

10 JAY STREET

BROOKLYN, NEW YORK

Remedial Action Report

OER Project Number 14EH-N547K

E-Designation E-231

CEQR Number 09DCP053K

DUMBO Rezoning

Prepared for:

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REMEDIAL ACTION REPORT

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LIST OF ACRONYMS

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

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

VB	Vapor Barrier
VOCs	Volatile Organic Compounds

CERTIFICATION

The original Professional Engineer, who certified the RAWP, Mr. Shaik Saad, a registered professional engineer licensed by the State of New York, performed professional engineering services and had primary direct responsibility for implementation of the remedial program for the 10 Jay Street site, site number 14EH-N547K.

Mr. Saad is no longer available to stamp this RAR. Since the field work was completed under Hydro Tech supervision, I, Tarek Z. Khouri, P.E. certify the following:

- I am currently a registered professional engineer licensed by the State of New York.
- I have reviewed this document, to which my signature and seal are affixed.
- I have discussed this project with the Hydro Tech Project Manager.
- Engineering Controls developed for this remedial action included in the approved RAWP were designed to achieve the goals established in the Remedial Action Work Plan for this site.
- The Engineering Controls constructed during this remedial action were professionally observed by a Hydro Tech Engineer, and have been reviewed by me, and are (1) are consistent with the Engineering Control design established in the Remedial action Work Plan and (2) are accurately reflected in the text and drawings for as-built design reported in this Remedial Action Report.
- The OER-approved Remedial Action Work Plan dated October 2015 and Stipulations in a letter dated May 24, 2016 were implemented by Hydro Tech personnel and that all requirements in those documents have been substantively complied with. I certify that contaminated soil, fill, liquid or other material from the property was taken to facilities licensed to accept this material in full compliance with applicable laws and regulations.

Name: Tarek Z. Khouri, P.E.

PE License Number: 086611

Signature:



Date: October 15, 2018



I, Mark Robbins, certify the following:

- I am a Qualified Environmental Professional. I had primary direct responsibility for implementation of the remedial program for the 10 Jay Street site, site number 14EH-N547K.
- The OER-approved Remedial Action Work Plan dated October 2015 and Stipulations in a letter dated May 24, 2016 were implemented and that all requirements in those documents have been substantively complied with. I certify that contaminated soil, fill, liquid or other material from the property was taken to facilities licensed to accept this material in full compliance with applicable laws and regulations.

QEP Name

QEP Signature

Date

EXECUTIVE SUMMARY

Glacier Global Partners, LLC has performed this remedial action to remediate a 19,682-square foot site located at 10 Jay Street in Brooklyn, New York. A Phase II Subsurface Investigation (Phase II) was performed to compile and evaluate data and information necessary to develop a Remedial Action Plan (RAP). The remedial action described in this document fulfills the remedial objectives defined in the RAP, complies with applicable environmental standards, criteria and guidance and conforms with applicable laws and regulations.

Site Location and Prior Usage

The Site is located at 10 Jay Street in the DUMBO section of Brooklyn, New York and is identified as Block 1 and Lot 50 on the New York City Tax Map. A map of the site boundary is shown in Figure 1. Figure 2 shows the Site location. The Site is 19,682-square feet and is bounded by the East River to the north, John Street to the south, Jay Street to the east, and Pearl Street to the west. Currently, the Site is used for a 10-story commercial office space and contains a partial basement used for storage and utilities, a lobby and storage space on the first floor, and 9 floors (floors 2-10) of commercial office space.

Summary of Proposed Redevelopment Plan

The Site was developed with a 10-story building used for commercial office space with a partial basement of approximately 166,000 square feet in area. The basement will consist of mechanical and storage rooms and the building engineer's office. The building interior was fully renovated as part of the development; however, the development did not include any disturbance to the existing building foundation. The current zoning designation is M1- 4/R8A/MX-2. The development and proposed use is consistent with existing zoning for the property.

Summary of Past Uses of Site

Based upon the review of a Phase I Environmental Assessment Survey performed by IVI Assessment Services dated October 2, 2012, a Site history was established. According to the DUMBO Historic District Designation Report, compiled by the NYC Landmarks Preservation

Commission and dated December 2007, the Subject Property was developed between 1897 and 1898 on landfill. In addition, a NY Spills listing for the adjoining property to the west indicates that fill material is in the Subject area and creosote is beneath the pavement in the area.

The original use of the Subject Property was a dry color works, cutting, hatting, and fur manufacturer. The current building was constructed between 1887 and 1904 and operated as a sugar refinery until approximately 1945. The building was then used as office space through 2007. These previous operations would have involved the use of cutting oils, machine lubricants, cleaners and solvents as well as mercury (fur and hatting operations). Given the duration of these various industrial operations, it is possible that accidental releases of chemicals used on-site may have impacted the subsurface. The AOCs identified for this site include:

The AOCs identified for this site include:

1. The Site in general due to the historical use as a manufacturing facility.

Summary of Environmental Findings

Based on the findings of the remedial investigation and RIR dated January 2015:

1. Depth to groundwater and flow direction was not established during the RIR investigation.
2. Bedrock was not encountered at the Site.
3. The stratigraphy of the site was not established.
4. The soil vapor results collected during the RI were compared to the compounds listed in Table 3.1 Air Guideline Values Derived by the NYSDOH located in the New York State Department of Health (NYSDOH) Final Guidance for Evaluating Soil Vapor Intrusion. A total of twelve (12) VOCs, specifically; 1,1,1-Trichloroethane (maximum 63.2 ug/m³), 1,1-Dichloroethane (maximum 29.4 ug/m³), 1,2,4-Trimethylbenzene (maximum 9.09 ug/m³), 4-Methyl-2-pentanone (maximum 9.58 ug/m³), Acetone (maximum 1,020 ug/m³), Ethylbenzene (maximum 36.8 ug/m³), p- & m- Xylenes (maximum 108 ug/m³), and oXylene (maximum 21.6 ug/m³) were detected at concentrations exceeding the NYSDOH

soil vapor intrusion guidelines. Contaminants related to PCE and its degradation products were detected in the samples including Chloroethane (maximum 1.42 ug/m³), Chloroform (13.3 ug/m³), Tetrachloroethene (maximum 13.1 ug/m³), and Trichloroethene (maximum 5.21 ug/m³).

A copy of the RIR is included in **Appendix 1**.

