzene	ug/L	3	< 2.5	< 2.5	< 2.6	< 2.5	< 2.5	< 2.5
1,2-Diphenylhydrazine	ug/L	NA	< 5.0	< 5.0	< 5.1	< 5.0	< 5.0	< 5.0
1,3-Dichlorobenzene	ug/L	3	< 2.5	< 2.5	< 2.6	< 2.5	< 2.5	< 2.5
1,4-Dichlorobenzene	ug/L	3	< 2.5	< 2.5	< 2.6	< 2.5	< 2.5	< 2.5
2,4,5-Trichlorophenol	ug/L	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,4,6-Trichlorophenol	ug/L	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,4-Dichlorophenol	ug/L	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,4-Dimethylphenol	ug/L	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,4-Dinitrophenol	ug/L	10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,4-Dinitrotoluene	ug/L	5	< 5.0	< 5.0	< 5.1	< 5.0	< 5.0	< 5.0
2,6-Dinitrotoluene	ug/L	5	< 5.0	< 5.0	< 5.1	< 5.0	< 5.0	< 5.0
2-Chloronaphthalene	ug/L	10	< 5.0	< 5.0	< 5.1	< 5.0	< 5.0	< 5.0
2-Chlorophenol	ug/L	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Methylnaphthalene	ug/L	NA	13	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

**Table 10: SVOCs in Groundwater**  
401 East 120th Street, New York, NY

Parameters	Sample ID	NYSDEC TOGS 1.1.1. AWOS	GW-1	GW-2	GW-3	GW-4	GW-5	GW-6
	Sample Date		3/12/2015	3/12/2015	3/12/2015	4/29/2015	4/29/2015	4/29/2015
2-Methylphenol (o-cresol)	ug/L	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Nitroaniline	ug/L	5	< 5.0	< 5.0	< 5.1	< 5.0	< 5.0	< 5.0
2-Nitrophenol	ug/L	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
3&4-Methylphenol (m&p-cresol)	ug/L	NA	< 10	< 10	< 10	< 10	< 10	< 10
3,3'-Dichlorobenzidine	ug/L	5	< 5.0	< 5.0	< 5.1	< 5.0	< 5.0	< 5.0
3-Nitroaniline	ug/L	5	< 5.0	< 5.0	< 5.1	< 5.0	< 5.0	< 5.0
4,6-Dinitro-2-methylphenol	ug/L	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Bromophenyl phenyl ether	ug/L	NA	< 5.0	< 5.0	< 5.1	< 5.0	< 5.0	< 5.0
4-Chloro-3-methylphenol	ug/L	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chloroaniline	ug/L	5	< 5.0	< 5.0	< 5.1	< 5.0	< 5.0	< 5.0
4-Chlorophenyl phenyl ether	ug/L	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Nitroaniline	ug/L	5	< 5.0	< 5.0	< 5.1	< 5.0	< 5.0	< 5.0
4-Nitrophenol	ug/L	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Acetophenone	ug/L	NA	< 5.0	< 5.0	< 5.1	< 5.0	< 5.0	< 5.0
Aniline	ug/L	5	< 5.0	< 5.0	< 5.1	< 5.0	< 5.0	< 5.0
Benzidine	ug/L	NA	< 5.0	< 5.0	< 5.1	< 5.0	< 5.0	< 5.0
Benzoic acid	ug/L	NA	< 50	< 50	< 51	< 50	< 50	< 50
Benzyl butyl phthalate	ug/L	50	< 5.0	< 5.0	< 5.1	< 5.0	< 5.0	< 5.0
Bis(2-chloroethoxy)methane	ug/L	5	< 5.0	< 5.0	< 5.1	< 5.0	< 5.0	< 5.0
Bis(2-chloroethyl)ether	ug/L	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bis(2-chloroisopropyl)ether	ug/L	5	< 5.0	< 5.0	< 5.1	< 5.0	< 5.0	< 5.0
Carbazole	ug/L	NA	< 5.0	< 5.0	< 5.1	< 5.0	< 5.0	< 5.0
Dibenzofuran	ug/L	NA	< 5.0	< 5.0	< 5.1	< 5.0	< 5.0	< 5.0
Diethyl phthalate	ug/L	50	< 5.0	< 5.0	< 5.1	< 5.0	< 5.0	< 5.0
Dimethylphthalate	ug/L	50	< 5.0	< 5.0	< 5.1	< 5.0	< 5.0	< 5.0
Di-n-butylphthalate	ug/L	50	< 5.0	< 5.0	< 5.1	< 5.0	< 5.0	< 5.0
Di-n-octylphthalate	ug/L	50	< 5.0	< 5.0	< 5.1	< 5.0	< 5.0	< 5.0
Hexachlorocyclopentadiene	ug/L	5	< 5.0	< 5.0	< 5.1	< 5.0	< 5.0	< 5.0
Isophorone	ug/L	50	< 5.0	< 5.0	< 5.1	< 5.0	< 5.0	< 5.0
N-Nitrosodimethylamine	ug/L	NA	< 5.0	< 5.0	< 5.1	< 5.0	< 5.0	< 5.0
N-Nitrosodi-n-propylamine	ug/L	NA	< 5.0	< 5.0	< 5.1	< 5.0	< 5.0	< 5.0
N-Nitrosodiphenylamine	ug/L	50	< 5.0	< 5.0	< 5.1	< 5.0	< 5.0	< 5.0
Phenol	ug/L	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Notes:

mg/L: milligram per liter (ppm)

ug/L: microgram per liter (ppb)

Analyte detected

Concentration above TOGS 1.1.1 Ambient Water Quality Standard in unfiltered sample

Concentration above TOGS 1.1.1 Ambient Water Quality Standard in filtered sample

**Table 11: Pesticides and PCBs in Groundwater**  
401 East 120th Street, New York, NY

Parameters	Sample ID	NYSDEC TOGS 1.1.1. AWQS	GW-1	GW-2	GW-3	GW-4	GW-5	GW-6
	Sample Date		3/12/2015	3/12/2015	3/12/2015	4/29/2015	4/29/2015	4/29/2015
<b>PCBs By E608/SW8082A</b>								
PCB-1016	ug/L	0.09	NA	NA	NA	< 0.050	< 0.050	< 0.050
PCB-1221	ug/L		NA	NA	NA	< 0.050	< 0.050	< 0.050
PCB-1232	ug/L		NA	NA	NA	< 0.050	< 0.050	< 0.050
PCB-1242	ug/L		NA	NA	NA	< 0.050	< 0.050	< 0.050
PCB-1248	ug/L		NA	NA	NA	< 0.050	< 0.050	< 0.050
PCB-1254	ug/L		NA	NA	NA	< 0.050	< 0.050	< 0.050
PCB-1260	ug/L		NA	NA	NA	< 0.050	< 0.050	< 0.050
PCB-1262	ug/L		NA	NA	NA	< 0.050	< 0.050	< 0.050
PCB-1268	ug/L		NA	NA	NA	< 0.050	< 0.050	< 0.050
<b>Pesticides By SW8081B</b>								
4,4' -DDD	ug/L	0.3	NA	NA	NA	< 0.050	< 0.25	< 0.050
4,4' -DDE	ug/L	0.2	NA	NA	NA	< 0.050	< 0.25	< 0.050
4,4' -DDT	ug/L	0.2	NA	NA	NA	< 0.050	< 0.25	< 0.050
a-BHC	ug/L	0.01	NA	NA	NA	< 0.025	< 0.13	< 0.025
Alachlor	ug/L	NA	NA	NA	NA	< 0.075	< 0.38	< 0.075
Aldrin	ug/L	MDL	NA	NA	NA	< 0.002	< 0.008	< 0.002
b-BHC	ug/L	0.04	NA	NA	NA	< 0.005	< 0.025	< 0.005
Chlordane	ug/L	NA	NA	NA	NA	< 0.30	< 1.5	< 0.30
d-BHC	ug/L	0.04	NA	NA	NA	< 0.025	< 0.13	< 0.025
Dieldrin	ug/L	0.004	NA	NA	NA	0.004	< 0.008	< 0.005
Endosulfan I	ug/L	NA	NA	NA	NA	< 0.050	< 0.25	< 0.050
Endosulfan II	ug/L	NA	NA	NA	NA	< 0.050	< 0.25	< 0.050
Endosulfan Sulfate	ug/L	NA	NA	NA	NA	< 0.050	< 0.25	< 0.050
Endrin	ug/L	MDL	NA	NA	NA	< 0.050	< 0.25	< 0.050
Endrin Aldehyde	ug/L	5	NA	NA	NA	< 0.050	< 0.25	< 0.050
Endrin ketone	ug/L	5	NA	NA	NA	< 0.050	< 0.25	< 0.050
g-BHC (Lindane)	ug/L	0.05	NA	NA	NA	< 0.025	< 0.13	< 0.025
Heptachlor	ug/L	0.04	NA	NA	NA	< 0.025	< 0.13	< 0.025
Heptachlor epoxide	ug/L	0.03	NA	NA	NA	< 0.025	< 0.13	< 0.025
Methoxychlor	ug/L	35	NA	NA	NA	< 0.10	< 0.50	< 0.10
Toxaphene	ug/L	0.06	NA	NA	NA	< 1.0	< 5.0	< 1.0

Notes:

mg/L: milligram per liter (ppm)

ug/L: microgram per liter (ppb)

Analyte detected

Concentration above TOGS 1.1.1 Ambient Water Quality Standard in unfiltered sample

Concentration above TOGS 1.1.1 Ambient Water Quality Standard in filtered sample

**Table 12: TAL Metals (Total) in Groundwater**  
401 East 120th Street, New York, NY

Parameters	Sample ID	NYSDEC TOGS 1.1.1. AWQS	GW-1	GW-2	GW-3	GW-4	GW-5	GW-6
	Sample Date		3/12/2015	3/12/2015	3/12/2015	4/29/2015	4/29/2015	4/29/2015
<b>Metals, Total</b>								
Aluminum	mg/L	0.1	97.5	12.6	181	52.6	28	0.444
Antimony	mg/L	0.003	< 0.005	< 0.005	< 0.025	< 0.005	< 0.005	< 0.005
Arsenic	mg/L	0.025	0.022	0.005	0.062	0.007	0.013	< 0.004
Barium	mg/L	1	1.01	0.244	1.67	0.354	0.288	0.154
Beryllium	mg/L	0.003	0.006	< 0.001	0.01	0.002	0.001	< 0.001
Cadmium	mg/L	0.005	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.002
Calcium	mg/L	NA	205	212	162	259	252	107
Chromium	mg/L	0.05	0.227	0.018	0.265	0.067	0.052	0.007
Cobalt	mg/L	NA	0.07	0.009	0.116	0.033	0.017	< 0.002
Copper	mg/L	0.2	0.216	0.034	0.392	0.06	0.059	0.018
Iron	mg/L	0.3	134	8.95	283	49.2	38.6	1.16
Lead	mg/L	0.025	0.108	0.078	0.146	0.029	0.041	< 0.002
Magnesium	mg/L	35	43.5	20.9	67.8	61.6	36.7	23.2
Manganese	mg/L	0.3	7.46	0.671	14	7.23	3.89	2.23
Mercury	mg/L	0.0007	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Nickel	mg/L	0.1	0.148	0.014	0.228	0.067	0.045	0.005
Potassium	mg/L	NA	35.4	17.3	34.5	30.6	21.5	16.9
Selenium	mg/L	0.01	0.011	< 0.010	< 0.050	< 0.010	< 0.010	< 0.010
Silver	mg/L	0.05	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Sodium	mg/L	20	91.6	134	67.4	93.6	27	224
Thallium	mg/L	0.0005	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Vanadium	mg/L	NA	0.206	0.021	0.298	0.063	0.047	< 0.002
Zinc	mg/L	2	0.277	0.099	0.594	0.123	0.088	0.057

Notes:

mg/L: miligram per liter (ppm)

ug/L: microgram per liter (ppb)

Analyte detected

Concentration above TOGS 1.1.1 Ambient Water Quality Standard in unfiltered sample

Concentration above TOGS 1.1.1 Ambient Water Quality Standard in filtered sample

**Table 13: TAL Metals (Dissolved) in Groundwater**  
401 East 120th Street, New York, NY

Parameters	Sample ID	NYSDEC TOGS 1.1.1. AWQS	GW-1	GW-2	GW-3	GW-4	GW-5	GW-6
	Sample Date		3/12/2015	3/12/2015	3/12/2015	4/29/2015	4/29/2015	4/29/2015
<b>Metals, Total</b>								
Aluminum (Dissolved)	mg/L	0.1	0.479	0.241	0.094	0.056	0.107	0.014
Antimony (Dissolved)	mg/L	0.003	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Arsenic (Dissolved)	mg/L	0.025	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004
Barium (Dissolved)	mg/L	1	0.159	0.061	0.049	0.109	0.155	0.126
Beryllium (Dissolved)	mg/L	0.003	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Cadmium (Dissolved)	mg/L	0.005	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Calcium (Dissolved)	mg/L	NA	182	200	104	222	254	107
Chromium (Dissolved)	mg/L	0.05	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.002
Cobalt (Dissolved)	mg/L	NA	< 0.001	< 0.001	< 0.001	0.006	0.002	< 0.001
Copper (Dissolved)	mg/L	0.2	< 0.005	0.006	< 0.005	< 0.005	< 0.005	< 0.005
Iron (Dissolved)	mg/L	0.3	1.29	0.141	0.072	0.183	1.66	< 0.011
Lead (Dissolved)	mg/L	0.025	< 0.002	< 0.002	< 0.002	0.003	0.006	< 0.002
Magnesium (Dissolved)	mg/L	35	17.7	19	14	69.7	43.1	23.3
Manganese (Dissolved)	mg/L	0.3	1.94	0.135	0.587	5.11	2.5	1.98
Mercury (Dissolved)	mg/L	0.0007	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Nickel (Dissolved)	mg/L	0.1	0.003	< 0.001	0.001	0.007	0.006	0.003
Potassium (Dissolved)	mg/L	NA	17.8	14.8	10.6	28.7	24.3	16.1
Selenium (Dissolved)	mg/L	0.01	< 0.002	< 0.010	< 0.010	< 0.002	< 0.002	< 0.002
Silver (Dissolved)	mg/L	0.05	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Sodium (Dissolved)	mg/L	20	97.3	136	74.9	103	35.5	239
Thallium (Dissolved)	mg/L	0.0005	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Vanadium (Dissolved)	mg/L	NA	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Zinc (Dissolved)	mg/L	2	0.002	0.004	< 0.002	0.003	0.005	0.031

Notes:

mg/L: milligram per liter (ppm)

ug/L: microgram per liter (ppb)

Analyte detected

Concentration above TOGS 1.1.1 Ambient Water Quality Standard in unfiltered sample

Concentration above TOGS 1.1.1 Ambient Water Quality Standard in filtered sample

**Table 14: VOCs in Soil Vapor**  
401 East 120th Street, New York, New York

Parameters	Sample ID	NYS DOH Air Guideline Value	NYS DOH Action Level	SG-1	SG-2	SG-3	SG-4	SG-5
	Sample Date			3/12/2015	3/12/2015	3/12/2015	4/29/2015	4/29/2015
<b>Volatiles by TO-15</b>								
1,1,1,2-Tetrachloroethane	ug/m <sup>3</sup>			<200	<1.00	<1.00	< 1.00	< 1.00
1,1,1-Trichloroethane	ug/m <sup>3</sup>		100	<200	<1.00	<1.00	< 1.00	< 1.00
1,1,2,2-Tetrachloroethane	ug/m <sup>3</sup>			<200	<1.00	<1.00	< 1.00	< 1.00
1,1,2-Trichloroethane	ug/m <sup>3</sup>			<200	<1.00	<1.00	< 1.00	< 1.00
1,1-Dichloroethane	ug/m <sup>3</sup>			<200	<1.00	<1.00	< 1.00	< 1.00
1,1-Dichloroethene	ug/m <sup>3</sup>			<200	<1.00	<1.00	< 1.00	< 1.00
1,2,4-Trichlorobenzene	ug/m <sup>3</sup>			<200	<1.00	<1.00	< 1.00	< 1.00
1,2,4-Trimethylbenzene	ug/m <sup>3</sup>			<200	19.6	<1.00	48.1	46.7
1,2-Dibromoethane(EDB)	ug/m <sup>3</sup>			<200	<1.00	<1.00	< 1.00	< 1.00
1,2-Dichlorobenzene	ug/m <sup>3</sup>			<200	<1.00	<1.00	< 1.00	< 1.00
1,2-Dichloroethane	ug/m <sup>3</sup>			<200	<1.00	<1.00	< 1.00	< 1.00
1,2-dichloropropane	ug/m <sup>3</sup>			<200	<1.00	<1.00	< 1.00	< 1.00
1,2-Dichlorotetrafluoroethane	ug/m <sup>3</sup>			<200	<1.00	<1.00	< 1.00	< 1.00
1,3,5-Trimethylbenzene	ug/m <sup>3</sup>			<200	11.8	<1.00	13.1	12.5
1,3-Butadiene	ug/m <sup>3</sup>			<200	<1.00	<1.00	< 1.00	< 1.00
1,3-Dichlorobenzene	ug/m <sup>3</sup>			<200	<1.00	<1.00	< 1.00	< 1.00
1,4-Dichlorobenzene	ug/m <sup>3</sup>			<200	<1.00	<1.00	< 1.00	< 1.00
1,4-Dioxane	ug/m <sup>3</sup>			<200	<1.00	<1.00	< 1.00	< 1.00
2-Hexanone(MBK)	ug/m <sup>3</sup>			<200	<1.00	<1.00	< 1.00	< 1.00
4-Ethyltoluene	ug/m <sup>3</sup>			<200	12.8	<1.00	15.8	11.4
4-Isopropyltoluene	ug/m <sup>3</sup>			<200	1.22	<1.00	2.1	1.68
4-Methyl-2-pentanone(MIBK)	ug/m <sup>3</sup>			<200	31.5	<1.00	1.52	1.08
Acetone	ug/m <sup>3</sup>			1620	154	16.0	156	187
Acrylonitrile	ug/m <sup>3</sup>			<200	<1.00	<1.00	< 1.00	< 1.00
Benzene	ug/m <sup>3</sup>			<200	3.48	<1.00	8.97	14.1
Benzyl chloride	ug/m <sup>3</sup>			<200	<1.00	<1.00	< 1.00	< 1.00
Bromodichloromethane	ug/m <sup>3</sup>			<200	<1.00	<1.00	< 1.00	< 1.00
Bromoform	ug/m <sup>3</sup>			<200	<1.00	<1.00	< 1.00	< 1.00
Bromomethane	ug/m <sup>3</sup>			<200	<1.00	<1.00	< 1.00	< 1.00
Carbon Disulfide	ug/m <sup>3</sup>			<200	3.36	<1.00	10.2	17.4
Carbon Tetrachloride	ug/m <sup>3</sup>		250	<49.9	0.44	0.99	0.51	0.4
Chlorobenzene	ug/m <sup>3</sup>			<200	<1.00	<1.00	< 1.00	< 1.00
Chloroethane	ug/m <sup>3</sup>			<200	<1.00	<1.00	< 1.00	< 1.00
Chloroform	ug/m <sup>3</sup>			<200	<1.00	<1.00	< 1.00	9.27
Chloromethane	ug/m <sup>3</sup>			<200	1.58	1.50	< 1.00	11.9
Cis-1,2-Dichloroethene	ug/m <sup>3</sup>			<200	<1.00	<1.00	< 1.00	< 1.00
cis-1,3-Dichloropropene	ug/m <sup>3</sup>			<200	<1.00	<1.00	< 1.00	< 1.00
Cyclohexane	ug/m <sup>3</sup>			894	3.34	<1.00	5.95	9.98
Dibromochloromethane	ug/m <sup>3</sup>			<200	<1.00	<1.00	< 1.00	< 1.00
Dichlorodifluoromethane	ug/m <sup>3</sup>			<200	1.43	2.19	1.68	1.59
Ethanol	ug/m <sup>3</sup>			<200	35.2	21.8	5.16	4.59
Ethyl acetate	ug/m <sup>3</sup>			<200	<1.00	<1.00	< 1.00	< 1.00
Ethylbenzene	ug/m <sup>3</sup>			<200	8.81	<1.00	20.9	19.4
Heptane	ug/m <sup>3</sup>			1040	32.4	<1.00	25.3	35
Hexachlorobutadiene	ug/m <sup>3</sup>			<200	<1.00	<1.00	< 1.00	< 1.00
Hexane	ug/m <sup>3</sup>			905	620	2.78	44.7	80.3
Isopropylalcohol	ug/m <sup>3</sup>			<200	1.89	1.82	1.67	1.09
Isopropylbenzene	ug/m <sup>3</sup>			358	3.25	<1.00	2.01	1.84
m,p-Xylene	ug/m <sup>3</sup>			<200	31.4	1.21	84.2	79
Methyl Ethyl Ketone	ug/m <sup>3</sup>			<200	81.3	4.24	177	160
Methyl tert-butyl ether(MTBE)	ug/m <sup>3</sup>			<200	<1.00	<1.00	< 1.00	< 1.00

**Table 14: VOCs in Soil Vapor**  
401 East 120th Street, New York, New York

Parameters	Sample ID	NYS DOH Air Guideline Value	NYS DOH Action Level	SG-1	SG-2	SG-3	SG-4	SG-5
	Sample Date			3/12/2015	3/12/2015	3/12/2015	4/29/2015	4/29/2015
Methylene Chloride	ug/m <sup>3</sup>	60		<200	<1.00	<1.00	2.1	1.85
n-Butylbenzene	ug/m <sup>3</sup>			<200	<1.00	<1.00	3.83	3.68
o-Xylene	ug/m <sup>3</sup>			<200	11.7	<1.00	31.8	30
Propylene	ug/m <sup>3</sup>			<200	<1.00	<1.00	54.5	359
sec-Butylbenzene	ug/m <sup>3</sup>			<200	<1.00	<1.00	< 1.00	< 1.00
Styrene	ug/m <sup>3</sup>			<200	<1.00	<1.00	2.77	2.77
Tetrachloroethene	ug/m <sup>3</sup>	100	100	<50	0.61	0.49	4.26	1.31
Tetrahydrofuran	ug/m <sup>3</sup>			<200	52.5	5.57	380	410
Toluene	ug/m <sup>3</sup>			1020	30.5	1.63	55	48.6
Trans-1,2-Dichloroethene	ug/m <sup>3</sup>			<200	<1.00	<1.00	< 1.00	< 1.00
trans-1,3-Dichloropropene	ug/m <sup>3</sup>			<200	<1.00	<1.00	< 1.00	< 1.00
Trichloroethene	ug/m <sup>3</sup>	5	250	<50	<0.25	ND	< 0.25	< 0.25
Trichlorofluoromethane	ug/m <sup>3</sup>			<200	1.27	1.41	2.43	2.33
Trichlorotrifluoroethane	ug/m <sup>3</sup>			<200	<1.00	<1.00	< 1.00	< 1.00
Vinyl Chloride	ug/m <sup>3</sup>			<50.1	<0.25	<0.25	< 0.25	1.4

Notes:

ug/m3: microgram per kilogram (ppb)

Analyte detected

Detected at concentration above NYSDOH Air Guidance Value

## **APPENDIX A**

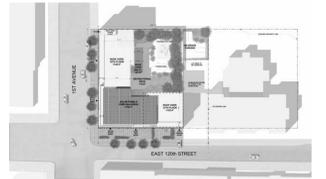
### **Proposed Development Plan**

**ACACIA GARDENS - NEW MIXED-USE BUILDING**

413 East 120th Street  
New York, NY 10035



BLOCK: 1808 LOT: 8  
NYC DOB #: 121190022



**Key Plan:**

Issued:

NUMBER	DATE	DESCRIPTION
1	04.15.14	BLDS SUBMISSION
2	06.26.14	BLDS SUBMISSION
3	09.04.14	BLDS SUBMISSION
4	03.20.15	DOB SUBMISSION PREP SET
5	07.29.15	70% PRICING SET
7	09.22.15	BLDS SUBMISSION
8	10.15.15	DOB SUBMISSION
9	11.20.15	100% CONSTRUCTION DOCUMENTS

**Revisions:**

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Magnusson Architecture & Planning PC  
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Client Representative:

Filing Representative:

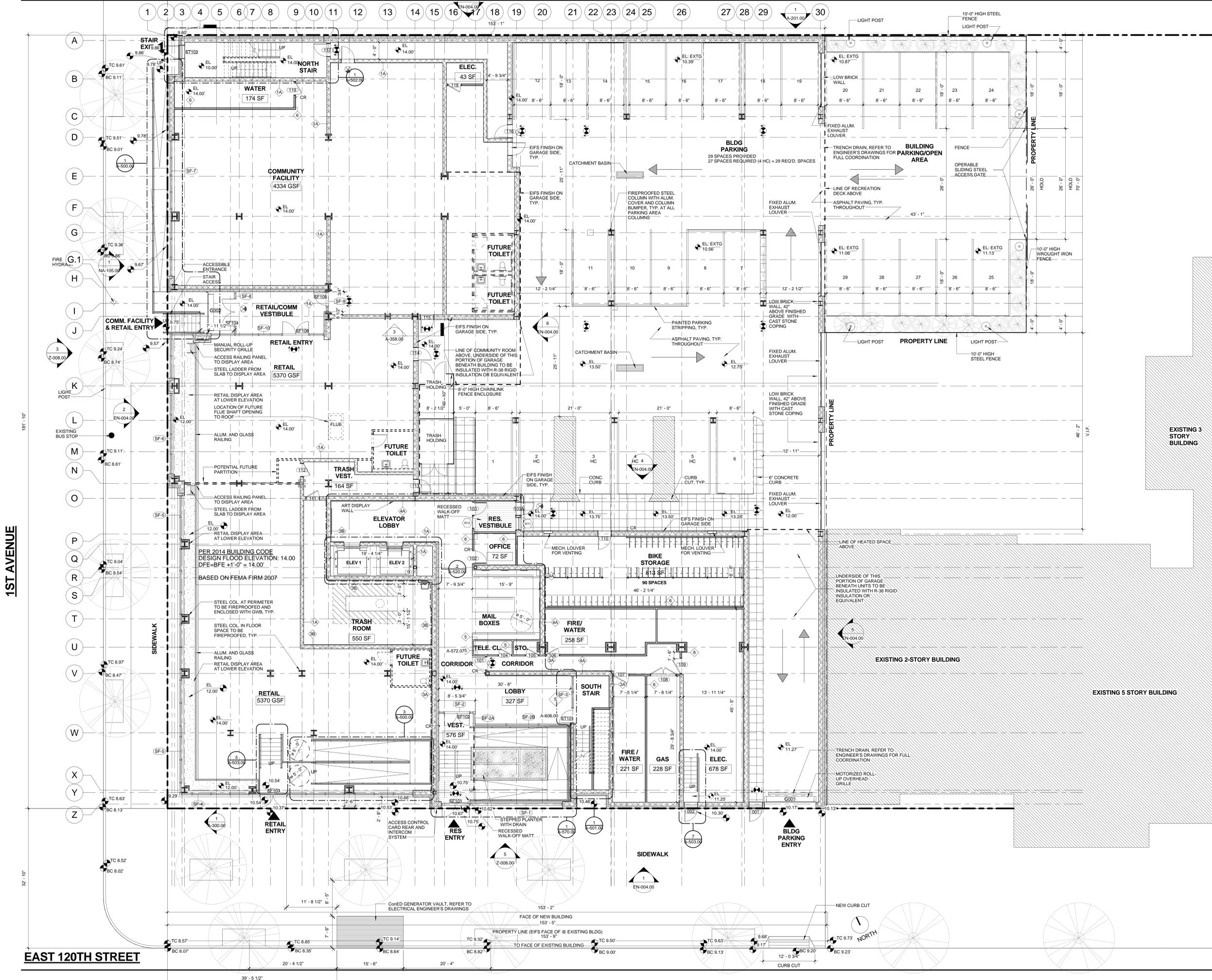
**James MacDonald Consulting**  
225 Broadway  
New York, NY 10007  
t: 212-389-9101  
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**1ST FLOOR PLAN**

SEAL & SIGNATURE:

PROJECT No: 14002  
DRAWING BY: Author  
CHK BY: Checker  
DWG No: **A-100.00**

SCALE: 1/8" = 1'-0"



**EAST 120TH STREET**

**1ST AVENUE**

EXISTING 3 STORY BUILDING

EXISTING 2-STORY BUILDING

EXISTING 5 STORY BUILDING

Do Not Scale Plans. Contractor to promptly notify Architect of any material variations between field conditions and existing conditions as indicated in Contract documents.



ACACIA GARDENS - NEW MIXED-USE BUILDING

413 East 120th Street  
New York, NY 10035

Owner:



BLOCK: 1808 LOT: 8  
NYC DOB #: 121190022



Key Plan:  
Issued:

NUMBER	DATE	DESCRIPTION
1	04.15.14	BLDS SUBMISSION
2	08.26.14	BLDS SUBMISSION
3	09.04.14	BLDS SUBMISSION
4	03.20.15	DOB SUBMISSION PREP SET
5	07.29.15	70% PRICING SET
7	09.22.15	BLDS SUBMISSION
8	10.15.15	DOB SUBMISSION
9	11.20.15	100% CONSTRUCTION DOCUMENTS

Revisions:  
Architect:  
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Do Not Scale Plans.  
Contractor to promptly notify Architect of any material variations between field conditions and existing conditions as indicated in Contract documents.

