



## *Don Carlo Environmental Services Inc.*

790 East 91<sup>st</sup> Street  
Brooklyn, NY 11236  
Tel: (718) 857-3100  
Fax: (718) 857-2100  
Email: [doncarlo@aol.com](mailto:doncarlo@aol.com)

# **Remedial Action Work Plan**

**For**

**Nikki Suites  
872-874 Willoughby Avenue  
Brooklyn, NY 11221  
Block 1593, Lot23  
NYC VCP Site No. 14CVCP253K  
OER Project Number: 13EHAN379K**

**E-Designation E-285  
CEQR Number 12DCP156Y**

**Hazardous Materials**

**Prepared for:**  
NYC Office of Environmental Remediation  
100 Gold Street, 2<sup>nd</sup> Floor  
New York, NY 10038  
Mr. Eric Ilijevich  
Email: [EIlijevich@dep.nyc.gov](mailto:EIlijevich@dep.nyc.gov)

**Prepared by:**  
Don Carlo Environmental Services, Inc.  
790 East 91<sup>st</sup> Street  
Brooklyn, NY 11236  
Tel: (718) 857-3100  
Fax: (718) 857-2100  
Email: [doncarlo@aol.com](mailto:doncarlo@aol.com)

**JUNE 20, 2014**

# REMEDIAL ACTION WORK PLAN

## TABLE OF CONTENTS

<b>CERTIFICATION</b> .....	1
<b>EXECUTIVE SUMMARY</b> .....	2
<b>REMEDIAL ACTION PLAN</b> .....	11
1.0 SITE BACKGROUND .....	11
1.1 Site Location and Current Usage .....	11
1.2 Proposed Redevelopment Plan .....	12
1.3 Description of Surrounding Property .....	12
1.4 Environmental Investigation Reports .....	13
2.0 DESCRIPTION OF REMEDIATION.....	16
2.1 Objectives .....	16
Soil.....	16
Groundwater .....	16
Soil Vapor .....	16
3.0 REMEDIAL ALTERNATIVES ANALYSIS.....	17
3.1 Threshold Criteria .....	19
3.2 Balancing Criteria .....	20
4.0 DESCRIPTION OF REMEDIATION.....	26
4.1 Summary of Preferred Remedial Action.....	26
4.2 Soil Cleanup Objectives and Soil/Fill Management.....	28
4.3 Engineering Controls .....	32
4.4 Institutional Controls .....	33
4.5 Site Management Plan .....	34
4.6 Qualitative Human Health Exposure Assessment .....	35
5.0 REMEDIAL ACTION MANAGEMENT .....	40
5.1 Project Organization and Oversight.....	40
5.2 Site Security .....	40
5.3 Work Hours.....	40

5.4	Construction Health and Safety Plan .....	40
5.5	Community Air Monitoring Plan.....	41
5.6	Agency Approvals .....	43
5.7	Site Preparation .....	44
5.8	Traffic Control .....	48
5.9	Demobilization.....	48
5.10	Reporting and Record Keeping.....	49
5.11	Compliant Management.....	50
5.12	Deviations From the Remedial Action Work Plan .....	50
6.0	REMEDIAL CLOSURE REPORT.....	51
	Certification .....	52
7.0	SCHEDULE.....	53

## **PHOTOS**

- Photos of Phase-II Subsurface Investigation

## **FIGURES**

- Site Location Map – Figure 1
- Redevelopment Plan – Figure 2
- Boring Location Map – Figure 3

## **TABLES**

- Analytical results for soil
- Analytical results for groundwater

## **APPENDICES**

- Construction Health and Safety Plan
- Vapor Barrier Specs
- Soil and Groundwater Laboratory Analytical Results

## LIST OF ACRONYMS

Acronym	Definition
AOC	Area of Concern
AS/SVE	Air Sparging/Soil Vapor Extraction
BOA	Brownfield Opportunity Area
CAMP	Community Air Monitoring Plan
C/D	Construction/Demolition
COC	Certificate of Completion
CQAP	Construction Quality Assurance Plan
CSOP	Contractors Site Operation Plan
DCR	Declaration of Covenants and Restrictions
ECs/ICs	Engineering and Institutional Controls
HASP	Health and Safety Plan
IRM	Interim Remedial Measure
VCA	Voluntary Cleanup Agreement
MNA	Monitored Natural Attenuation
NOC	Notice of Completion
NYC VCP	New York City Voluntary Cleanup Program
NYC DEP	New York City Department of Environmental Protection
NYC DOHMH	New York State Department of Health and Mental Hygiene
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 DOH	New York State Department of Health
NYS DOT	New York State Department of Transportation
ORC	Oxygen-Release Compound
OSHA	United States Occupational Health and Safety Administration
PE	Professional Engineer
PID	Photo Ionization Detector
QEP	Qualified Environmental Professional
QHHEA	Qualitative Human Health Exposure Assessment
RAOs	Remedial Action Objectives
RAR	Remedial Action Report

RAWP	Remedial Action Work Plan or Plan
RCA	Recycled Concrete Aggregate
RD	Remedial Design
RI	Remedial Investigation
RMZ	Residual Management Zone
SCOs	Soil Cleanup Objectives
SCG	Standards, Criteria and Guidance
SMP	Site Management Plan
SPDES	State Pollutant Discharge Elimination System
SVOC	Semi-Volatile Organic Compound
USGS	United States Geological Survey
UST	Underground Storage Tank
VOC	Volatile Organic Compound

# CERTIFICATION

I, Antonio T. Gulfin, am a Professional Engineer licensed in the State of New York. I have primary direct responsibility for implementation of the remedial action for the Nikki Suites Site known as OER Project No. 13EHAN379K and NYC VCP Site No. 14CVCP253K.

I, Dhanraj Singh, am a Qualified Environmental Professional as defined in §43-140. I have primary direct responsibility for implementation of the remedial action for the Nikki Suites Site known as OER Project No. 13EHAN379K and NYC VCP Site No. 14CVCP253K.

I certify that this Remedial Action Work Plan (RAWP) has a plan for handling, transport and disposal of soil, fill, fluids and other materials removed from the property in accordance with applicable City, State and Federal laws and regulations. Importation of all soil, fill and other material from off-Site will be in accordance with all applicable City, State and Federal laws and requirements. This RAWP has provisions to control nuisances during the remediation and all invasive work, including dust and odor suppression.

\_\_\_\_\_  
Name

\_\_\_\_\_  
NYS PE License Number

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date



\_\_\_\_\_  
QEP Name

\_\_\_\_\_  
QEP Signature

\_\_\_\_\_  
Date

## **EXECUTIVE SUMMARY**

Nikki Suites, LLC has established this plan to remediate a 14,868-square foot site located at 872-874 Willoughby Avenue in Brooklyn, 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 achieves the remedial objectives, complies with applicable environmental standards, criteria and guidance and conforms with applicable laws and regulations.

### **Site Location and Current Usage**

The Site is located in the Bedford Stuyvesant section of Brooklyn, New York and is identified as Block 1593 and Lot 23 on the New York City Tax Map. Figure 1 is a Site location map. The Site is 14,868-square feet and is bounded by Willoughby Avenue to the north, Broadway to the west, residential properties beyond Stuyvesant Avenue to the east, and mixed-use commercial and residential properties beyond Hart Street to the north. A map of the site boundary is shown in Figure 1. Currently, the Site is a vacant parcel and vegetated with no on-site structures or operations.

There are no partial tax lots or merging/subdivided lots associated with the project. The OER Project number is 13EHAN379K, and NYC VCP Site Number is 14CVCP253K. There are no NYSDEC Spill Numbers or other case numbers associated with this property.

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

The proposed future use for the site will consist of residential and commercial use. The proposed development consists of construction of a 9-story mixed use building with a cellar. The building foundation will be at a depth of 10-feet below grade surface (bgs). The footprint of the building upon completion will be approximately 13,889 square feet (approximately 93% lot coverage). The cellar will contain the maintenance office, utility rooms, elevator and parking. The first floor will be used for 4 commercial retail spaces, the residential lobby, a laundry room, and open parking area; and floors 2 through 9 as

apartment units. Layout of the proposed site development is presented in Figure 2. The current zoning designation is C4-4L General Commercial District.

Based on the proposed building footprint of approximately 13,889 square feet and in order to give clearance for the proposed building cellar, the estimated volume of materials to be excavated and removed offsite is approximately 5,200 cubic yards (6,500 tons). During the proposed excavation work, groundwater is not expected to be encountered as the depth to groundwater was encountered beyond fifty-five feet (55') bgs.

### **Summary of the Remedy**

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. Preparation of a Community Protection Statement and performance of all required NYC VCP citizen participation activities according to an approved Citizen Participation Plan (CPP);
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. Excavation and removal of soil/fill exceeding Track 4 SCOs. 93% of the property will be excavated to a depth of approximately 10 feet in the cellar area across the building

footprint. Approximately, 6500 tons of soil will be excavated and removed from this Site. In addition, the PCE and cadmium hotspots will be removed to a minimum depth of 12' below grade.

6. 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 onsite;
7. Removal of USTs (if encountered) and closure of petroleum spills (if evidence of a spill/leak is encountered during Site excavation) in compliance with applicable local, State, and Federal laws and regulations;
8. Transportation and off-Site disposal of all soil/fill material at 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 onsite.
9. Collection and analysis of end-point samples to determine the performance of the remedy with respect to attainment of SCOs.
10. Installation of a vapor barrier system beneath the building slabs and behind the foundation sidewalls of the proposed building.
11. Construction and maintenance of an engineered composite cover consisting of 6 inch thick concrete slab across the Site installed on top of a 6 inch gravel bed;
12. As part of development, installation of a sub-grade air exchange and ventilation system in the parking area of the cellar in accordance with the NYC Mechanical Code;
13. Import of materials to be used for backfill and cover in compliance with this plan and in accordance with applicable laws and regulations.
14. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations.

15. Performance of all activities required for the remedial action, including permitting requirements and pretreatment requirements, in compliance with applicable laws and regulations.
16. Submission of an approved Site Management Plan (SMP) in the RAR 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.
17. Submission of a Remedial action report (RAR) that describes the remedial activities, certifies that the remedial requirements have been achieved, defines the Site boundaries, and describes all Engineering and Institutional Controls to be implemented at the Site, and lists any changes from this RAWP, and, if Track 1 SCOs are not achieved, describes all Engineering and Institutional Controls to be implemented at the Site.
18. The property will continue to be registered with an E-Designation at the NYC Buildings Department. Establishment 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.

## COMMUNITY PROTECTION STATEMENT

The Office of Environmental Remediation created the New York City Voluntary Cleanup Program (NYC VCP) to provide governmental oversight for the cleanup of contaminated property in NYC. This Remedial Action Work Plan (“cleanup plan”) describes the findings of prior environmental studies that show the location of contamination at the site, and describes the plans to clean up the site to protect public health and the environment.

This cleanup plan provides a very high level of protection for neighboring communities and also includes many other elements that address common community concerns, such as community air monitoring, odor, dust and noise controls, hours of operation, good housekeeping and cleanliness, truck management and routing, and opportunities for community participation. The purpose of this Community Protection Statement is to explain these community protection measures in non-technical language to simplify community review.

**Remedial Investigation and Cleanup Plan.** Under the NYC VCP, a thorough cleanup study of this property (called a remedial investigation) has been performed to identify past property usage, to sample and test soils, groundwater and soil vapor, and identify contaminant sources present on the property. The cleanup plan has been designed to address all contaminant sources that have been identified during the study of this property.

**Identification of Sensitive Land Uses.** Prior to selecting a cleanup, the neighborhood was evaluated to identify sensitive land uses nearby, such as schools, day care facilities, hospitals and residential areas. The cleanup program was then tailored to address the special conditions of this community.

**Qualitative Human Health Exposure Assessment.** An important part of the cleanup planning for the Site is the performance of a study to find all of the ways that people might come in contact with contaminants at the Site now or in the future. This study is called a Qualitative Human Health Exposure Assessment (QHHEA). A QHHEA was performed for this project. This assessment has considered all known contamination at the Site and evaluated the potential for people to come in contact with this contamination. All identified public exposures will be addressed under this cleanup plan.

**Health and Safety Plan.** This cleanup plan includes a Construction Health and Safety Plan (CHASP) that is designed to protect community residents and on-Site workers. The elements of this plan are in compliance with safety requirements of the United States Occupational Safety and Health Administration (OSHA). This plan includes many protective elements including those discussed below.

**Site Safety Coordinator.** This project has a designated Site safety coordinator to implement the Health and Safety Plan. The safety coordinator maintains an emergency contact sheet and protocol for management of emergencies. The Site Safety Coordinator will be **Dhanraj Singh** and can be reached at 718-857-3100<sup>[E11]</sup>.

**Worker Training.** Workers participating in cleanup of contaminated material on this project are required to be trained in a 40-hour hazardous waste operators training course and to take annual refresher training. This pertains to workers performing specific tasks including removing contaminated material and installing cleanup systems in contaminated areas.

**Community Air Monitoring Plan.** Community air monitoring will be performed during this cleanup project to ensure that the community is properly protected from contaminants, dust and odors. Air samples will be tested in accordance with a detailed plan called the Community Air Monitoring Plan or CAMP. Results will be regularly reported to the NYC Office of Environmental Remediation. This cleanup plan also has a plan to address any unforeseen problems that might occur during the cleanup (called a 'Contingency Plan').

**Odor, Dust and Noise Control.** This cleanup plan includes actions for odor and dust control. These actions are designed to prevent off-Site odor and dust nuisances and includes steps to be taken if nuisances are detected. Generally, dust is managed by application of physical covers and by water sprays. Odors are controlled by limiting the area of open excavations, physical covers, spray foams and by a series of other actions (called operational measures). The project is also required to comply with NYC noise control standards. If you observe problems in these areas, please contact the onsite Project Manager **Dhanraj Singh** at 718-857-3100<sup>[E12]</sup> or NYC Office of Environmental Remediation Project Manager Eric Ilijevich at 212-788-8841.

**Quality Assurance.** This cleanup plan requires that evidence be provided to illustrate that all cleanup work required under the plan has been completed properly. This evidence will be

summarized in the final report, called the Remedial Action Report. This report will be submitted to the NYC Office of Environmental Remediation and will be thoroughly reviewed.