Summary of the Remedy

The completed remedial action achieves the remedial objectives established in the RAWP and consists of:

1. Mobilized for remedial action involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas.
2. Performed Community Air Monitoring Program during invasive activities to screen for particulates and volatile organic carbon compounds during ten (10) days of excavation of soil/fill along Pearl Street for the installation of two (2) Con Edison transformer vaults.
3. Screened excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a photo ionization detector (PID).
4. The following excavations were performed: Approximately 177.15 tons of soil/fill material were excavated and stockpiled for the installation of two elevator pits and two suction pits. Soil was removed in two, 2 foot by 2 foot squares, each to a depth of 2 feet, for the installation of two SSDS suction pits. This soil was also stockpiled with the soil from the elevator excavation. Approximately 859.38 tons of soil was excavated for the installation of two (2) Con Edison transformer vaults along the Pearl Street sidewalk, located west of the Site, to a depth of approximately 15 feet below grade. The excavation extends across 80 feet along the sidewalk. This soil was removed from the site by live loading. A total of approximately 1,036.53 tons of soil/fill was excavated and removed from the property.
5. Sampled and analyzed excavated media as required by disposal facilities. Conducted materials management including temporarily stockpiling soil/fill that was not disposed of by live-loading. Appropriately segregated excavated media on-site prior to disposal.

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.

6. All 1,036.53 tons of non-hazardous (petroleum contaminated) soil/fill material was transported to Clean Earth of Carteret located at 24 Middlesex Avenue in Carteret, New Jersey.
7. Imported 121.73 tons of $\frac{3}{4}$ '' stone from Stavola Construction Materials Inc. located at 810 Thompson Avenue, Bound Brook, New Jersey 08805, to be used for backfill in the area of the Con Edison vault excavation in accordance with all Federal, State and City laws and regulations and with OER approval.
8. Submitted daily reports documenting air monitoring and soil/fill disposal activities from November 13, 2017 through December 1, 2017. Also submitted a monthly report to document construction activities through February 2018.
9. As part of development, constructed an engineered composite cover consisting of a 14'' mat slab poured on top of the existing 7'' concrete building slab, covered roads, concrete covered sidewalks, and clean imported soil in landscaped areas.
10. Installed and operated an active Sub-Slab Depressurization System (SSDS) consisting of two (2) subsurface suction pits beneath the building connected to two (2) Radon Away G-501 model fans, one for each suction pit, which actively exhaust air from beneath the slab to the outdoors. The contractor for the construction of the active SSDS system was Enviro Drilling and Contracting, Inc. located at 15 Ocean Avenue in Brooklyn, New York.
11. Performed all activities required for the remedial action, including permitting requirements and pretreatment requirements, in accordance with all applicable laws and regulations. An NYCDEP dewatering permit was secured by HAKS Engineering located at 40 Wall Street in New York, NY. The permit was issued on June 29, 2017 and approximately 1,170,000 gallons of water were discharged from the site between June 2017 and January of 2018.
12. Submitted RAR that describes the remedial activities, certifies that the remedial requirements have been achieved, defines the Site boundaries, describes any Engineering Controls to be implemented at the Site, and explains any changes from the RAWP.

13. Submitted a Site Management Plan (SMP) for long-term management of residual soil, including plans for operation, maintenance, inspection and certification of the performance of Engineering Controls and Institutional Controls. Inspections will be performed annually. Inspection and Certification reports will be submitted by July 30, 2020 (for the reporting period calendar year 2019), July 30, 2021 (for the reporting period calendar years 2020) and every 1 year thereafter (for the reporting period consisting of the same number prior calendar years). Inspection and Certification Reports will cover all calendar years since the prior reporting period.
14. Placement of a deed notice to record the ECs/ICs on the deed to ensure that future owners of the Site continue to comply with the SMP, as required.

REMEDIAL ACTION REPORT

1.0 SITE BACKGROUND

This Remedial Action Report (RAR) has been developed for 10 Jay Street located in the DUMBO section of Brooklyn, New York (the Site). This project has been assigned project number 14EH-N547K by OER. This RAR describes the remediation and/or mitigation activities 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 of Satisfaction. An E-Designation for Hazardous Materials (E-231) was placed on the Site by the New York City Department of City Planning (DCP) as part of the 7/29/2009, DUMBO Rezoning Action (CEQR number 09DCP053K).

1.1 Site Location and Prior Usage

The Site is located at 10 Jay Street in the DUMBO section in Brooklyn, New York and is identified as Block 1 and Lot 50 on the New York City Tax Map. A map of the site boundary is shown in Figure 1. Figure 2 shows the Site location. The Site is 19,682-square feet and is bounded by the East River to the north, John Street to the south, Jay Street to the east, and Pearl Street to the west. Currently, the Site is used for a 10-story commercial office space and contains a partial basement used for storage and utilities, a lobby and storage space on the first floor, and 9 floors (floors 2-10) of commercial office space.

1.2 Redevelopment Plan

The redevelopment of the Site included the renovation of the pre-existing 10-story building into the existing commercial office space. The redevelopment did not involve any disturbance to the current foundations. Layout of the site development is presented in Figure 3. The current zoning designation is M1- 4/R8A/MX-2. The current use is consistent with existing zoning for the property.

1.3 Environmental Investigations

The following environmental reports were developed for the Site:

- *Phase I Environmental Site Assessment (ESA)*, October 2, 2012, prepared by IVI Assessment Services, Inc.
- *Remedial Investigation Report (RIR)*, January 2015, prepared by Hydro Tech Environmental, Corp.

According to the October 2012 Phase I ESA by IVI Assessment Services, Inc., the Site was originally utilized by a dry color works, cutting, hatting, and fur manufacturer. The current building was constructed between 1887 and 1904 and operated as a sugar refinery until approximately 1945. The building was then used as office space through 2007. These previous operations would have involved the use of cutting oils, machine lubricants, cleaners and solvents as well as mercury (fur and hatting operations). Given the duration of these various industrial operations, it is possible that accidental releases of chemicals used on-site may have impacted the subsurface. The Phase I ESA also included a review of the DUMBO Historic District Designation Report compiled by the NYC Landmarks Preservation Commission which is dated December 2007. This report indicated that the Site was developed between 1897 and 1898 on landfill. A review of the NY Spills listing for the adjoining property to the west indicates that fill material is in the Subject area and that creosote is located beneath the pavement in the area.

The following Area of Concern was identified by the Phase I ESA:

1. The historical use of the Site as a manufacturing facility.

The following remedial investigations were performed at the Site:

1. Conducted a site inspection to identify AOC and physical obstructions (i.e. structures, buildings, etc.);
2. Installed three (3) soil vapor probes around the Site perimeter and collected three (3) samples for chemical analysis; and
3. Collected (1) indoor and one (1) ambient air sample for chemical analysis.