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3RD-4TH FLOOR PLAN

SEAL & SIGNATURE:



PROJECT No: 14002  
DRAWING BY: Author  
CHK BY: Checker  
DWG No:

**A-102.00**

SCALE:  
1/8" = 1'-0"



1ST AVENUE

EAST 120TH STREET



ACACIA GARDENS - NEW MIXED-USE BUILDING

413 East 120th Street  
New York, NY 10035

Owner:



BLOCK: 1808 LOT: 8  
NYC DOB #: 121190022



Key Plan:

NUMBER	DATE	DESCRIPTION
1	04.15.14	BLDS SUBMISSION
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3	09.04.14	BLDS SUBMISSION
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7	09.22.15	BLDS SUBMISSION
8	10.15.15	DOB SUBMISSION
9	11.20.15	100% CONSTRUCTION DOCUMENTS

Revisions:

Architect:  
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Structural Engineer:  
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f: 212.477.6548

Client Representative:

Filing Representative:  
**James MacDonald Consulting**  
225 Broadway  
New York, NY 10007  
t: 212.389.9101  
f: 212.389.9101

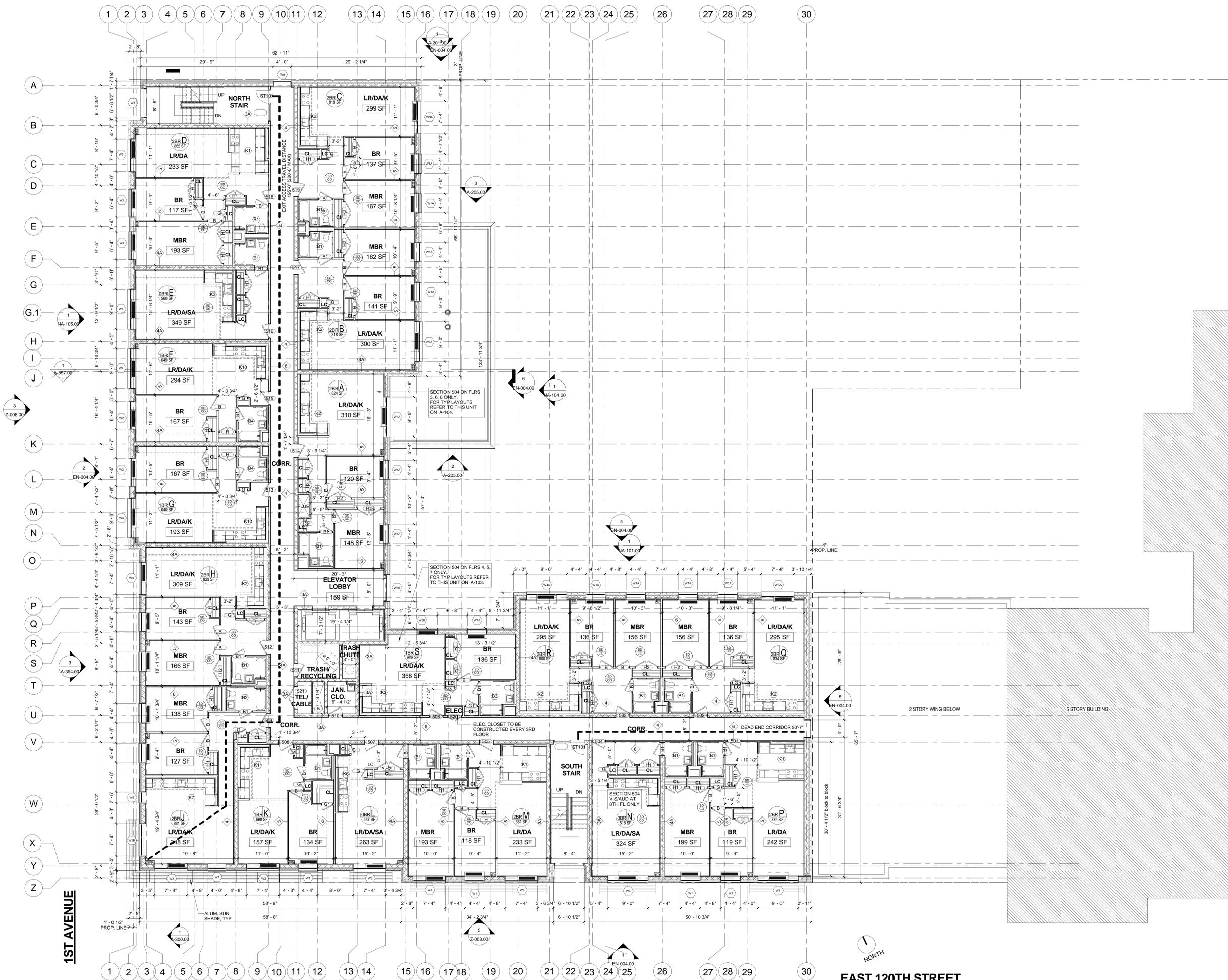
Do Not Scale Plans.  
Contractor to promptly notify Architect of any material variations between field conditions and existing conditions as indicated in Contract documents.

5TH-8TH FLOOR PLAN

SEAL & SIGNATURE:

PROJECT No: 14002  
DRAWING BY: Author  
CHK BY: Checker  
DWG No: **A-103.00**

SCALE: 1/8" = 1'-0"



1ST AVENUE

EAST 120TH STREET

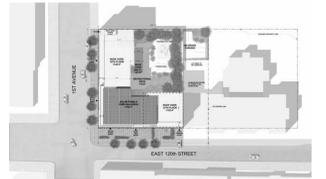
ACACIA GARDENS - NEW MIXED-USE BUILDING

413 East 120th Street  
New York, NY 10035

Owner:



Block: 1808 Lot: 8  
NYC DOB #: 121190022



Key Plan:

NUMBER	DATE	DESCRIPTION
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2	06.26.14	BLDS SUBMISSION
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5	07.29.15	70% PRICING SET
7	09.22.15	BLDS SUBMISSION
8	10.15.15	DOB SUBMISSION
9	11.20.15	100% CONSTRUCTION DOCUMENTS

Revisions:

Architect:

**MASS**  
Magnusson Architecture & Planning PC  
42 West 39th Street  
New York, NY 10018  
Tel (212) 253 7820 Fax (212) 253 1276

Structural Engineer:

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f: 212.477.6548

Client Representative:

Filing Representative:

**James MacDonald Consulting**  
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New York, NY 10007  
t: 212-389-9101  
f: 212-389-9101

Do Not Scale Plans.  
Contractor to promptly notify Architect of any material variations between field conditions and existing conditions as indicated in Contract documents.

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9TH-10TH FLOOR PLAN

SEAL & SIGNATURE:



PROJECT No: 14002  
DRAWING BY: Author  
CHK BY: Checker  
DWG No:

**A-104.00**

SCALE:  
1/8" = 1'-0"



EAST 120TH STREET

1ST AVENUE

ACACIA GARDENS - NEW MIXED-USE BUILDING

413 East 120th Street  
New York, NY 10035

Owner:



Block: 1808 Lot: 8  
NYC DOB #: 121190022



Key Plan:

NUMBER	DATE	DESCRIPTION
1	04.15.14	BLDS SUBMISSION
2	06.26.14	BLDS SUBMISSION
3	09.04.14	BLDS SUBMISSION
4	03.20.15	DOB SUBMISSION PREP SET
5	07.29.15	70% PRICING SET
7	09.22.15	BLDS SUBMISSION
8	10.15.15	DOB SUBMISSION
9	11.20.15	100% CONSTRUCTION DOCUMENTS

Revisions:

Architect:

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Magnusson Architecture & Planning PC  
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Landscape Architect:  
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t: 212-389-9101  
f: 212-389-9101

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11TH-12TH FLOOR PLAN

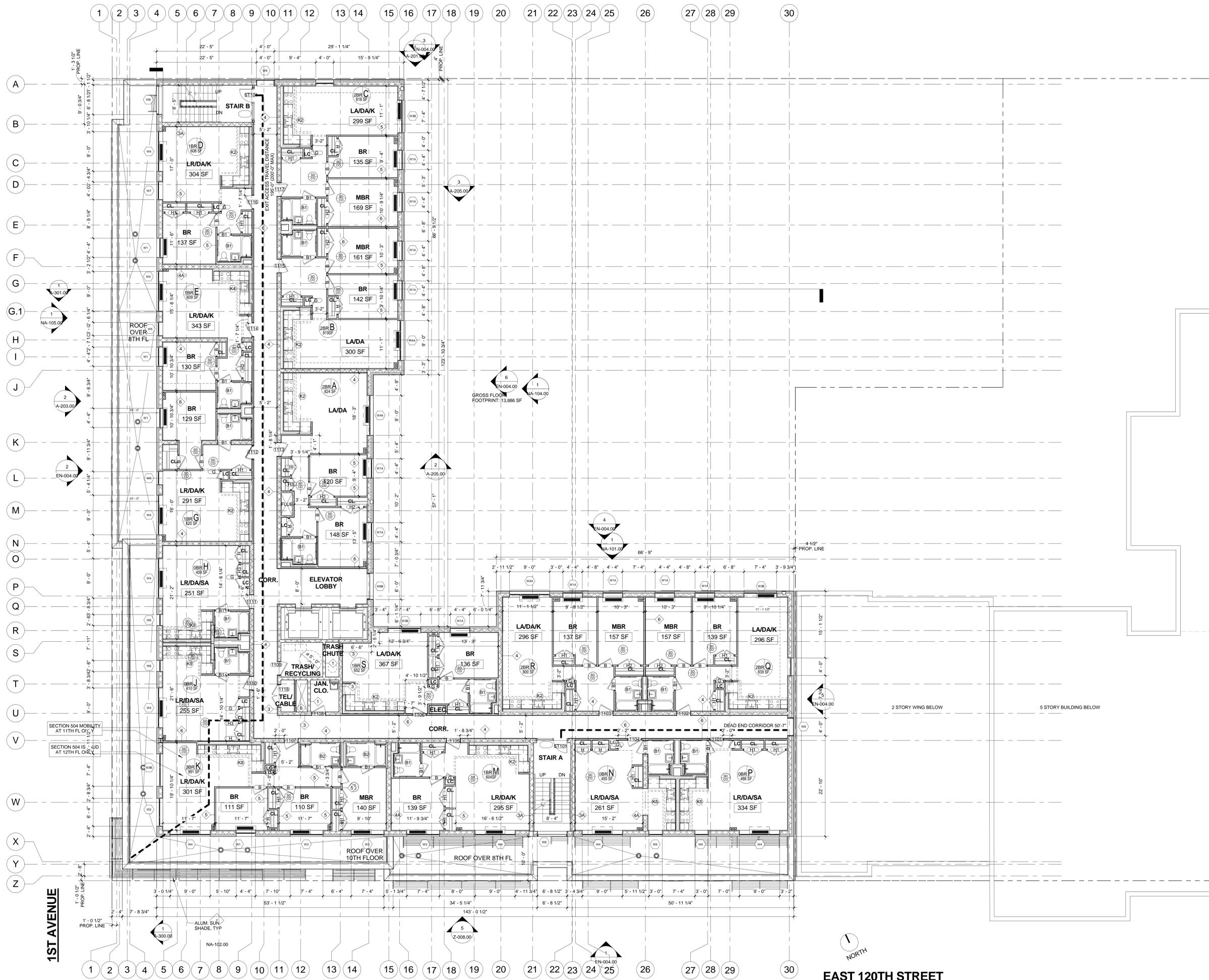
SEAL & SIGNATURE:



PROJECT No: 14002  
DRAWING BY: Author  
CHK BY: Checker  
DWG No:

A-105.00

SCALE:  
1/8" = 1'-0"



ACACIA GARDENS - NEW MIXED-USE BUILDING

413 East 120th Street  
New York, NY 10035

Owner:



BLOCK: 1808 LOT: 8  
NYCDOB#: 121190022



Key Plan:

NUMBER	DATE	DESCRIPTION
5	07.29.15	70% PRICING SET
7	08.22.15	BIDS SUBMISSION
8	10.15.15	DOB SUBMISSION
9	11.20.15	100% CONSTRUCTION DOCUMENTS

Revisions:

Architect:

**MAGNUSON**  
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f: 212.477.6548

Client Representative:

Filing Representative:

**James MacDonald Consulting**  
225 Broadway  
New York, NY 10007  
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f: 212-389-9101

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PARTIAL FLOOR PLANS,  
FLOORS 10 AND 12

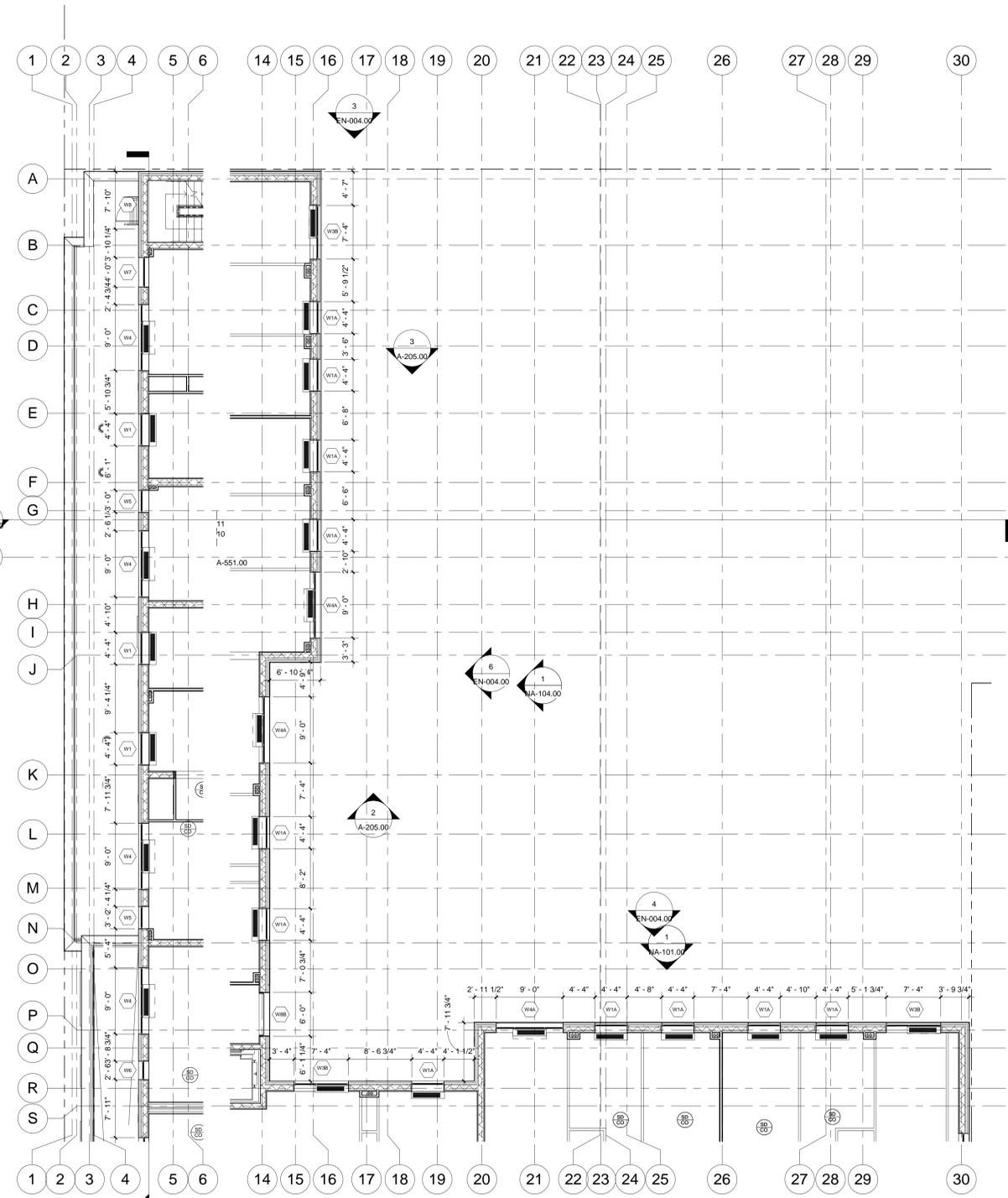
SEAL & SIGNATURE:

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DRAWING BY: Author  
CHK BY: Checker  
DWG No:



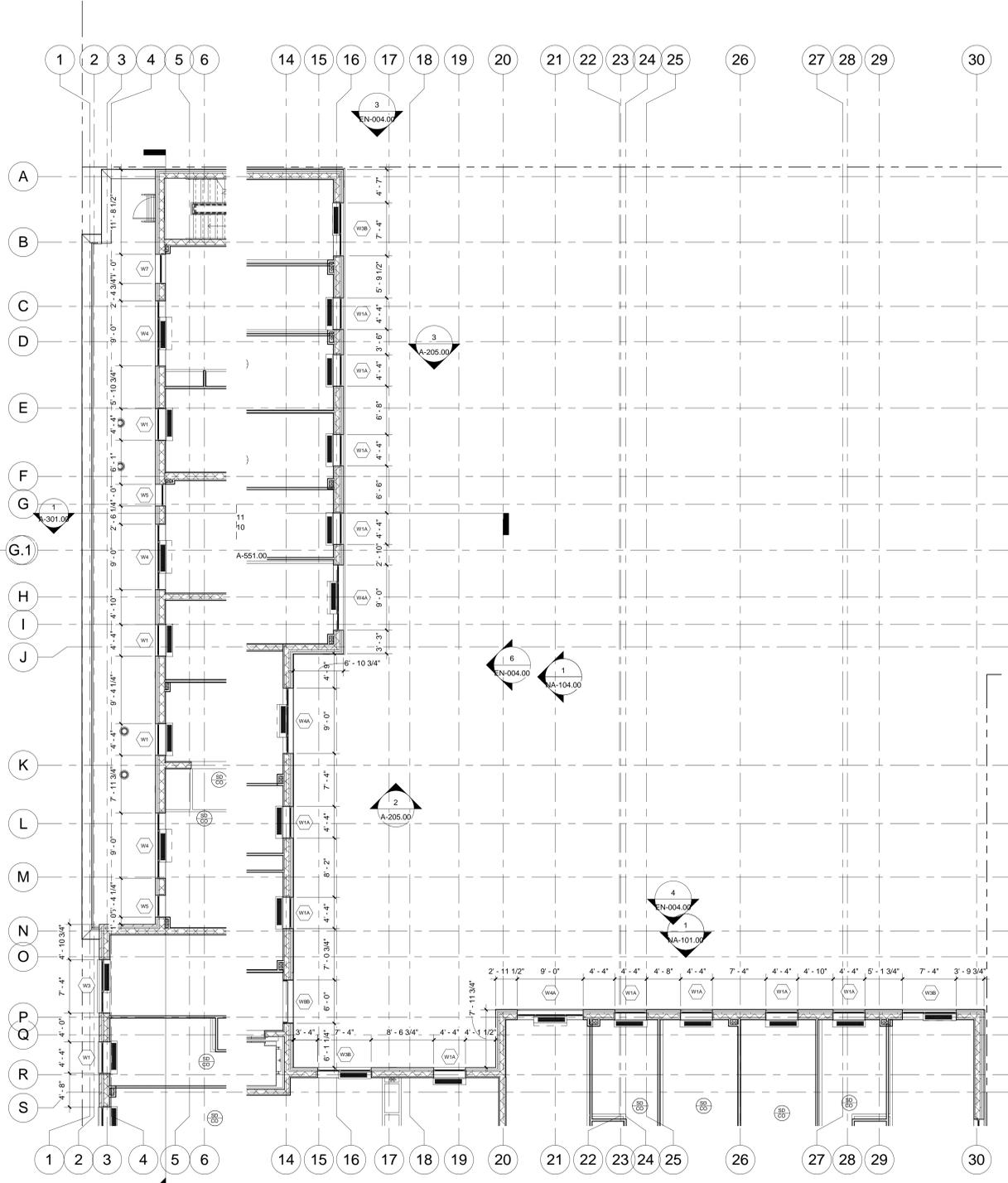
**A-106.00**

SCALE:  
1/8" = 1'-0"



NOTE: PLAN PROVIDED FOR DIMENSIONAL INFORMATION ONLY

2 LEVEL 12  
1/8" = 1'-0"



NOTE: PLAN PROVIDED FOR DIMENSIONAL INFORMATION ONLY

1 LEVEL 10  
1/8" = 1'-0"

ACACIA GARDENS - NEW MIXED-USE BUILDING

413 East 120th Street  
New York, NY 10035

Owner:



BLOCK: 1808 LOT: 8  
NYC DOB #: 121190022



Key Plan:

Issued:

NUMBER	DATE	DESCRIPTION
1	04.15.14	BLDS SUBMISSION
2	06.26.14	BLDS SUBMISSION
3	09.04.14	BLDS SUBMISSION
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7	09.22.15	BLDS SUBMISSION
8	10.15.15	DOB SUBMISSION
9	11.20.15	100% CONSTRUCTION DOCUMENTS

Revisions:

Architect:

MEP:

**ACACIA GARDENS - NEW MIXED-USE BUILDING**

413 East 120th Street  
New York, NY 10035

Owner:



ROOTED IN THE COMMUNITY SINCE 1969

BLOCK: 1808 LOT: 8

NYC DOB #: 121190022



Key Plan:

Issued:

NUMBER	DATE	DESCRIPTION
1	04.15.14	BLDS SUBMISSION
2	08.26.14	BLDS SUBMISSION
3	09.04.14	BLDS SUBMISSION
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5	07.29.15	70% PRICING SET
7	09.22.15	BLDS SUBMISSION
8	10.15.15	DOB SUBMISSION
9	11.20.15	100% CONSTRUCTION DOCUMENTS

Revisions:

Architect:

MEP:

MEP:

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f: 212.477.6548

Client Representative:

Filing Representative:

**James MacDonald Consulting**

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t: 212-389-9101  
f: 212-389-9101

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**BULKHEAD PLAN**

SEAL & SIGNATURE:



PROJECT No: 14002

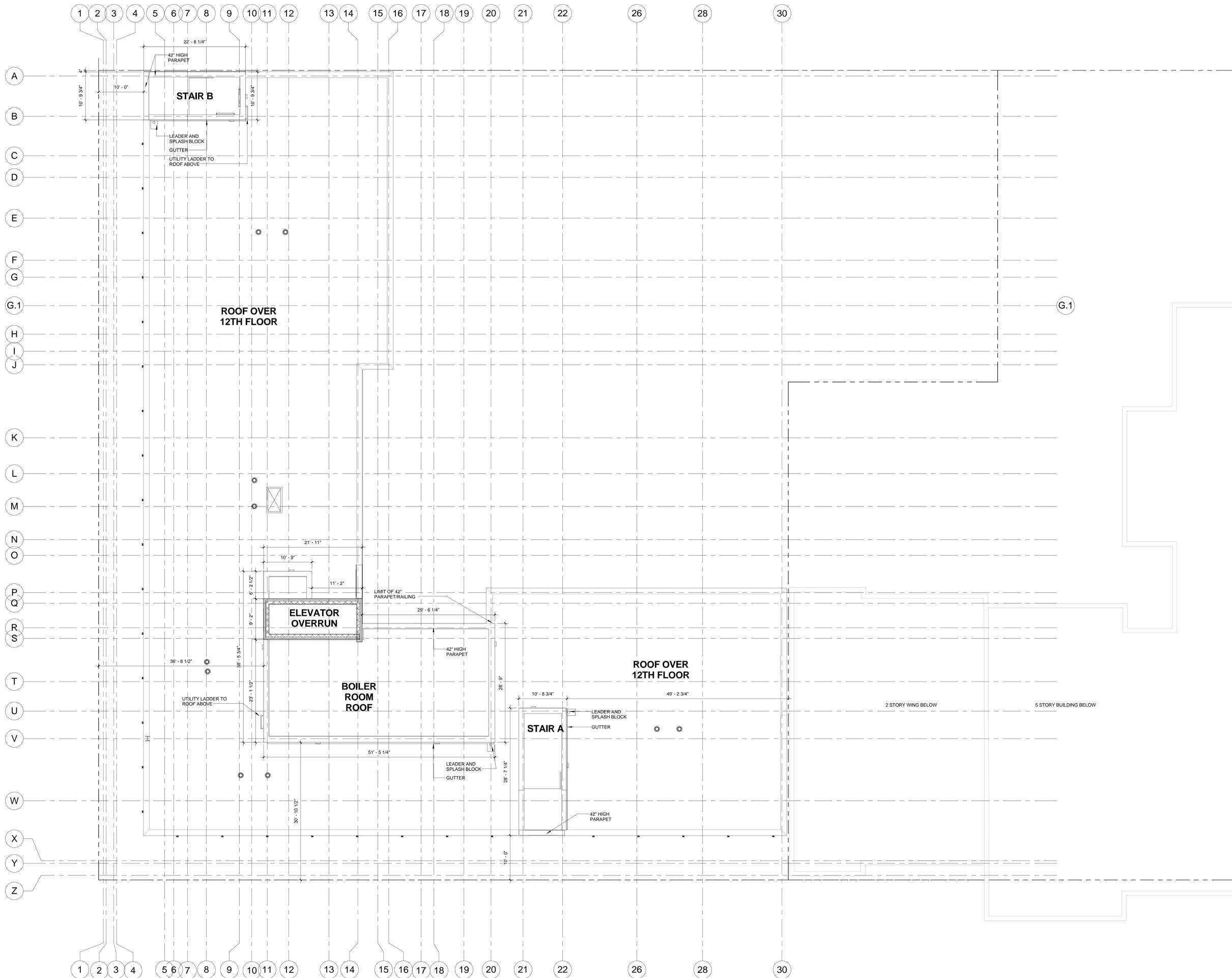
DRAWING BY: Author

CHK BY: Checker

DWG No:

**A-108.00**

SCALE:  
1/8" = 1'-0"



ACACIA GARDENS - NEW MIXED-USE BUILDING

413 East 120th Street  
New York, NY 10035

Owner:



BLOCK: 1808 LOT: 8  
NYC DOB #: 121190022



Key Plan:

NUMBER	DATE	DESCRIPTION
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7	09.22.15	BLDS SUBMISSION
8	10.15.15	DOB SUBMISSION
9	11.20.15	100% CONSTRUCTION DOCUMENTS

Revisions:

Architect:

MEP:

Structural:

Landscaping:

Other:

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Filing Representative:

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f: 212-389-9101

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TYPICAL UNIT PLANS

SEAL & SIGNATURE:

PROJECT No: 14002

DRAWING BY: Author

CHK BY: Checker

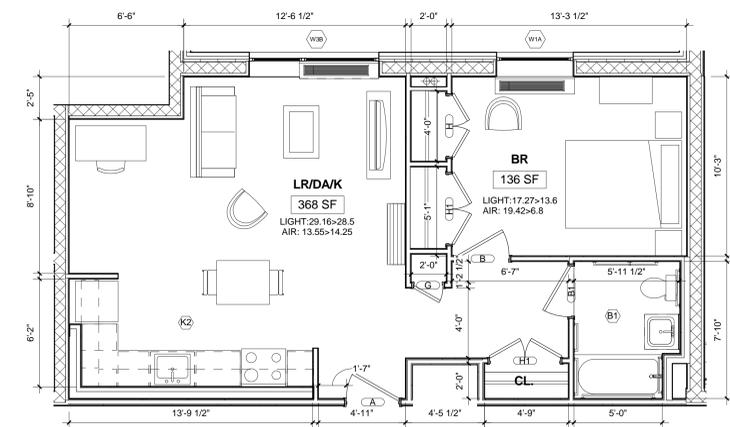
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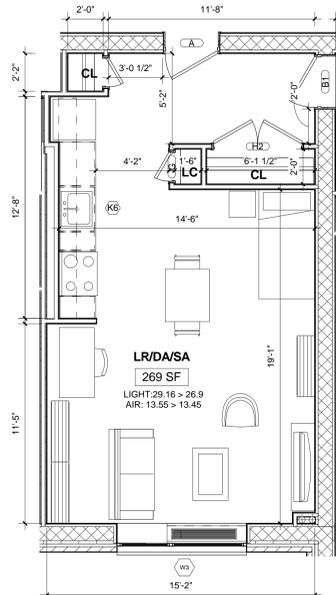
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A-110.00