**Storm-Water Management.** To limit the potential for soil erosion and discharge, this cleanup plan has provisions for storm-water management. The main elements of the storm water management include physical barriers such as tarp covers and erosion fencing, and a program for frequent inspection.

**Hours of Operation.** The hours for operation of cleanup will comply with the NYC Department of Buildings construction code requirements or according to specific variances issued by that agency. For this cleanup project, the hours of operation are 7:00 AM to 5:00 PM<sup>[E13]</sup>.

**Signage.** While the cleanup is in progress, a placard will be prominently posted at the main entrance of the property with a laminated project Fact Sheet that states that the project is in the NYC Voluntary Cleanup Program, provides project contact names and numbers, and locations of project documents can be viewed.

**Complaint Management.** The contractor performing this cleanup is required to address all complaints. If you have any complaints, you can call the facility Project Manager Dhanraj Singh at 718-857-3100<sup>[E14],[E15]</sup> the NYC Office of Environmental Remediation Project Manager Eric Ilijevich at 212-788-8841, or call 311 and mention the Site is in the NYC Voluntary Cleanup Program.

**Utility Mark-outs.** To promote safety during excavation in this cleanup, the contractor is required to first identify all utilities and must perform all excavation and construction work in compliance with NYC Department of Buildings regulations.

**Soil and Liquid Disposal.** All soil and liquid material removed from the Site as part of the cleanup will be transported and disposed of in accordance with all applicable City, State and Federal regulations and required permits will be obtained.

**Soil Chemical Testing and Screening.** All excavations will be supervised by a trained and properly qualified environmental professional. In addition to extensive sampling and chemical testing of soils on the Site, excavated soil will be screened continuously using hand-held

instruments, by sight, and by smell to ensure proper material handling and management, and community protection.

**Stockpile Management.** Soil stockpiles will be kept covered with tarps to prevent dust, odors and erosion. Stockpiles will be frequently inspected. Damaged tarp covers will be promptly replaced. Stockpiles will be protected with silt fences. Hay bales will be used, as needed to protect storm water catch basins and other discharge points.

**Trucks and Covers.** Loaded trucks leaving the Site will be covered in compliance with applicable laws and regulations to prevent dust and odor. Trucks will be properly recorded in logs and records and placarded in compliance with applicable City, State and Federal laws, including those of the New York State Department of Transportation. If loads contain wet material that can leak, truck liners will be used. All transport of materials will be performed by licensed truckers and in compliance with all laws and regulations.

**Imported Material.** All fill materials proposed to be brought onto the Site will comply with rules outlined in this cleanup plan and will be inspected and approved by a qualified worker located on-Site. Waste materials will not be brought onto the Site. Trucks entering the Site with imported clean materials will be covered in compliance with applicable laws and regulations.

**Equipment Decontamination.** All equipment used for cleanup work will be inspected and washed, if needed, before it leaves the Site. Trucks will be cleaned at a truck inspection station on the property before leaving the Site.

**Housekeeping.** Locations where trucks enter or leave the Site will be inspected every day and cleaned regularly to ensure that they are free of dirt and other materials from the Site.

**Truck Routing.** Truck routes have been selected to: (a) limit transport through residential areas and past sensitive nearby properties; (b) maximize use of city-mapped truck routes; (c) limit total distance to major highways; (d) promote safety in entry to highways; (e) promote overall safety in trucking; and (f) minimize off-Site line-ups (queuing) of trucks entering the property. Operators of loaded trucks leaving the Site will be instructed not to stop or idle in the local neighborhood.

**Final Report.** The results of all cleanup work will be fully documented in a final report (called a Remedial Action Report) that will be available for you to review in the public document repository online. Access to the document repository is available at Brooklyn Public Library – Bushwick Branch located at 340 Bushwick Ave, New York, New York 11206.

**Long-Term Site Management.** If long-term protection is required after the cleanup is complete, the property owner will be required to comply with an ongoing Site Management Plan that calls for continued inspection of protective controls, such as Site covers. The Site Management Plan is evaluated and approved by the NYC Office of Environmental Remediation. Requirements that the property owner must comply with are defined in the property's deed or established through a city environmental designation. A certification of continued protectiveness of the cleanup will be required from time to time to show that the approved cleanup is still effective.

# **REMEDIAL ACTION WORK PLAN**

## **1.0 SITE BACKGROUND**

Nikki Suites has applied to enroll in the New York City Voluntary Cleanup Program (NYC VCP) to investigate and remediate a property located at 872-874 Willoughby Avenue in the Bedford Stuyvesant section of Brooklyn, New York (the Site). Remedial Investigations (RI) were performed to compile and evaluate data and information necessary to develop this Remedial Action Work Plan (RAWP) and site-specific Construction Health and Safety Plan (CHASP) in a manner that will render the Site protective of public health and the environment consistent with the contemplated end use. This project has been assigned OER Project Number 13EHAN379K and NYC VCP Site Number 14CVCP253K. This RAWP describes the remediation and/or mitigation activities to be implemented at the Site in coordination with the New York City Office of Environmental Remediation (OER) for the purposes of satisfying the requirements of the Hazardous Materials E-Designation Program and obtaining a Notice To Proceed. An E-Designation for Hazardous Materials (E-285) was placed on the Site by the New York City Department of City Planning (DCP) as part of the 10/11/2012, of the Bedford Stuyvesant North rezoning action (CEQR number 12DCP156Y). 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 remedial action described in this document provides for the protection of public health and the environment, complies with applicable environmental standards, criteria and guidance and applicable laws and regulations.

### **1.1 Site Location and Current Usage**

The Site is located in the Bedford Stuyvesant section of Brooklyn, New York and is identified as Block 1593 and Lot 23 on the New York City Tax Map. Figure 1 is a Site location map. The Site is 14,868-square feet and is bounded by Willoughby Avenue to the north, Broadway to the west, residential properties beyond Stuyvesant Avenue to the east, and mixed-use commercial and residential properties beyond Hart Street to the

north. A map of the site boundary is shown in Figure 1. Currently, the Site is vacant parcel and vegetated with no on-site structures or operations.

There are no partial tax lots or merging/subdivided lots associated with the project. The OER Project number is 13EHAN379K and NYC VCP Site number is 14CVCP253K. There are no NYSDEC Spill Numbers or other case numbers associated with this property.

## 1.2 Proposed Redevelopment Plan

The proposed future use for the site will consist of residential and commercial use. The proposed development consists of construction of a 9-story mixed use building with a cellar. The building foundation will be at a depth of 10-feet below grade surface (bgs). The footprint of the building upon completion will be approximately 13,889 square feet (approximately 93% lot coverage). The cellar will contain the maintenance office, utility rooms, elevator and parking. The first floor will be used for 4 commercial retail spaces, the residential lobby, a laundry room, an open recreation area, and parking; and floors 2 through 9 as apartment units. Layout of the proposed site development is presented in Figure 2. The current zoning designation is C4-4L General Commercial District.

Based on the proposed building footprint of approximately 13,889 square feet and in order to give clearance for the proposed building cellar, the estimated volume of materials to be excavated and removed offsite is approximately 5,200 cubic yards (6,500 tons). During the proposed excavation work, groundwater is not expected to be encountered as the depth to groundwater was encountered beyond fifty-five feet (55') bgs.

## 1.3 Description of Surrounding Property

The site is located in a residential and commercial neighborhood. Willoughby Avenue and Broadway are located and intersect north of the site. A one-story commercial building (1000 Broadway); a five-story mixed-use building (1011 Broadway) and a four-story mixed-use building (1013 Broadway) are located north of the site (across

Broadway). Four (4) three- and four-story residential buildings are located south of the site. A four-story mixed-use building (1022 Broadway) is located east of the site. A three-story residential building (864 Willoughby) is located west of the site.

Within a 500 feet radius of the Site, there are a variety of land uses including: residential (multi-story residential apartments), commercial and medical facility. Properties located within a ¼-mile radius of the Site are zoned R6, R6A and R6B (general residential districts) and C4-4L (general commercial district fronting on elevated rail line). Within 250 feet radius of the Site, one (1) sensitive receptor (medical facility) known as Interfaith Medical Center (1038 Broadway) is identified. The land uses in the area include residential buildings, commercial uses and community facilities.

#### 1.4 Summary of the Remedial Investigation

A remedial investigation was performed and the results are documented in a companion document called “Remedial Investigation Report, site name”, dated month, year (RIR).

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

1. Past use of furniture manufacturing and upholstery.
2. Presence of historic fill material.

#### **Summary of the Work Performed under the Remedial Investigation**

The following work has been performed at the site:

1. Conducted a Site inspection to identify AOCs and physical obstructions (i.e. structures, buildings, etc.); and
2. Installed seven soil borings in 2013 and 4 soil borings in 2014. Collected 14 soil samples and one duplicate sample in 2013 and 6 soil samples in 2014 for chemical analysis from the soil borings to evaluate soil quality; and
3. Installed 4 temporary groundwater monitoring wells in 2013 and 4 groundwater monitoring wells in 2014. Collected 4 groundwater samples and 1 duplicate sample in 2013 and 4 groundwater samples in 2014 for chemical analysis to evaluate groundwater

quality. In 2014, groundwater wells were gauged with a water level meter to record a depth to groundwater reading to the nearest (+/-) 1/100-foot. The well casings were surveyed by a trained QEP to determine the groundwater flow.

### **Summary of Environmental Findings**

1. Elevation of the property above mean sea level ranges from 50-feet to 66- feet.
2. Depth to groundwater ranges from 45-feet to 55-feet below grade at the Site.
3. Groundwater flow is generally from northeast to southwest beneath the Site.
4. Depth to bedrock is undetermined at this time at the Site. During soil borings advancement down to 60-feet bgs, bedrock was not encountered.
5. The stratigraphy of the site, from the surface down, consists of 2-feet to 7-feet of historic fill, crushed brick and organic surficial material on select locations (topsoil) underlain by 3-feet of gravel and brown coarse sand underlain by brown fine and coarse sand.
6. Soil/fill samples showed the chlorinated VOC tetrachloroethene (PCE) above its Unrestricted Use SCO, but below its Restricted Residential Use SCO at a maximum concentration of 2.3 ppm. No other VOCs were detected above Unrestricted Use SCOs. Several SVOCs, all PAHs, were detected above Restricted Residential Use SCOs in shallow and select deep samples and included benzo(a)pyrene (max 6.87 ppm), benzo(b)fluoranthene (max 6.9 ppm), chrysene (max 12.2 ppm), benzo(k)fluoranthene (max 6.2 ppm), dibenzo(a,h)anthracene (0.65 ppm), and indeno(1,2,3-cd)pyrene (max 2.8 ppm). No PCBs detected in any sample. The pesticides aldrin, chlordane, and dieldrin were detected above Unrestricted Use SCOs, but below Restricted Residential Use SCOs. Seven metals were detected above Unrestricted Use SCOs, and of these cadmium (max 9.92 ppm), lead (max 602 ppm), and zinc (max 3000 ppm) were detected above Restricted Residential Use SCOs. With the exception of the identified PCE hotspot, the results are consistent with concentrations of SVOCs and metals identified throughout NYC.
7. Groundwater samples showed PCE at concentrations which exceeded their respective allowed values as compared with NYSDEC Ambient Groundwater Quality Standards

(GQS) in seven of eight groundwater samples. PCE concentrations ranged from 30 ppb to 160 ppb. The highest concentrations of PCE were observed at wells located hydraulically upgradient, indicating a potential offsite source. The PAH benzo(a)anthracene (max 0.11 ppb) was detected above GQS. No PCBs or pesticides were detected in any of the groundwater samples, and no metals were detected above GQS.

8. Soil vapor samples showed generally low concentrations of petroleum-related and chlorinated VOCs. PCE (6.3 ug/m<sup>3</sup> to 24.2 ug/m<sup>3</sup>), TCE (maximum concentration of 1.86 ug/m<sup>3</sup>), 1,1,1-TCA (16.5 ug/m<sup>3</sup>), and carbon tetrachloride (maximum concentration of 0.05 ug/m<sup>3</sup>) were detected below the monitoring ranges established by NYSDOH Vapor Intrusion Guidance.

For more detailed results, consult the RIR. Based on an evaluation of the data and information from the RIR and this RAWP, disposal of significant amounts of hazardous waste is not suspected at this site.

## **2.0 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**

- 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 REMEDIAL ALTERNATIVES ANALYSIS

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 remedial action objectives (RAOs) for media in which chemical constituents were found in exceedance of applicable standards, criteria and guidance values (SCGs). A remedy is then developed based on the following ten criteria:

- Protection of human health and the environment;
- 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;
- Land use; and
- Sustainability.

The following is a detailed description of the alternatives analysis and remedy selection to address impacted media at the Site. As required, a minimum of two remedial alternatives (including a Track 1 scenario) are evaluated, as follows:

**Alternative 1 involves:**

- Establishment of 6NYCRR Part 375 Unrestricted Use (Track 1) Soil Cleanup Objective (SCOs);
- Removal of all soil/ fill exceeding Unrestricted Use SCOs throughout the Site. 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 cellar 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 would be required for a Track 1 cleanup, but a vapor barrier and sub-grade ventilated parking would be installed as part of construction to prevent any potential future exposures from soil vapor; and
- As part of new development, a final cover would be placed over the entire Site.

**Alternative 2 involves:**

- Establishment of Site-specific (Track 4) SCOs;
- Removal of soil/ fill exceeding Track 4 Site-Specific SCOs and confirmation that the site-specific Track 4 SCOs have been achieved through post-excavation end point sampling. Based on the results of the RI, it is expected that Track 4 Site-specific SCOs would be achieved based on excavation for development purposes to a depth of 10 feet below grade for the cellar foundations;
- Placement of a composite cover system over the entire site to prevent exposure to remaining soil/fill;
- Placement of a vapor barrier beneath the building slab and along foundation side walls to grade and installation of sub-grade ventilated parking garage to prevent soil vapor entering the new building;
- Establishment of use restrictions including prohibitions on the use of groundwater from the site and prohibitions on sensitive site uses, such as farming or vegetable gardening, to eliminate future exposure pathways;
- Establishment of an approved Site Management Plan 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; and
- The property would continue to be registered with an E-Designation at the NYC Buildings Department.