The remedial investigation yielded the following findings:

1. Depth to groundwater and flow direction was not established during this investigation.
2. Bedrock was not encountered at the Site.
3. The stratigraphy of the site was not established.
4. The soil vapor results collected during the RI were compared to the compounds listed in Table 3.1 Air Guideline Values Derived by the NYSDOH located in the New York State Department of Health (NYSDOH) Final Guidance for Evaluating Soil Vapor Intrusion. A total of twelve (12) VOCs, specifically; 1,1,1-Trichloroethane (maximum 63.2 ug/m³), 1,1-Dichloroethane (maximum 29.4 ug/m³) 1,2,4-Trimethylbenzene (maximum 9.09 ug/m³), 4-Methyl-2-pentanone (maximum 9.58 ug/m³), Acetone (maximum 1,020 ug/m³), Ethylbenzene (maximum 36.8 ug/m³), p- & m- Xylenes (maximum 108 ug/m³), and o-Xylene (maximum 21.6 ug/m³) were detected at concentrations exceeding the NYSDOH soil vapor intrusion guidelines. Contaminants related to PCE and its degradation products were detected in the samples including Chloroethane (maximum 1.42 ug/m³), Chloroform (13.3 ug/m³), Tetrachloroethene (maximum 13.1 ug/m³), and Trichloroethene (maximum 5.21 ug/m³).

2.0 DESCRIPTION OF REMEDIAL ACTIONS

The Site was remediated in accordance with the scope of work presented in the OER-approved Remedial Action Work Plan (RAWP) dated October 2015 and an RAWP Stipulation List dated May 9, 2016. Remedial actions were taken in accordance with applicable laws and regulations, and the site-specific Construction Health and Safety Plan (CHASP). Any deviations from the RAWP and RAWP Stipulation List are noted below. **Appendix 2** includes the RAWP and RAWP Stipulation List.

The following remedial actions were completed in this program:

1. Mobilized for remedial action involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas.
2. Performed Community Air Monitoring Program during invasive activities to screen for particulates and volatile organic carbon compounds during ten (10) days of excavation of soil/fill along Pearl Street for the installation of two (2) Con Edison transformer vaults.
3. Screened excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a photo ionization detector (PID).
4. The following excavations were performed: Approximately 177.15 tons of soil/fill material were excavated for the installation of two elevator pits and two suction pits. Soil was removed in two, 2 foot by 2 foot squares, each to a depth of 2 feet, for the installation of two SSDS suction pits. Excavated soil from the elevator and suction pits was stockpiled prior to disposal. Approximately 859.38 tons of soil was excavated for the installation of two (2) Con Edison transformer vaults along the Pearl Street sidewalk, located west of the Site, to a depth of approximately 12 feet below grade. The excavation extends across 80 feet along the sidewalk. This soil was live loaded and removed from the site. A total of approximately 1,036.53 tons of soil/fill was excavated and removed from the property.
5. Sampled and analyzed excavated media as required by disposal facilities. Conducted materials management including temporarily stockpiling soil/fill that was not disposed of

by live-loading. Appropriately segregated excavated media on-site prior to disposal. 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.

6. All 1,036.53 tons of non-hazardous (petroleum contaminated) soil/fill material was transported to Clean Earth of Carteret located at 24 Middlesex Avenue in Carteret, New Jersey.
7. Imported 121.73 tons of ¾ '' stone from Stavola Construction Materials Inc. located at 810 Thompson Avenue, Bound Brook, New Jersey 08805, to be used for backfill in the area of the Con Edison vault excavation in accordance with all Federal, State and City laws and regulations and with OER approval.
8. Submitted daily reports documenting air monitoring and soil/fill disposal activities from November 13, 2017 through December 1, 2017. Also submitted a monthly report to document construction activities through February 2018.
9. As part of development, constructed an engineered composite cover consisting of 14'' mat slab poured on top of the existing 7'' concrete building slab, covered roads, concrete covered sidewalks, and clean imported soil in landscaped areas.
10. Installed and operated an active Sub-Slab Depressurization System (SSDS) consisting of two (2) subsurface suction pits beneath the building connected to two (2) Radon Away G-501 model fans, one for each suction pit, which actively exhaust air from beneath the slab to the outdoors. The contractor for the construction of the active SSDS system was Enviro Drilling and Contracting, Inc. located at 15 Ocean Avenue in Brooklyn, New York.
11. Performed all activities required for the remedial action, including permitting requirements and pretreatment requirements, in accordance with all applicable laws and regulations. An NYCDEP dewatering permit was secured by HAKS Engineering located at 40 Wall Street in New York, NY. The permit was issued on June 29, 2017 and

approximately 1,170,000 gallons of water were discharged from the site between June 2017 and January 2018.

12. Submitted RAR that describes the remedial activities, certifies that the remedial requirements have been achieved, defines the Site boundaries, describes any Engineering Controls to be implemented at the Site, and explains any changes from the RAWP.

3.0 COMPLIANCE WITH REMEDIAL ACTION WORK PLAN

3.1 Construction Health and Safety Plan

The remedial construction activities performed under this program were in compliance with the site-specific CHASP and applicable laws and regulations. The Site Safety Coordinator was Erica Johnston.

3.2 Community Air Monitoring Plan

The Community Air Monitoring Plan provided for the collection and analysis of air samples during remedial construction activities to ensure proper protections were employed to protect workers and the neighboring community. Monitoring was performed in compliance with the Community Air Monitoring Plan in the approved RAWP. Personnel stationed near soil excavation activities and downwind in the immediate vicinity of the Site monitored air quality. This task consisted of monitoring the air for VOCs and particulates by utilizing a Photo Ionization Detector (PID) and Real-Time Particulate Dust Tracker, respectively. Downwind mobile PID measurements and mobile PID in the vicinity of the excavation did not exceed 0.5 ppm. The results of Community Air monitoring are shown in **Appendix 3**.

3.3 Soil/Materials Management Plan

The Soil/Materials Management Plan in the RAWP provided detailed plans for managing all soils/materials that were disturbed at the Site, including excavation, handling, storage, transport and disposal. It also included a series of controls to assure effective, nuisance free remedial activity in compliance with applicable laws and regulations. Remedial construction activities performed under this program were in compliance with the SMMP in the approved RAWP.