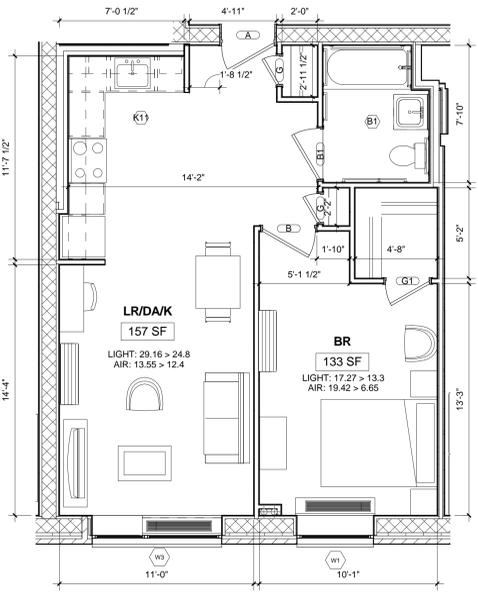
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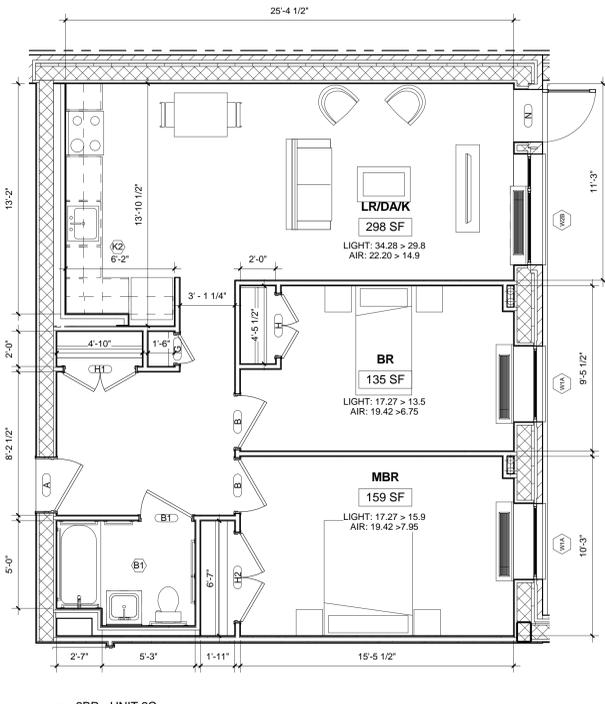
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1/4" = 1'-0"



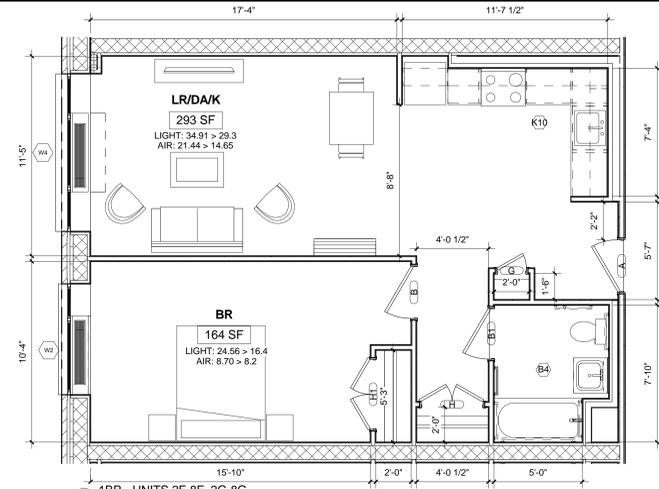
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1/4" = 1'-0"



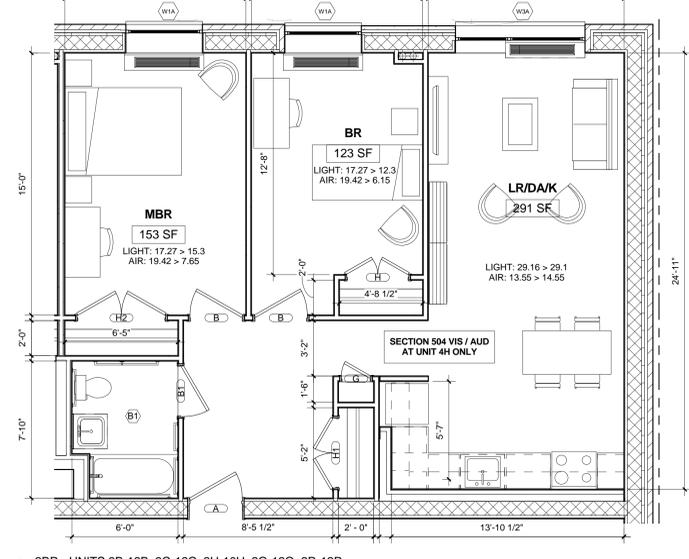
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1/4" = 1'-0"



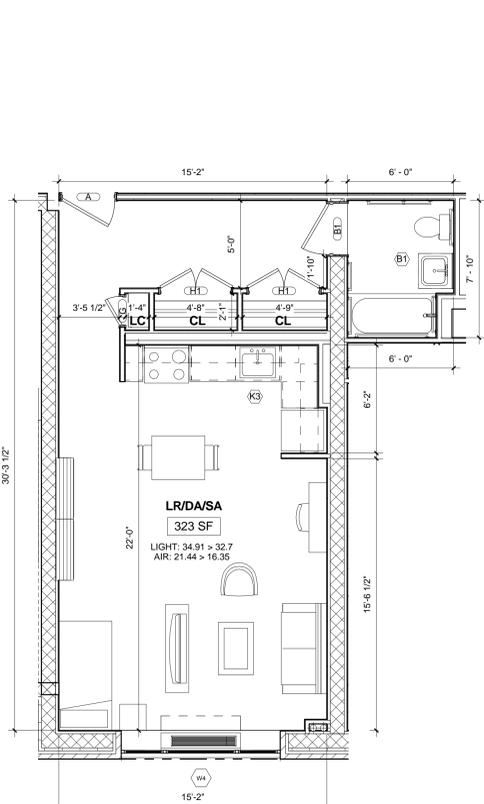
2BR - UNIT 2C  
1/4" = 1'-0"



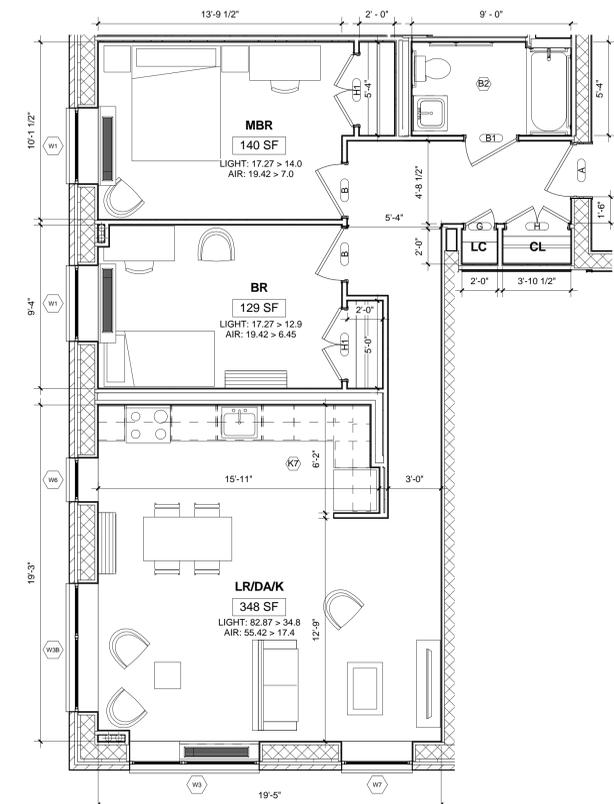
1BR - UNITS 2F-8F, 2G-8G  
1/4" = 1'-0"



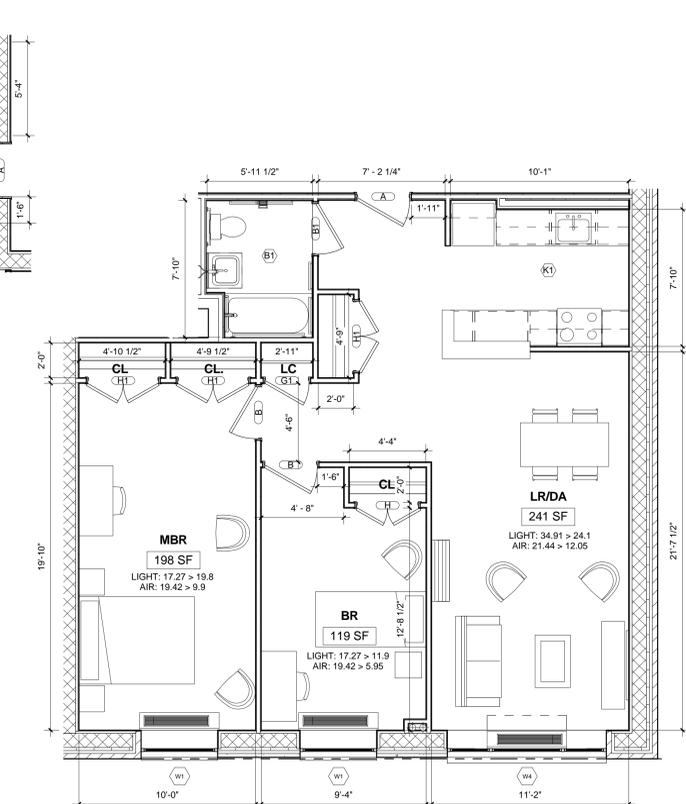
2BR - UNITS 3B-12B, 3C-12C, 2H-10H, 2Q-12Q, 2R-12R  
1/4" = 1'-0"



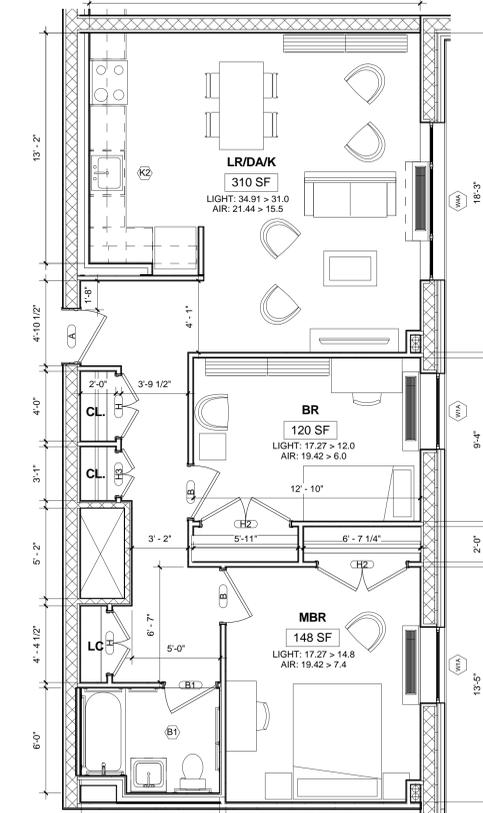
0BR - UNITS 2E-8E, 2N-8N  
1/4" = 1'-0"



2BR - UNITS 2J-10J  
1/4" = 1'-0"



2BR - UNITS 2D-8D, 2M-8M, 2P-8P  
1/4" = 1'-0"



2BR - UNITS 4A, 5A, 7A, 9A-12A  
1/4" = 1'-0"

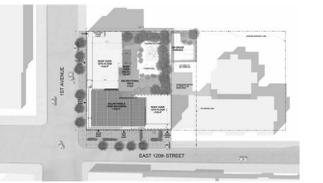
**ACACIA GARDENS - NEW MIXED-USE BUILDING**

413 East 120th Street  
New York, NY 10035

Owner:



BLOCK: 1808 LOT: 8  
NYC DOB #: 121190022



Key Plan:

NUMBER	DATE	DESCRIPTION
1	04.15.14	BLDS SUBMISSION
2	08.26.14	BLDS SUBMISSION
3	09.04.14	BLDS SUBMISSION
4	03.20.15	DOB SUBMISSION PREP SET
5	07.29.15	70% PRICING SET
7	09.22.15	BLDS SUBMISSION
8	10.15.15	DOB SUBMISSION
9	11.20.15	100% CONSTRUCTION DOCUMENTS

Revisions:

Architect:

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MEP Engineer:  
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Landscape Architect:  
**MPFP p/c / M. Paul Friedberg & Partners**  
120 Broadway, Floor 20  
New York, NY 10021  
t: 212.477.6369 x.108  
f: 212.477.6548

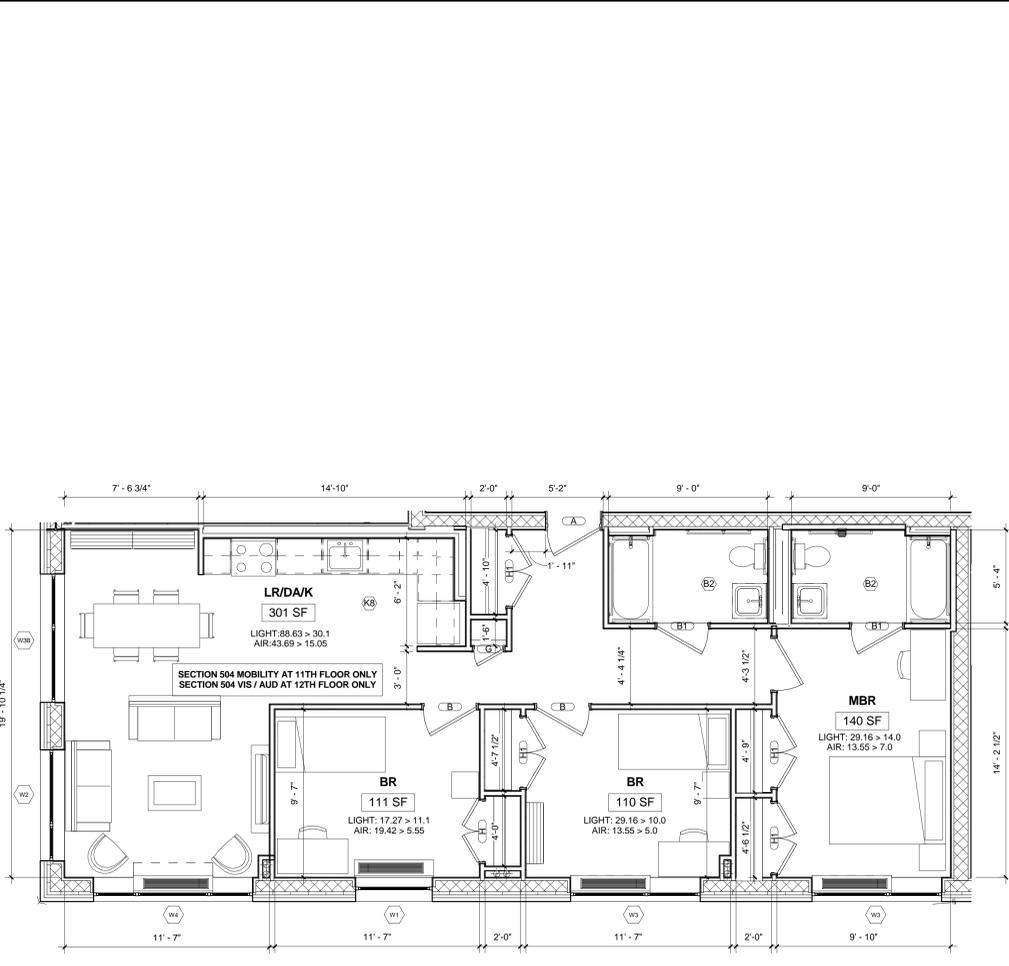
Client Representative:

Filing Representative:  
**James MacDonald Consulting**  
225 Broadway  
New York, NY 10007  
t: 212-389-9101  
f: 212-389-9101

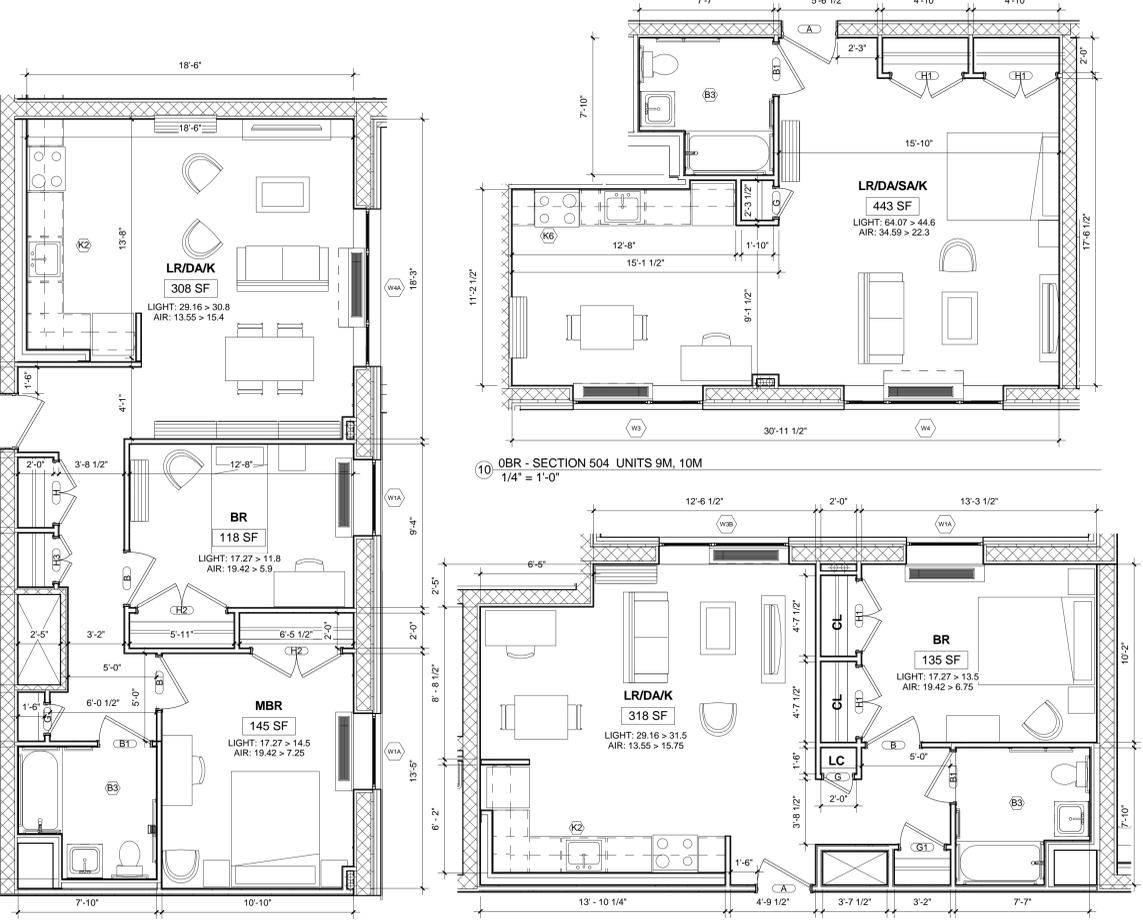
Do Not Scale Plans.  
Contractor to promptly notify Architect of any material variations between field conditions and existing conditions as indicated in Contract documents.

**9TH-12TH FLOOR  
ATYPICAL UNIT PLANS &  
SECTION 504 UNIT  
PLANS**

SEAL & SIGNATURE:	PROJECT No: 14002
	DRAWING BY: Author
	CHK BY: Checker
	DWG No: A-111.00
	SCALE: 1/4" = 1'-0"



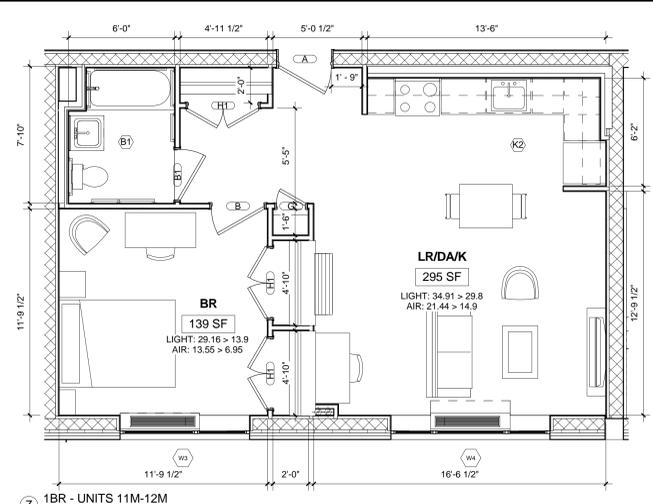
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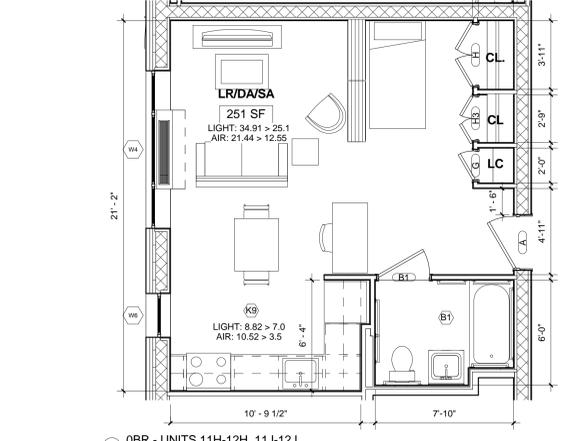
10BR - SECTION 504 UNITS 9M, 10M  
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9BR - SECTION 504 UNITS 3A, 6A, 8A  
1/4" = 1'-0"

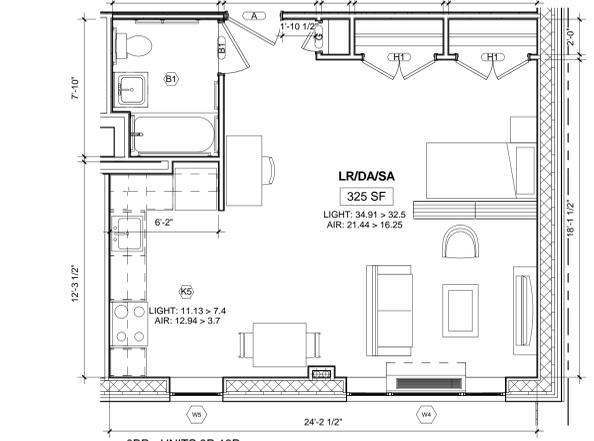
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1/4" = 1'-0"



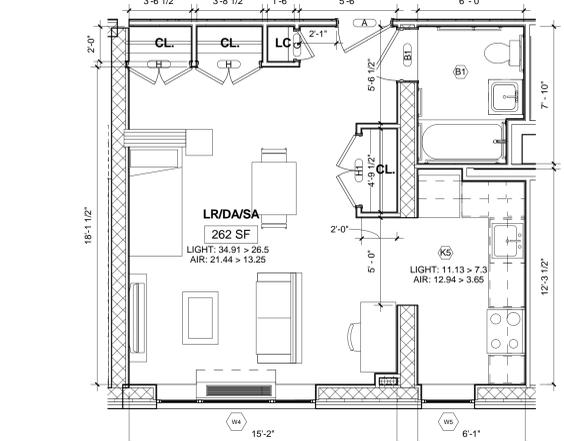
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1/4" = 1'-0"



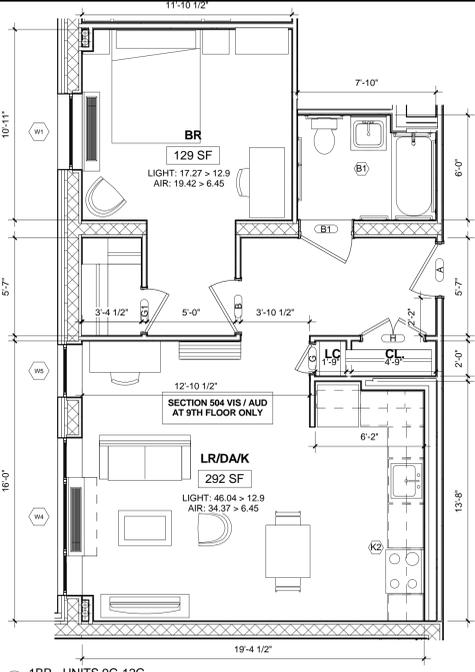
6BR - UNITS 11H-12H, 11J-12J  
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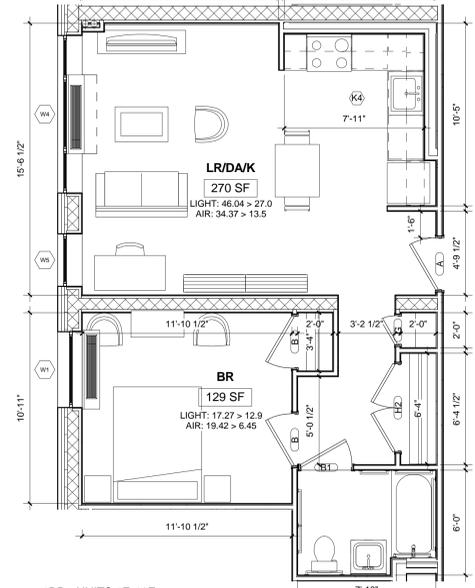
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1/4" = 1'-0"



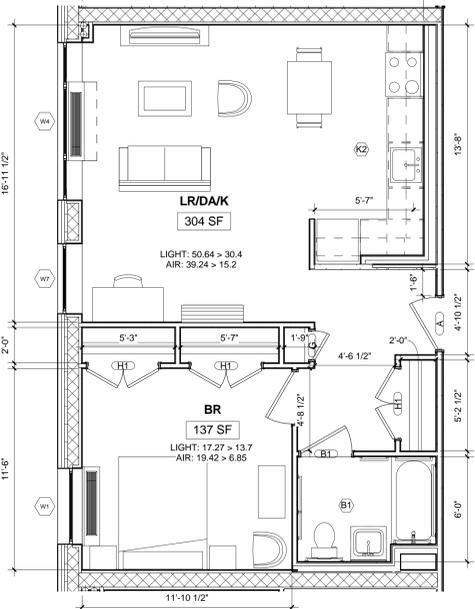
4BR - UNITS 9N-12N  
1/4" = 1'-0"



1BR - UNITS 9G-12G  
1/4" = 1'-0"



2BR - UNITS 9E-12E  
1/4" = 1'-0"



1BR - UNITS 9D-12D  
1/4" = 1'-0"

ACACIA GARDENS - NEW MIXED-USE BUILDING

413 East 120th Street  
New York, NY 10035

Owner:



BLOCK: 1808 LOT: 8  
NYC DOB #: 121190022



Key Plan:  
Issued:

NUMBER	DATE	DESCRIPTION
1	04.15.14	BLDS SUBMISSION
2	08.26.14	BLDS SUBMISSION
3	09.04.14	BLDS SUBMISSION
4	03.20.15	DOB SUBMISSION PREP SET
5	07.29.15	70% PRICING SET
7	09.22.15	BLDS SUBMISSION
8	10.15.15	DOB SUBMISSION
9	11.20.15	100% CONSTRUCTION DOCUMENTS

Revisions:  
Architect:  
**MAGNUSON**  
Magnusson Architecture & Planning PC  
42 West 39th Street  
New York, NY 10018  
Tel (212) 253 7820 Fax (212) 253 1276

Structural Engineer:  
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Landscape Architect:  
**MPFP p/c / M. Paul Friedberg & Partners**  
120 Broadway, Floor 20  
New York, NY 10021  
t: 212.477.6366 x.108  
f: 212.477.6548

Client Representative:

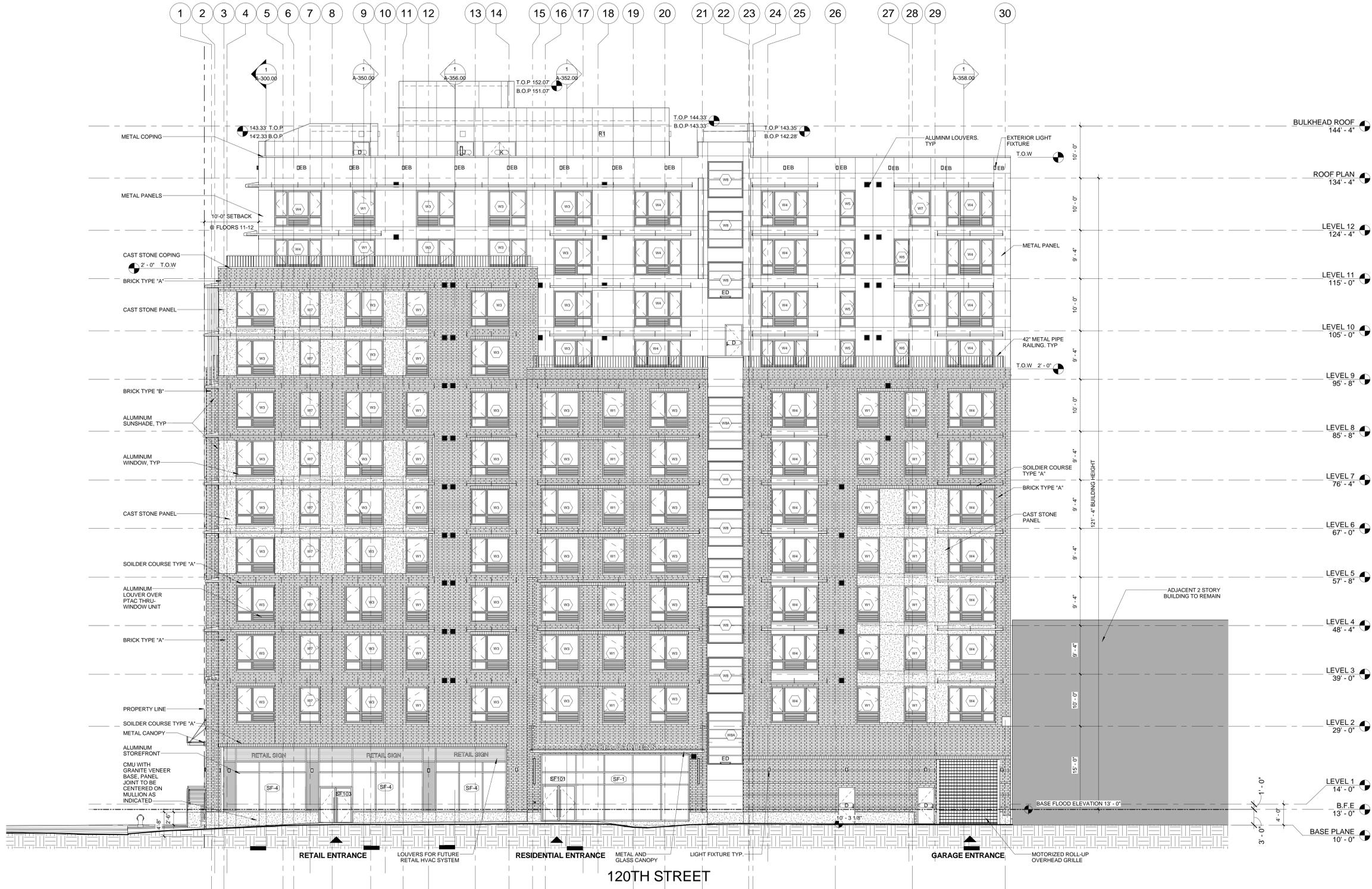
Filing Representative:  
**James MacDonald Consulting**  
225 Broadway  
New York, NY 10007  
t: 212-389-9101  
f: 212-389-9101