### 3.1 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 the historic fill at the Site, 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 excavating the historic fill at the Site and by ensuring that remaining soil/fill on-Site meets Track 4 Site-Specific SCOs, as well as by placement of Institutional and Engineering controls, including a composite cover system, vapor barrier and sub-grade ventilated garage. The composite cover system would prevent direct contact with any remaining on-Site soil/fill. Implementing institutional controls including a site management plan and continued "E" designation of property would ensure that the composite cover system remains intact and protective. Establishment of Track 4 Site-Specific SCOs 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, a Soil and Materials Management Plan and Community Air Monitoring Plan (CAMP). Groundwater is 55 feet deep and contact with contaminated groundwater is not anticipated, and would be prevented during construction and the remedial action 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 system below the new building's basement slab and continuing the vapor barrier around foundation walls as part of new construction. In addition, the

presence of a ventilation system in the parking cellar garage would prevent soil vapor from accumulating in the new building.

### 3.2. 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.

Alternative 1 would achieve compliance with the remedial goals, chemical specific SCGs and RAOs for soil through removal to achieve Track 1 Unrestricted Use SCOs and Groundwater Protection Standards. Compliance with SCGs for soil vapor would also be achieved by installing a vapor barrier system below the new building's cellar slab and continuing the vapor barrier around foundation walls, as part of development. In addition, the presence of a ventilated garage at cellar level would prevent soil vapor from accumulating in the new building.

Alternative 2 would achieve compliance with the remedial goals, chemical-specific SCGs and RAOs for soil through removal of soil to meet Track 4 SCOs. Compliance with SCGs for soil vapor would also be achieved by installing a vapor barrier below the new building's cellar slab and continuing the vapor barrier around foundation walls and through construction of a ventilated garage at cellar level. A Site Management Plan would ensure that these controls remained protective for the long term.

Health and safety measures contained in the CHASP and Community Air Monitoring Plan (CAMP) that comply with the applicable SCGs shall 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 effects on public health and the environment during implementation of the remedial action, including protection of the community, environmental impacts, time until remedial response objectives are achieved, and protection of workers during remedial actions.

Both Alternatives 1 and 2 have similar-short term effectiveness during their respective implementations, as each requires excavation of historic fill material to a depth of at least 10 feet below ground surface. 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 if excavation of greater amounts of historical fill material is encountered below the excavation depth of the proposed building. However, focused attention to means and methods during the remedial action during a Track 1 removal action, including community air monitoring and appropriate truck routing, would minimize or negate 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. Approximately 300, 25-ton capacity truck trips would be necessary to transport fill and soil excavated during Site development. Truck traffic will be routed on the most direct course using major thoroughfares where possible and flaggers will be used to protect pedestrians at Site entrances and exits.

Both alternatives would employ appropriate measures to prevent short-term impacts, including a Construction Health and Safety Plan (CHASP), 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 CHASP will be protected from on-Site contaminants (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 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 Engineering Controls.

Alternative 1 would achieve long-term effectiveness and permanence by permanently removing all impacted soil/fill material and enabling unrestricted usage of the property. Removal of on-Site contaminant sources will prevent future groundwater contamination.

Alternative 2 would provide long-term effectiveness by removing most on-site contamination and attaining Track 4 Site-Specific SCOs, establishing a composite cover system across the Site, establishing use restrictions, establishing a Site Management Plan (SMP) to ensure long-term management of Institutional Controls (ICs) and Engineering Controls (ECs), and continued E designation of property to memorialize these controls for the long term. Establishment of an SMP will ensure that this protection remains effective for the long-term. The SMP will ensure long-term effectiveness of all ECs and ICs by requiring periodic inspection and certification that these controls and use restrictions continue to be in place and are functioning as they were intended assuring that protections designed into the remedy will provide continued high level of protection in perpetuity.

Both alternatives would result in removal of soil contamination exceeding the SCOs providing the highest level, most effective and permanent remedy over the long-term with respect to a remedy for contaminated soil, which will eliminate any migration to groundwater.

### **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 meeting Track 1 Unrestricted Use SCOs.

Alternative 2 would permanently eliminate the toxicity, mobility, and volume of contaminants from on-Site soil excavated for development purposes, and any remaining soil/fill would meet Track 4 Site-Specific SCOs. Alternative 1 would eliminate a greater total mass of contaminants on Site.

### **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.

Both Track 1 and Track 4 cleanup alternatives are feasible and implementable. The techniques, materials and equipment to implement both remedial alternatives are readily available and have been proven effective in remediating the contaminants associated with the Site. They use standard materials and services that are well established technology. 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 exceedances of Track 1 Unrestricted Use SCOs were identified at the Site to a depth of 10-12 feet below grade, and the new building requires excavation of the entire Site to a depth of a maximum of 10 feet, the costs of excavation and disposal will likely be higher for Alternative 1. Also, the long-term costs are higher for Alternative 2 than Alternative 1 based on implementation of a Site Management Plan as part of Alternative 2. In both cases, appropriate public health and environmental protections are achieved.

The remedial plan creates an approach that combines the remedial action with the redevelopment of the Site, including the construction of the building foundation and subgrade structures. The remedial plan is also cost effective in that it will take into consideration the selection of the closest and most appropriate disposal facilities to reduce transportation and disposal costs during the excavation of historic fill and other soils during the redevelopment of the Site.

### **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.

Both of the alternatives for the Site would provide a remedial action that is protective of public health and the environment and would be safe to achieve and should be acceptable to the community. This RAWP will be subject to and undergo public review under the NYC VCP and will provide the opportunity for detailed public input on the remedial alternatives and the selected remedial action. This public comment will be considered by OER prior to approval of this plan. A Citizen Participation Plan is provided in Appendix 1.

### **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 proposed redevelopment of the Site is compatible with its current C4-4L Special Enhanced Commercial District. Following remediation, the Site will meet either Track 1 Unrestricted Use or Track 4 Site-Specific SCOs, both of which are appropriate for its planned mixed commercial/residential use. Improvements in the current environmental condition of the property achieved by both alternatives are also consistent with the City's goals for cleanup of contaminated land, making them safer and bringing such properties into productive reuse. Both alternatives are equally protective of natural resources and cultural resources.

### **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 *PlaNYC: A Greener, Greater New York*. 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. A sustainability statement is provided in Appendix 2.

Both Alternative 1 and Alternative 2 would potentially result in similar energy usage based on the potentially equal volume of material transported off-Site. Both remedial alternatives are comparable with respect to the opportunity to achieve sustainable remedial action. A complete list of green remedial activities considered as part of the NYC VCP is included in the Sustainability Statement, included as Appendix C.

## 4.0 DESCRIPTION OF REMEDIATION

### 4.1 SUMMARY OF PREFERRED REMEDIAL ACTION

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

The proposed remedial action will consist of:

1. Preparation of a Community Protection Statement and performance of all required NYC VCP citizen participation activities according to an approved Citizen Participation Plan (CPP);
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. Excavation and removal of soil/fill exceeding Track 4 SCOs. 93% of the property will be excavated to a depth of approximately 10 feet in the cellar area across the building

footprint. Approximately, 6500 tons of soil will be excavated and removed from this Site. In addition, the PCE and cadmium hotspots will be removed to a minimum depth of 12' below grade.

6. 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 onsite;
7. Removal of USTs (if encountered) and closure of petroleum spills (if evidence of a spill/leak is encountered during Site excavation) in compliance with applicable local, State, and Federal laws and regulations;
8. Transportation and off-Site disposal of all soil/fill material at 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 onsite.
9. Collection and analysis of end-point samples to determine the performance of the remedy with respect to attainment of SCOs.
10. Installation of a vapor barrier system beneath the building slabs and behind the foundation sidewalls of the proposed building.
11. Construction and maintenance of an engineered composite cover consisting of 6 inch thick concrete slab across the Site installed on top of a 6 inch gravel bed;
12. As part of development, installation of a sub-grade air exchange and ventilation system in the parking area of the cellar in accordance with the NYC Building Code;
13. Import of materials to be used for backfill and cover in compliance with this plan and in accordance with applicable laws and regulations.
14. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations.

15. Performance of all activities required for the remedial action, including permitting requirements and pretreatment requirements, in compliance with applicable laws and regulations.
16. Submission of an approved Site Management Plan (SMP) in the RAR 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.
17. Submission of a Remedial action report (RAR) that describes the remedial activities, certifies that the remedial requirements have been achieved, defines the Site boundaries, and describes all Engineering and Institutional Controls to be implemented at the Site, and lists any changes from this RAWP, and, if Track 1 SCOs are not achieved, describes all Engineering and Institutional Controls to be implemented at the Site.
18. The property will continue to be registered with an E-Designation at the NYC Buildings Department. Establishment 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.

#### 4.2 Soil Cleanup Objectives and Soil/Fill Management

Track 4 Site-specific Soil Cleanup Objectives (SCOs) are proposed for this project. The following Track 4 Site-specific SCOs will be used:

<b><u>Contaminant</u></b>	<b><u>Track 4 SCOs</u></b>
Total SVOCs	250 ppm
PCE	1.3 ppm

Cadmium 9.3 ppm

Lead 750 ppm

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. The location of planned excavations is shown in Figure 3.

Discrete contaminant sources (such as hotspots) identified during the remedial action will be horizontally and vertically identified by GPS or surveyed. This information will be provided in the RCR.

### **Estimated Soil/Fill Removal Quantities**

Excavation and removal of soil/fill exceeding Track 4 SCOs. 93% of the property will be excavated to a depth of approximately 10 feet in the cellar area across the building footprint. In addition, the PCE and cadmium hotspots will be removed to a minimum depth of 12' below grade.

The total quantity of soil/fill expected to be excavated and disposed off-Site is 6,500 tons. [D6] Disposal locations will be reported promptly to the OER Project Manager prior to the start of the remedial action.

## **End-Point Sampling**

Removal actions under this plan will be performed in conjunction with remedial end-point sampling. Confirmation end-point sampling and testing will be performed following materials removal and completed proper to Site development activities. To evaluate attainment of Track 4 Site-Specific SCOs, five confirmation end-point samples will be collected and analyzed for the trigger compounds and elements established on the Track 4 Site-Specific SCOs list. If Track 1 SCOs are pursued, endpoint samples will be collected and analyzed for VOCs, SVOCs, pesticides, and metals. In addition, if hotspots are encountered, hotspot removal end-point sampling frequency will consist of the following:

1. For excavations less than 20 feet in total perimeter, at least one bottom sample and one sidewall sample biased in the direction of surface runoff.
2. For excavations 20 to 300 feet in perimeter:
  - For surface removals, one sample from the top of each sidewall for every 30 linear feet of sidewall and one sample from the excavation bottom for every 900 square feet of bottom area.
  - For subsurface removals, one sample from each sidewall for every 30 linear feet of sidewall and one sample from the excavation bottom for every 900 square feet of bottom area.
3. For sampling of volatile organics, bottom samples should be taken within 24 hours of excavation, and should be taken from the zero to six-inch interval at the excavation floor. Samples taken after 24 hours should be taken at six to twelve inches.
4. For contaminated soil removal, post remediation soil samples for laboratory analysis should be taken immediately after contaminated soil removal. If the excavation is enlarged horizontally, additional soil samples will be taken pursuant to bullets 1-3 above.

Post-remediation sample locations and depth will be biased towards the areas and depths of highest contamination identified during previous sampling episodes unless field indicators such as field instrument measurements or visual contamination identified during the remedial action indicate that other locations and depths may be more heavily contaminated. In all cases, post-remediation samples should be biased toward locations and depths of the highest expected contamination.

New York State Department of Health ELAP certified labs will be used for all end-point sample analyses. Labs for end-point sample analyses will be reported in the RCR. The RCR will provide a tabular and map summary of all end-point sample results. End-point samples will be analyzed for trigger analytes (those for which SCO exceedance is identified) utilizing the following methodology:

Soil analytical methods for Full List will include:

- 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.

If either LNAPL and/or DNAPL are detected, appropriate samples will be collected for characterization and “finger print analysis” and required regulatory reporting (i.e. spills hotline) will be performed.

#### **Quality Assurance/Quality Control (QA/QC)**

QA/QC for chemical analytical program and assessment of the usability of the data will be provided by the contracted laboratory and consultant. Chemical analysis will be performed by a NYSDOH/ELAP certified laboratory. Analysis will be sufficient to allow comparison of soil data to applicable Standards, Criteria, and Guidance including 6NYCRR Part 375 Quality Control samples for soil will include one duplicate sample for each day of sampling.

#### **Import and Reuse of Soils**

Import of soils onto the property and reuse of soils already onsite will be performed in conformance with the Soil/Materials Management Plan. No soil is expected to be

imported into the Site for backfill and/or cover; if such soil importation is needed, soil quantity will be reported promptly to the OER Project Manager.

#### 4.3 Engineering Controls

The excavation required for the proposed Site development will achieve Site Specific Track 4 Use SCOs. Engineering Controls are required to address residual contamination at the Site. The following elements incorporated into the foundation design will act as ECs and ICs: composite cover system, soil vapor barrier and a sub-grade ventilation and air exchange system.

##### Composite Cover System

Exposure to residual soil/fill will be prevented by an engineered, composite cover system to be built on the Site. The entire property will be covered by an engineered permanent cover system comprised of structural 6-inch slab foundation beneath the building footprint.

The composite cover system is a permanent engineering control for the Site. The system will be inspected and reported at specified intervals as required by this RAWP and the SMP. A Soil 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 RAR.

##### **Vapor Barrier**

Migration of soil vapor will be mitigated with a combination of building structural slab and a vapor barrier system (minimum 20-mil thickness). In order to prevent subsurface vapors from impacting the interior air of the building at the Site, a vapor barrier system will be installed beneath the building slab and along foundation sidewalls to grade. The vapor barrier will be installed according to manufacturer specifications.

The Remedial Action Report will include photographs (maximum of two photos per

page) of the installation process, PE/RA certified letter (on company letterhead) from primary contractor responsible for installation oversight and field inspections, and a copy of the manufacturers certificate of warranty.