3.4 Storm-Water Pollution Prevention

Storm water pollution prevention included physical methods and processes to control and/or divert surface water flows and to limit the potential for erosion and migration of Site soils, via wind or water. Remedial construction activities performed under this program were in compliance with applicable storm-water pollution prevention laws and regulations and the RAWP.

3.5 Deviations from the Remedial Action Work Plan

Deviations in the remedial activities from the OER approved RAWP are as follows:

1. A single sub-slab suction pit was proposed to be installed in the southern portion of the property to address elevated levels of VOCs in soil vapor identified in the RIR. The more conservative system was discussed with OER on Friday, November 17, 2017 and OER gave verbal confirmation regarding approval of this deviation.
2. The OER approved RAWP did not include excavation as part of the proposed development or proposed remediation of the Site. Additionally, the RAWP did not anticipate the slab of the building being disturbed. During the April 26, 2016 pre-construction meeting, it was discovered that excavation had taken place in the south central portion of the building for the installation of two elevator pits and that the soil/fill material from the excavation had been stockpiled in the north central portion of the Site. Hydro Tech Environmental was not on site and had not been present to perform air monitoring during the excavation and stockpiling. This was discussed by the project team during the pre-construction meeting and this scope of work was included in the Stipulation List submitted on May 9, 2016. Following submission of the Stipulation List, the proposed development plans were ultimately changed to include an additional invasive work, namely: excavation along Pearl Street, under an agreement with Brooklyn Bridge Park, for the installation of two Con Edison transformer vaults. Excavation associated with the installation of the transformer vaults resulted in 859.38 tons of soil/fill material for disposal. The soil/fill material was characterized for disposal via the collection of one (1) sample and an updated approval letter was obtained from the facility prior to disposal. This material was disposed of via live-loading.
3. The Daily Report from November 16, 2017 has a typo that reads “A single truckload of oil was excavated and transported to Clean Earth...” The correct sentence would have been “A single truckload of soil was excavated and transported to Clean Earth...”. It is important to note that no oil or petroleum contaminated soil was

encountered during excavation. Excavation and off-site shipment of soil was performed on November 28, 2018. HydroTech was on-site to perform air monitoring and to provide QEP oversight. Daily activities were documented via an air monitoring log, a trucking log and photos provided by the on-site technician; however, a daily report was not submitted. Having been informed about this oversight, HydroTech prepared the daily report using archived information provided by the technician on November 28, 2017 and submitted the report on October 1, 2018. The air monitoring log is included in **Appendix 3** and the daily report is included in **Appendix 5** of this report.

The deviations implemented as part of the remedial action are protective of public health and the environment. **Appendix 4** provides correspondences with OER regarding the approved deviations.

4.0 REMEDIAL PROGRAM

4.1 Project Organization

The principal personnel who participated in the remedial action included Erica Johnston, a Project Geologist and Dorina Aliu, an Environmental Engineer. The Professional Engineer (PE) and Qualified Environmental Professional (QEP) for this project are Tarek Z. Khouri and Mark E. Robbins, respectively. The principal contractor involved in the Remedial Action were Enviro Drilling and Contracting, Inc., the contractor for the installation of the SSDS and SA-FE Windows, Inc. located at 206 West Kendig Road in Pennsylvania 17584, the contractor for the installation of windows and other components of the noise remedy. The developer for the Site was Glacier Global Partners LLC.

Remedial activities at the Site were overseen by NYC OER under the E-Designation program in accordance with the October 2015 RAWP addressing the HAZMAT E-designation (E-231; CEQR 09DCP053K) (NYC E-Designation Project Number 14EH-N547K). The NYC OER Project Manager is Zach Schreiber.

4.2 Site Controls

Site Preparation

Prior to, and throughout, the different phases of remedial activities, all necessary construction permits were acquired and maintained on-site as per the New York City Department of Buildings (NYCDOB) rules and regulations. No site clearing and site grubbing of organic matter (wood, roots, stumps, etc.) or other solid waste were required prior to all remedial work.

A pre-construction meeting was held at the site on April 26, 2016. Site mobilization, including utility mark outs, site security setup, and marking and staking excavation areas was performed in May of 2016.

Mobilization

Mobilization was conducted as necessary prior to the start of construction at the Site. Mobilization included 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 attended an orientation meeting to become familiar with the general operation of the Site, health and safety requirements, and field procedures.

Soil Screening

All excavated soil was examined for visual/olfactory evidence of petroleum contamination and for organic vapors utilizing a Photoionization Detector (PID). No organic vapors (<0.1 ppm) or visual/olfactory evidence of contamination were identified in the soil that was excavated and removed from the Site.

According to the waste characterization exercise performed at this site, the soil was classified by HydroTech to be urban fill material with slightly elevated concentrations of metals and SVOCs in soil. The waste characterization sampling did not identify any visual or olfactory evidence indicating the presence of petroleum impacted soil. Based on the findings and data derived from the waste characterization exercise, the disposal facility accepted the soil for disposal as part of the following waste class: "Non-Hazardous Petroleum Contaminated Soil/Urban Fill". This is the classification that is listed on all of the waste manifests and weight tickets. This classification does not indicate that petroleum contamination was identified in soil during excavation activities however.

All excavated soil was examined for visual/olfactory evidence of petroleum contamination and for organic vapors utilizing a Photoionization Detector (PID). No organic vapors (<0.1 ppm) or visual/olfactory evidence of contamination were identified in the soil that was excavated and removed from the Site. While this site may classify as an urban fill site with elevated PAH levels, since there were no detectable VOC readings or any visual or olfactory evidence of any spill sources, a spill classification/call was not warranted for this Site.

Stockpile Management

Soil excavated for the installation of elevator and suction pits during remedial Site development was first stockpiled, and then was loaded into trucks. Excavated soil was placed directly on 6-mil poly-sheeting and covered at all times with appropriately anchored plastic tarps. This task was completed in accordance with the soil material management plan in the RAWP.

Traffic Control

Drivers of trucks leaving the NYC VCP Site with soil/fill were 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 was planned by the construction manager for the Site and reported to OER.

Truck Inspection

Truck inspection and cleaning was performed for all loaded trucks prior to leaving the site. Trucks were staged for loading contaminated soil/fill material on the west-adjacent sidewalk along Howard Avenue to the west of the Site and were then inspected prior to leaving the Site for any debris adhering to their surface. Trucks also went through thorough cleaning including brushing and rinsing their tires with water, when necessary, in order to prevent any tracking of soil/fill into surrounding community. Hauling trucks were also covered in order to control the generation of fugitive dust and leakage of contaminated material during transport.