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SOUTH ELEVATION

SEAL & SIGNATURE:	PROJECT No: 14002
	DRAWING BY: Author
	CHK BY: Checker
	DWG No: A-200.00
	SCALE: 1/8" = 1'-0"



**ACACIA GARDENS - NEW MIXED-USE BUILDING**

413 East 120th Street  
New York, NY 10035

Owner:



BLOCK: 1808 LOT: 8  
NYC DOB #: 121190022



Key Plan:

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7	09.22.15	BLDS SUBMISSION
8	10.15.15	DOB SUBMISSION
9	11.20.15	100% CONSTRUCTION DOCUMENTS

Revisions:

Architect:

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MEP Engineer:  
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f: 212.477.6548

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f: 212-369-9101

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**NORTH ELEVATION**

SEAL & SIGNATURE:	PROJECT No: 14002
	DRAWING BY: Author
	CHK BY: Checker
	DWG No: A-201.00
	SCALE: 1/8" = 1'-0"



ACACIA GARDENS - NEW MIXED-USE BUILDING

413 East 120th Street  
New York, NY 10035

Owner:



BLOCK: 1808 LOT: 8  
NYCDOB#: 121190022



Key Plan:

NUMBER	DATE	DESCRIPTION
1	04.15.14	BLDS SUBMISSION
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5	07.29.15	70% PRICING SET
7	09.22.15	BLDS SUBMISSION
8	10.15.15	DOB SUBMISSION

Revisions:

Architect:

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Structural Engineer:  
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t: 212.545.7878

MEP Engineer:  
**Johnson & Urban, LLC**  
295 Highway 34  
Cotts Neck, NJ 07722  
t: 732.772.1500  
f: 732.772.1515

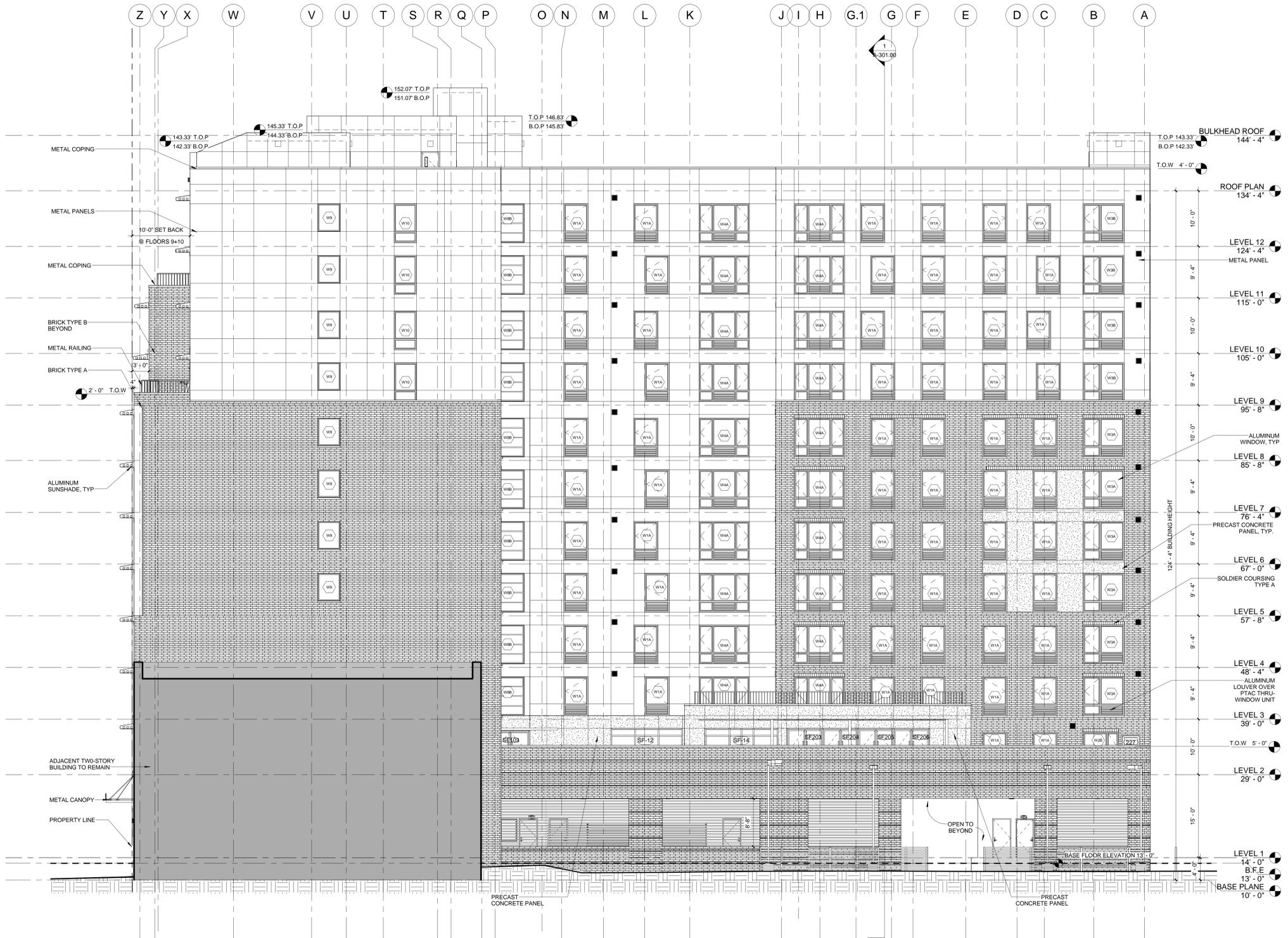
Landscape Architect:  
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Client Representative:

Filing Representative:  
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Do Not Scale Plans.  
Contractor to promptly notify Architect of any material variations between field conditions and existing conditions as indicated in Contract documents.

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EAST ELEVATION

SEAL & SIGNATURE:	PROJECT No: 14002
	DRAWING BY: Author
	CHK BY: Checker
	DWG No: A-202.00
	SCALE: 1/8" = 1'-0"

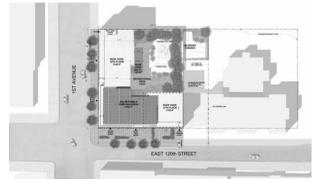
**ACACIA GARDENS - NEW MIXED-USE BUILDING**

413 East 120th Street  
New York, NY 10035

Owner:



BLOCK: 1808 LOT: 8  
NYCDOB#: 121190022



**Key Plan:**

NUMBER	DATE	DESCRIPTION
1	04.15.14	BLDS SUBMISSION
2	08.26.14	BLDS SUBMISSION
3	09.04.14	BLDS SUBMISSION
4	03.20.15	DOB SUBMISSION PREP SET
5	07.29.15	70% PRICING SET
7	09.22.15	BLDS SUBMISSION
8	10.15.15	DOB SUBMISSION
9	11.20.15	100% CONSTRUCTION DOCUMENTS

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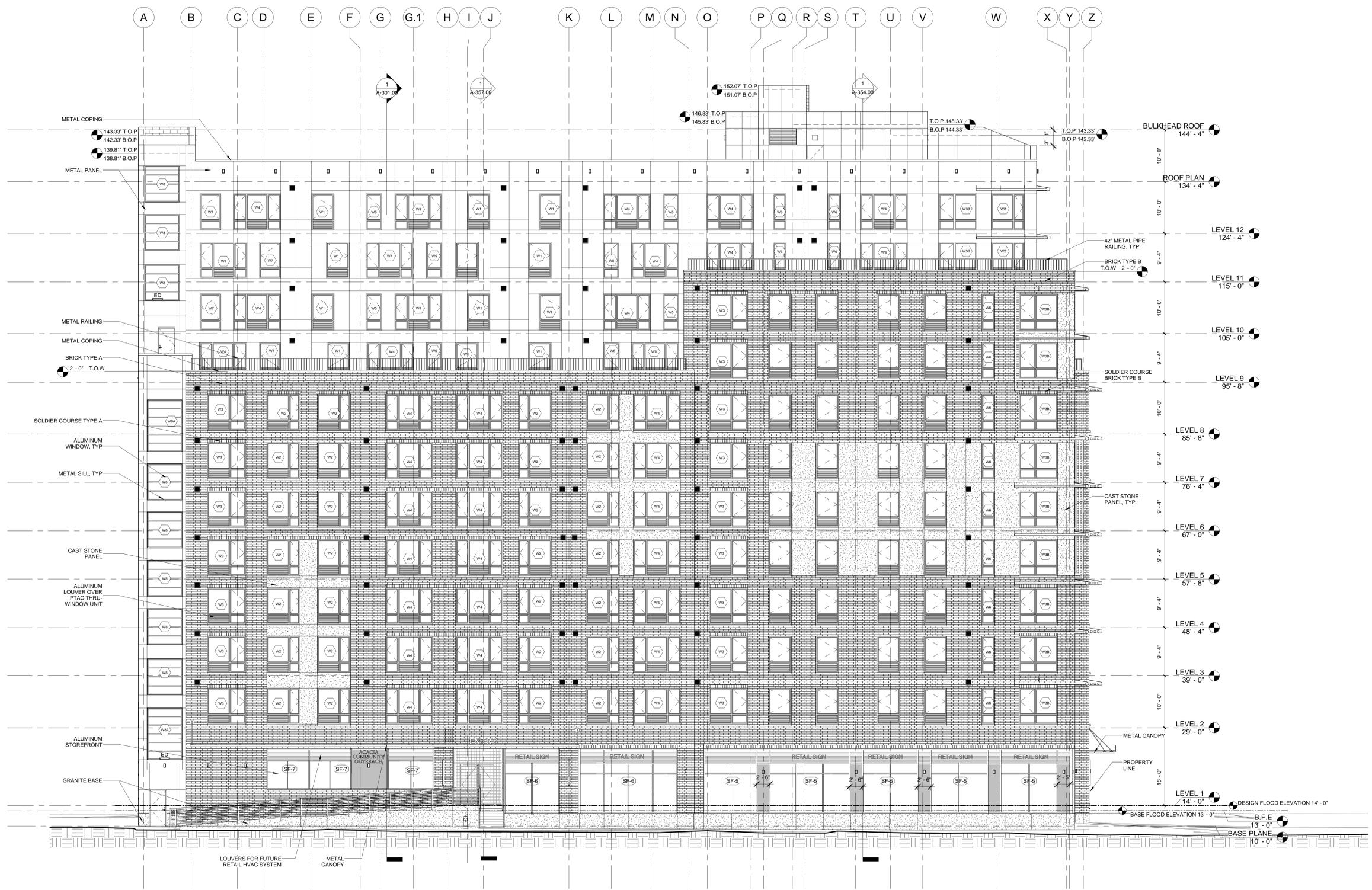
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**WEST ELEVATION**

SEAL & SIGNATURE: \_\_\_\_\_

PROJECT No: 14002  
DRAWING BY: Author  
CHK BY: Checker  
DWG No: \_\_\_\_\_

**A-203.00**

SCALE: 1/8" = 1'-0"



ACACIA GARDENS - NEW MIXED-USE BUILDING

413 East 120th Street  
New York, NY 10035

Owner:



BLOCK: 1808 LOT: 8  
NYCDOB#: 121190022



Key Plan:

NUMBER	DATE	DESCRIPTION
5	07.29.15	70% PRICING SET
7	08.22.15	BLDS SUBMISSION
8	10.15.15	DOB SUBMISSION
9	11.20.15	100% CONSTRUCTION DOCUMENTS

Revisions:

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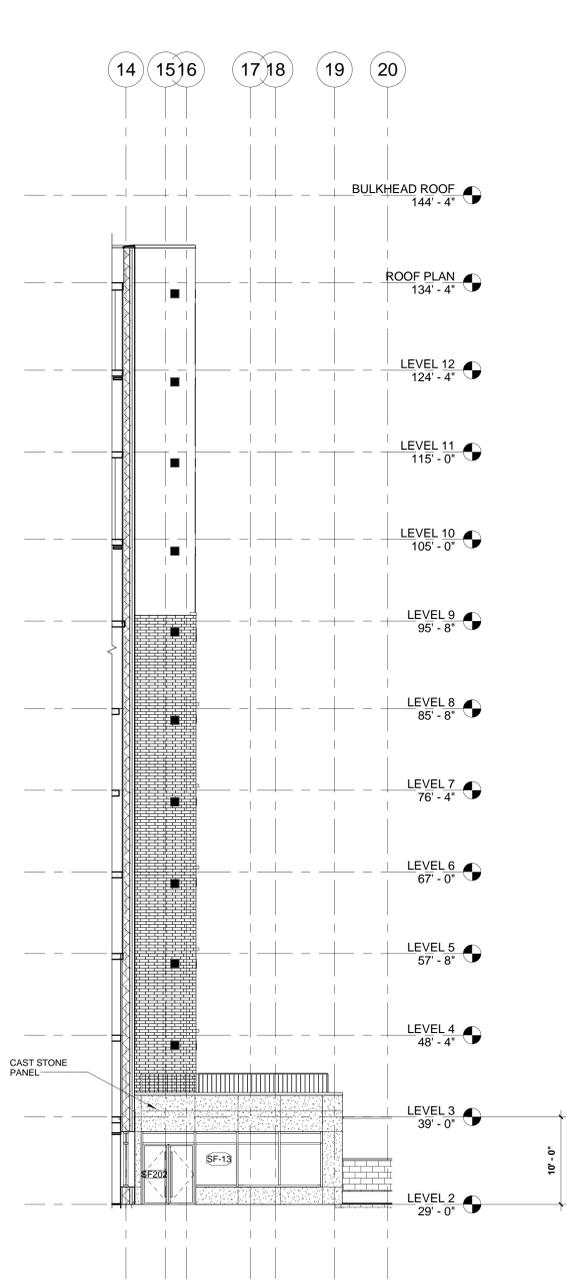
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f: 212-389-9101

Do Not Scale Plans.  
Contractor to promptly notify Architect of any material variations between field conditions and existing conditions as indicated in Contract documents.

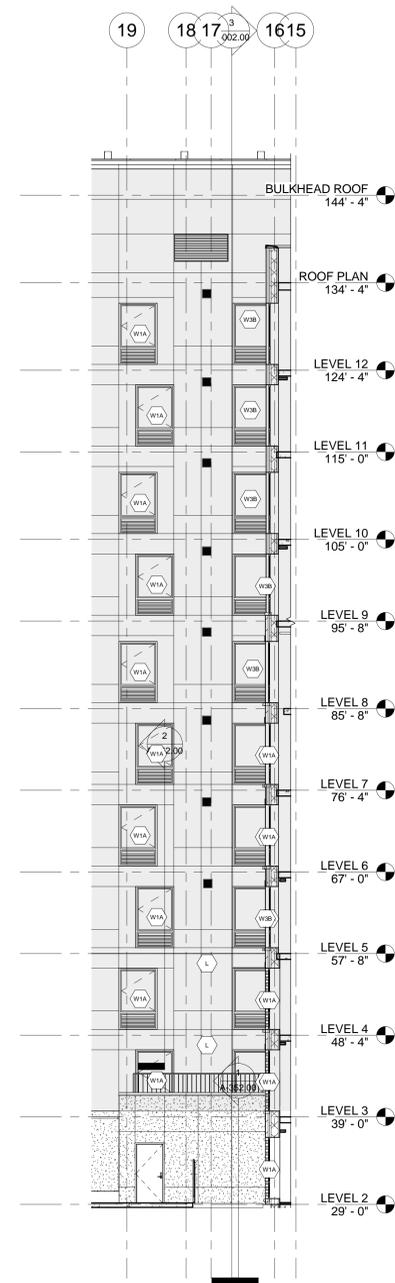
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PARTIAL ELEVATIONS

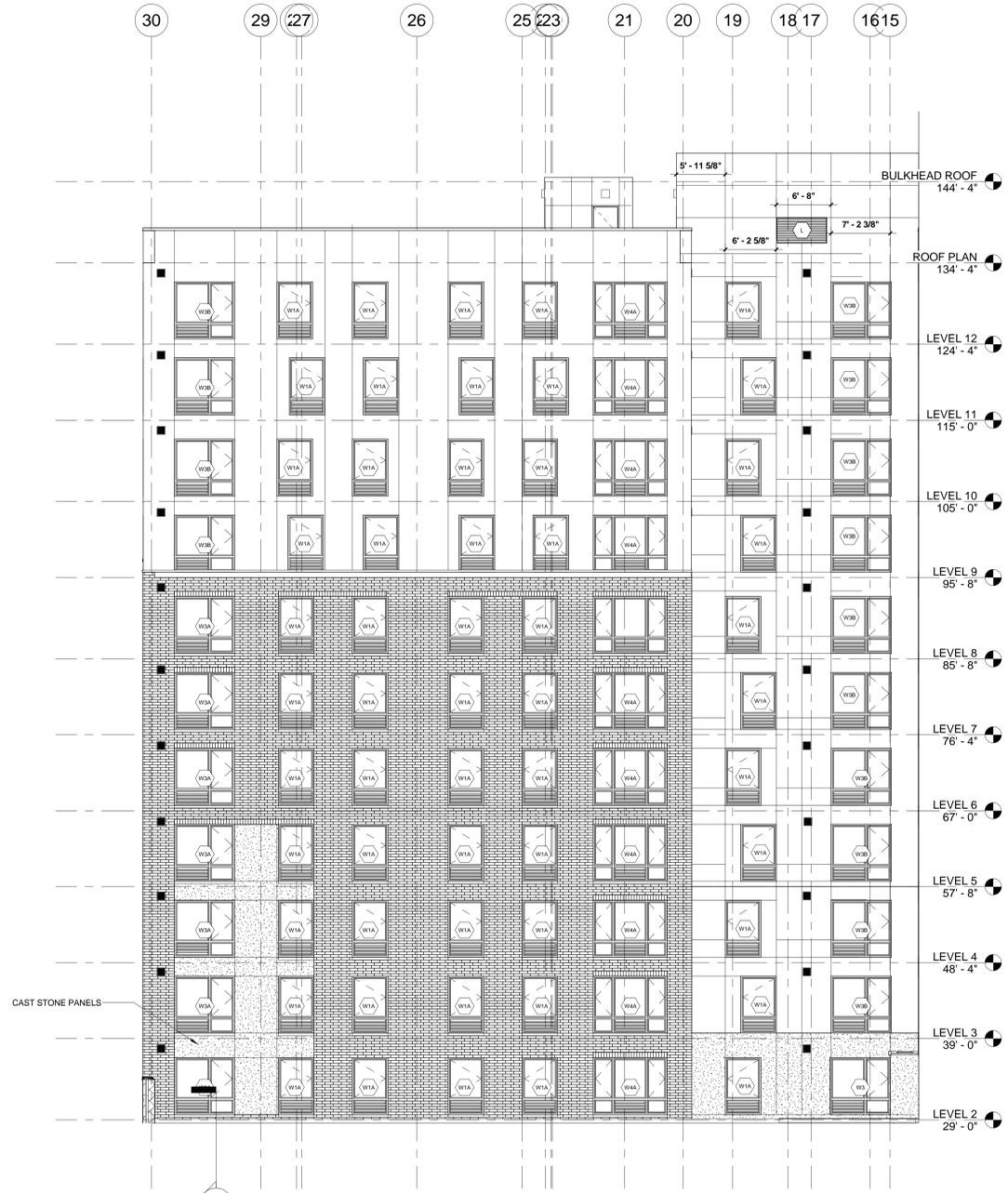
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	CHK BY: Checker
	DWG No: A-205.00
	SCALE: 1/8" = 1'-0"



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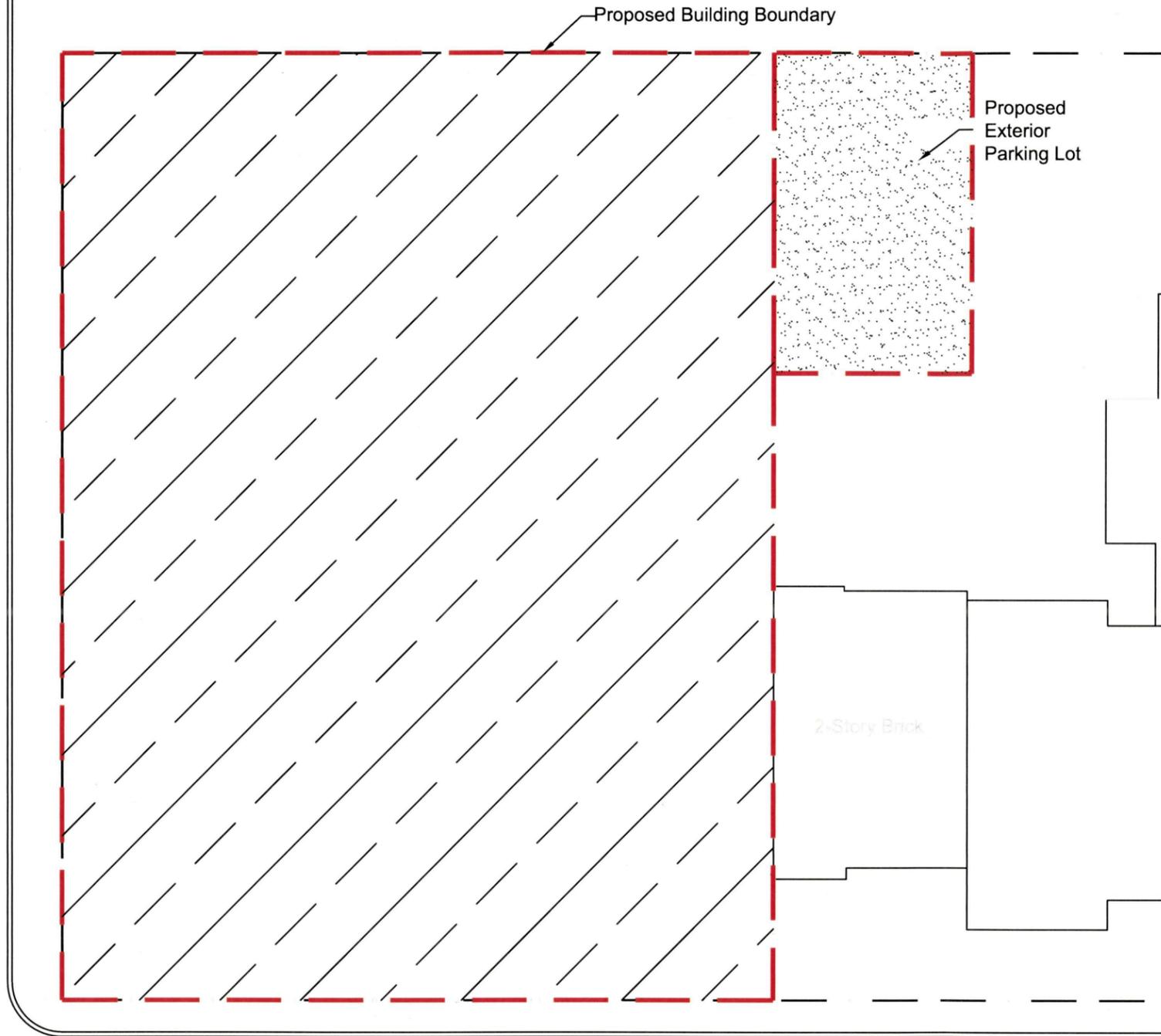
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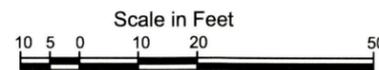
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First Avenue



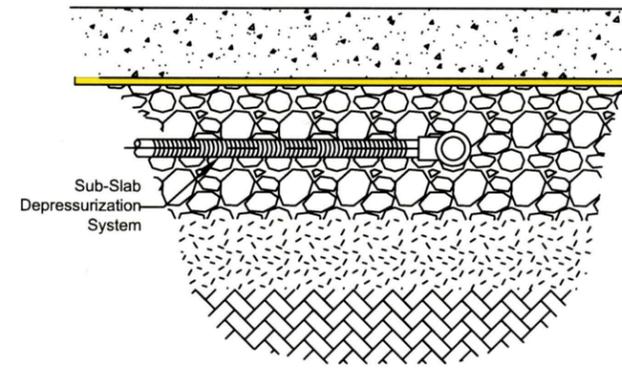
East 120th Street



Legend

-  Cover System Beneath Building Slab
-  Cover System Beneath Exterior Parking Lot

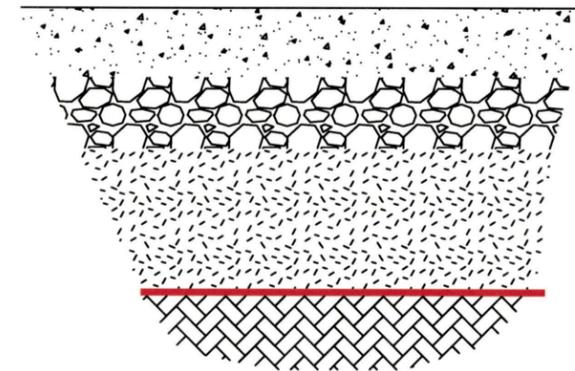
Typical Cover System Layout Below Building Slab



N.T.S.

- ← 6" Layer of Concrete Slab
- ← 20-mil Vapor Barrier
- ← 12" Layer of 3/4" Gravel
- ← 6" Layer of Imported Clean Soil
- ← Native Soil

Typical Cover System Layout Below Exterior Parking Lot



N.T.S.