### **Sub- Grade Air Exchange and Ventilation System**

A parking garage will be constructed in the cellar and ventilated in accordance with the NYC building code. The operation of this ventilation system will prevent accumulation of potential soil vapor in the parking garage, and further prevent migration of soil vapor into the occupied above-grade spaces of the building. Since there is sub-grade parking that will be mechanically vented in accordance with NYCDOB Code, there is no need for a sub-slab depressurization system (SSD) as the mechanical ventilation will provide appropriate ventilation for sub-grade parking.

## **4.4 INSTITUTIONAL CONTROLS**

Institutional Controls are required on sites that achieve Track 4 Remedial Action. Institutional Controls (IC) will be utilized in this remedial action to manage residual soil/fill and other media and render the Site protective of public health and the environment. Long-term employment of EC/ICs will be implemented under a site-specific Site Management Plan (SMP) that will be included in the RAR.

Institutional Controls for this remedial action are:

- Continued registration of the E-Designation for the property. This RAWP includes a description of all ECs and ICs, and summarizes the requirements of the Site Management Plan (SMP) which will note that the property owner and property owner's successors and assigns must comply with the approved SMP;
- Submittal of a Site Management Plan in the RAR for approval by OER that provides procedures for appropriate operation, maintenance, monitoring, inspection, reporting and certification of ECs. SMP will require that the property owner and property owner's successors and assigns will submit to OER 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 OER; 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. OER 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 OER in the SMP and will comply with RCNY §43-1407(1)(3).

- 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 use and will not be used for a higher level of use without prior approval by OER.

#### 4.5 SITE MANAGEMENT PLAN

Site Management is required on sites that do not achieve Track 1 Remedial Action. Site Management will be performed and will be the last phase of remediation and begins with the approval of the Remedial Action Report and issuance of the Notice of Completion (NOC) 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 RAR but will be written in a manner that allows its use as an independent document. Site Management continues until terminated in writing by OER. 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 Voluntary Cleanup Agreement with OER. This includes a plan for: (1)

implementation of EC's and ICs; (2) implementation of monitoring programs; (3) operation and maintenance of EC's; (4) inspection and certification of EC's; and (5) reporting.

Site management activities, reporting, and EC/IC certification will be scheduled on a periodic basis to be established in the SMP and will be subject to review and modification by OER. The Site Management Plan will be based on a calendar year and certification reports will be due for submission to OER by July 31 of the year following the reporting period.

#### 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.

Investigations reported in the Remedial Investigation Report (RIR) are sufficient to complete a Qualitative Human Health Exposure Assessment (QHHEA). As part of the VCP 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 by characterizing the exposure setting, identifying exposure pathways, and evaluating contaminant fate and transport. This QHHEA was prepared in accordance with Appendix 3B and Section 3.3 (b) 8 of the NYSDEC Draft DER-10 Technical Guidance for Site Investigation and Remediation.

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

Historic fill material is present at the Site at variable depths ranging in thickness

from zero to 8 feet. Based on the results of both the May 2014 and December 2013 RIR, the contaminants of concern found are:

#### Soil

- SVOCs including benzo(a)anthracene, benzo(a)pyrene, benzo(a)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene and indeno(1,2,3-cd)pyrene exceeded Restricted Residential SCOs;
- Metals, including lead and chromium exceeded Restricted Residential SCOs; and

#### Groundwater

- Two VOCs, PCE and sec-Butylbenzene, exceeded GQS;
- One SVOC, benzo(a)anthracene, exceeded GQS;

#### Soil vapor

- Chlorinated VOCs including PCE and TCE were detected at low to moderate concentrations; and
- Petroleum VOCs detected at low to moderate concentrations.

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

SVOCs and metals are present in the historic fill materials throughout the Site at shallow and deep depths. One VOC and one SVOC were also detected in groundwater. Metal contaminant found in groundwater are most likely linked to regional impacts. PCE was identified in soil above its groundwater protection SCO in one isolated location. The highest concentrations of PCE were identified in hydraulically upgradient groundwater wells. PCE was only in soil gas at low concentrations.

### **Potential Routes of Exposure**

The five elements of an exposure pathway are: (1) a contaminant source; (2) contaminant release and transport mechanisms; (3) a point of exposure; (4) a route of exposure; and (5) a receptor population. An exposure pathway is considered complete

when all five elements of an exposure pathway are documented. A potential exposure pathway exists when any one or more of the five elements comprising an exposure pathway cannot be documented. An exposure pathway may be eliminated from further evaluation when any one of the five elements comprising an exposure pathway has not existed in the past, does not exist in the present, and will never exist in the future. Three potential primary routes exist by which chemicals can enter the body:

- Ingestion of fill or soil;
- Inhalation of vapors and particulates; and
- Dermal contact with water, fill and soil.

### **Potential Points of Exposure**

Existing – The Site is undeveloped, vacant and uncapped. Therefore, exposure to surficial soil/fill material is possible. Groundwater is 55 feet deep and not exposed at the Site, and because the Site is served by the public water supply, groundwater is not used at the Site. There are no structures on Site where soil vapor could accumulate.

Construction/ Remediation Activities – Once redevelopment activities begin, construction workers will come into direct contact with surface and subsurface soils as a result of on-Site construction/excavation activities. Similarly, off-Site receptors could be exposed to dust from onsite activities. During construction, on-Site and off-Site exposures to contaminated dust from on-Site will be addressed through dust controls, and through the implementation of the Community Air Monitoring Plan and a Construction Health and Safety Plan. Groundwater is not anticipated to be encountered, and there will be no structures on site where soil vapor could accumulate.

Proposed Future Conditions – Once the remedial actions and redevelopment of the Site have been completed, there will be no potential onsite exposure pathways. Not only will most historic fill be removed, but the Site will also be fully capped with the concrete building slab, which will prevent contact with any residual soils. Any exposures to vapors from off-site sources will be prevented by installation of a vapor barrier, a

building slab and a ventilation and air exchange system in the parking cellar.

### **Receptor Populations**

The immediate area is mixed use residential/commercial/light industrial, and is anticipated to remain as such. The new building at the site will be utilized as a residential facility. Potential receptor populations are as follows:

On-Site Receptors - The Site is currently vacant. Therefore, the only potential on-Site receptors are Site representatives, trespassers and visitors granted access to the property. During redevelopment of the Site, the on-Site potential receptors will include construction workers, site representatives, and visitors. Once the Site is redeveloped, the on-Site potential sensitive receptors will include adult and child residents and workers.

Off-Site Receptors - Potential offsite receptors within a 0.25-mile radius of the Site include: adult and child residents, commercial, industrial and construction workers, pedestrians, trespassers, and cyclists, based on the following:

1. Commercial Businesses (up to 0.25 mile) – existing and future
2. Light Industrial (up to 0.25 mile) – existing and future
3. Residential Buildings (up to 0.25 mile) – existing and future
4. Building Construction/Renovation (up to 0.25 mile) – existing and future
5. Pedestrians, Trespassers, Cyclists (up to .25 mile) – existing and future
6. Schools (up to .25 mile) – existing and future
7. Community (up to .25 mile) – existing and future

### **Overall Human Health Exposure Assessment**

Based upon this analysis, complete on-site exposure pathways appear to be present only during the current unremediated phase and the remedial action phase. Under current conditions, on-Site exposure pathways are minimized by preventing access to the Site. During the remedial action, on-site exposure pathways will be eliminated by preventing

access to the Site, through implementation of soil/materials management, storm water pollution prevention, dust controls, employment of a community air monitoring plan, and implementation of a Construction Health and Safety Plan. After the remedial action is complete, there will be no remaining exposure pathways to on-Site soil/ fill, as the composite cover system and use restrictions will prevent contact with residual soil and groundwater. The vapor barrier, concrete building slab and the ventilation and aeration system in parking cellar will interrupt potential for soil vapor intrusion and vapor build-up inside the building. Continued protection after the remedial action will be achieved by the implementation of site management including periodic inspections and certification of the performance of remedial controls.

## 5.0 REMEDIAL ACTION MANAGEMENT

### 5.1 Project Organization and Oversight

Principal personnel who will participate in the remedial action include Mr. George Kelesidis, owner/developer. The Professional Engineer (PE) and Qualified Environmental Professionals (QEP) for this project are Antonio T. Gulfin, PE and Dhanraj Singh who will perform the oversight on the development.

### 5.2 Site Security

Site access will be gained by one (1) gated entrance with an enclosed fence and controlled by onsite designated contractors.

### 5.3 Work Hours

The hours for operation of remedial construction will be from 7am to 5pm unless a variance is permitted. These hours conform to the New York City Department of Buildings construction code requirements.

### 5.4 Construction Health and Safety Plan

The site-specific Construction Health and Safety Plan (CHASP) is included in Appendix 1. The Site Safety Coordinator will be Dhanraj Singh. Remedial work performed under this RAP will be in full compliance with applicable health and safety laws and regulations, including Site and OSHA worker safety requirements and HAZWOPER requirements. Confined space entry, if any, will comply with OSHA requirements and industry standards and will address potential risks. The parties performing the remedial construction work will ensure that performance of work is in compliance with the CHASP and applicable laws and regulations. The CHASP pertains to remedial and invasive work performed at the Site until the issuance of the Notice Of Satisfaction.

All field personnel involved in remedial activities will participate in training required under 29 CFR 1910.120, including 40-hour hazardous waste operator training and annual 8-hour refresher training. Site Safety Officer will be responsible for maintaining workers training records.

Personnel entering any exclusion zone will be trained in the provisions of the CHASP and be required to sign an CHASP acknowledgment. Site-specific training will be provided to field personnel. Additional safety training may be added depending on the tasks performed. Emergency telephone numbers will be posted at the site location before any remedial work begins. A safety meeting will be conducted before each shift begins. Topics to be discussed include task hazards and protective measures (physical, chemical, environmental); emergency procedures; PPE levels and other relevant safety topics. Meetings will be documented in a log book or specific form.

An emergency contact sheet with names and phone numbers is included in the CHASP. That document will define the specific project contacts for use in case of emergency.

## 5.5 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 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. Exceedences of action levels observed during performance of the Community Air Monitoring Plan (CAMP) will be reported to the OER 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 OER 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  $150 \text{ mcg}/\text{m}^3$  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  $150 \text{ mcg}/\text{m}^3$  of the upwind level and in preventing visible dust migration.

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

### 5.6 Agency Approvals

All permits or government approvals required for remediation and construction have been or will be obtained prior to the start of remediation and construction. Acceptance of

this RAWP by OER does not constitute satisfaction of these requirements and will not be a substitute for any required permit.

## 5.7 Site Preparation

### **Pre-Construction Meeting**

OER will be invited to attend the pre-construction meeting at the Site with all parties involved in the remedial process prior to the start of remedial construction activities.

### **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.

### **Utility Marker Layouts, Easement Layouts**

The presence of utilities and easements on the Site will be fully investigated prior to the performance of invasive work such as excavation or drilling under this plan by using, at a minimum, the One-Call System (811). Underground utilities may pose an electrocution, explosion, or other hazard during excavation or drilling activities. All invasive activities will be performed in compliance with applicable laws and regulations to assure safety. Utility companies and other responsible authorities will be contacted to locate and mark the locations, and a copy of the Markout Ticket will be retained by the contractor prior to the start of drilling, excavation or other invasive subsurface operations. Overhead utilities may also be present within the anticipated work zones. Electrical hazards associated with drilling in the vicinity of overhead utilities will be prevented by maintaining a safe distance between overhead power lines and drill rig masts.

Proper safety and protective measures pertaining to utilities and easements, and compliance with all laws and regulations will be employed during invasive and other

work contemplated under this RAP. The integrity and safety of on-Site and off-Site structures will be maintained during all invasive, excavation or other remedial activity performed under the RAP.

### **Dewatering**

If dewatering from waste surface water is to be implemented at the Site during the course of redevelopment, appropriate coordination will be made to mobilize the necessary equipment and water holding/storage tanks needed in order to pump and store the waste water. Coordination with Clean Water of NY will be made on a service call to transport the water offsite for legal disposal. Groundwater intrusion is not anticipated due to the depth of the groundwater and the new building excavation depth. A NYCDEP discharge permit will be maintained before any dewatering to the NYC Sewer system takes place.

### **Equipment and Material Staging**

Equipment and materials will be stored and staged in a manner that complies with applicable laws and regulations. The location of proposed equipment and material staging areas, truck inspection station, stockpile areas, and other pertinent remedial management features will be determined during redevelopment.

### **Stabilized Construction Entrance**

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.

### **Truck Inspection Station**

An outbound-truck inspection station will be set up close to the Site exit. Before exiting the Site, trucks will be required to stop at the truck inspection station and will be examined for evidence of contaminated soil on the undercarriage, body, and wheels. Soil and debris will be removed. Brooms, shovels and potable water will be utilized for the removal of soil from vehicles and equipment, as necessary.

## **Extreme Storm Preparedness and Response Contingency Plan**

Damage from flooding or storm surge can include dislocation of soil and stockpiled materials, dislocation of site structures and construction materials and equipment, and dislocation of support of excavation structures. Damage from wind during an extreme storm event can create unsafe or unstable structures, damage safety structures and cause downed power lines creating dangerous site conditions and loss of power. In the event of emergency conditions caused by an extreme storm event, the enrollee will undertake the following steps for site preparedness prior to the event and response after the event.

### **Storm Preparedness**

Preparations in advance of an extreme storm event will include the following: containerized hazardous materials and fuels will be removed from the property; loose materials will be secured to prevent dislocation and blowing by wind or water; heavy equipment such as excavators and generators will be removed from holes, trenches and depressions on the property to high ground or removed from the property; an inventory of the property with photographs will be performed to establish conditions for the site and equipment prior to the event; stockpile covers for soil and fill will be secured by adding weights such as sandbags for added security and worn or ripped stockpile covers will be replaced with competent covers; stockpiled hazardous wastes will be removed from the property; stormwater management systems will be inspected and fortified, including, as necessary: clean and reposition silt fences, hay bales; clean storm sewer filters and traps; and secure and protect pumps and hosing.