Site Security

Site security was maintained with a locked fence in accordance with the NYCDOB code.

Nuisance Controls

All necessary means were employed to prevent dust, odor and vapor nuisances during the remedial excavation and disposal of soil/fill material. Such measures included shrouding stockpiled material with plastic tarp. The nuisance control measures also included using water from the nearest fire hydrant to apply sprinkled water over dry surfaces to reduce dust

generation. Other provisions for mist applications of odor chemical solutions to suppress potential odor and vapors were also considered but did not need to be utilized.

No odors, dust or vapors were generated or identified during remedial work.

Reporting

Daily reports providing a general summary of invasive and other remedial activities were provided to the OER Project Manager for each day of active remedial work. A monthly report was also submitted for January 2018 to document progress and closeout of construction activities on site. A total of ten (10) daily reports were submitted from November 13, 2017 to December 1, 2017 and excluded periods of no invasive or remedial activity during the reporting period. One (1) monthly report was submitted for January 2018.

All reports are included in **Appendix 5**. Digital photographs of the Remedial Action are included in **Appendix 6**.

4.3 Materials Excavation and Removal

A plan showing the approximate locations where excavations were performed, as well as approximate thickness of excavated material, is provided in Figure 3. Soil was excavated to a depth of approximately 2 feet for the installation of two suction pits and to a depth of approximately 4 feet below grade for the installation of the elevator pits. The soil excavation for the installation of the two Con Edison transformer vaults was performed to the depth of approximately 12 feet below grade along Pearl Street. A total of 1,036.53 tons of non-hazardous soil/fill material were excavated from the Site and shipped to Clean Earth of Carteret located at 24 Middlesex Avenue in Carteret, NJ 07008 for disposal.

Dewatering

During excavation for the installation of the transformer vaults along Pearl Street, groundwater was encountered at approximately 7 feet below grade and dewatering was required in order to keep the water table sufficiently low to carry out the earthmoving work. Dewatering was performed under a NYCDEP dewatering permit obtained by HAKS Engineers, Architecture and Surveying, DPC dated June 29, 2017. A copy of the dewatering permit is provided in **Appendix 14**.

End Point Sample Results

Post removal endpoint sampling and testing was not conducted in relation to the Con Ed vault soil excavation and removal. Analytical results for the endpoint samples collected from the base of the excavation for the two elevator pits are included in the RAWP Stipulation List provided in **Appendix 2**.

4.4 Materials Disposal

Excavation activities were limited to excavation of two 4-foot deep pits for the installation of the elevator pits, excavation of two 2-foot deep pits for the SSDS installation and excavation down to 12 feet along Pearl Street for the installation of two Con Ed vaults. Approximately 177.15 tons of soil/fill material were excavated and stockpiled for the installation of two elevator pits and two suction pits. Soil was removed in two, 2 foot by 2 foot squares, each to a depth of 2 feet, for the installation of two SSDS suction pits. This soil was also stockpiled with the soil from the elevator excavation and later shipped off-site. Approximately 859.38 tons of soil was excavated for the installation of two (2) Con Edison transformer vaults along the Pearl Street sidewalk, located west of the Site, to a depth of approximately 15 feet below grade. The excavation extends across 80 feet along the sidewalk. This soil was removed from the site by live loading. A total of approximately 1,036.53 tons of soil/fill was excavated and removed from the property.

A summary of the quantity of materials that were excavated and disposed of off-site is presented below:

Destination	Type of Material	Quantity
Clean Earth of Carteret	Non-hazardous	1,036.53

Correspondence from Glacier Global Partners, LLC via Hydro Tech Environmental to Clean Earth of Carteret providing materials type, source and data; and acceptance letters from Clean Earth of Carteret stating it is approved to accept these materials are attached in **Appendix 7**. The OER Historic Fill Notification Form provided to the facility is included in **Appendix 8**. Shipping and disposal manifests are included in **Appendix 9**. A table of individual truck transport and material disposal quantities is included in Table 1.

4.5 Backfill Import

Approximately 121.73 tons of ¾" crushed stone material was imported from Stavola Construction Materials Inc. located at 810 Thompson Avenue, Bound Brook, New Jersey 08805, to be used for backfill in the area of the Con Edison vault excavation in accordance with all Federal, State and City laws and regulations and with OER approval. A table of all backfill type, quantity, and source is shown in Table 2.

4.6 Demarcation

A demarcation layer was not required as part of the remedial activities included in the approved RAWP.

5.0 ENGINEERING CONTROLS

Engineering Controls were employed in the remedial action to address residual contamination remaining at the site. The Site has two (2) primary Engineering Control Systems. These are:

- (1) A composite cover system consisting of a 14-inch thick mat slab poured on top of the existing 7'' concrete slab, covered roads, concrete covered sidewalks, and clean imported soil in landscaped areas; and
- (2) Active pit-type Sub-Slab depressurization system.

5.1 Composite Cover System

Exposure to residual soil/fill is prevented by an engineered, composite cover system that has been built on the Site. This composite cover system is comprised of a concrete building slab, which consists of a 14-inch thick mat slab poured on top of the existing 7-inch thick building slab. The contractor for the cover construction was Clearwater Contracting located at 511 Canal Street, New York, NY 10013. The composite cover also includes paved roads surrounding the building, concrete covered sidewalks, and clean import fill in landscaped areas.

5.2 Sub-Slab Depressurization System

Exposure to soil vapor is prevented by an active SSDS that has been installed at the site. The active pit-type SSDS was installed starting in January 2017 and installation was completed in January of 2018. The SSDS system was installed per the revised design drawings which include two pits. This deviation was approved by OER prior to installation. Full time oversight during the installation was performed by Hydro Tech and HAKS Engineering. No deviations from the approved design were noted.

The SSDS consists of two (2) sub-slab suction pits installed beneath the cellar slab, in the eastern and western portions of the cellar. Each SSDS pit consists of a 4-inch diameter boring installed through the 21-inch thick reinforced concrete slab. Each SSDS suction pit measures two (2) feet by two (2) feet in area and extends two (2) feet below the bottom of the new building

slab. Each suction pit contains a 4-inch diameter perforated schedule 40 PVC pipe and is backfilled with clean Pavestone® brand crushed bluestone. The perforated PVC pipes are connected to 4-inch solid PVC risers which converge into a fire rated enclosure (shaft) that extends from the basement level up to the roof. Each riser (total of two) is outfitted with a blower fan (RadonAway GP501). Each vent pipe contains its own vacuum gauge and flow control alarm located in a secure SSDS equipment area located in the vicinity of the fire rated enclosure in the cellar. The roof exhaust is situated a minimum of 10 feet from all air intakes, and all visible SSDS piping is labeled “Soil Vapor Venting System – Do Not Tamper with or Disturb”. The vent on the roof line terminates with a goose-neck pipe to prevent rain infiltration. The alarms were tested and confirmed to be in working, audible condition.

