

221-227 EAST 138TH STREET

BRONX, NEW YORK

Remedial Action Report

NYC VCP Project Number 16CVCP011X

OER Project Number 16EHAZ014X

Prepared For:

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REMEDIAL ACTION REPORT

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LIST OF ACRONYMS

Acronym	Definition
CAMP	Community Air Monitoring Plan
DER-10	NYS DEC Division of Environmental Remediation Technical Guidance Manual 10
EC	Engineering Control
HASP	Health and Safety Plan
IC	Institutional Control
NYC VCP	New York City Voluntary Cleanup Program
NYC DEP	New York City Department of Environmental Protection
NYC DOHMH	New York City Department of Health and Mental Hygiene
NYC OER	New York City Office of Environmental Remediation
ORC	Oxygen Release Compound
PID	Photoionization Detector
QA/QC	Quality Assurance/Quality Control
QEP	Qualified Environmental Professional
RAR	Remedial Action Report
RAWP	Remedial Action Work Plan
SCG	Standards, Criteria and Guidance
SCO	Soil Cleanup Objective
SMMP	Soil/Materials Management Plan
SMP	Site Management Plan
SVOCs	Semi-Volatile Organic Compounds
UST	Underground Storage Tank
VOCs	Volatile Organic Compounds

CERTIFICATION

The original Professional Engineer, who certified the RAP, 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 221-227 East 138 Street Site (Block 2340 and Lot 56 (former lots 56 and 58)), site number 16CVC011X.

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

- I am Professional Engineer licensed by the State of New York and the Principal Engineer at Hydro Tech.
- 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 approved RAWP were designed to achieve the goals established in this Remedial Action Work Plan for this site.
- Engineering Controls constructed during this remedial action were professionally observed by a HydroTech Engineer, and have been reviewed by me and (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 06, 2015 and Stipulations in a letter dated October 28, 2015 and April 15, 2016 were implemented by HydroTech personnel and that all requirements in those documents have been substantively complied with. I certify that I have reviewed documentation 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

PE License Number 086611

Signature



Date 6/13/2018

I, Mark E. Robbins, certify the following:

- I am a Qualified Environmental Professional. I had primary direct responsibility for implementation of the remedial program for the 221-227 East 138 Street Site (Block 2340 and Lot 56 (former lots 56 and 58)), site number 16CVC011X.
- The OER-approved Remedial Action Work Plan dated October 06, 2015 and Stipulations in a letter dated October 28, 2015 and April 15, 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 Mark E. Robbins

QEP Signature



Date 6/13/2018

EXECUTIVE SUMMARY

Tahoe Development has enrolled in the New York City Voluntary Cleanup Program (NYC VCP) to investigate and remediate a property located at 221 -227 East 138th Street in the Mott Haven section in Bronx, New York. A Remedial Investigation (RI) was performed to compile and evaluate data and information necessary to develop a Remedial Action Work Plan (RAWP). A remedial action was performed pursuant to the OER-approved RAWP in a manner that has rendered the Site protective of public health and the environment consistent with the proposed use of the property. This RAR describes the remedial action performed under the RAWP. The remedial action described in this document provides for the protection of public health and the environment and complies with applicable environmental standards, criteria and guidance and applicable laws and regulations.

Site Location and Background

The Site is located at 221 - 227 East 138th Street in the Mott Haven section in Bronx, New York and is identified as Block 2340, Lots 56 on the New York City Tax Map. Previously the Site consisted of two tax lots identified as Block 2340, Lots 56 and 58 on the New York City Tax Map. The Site is 10,000-square feet and is bounded by East 140th Street to the north, East 138th Street to the south, Rider Avenue to the east, and Canal Place to the west. Prior to development, the Site contained a vacant 1-story factory building that occupied the entirety of lots 56 and 58. The building was last occupied by a meat production facility.

Summary of Redevelopment Plan

The new development at the Site consists of a new 10-story mixed-use commercial and residential building with slab on grade. The new building is approximately 7,000 square feet in net zoning area and occupies the entirety of the property with the exception of a 30' x 100' rear yard located in the northern portion of the Site. The first floor is capped with an 8-inch thick concrete slab and the rear yard is paved with a 3-inch asphalt cover.

The first floor consists of two (2) commercial retail units encompassing approximately 3,500 square feet, a residential lobby and recreation space encompassing approximately 400 square feet. The remaining area of the first floor is occupied by refuse storage, a gas meter room, an electrical meters and equipment room and a mechanical closet. The rear yard is utilized for car and bicycle parking. Floors 2 – 10 contain a total of 47 residential units. The entire Site perimeter was excavated to the depth of 4 feet below grade established from the curb elevation along Canal Place to the west and also to the depth of 7 feet below the Site grade within the limits of three 10-foot diameter drywells installed in the rear parking area. Soil was also removed to the depth of 8.3 feet below the Site grade for the elevator pit. The Site excavation to the depth of 4 feet is a deviation from the approved RAWP stipulations.

Groundwater was encountered at depths of approximately 7 feet bgs. No soil excavation occurred below the groundwater table and dewatering was not required during site development activities.

The new development at the Site is consistent with the current NYC zoning designation of M1-4/R7X for the property. Figure 3 provides the development plan.

Summary of Description of Surrounding Property

The vicinity of the Site consists of commercial and industrial properties. The ground surfaces in the vicinity of the Site consist of asphalt and concrete. The results of the Site inspection and an evaluation of the United States Geological Survey (USGS) 7-½ Minute Topographic Map containing the properties indicate there is one sensitive receptor present within a 0.125-mile radius of the Site. The sensitive receptor is Nacro Freedom, Inc. The Site should not impact upon the sensitive receptor.