- ← 6" Layer of Asphalt
- ← 6" Layer of Clean Granular Sub-Base Material
- ← 18" Layer of Imported Clean Soil
- ← Demarcation Layer
- ← Native Soil



TITLE: Side-Wide Cover System Plan			
401 East 120th Street, New York, New York			
DRAWN BY: WF	REVISED BY:	PROJECT No. 2014-142	
CHECKED BY: JC	REVISED DATE:	FIGURE No. 11	
DATE: 11-17-2015	APPROVED BY:		
SCALE: N. T. S.	FILE NAME:		

Tel: (631) 616-4000 Fax: (631) 980-7972  
 www.CiderEnvironmental.com  
 6268 Jericho Tpke, Suite 12, Commack, NY 11725



## **APPENDIX B**

### **Construction Health and Safety Plan**

# Construction Health and Safety Plan

---

**November 2015**

**Subject Property:**

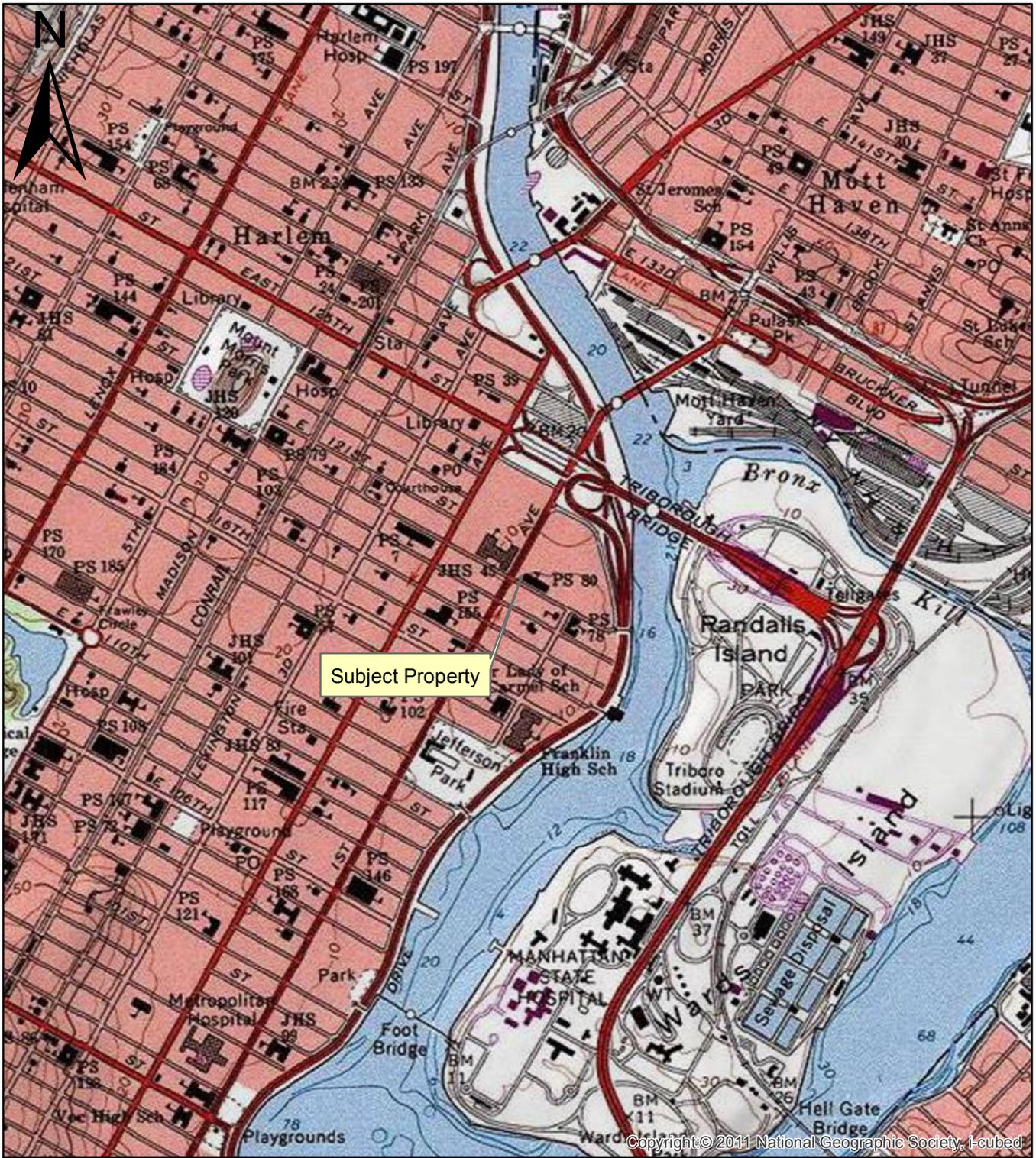
401 East 120th Street  
New York, New York

**Prepared for:**

ACACIA Gardens Housing Development Fund Corporation  
300 East 175<sup>th</sup> Street  
Bronx, NY

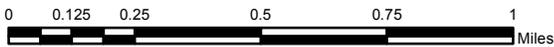
**Prepared by:**

Cider Environmental  
6268 Jericho Turnpike, Suite 12  
Commack, NY 11725



USGS 7.5 Minute Quadrangle Topographic Map (2011)

SCALE: 1:24,000



TITLE	SITE LOCATION MAP		Figure No.
			01
PROJECT	413 East 120th Street New York, NY		Project No.
			2014-142
	DESIGN	WF	12-4-2014
	CHECK		
	REVIEW		





413 E 120th St, New York, NY 10035

1. Head **southeast** on **E 120th St** toward **Pleasant Ave**

go 489 ft  
total 489 ft



2. Take the 1st right onto **Pleasant Ave**

go 0.2 mi  
total 0.2 mi



3. Turn right at the 3rd cross street onto **E 117th St**  
About 1 min

go 0.3 mi  
total 0.5 mi



4. Turn left at the 2nd cross street onto **2nd Ave**  
About 4 mins

go 1.1 mi  
total 1.6 mi



5. Turn right onto **E 96th St**  
About 2 mins

go 0.4 mi  
total 2.0 mi



6. Turn right onto **Madison Ave**  
Destination will be on the right

go 0.1 mi  
total 2.1 mi



**MOUNT SINAI MEDICAL CENTER**

1425 Madison Ave, New York, NY 10029

## Construction HEALTH AND SAFETY PLAN

**Client:** ACACIA Gardens Housing Development Fund Corporation  
**Project:** NYC OER VCP Site Redevelopment  
**Activities:** Soil/fill excavation, trucking and disposal; Installation of vapor barrier, sub-slab depressurization system and cover system.  
**Location:** 401 East 120th Street, New York, New York  
**Chemical Hazards:** Volatile Organic Compounds, Semi-Volatile Organic Compounds, Metals, Pesticides, Polychlorinated Biphenyls  
**Prepared By:** Cider Environmental, LLC

**Date:** November 2, 2015

### Client Contact

<u>Title</u>	<u>Name</u>	<u>Telephone</u>
Client Representative	David Almonte	347-649-3134

### Cider Key Personnel

<u>Title</u>	<u>Name</u>	<u>Telephone</u>
Project Manager:	James Cressy	(631) 616-4000
Site Health & Safety Officer:	Shuangtao Zhang	(631) 428-7521

CIDER ENVIRONMENTAL, LLC DO NOT GUARANTEE THE HEALTH OR SAFETY OF ANY PERSON ENTERING THIS SITE. DUE TO THE NATURE OF THIS SITE AND THE ACTIVITY OCCURRING THEREON, IT IS NOT POSSIBLE TO DISCOVER, EVALUATE, AND PROVIDE PROTECTION FOR ALL POSSIBLE HAZARDS WHICH MAY BE ENCOUNTERED. STRICT ADHERENCE TO THE HEALTH AND SAFETY GUIDELINES SET FORTH HEREIN WILL REDUCE, BUT NOT ELIMINATE, THE POTENTIAL FOR INJURY AT THIS SITE. THE HEALTH AND SAFETY GUIDELINES IN THIS PLAN WERE PREPARED SPECIFICALLY FOR THIS SITE AND SHOULD NOT BE USED ON ANY OTHER SITE WITHOUT PRIOR RESEARCH AND EVALUATION BY A TRAINED HEALTH AND SAFETY SPECIALIST.

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APPENDIX D	Material Safety Data Sheet

## 1 Introduction

### 1.1 Purpose

This Construction Health and Safety Plan (CHASP) has been developed to comply with the regulations under Occupational Safety and Health Administration (OSHA) 29 CFR 1910.1025. It addresses foreseeable activities associated with the site work activities to be conducted at 401 East 120th Street, New York, New York (herein referred to as the "Site" or "Subject Property". See **Figure 1** for site location).

This CHASP establishes personnel protection standards and mandatory safety practices and procedures. Additionally, it assigns responsibilities, establishes standard operating procedures, and provides for contingencies that may arise while operations are being conducted at known or suspected hazardous waste sites.

Cider personnel involved with inspection of site work activities which involve the displacement of soil and/or material or dewatering of excavations in the identified Area of Concern (AOC) during the proposed development shall comply with the requirements of this CHASP. All personnel engaged in onsite activities will read this document carefully and complete the Field Personal Review (**Section 11**). Contractors and subcontractors work in identified AOC will provide their own CHASP (equal or more stringent than the Cider CHASP) and are solely responsible for their own workers Health and Safety and providing a safe working environment in accordance with all applicable federal, state and local requirements. Each Subcontractor will have a designated Site Health and Safety Coordinator who will be responsible for ensuring that the designated procedures are implemented in the field. The level of protection and the procedures specified in this CHASP represent the minimum health and safety requirements to be observed by site personnel. Should an employee find himself or herself in a potentially hazardous situation, the employee will immediately discontinue the hazardous procedures(s) and either personally effect appropriate preventative or corrective measures, or immediately notify the Project Manager of the nature of the hazard. In the event of an immediately dangerous or life threatening situation, the employee always has "stop work" authority.

### 1.2 Site Condition

The Site is located at 401 East 120<sup>th</sup> Street in the East Harlem section in borough of New York, New York and is identified as the western portion of Block 1808 and Lot 8 on the New York City Tax Map. The Site is approximately 39,000 square feet and is bounded by 15-story apartment buildings to the north; East 120<sup>th</sup> Street followed by numerous commercial retail, offices, institutional and residential buildings to the south; commercial buildings on the remainder of Lot 8 followed by a 15-story apartment building to the

east; and 1<sup>st</sup> Avenue followed by John S. Roberts Junior High School to the west. Currently, the Site is used as school/offices/multi-uses and contains an approximately 4,480-square foot, one 1-story building. The remainder of the Site consists of an asphalt-paved parking lot.

### 1.3 Scope of Work

The site work activities which will require the oversight by Cider include the following scope and will include the completion of:

- Excavation of the entire Site to approximately 2 feet bgs.
- Excavation of the petroleum impacted soil in the vicinity of the former gasoline station on the southwestern corner.
- Transport the excavated soil/fill for off-site disposal.
- Removal of six known 550-gal USTs from the southwestern portion of the Site. Removal of other unknown USTs that are encountered during soil/fill removal actions.
- Installation of sub-slab depressurization system.
- Installation of vapor barrier system.
- Installation of a site-wide covering system.

Details of the scopes of work to be completed are provided within the Remedial Action Work Plan (RAWP), dated November 2015 prepared by Cider Environmental.

## 2 Project Team and Responsibilities

### 2.1 Project Manager

The Project Manager will be responsible for implementing the project and obtaining any necessary personnel or resources for the completion of the project. Specific duties will include:

- Coordinating the activities of all construction and Remedial Personnel, to include informing them of the required Personal Protective Equipment (PPE) and insuring their signature acknowledging this CHASP;
- Selecting a Site Health and Safety Officer and field personnel for the work to be undertaken on site;
- Ensuring that the tasks assigned are being completed as planned and on schedule;
- Providing authority and resources to ensure that the Site Health and Safety Officer is able to implement and manage safety procedures;
- Preparing reports and recommendations about the project to clients and affected personnel;
- Ensuring that all persons allowed to enter the site are made aware of the potential hazards associated with the substances known or suspected to be on site, and are knowledgeable as to the on-site copy of the specific CHASP;
- Ensuring that the Site Health and Safety Officer is aware of all of the provisions of this CHASP and is instructing all personnel on site about the safety practices and emergency procedures defined in the plan;
- Serving as liaison with public officials where there is no Public Affairs official designated.

### 2.2 Site Health and Safety Officer

The Site Health and Safety Officer shall be responsible for the implementation of the CHASP on site.

Specific duties will include:

- Monitoring the compliance of construction and environmental remediation activities personnel (field personnel) for the routine and proper use of the PPE that has been designated for each task;
- Routinely inspecting PPE and clothing to ensure that it is in good condition and is being stored and maintained properly;
- Stopping work on the site or changing work assignments or procedures if any operation threatens the health and safety of workers or the public;
- Monitoring personnel who enter and exit the site and all controlled access points.
- Reporting any signs of fatigue, work-related stress, or chemical exposures to the Project Manager;

- Dismissing field personnel from the site if their actions or negligence endanger themselves, co-workers, or the public, and reporting the same to the Project Manager;
- Reporting any accidents or violations of the CHASP plan to the Project Manager and documenting the same for the project in the records;
- Knowing emergency procedures, evacuation routes, and the telephone numbers of the ambulance, local hospital, poison control center, fire and police departments;
- Ensuring that all project-related personnel have signed the personnel agreement and acknowledgments form contained in this CHASP;
- Coordinate upgrading and downgrading PPE as necessary due to changes in exposure levels, monitoring results, weather, and other site conditions;
- Perform air monitoring with approved instruments in accordance with requirements stated in this CHASP.

### 3 Hazard Analysis and Control Measures

This section presents an assessment of the general, chemical, physical and biological hazards that may be encountered during the tasks specified under this CHASP.

#### 3.1 General Hazard Assessment

A general hazard assessment was conducted for the required field work described in Section 1.3 and the following potential hazards have been identified:

- Inhalation of volatile contaminants;
- Skin and eye contact with contaminants;
- Ingestion of contaminants;
- Inhalation of dusts impacted with semi-volatile, metals and PCB contaminants;
- Physical hazards associated with the use of heavy equipment;
- Excavation hazards;
- Tripping hazards;
- Noise exposure;
- Heat stress (depending on weather conditions);
- Cold exposure (depending on weather conditions);
- Flammable hazards;
- Electrical hazards; and,
- Use of personal protective equipment.

Specific chemical, physical and biological hazards are discussed below. Mitigation and controls will include as needed work procedures, work/rest regiment, dust control measures, personal protective equipment, and respiratory protection as appropriate.

#### 3.2 Chemical Exposure Hazards

The following chemical hazard evaluation is based on the previous environmental investigation of the site. The evaluation has been conducted to identify chemicals/ materials that potentially may be present at the site, and to ensure that work activities, personnel protection, and emergency response are consistent with the specific contaminants that potentially could be encountered.

##### *3.2.1 Chemical Hazard Exposure Routes*

Potential hazards and their exposure routes include:

- Inhalation of organic vapors due to the presence of volatile organic compounds from diesel-powered equipment.
- Inadvertent ingestion of potentially toxic substances via hand to mouth contact or deliberate ingestion of materials inadvertently contaminated with potentially toxic materials. Included in this list are polycyclic aromatic hydrocarbons (PAHs), pesticides and metals.
- Dermal exposure and possible percutaneous (skin) absorption of certain lipophilic (readily absorbed through the skin) PAHs and pesticides.
- Skin and eye contact with contaminants at the site and decontamination activities.

### *3.2.2 Control of Exposure to Chemical Hazards*

To protect potentially exposed personnel the following procedures and protocols will be adopted and used as needed: work procedures will be adhered to, work zones will be established, dust control will be utilized, respirators (if required) and personal protective equipment will be worn, area air monitoring will be conducted during times of disturbance of the impacted fill material. Strict personnel decontamination procedures will be followed.

## 3.3 Physical Hazards

### *3.3.1 Explosion and Fire*

#### 3.3.1.1 Flammable Vapors

The presence of flammable vapors can pose a potential fire and health hazard. Hazard reduction procedures include monitoring the ambient air with an oxygen/LEL meter (combustible gas indicator). If the LEL reading exceeds 20%, all work will stop and employees will leave the site immediately and contact the fire department.

#### 3.3.1.2 High Oxygen Levels

Atmospheres that contain a level of oxygen greater than 23% pose an extreme fire hazard (the usual ambient oxygen level is approximately 20.5%). All personnel encountering atmospheres that contain a level of oxygen greater than 23% must evacuate the site immediately and must notify the Fire Department.

#### 3.3.1.3 Fire Prevention

During equipment operation, periodic vapor concentration measurements should be taken with an explosimeter or combustimeter. If at any time the vapor concentrations exceed 20% of the lower explosive limit (LEL), then the Site Health and Safety Officer should immediately shut down all operations.

Only approved safety cans will be used to transport and store flammable liquids. All gasoline and diesel-driven engines requiring refueling must be shut down and allowed to cool prior to filling.

Smoking is not allowed during any operations within the work area in which petroleum products or solvents in free-floating, dissolved, or vapor forms, or other flammable liquids may be present.

No open flame or spark is allowed in any area containing petroleum products or other flammable liquids.

### *3.3.2 Vehicular Traffic*

All employees will be required to wear a fluorescent safety vest at all times while on site. In addition, supplemental traffic safety equipment use can be exercised when warranted by specific task.

Supplemental equipment can be items such as cones, flags, barricades, and/or caution tape. Drivers of waste transportation vehicles will only exit vehicles in designated areas within the Support Zone. During this time, drivers will only be allowed to inspect the placement of waste loads and cover their trailers.

### *3.3.3 Noise Hazards*

Hearing protection shall be provided to the employees where sound pressure levels exceed 85 dB.

Hearing protection shall be worn where sound pressure levels in areas and/or on equipment exceeds 90 dB. Typical heavy excavation operations have been monitored with a sound level meter and indicate that hearing protection is required for all personnel while engaged in this action.

### *3.3.4 Safe Material Handling*

Skin and eye contact with impacted soil/fill may occur during excavation, handling and decontamination activities. Nitrile gloves and approved safety glasses must be worn to prevent exposure to the associated contaminants. Employees working at or near (within ten feet of) excavation fronts could be required to wear respiratory protection. If necessary, all associated activities will be performed pursuant to 29 C.F.R. § 1910 Parts 1926.134 (a)(2) and 1926.55.

### *3.3.5 Heat Stress Hazards*

Heat stress may occur even in moderate temperature areas and may present any or all of the following:

- Heat Rash. Result of continuous exposure to heat, 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. Signs include severe spasms and pain in the extremities and abdomen.
- Heat Exhaustion. Result of 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; and dizziness.

- 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 include red, hot, dry skin, absence of perspiration, nausea, dizziness and confusion, strong, rapid pulse that could lead to coma or death.

#### Heat Stress Prevention

- 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". Employees must be encouraged to drink more than the amount required in order to satisfy thirst.
- Use cooling devices to aid the natural body ventilation. Cooling occurs through evaporation of perspiration and limited body contact with heat-absorbing protective clothing. Utilize fans and air conditioners to assist in evaporation. Long, cotton underwear is suggested to absorb perspiration and limit any contact with heat-absorbing protective clothing (i.e., coated Tyvek suits).
- Conduct non-emergency response activities in the early morning or evening during very hot weather.
- Provide shelter against heat and direct sunlight to protect personnel. Take breaks in shaded areas.
- Rotate workers utilizing protective clothing during hot weather.
- Establish a work regime that will provide adequate rest periods, with personnel working in shifts.

#### 3.3.6 Cold Exposure Hazards

Work schedules will be adjusted to provide sufficient rest periods in a heated area for warming up during operations conducted in cold weather. Also, thermal protective clothing such as wind and/or moisture resistant outerwear is recommended to be worn.

If work is performed continuously in the cold at or below  $-7^{\circ}\text{C}$  ( $20^{\circ}\text{F}$ ), including wind chill factor, heated warming shelters (tents, cabins, company vehicles, rest rooms, etc.) shall be made available nearby and the worker should be encouraged to use these shelters at regular intervals, the frequency depending on the severity of the environmental exposure. The onset of heavy shivering, frostnip, the feeling of excessive fatigue, drowsiness, irritability, or euphoria, are indications for immediate return to the shelter. When entering the heated shelter, the outer layer of clothing shall be removed and the remainder of the clothing loosened to permit sweat evaporation. A change of dry work clothing shall be provided as necessary to prevent workers from returning to their work with wet clothing.

Dehydration, or the loss of body fluids, occurs in the cold environment and may increase the susceptibility of the worker to cold injury due to a significant change in blood flow to the extremities.

Warm sweet drinks and soups should be provided at the work site to provide caloric intake and fluid volume. The intake of coffee should be limited because of a diuretic and circulatory effect.

### 3.4 Biological Hazards

During the course of the project, there is a potential for workers to come into contact with biological hazards such as animals and insects. As the potential for exposure to blood born pathogens during site investigation is anticipated to be low, a Blood Born Pathogen Exposure Plan (BBPEP) is not required

#### 3.4.1 *Animals*

During site operations, animals such as dogs, cats, pigeons, mice, and rats may be encountered. Workers shall use discretion and avoid all contact with animals. Bites and scratches from dogs and cats can be painful and if the animal is rabid, the potential for contracting rabies exists. Contact with rat and mice droppings may lead to contracting hantavirus. Inhalation of dried pigeon droppings may lead to psittacosis. Cryptococcosis and histoplasmosis are also diseases associated with exposure to dried bird droppings but these are less likely to occur in this occupational setting.

#### 3.4.2 *Insects*

Insects, including bees, wasps, hornets, mosquitoes, spiders, and ticks may be present at the site. Some individuals may have a severe allergic reaction to an insect bite or sting that can result in a life threatening condition. In addition, mosquito bites may lead to St. Louis encephalitis or West Nile encephalitis.

## 4 Personnel Training

### 4.1 Pre-assignment and OSHA Training

All Cider personnel that will be in direct contact (that is hand digging, sampling, processing) with the native soil/fill materials must complete an initial 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training course and, where necessary, a current eight hour refresher course (as required annually after initial 40-hour training completion). Personnel that will not be in direct contact with native soil/fill materials are only required to prove they have read and understood the procedures presented in this CHASP.

The Site Health and Safety Officer will conduct an on-site training meeting for all personnel and observers that could potentially be exposed to the native soil/fill material during construction activities. Training meetings will be provided routinely for any new project personnel. This program will cover specific health and safety equipment and protocols and potential problems inherent to each project operation. The Site Health and Safety Officer will be present for any activities being performed that will involve the handling of soil/fill during construction activities to provide supervision on exposure reduction. This may include insuring the use of proper PPE and air quality monitoring.

### 4.2 Respirator Requirements

#### 4.2.1 *Respirator Requirements and Fit Testing*

The OSHA respiratory protection standard, 29 CFR 1910.134, under paragraph (f)(2), requires fit testing for all employees using tight fitting respirators including filtering facepiece respirator. The fit test must be performed before the respirator is used and must be repeated at least annually and whenever a different respirator facepiece is used or a change in the employee's physical condition could affect the respirator fit.

The user seal check is a separate requirement under paragraph (g)(1)(iii) and must be performed each time the employee dons the respirator. Employers must adhere to the recommendations of the respirator's manufacturer; different manufacturers recommend different procedures.

#### 4.2.2 *Medical Surveillance*

OSHA requires a medical evaluation to determine whether each employee required to wear a respirator is physically able to wear a respirator and perform the work. This evaluation can be a medical examination or an evaluation of employee responses to the OSHA Respirator Medical Evaluation Questionnaire located in Appendix C of the Respiratory Protection Standard. Either method must be performed by a physician or other licensed healthcare professional.

## 5 Personal Protective Equipment

### 5.1 Levels of Protection

PPE must protect workers from the specific hazards they are likely to encounter on site. Selection of the appropriate PPE must take into consideration: (1) identification of the hazards or suspected hazards; (2) potential exposure routes; and, (3) the performance of the PPE construction (materials and seams) in providing a barrier to these hazards.

Based on anticipated site conditions and the proposed work activities to be performed at the Site, modified Level D Protection will be used. The upgrading/downgrading of these levels of protection will be based on continuous air monitoring results. The levels of protection are described below.

#### • Level D Protection

- a) Safety glasses w/ sideshields or chemical splash goggles
- b) Safety boots/shoes (toe-protected)
- c) Hard hat
- d) Long sleeve work shirt and work pants
- e) Nitrile gloves
- f) Hearing protection (as needed)
- g) Reflective traffic vest

#### • Level D Protection (Modified)

- a) Safety glasses w/ sideshields or chemical splash goggles
- b) Safety boots/shoes (toe-protected)
- c) Disposable chemical-resistant boot covers
- d) Coveralls (polycoated Tyvek or equivalent to be worn when contact with wet contaminated soil, groundwater, or non-aqueous phase liquids is anticipated)
- e) Hard hat
- f) Long sleeve work shirt and work pants
- g) Nitrile gloves
- h) Hearing protection (as needed)
- i) Reflective traffic vest

#### • Level C Protection

- a) Full face-piece, air-purifying, cartridge\*-equipped, NIOSH-approved respirator [\* combo cartridge P100/OV/CL/HC/SD/CD/HS (escape)]

- b) Inner (latex) and outer (nitrile) chemical-resistant glove
- c) Chemical-resistant safety boots/shoes (toe-protected)
- d) Disposable chemical-resistant boot covers
- e) Hard hat
- f) Long sleeve work shirt and work pants
- g) Coveralls (Tyvek or equivalent, poly-coated Tyvek will be worn when contact, or anticipated contact with wet contaminated soils, groundwater, and/or non-aqueous phase liquids (NAPL) is anticipated )
- h) Hearing protection (as needed)
- i) Reflective traffic vest

## 5.2 Respirator Fit-Test

All Cider personnel and subcontractors performing site work who could be exposed to hazardous substances at the work site are in possession of a full face-piece, air-purifying respirator and have been successfully quantitative fittested within the past year.

## 5.3 Respirator Cartridge Change-Out Schedule

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

- Cartridges shall be removed and disposed of at the end of each shift, when cartridges become wet or wearer experiences breakthrough, whichever occurs first.
- If the humidity exceeds 85%, then cartridges shall be removed and disposed of after 4 hours of use.
- Respirators shall not be stored at the end of the shift with contaminated cartridges left on. Cartridges shall not be worn on the second day, no matter how short the time period was the previous day they were used.

## 6 Air Monitoring Program

During site investigation/remediation, the air in work areas will be sampled periodically (on the site and at the property lines) for the presence of contaminants. Levels of organic vapors in the ambient air will be monitored during the fieldwork to ensure that appropriate levels of respiratory protection are employed at all times. Additionally, the testing will be performed to determine if changes to this plan are warranted to protect workers and the environment.

During site work involving disturbance of impacted fill material, real time air monitoring will be conducted for volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs). A photoionization detector (PID) and/or flame ionization detector (FID) will be used to monitor concentrations of VOCs at personnel breathing-zone height. Dust monitoring will be accomplished with an aerosol monitor. Air monitoring will be the responsibility of the Site Health and Safety Officer or designee. Air monitoring will be conducted approximately every 30 minutes during ground intrusive activities in the AOC on the project site. All manufacturers' instructions for instrumentation and calibration will be available onsite. Subcontractors' air monitoring plans must be equal or more stringent as the Cider plan.

### 6.1 Organic Compounds

Monitoring with a PID, such as a MiniRAE 2000 (11.7v) or equivalent will occur during intrusive work in the AOCs. Colorimetric Indicator Tubes for benzene may be used as backup for the PID, if measurements remain above background monitor every 2 hours. The Field Supervisor will monitor the employee breathing zone at least every 30 minutes, or whenever there is any indication that concentrations may have changed (odors, visible gases, appearance of drill cuttings, etc.) since the last measurement. Instrument action levels for monitored gases are:

<i>Photoionization Detector (PID)</i>	
<b>Concentrations (in ppm)</b>	<b>Level of PPE Required/Action Required</b>
< 15 ppm within AOC zone	Level D
> 15 ppm (initial)	Stop work. Resume work once readings are below 15 ppm.
> 15 ppm and < 30 ppm (steady state condition) within breathing zone	Level C/Initiate Perimeter Monitoring
> 30 ppm (steady state condition) within AOC zone	Stop Work / Suppress Emissions / Evacuate and reevaluate.
>5 ppm above background for the 15-minute average at downwind perimeter.	Stop Work/ Re-evaluate.
>5ppm and <25 ppm downwind perimeter of AOC Zone	Stop Work / Take corrective actions to abate emissions. Resume work if <5 ppm
>25 ppm at perimeter of work area	Stop work.

\*PID readings are taken at personnel breathing zone height using a 10.2V lamp PID or equivalent.

## 6.2 SVOCs, PCBs, Pesticides, and Metals

Based upon the site history, there is a potential for the soils to contain PAHs, PCBs, pesticides and metals. During invasive procedures which have the potential for creating airborne dust, such as excavation of dry soils, a real time airborne dust monitor such as a Mini-Ram should be used to monitor for air particulates. The Site Health and Safety Officer will monitor the employee breathing zone at least every 30 minutes, or whenever there is any indication that concentrations may have changed (appearance of visible dust) since the last measurement. Instrument action levels for dust monitoring are:

<i>Real Time Particulate Detection Meter</i>	
Concentration (mg/m <sup>3</sup> )	Level of PPE Required/Action Required
> 0.100 mg/m <sup>3</sup> above BKD (steady state condition) at perimeter of AOC zone for 15-minutes or visible dust.	Stop Work / Implement dust control / Continue dust monitoring if dust levels are less than 150 mg/m <sup>3</sup>
> 0.150 mg/m <sup>3</sup> above BKD (following dust suppression measures)	Stop Work / implement dust control, continue work once levels are <150 mg/m <sup>3</sup>

\*BKD = Background concentration

## 6.3 Noise Monitoring

As a standard work practice, hearing protection will be worn within the area that exceeds 85 dBA created by any loud machinery as a precaution. Hearing protection is required and should be used in designated areas of the site as indicated by the posted signs. If there is a reasonable possibility that workers may be exposed to an 8-hour time-weighted average exceeding 85 Dba specifically as a result of conducting the required tasks, noise monitoring will be conducted using a sound level meter. Work areas or tasks which pose an exposure risk greater than 85 dBA will require hearing protection.

The New York City Department of Environmental Protection (NYCDEP) has initiated construction noise rules effective 1 July 2007. Contractors employing construction equipment such as vacuum excavators, drill rigs, and jackhammers, are required by the rules to have noise mitigation plans. These plans will be available on site. Noise mitigation measures may include mufflers, etc. Boring activities will occur during daytime hours only to minimize noise disturbance to the community. In addition, no vehicles will idle for more than three minutes when not in use.

#### 6.4 Monitoring Equipment Calibration and Maintenance

Instrument calibration shall be documented and included in a dedicated safety and health logbook or on separate calibration pages of the field book. All instruments shall be calibrated before and after each shift. Calibration checks may be used during the day to confirm instrument accuracy. Duplicate readings may be taken to confirm individual instrument response. All instruments shall be operated in accordance with the manufacturers' specifications. Manufacturers' literature, including an operations manual for each piece of monitoring equipment will be maintained on site by the Site Health and Safety Officer for reference.

#### 6.5 Determination of Background Levels

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

## 7 Work Zone and Decontamination

### 7.1 Work Zone Definition

Work and support areas shall be established based on ambient air data and proposed work sites. They shall be established in order to contain contamination within the smallest areas possible and shall ensure that each employee has the proper PPE for the area or zone in which work is to be performed.