In addition to the two suction pits and associated piping, fans, and alarms and gauges, the SSD system also includes a total of six pressure probes. Three pressure probes were installed around each suction pit at 5-, 10-, and 15-foot radiuses around each suction pit located in the southwest and southeast portions of the cellar. Installation of the pressure probes was completed in January of 2018, marking the completion of the SSD system installation. Pressure probes were installed to a depth of approximately 6-inches below the bottom of the concrete building slab and consist of a stainless-steel implant fitted with inert, laboratory quality 1/4-inch tubing to the concrete slab surface. The pressure probes are backfilled with glass beads and clean sand and are sealed with a bentonite slurry and concrete. Pressure probes are outfitted with a plastic ball valve to seal ports when not in use. The locations of the pressure probes and other system components are provided in the as-built drawings provided in **Appendix 12**. The drawings also provide the location of the system exhaust vents in relation to mechanical equipment located on the roof. The SSDS exhaust vents were installed adjacent to the Post-Fire Smoke Purge Exhaust Duct Riser and are located a minimum of ten feet away from operable windows and mechanical equipment air intake vents.

Subsequent to installation, pressure readings were obtained from the pressure probes to determine if negative pressure is present beneath the concrete building slab. Sub-slab pressure was measured with an Extech HD755 Differential Pressure manometer which measures differential pressure in inches of mercury. Differential pressure readings obtained from each of

the sampling ports indicated negative pressure of less than or equal to -0.002 inches of water beneath the slab. This indicates that there is communication across the slab in the vicinity of the SSDS pits and verifies proper functioning of the system. The vacuum test memo is included in **Appendix 15**. Included are a site map showing the location of sampling ports, the resulting vacuum at each location, and photographs of the inspection, including photographs of the pressure meter showing the resulting vacuum at respective monitoring points.

The SSDS was installed by Enviro Drilling and Contracting, Inc. located at 15 Ocean Avenue in Brooklyn, New York. Prior to SSDS start-up, Hydro Tech was on-site to inspect the system for proper functioning and the system has been in full operation since February 2018. **Appendix 12** provides PE certified as-built plans of the active SSDS. **Appendix 13** provides a certified contractor affidavit for the SSDS installation.

6.0 SITE MANAGEMENT PLAN

Site Management is the last phase of the remedial process and begins after the approval of the Remedial Action Report (RAR) and issuance of the Notice of Completion (NOC) by OER. It is the responsibility of the property owner to ensure that all Site Management responsibilities are performed. The penalty for failure to implement the SMP includes revocation of the Notice of Completion and all associated certifications and liability protections.

Engineering Controls and Institutional Controls have been incorporated into this Remedial Action to ensure that the site remains protective of public health and the environment. Generally, EC's provide physical protective measures and IC's provide restrictions on Site usage and establish remedial operation, maintenance, inspection and certification measures. This Site Management Plan has been established to govern long-term performance of EC's and IC's for this property.

The SMP provides a detailed description of procedures required to manage residual material at the Site following the completion of remedial construction in accordance with the NYC Voluntary Cleanup Agreement with OER. This includes: (1) operation and maintenance of Engineering Controls; (2) inspection of EC's and IC's; and (3) certification of performance of EC's and IC's.

ENGINEERING CONTROLS

Engineering Controls were employed in the remedial action to address residual materials remaining at the site. The Site has two Engineering Control Systems. Engineering Controls for this property are:

- (1) Composite Cover System consisting of asphalt covered roads, concrete covered sidewalks, and concrete building slabs;
- (2) Active pit-type Sub-Slab Depressurization System.

Operation and Maintenance of Composite Cover System

Chapter 5 describes the Composite Cover System utilized in this Remedial Action and provides as-built design details and the location of each cover type. The Composite Cover System is a permanent Engineering Control for the Site. The system will be inspected and its

performance certified at specified intervals defined in this SMP. A Soil/Materials Management Plan is included in this Site Management Plan and outlines the procedures to be followed in the event that the composite cover system and underlying residual soil/material must be disturbed after the Remedial Action is complete.

The Composite Cover System does not require any special operation or maintenance activities. If the system is breached during future construction activities, the system will be rebuilt by reconstructing the system according to the original design and tying newly constructed cover layers into existing cover layers to form a continuous layer(s).

Operation and Maintenance of Sub-Slab Depressurization System

Chapter 5 describes the active Sub-Slab Depressurization System utilized in this Remedial Action and provides as-built design details and the system location. The SSDS is a permanent Engineering Control for the Site. The system will be inspected and its performance certified at specified intervals defined in this SMP.

The SSDS is required to be run continuously. During operation, the minimum vacuum gauge reading beneath the slab should be 0.01 inches of water. During operation, the SSDS should be monitored for physical wear and damage and other operational problems, making component replacements as necessary. Any blockages in rise or discharge piping or vacuum alarm or gauge tubing should be cleared. Operation of vacuum alarms/monitors (red and green indicator lights, audible alarm) should be verified by disconnecting tubing from riser pipe and noting if the red indicator light and audible alarm turn on. Operation of vacuum gauges should be verified by disconnecting tubing from riser pipe and noting if the indicator moves to zero and checking high- and low-pressure ports to see if they are plugged correctly. Proper seal should be maintained in riser pipe penetrations in concrete slab. Riser pipe connections at fan should be free of leaks and fan mounts should be in proper condition. A designated building supervisor will be appointed to be contacted in the event of a problem with the SSDS.

INSTITUTIONAL CONTROLS

A series of Institutional Controls are required under this Remedial Action to assure permanent protection of public health by elimination of exposure to residual materials. These IC's define the program to operate, maintain, inspect and certify the performance of Engineering Controls

and Institutional Controls on this property. These Institutional Controls will be implemented in accordance with the Site Management Plan included in this RAR.