### **Storm Response**

At the conclusion of an extreme storm event, as soon as it is safe to access the property, a complete inspection of the property will be performed. A site inspection report will be submitted to OER at the completion of site inspection and after the site security is assessed. Site conditions will be compared to the inventory of site conditions and material performed prior to the storm event and significant differences will be noted. Damage from storm conditions that result in acute public safety threats, such as downed power lines or imminent collapse of buildings, structures or equipment will be reported to

public safety authorities via appropriate means such as calling 911. Petroleum spills will be reported to NYS DEC within 2 hours of identification and consistent with State regulations. Emergency and spill conditions will also be reported to OER. Public safety structures, such as construction security fences will be repaired promptly to eliminate public safety threats. Debris will be collected and removed. Dewatering will be performed in compliance with existing laws and regulations and consistent with emergency notifications, if any, from proper authorities. Eroded areas of soil including unsafe slopes will be stabilized and fortified. Dislocated materials will be collected and appropriately managed. Support of excavation structure will be inspected and fortified as necessary. Impacted stockpiles will be contained and damaged stockpile covers will be replaced. Storm-water control systems and structures will be inspected and maintained as necessary. If soil or fill materials are discharged off site to adjacent properties, property owners and OER will be notified and corrective measure plan designed to remove and clean dislocated material will be submitted to OER and implemented following approval by OER and granting of site access by the property owner. Impacted offsite areas may require characterization based on site conditions, at the discretion of OER. If onsite petroleum spills are identified, a qualified environmental professional will determine the nature and extent of the spill and report to NYS DEC's spill hotline at DEC 800-457-7362. If the source of the spill is ongoing and can be identified, it should be stopped if this can be done safely. Potential hazards will be addressed immediately, consistent with guidance issued by NYS DEC.

### **Storm Response Reporting**

A site inspection report will be submitted to OER at the completion of site inspection. An inspection report established by OER is available on OER's website ([www.nyc.gov/oer](http://www.nyc.gov/oer)) and will be used for this purpose. Site conditions will be compared to the inventory of site conditions and material performed prior to the storm event and significant differences will be noted. The site inspection report will be sent to the OER project manager and will include the site name, address, tax block and lot, site primary and alternate contact name and phone number. Damage and soil release assessment will include: whether the project had stockpiles; whether stockpiles were damaged;

photographs of damage and notice of plan for repair; report of whether soil from the site was dislocated and whether any of the soil left the site; estimates of the volume of soil that left the site, nature of impact, and photographs; description of erosion damage; description of equipment damage; description of damage to the remedial program or the construction program, such as damage to the support of excavation; presence of onsite or offsite exposure pathways caused by the storm; presence of petroleum or other spills and status of spill reporting to NYS DEC; description of corrective actions; schedule for corrective actions. This report should be completed and submitted to OER project manager with photographs within 24 hours of the time of safe entry to the property after the storm event.

## 5.8 Traffic Control

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 will be via Willoughby Avenue.

## 5.9 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.

## 5.10 Reporting and Record Keeping

### **Daily Reports**

Daily reports providing a general summary of activities for each day of *active remedial work* will be emailed to the OER Project Manager by the end of the following day. Those reports will include:

- Project number and statement of the activities and an update of progress made and locations of work performed;
- Quantities of material imported and exported from the Site;
- Status of on-Site soil/fill stockpiles;
- A summary of all citizen complaints, with relevant details (basis of complaint; actions taken; etc.);
- A summary of CAMP excursions, if any;
- Photograph of notable Site conditions and activities.

The frequency of the reporting period may be revised in consultation with OER project manager based on planned project tasks. Daily email reports are not intended to be the primary mode of communication for notification to OER of emergencies (accidents, spills), requests for changes to the RAP or other sensitive or time critical information. However, such information will be included in the daily reports. Emergency conditions and changes to the RAWP will be communicated directly to the OER project manager by personal communication. Daily reports will be included as an Appendix in the RAR.

### **Record Keeping and Photo-Documentation**

Job-site record keeping for all remedial work will be performed. These records will be maintained on-Site during the project and will be available for inspection by OER staff. Representative photographs will be taken of the Site prior to any remedial activities and during major remedial activities to illustrate remedial program elements and

contaminant source areas. Photographs will be submitted at the completion of the project in the RAR in digital format (i.e. jpeg files).

#### 5.11 Complaint Management

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

#### 5.12 Deviations from the Remedial Action Work Plan

All changes to the RAWP will be reported to the OER Project Manager and will be documented in daily reports and reported in the RAR. The process to be followed if there are any deviations from the RAWP will include a request for approval for the change from OER 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.

## 6.0 REMEDIAL CLOSURE REPORT

A Remedial Action Report (RAR) will be submitted to OER following implementation of the remedial action defined in this RAWP. The RAR will document that the remedial work required under this RAWP has been completed and has been performed in compliance with this plan. The RAR will include:

- Information required by this RAWP;
- As-built drawings for all constructed remedial elements, required certifications, manifests and other written and photographic documentation of remedial work performed under this remedy;
- Site Management Plan;
- 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 and all material 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 contaminated material removed from the Site including a map showing source areas;
- Account 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.
- Reports and supporting material will be submitted in digital form.

## **Remedial Action Report Certification**

The following certification will appear in front of the Executive Summary of the Remedial Action Report. The certification will include the following statements:

*I, Antonio T. Gulfin, am currently a Professional Engineer licensed by the State of New York. I had primary direct responsibility for implementation of the remedial program for the Nikki Suites with OER Site number 13EHAN379K.*

*I, Dhanraj Singh, am a qualified Environmental Professional. I had primary direct responsibility for implementation remedial program for the Nikki Suites with OER Site number 13EHAN379K.*

*I certify that the OER-approved Remedial Action Work Plan dated May 12, 2014 was implemented and that all requirements in those documents have been substantively complied with. I certify that contaminated soil, fill, liquids or other material from the property were taken to facilities licensed to accept this material in full compliance with applicable laws and regulations.*

## 7.0 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 OER. Currently, a one (1) month remediation period is anticipated.

<b>Schedule Milestone</b>	<b>Weeks from Remedial Action Start</b>	<b>Duration (weeks)</b>
OER Approval of RAP	0	-
Fact Sheet 2 Announces Start of Remedy	0	-
Mobilization	6	1
Remedial Work	6	4
Demobilization	10	1
Submit Remedial Action Report	12	4

## **TABLES**

## **Appendix A**

### **Citizen Participation Plan**

The NYC Office of Environmental Remediation and Allied West Farms (NY) LLC have established this Citizen Participation Plan because the opportunity for citizen participation is an important component of the NYC Voluntary Cleanup Program. This Citizen Participation Plan describes how information about the project will be disseminated to the Community during the remedial process. As part of its obligations under the NYC VCP, Nikki Suites, LLC will maintain a repository for project documents and provide public notice at specified times throughout the remedial program. This Plan also takes into account potential environmental justice concerns in the community that surrounds the project Site. Under this Citizen Participation Plan, project documents and work plans are made available to the public in a timely manner. Public comment on work plans is strongly encouraged during public comment periods. Work plans are not approved by the NYC Office of Environmental Remediation (OER) until public comment periods have expired and all comments are formally reviewed. An explanation of cleanup plans in the form of a public meeting or informational session is available upon request to OER's project manager assigned to this Site, Eric Ilijevich, who can be contacted about these issues or any others questions, comments or concerns that arise during the remedial process at (212) 788-8841.

**Project Contact List.** OER has established a Site Contact List for this project to provide public notices in the form of fact sheets to interested members of the Community. Communications will include updates on important information relating to the progress of the cleanup program at the Site as well as to request public comments on the cleanup plan. The Project Contact List includes owners and occupants of adjacent buildings and homes, principal administrators of nearby schools, hospitals and day care centers, the public water supplier that serves the area, established document repositories, the representative Community Board, City Council members, other elected representatives and any local Brownfield Opportunity Area (BOA) grantee organizations. Any member of the public or organization will be added to the Site Contact List on request. A copy of the Site Contact List is maintained by OER's project

manager. If you would like to be added to the Project Contact List, contact NYC OER at (212) 788-8841 or by email at [brownfields@cityhall.nyc.gov](mailto:brownfields@cityhall.nyc.gov).

**Repositories.** A document repository is maintained in the nearest public library that maintains evening and weekend hours. This document repository is intended to provide access to the online document repository for community review of all principal documents generated during the cleanup program including Remedial Investigation reports, Remedial Action work plans and reports, and all public notices and fact sheets produced during the lifetime of the remedial project. Nikki Suites, LLC will inspect the repositories to ensure that they are fully populated with project information. The repository for this project is:

Repository Name: Brooklyn Public Library – Bushwick Branch

Repository Address: 340 Bushwick Ave. at Siegel St.

Repository Telephone Number: (718)-602-1348

Repository Hours of Operation:

Mon	10:00 AM - 6:00 PM
Tue	10:00 AM - 6:00 PM
Wed	10:00 AM - 6:00 PM
Thu	1:00 PM - 8:00 PM
Fri	10:00 AM - 5:00 PM
Sat	Closed
Sun	Closed

**Digital Documentation.** NYC OER strongly encourages the use of digital documents in repositories as a means of minimizing paper use while also increasing convenience in access and ease of use.

**Identify Issues of Public Concern.** The major issues of concern to the public will be potential impacts of nuisance odors and dust during the disturbance of historic fill soils at the Site. This work will be performed in accordance with procedures which will be specified under a detailed Remedial Program which considers and takes preventive measures for exposures to future residents of the property and those on adjacent properties during construction. Detailed plans to monitor the potential for exposure including a Construction Health and Safety Plan and a Community Air Monitoring Plan are required components of the remedial program. Implementation of these plans will be under the direct oversight of the New York City Office of Environmental Remediation (NYCOER).

These plans will specify the following worker and community health and safety activities during remedial activity at the Site:

- On-Site air monitoring for worker protection,
- Perimeter air monitoring for community protection.

The Health and Safety Plan and the Community Air Monitoring Plan prepared as part of the Remedial Action Work Plan will be available for public review at the document repository.

**Public Notice and Public Comment.** Public notice to all members of the Project Contact List is required at three major steps during the performance of the cleanup program (listed below) and at other points that may be required by OER. Notices will include Fact Sheets with descriptive project summaries, updates on recent and upcoming project activities, repository information, and important phone and email contact information. All notices will be prepared by Nikki Suites, LLC reviewed and approved by OER prior to distribution and mailed by Nikki Suites, LLC. Public comment is solicited in public notices for all work plans developed under the NYC Voluntary Cleanup Program. Final review of all work plans by OER will consider all public comments. Approval will not be granted until the public comment period has been completed.

**Citizen Participation Milestones.** Public notice and public comment activities occur at several steps during a typical NYC VCP project. See flow chart on the following page, which identifies when during the NYC VCP public notices are issued: These steps include:

- **Public Notice of the availability of the Remedial Investigation Report and Remedial Action Work Plan and a 30-day public comment period on the Remedial Action Work Plan.**

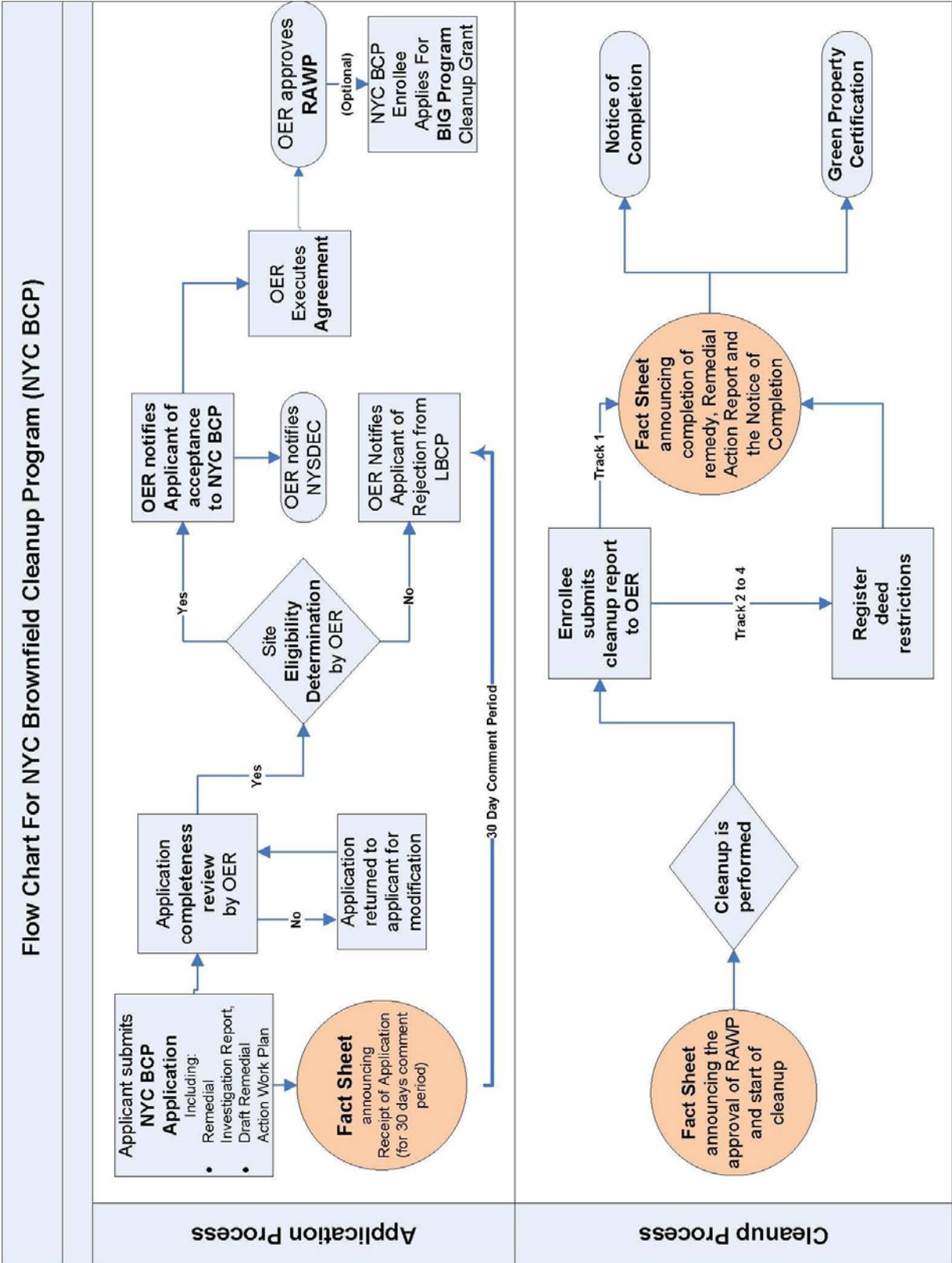
Public notice in the form of a Fact Sheet is sent to all parties listed on the Site Contact List announcing the availability of the Remedial Investigation Report and Remedial Action Work Plan and the initiation of a 30-day public comment period on the Remedial Action Work Plan. The Fact Sheet summarizes the findings of the RIR and provides details of the RAWP. The public comment period will be extended an additional 15 days upon public request. A public meeting or informational session will be conducted by OER upon request.