#### 7.1.1 Exclusion Zone

It is within this zone that the excavation or environmental remediation activities such as tank abandonment operations are performed. No one shall enter this zone unless the appropriate PPE is donned. The location of this zone will change as the construction-related excavation activities are performed.

#### 7.1.2 Contaminant Reduction Zone

It is within this zone that the decontamination process is undertaken. Personnel and their equipment must be adequately decontaminated before leaving this zone for the support zone. This zone will be set up between the EZ and the site boundary.

#### 7.1.3 Support Zone

The support zone is considered to be uncontaminated; as such, protective clothing and equipment are not required but should be available for use in emergencies. All equipment and materials are stored and maintained within this zone. Protective clothing is put on within the SZ before entering the EZ or the CRZ. The SZ will be established in a safe environment at least 50 feet away from the EZ.

### 7.2 Decontamination

In general, decontamination involves scrubbing with a detergent water solution followed by clean water rinses. All disposable items shall be disposed of in a dry container. Certain parts of contaminated respirators, such as harness assemblies and leather or cloth components, are difficult to decontaminate. If grossly contaminated, they may have to be discarded. Rubber components can be soaked in detergent and water and scrubbed with a brush. In addition to being contaminated, all respirators, non-disposable protective clothing, and other personal articles must be sanitized or replaced before they can be used again if they become soiled from exhalation, body oils, and perspiration. The manufacturer's instructions should be followed in sanitizing the respirator masks.

The Site Health and Safety Officer will be responsible for the proper maintenance, decontamination, and sanitizing of any respirator equipment that may be used on-site.

The following procedures have been established to provide site personnel with minimum guidelines for proper decontamination. Personnel leaving the point of operations designated as the EZ must follow these minimum procedures. The decontamination process shall take place within the contaminant reduction zone.

#### *7.2.1 Minimum Decontamination Procedure*

Personnel leaving the point of operations should remove or change outer gloves. At a minimum, boots shall be cleaned of all accumulated soil/fill. Outer boots must be properly washed where gross contamination is evident or disposed of. If Tyvek suits are being utilized, they should be removed or changed. Personnel should remove the Tyvek suits so that the inner clothing does not come in contact with any contaminated surfaces. After Tyvek removal, personnel shall remove and discard outer Nitrile gloves. Personnel shall then remove the respirator, where applicable. Respirators shall be disinfected between uses with towelettes or other sanitary methods. Potable water, at a minimum, will be present so that site personnel can thoroughly wash hands and face after leaving the point of operations.

The Site Health and Safety Officer will monitor decontamination procedures to ensure their effectiveness. Modifications of the decontamination procedure may be necessary as determined by the Site Health and Safety Officer's observations.

#### *7.2.2 Hand-Held Equipment Decontamination*

Hand-held equipment includes all monitoring instruments as stated earlier, samples, hand tools, and notebooks. The hand-held equipment is dropped at the first decontamination station to be decontaminated by one of the decontamination team members. These items must be decontaminated or discarded as waste prior to removal from the CRZ. To aid in decontamination, monitoring instruments can be sealed in plastic bags or wrapped in polyethylene. This will also protect the instruments against contaminants. The instruments will be wiped clean using wipes or paper towels if contamination is visually evident. Sampling equipment, hand tools, etc. will be cleaned with non-phosphorous soap to remove any potentially contaminated soil, and rinsed with deionized water. All decontamination fluids will be containerized and stored on-site pending waste characterization sampling and appropriate off-site disposal.

#### *7.2.3 Heavy Equipment Decontamination*

Equipment traversing the site and exiting the site will be subjected to a decontamination protocol. At a minimum the protocol will consist of an inspection of the truck fenders, tires and mud flaps for accumulated soil/fill, and removal of all accumulations using hand tools (brush, broom and scrapers). If deemed necessary by the Site Health and Safety Officer, this inspection will be performed over a thirty by

fifteen foot area that has been filled with  $\frac{3}{4}$  inch crushed recycled concrete aggregate to facilitate the removal of soil/fill accumulations from the tires, and to immobilize soil/fill removed from the truck body. Additionally, all trucks hauling waste will be required to be covered prior to exiting the site.

#### *7.2.4 Emergency Decontamination*

If circumstances dictate that contaminated clothing cannot be readily removed, then remove gross contamination and wrap injured personnel with clean garments/blankets to avoid contaminating other personnel or transporting equipment.

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

## 8 General Safety and Health Provisions

### 8.1 Safety Practices / Standing Orders

The following are important safety precautions that will be enforced during work activities.

- Eating, drinking, chewing gum or tobacco, smoking, or any practice that increases the probability of hand-to-mouth transfer and ingestion of material is prohibited in any area designated as contaminated.
- Hands and face must be thoroughly washed upon leaving the work area and before eating, drinking, or any other activity.
- Whenever decontamination procedures for outer garments are in effect, the entire body should be thoroughly washed as soon as possible after the protective garments are removed.
- No excessive facial hair that interferes with the effectiveness of a respirator will be permitted on personnel required to wear respiratory protection equipment. The respirator must seal against the face so that the wearer receives air only through the air purifying cartridges attached to the respirator. Fit testing shall be performed prior to respirator use to ensure the wearer obtains a proper seal.
- Contact with potentially contaminated surfaces should be avoided whenever possible. One should not walk through puddles; kneel on the ground; lean, sit, or place equipment on drums, containers, vehicles, or the ground.
- Medicine and alcohol can potentiate the effect from exposure to certain compounds. Prescribed drugs and alcoholic beverages should not be consumed by personnel involved in the project.
- Personnel and equipment in the work areas should be minimized, consistent with effective site operations.
- Work areas for various operational activities should be established.
- Procedures for leaving the work area must be planned and implemented prior to going to the site. Work areas and decontamination procedures must be established on the basis of prevailing site conditions.
- Respirators will be issued for the exclusive use of one worker and will be cleaned and disinfected after each use.
- Safety gloves and boots shall be taped to the disposable, chemical-protective suits as necessary.
- All unsafe equipment left unattended will be identified by a "DANGER, DO NOT OPERATE" tag.
- Noise mufflers or earplugs may be required for all site personnel working around heavy equipment. This requirement will be at the discretion of the Site Health and Safety Officer. Disposable, form-fitting plugs are preferred.
- Cartridges for air-purifying respirators in use will be changed daily at a minimum.

## 8.2 Buddy System

Site personnel will employ the buddy system when working under certain circumstances, such as enclosed spacing. Under the buddy system, each site worker is responsible for monitoring the well-being of another worker. No one will work alone when the buddy system is implemented. At no time will fewer than two employees be present at the site if activities are underway.

## 8.3 Site Communications Plan

Mobile telephone and/or two-way radios will be used to communicate between the work parties on the site. The following standard hand signals will be used in case of failure of radio communication:

- Hands on top of head = Need assistance
- Thumbs up = OK, I am alright, I understand
- Thumbs down = No, negative

Personnel in the Contaminated Zone should remain in constant radio communication or within sight of the project team leader. Any failure of radio communication will require the team leader to evaluate whether personnel should leave the zone.

## 9 Emergency Response / Contingency Plan

### 9.1 Pre-Emergency Planning

In order to properly prepare for emergencies, Material Safety Data Sheets (MSDS) will be maintained on-site for the type of contaminants to which workers may be exposed. The MSDS for potential chemicals to be encountered at the Site are presented in **Appendix D**.

In the event a suspected or known hazardous substance or substance container is encountered during site activities, a contingency plan will be triggered.

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

### 9.2 Emergency Contact Information

In the event of an accident or emergency situation, emergency procedures will be executed. Said procedures can and will be executed by the first person to observe an accident or emergency situation. The Site Health and Safety Officer will be notified about the situation immediately after emergency procedures are implemented.

#### 9.2.1 Utility Emergencies / Initiating Subsurface Investigation Work

Where necessary, utility markouts will be called in via the one call center or to the individual entities listed below.

<i>Mark Out One-Call Center</i>	1-800-272-4480	No-Cuts
<i>Gas Company:</i>	718-643-4050	Keyspan/Con Edison
<i>Telephone Company:</i>	516-661-6000	Bell Atlantic / Verizon
<i>Electric Company:</i>	718-643-4050	Keyspan/Con Edison

#### 9.2.2 Emergency Contacts

<b>ORGANIZATION</b>	<b>CONTACT</b>	<b>TELEPHONE</b>
New York City Police		911
New York City Fire		911
Cider Project Manager	James Cressy	631-616-4000
National Response Center		800-424-8802
Center For Disease Control		404-488-4100

Chemtrec		800-424-9300
TSCA Hotline		202-554-1404
RCRA Hotline		800-424-9346
CDC	(DAY) (NIGHT)	404-452-4100 404-329-2888
Bureau Of Alcohol, Tobacco & Firearms		800-424-9555 202-566-7777
National Response Center		800-424-8802
Pesticide Information Service		800-424-9346
Bureau Of Explosives, A.A. Railways		202-835-9500
Federal Express - Hazardous Material Info		901-922-1666

### 9.3 Contingency Plan

If an unknown substance or substance container is encountered during site activities, the following contingency plan will be triggered.

- The Site Health and Safety Officer, Project Manager and Field Operations Leader will be notified and an Exclusion Zone (the aerial extent of which will be determined by the above safety staff) will be established.
- All staff will be evacuated from the Exclusion Zone.
- Air monitoring will be conducted down-wind of the Exclusion Zone.
- The NYSDEC, as well as any other Government regulatory agency whose need may be prompted by the particular situation, will be notified.
- Upon arrival of the NYSDEC or Government regulatory agency representative(s), site control will transfer to the appropriate Government personnel.

It may be possible that a situation could develop site emergency could necessitate the evacuation of all personnel from the site. If such a situation develops, an audible alarm shall be given for site evacuation (consisting of an air horn). Personnel shall evacuate the site in a calm and controlled fashion and regroup at a predetermined location. The route of evacuation will be dependent on wind direction, severity, type of incident, etc. The site must not be re-entered until back-up help, monitoring equipment, and/or personal protective equipment are on hand and the appropriate regulatory agencies have been notified.

## 9.4 Emergency Medical Treatment Procedures

All injuries, no matter how slight, will be reported to the site safety supervisor immediately. The safety supervisor will complete an accident report for all incidents.

Some injuries, such as severe lacerations or burns, may require immediate treatment. Unless required due to immediate danger, seriously injured persons should not be moved without direction from attending medical personnel.

Only in non-emergency situations will an injured person be transported to the hospital by means other than an ambulance.

**Nearest Hospital with Emergency Room:**

**Mount Sinai Medical Center**

**1425 Madison Avenue**

**New York, NY**

**Tel: (212) 241-6500**

*(Directions from site to hospital can be found on **Figure 2**, Attached to the front of this plan)*

### 9.4.1 Standard Procedures for Injury

1. Notify the Site Health and Safety Officer, Project Manager, and the proper regulatory agency of all accidents, incidents, and near emergency situations.
2. If the injury is minor, trained personnel should proceed to administer appropriate first aid.
3. Telephone for ambulance/medical assistance if necessary. Whenever possible, notify the receiving hospital of the nature of physical injury or chemical overexposure. If no phone is available, transport the person to the nearest hospital.
4. When transporting an injured person to a hospital, bring this Health and Safety Plan with the attached MSDS to assist medical personnel with diagnosis and treatment.

### 9.4.2 Chemical Overexposure

The following are standard procedures to treat chemical exposures. Other, specific procedures detailed on the MSDS will be followed, when necessary.

- SKIN AND EYE: Use copious amounts of soap and water from eye-wash kits and portable hand wash stations.
- CONTACT: Wash/rinse affected areas thoroughly, then provide appropriate medical attention. Skin shall also be rinsed for 15 minutes if contact with caustics, acids or hydrogen peroxide occurs. Affected items of clothing shall also be removed from contact with skin.

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

## 9.5 Fire Prevention and Protection

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

Fires will be prevented by adhering to the following precautions:

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

## 9.6 Significant Vapor Release

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

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

## 9.7 Adverse Weather Conditions

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

- Potential for heat stress and heat-related injuries.
- Potential for cold stress and cold-related injuries.

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

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

## 9.8 First Aid

A first aid kit and an emergency eyewash will be available on-site. Field crews, when performing field operations, will carry portable first aid kits that include emergency eye wash stations.

## 10 Recordkeeping

### 10.1 Employer's First Report of Injury

The site safety supervisor for all accidents involving work injury at the site will complete this form (**Appendix A**). Follow-up procedures will include investigation of each accident or near-miss by the safety supervisor to assure that no similar accidents occur in the future.

### 10.2 Injuries and Illnesses Form (OSHA 200)

All occupational injuries and illnesses that are required to be recorded under the Occupational Safety and Health Act will be registered on OSHA Form 200 (see **Appendix B**). The site safety supervisor will record occupational injuries and illnesses within 48 hours of occurrence, as required by statute.



## FIGURES

## **APPENDIX A**

Accident Report Form

## **APPENDIX B**

OSHA Form 200-Occupational Injuries & Illnesses

## **APPENDIX C**

Air Monitoring and Instrument Calibration Sheet

## **APPENDIX D**

Material Safety Data Sheet

**APPENDIX C**

**Sample of Non-Hazardous Soil Disposal Manifest**

GENERATOR  
 INT'L  
 TRANSPORTER  
 DESIGNATED FACILITY

**NON-HAZARDOUS WASTE MANIFEST** | 1. Generator ID Number | 2. Page 1 of | 3. Emergency Response Phone 631-365-6118 | 4. Waste Tracking Number **E 008456**

5. Generator's Name and Mailing Address: **401 East 120th Street, New York, NY**  
 Generator's Phone: **347-649-3134** | 
 Generator's Site Address (if different than mailing address): **300 East 175th Street, Bronx, NY**

6. Transporter 1 Company Name | U.S. EPA ID Number  
 7. Transporter 2 Company Name | U.S. EPA ID Number  
 8. Designated Facility Name and Site Address | U.S. EPA ID Number  
 Facility's Phone:

9. Waste Shipping Name and Description	10. Containers		11. Total Quantity	12. Unit Wt./Vol.	
	No.	Type			
1.					
2.					
3.					
4.					

13. Special Handling Instructions and Additional Information

**14. GENERATOR'S CERTIFICATION:** I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.  
 Generator's/Officer's Printed/Typed Name | Signature | Month | Day | Year

15. International Shipments  Import to U.S.  Export from U.S. | Port of entry/exit: \_\_\_\_\_  
 Transporter Signature (for exports only): | Date leaving U.S.: \_\_\_\_\_

**16. Transporter Acknowledgment of Receipt of Materials**  
 Transporter 1 Printed/Typed Name | Signature | Month | Day | Year  
 Transporter 2 Printed/Typed Name | Signature | Month | Day | Year

17. Discrepancy  
 17a. Discrepancy Indication Space  Quantity  Type  Residue  Partial Rejection  Full Rejection  
 Manifest Reference Number:

17b. Alternate Facility (or Generator) | U.S. EPA ID Number  
 Facility's Phone:  
 17c. Signature of Alternate Facility (or Generator) | Month | Day | Year

18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a  
 Printed/Typed Name | Signature | Month | Day | Year

## **APPENDIX D**

### **Specifications for Waterproof Membrane**

# VAPORBLOCK® PLUS™ VBP20

Under-Slab Vapor / Gas Barrier



## Product Description

VaporBlock® Plus™ 20 is a seven-layer co-extruded barrier made from state-of-the-art polyethylene and EVOH resins to provide unmatched impact strength as well as superior resistance to gas and moisture transmission. VaporBlock® Plus™ 20 is a highly resilient underslab / vertical wall barrier designed to restrict naturally occurring gases such as radon and/or methane from migrating through the ground and concrete slab. VaporBlock® Plus™ 20 is more than 100 times less permeable than typical high-performance polyethylene vapor retarders against Methane, Radon and other harmful VOCs.

VaporBlock® Plus™ 20 is one of the most effective underslab gas barriers in the building industry today far exceeding ASTM E-1745 (Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs) Class A, B and C requirements. Available in a 20 (Class A) mil thicknesses designed to meet the most stringent requirements. VaporBlock® Plus™ 20 is produced within the strict guidelines of our ISO 9001:2008 Certified Management System.

## Product Use

VaporBlock® Plus™ 20 resists gas and moisture migration into the building envelop when properly installed to provide protection from toxic/harmful chemicals. It can be installed as part of a passive or active control system extending across the entire building including floors, walls and crawl spaces. When installed as a passive system it is recommended to also include a ventilated system with sump(s) that could be converted to an active control system with properly designed ventilation fans.

VaporBlock® Plus™ 20 works to protect your flooring and other moisture-sensitive furnishings in the building's interior from moisture and water vapor migration, greatly reducing condensation, mold and degradation.

## Size & Packaging

VaporBlock® Plus™ 20 is available in 10' x 150' rolls to maximize coverage. All rolls are folded on heavy-duty cores for ease in handling and installation. Other custom sizes with factory welded seams are available based on minimum volume requirements. Installation instructions and ASTM E-1745 classifications accompany each roll.



Under-Slab Vapor/Gas Retarder

## Product

## Part #

VaporBlock Plus 20 ..... VBP20

## APPLICATIONS

- |                 |                                |
|-----------------|--------------------------------|
| Radon Barrier   | Under-Slab Vapor Retarder      |
| Methane Barrier | Foundation Wall Vapor Retarder |
| VOC Barrier     |                                |

**VaporBlock® Plus™**  
UNDERSLAB VAPOR RETARDER / GAS BARRIER

# VAPORBLOCK® PLUS™ VBP20

Under-Slab Vapor / Gas Barrier

PROPERTIES	TEST METHOD	VAPORBLOCK PLUS 20	
		IMPERIAL	METRIC
APPEARANCE		White/Gold	
THICKNESS, NOMINAL		20 mil	0.51 mm
WEIGHT		102 lbs/MSF	498 g/m <sup>2</sup>
CLASSIFICATION	ASTM E 1745	CLASS A, B & C	
TENSILE STRENGTH LBF/IN (N/CM) AVERAGE MD & TD (NEW MATERIAL)	ASTM E 154 Section 9 (D-882)	58 lbf	102 N
IMPACT RESISTANCE	ASTM D 1709	2600 g	
MAXIMUM USE TEMPERATURE		180° F	82° C
MINIMUM USE TEMPERATURE		-70° F	-57° C
PERMEANCE (NEW MATERIAL)	ASTM E 154 Section 7 ASTM E 96 Procedure B	0.0098 Perms grains/(ft <sup>2</sup> ·hr·in·Hg)	0.0064 Perms g/(24hr·m <sup>2</sup> ·mm Hg)
(AFTER CONDITIONING) PERMS (SAME MEASUREMENT AS ABOVE PERMEANCE)	ASTM E 154 Section 8, E96 Section 11, E96 Section 12, E96 Section 13, E96	0.0079 0.0079 0.0097 0.0113	0.0052 0.0052 0.0064 0.0074
WVTR	ASTM E 96 Procedure B	0.0040 grains/hr-ft <sup>2</sup>	0.0028 gm/hr-m <sup>2</sup>
RADON DIFFUSION COEFFICIENT	K124/02/95	< 1.1 x 10 <sup>-13</sup> m <sup>2</sup> /s	
METHANE PERMEANCE	ASTM D 1434	< 1.7 x 10 <sup>-10</sup> m <sup>2</sup> /d·atm 0.32 GTR (Gas Transmission Rate) ml/m <sup>2</sup> ·D·ATM	

## VaporBlock® Plus™ Placement

All instructions on architectural or structural drawings should be reviewed and followed.

Detailed installation instructions accompany each roll of VaporBlock® Plus™ and can also be located on our website.

ASTM E-1643 also provides general installation information for vapor retarders.

**VaporBlock® Plus™**  
UNDERSLAB VAPOR RETARDER / GAS BARRIER

VaporBlock® Plus™ is a seven-layer co-extruded barrier made using high quality virgin-grade polyethylene and EVOH resins to provide unmatched impact strength as well as superior resistance to gas and moisture transmission.

Note: To the best of our knowledge, unless otherwise stated, these are typical property values and are intended as guides only, not as specification limits. Chemical resistance, odor transmission, longevity as well as other performance criteria is not implied or given and actual testing must be performed for applicability in specific applications and/or conditions. RAVEN INDUSTRIES MAKES NO WARRANTIES AS TO THE FITNESS FOR A SPECIFIC USE OR MERCHANTABILITY OF PRODUCTS REFERRED TO, no guarantee of satisfactory results from reliance upon contained information or recommendations and disclaims all liability for resulting loss or damage. Limited Warranty available at [www.RavenEFD.com](http://www.RavenEFD.com)



Scan QR Code to download current technical data sheets via the Raven website.

**RAVEN**  
INDUSTRIES

## Engineered Films Division

P.O. Box 5107  
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[www.ravenefd.com](http://www.ravenefd.com)  
1/11 EFD 1125

## **APPENDIX E**

### **Citizen Participation Plan**



New York State Department of Environmental Conservation

## **Brownfield Cleanup Program**

# **Citizen Participation Plan**

for  
**401 East 120<sup>th</sup> Street**  
**New York, New York**

401 East 120<sup>th</sup> Street  
New York, New York

November 2015

# Contents

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\* \* \* \* \*

**Note:** The information presented in this Citizen Participation Plan was current as of the date of its approval by the New York State Department of Environmental Conservation. Portions of this Citizen Participation Plan may be revised during the site’s investigation and cleanup process.

Applicant: **ACACIA Gardens Housing Development Fund Corporation**  
Site Name: **401 East 120<sup>th</sup> Street Site**  
Site Address: **401 East 120<sup>th</sup> Street**  
Site County: **New York**  
Site Number: **XXXX**

## **1. What is New York’s Brownfield Cleanup Program?**

New York’s Brownfield Cleanup Program (BCP) works with private developers to encourage the voluntary cleanup of contaminated properties known as “brownfields” so that they can be reused and developed. These uses include recreation, housing, and business.

A *brownfield* is any real property that is difficult to reuse or redevelop because of the presence or potential presence of contamination. A brownfield typically is a former industrial or commercial property where operations may have resulted in environmental contamination. A brownfield can pose environmental, legal, and financial burdens on a community. If a brownfield is not addressed, it can reduce property values in the area and affect economic development of nearby properties.

The BCP is administered by the New York State Department of Environmental Conservation (NYSDEC) which oversees Applicants that conduct brownfield site investigation and cleanup activities. An Applicant is a person who has requested to participate in the BCP and has been accepted by NYSDEC. The BCP contains investigation and cleanup requirements, ensuring that cleanups protect public health and the environment. When NYSDEC certifies that these requirements have been met, the property can be reused or redeveloped for the intended use.

For more information about the BCP, go online at: <http://www.dec.ny.gov/chemical/8450.html> .

## **2. Citizen Participation Activities**

*Why NYSDEC Involves the Public and Why It Is Important*

NYSDEC involves the public to improve the process of investigating and cleaning up contaminated sites, and to enable citizens to participate more fully in decisions that affect their health, environment, and social well being. NYSDEC provides opportunities for citizen involvement and encourages early two-way communication with citizens before decision makers form or adopt final positions.

Involving citizens affected and interest in site investigation and cleanup programs is important for many reasons. These include:

- Promoting the development of timely, effective site investigation and cleanup programs that protect public health and the environment

- Improving public access to, and understanding of, issues and information related to a particular site and that site's investigation and cleanup process
- Providing citizens with early and continuing opportunities to participate in NYSDEC's site investigation and cleanup process
- Ensuring that NYSDEC makes site investigation and cleanup decisions that benefit from input that reflects the interests and perspectives found within the affected community
- Encouraging dialogue to promote the exchange of information among the affected/interested public, State agencies, and other interested parties that strengthens trust among the parties, increases understanding of site and community issues and concerns, and improves decision making.

This Citizen Participation (CP) Plan provides information about how NYSDEC will inform and involve the public during the investigation and cleanup of the site identified above. The public information and involvement program will be carried out with assistance, as appropriate, from the Applicant.

#### *Project Contacts*

Appendix A identifies NYSDEC project contact(s) to whom the public should address questions or request information about the site's investigation and cleanup program. The public's suggestions about this CP Plan and the CP program for the site are always welcome. Interested people are encouraged to share their ideas and suggestions with the project contacts at any time.

#### *Locations of Reports and Information*

The locations of the reports and information related to the site's investigation and cleanup program also are identified in Appendix A. These locations provide convenient access to important project documents for public review and comment. Some documents may be placed on the NYSDEC web site. If this occurs, NYSDEC will inform the public in fact sheets distributed about the site and by other means, as appropriate.

#### *Site Contact List*

Appendix B contains the site contact list. This list has been developed to keep the community informed about, and involved in, the site's investigation and cleanup process. The site contact list will be used periodically to distribute fact sheets that provide updates about the status of the project. These will include notifications of upcoming activities at the site (such as fieldwork), as well as availability of project documents and announcements about public comment periods.

The site contact list includes, at a minimum:

- chief executive officer and planning board chairperson of each county, city, town and village in which the site is located;
- residents, owners, and occupants of the site and properties adjacent to the site;
- the public water supplier which services the area in which the site is located;
- any person who has requested to be placed on the site contact list;
- the administrator of any school or day care facility located on or near the site for purposes of posting and/or dissemination of information at the facility;
- location(s) of reports and information.

The site contact list will be reviewed periodically and updated as appropriate. Individuals and organizations will be added to the site contact list upon request. Such requests should be submitted to the NYSDEC project contact(s) identified in Appendix A. Other additions to the site contact list may be made at the discretion of the NYSDEC project manager, in consultation with other NYSDEC staff as appropriate.

#### *CP Activities*

The table at the end of this section identifies the CP activities, at a minimum, that have been and will be conducted during the site's investigation and cleanup program. The flowchart in Appendix D shows how these CP activities integrate with the site investigation and cleanup process. The public is informed about these CP activities through fact sheets and notices distributed at significant points during the program. Elements of the investigation and cleanup process that match up with the CP activities are explained briefly in Section 5.

- **Notices and fact sheets** help the interested and affected public to understand contamination issues related to a site, and the nature and progress of efforts to investigate and clean up a site.
- **Public forums, comment periods and contact with project managers** provide opportunities for the public to contribute information, opinions and perspectives that have potential to influence decisions about a site's investigation and cleanup.

The public is encouraged to contact project staff at any time during the site's investigation and cleanup process with questions, comments, or requests for information.

This CP Plan may be revised due to changes in major issues of public concern identified in Section 3 or in the nature and scope of investigation and cleanup activities. Modifications may include additions to the site contact list and changes in planned citizen participation activities.

### *Technical Assistance Grant*

NYSDEC must determine if the site poses a significant threat to public health or the environment. This determination generally is made using information developed during the investigation of the site, as described in Section 5.

If the site is determined to be a significant threat, a qualifying community group may apply for a Technical Assistance Grant (TAG). The purpose of a TAG is to provide funds to the qualifying group to obtain independent technical assistance. This assistance helps the TAG recipient to interpret and understand existing environmental information about the nature and extent of contamination related to the site and the development/implementation of a remedy.

An eligible community group must certify that its membership represents the interests of the community affected by the site, and that its members' health, economic well-being or enjoyment of the environment may be affected by a release or threatened release of contamination at the site.

For more information about TAGs, go online at <http://www.dec.ny.gov/regulations/2590.html>

Note: The table identifying the citizen participation activities related to the site's investigation and cleanup program follows on the next page:

Citizen Participation Requirements (Activities)	Timing of CP Activity(ies)
<b>Application Process:</b>	
<ul style="list-style-type: none"> <li>• Prepare site contact list</li> <li>• Establish document repositories</li> </ul>	At time of preparation of application to participate in the BCP.
<ul style="list-style-type: none"> <li>• Publish notice in Environmental Notice Bulletin (ENB) announcing receipt of application and 30-day public comment period</li> <li>• Publish above ENB content in local newspaper</li> <li>• Mail above ENB content to site contact list</li> <li>• Conduct 30-day public comment period</li> </ul>	When NYSDEC determines that BCP application is complete. The 30-day public comment period begins on date of publication of notice in ENB. End date of public comment period is as stated in ENB notice. Therefore, ENB notice, newspaper notice, and notice to the site contact list should be provided to the public at the same time.
<b>After Execution of Brownfield Site Cleanup Agreement:</b>	
<ul style="list-style-type: none"> <li>• Prepare Citizen Participation (CP) Plan</li> </ul>	Before start of Remedial Investigation
<b>Before NYSDEC Approves Remedial Investigation (RI) Work Plan:</b>	
<ul style="list-style-type: none"> <li>• Distribute fact sheet to site contact list about proposed RI activities and announcing 30-day public comment period about draft RI Work Plan</li> <li>• Conduct 30-day public comment period</li> </ul>	Before NYSDEC approves RI Work Plan. If RI Work Plan is submitted with application, public comment periods will be combined and public notice will include fact sheet. Thirty-day public comment period begins/ends as per dates identified in fact sheet.
<b>After Applicant Completes Remedial Investigation:</b>	
<ul style="list-style-type: none"> <li>• Distribute fact sheet to site contact list that describes RI results</li> </ul>	Before NYSDEC approves RI Report
<b>Before NYSDEC Approves Remedial Work Plan (RWP):</b>	
<ul style="list-style-type: none"> <li>• Distribute fact sheet to site contact list about proposed RWP and announcing 45-day public comment period</li> <li>• Public meeting by NYSDEC about proposed RWP (if requested by affected community or at discretion of NYSDEC project manager)</li> <li>• Conduct 45-day public comment period</li> </ul>	Before NYSDEC approves RWP. Forty-five day public comment period begins/ends as per dates identified in fact sheet. Public meeting would be held within the 45-day public comment period.
<b>Before Applicant Starts Cleanup Action:</b>	
<ul style="list-style-type: none"> <li>• Distribute fact sheet to site contact list that describes upcoming cleanup action</li> </ul>	Before the start of cleanup action.
<b>After Applicant Completes Cleanup Action:</b>	
<ul style="list-style-type: none"> <li>• Distribute fact sheet to site contact list that announces that cleanup action has been completed and that summarizes the Final Engineering Report</li> <li>• Distribute fact sheet to site contact list announcing issuance of Certificate of Completion (COC)</li> </ul>	At the time NYSDEC approves Final Engineering Report. These two fact sheets are combined if possible if there is not a delay in issuing the COC.