Institutional Controls are also designed to prevent future exposure to residual soil/materials by controlling disturbances in the subsurface, restrict higher uses of the property than those addressed by the Remedial Action and establish restrictions on activities and site usage. Institutional Controls for this property are:

- (1) The property will continue to be registered with an E-Designation by the NYC Department of Buildings. Property owner and property owner's successors and assigns are required to comply with the approved SMP;
- (2) Compliance with an OER-approved Site Management Plan including procedures for appropriate maintenance, inspection, and certification of performance of EC's and IC's. The property owner and property owner's successors and assigns will inspect EC's and IC's and submit to OER a written certification that evaluates their performance in a manner and at a frequency to be determined by OER;
- (3) Engineering Controls will not be discontinued without prior OER approval;
- (4) OER has the right to enter the Site upon notice for the purpose of evaluating the performance of EC's and IC's;
- (5) Vegetable gardens and farming in residual soil/fill on the Site are prohibited;
- (6) Use of groundwater underlying the Site without treatment rendering it safe for its intended use is prohibited;
- (7) All future activities on the Site that will disturb residual soil/fill must be conducted pursuant to the Soil/Materials Management provisions of the SMP, or otherwise approved by OER;
- (8) The Site is intended to be used for restricted residential use and will not be used for a higher level of use without prior approval by OER.
- (9) Placement of a deed notice to record the ECs/ICs on the deed to ensure that future owners of the Site continue to comply with the SMP, as required.

INSPECTIONS

Engineering Controls and Institutional Controls will be inspected on 5th year and every 10 years thereafter. The inspections will evaluate the following:

- If Engineering Controls or Institutional Controls employed at the Site continue to perform as designed and continue to be protective of human health and the environment;
- If anything has occurred that impairs the ability of the Engineering Controls or Institutional Controls to protect public health and the environment;
- If changes are needed to the remedial systems or controls;
- If compliance with this SMP has been maintained;
- If site records are complete and up to date; and
- General Site conditions at the time of inspection.

In an addition, if an emergency occurs, such as a natural disaster, or if an unforeseen failure of any of the Engineering Controls occurs, an inspection of the Site will be performed within 14 days to evaluate the Engineering Controls and a letter report of findings will be submitted to OER.

Inspection of Composite Cover System

The composite cover will be visually inspected for any breaks or cracks in the building slab and the backyard cap. Any breaks should be promptly repaired with concrete. Evidence of active invasive activity through the cover system, or past invasive activity, such as patches and repairs, should be evaluated. Photographs should be taken and presented in the Report to document findings.

Inspection of Sub-Slab Depressurization System

Inspection of the SSDS will performed on an annual basis and will constitute the following:

- Observe visible components (fan, vacuum alarm/monitor, vacuum gauge, tubing, riser pipe, etc.) for physical wear, damage and operational issues, and replace as necessary;
- Remove any blockages in vacuum alarm/monitor and gauge tubing and riser pipe taps;

- Verify operation of vacuum alarm/monitor (red and green indicator lights, audible alarm) by disconnecting tubing from riser pipe and noting if the red indicator light and audible alarm turn on;
- Verify operation of vacuum gauge by disconnecting tubing from riser pipe and noting if the indicator moves to zero (check high and low pressure ports to see if they are plugged correctly);
- Inspect riser pipe penetrations in concrete slab for proper seal;
- Inspect riser pipe connections at fan for leaks and tightness;
- Inspect power to fan by operating dedicated switch;
- Inspect fan mounts.

Site Use Prohibitions

Inspections to evaluate the status of site use prohibitions will include an evaluation of whether there is vegetable gardening or farming in residual soil/fill; whether groundwater underlying the site has been used without treatment rendering it safe for its intended use; whether activities that have disturbed site soil/fill have been conducted pursuant to the Soil/Material Management provisions of the SMP, or otherwise approved by OER; and whether the site has been used for a higher level of use other than the restricted residential use addressed by the Remedial Action.

INSPECTION AND CERTIFICATION LETTER REPORT

Results of inspections performed during a reporting period and certification of performance of all Engineering Controls and Institutional Controls will be included in an Inspection and Certification Letter Report. Inspections will be performed in 2019, 2020 and every 1 year thereafter. Inspection and Certification Letter Reports will be submitted by July 30, 2020 (for the reporting period calendar year 2019), July 30, 2021 (for the reporting period calendar years 2020) and every 1 year thereafter (for the reporting period consisting of the 1 prior calendar years). Inspection and Certification Reports will cover all calendar years since the prior reporting period. Inspection and Certification Letter Reports will be submitted to OER in digital format. The letter report will include, at a minimum:

- Date of inspections;
- Personnel conducting inspections;

- Description of the inspection activities performed;
- Any observations, conclusions, or recommendations;
- Copy of any inspection forms;
- A determination as to whether groundwater plume conditions, if any, have changed since the last reporting event; and
- Certification of the performance of Engineering Controls and Institutional Controls, as discussed below.

The certification of the performance of EC's and IC's will establish:

- If Engineering Controls or Institutional Controls employed at the Site continue to be in place and perform as designed and continue to be protective of human health and the environment;
- If anything has occurred that impairs the ability of Engineering Controls or Institutional Controls to protect public health and the environment;
- If changes are needed to the remedial systems or controls;
- If compliance with this Site Management Plan has been maintained;
- If vegetable gardening and farming in residual soils has been prevented;
- If groundwater underlying the Site is being utilized without treatment rendering it safe for the intended purpose has been prevented;
- If activities on the Site that have disturbed residual soil/fill material have been in accordance with the Soil/Materials Management Plan in this SMP;
- If the Site has been used for a higher level of use other than the restricted residential use addressed by the Remedial Action;
- If site records are complete and up to date;
- If the Site continues to be registered as an E-Designated property by the NYC Department of Buildings;
- If the Site continues to be subject to the deed notice notifying of site ICs/ECs;

OER may enter the Site upon notice for the purpose of evaluating the performance of EC's and IC's.

NOTIFICATIONS

Notifications will be submitted by the property owner to OER as described below:

- 60-day advance notice of any proposed changes in Site use, such as an upgrade from existing use to commercial use that was not contemplated in the Remedial Action.
- Notice within 30 days of any emergency, such as a fire, flood, or earthquake that has the potential to reduce the effectiveness of Engineering Controls in place at the Site.