- **Public Notice announcing the approval of the RAWP and the start of remediation**

Public notice in the form of a Fact Sheet is sent to all parties listed on the Site Contact List announcing the approval of the RAWP and the start of remediation.

- **Public Notice announcing the completion of remediation, designation of Institutional and Engineering Controls and issuance of the Notice of Completion**

Public notice in the form of a fact sheet is sent to all parties listed on the site contact list announcing the completion of remediation, providing a list of all institutional and engineering controls implemented for to the site and announcing the issuance of the notice of completion.



## Appendix B

### Sustainability Statement

This Sustainability Statement documents sustainable activities and green remediation efforts planned under this remedial action.

**Reuse of Clean, Recyclable Materials.** Reuse of clean, locally-derived recyclable materials reduces consumption of non-renewable virgin resources and can provide energy savings and greenhouse gas reduction.

This project intends to use recycled concrete aggregate wherever possible in grading and backfilling the Site. An estimate of the quantity (in tons) of clean, non-virgin materials (reported by type of material) reused under this plan will be quantified and reported in the RAR.

**Reduce Consumption of Virgin and Non-Renewable Resources.** Reduced consumption of virgin and non-renewable resources lowers the overall environmental impact of the project on the region by conserving these resources.

The project will reduce the consumption of virgin materials by substituting recycled concrete aggregate for mined gravel and/or sand backfill whenever possible. An estimate of the quantity (in tons) of virgin and non-renewable resources, the use of which will be avoided under this plan, will be quantified and reported in the RAR.

**Reduced Energy Consumption and Promotion of Greater Energy Efficiency.** Reduced energy consumption lowers greenhouse gas emissions, improves local air quality, lessens in-city power generation requirements, can lower traffic congestion, and provides substantial cost savings.

Recycled concrete materials and other backfill materials will be locally sourced reducing the energy consumption associated with transporting these materials to the Site. Best efforts will be made to quantify energy efficiencies achieved during the remediation and will be reported in the Remedial Action Report (RAR). Where energy savings cannot be easily quantified, a gross indicator of the amount of energy saved or the means by which energy savings was achieved will be reported.

**Recontamination Control.** Recontamination after cleanup and redevelopment is completed undermines the value of work performed, may result in a property that is less protective of public health or the environment, and may necessitate additional cleanup work later or impede future redevelopment. Recontamination can arise from future releases that occur within the property or by influx of contamination from off-Site.

The installation of a vapor barrier system throughout the proposed building basement slab and foundation walls will eliminate the risk of future migration of soil vapor contamination from potential off-Site sources. An estimate of the area of the Site that utilizes recontamination controls under this plan will be reported in the RAR in square feet.

**Storm-water Retention.** Storm-water retention improves water quality by lowering the rate of combined storm-water and sewer discharges to NYC's sewage treatment plants during periods of precipitation, and reduces the volume of untreated influent to local surface waters. An estimate of the enhanced storm-water retention capability of the redevelopment project will be included in the RAR.

**Linkage with Green Building.** Green buildings provide a multitude of benefits to the city across a broad range of areas, such as reduction of energy consumption, conservation of resources, and reduction in toxic materials use. The number of Green Buildings that are associated with this brownfield redevelopment property will be reported in the RAR. The total square footage of green building space created as a function of this brownfield redevelopment will be quantified for residential, commercial and industrial/manufacturing uses.

**Paperless Voluntary Cleanup Program.** Nikki Suites, LLC is participating in OER's Paperless Voluntary Cleanup Program. Under this program, submission of electronic documents will replace submission of hard copies for the review of project documents, communications and milestone reports.

**Low-Energy Project Management Program.** Nikki Suites, LLC is participating in OER's low-energy project management program. Under this program, whenever possible, meetings are held using remote communication technologies, such as videoconferencing and teleconferencing to reduce energy consumption and traffic congestion associated with personal transportation.

**Trees and Plantings.** Trees and other plantings provide habitat and add to NYC's environmental quality in a wide variety of ways. Native plant species and native habitat provide optimal support to local fauna, promote local biodiversity, and require less maintenance. An estimate of the land area that will be vegetated, including the number of trees planted or preserved, will be reported in square feet in the RAR.

## Appendix C

### SOIL/MATERIALS MANAGEMENT PLAN

#### 1.1 Soil Screening Methods

Visual, olfactory and PID soil screening and assessment will be performed under the supervision of a Qualified Environmental Professional and will be reported in the Remedial Action Report (RAR). Soil screening will be performed during invasive work performed during the remedy and development phases prior to issuance of the Notice of Satisfaction.

#### 1.2 Stockpile Methods

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. While stockpiles are in place, they will be inspected daily, and before and after every storm event. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by OER. Excavated soils will be stockpiled on, at minimum, double layers of 8-mil minimum sheeting, will be kept covered at all times with appropriately anchored plastic tarps, and will be routinely inspected. Broken or ripped tarps will be promptly replaced.

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. Stockpiles of excavated soils and other materials shall be located at least of 50 feet from the property boundaries, where possible. Hay bales or equivalent will surround soil stockpiles except for areas where access by equipment is required. Silt fencing and hay bales will be used as needed near catch basins, surface waters and other discharge points.

#### 1.3 Characterization of Excavated Materials

Soil/fill or other excavated media that is transported off-Site for disposal will be sampled in a manner required by the receiving facility, and in compliance with applicable laws and regulations. Soils proposed for reuse on-Site will be managed as defined in this plan.

#### 1.4 Materials Excavation, Load-Out and Departure

The PE/QEP overseeing the remedial action will:

- oversee remedial work and the excavation and load-out of excavated material;
- ensure that there is a party responsible for the safe execution of invasive and other work performed under this work plan;
- ensure that Site development activities and development-related grading cuts will not interfere with, or otherwise impair or compromise the remedial activities proposed in this RAP;
- ensure that the presence of utilities and easements on the Site has been investigated and that any identified risks from work proposed under this plan are properly addressed by appropriate parties;
- ensure that all loaded outbound trucks are inspected and cleaned if necessary before leaving the Site;
- ensure that all egress points for truck and equipment transport from the Site will be kept clean of Site-derived materials during Site remediation.

Locations where vehicles exit the Site shall be inspected daily for evidence of soil tracking off premises. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to Site-derived materials.

Open and uncontrolled mechanical processing of historical fill and contaminated soil on-Site will not be performed without prior OER approval.

#### 1.5 Off-Site Materials Transport

Loaded vehicles leaving the Site will comply with all applicable materials transportation requirements (including appropriate covering, manifests, and placards) in accordance with applicable laws and regulations, including use of licensed haulers in accordance with 6 NYCRR Part 364. If loads contain wet material capable of causing leakage from trucks, truck liners will be used. Queuing of trucks will be performed on-Site, when possible in order to minimize off Site disturbance. Off-Site queuing will be minimized.

Outbound truck transport routes will take into account the following factors: (a) limiting transport through residential areas and past sensitive sites; (b) use of mapped truck routes; (c) minimizing 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. To the extent possible, all trucks loaded with Site materials will travel from the Site using these truck routes. Trucks will not stop or idle in the neighborhood after leaving the project Site.

#### 1.6 Materials Disposal Off-Site

The following documentation will be established and reported by the PE/QEP for each disposal destination used in this project to document that the disposal of regulated material exported from the Site conforms with applicable laws and regulations: (1) a letter from the PE/QEP or Applicant to each disposal facility describing the material to be disposed and requesting written acceptance of the material. This letter will state that material to be disposed is regulated material generated at an environmental remediation Site in New York under a governmental remediation program. The letter will provide the project identity and the name and phone number of the PE/QEP or Applicant. The letter will include as an attachment a summary of all chemical data for the material being transported; and (2) a letter from each disposal facility stating it is in receipt of the correspondence (1, above) and is approved to accept the material. These documents will be included in the RAR.

The RAR will include an itemized account of the destination of all material removed from the Site during this remedial action. Documentation associated with disposal of all material will include records and approvals for receipt of the material. This information will be presented in the RAR.

All impacted soil/fill or other waste excavated and removed from the Site will be managed as regulated material and will be disposed in accordance with applicable laws and regulations. Historic fill and contaminated soils taken off-Site will be handled as solid waste and will not be disposed at a Part 360-16 Registration Facility (also known as a Soil Recycling Facility).

Waste characterization will be performed for off-Site disposal in a manner required by the receiving facility and in conformance with its applicable permits. Waste characterization sampling and analytical methods, sampling frequency, analytical results and QA/QC will be reported in the RAR. A manifest system for off-Site transportation of exported materials will be employed.

Manifest information will be reported in the RAR. Hazardous wastes derived from on-Site will be stored, transported, and disposed of in compliance with applicable laws and regulations.

### 1.7 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. The soil cleanup objectives for on-Site reuse are listed in the RAWP. “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 PE/QEP will ensure that reused materials are segregated from other materials to be exported from the Site and that procedures defined for material reuse in this RAWP are followed. The expected location for placement of reused material is shown in the RAWP.

Organic matter (wood, roots, stumps, etc.) or other waste derived from clearing and grubbing of the Site will not be buried on-Site. Soil or fill excavated from the site for grading or other purposes will not be reused within a cover soil layer or within landscaping berms.

### 1.8 Demarcation

After completion of hotspot 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 RAR; 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 RAR. This demarcation will constitute the top of the site management horizon.

## 1.9 Import of Backfill Soil from Off-Site Sources

This Section presents the requirements for imported fill materials to be used below the cover layer and within the clean soil cover layer. All imported soils will meet OER-approved backfill and cover soil quality objectives for this Site. The backfill and cover soil quality objectives are listed in the RAWP.

A process will be established to evaluate sources of backfill and cover soil to be imported to the Site, and will include an examination of source location, current and historical use(s), and any applicable documentation. Material from industrial sites, spill sites, environmental remediation sites or other potentially contaminated sites will not be imported to the Site.

The following potential sources may be used pending attainment of backfill and cover soil quality objectives:

- Clean soil from construction projects at non-industrial sites in compliance with applicable laws and regulations;
- Clean soil from roadway or other transportation-related projects in compliance with applicable laws and regulations;
- Clean recycled concrete aggregate (RCA) from facilities permitted or registered by the regulations of NYS DEC.

All materials received for import to the Site will be approved by a PE/QEP and will be in compliance with provisions in this RAWP. The RAR will report the source of the fill, evidence that an inspection was performed on the source, chemical sampling results, frequency of testing, and a Site map indicating the locations where backfill or soil cover was placed.

### **Source Screening and Testing**

Inspection of imported fill material will include visual, olfactory and PID screening for evidence of contamination. Materials imported to the Site will be subject to inspection, as follows:

- Trucks with imported fill material will be in compliance with applicable laws and regulations and will enter the Site at designated locations;
- The PE/QEP is responsible to ensure that every truck load of imported material is inspected for evidence of contamination; and

- Fill material will be free of solid waste including pavement materials, debris, stumps, roots, and other organic matter, as well as ashes, oil, perishables or foreign matter.

Composite samples of imported material will be taken at a minimum frequency of one sample for every 500 cubic yards of material. Once it is determined that the fill material meets imported backfill or cover soil chemical requirements and is non-hazardous, and lacks petroleum contamination, the material will be loaded onto trucks for delivery to the Site.

Recycled concrete aggregate (RCA) will be imported from facilities permitted or registered by NYSDEC. Facilities will be identified in the RCR. A PE/QEP is responsible to ensure that the facility is compliant with 6NYCRR Part 360 registration and permitting requirements for the period of acquisition of RCA. RCA imported from compliant facilities will not require additional testing, unless required by NYSDEC under its terms for operation of the facility. RCA imported to the Site must be derived from recognizable and uncontaminated concrete. RCA material is not acceptable for, and will not be used as cover material.

#### 1.10 Fluids Management

All liquids to be removed from the Site, including dewatering fluids, will be handled, transported and disposed in accordance with applicable laws and regulations. Liquids discharged into the New York City sewer system will receive prior approval by New York City Department of Environmental Protection (NYC DEP). The NYC DEP regulates discharges to the New York City sewers under Title 15, Rules of the City of New York Chapter 19. Discharge to the New York City sewer system will require an authorization and sampling data demonstrating that the groundwater meets the City's discharge criteria. The dewatering fluid will be pretreated as necessary to meet the NYC DEP discharge criteria. If discharge to the City sewer system is not appropriate, the dewatering fluids will be managed by transportation and disposal at an off-Site treatment facility.

Discharge of water generated during remedial construction to surface waters (i.e. a stream or river) is prohibited without a SPDES permit issued by New York State Department of Environmental Conservation.

### 1.11 Storm-water Pollution Prevention

Applicable laws and regulations pertaining to storm-water pollution prevention will be addressed during the remedial program. Erosion and sediment control measures identified in this RAWP (silt fences and barriers, and hay bale checks) will be installed around the entire perimeter of the remedial construction area and inspected once a week and after every storm event to ensure that they are operating appropriately. Discharge locations will be inspected to determine whether erosion control measures are effective in preventing significant impacts to receptors. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by OER. All necessary repairs shall be made immediately. Accumulated sediments will be removed as required to keep the barrier and hay bale check functional. Undercutting or erosion of the silt fence anchor will be repaired immediately with appropriate backfill materials. Manufacturer's recommendations will be followed for replacing silt fencing damaged due to weathering.

### 1.12 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 OER's Project Manager. Petroleum spills will be reported to the NYS DEC 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 OER. Chemical analytical testing will be performed for Full List volatiles and semi-volatiles, pesticides/PCBs, and TAL metals, as appropriate.