### 3. Major Issues of Public Concern

This section of the CP Plan identifies major issues of public concern that relate to the site. Additional major issues of public concern may be identified during the course of the site's investigation and cleanup process.

The site is currently occupied by one 1-story building and parking lot. Based on information reviewed to date, soil at the site is known to be contaminated with petroleum-related chemicals. Based on the historic gasoline station operations, additional contaminants suspected to be present in on-site soil and/or groundwater include solvents (chemicals used as dissolving agents) and metals. The extent and the contamination appears to be focused on the southwestern corner, there is potential that the contamination has impacted adjacent/neighboring properties, which include residential and commercial uses. This may present a public health risk to adjacent/neighboring property owners and residents if they were to come into contact with contaminated soil or vapors. Groundwater in the area of the site is not used for potable purposes; therefore, any contaminated groundwater which may be present is not a major issue of public concern unless it is contributing to the migration of contaminated vapors.

The site is located in highly developed residential and commercial area. The continued presence of the site with known contamination may affect local residents and property owners by negatively impacting local property values, business, and economic redevelopment.

### 4. Site Information

Appendix C contains a map identifying the location of the site.

#### *Site Description*

The site is located at 401 East 120<sup>th</sup> Street in the East Harlem section in borough of New York, New York. The site measures approximately 39,000 square feet and is located in a highly developed, suburban, residential and commercial area. Properties adjacent to the site include the following:

**North** – To the north and northeast of the Site are 15-story apartment buildings.

**South** – The Site is bordered to the south by East 120th Street followed by numerous commercial retail, commercial-office, institutional, and residential buildings along East 120th Street.

**East** – The Site is bordered to the east by commercial buildings on the remainder of Lot 8 followed by a 15-story apartment building.

**West** - The Site is bordered to the west by 1st Avenue, beyond which is the John S. Roberts Junior High School (2351 1st Avenue).

According to OER's online SPEED application, there are no hospitals or schools (other than the school to the west) within a 500-foot radius. A day care facility (Please Avenue Day Care Center, 451 East 120<sup>th</sup> Street) is located approximately 250 feet northeast of the site.

#### *History of Site Use, Investigation, and Cleanup*

Prior to 1940, the Site has been utilized for residential, commercial, stone yard (1896), lumber yard (1911), coal yard (1911), school (1923) and gasoline station (1938). From 1941 to 1980, the Site has been utilized for residential, commercial, school and gasoline station. From 1981 to present, the Site has been utilized for institutional and commercial uses.

Much of this information was included in a Phase I Environmental Site Assessment (ESA) report, dated September 2008 prepared by ATC Associated Inc.

From March to May 2015, a subsurface investigation was performed at the Site. Based on the investigation, soil and groundwater on the southwestern corner, where the gas station used to be, is known to be contaminated with petroleum compounds. The NYSDEC was contacted and the Spill No. 1503447 was assigned to the Site.

There is health risks associated with these chemicals; however, to date, health risks associated with the site have not been identified.

### **5. Investigation and Cleanup Process**

#### *Application*

The Applicant has applied for and been accepted into New York's Brownfield Cleanup Program as a Volunteer. This means that the Applicant was not responsible for the disposal or discharge of the contaminants or whose ownership or operation of the site took place after the discharge or disposal of the contaminants. The Volunteer must fully characterize the nature and extent of contamination on-site, and must conduct a qualitative exposure assessment, a process that characterizes the actual or potential exposures of people, fish, and wildlife to contaminants on the site and to contamination that has migrated from the site.

The Applicant in its Application proposes that the site will be used for unrestricted purposes.

To achieve this goal, the Applicant will conduct investigation and cleanup activities at the site with oversight provided by NYSDEC. The Brownfield Cleanup Agreement executed by NYSDEC and the Applicant sets forth the responsibilities of each party in conducting these activities at the site.

### *Remedy Selection*

When the investigation of the site has been determined to be complete, the project likely would proceed in one of two directions:

1. The Applicant may recommend in its investigation report that no action is necessary at the site. In this case, NYSDEC would make the investigation report available for public comment for 45 days. NYSDEC then would complete its review, make any necessary revisions, and, if appropriate, approve the investigation report. NYSDEC would then issue a Certificate of Completion (described below) to the Applicant.

**or**

2. The Applicant may recommend in its investigation report that action needs to be taken to address site contamination. After NYSDEC approves the investigation report, the Applicant may then develop a cleanup plan, officially called a Remedial Work Plan. The Remedial Work Plan describes the Applicant's proposed remedy for addressing contamination related to the site.

When the Applicant submits a proposed Remedial Work Plan for approval, NYSDEC would announce the availability of the proposed plan for public review during a 45-day public comment period.

### *Cleanup Action*

NYSDEC will consider public comments, and revise the draft cleanup plan if necessary, before approving the proposed remedy. The New York State Department of Health (NYSDOH) must concur with the proposed remedy. After approval, the proposed remedy becomes the selected remedy.

The Applicant may then design and perform the cleanup action to address the site contamination. NYSDEC and NYSDOH oversee the activities. When the Applicant completes cleanup activities, it will prepare a final engineering report that certifies that cleanup requirements have been achieved or will be achieved within a specific time frame. NYSDEC will review the report to be certain that the cleanup is protective of public health and the environment for the intended use of the site.

### *Certificate of Completion*

When NYSDEC is satisfied that cleanup requirements have been achieved or will be achieved for the site, it will approve the final engineering report. NYSDEC then will issue a Certificate of Completion (COC) to the Applicant. The COC states that cleanup goals have been achieved, and relieves the Applicant from future liability for site-related contamination, subject to certain conditions. The Applicant would be eligible to redevelop the site after it receives a COC.

### *Site Management*

Site management is the last phase of the site cleanup program. This phase begins when the COC is issued. Site management may be conducted by the Applicant under NYSDEC oversight, if contamination will remain in place. Site management incorporates any institutional and engineering controls required to ensure that the remedy implemented for the site remains protective of public health and the environment. All significant activities are detailed in a Site Management Plan.

An institutional control is a non-physical restriction on use of the site, such as a deed restriction that would prevent or restrict certain uses of the property. An institutional control may be used when the cleanup action leaves some contamination that makes the site suitable for some, but not all uses.

An engineering control is a physical barrier or method to manage contamination. Examples include: caps, covers, barriers, fences, and treatment of water supplies.

Site management also may include the operation and maintenance of a component of the remedy, such as a system that is pumping and treating groundwater. Site management continues until NYSDEC determines that it is no longer needed.

# **Appendix A**

## **Project Contacts and Locations of Reports and Information**

### **Project Contacts**

For information about the site's investigation and cleanup program, the public may contact any of the following project staff:

#### **New York State Department of Environmental Conservation (NYSDEC):**

Mr. Paul John  
Regional Remediation Engineer  
NYSDEC Region 2  
Division of Environmental Remediation  
1 Hunter's Point Plaza  
47-40 21<sup>st</sup> Street, LIC, NY  
(718) 482-4900

Ms. Thomas Panzone  
Citizen Participation Specialist  
NYSDEC Region 2  
1 Hunter's Point Plaza  
47-40 21<sup>st</sup> Street, LIC, NY  
(718) 482-4900

#### **New York State Department of Health (NYSDOH):**

Ms. Maureen Little  
NYSDOH  
Empire State Plaza, Corning Tower  
Room 1787  
Albany, NY  
(518) 402-7860

### **Locations of Reports and Information**

The facilities identified below are being used to provide the public with convenient access to important project documents:

New York Public Library  
224 East 125<sup>th</sup> Street  
New York, NY 10035  
Phone: (212) 534-5050  
Hours:  
Sunday: Closed  
Monday: 11:00 AM – 6:00 PM  
Tuesday: 12:00 PM – 7:00 PM  
Wednesday: 11:00 AM – 6:00 PM  
Thursday: 12:00 PM – 7:00 PM  
Friday: 10:00 AM – 5:00 PM  
Saturday: 10:00 AM – 5:00 PM

NYSDEC Region 2  
1 Hunter's Point Plaza  
47-40 21<sup>st</sup> Street, LIC, NY  
Attn: TBD  
Phone: (718) 482-4900  
Hours: Monday-Friday: 8:30 AM – 4:45 PM  
(call for appointment)

## **Appendix B Site Contact List**

**Site Contact List**  
Site # 15CVCP130M  
413 East 120<sup>th</sup> Street  
New York, NY, 10035

1. **LOCAL AND STATE OFFICIALS** (Including borough president, council member, community board, NYS DEC)

Manhattan Borough President Gale Brewer  
1 Centre Street, 19th Floor  
New York, NY 10007  
212-669-8300

Council Member Melissa Mark-Viverito  
District: 8  
105 E. 116th Street  
New York, NY 10029  
212-828-9800

District Manager Angel D. Mescain  
Manhattan Community Board 11  
1664 Park Avenue, Ground floor  
New York, NY 10035

New York City Department of Planning – Manhattan Office  
Borough Director Edith Hsu-Chen  
22 Reade Street, 6th Fl. West  
New York, NY 10007-1216  
Tel. 212-720-3480  
FAX 212-720-3488

Deputy Director Shaminder Chawla  
OER  
100 Gold Street, 2<sup>nd</sup> Floor  
New York, NY 10038

## **2. OWNERS, RESIDENTS, AND OCCUPANTS ON OR ADJACENT TO THE SITE**

NYC Housing Authority  
2342 First Avenue  
New York, NY 10035

DCAS/Department of Education  
2345 First Avenue  
New York, NY 10035

La Casa Nuestra HDFC or current owner  
23361 First Avenue  
New York, NY 10035

SPAHA 406, LLC or current owner  
406 East 120<sup>th</sup> Street  
New York, NY 10035

Jefferson and Sons LLC or current owner  
408 East 120<sup>th</sup> Street  
New York, NY 10035

Paul Durstenberg or current owner  
410 East 120<sup>th</sup> Street  
New York, NY 10035

## **3. LOCAL NEWS MEDIA**

New York Post  
1211 Avenue of Americas  
New York, New York 10036-8790  
Phone: 212-930-8000

## **4. ANY PERSON, COMMUNITY BASED ORGANIZATION, BOA GROUP, OR LOCAL MEDIA WHO HAS REQUESTED TO BE PLACED ON THE CONTACT LIST.**

At this point, no requests have been made to be placed on the site contact list.

## **5. ADMINISTRATOR/OPERATOR OF ANY SCHOOL OR DAY CARE FACILITY LOCATED ON OR NEAR THE SITE.**

Pleasant Avenue Day Care Center  
451 East 120<sup>th</sup> Street  
New York, NY 10035

John S. Roberts Junior High School  
2351 1st Avenue  
New York, NY 10035

## **6. DOCUMENT REPOSITORY**

New York Public Library – 125th Street Branch  
224 E 125th Street  
New York, NY 10035

**1B. LOCAL AND STATE OFFICIALS AND PROJECT TEAM CONTACTS**  
**(continued - This list is to receive distributions by email. OER will email them.)**

Bob Cozzy  
NYS DEC, Albany  
Email: [robert.cozzy@dec.ny.us](mailto:robert.cozzy@dec.ny.us)

Maureen Little  
NYC DOHMH  
Email: [mlittle@health.nyc.gov](mailto:mlittle@health.nyc.gov)

Dennis Farrar  
NYS DEC, Albany  
Email: [Dennis.farrar@dec.ny.us](mailto:Dennis.farrar@dec.ny.us)

Christopher D'Andrea  
NYC DOHMH  
Email: [cdandrea@health.nyc.gov](mailto:cdandrea@health.nyc.gov)

Paul John  
NYS DEC – Region 2  
Email: [paul.john@dec.ny.us](mailto:paul.john@dec.ny.us)

Thomas Milora  
NYC DOS  
Email: [tmilora@dsny.nyc.gov](mailto:tmilora@dsny.nyc.gov)

Jane O'Connell  
NYS DEC – Region 2  
Email: [jane.oconne@dec.ny.us](mailto:jane.oconne@dec.ny.us)

Roberto Diaz, Hazmat Supervisor,  
NYC DEP  
Email: [robertod@dep.nyc.gov](mailto:robertod@dep.nyc.gov)

Venetia Lannon  
NYS DEC – Region 2  
Email: [Venetia.Lannon@dec.ny.us](mailto:Venetia.Lannon@dec.ny.us)

Gregg Hoag  
NYC DEP  
E-mail: [GregHoag@dep.nyc.gov](mailto:GregHoag@dep.nyc.gov)

Dana Kaplan  
NYS DEC  
Email: [dana.kaplan@dec.ny.us](mailto:dana.kaplan@dec.ny.us)

Andrea Mules  
BRS  
Email: [andrea@njbrownfield.com](mailto:andrea@njbrownfield.com)

Dan Walsh, Director  
NYC Office of Environmental Remediation  
Email: [dwalsh@cityhall.nyc.gov](mailto:dwalsh@cityhall.nyc.gov)

Queens Borough President  
Borough President Gale Brewer  
Email: [info@manhattanbp.nyc.gov](mailto:info@manhattanbp.nyc.gov)

Shaminder Chawla, Assistant Director  
NYC Office of Environmental Remediation  
Email: [schawla@dep.nyc.gov](mailto:schawla@dep.nyc.gov)

District Manager Angel D. Mescain  
Queens Community Board 11  
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Mark McIntyre, General Counsel  
NYC Office of Environmental Remediation  
Email: [mmcintyre@cityhall.nyc.gov](mailto:mmcintyre@cityhall.nyc.gov)

Shana Holberton  
NYC Office of Environmental Remediation  
Email: [sholberton@dep.nyc.gov](mailto:sholberton@dep.nyc.gov)

Maurizio Bertini  
NYC Office of Environmental Remediation  
Email: [mauriziob@dep.nyc.gov](mailto:mauriziob@dep.nyc.gov)

James Cressy  
Cider Environmental  
Email: [jcressy@ciderenvironmental.com](mailto:jcressy@ciderenvironmental.com)

Zach Schreiber  
NYC Office of Environmental Remediation  
Email: [zschreiber@dep.nyc.gov](mailto:zschreiber@dep.nyc.gov)

David Almonte  
Acacia / Promesa  
Email: [dalmonte@promesa.org](mailto:dalmonte@promesa.org)

Hannah Moore  
NYC Office of Environmental Remediation  
Email: [hmoore@dep.nyc.gov](mailto:hmoore@dep.nyc.gov)

## **Fact Sheet 1 – Application Fact Sheet**

The New York City Office of Environmental Remediation is providing the attached Fact Sheet pursuant to the New York City Voluntary Cleanup Program (VCP).

Acacia has applied to enroll in the City VCP. The 413 East 120<sup>th</sup> Street site is located in Manhattan, New York and consists of an approximately 39,000 square foot site which is currently developed with an approximately 4,480-square foot, 1-story building which is occupied by a school/office/commercial facility. The remainder of the Site consists of an asphalt-paved parking lot. The proposed development consists of a 12-story slab-on-grade building which will consist primarily of residential uses with mixed commercial uses on the first floor. The proposed use includes 184,611 square feet of residential space, 5,450 square feet of commercial space, and 3,920 square feet of community facility space. The remainder of the site will consist of an approximately 11,500 square foot asphalt-paved parking lot.

Public comment period on the 413 East 120<sup>th</sup> Street site runs through December 13, 2015.

Direct link to Document Repository is:

<http://www.nyc.gov/html/oer/html/repository/RManhattan.shtml>

## **Fact Sheet 2 – Remedial Fact Sheet**

The New York City Office of Environmental Remediation is providing the attached Fact Sheet pursuant to the New York City Voluntary Cleanup Program (VCP).

Acacia has enrolled in the City VCP. The 413 East 120<sup>th</sup> Street site is located in Manhattan, New York and consists of an approximately 39,000 square foot site which is currently developed with an approximately 4,480-square foot, 1-story building which is occupied by a school/office/commercial facility. The remainder of the Site consists of an asphalt-paved parking lot. The proposed development consists of a 12-story slab-on-grade building which will consist primarily of residential uses with mixed commercial uses on the first floor. The proposed use includes 184,611 square feet of residential space, 5,450 square feet of commercial space, and 3,920 square feet of community facility space. The remainder of the site will consist of an approximately 11,500 square foot asphalt-paved parking lot.

Remedial Construction is starting December 2015.

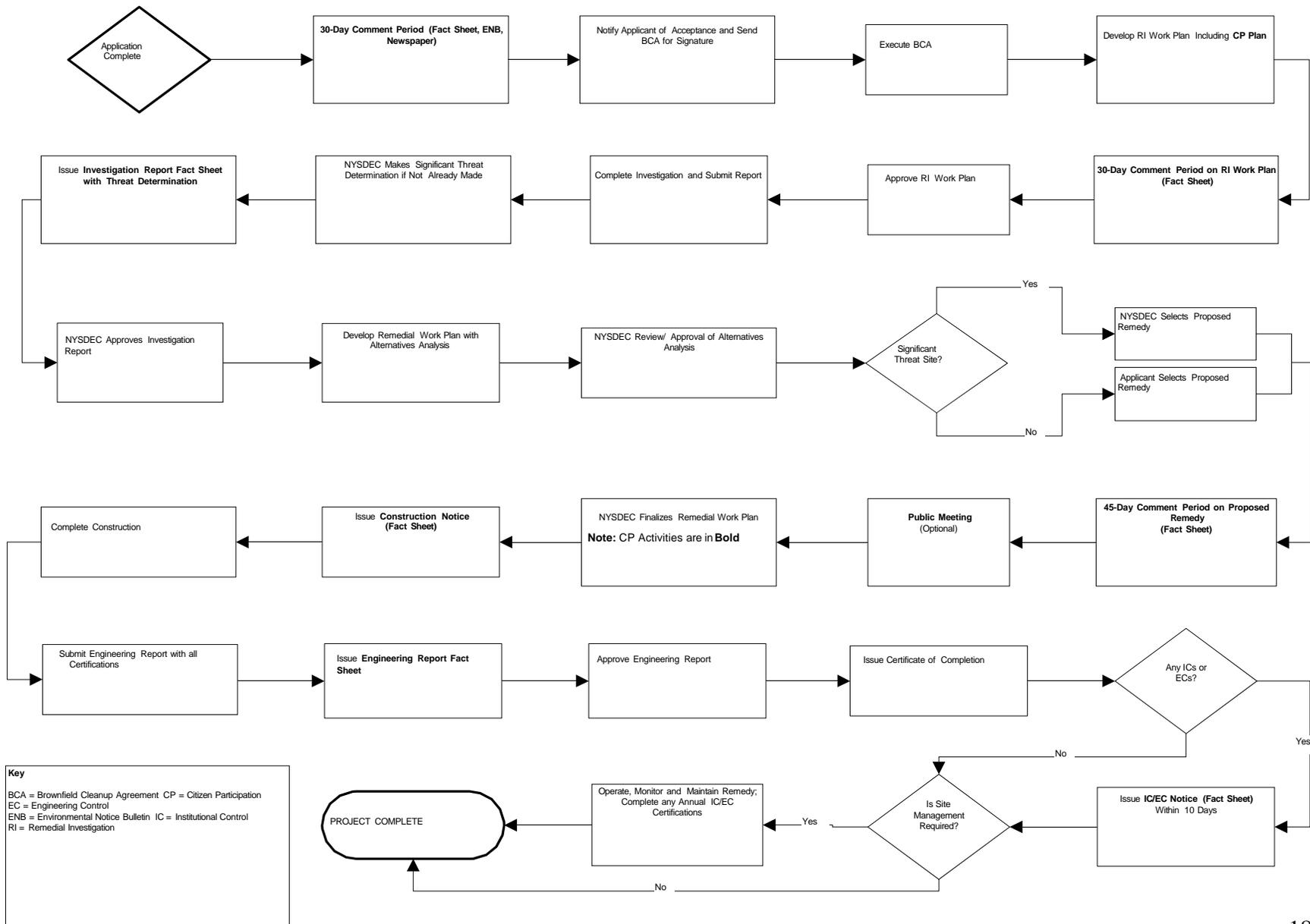
## **Fact Sheet 3 – Completion Fact Sheet**

The New York City Office of Environmental Remediation is providing the attached Fact Sheet pursuant to the New York City Voluntary Cleanup Program (VCP).

OER has accepted the Remedial Action Report submitted by Acacia for the property at 413 East 120<sup>th</sup> Street in Manhattan, New York. The Site consisted of an approximately 39,000 square foot site which was developed with an approximately 4,480-square foot 1-story building which was

occupied by a school/office/commercial facility. The remainder of the Site consisted of an asphalt-paved parking lot. The site has been developed with a 12-story slab-on-grade building which consists primarily of residential uses with mixed commercial uses on the first floor. The site includes 184,611 square feet of residential space, 5,450 square feet of commercial space, and 3,920 square feet of community facility space. The remainder of the site consists of an approximately 11,500 square foot asphalt-paved parking lot. The Site achieved a Track 4 cleanup.

## Appendix D– Brownfield Cleanup Program Process



**APPENDIX F**

**Cost Estimation**

**Remedial Cost Estimation**  
401 East 120th Street, New York, New York

Environmental Remediation Activities	Type of Unit	Qty	Unit Rate	Extended Cost	Sub Total
Remedial Action Work Plan					<b>\$ 12,250.00</b>
Remedial Action Work Plan with NYSDEC and NYCOER	Lump Sum	1	\$ 4,000.00	\$ 4,000.00	
Health and Safety Plan (HASP) for Excavation and UST Removal	Lump Sum	1	\$ 1,250.00	\$ 1,250.00	
Application for Brownfield Cleanup Program	Lump Sum	1	\$ 5,000.00	\$ 5,000.00	
Pre-Job Meetings with NYSDEC and NYCOER	Per Event	2	\$ 1,000.00	\$ 2,000.00	
Remedial Action Report with NYC OER					<b>\$ 11,500.00</b>
P.E. Certified Remedial Action Report (RAR) with Site Management Plan (SMP)	Lump Sum	1	\$ 6,000.00	\$ 6,000.00	
Daily Field Report to OER	Per Day	20	\$ 150.00	\$ 3,000.00	
Administrative	Per Hour	10	\$ 50.00	\$ 500.00	
Project Management	Per Hour	20	\$ 100.00	\$ 2,000.00	
UST Removal					<b>\$ 52,365.00</b>
Environmental Technician / Scientist	Per Day	4	\$ 600.00	\$ 2,400.00	
Sr Geologist / Sr. Engineer	Per Day	4	\$ 780.00	\$ 3,120.00	
Particulate Meters and PID	Per Day	4	\$ 175.00	\$ 700.00	
Vapor and Dust Suppression-Equipment and Materials	Per Day	4	\$ 75.00	\$ 300.00	
Mob/demob of NYC Certified UST Removal Contractor	Lump Sum	1	\$ 500.00	\$ 500.00	
UST Liquid Removal and Disposal	Per Gallon	2000	\$ 1.75	\$ 3,500.00	
UST Liquid Removal Truck	Per Truck	3	\$ 475.00	\$ 1,425.00	
Tank Disposal/Cut/Clean & Scrap/NYCFM Affidavit (UST)	Per Tank	7	\$ 3,500.00	\$ 24,500.00	
UST Sludge Removal (55-gallon drum)	Per Drum	21	\$ 395.00	\$ 8,295.00	
PPE Level D	Per Day	4	\$ 50.00	\$ 200.00	
6-mil Plastic sheeting	Per Roll	5	\$ 125.00	\$ 625.00	
Laboratory Analysis- Petroleum Impacted Soil (including TCLP, Haz Characters)	Per Sample	2	\$ 1,525.00	\$ 3,050.00	
Confirmatory Sample Analysis - 8260/8270 CP-51	Per Sample	15	\$ 250.00	\$ 3,750.00	
Supervise Site Excavation (for Urban Fill)					<b>\$ 17,400.00</b>
Environmental Technician / Scientist	Per Day	15	\$ 600.00	\$ 9,000.00	
Sr Geologist / Sr. Engineer	Per Day	5	\$ 780.00	\$ 3,900.00	
Particulate Meters and PID	Per Day	15	\$ 175.00	\$ 2,625.00	
PPE Level D	Per Day	15	\$ 50.00	\$ 750.00	
Vapor and Dust Suppression-Equipment and Materials	Per Day	15	\$ 75.00	\$ 1,125.00	
Transportation and Disposal of Impacted Soil/Fill					<b>\$ 395,300.00</b>
T&D of Urban Fill Exceeding Track 1 Unrestricted SCO	Per Ton	3000	\$ 48.00	\$ 144,000.00	
T&D of Petroleum Impacted soil	Per Ton	150	\$ 72.00	\$ 10,800.00	
Hazardous Lead Transportation & Disposal	Per Ton	500	\$ 325.00	\$ 162,500.00	
Certified Clean Fill	Per Ton	2000	\$ 39.00	\$ 78,000.00	
Endpoint Sampling and Analysis (Fill Material)					<b>\$ 4,525.00</b>
Laboratory Analysis of Endpoint Samples (8260, 8270, TAL metals, 8081, 8082)	Per Sample	4	\$ 875.00	\$ 3,500.00	
QA/QC Duplicate (8260, 8270, TAL metals, 8081, 8082) Standard TAT	Per Sample	1	\$ 875.00	\$ 875.00	
QA/QC Trip Blanks (VOCs)	Per Sample	1	\$ 150.00	\$ 150.00	
Engineering Controls					<b>\$ 138,000.00</b>
Vapor Barrier, All Materials and Installation	Per Sft	27000	\$ 3.00	\$ 81,000.00	
Passive Sub Slab Depressurization System, Design, Material and Installation	Lump Sum	1	\$ 52,000.00	\$ 52,000.00	
PE Inspections of SSDS and vapor barrier	Lump Sum	1	\$ 5,000.00	\$ 5,000.00	
Spill Closure with NYSDEC					<b>\$ 66,500.00</b>
In-Situ Chemical Oxidation (or Enhanced Aerobic Bio)	Per Event	1	\$ 10,000.00	\$ 10,000.00	
Permanent Monitoring Wells Installation	Per Well	4	\$ 5,000.00	\$ 20,000.00	
Quarterly Monitoring (Sampling, laboratory analysis and reporting)	Per Event	6	\$ 4,000.00	\$ 24,000.00	
Spill Closure Report for NYSDEC	Lump Sum	1	\$ 4,000.00	\$ 4,000.00	
Monitoring Wells Decommission	Per Well	4	\$ 500.00	\$ 2,000.00	
Administrative	Per Hour	20	\$ 50.00	\$ 1,000.00	
Project Management	Per Hour	40	\$ 100.00	\$ 4,000.00	
Obtain Closure from the NYSDEC	Lump Sum	1	\$ 1,500.00	\$ 1,500.00	
<b>ESTIMATED TOTAL for REMEDIAL SERVICES</b>					<b>\$ 697,840.00</b>

**APPENDIX G**

**Significant Threat Determination**

**(To Be Provided)**

## **APPENDIX H**

### **Resumes**

**WENQING FANG P.E.**

Sr. Consultant/ Principal

**Professional Experience**

June 2013- Present

Cider Environmental

Hauppauge, NY

**Sr. Consultant/Principal**

- Established Cider Environmental. Designed companywide standard operation procedures (SOPs) and quality assurance and quality control (QA/QC) program.
- Provide technical oversight for environmental assessment and remediation services.
- Supervise and train junior staffs both in the field and in the office.
- Maintain good relationship with clients and regulatory agencies.

Jun 2012- Jun 2013

Golder Associates

Houston, TX

**Sr. Remediation Project Manager**

- Performed assessment and remediation at oil & gas facilities, commercial laboratories, and commercial compounds.
- Prepared project budget/cash flow projection for remedial alternatives, including "dig-and-haul", in-situ chemical oxidation (ISCO) and monitored natural attenuation (MNA). Evaluated existing/historical remedial activities and made recommendations on exit strategies.
- Performed feasibility studies on municipal setting designation (MSD) application.
- Prepared Affected Property Assessment Report (APAR) and Response Action Plan (RAP) for Texas Risk Reduction Program (TRRP) sites.
- Construct site-specific environmental database, incorporated with ArcGIS and AutoCAD.
- Perform groundwater modeling (BIOCHLOR and BIOSCREEN) to track contaminants fate-and-transport; evaluate feasibility of MNA as the sole remedy, and calculate appropriate action levels (AALs).
- Perform operational risk assessment as part of Environmental and Social Impact Assessment (ESIA) for a liquefied natural gas (LNG) pipeline project in PNG, a gold mining project in Mexico, and an iron mining project in Guinea.
- Perform Phase I/II Environmental Site Assessment (ESA) in Texas, Louisiana and Oklahoma.