SOIL/MATERIALS MANAGEMENT PLAN

Any future intrusive work that will disturb residual soil/fill beneath the property, including modifications or repairs to the existing composite cover system, will be performed in compliance with this Soil/Materials Management Plan (SMMP). Intrusive work will also be conducted in accordance with the procedures defined in the Community Air Monitoring Plan (CAMP) included in this chapter and a Construction Health and Safety Plan (HASP). The HASP is the responsibility of the property owner and should be in compliance with NYSDEC DER-10 Technical Guide and 29 CFR 1910 and 1926, and all other applicable Federal, State and City regulations. Intrusive construction work should be compliant with this SMMP and described in the next Inspection and Certification Letter Report.

SOIL/MATERIALS MANAGEMENT PLAN

Any future intrusive work that will disturb residual soil/fill beneath the property, including modifications or repairs to the existing composite cover system, will be performed in compliance with this Soil/Materials Management Plan (SMMP). Intrusive work will also be conducted in accordance with the procedures defined in the Community Air Monitoring Plan (CAMP) in this plan and a Construction Health and Safety Plan (HASP). The HASP is the responsibility of the property owner and should be in compliance with NYSDEC DER-10 Technical Guide and 29 CFR 1910 and 1926, and all other applicable Federal, State and City regulations. Intrusive construction work should be compliant with this SMMP and described in the next Inspection and Certification Letter Report.

Soil Screening Methods

Visual, olfactory and PID soil screening and assessment will be performed under the supervision of a Qualified Environmental Professional (QEP). Soil screening will be performed during any future intrusive work.

Stockpile Methods

Stockpiles will be used to isolate excavated soil 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 6-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.

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. Excavated soil will only be reused on-site with prior approval by OER.

Materials Excavation, Load-Out and Departure

The PE/QEP overseeing the remedial action will:

- Oversee intrusive 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 management plan;
- Ensure that Site maintenance activities and maintenance-related grading cuts will not interfere with, or otherwise impair or compromise the remedial measures established during the remediation construction phase;
- 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 permits or authorized notifications;
- Ensure that all loaded outbound trucks are inspected and cleaned if necessary before leaving the Site; and
- Ensure that all egress points for truck and equipment transport from the Site will be kept clean of Site-derived materials during Site intrusive work.

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.

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.

Outbound truck transport routes are shown on Figure 8. This routing takes 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.

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 Enrollee 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 Brooklyn, 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 Enrollee. 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.

Documentation associated with disposal of all material will include records and approvals for receipt of the material. 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 retained and included in the following Inspection and Certification Report. A manifest system for off-Site transportation of exported materials will be employed. Hazardous wastes derived from on-Site will be stored, transported, and disposed of in compliance with applicable laws and regulations.

Materials Reuse On-Site

All of the soil excavated during any future repair or construction purposes will be placed in the same excavation it was derived from or will be disposed of off-site unless otherwise approved by OER beforehand.

Repair of Remedial Systems

After completion of invasive work, any damage of the engineering controls (composite cover system, vapor barrier, etc.) will be restored to the original condition established during initial construction.

Import of Backfill Soil from Off-Site Sources

In the event that soil importation is needed for the backfilling purposes, this Section presents the requirements for imported fill materials. All imported soils will meet OER-approved backfill and cover soil quality objectives for this Site. The backfill and cover soil quality objectives including NYSDEC Part 375 Track 2 Residential SCOs and groundwater protections standards. 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; and

- Virgin quarried material or other materials with an approved Beneficial Use Determination (BUD) from NYSDEC for reuse as clean fill.

All materials received for import to the Site will be approved by a PE/QEP and will be in compliance with provisions in this SMP. The Inspection and Certification Report 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 from the identified clean soil sources will be taken at a minimum frequency of one sample for every 500 cubic yards of material. One composite sample will be collected from each source of virgin quarried material or other material with an NYSDEC approved BUD, unless otherwise approved by OER. 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) may be imported from facilities permitted or registered by NYSDEC. 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 will not be used as cover material.

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. 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 NYSDEC.

Storm-water Pollution Prevention

Applicable laws and regulations pertaining to storm-water pollution prevention will be addressed during the remedial program. All existing stormwater systems will be inspected to ensure proper operation.

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/QEPs.

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.

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/QEPs.

Noise

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

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. Exceedances 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 (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques 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.

CONTINGENCY PLAN

This contingency plan is developed for the remedial construction or repair work 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. 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 TAL metals, TCL volatiles and semi-volatiles, TCL pesticides and PCBs, as appropriate.

Emergency Telephone Numbers

In the event of any emergency condition pertaining to these remedial systems, the Owner's representative(s) should contact the appropriate parties from the contact list below. Prompt contact should also be made to Mark Robbins. These emergency contact lists must be maintained in an easily accessible location at the Site.

Emergency Contact Numbers

Medical, Fire, and Police:	911
One Call Center: 3 day notice required for utility markout	(800) 272-4480
Poison Control Center:	(800) 222-1222
Pollution Toxic Chemical Oil Spills:	(800) 424-8802
NYSDEC Spills Hotline	(800) 457-7362

Contact Numbers

Mark Robbins, Hydro Tech Environmental	631-462-5866
Office of Environmental Remediation	(212) 788-8841; 311

7.0 SUSTAINABILITY REPORT

This Remedial Action Work Plan provides for sustainable remediation and redevelopment through a variety of means that are defined in this Sustainability Report.

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.

The following means were used to reduce energy consumption in this project: Efficient loading times of trucks to prevent extensive idling times and consolidating the number of days that soil was shipped from the Site to reduce truck traffic in the neighborhood.

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 that could impede future redevelopment. Recontamination can arise from future releases that occur within the property or by influx of existing contamination from off-Site.

The methods used to provide recontamination controls in the development included the prevention of transport of contamination to the site from off-site by ensuring that no unapproved materials were brought to the Site, a vapor barrier was installed at the Site to provide protections if recontamination from off-site were to occur, and the use of natural gas to ensure no fuel oil will be leaked into the environment.

100% of the area of the Site, or 20,000 square feet, utilizes recontamination controls under this plan.

Paperless Brownfield Cleanup Program.

The entity Glacier Global Partners LLC participated in OER's Paperless Brownfield Cleanup Program. Under this program, submission of electronic documents replaced submission of hard copies for the review of project documents, communications and milestone reports. A best estimate of the mass (pounds) of paper saved under this plan is 100 pounds.

Low-Energy Project Management Program

The entity Glacier Global Partners LLC participated in OER's low-energy project management program. Under this program, whenever possible, meetings were held using remote communication technologies, such as videoconferencing and teleconferencing to reduce energy consumption and traffic congestion associated with personal transportation. A gross estimate of the number of miles of personal transportation that was conserved in this process is 500 miles.