### 1.13 Odor, Dust and Nuisance Control

#### Odor Control

All necessary means will be employed to prevent on- and off-Site odor 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) use of foams to cover exposed odorous soils. If odors develop and cannot otherwise be controlled, additional means to eliminate odor nuisances will

include: (d) direct load-out of soils to trucks for off-Site disposal; and (e) use of chemical odorants in spray or misting systems.

This odor control plan is capable of controlling emissions of nuisance odors. If nuisance odors are identified, 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. OER will be notified of all odor complaint events. Implementation of all odor controls, including halt of work, will be the responsibility of the PE/QEP's certifying the RAR.

### Dust Control

Dust management during invasive on-Site work will include, at a minimum:

- Use of a dedicated water spray methodology for roads, excavation areas and stockpiles.
- Use of properly anchored tarps to cover stockpiles.
- Exercise extra care during dry and high-wind periods.
- Use of gravel or recycled concrete aggregate on egress and other roadways to provide a clean and dust-free road surface.

This dust control plan is capable of controlling emissions of dust. If nuisance dust emissions are identified, work will be halted and the source of dusts will be identified and corrected. Work will not resume until all nuisance dust emissions have been abated. OER will be notified of all dust complaint events. Implementation of all dust controls, including halt of work, will be the responsibility of the PE/QEP's responsible for certifying the Remedial Action Report.

### Other Nuisances

Noise control will be exercised during the remedial program. All remedial work will conform, at a minimum, to NYC noise control standards.

Rodent control will be provided, during Site clearing and grubbing, and during the remedial program, as necessary, to prevent nuisances.

#### 1.14 Import of Clean Cover

Importation of clean fill soil is not anticipated at the Site for use as clean cover. If needed, all imported soil will be uncontaminated, clean soil that meets the lesser of the appropriate NYSDEC 6 NYCRR Part 375-6.8(a) Restricted Residential Use SCOs and the NYSDEC 6 NYCRR Part 375-6.8 groundwater protection SCOs.

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

- 1) That a segregated stockpile for the quantity of clean soil 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;
- 2) That the material does not include any solid waste, including construction and demolition material, as it's prohibited;
- 3) That 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
- 4) That a maximum five-part composite sample will be collected from the segregated stockpile at the source at a minimum frequency of one sample per 250 cubic yards and analyzed for the following Full List parameters:
  - VOCs by EPA Method 8260C (rev. 2006)
  - SVOCs by EPA Method 8270D (rev. 2007)
  - Pesticides by EPA Method 8081B (rev. 2000)
  - PCBs by EPA Method 8082A (rev. 2000)
  - TAL Metals by EPA Method 6010C (rev. 2007)

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

- 1) Summary of number of samples collected and analyzed, tabulated data and comparison to the selected Site Use SCOs;
- 2) Analytical data sheets and chain of custody documentation;

- 3) Summary of quantity of clean soil;
- 4) Photographs from the segregated stockpile at the source with sample point locations identified;
- 5) An affidavit from the source/facility on company letterhead stating that the segregated stockpile for the quantity of soil has been properly maintained at the source and complies with the requirements listed above; and
- 6) A copy of source/facility NYSDEC permit;

A highly visible demarcation barrier (i.e. orange geo-synthetic material or equivalent) will be installed beneath the clean soil/fill surface cover. Upon importing and grading the OER approved clean soil cover for the quantity of soil on top of a highly visible demarcation barrier, the following documentation will be presented in the Final Remedial Action Report:

1. Copies of purchase invoices;
2. Truck transportation slips from the source to the Site;
3. Confirmation of the quantity of clean soil of OER approved clean soil cover material imported and graded at the site on top of highly visible demarcation barrier;
4. Site plan depicting all areas where the OER approved clean soil cover has been placed; and
5. Photographs documenting the importing and grading of the OER approved clean soil cover across the site with the underlying highly visible demarcation barrier (i.e. orange geo-synthetic material or equivalent).

## *Photos*

### ***Photos of Phase-II Subsurface Investigation***

Photo Location: Depicts boring location B1



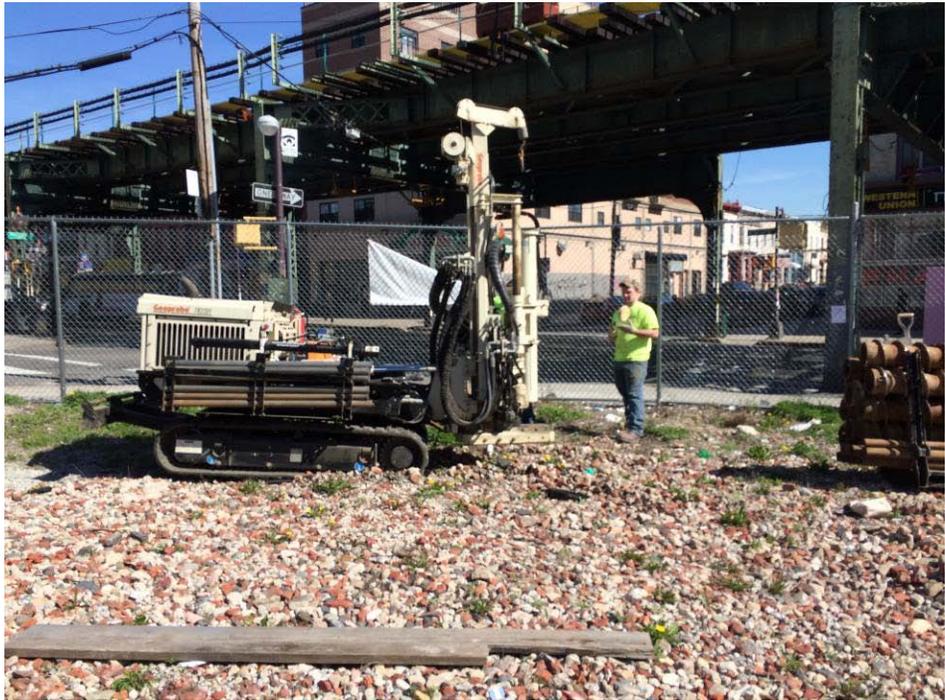
Photo Location: Depicts boring location B2



Photo Location: Depicts boring location B3



Photo Location: Depicts boring location B4



## *Figures*

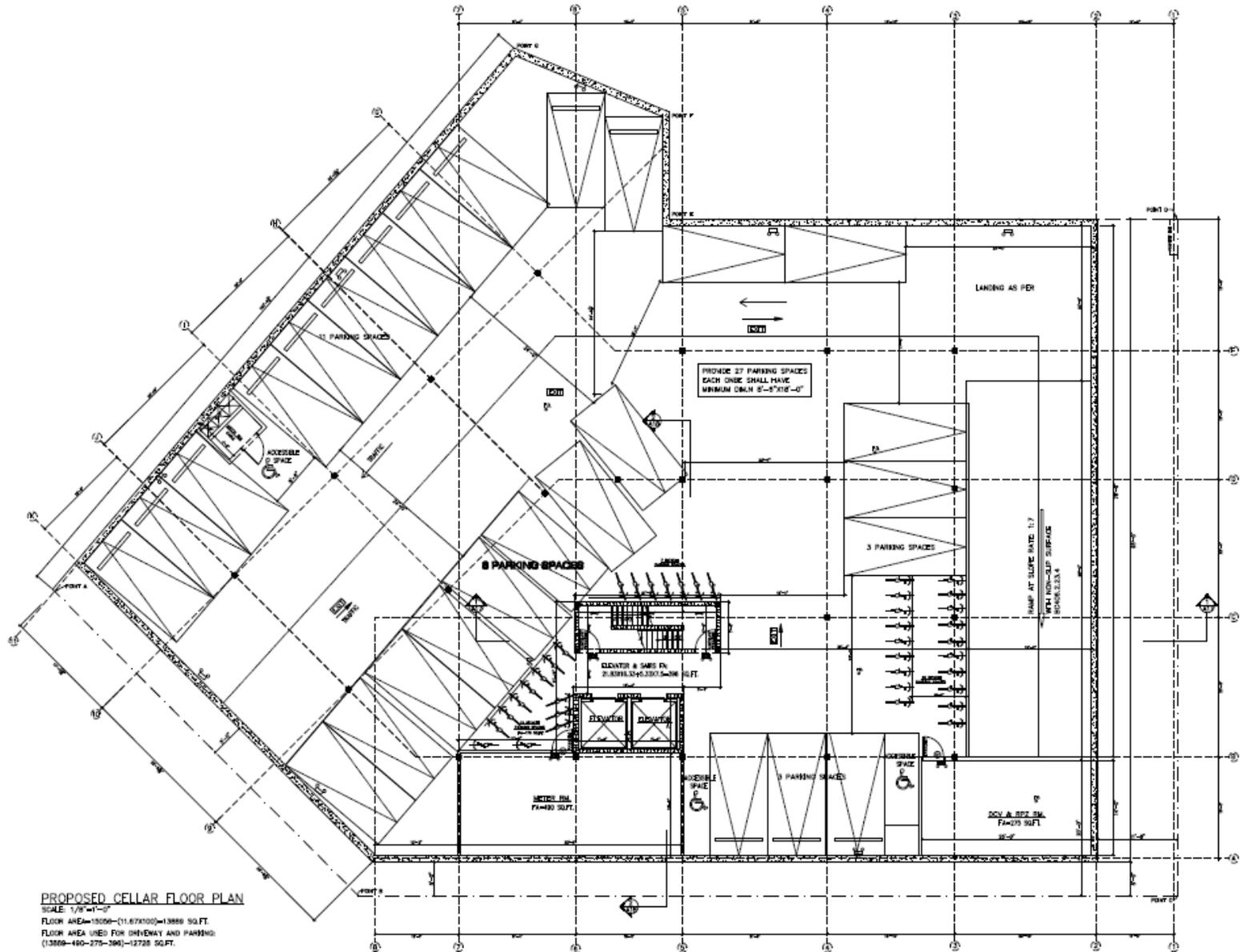
***Figure 1 – Site Location Map***

***Figure 2 – Redevelopment Plan***

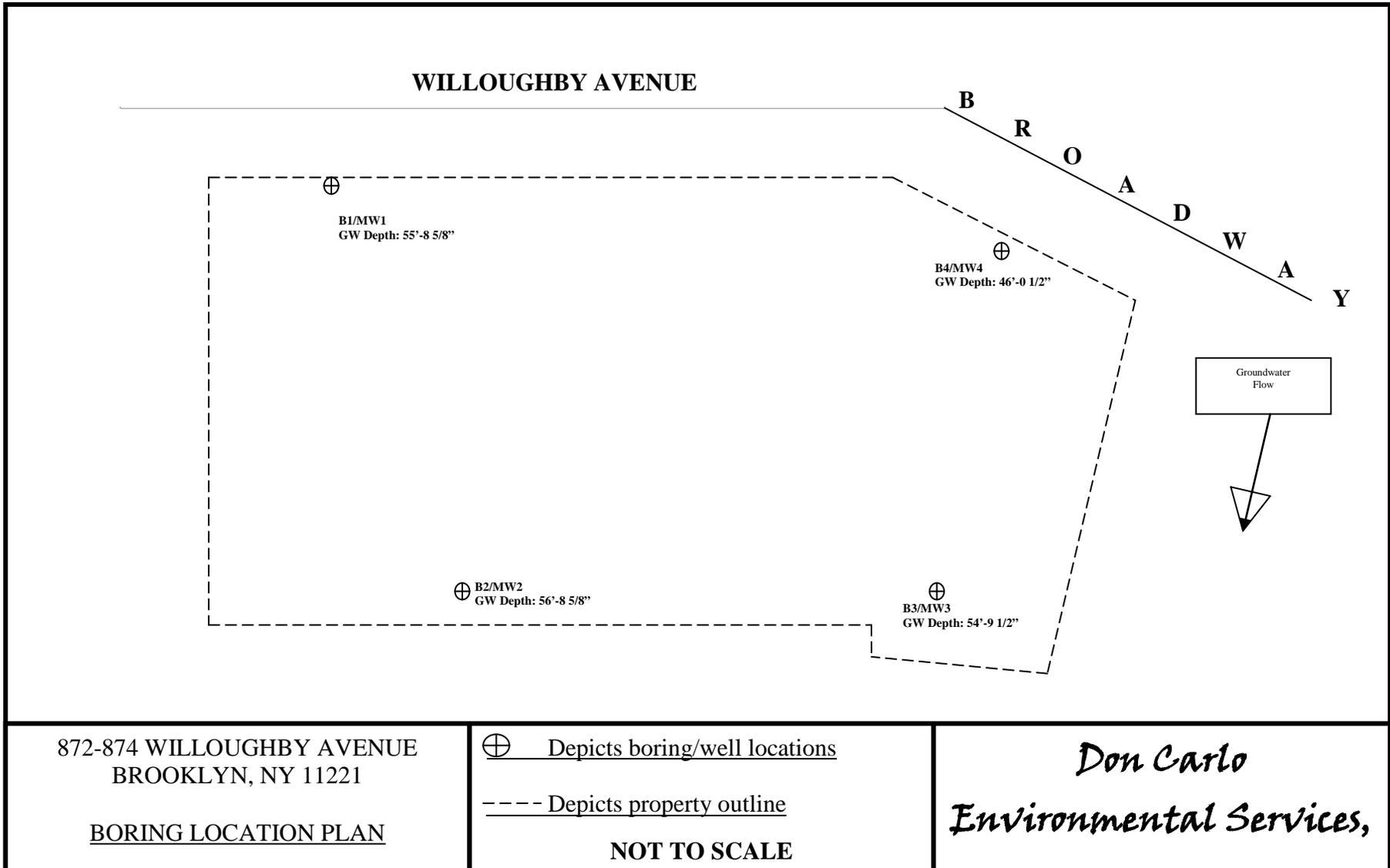
***Figure 3 – Boring Location Map***



**Figure 2 – Redevelopment Plan**



**Figure 3 – Boring Location Map**



# *Boring Logs*



# Don Carlo Environmental Services Inc.

790 East 91<sup>st</sup> Street  
 Brooklyn, NY 11236  
 Tel: 718-857-3100  
 Fax: 718-857-2100

<b>Project Address:</b>	872-874 Willoughby Avenue, Brooklyn, NY	<b>Date:</b>	April 23, 2014
-------------------------	---	--------------	----------------