Apr 2004- Jun 2012

Impact Environmental

Bohemia, NY

**Environmental Engineer / Project Manager**

- Managed multiple projects. Lead project teams both in the field and in the office. Take full responsibilities of the projects from initiation to closure. Work closely with clients to develop site-specific strategies. Provide both aggressive and passive alternatives to address clients' budget concerns and schedules. Deal with emergencies and unexpected events with timely responses and flexibilities.
- Designed and performed site investigation, including multi-media sampling (soil/ sediment/ surface water/ groundwater/ ambient air/ soil gas); groundwater well installation, gauging and survey; natural gamma logging; and electrical conductivity logging. Experienced with Geoprobe, hollow stem auger, sonic drill rig, and air/mud rotary. Prepared remedial cost estimation and remedial investigation and feasibility study (RI/FS).
- Designed and performed site remediation, including soil vapor extraction and air sparging system (SVE/AS); ISCO; In-Situ Chemical Reduction (ISCR); enhanced aerobic/anaerobic bio-remediation (EAB); bio-augmentation; and soil off-site disposal. Design and perform pilot test for the comparison and evaluation of remedial alternatives.

- Conducted real property transaction risk reviews and site baseline studies. Perform ASTM Due Diligence Phase I/II ESAs.
- Prepared human health based risk assessment. Experienced with achieving administrative closure for sites with residual contamination by utilizing exposure assessments.
- Designed and installed Engineering Control measures, including soil caps, sub-slab depressurization systems (SSDS) and vapor barriers, to minimize human exposure risks.
- Performed aquifer test (pumping test and slug test) and the associated data processing. Performed construction dewatering modeling and designed dewatering system layout. Used Visual MODFLOW and Groundwater Modeling System (GMS) for groundwater contamination fate-and-transport modeling. Used various tools and software for subsurface stratigraphic interpretation.
- Excellent AutoCAD drafter. Experienced with ArcGIS. Experienced with Microsoft Access/Excel programming (via VBA).

Aug 2002- Dec 2003

EH&S at Stony Brook University

Stony Brook, NY

**Graduate Student Assistant**

- Performed indoor air quality sampling.
- Provided assistance in OSHA training for the university staff.
- Prepared transportation manifest for laboratory-generated hazardous materials.
- Maintained online Material Safety Data Sheet (MSDS) database for the university.

Aug 2001- Aug 2002

Environmental Protection Bureau of China

Jingzhou, China

**Environmental Engineer**

- Prepared regional Environmental Assessment regarding the impact of agriculture non-point discharge on the environmental quality of surface water bodies of Hubei Province, China. Provided technical documents for the establishment of regional sustainability strategies.
- Performed Environmental Impact Assessment (EIA) on proposed industrial projects, with focus on the potential impacts on ambient air and drinking water resources. Attended project evaluation meetings with various regulatory agencies and researchers.
- Performed surface water and ambient air quality sampling and contamination fate-and-transport modeling.

**Education**

2002–2004

Stony Brook University

Stony Brook, NY

- M. S. Technological Systems Management (Environmental & Waste Management)

1997-2001

Wuhan University

Wuhan, China

- B. Eng. Environmental Engineering

**Trainings**

- OSHA 40 Hour HAZWOPER Training
- OSHA 10 Hour Construction Safety Training

**JAMES CRESSY**

Sr. Consultant/ Principal

A dedicated, results-oriented leader and environmental professional, with broad-based knowledge of site assessment and remediation for large and small projects. Excellent project management skill and business communication skills to handle demanding schedules, rigid deadlines, tight budgets, and shifting priorities. Capability to manage widely divergent, simultaneously occurring projects with inflexible time-lines, through the use of exceptional organizational skills, advanced technical tools, out-of-the box thinking, and innovative problem solving abilities.

**Professional Experience**

Jun 2013- Present Cider Environmental Hauppauge, NY

**Sr. Consultant/Principal**

- Establish client basis for the company. Arrange client meetings and prepare bid documents. Prepare corporate qualification materials for client development. Lead the marketing efforts and being the point-of-contact for key clients.
- Monitor financial status of the company. Supervise time & material (T&M) tracking and invoicing.
- Negotiate with subcontractor for SOP and insurance.
- Supervise human resource department.
- Supervise companywide Phase I environmental site assessment (ESA) projects.
- Provide training for junior staff both in the field and in the office.
- Maintain healthy relationship with regulatory agencies at federal, state, county and local levels.

Apr 2005- June 2013 Impact Environmental Bohemia, NY

**Project Manager/Supervisor**

- Supervised Assessment Division with over \$400,000 annual revenue, and produced over 200 Phase I ESAs and over 30 Phase II ESAs annually. Managed entire assessment portfolio. Supervised multiple project managers and junior staff. Held regular project meetings with project managers to track project status. Arranged regular project status meetings with key clients for updates.
- Monitored division-wide financial status. Work closely with accounting and human resource departments to maintain health status of the division.
- Simultaneously manage multiple projects. Use advanced project scheduling tools to allocate and track equipment resources and manpower accordingly.
- Interacted with client, attorneys, property owners, and regulatory agencies on regular basis to ensure smooth progress.
- Designed companywide standard operation procedures (SOPs) and quality assurance and quality control (QA/QC) program for Phase I ESAs. Provided Phase I ESA trainings for junior staff. Lead companywide program update to be in compliance with ASTM and AAI standards.
- Managed companywide field equipment's. Kept abreast with the emerging technologies, and made sure all field equipment's were always in ready-to-use condition and were compatible with the latest technologies and regulatory standards.
- Provided prompt spill emergency response, and supervised emergency cleanup efforts for impacted soil and groundwater.
- Supervised underground storage tanks (USTs) removal and associated soil and groundwater remediation.
- Supervised underground injection well (UIW) remediation projects.
- Designed and performed in-site groundwater remediation by enhanced aerobic bio-degradation.

- Designed and implemented vapor intrusion prevention measures, including sub-slab depressurization systems and vapor barrier systems.
- Performed and supervised over 2,000 Phase I ESAs and over 400 Phase II ESAs.
- Provided litigation support as expert witness in groundwater contamination cases.
- Designed and implemented remedial strategies for petroleum and/or chlorinated solvents impacted sites. Prepared various submittals, including, but not limited to, remedial action work plan, health and safety plan, remedial action report, and closure report.

Dec 1999 – Dec 2004

Atlantic Express

Staten Island, NY

**Communications Technician**

- Installed, maintained and upgraded communications system for over 10,000 vehicles
- Provided assistance in creating and implementing proprietary software

**Education**

2007–2009

Stony Brook University

Stony Brook, NY

- College of Engineering and Applied Sciences. Masters of Science in Technological Systems Management: Energy and Environmental Systems

1999-2001

Stony Brook University

Stony Brook, NY

- Bachelor of Art

**Area of Expertise**

- Project/Client portfolio management.
- A wide-ranging academic background with solid technical and practical experience.
- Extremely proficient in environmental assessments and remediation.
- Design and evaluation of groundwater/vapor recovery systems.
- Proven track records of project management with impeccable records on EH&S.
- Capable of multi-tasking and seamless switching between field work and office work.
- Perform quick, detailed and accurate assessments; from small vacant properties to large multi-use properties.

**Trainings**

- OSHA 40 Hour HAZWOPER Training
- OSHA 10 Hour Construction Safety Training
- NYSDEC Vapor Intrusion Seminar
- New York City Office of Environmental Remediation Gold Certified

## RICHARD KLEINERT

Environmental Scientist

### Professional Experience

Jun 2013- Present

Cider Environmental

New York, NY

#### **Environmental Scientist**

- Submission of Freedom of information Requests to various agencies.
- Conduct government record searches and file reviews in association with the performance of Phase I Site Assessments.
- Utilize various publicly and privately compiled computer databases to satisfy the requirements of ASTM E-1527-05.
- Technical Operator of Geoprobe sampling system for the acquisition of subsurface soil and groundwater.

October 2007 – December 2009

Impact Environmental

Bohemia, NY

#### **Environmental Scientist/Geologist**

- Submission of Freedom of Information Requests to various agencies
- Conducts government record searches and file reviews in association with the performance of Phase I Environmental Site Assessments
- Working relationship with several governmental agency contacts
- Utilizes various publicly and privately compiled computer databases to satisfy the requirements of ASTM E-1527-05
- Conducts site reconnaissance work
- Performed over 100's of Phase I Environmental Site Assessments both in NY and country-wide
- Technical Operator for Geoprobe sampling system for the acquisition of subsurface soil and groundwater
- Performed over 50 Phase II Environmental Site Assessments
- Familiar with composing Remedial Action Work Plans, Closure Reports, UST and AST removals
- Interaction with clients, attorneys, property owners, etc.

January 2004- October2007

R&J Abstracts Inc

Mineola, NY

#### **Real Estate Title Examiner**

- Independently research and develop reports for Lending Institutions and Real Estate Insurance companies.
- Research county clerk records to verify judgments, mortgages delinquencies, foreclosures and federal tax/ mechanical liens.
- Perform title examinations for default properties. Verify that the contents of search packet (from in-house searches or from abstractors) were accurate and complete. Identify vesting, legal description and pertinent encumbrances to the property. Included in the final examination product are mortgages, judgments, liens, bankruptcies and any other pertinent senior or junior items and/or exceptions to the title.
- Plot difficult legal descriptions and compare with pertinent assessor maps, records of survey, parcel maps, tract maps, etc. Ensure that all reports accurately describe the properties requested by clients.

- Perform quick and accurate title searches (by both chain of title and grantor-grantee methods), including searches on owners with multiple properties, recent subdivision splits, or boundary line adjustments.

March 1998- November 2003, *Archaeologist, Independent Contractor for various companies*

- Interpreted and implemented various government regulations and requirements.
- Collected and recorded field data for future analysis.
- Monitored heavy construction equipment for the presence of archaeological materials.
- Communicated diplomatically with land owners, reporters and community members.
- Performed survey and excavation of archaeological sites to determine eligibility for the National Historic Registry of Historical Places.
- Conducted archival research to determine the historical uses of subject properties.
- Analyzed recovered artifacts to establish use and historical importance.
- Generated field maps of surveys and excavations for use in report preparation.

### **Education**

December 1995      State University of New York at New Paltz      New Paltz, New York  
➤ Bachelor of Arts in Anthropology

December 2012      Dowling University      Sayville, New York  
➤ Masters in Science Education

### **Area of Expertise**

- Phase I ESA
- Phase II ESA
- Subsurface geology of New York
- Subsurface groundwater transportation at greater New York Area.

### **Trainings**

- OSHA 40 Hour HAZWOPER Training
- OSHA 10 Hour Construction Safety Training



- Identified potential oil field and develop plans to expand existing oil field by adding new well locations and development layers.

### **Education**

- |  |                            |                 |
|--|----------------------------|-----------------|
| Aug 2006- Aug2008  | Stony Brook University     | Stony Brook, NY |
| ➤ M.S. of Geology, Geosciences Department                      |                            |                 |
| Aug 2001- Aug2004  | Peking University          | Beijing, China  |
| ➤ M.S. of Geology, School of Earth and Space Sciences          |                            |                 |
| Sep 1991- Jul 1995   | Daqing Petroleum Institute | Daqing, China   |
| ➤ B.S. of Petroleum Geology, Department of Petroleum Exploring |                            |                 |

### **Area of Expertise**

- Phase I and Phase II ESA.
- Oil field geology and hydrogeology.
- Expert in petroleum product characterization.
- Expert with Microsoft Excel, Word, Access, PowerPoint, Adobe and other Office software.
- Familiar with AutoCAD, Soil Log Plot, ArcGIS, CoralDraw, Photoshop, ACDSec.
- Familiar with GPR to identify objects underground such as pipes and USTs.
- Excellent skills on 3-Dimensionally geometrical thinking, imagination and solving 3-D problem.
- Team working, communicating, flexibility, responsibility, self-motivated, concentrated, fast learning.

### **Trainings**

- OSHA 40 Hour HAZWOPER Training
- OSHA 10 Hour Construction Safety Training

## NADIA CRESSY

Office Manager/Executive Assistant

### Professional Experience

Jun 2013- Present

Cider Environmental

New York, NY

#### **Office Manager/Executive Assistant**

- Manage day to day operations of the office.
- Assigning and monitoring clerical functions.
- Responsible for designing and implementing office policies.
- Organize all aspects of fast paced working environment.
- Creating an efficient and effective working environment.
- Review and approve supply and equipment requisitions.
- Maintain office equipment, programs and facilities.
- Preparing payroll; controlling correspondence.

2001 – 2013

The IMA Group

Bohemia, NY

#### **Operations Supervisor**

- Manage daily operation and flow of two Occupational Health clinics.
- Serve as on-site OSHA coordinator
- Responsible for recruiting, interviewing, hiring, training, monitoring of performance and evaluation of staff.
- Client and patient liaison.
- Obtained certifications for job duties as needed.

1999 - 2001

The IMA Group

Holbrook, NY

#### **Biller/Reports Processor**

- Performed QA and edits to dictated medical reports.
- Contacted and distributed reports to doctors for review and signature.
- Billed and uploaded medical reports to NYS Disability portal.
- Promoted to supervisory position within company.

1998 - 1999

Family Dental

Massapequa, NY

#### **Assistant Office Manager**

- Provided clerical and administrative support in busy dental practice.
- Scheduled dental and orthodontic appointments.
- Billed insurance companies for services rendered and performed bookkeeping duties.
- Ordered office supplies.

**Education**

2009 - 2014	Stony Brook University	Stony Brook, NY
➤ B.A. English		
1996 - 1999	SUNY Suffolk	Brentwood, NY
➤ A.A. Liberal Arts and Sciences		

**Additional Skills**

- Fluent in Spanish.
- Excellent skills with Microsoft software products (word, excel, PowerPoint, etc.)
- Familiar with AutoCAD.
- Team working, communicating, flexibility, responsibility, self-motivated, concentrated, fast learning.

# Jesse Bohner

Environmental Scientist

## Professional Experience

Sept 2015- Present Cider Environmental Hauppauge, NY

### **Environmental Professional**

- Supervise subsurface environmental soil sampling via hollow stem auger, direct pushing techniques, core drilling, and hand auger.
- Collect sediment samples from underground injection wells (UIWs)
- Collect groundwater samples via temporary and permanent groundwater monitoring wells using low-flow and standard purging techniques.
- Perform sub-slab soil vapor and indoor air testing for vapor intrusion studies.
- Implement Remedial Action Work Plan. Supervise impacted soil excavation. Perform air monitoring for the remediation work. Manage waste manifests. Produce daily site reports.
- Supervise closure activities of petroleum product underground storage tanks (USTs).

April 2012- September 2015 Matson HVAC Bohemia, N.Y

### **Assistant Technician**

- Install equipment.
- Organize Trucks/tools.
- Ensure proper disposal of refrigerant, metals, and other hazardous wastes.

Jan 2014– May 2015 Binghamton University Recycling company Binghamton, NY

### **Student Assistant**

- Drive Recycling trucks.
- Pick-up and drop off recycling.
- Organize and coordinate Earth day & Recycle-mania events 2014 and 2015

April 2008- August 2011 Dairy Barn Stores Inc. St. James, NY

### **Store Night-Manager/Cashier**

- Store manager 2009-2011
- Work Cash register.
- Receive, invoice, and stock deliveries.
- Log and maintain inventory.
- Train new employees.
- Maintenance.

April 2006- Jan. 2008 Hitherbrook Nursery St. James, NY

### **Landscaper/ Helper**

- Care and maintenance of plants.
- Deliver and landscape purchased plants/materials.

- Customer service.

June 2004- Feb. 2006

The Country House restaurant      Stony Brook, NY

**Dish Washer/Maintenance**

- Dish Washing.
- Building Maintenance.
- Receive Deliveries.

**Education**

2012–2015

Binghamton University      Binghamton, NY

- Bachelors of Science, Environmental Science.

**Area of Expertise**

- Phase I Environmental Site Assessments.
- Phase II Environmental Site Assessments.
- Soil excavation/management and supervision.

**Trainings**

- OSHA 40 Hour HAZWOPER Training.

**APPENDIX I**

**BCP Signage**

**(To Be Provided)**

## **APPENDIX J**

### **Quality Assurance Project Plan**

# Quality Assurance Project Plan

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**November 2015**

**Subject Property:**

401 East 120th Street  
New York, New York

**Prepared for:**

ACACIA Gardens Housing Development Fund Corporation  
300 East 175<sup>th</sup> Street  
Bronx, NY

**Prepared by:**

Cider Environmental  
6268 Jericho Turnpike, Suite 12  
Commack, NY 11725

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## 1 Introduction

### 1.1 Purpose

Cider Environmental (CE) has prepared this Quality Assurance Project Plan (QAPP) for work related to remedial action at 401 East 120<sup>th</sup> Street, New York, New York (“Site”).

This QAPP identifies the necessary procedures for an orderly, accurate, and efficient data collection and analysis program for the project, and ensures that data meet quality objectives. The objectives for monitoring and ensuring data quality include the following:

- Identify key responsibilities and qualifications of staff responsible for data quality monitoring;
- Ensure samples are properly managed both in the field and the laboratory;
- Ensure realistic data quality goals that will produce data of known and acceptable quality are established; and
- Ensure that data are accurate, complete, and verifiable.

### 1.2 Site Condition

The Site is located at 401 East 120<sup>th</sup> Street in the East Harlem section in borough of New York, New York and is identified as the western portion of Block 1808 and Lot 8 on the New York City Tax Map. The Site is approximately 39,000 square feet and is bounded by 15-story apartment buildings to the north; East 120<sup>th</sup> Street followed by numerous commercial retail, offices, institutional and residential buildings to the south; commercial buildings on the remainder of Lot 8 followed by a 15-story apartment building to the east; and 1<sup>st</sup> Avenue followed by John S. Roberts Junior High School to the west. Currently, the Site is used as school/offices/multi-uses and contains an approximately 4,480-square foot, one 1-story building. The remainder of the Site consists of an asphalt-paved parking lot.

### 1.3 Scope of Work

The site work activities which will require the oversight by Cider include the following scope and will include the completion of:

- Excavation of the entire Site to approximately 2 feet bgs.
- Excavation of the petroleum impacted soil in the vicinity of the former gasoline station on the southwestern corner.
- Transport the excavated soil/fill for off-site disposal.
- Removal of six known 550-gal USTs from the southwestern portion of the Site. Removal of other unknown USTs that are encountered during soil/fill removal actions.
- Installation of sub-slab depressurization system.

- Installation of vapor barrier system.
- Installation of a site-wide covering system.

Details of the scopes of work to be completed are provided within the Remedial Action Work Plan (RAWP), dated November 2015 prepared by Cider Environmental.

## 2 Quality Assurance Objectives

Quality objectives ensure that data collected are sufficient to meet the intended project goals. Quality objectives are pre-established goals or "benchmarks" that are used to monitor and assess the progress and quality of the work performed. It is essential to define quality objectives prior to initiation of any project work to ensure that activities yield data sufficient to meet project objectives.

Quality objectives are divided into two categories: data quality objectives (DQOs) and quality assurance objectives (QAOs). The DQOs are associated with the overall project objective as it relates to data collection. The QAOs define acceptance limits for project-generated data as they relate to data quality.

### 2.1 Data Quality Objectives

DQOs are qualitative and quantitative criteria required to support the decision making process. DQOs define the uncertainty in a data set and are expressed in terms of precision, accuracy, representativeness, completeness, and comparability (PARCC). The DQOs apply to both characterization and confirmation samples at the site. These parameters are defined as follows:

- **Precision:** a measure of mutual agreement among measurements of the same property usually under prescribed similar conditions. Precision is best expressed in terms of the standard deviation. Various measures of precision exist depending upon the "prescribed similar conditions".
- **Accuracy:** the degree of agreement of a measurement (or an average of measurements) with an accepted reference of "true value". Accuracy is one estimate of the bias in a system.
- **Representativeness:** expresses the degree to which data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition.
- **Completeness:** a measure of the amount of valid data obtained from a measurement system compared to the amount that was expected to be obtained under correct normal conditions.
- **Comparability:** expresses the confidence with which one data set can be compared with

another. Comparability is a qualitative, not quantitative measurement, as in the case of accuracy and precision. Comparability is assessed by reviewing results or procedures for data that do not agree with expected results.

It is the responsibility of the field team to collect representative and complete samples. It is the responsibility of the field-screening chemist at the laboratory to analyze these samples using accepted protocols resulting in data that meet PARCC standards.

## 2.2 Field Sampling Quality Objectives

The overall quality of sample results depends on proper sample management. Management of samples begins at the time of collection and continues throughout the analytical process. To ensure samples are collected and managed properly and consistently, field procedures for sample collection activities have been developed for the project. The laboratory also has procedures that ensure a proper and consistent analytical process.

Field procedures include descriptions of equipment and procedures required to perform a specific task. The purpose is to increase reproducibility and to document each of the steps required to perform the task. Approved and correctly implemented field procedures should produce data of acceptable quality that meet project DQOs.

## 2.3 Laboratory Data Quality Objectives

The laboratory will demonstrate analytical precision and accuracy by the analysis of laboratory duplicates and by adherence to accepted manufacture and procedural methodologies.

The performance of the laboratory will be evaluated by the Project Manager and Project Quality Assurance Officer during data reduction. The evaluation will include a review of all deliverables for completeness and accuracy when applicable.

### 3 Quality Control Procedures

This section presents a general overview of the quality assurance and quality control procedures that will be implemented during the project.

#### 3.1 Field Quality Control Activities

Several types of field QC samples will be collected and submitted for analysis during the project. Each type of QC sample monitors a different aspect of the field effort. Analytical results for QC samples provide information regarding the adequacy of the sample collection and transportation of samples.

The frequency of field QC samples collected will depend on the total number of samples being collected. Specifics of the sampling activities, including collection frequency and sampling procedures, are described in the field procedures. The types of field QC samples that will be generated during the project are defined below.

- **Trip blanks** – Trip blank samples monitor for contamination due to handling, transport, cross contamination from other samples during storage, or laboratory contamination.
- **Blind duplicates** – Blind duplicates are used to monitor field and laboratory precision, as well as matrix heterogeneity.
- **Matrix Spikes** – Matrix Spikes (MS) are used to monitor precision and accuracy of the analytical method on various matrices.

#### 3.2 Laboratory Quality Control Activities

Laboratory QC samples will include the use of method blanks, MS, laboratory control samples, laboratory duplicates, and surrogate spikes. The types of laboratory QC samples are defined below.

- **Method blanks** - Method blanks are used to monitor and ensure that the analytical system is free of contamination due either to carryover from previous samples or from laboratory procedures.
- **Matrix Spike samples** - MS samples monitor and assess the effects of the sample matrix on the sample analysis and verify the accuracy and precision of the analysis.
- **Laboratory Control samples** - LCSs are used to monitor the accuracy of the

analytical procedure without the potential interferences of a matrix.

- **Laboratory Duplicate samples** - Laboratory duplicate samples are used to monitor and assess laboratory precision, as well as potential matrix heterogeneity.
- **Surrogate Spikes** - Surrogate Spikes are utilized to monitor potential interferences from the sample matrix. Surrogate spikes are required for organic analyses only.

## 4 Calibration Procedures

Calibration is an integral part of ensuring that results are quantitated correctly. Instruments that are not calibrated either to manufacturers and/or method specifications are likely to produce unreliable results. Proper procedures must be followed and sufficient documentation maintained to ensure calibrations are performed correctly and that sample quantitation accurately reflects sample concentrations.

During the course of this project, instruments that may be used in the field in conjunction with sampling activities include photoionization detector (PID) and particulate meter. A maintenance, calibration, and operation program will be implemented to ensure that routine calibration and maintenance is performed on all field instruments. The program will be monitored by the Field Team Leader. Trained team members will perform scheduled calibration, field calibrations, checks, and instrument maintenance prior to use each day. Additionally, calibration will be checked as necessary to ascertain that proper measurements are being taken.

Team members are familiar with the field calibration, operation, and maintenance of the equipment, and will perform the prescribed field operating procedures outlined in the operation and field manuals accompanying the respective instrument. Field personnel will keep records of all field instruments calibrations and field checks in the field logbooks. Calibration information recorded in field logbooks will include date, time, instrument model, and a description of calibration or field check procedure, results, and any instrument deviations. If on-site monitoring equipment should fail, the Field Team Leader will be contacted immediately. Replacement equipment will be provided or the malfunction will be repaired in a timely fashion.

## 5 Analytical Procedures and Data Evaluation

Soil and ground water samples will be collected for the Site-specific target analytes. Samples will be analyzed by a New York State Department of Health-approved ELAP Contract Laboratory Protocol-certified laboratory.

Upon receipt of analytical reports from the laboratory, CE will evaluate data packages and confirm that samples were analyzed within required holding time and at proper detection limits. Data validation is not included in the scope of work; however, the laboratory will provide ASP Category B data packages for confirmation soil samples.

The project Quality Assurance/Quality Control (QA/QC) officer will review the data packages and prepare a Data Usability Summary Report (DUSR) in accordance with NYSDEC guidelines. At a minimum, the following information will be evaluated:

- Chain-of-custody forms;
- Date sampled/date analyzed;
- Sample temperature at check-in;
- Original laboratory analysis report;
- Initial and continuing instrument calibrations;
- Matrix spikes;
- Laboratory duplicate analysis;
- Surrogate recoveries (organics); and
- Laboratory control samples (inorganics).

Data reduction will consist of presenting analytical results on summary tables. Data resulting from confirmation analyses will then be used to evaluate the success of the remedial options.

## 6 Project Roles and Responsibilities

Specific roles and responsibilities have been defined for key project personnel to ensure that project goals are achieved. Each defined role will be performed by a qualified individual. Roles and responsibilities for tasks specific to this QAPP are as follows:

- The **Project Manager** has overall responsibility for developing the QAPP, monitoring the quality of the technical and managerial aspects of the project, and implementing the QAPP and corrective measures, where necessary. Project Manager is responsible for the successful and timely completion of the field activities and ensures that all policies and procedures outlined in the work plan, this QAPP, and the Construction Health and Safety Plan are followed by the project team, and is responsible for assigning appropriate staff to project tasks.
- The **Task Manager** is responsible for implementation of the activities described in the appropriate sampling and analysis plan for each specific study area. The Task Manager also handles project oversight and coordination between each of the project team members.
- The **Project Scientist** oversees the laboratory contract, monitors data quality, and conducts data review to ensure the accuracy of data collected during the investigation. The Project Scientist is the laboratory contact for questions and/or revisions of procedures, methods, or chain-of-custody (COC) information, and will verify laboratory procedures and conduct laboratory audits.
- The **Data Manager** is responsible for establishing and maintaining an accurate and representative database for chemical and hydrogeologic data collected during the investigation.
- The **QA/QC Officer** is responsible for the periodic review, auditing, or assignment of qualified individuals to perform audits of activities associated with the procedures in the QAPP, and for ensuring acceptable data quality

## **APPENDIX K**

### **Community Air Monitoring Program**

## **Appendix K**

### **Community Air Monitoring Plan**

Real-time air monitoring for volatile organic compounds (VOCs) and particulate levels at the perimeter of the exclusion zone or work area will be performed. Continuous monitoring will be performed for all ground intrusive activities and during the handling of contaminated or potentially contaminated media. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pit excavation or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be performed 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, for instance, will consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well bailing/purging, and taking a reading prior to leaving a sample location. Depending upon the proximity of potentially exposed individuals, continuous monitoring may be performed 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. Exceedences of action levels observed during performance of the Community Air Monitoring Plan (CAMP) will be reported to the NYSDEC Project Manager and included in the Daily Report.

### **VOC Monitoring, Response Levels, and Actions**

Volatile organic compounds (VOCs) will be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis during invasive work. Upwind concentrations will be measured at the start of each workday and periodically thereafter to establish background conditions. The monitoring work will be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment will be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment will be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

- 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 will be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities will resume with continued monitoring.
- 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 will be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities will resume provided that the total organic vapor level 200 feet downwind of the 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.
- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities will be shutdown.

All 15-minute readings must be recorded and be available for NYSDEC personnel to review. Instantaneous readings, if any, used for decision purposes will also be recorded.

### **Particulate Monitoring, Response Levels, and Actions**

Particulate concentrations will be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring will be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment will 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.

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m<sup>3</sup>) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques will be employed. Work will continue with dust suppression techniques provided that downwind PM-10

particulate levels do not exceed 150 mcg/m<sup>3</sup> above the upwind level and provided that no visible dust is migrating from the work area.

- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m<sup>3</sup> above the upwind level, work will be stopped and a re-evaluation of activities initiated. Work will resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m<sup>3</sup> of the upwind level and in preventing visible dust migration.

All readings will be recorded and be available for NYSDEC personnel to review.