<b>Block:</b>	1593	<b>Client Name:</b>	Nikki Suites, LLC
<b>Lot(s):</b>	23	<b>Address:</b>	15 Lawton Street, Ste 48, Brooklyn
<b>Boring No.:</b>	B1	<b>Telephone:</b>	(718) 880-8073
<b>Report No.:</b>	DC-1	<b>Fax Number:</b>	(718) 228-9899

Depth from Surface (ft)	Sample Number	N - Blows Per 6"	Description	Approx. (NYCDOB Classification)
1	S-1	N/A	Brown miscellaneous FILL	11-65
			(Brown c- SAND, brick, concrete), DRY	
5	S-2	N/A	Brown c SAND, little gravel, trace silt, DRY	8-65
10				
30				
40				
50				
<b>GWT~55.72'</b>			<b>MW-1</b>	
60			<b>End of Borehole – 60'</b>	



# Don Carlo Environmental Services Inc.

790 East 91<sup>st</sup> Street  
 Brooklyn, NY 11236  
 Tel: 718-857-3100  
 Fax: 718-857-2100

<b>Project Address:</b>	872-874 Willoughby Avenue, Brooklyn, NY	<b>Date:</b>	April 22, 2014
-------------------------	---	--------------	----------------

<b>Block:</b>	1593	<b>Client Name:</b>	Nikki Suites, LLC
<b>Lot(s):</b>	23	<b>Address:</b>	15 Lawton Street, Ste 48, Brooklyn
<b>Boring No.:</b>	B2	<b>Telephone:</b>	(718) 880-8073
<b>Report No.:</b>	DC-1	<b>Fax Number:</b>	(718) 228-9899

Depth from Surface (ft)	Sample Number	N - Blows Per 6"	Description	Approx. (NYCDOB Classification)
1	S-1	N/A	Brown miscellaneous FILL	11-65
			(Brown c- SAND, brick, concrete), DRY	
5	S-2	N/A	Brown c SAND, little gravel, trace silt, DRY	8-65
10				
30				
40				
50				
<b>GWT~56.72'</b>			<b>MW-2</b>	
60			<b>End of Borehole – 60'</b>	



# Don Carlo Environmental Services Inc.

790 East 91<sup>st</sup> Street  
 Brooklyn, NY 11236  
 Tel: 718-857-3100  
 Fax: 718-857-2100

<b>Project Address:</b>	872-874 Willoughby Avenue, Brooklyn, NY	<b>Date:</b>	April 22, 2014
-------------------------	---	--------------	----------------

<b>Block:</b>	1593	<b>Client Name:</b>	Nikki Suites, LLC
<b>Lot(s):</b>	23	<b>Address:</b>	15 Lawton Street, Ste 48, Brooklyn
<b>Boring No.:</b>	B3	<b>Telephone:</b>	(718) 880-8073
<b>Report No.:</b>	DC-1	<b>Fax Number:</b>	(718) 228-9899

Depth from Surface (ft)	Sample Number	N - Blows Per 6"	Description	Approx. (NYCDOB Classification)
1	S-1	N/A	Brown miscellaneous FILL	11-65
			(Brown c- SAND, brick, concrete), DRY	
5	S-2	N/A	Brown c SAND, little gravel, trace silt, DRY	8-65
10				
30				
40				
50	S10	N/A	Brown c SAND	8-65
<b>GWT~54.79'</b>			<b>MW-3</b>	
60			<b>End of Borehole – 60'</b>	



# Don Carlo Environmental Services Inc.

790 East 91<sup>st</sup> Street  
 Brooklyn, NY 11236  
 Tel: 718-857-3100  
 Fax: 718-857-2100

<b>Project Address:</b>	872-874 Willoughby Avenue, Brooklyn, NY	<b>Date:</b>	April 21, 2014
-------------------------	---	--------------	----------------

<b>Block:</b>	1593	<b>Client Name:</b>	Nikki Suites, LLC
<b>Lot(s):</b>	23	<b>Address:</b>	15 Lawton Street, Ste 48, Brooklyn
<b>Boring No.:</b>	B4	<b>Telephone:</b>	(718) 880-8073
<b>Report No.:</b>	DC-1	<b>Fax Number:</b>	(718) 228-9899

Depth from Surface (ft)	Sample Number	N - Blows Per 6"	Description	Approx. (NYCDOB Classification)
1	S-1	N/A	Brown miscellaneous FILL	11-65
			(Brown c- SAND, brick, concrete), DRY	
5	S-2	N/A	Brown c SAND, little gravel, trace silt, DRY	8-65
10				
30				
40				
<b>GWT~46.04'</b>			<b>MW-4</b>	
50	S10	N/A	Brown c SAND	8-65
60			<b>End of Borehole – 60'</b>	

## ***Tables***

***Table 1 – Soil Analytical for VOCs***

***Table 2 – Soil Analytical for SVOCs***

***Table 3 – Groundwater Analytical for VOCs***

***Table 4 – Groundwater Analytical for SVOCs***

**872-874 WILLOUGHBY AVENUE  
BROOKLYN, NY 11221**

**TABLE 1**

**SOIL ANALYTICAL RESULTS FOR VOLATILE ORGANIC COMPOUNDS (VOCs)**

Contaminants	NYS DEC PART-375 (SCO's)	B1-S2 (10')	B2-S2 (10')	B3-S2 (10')	B3-S10 (50')	B4-S2 (10')	B4-S10 (50')
1,1,1-Trichloroethane	680	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	270	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	330	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	1,100	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	20	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	250	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	190	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	2,400	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	1,800	ND	ND	ND	ND	ND	ND
1,4-Dioxane	100	ND	ND	ND	ND	ND	ND
Acetone	50	39	ND	<b>62</b>	22	26	ND
Benzene	60	ND	ND	ND	ND	ND	ND
n-Butylbenzene	12,000	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	760	ND	ND	ND	ND	ND	ND
Chlorobenzene	1,100	ND	ND	ND	ND	ND	ND
Chloroform	370	ND	ND	ND	ND	ND	ND
Ethylbenzene	1,000	ND	ND	ND	ND	ND	ND
Hexachlorobenzene	330	ND	ND	ND	ND	ND	ND
Methyl ethyl ketone	120	ND	ND	ND	ND	ND	ND
Methyl tert-butyl ether	930	ND	ND	ND	ND	ND	ND
Methylene chloride	50	ND	ND	6.2	ND	ND	ND
n-Propylbenzene	3,900	ND	ND	ND	ND	ND	ND
sec-Butylbenzene	11,000	ND	ND	ND	ND	ND	ND
tert-Butylbenzene	5,900	ND	ND	ND	ND	ND	ND
Tetrachloroethene	1,300	ND	ND	ND	ND	ND	ND
Toluene	700	ND	ND	ND	ND	ND	ND
Trichloroethene	470	ND	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	3,600	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	8,400	ND	ND	ND	ND	ND	ND
Vinyl chloride	20	ND	ND	ND	ND	ND	ND
Xylene (Mixed)	260	ND	ND	ND	ND	ND	ND

**NOTES:**

NYSDEC PART-375 (Unrestricted Use Soil Cleanup Objectives)

ND – Not Detected

NS – No Standard

Bold Text denotes exceedances

All units are µg/kg or ppb

**872-874 WILLOUGHBY AVENUE  
BROOKLYN, NY 11221**

**TABLE 2**

**SOIL ANALYTICAL RESULTS FOR SEMI-VOLATILE ORGANIC COMPOUNDS (SVOCs)**

Contaminants	NYS DEC PART-375 (SCO's)	B1-S2 (10')	B2-S2 (10')	B3-S2 (10')	B3-S10 (50')	B4-S2 (10')	B4-S10 (50')
Acenaphthene	20,000	ND	ND	3,540	ND	ND	ND
Acenaphthylene	100,000	ND	ND	ND	ND	ND	ND
Anthracene	100,000	ND	ND	7,150	ND	61	46.9
Benzo(a)anthracene	1,000	ND	ND	<b>13,700</b>	71.1	173	146
Benzo(a)pyrene	1,000	ND	ND	<b>6,870</b>	45.7	116	120
Benzo(b)fluoranthene	1,000	ND	ND	<b>6,340</b>	ND	111	106
Benzo(g,h,i)perylene	100,000	ND	ND	2,130	ND	ND	ND
Benzo(k)fluoranthene	800	ND	ND	<b>6,210</b>	44	108	114
Chrysene	1,000	ND	ND	<b>12,200</b>	64.2	146	129
Dibenzo(a,h)anthracene	330	ND	ND	<b>567</b>	ND	ND	ND
Fluoranthene	100,000	ND	ND	25,600	137	358	314
Fluorene	30,000	ND	ND	3,490	ND	ND	ND
Indeno (1,2,3-cd)pyrene	500	ND	ND	<b>2,530</b>	ND	52.9	61.7
m-Cresol	330	ND	ND	ND	ND	ND	ND
Naphthalene	12,000	ND	67.1	2,900	59.4	66.3	54.8
o-Cresol	330	ND	ND	ND	ND	ND	ND
p-Cresol	330	ND	ND	ND	ND	ND	ND
Pentachlorophenol	800	ND	ND	ND	ND	ND	ND
Phenanthrene	100,000	ND	ND	30,600	130	291	206
Phenol	330	ND	ND	ND	ND	ND	ND
Pyrene	100,000	ND	ND	25,500	132	328	275

**NOTES:**

NYSDEC PART-375 (Unrestricted Use Soil Cleanup Objectives)

ND – Not Detected

NS – No Standard

Bold Text denotes exceedances.

All units are µg/kg or ppb

**872-874 WILLOUGHBY AVENUE  
 BROOKLYN, NY 11221**

**TABLE 3**

**GROUNDWATER ANALYTICAL RESULTS FOR VOLATILE ORGANIC COMPOUNDS  
 (VOCs)**

Contaminants	NYS DEC Ambient (GQS's)	MW-1 (55.72')	MW-2 (56.72')	MW-3 (54.79')	MW-4 (46.04')
1,1,1-Trichloroethane	NS	ND	ND	ND	ND
1,1-Dichloroethane	NS	ND	ND	ND	ND
1,1-Dichloroethane	NS	ND	ND	ND	ND
1,2-Dichlorobenzene	NS	ND	ND	ND	ND
1,2-Dichloroethane	NS	ND	ND	ND	ND
cis-1,2-Dichloroethene	NS	ND	ND	ND	ND
trans-1,2-Dichloroethene	NS	ND	ND	ND	ND
1,3-Dichlorobenzene	NS	ND	ND	ND	ND
1,4-Dichlorobenzene	NS	ND	ND	ND	ND
1,4-Dioxane		ND	ND	ND	ND
Acetone	50	11	8.8	4.7	7.8
Benzene	1	ND	ND	ND	ND
n-Butylbenzene	5	ND	ND	ND	ND
Carbon tetrachloride	NS	ND	ND	ND	ND
Chlorobenzene	5	ND	ND	ND	ND
Chloroform	7	ND	ND	ND	ND
Ethylbenzene	5	ND	ND	ND	ND
Hexachlorobenzene	NS	ND	ND	ND	ND
Methyl ethyl ketone	NS	ND	ND	ND	ND
Methyl tert-butyl ether	10	ND	ND	ND	ND
Methylene chloride	5	ND	ND	ND	ND
n-Propylbenzene	5	ND	ND	ND	ND
sec-Butylbenzene	5	ND	ND	ND	ND
tert-Butylbenzene	5	ND	ND	ND	ND
Tetrachloroethene	5	<b>89</b>	<b>57</b>	<b>55</b>	<b>140</b>
Toluene	5	ND	ND	ND	ND
Trichloroethene	5	ND	ND	ND	ND
1,2,4-Trimethylbenzene	5	ND	ND	ND	ND
1,3,5-Trimethylbenzene	5	ND	ND	ND	ND
Vinyl chloride	2	ND	ND	ND	ND
Xylene (Mixed)	5	ND	ND	ND	ND

**NOTES:**

NYSDEC GQS's – Ambient Groundwater Quality Standards

ND – Not Detected

NS – No Standard

Bold Text denotes exceedances

All units are µg/L or ppb

**872-874 WILLOUGHBY AVENUE  
 BROOKLYN, NY 11221**

**TABLE 4**

**GROUNDWATER ANALYTICAL RESULTS FOR SEMI-VOLATILE ORGANIC  
 COMPOUNDS (SVOCs)**

Contaminants	NYS DEC Ambient (GQS's)	MW-1 (55.72')	MW-2 (56.72')	MW-3 (54.79')	MW-4 (46.04')
Acenaphthene	20	ND	0.06	ND	0.12
Acenaphthylene	NS	ND	ND	ND	ND
Anthracene	50	ND	0.05	ND	0.07
Benzo(a)anthracene	0.002	ND	<b>0.11</b>	ND	ND
Benzo(a)pyrene	0.002	ND	ND	ND	ND
Benzo(b)fluoranthene	0.002	ND	ND	ND	ND
Benzo(g,h,i)perylene	5	ND	ND	ND	ND
Benzo(k)fluoranthene	0.002	ND	ND	ND	ND
Bis(2-ethylhexyl)phthalate	5	1.54	1.91	1.57	1.66
Chrysene	0.002	ND	ND	ND	ND
Dibenzo(a,h)anthracene	50	ND	ND	ND	ND
Fluoranthene	50	0.05	0.06	ND	0.06
Fluorene	50	0.10	0.22	0.05	0.17
Indeno (1,2,3-cd)pyrene	0.002	ND	ND	ND	ND
m-Cresol	NS	ND	ND	ND	ND
Naphthalene	10	0.12	0.07	ND	0.09
o-Cresol	330	ND	ND	ND	ND
p-Cresol	NS	ND	ND	ND	ND
Pentachlorophenol	1	ND	ND	ND	ND
Phenanthrene	50	0.17	0.35	0.06	0.20
Phenol	1	ND	ND	ND	ND
Pyrene	50	ND	0.05	0.12	0.05

**NOTES:**

NYSDEC PART-375 (Unrestricted Use Soil Cleanup Objectives)  
 ND – Not Detected  
 NS – No Standard  
 Bold Text denotes exceedances.  
 All units are µg/kg or ppb

# **Appendix 1**

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

## **Appendix 2**

### ***Vapor Barrier Specs***

## **Appendix 3**

### ***Soil and Groundwater Laboratory Analytical Results***