Summary of Past Site Uses and Areas of Concern

Based upon the review of Sanborn Fire Rate Insurance Maps, Property Shark, the City Directory and the NYC Automated City Register Information System (ACRIS) database for the Site and its vicinity and the Phase I ESA Report prepared by Hydro Tech Environmental, Corp. during March 2015 a Site history was established.

According to Sanborn Fire Rate Insurance Maps, the Site was depicted as various one- and two-story commercial buildings, including a farrier shop (1908 Map), a metal spinning factory (1908 Map), a gasoline station and auto repair shop (1935 Map), unspecified warehouse use (1944 Map) and a provision manufacturing facility (1946 – 2007 Maps). According to the City Directory, the occupants of the Site include an electroplating company, a service station, a brass foundry, an auto body shop, an auto repair shop, and a meat packing company. The historical uses of the Site as a gasoline station, an auto repair and auto body shop and various manufacturing likely involved the use of petroleum and/or hazardous materials, potentially having had an adverse impact upon the environmental quality of the Site.

The AOCs identified for this site include:

1. The historical use of the Subject Property as a gasoline station and various manufacturing purposes;
2. The historical use of the adjacent properties as a drain pipe yard, coal yard, manufacturing facility, iron foundry and scrap yard, auto junk yard, filling station and auto repair shop;
3. The presence of an adjacent spill #9101008, which was closed on June 24, 2015;
4. The listing of an adjacent property as an Inactive Hazardous Waste Disposal Site;
5. The presence of a Potential Vapor Encroachment Condition;
6. The presence of thirteen underground storage tanks.

Summary of the Work Performed under the Remedial Investigation

Hydro Tech Environmental, Corp. performed the following scope of work:

1. Conducted a Site inspection to identify AOCs and physical obstructions (i.e. structures, buildings, etc.);

2. Installed nine (9) soil borings across the entire project Site, and collected eighteen (18) soil samples for chemical analysis from the soil borings to evaluate soil quality;
3. Installed two (2) longitudinal trenches to the depth of 4 feet across the Site to determine the presence of USTs;
4. Installed three (3) groundwater monitoring wells throughout the Site to establish groundwater flow and collected three (3) groundwater samples for chemical analysis to evaluate groundwater quality;
5. Installed five (5) soil vapor probes throughout the Site and collected five (5) soil gas samples for chemical analysis.

Summary of Findings of Remedial Investigation

1. Elevation of the property is 17 feet.
2. Depth to groundwater ranges from 7.30 to 8.34 feet at the Site.
3. Groundwater flow is generally toward the southwest beneath the Site.
4. Bedrock was not encountered at the Site.
5. The stratigraphy of the site, from the surface down to about 12 feet bgs, is classified as fill consisting of a mixture of gravel, sand, rocks, wood and possibly other construction debris. Drilling did not occur deeper than 12 feet bgs and bedrock was not encountered.
6. Soil/fill samples results were compared to NYSDEC Unrestricted Use Soil Cleanup Objectives and Restricted Residential Soil Cleanup Objectives as presented in 6NYCRR Part 375-6.8 and CP51. No PCBs were detected in any soil samples. Trace concentrations of one VOC, acetone (max. 0.10 mg/kg), exceeded Unrestricted Use SCOs.

Seven semi-volatile organic compounds (SVOCs) consisting of PAH compounds including benzo(a)anthracene (max. 12.3 mg/kg), Benzo(a)pyrene (max. 6.25 mg/kg), Benzo(b)fluoranthene (max. 9.88 mg/kg), Benzo(k)fluoranthene (max. 8.23 mg/kg), Dibenzo(a,h)anthracene (max. 1.49 mg/kg), chrysene (max. 10.6 mg/kg) were detected in seven shallow and two deep soil samples at concentrations exceeding Restricted Residential Use SCOs. One pesticide, 4,4'-DDE (max. 0.0079 mg/kg) was detected in one shallow and one deep soil samples at a concentration exceeding Unrestricted Use SCOs. Seven metals including barium (max. 712 mg/kg), cadmium (max. 13.50 mg/kg), copper (max. 4,810 mg/kg), lead (max. 1,450 mg/kg), mercury (max. 2.54 mg/kg) nickel (max. 145 mg/kg) and zinc (max. 4,620) were detected in shallow and deep samples at concentrations exceeding Restricted Residential Use SCOs. The metal selenium (max. 7.68 mg/kg) was detected in shallow and deep samples at concentrations exceeding Unrestricted Use SCOs. As noted in the soil logs, oily sheens were observed in SP-2 and SP-3 at a depth of 10 to 12 feet bgs. Overall, soil chemistry is consistent with sites with historic fill in New York City.

7. Groundwater sample results were compared to New York State 6NYCRR Part 703.5 Class GA groundwater quality standards (GQS). Groundwater collected during the investigation showed no VOCs, pesticides or PCBs at concentrations exceeding their respective GQS. The SVOCs Benzo(a)anthracene (max. 1.62 µg/L), Benzo(b)fluoranthene (max. 0.90 µg/L), Benzo(k)fluoranthene (max. 1.45 µg/L), Chrysene (max. 1.75 µg/L) and Indeno(1,2,3-cd)pyrene (max. 1.05 µg/L) were detected in MW-1 at concentrations exceeding their respective GQS. Several metals were identified and of those, antimony (max. 32 µg/L), magnesium (max. 39,200 µg/L), manganese (max. 1,580 µg/L) and sodium (max. 334,000 µg/L) were detected in all groundwater samples at concentrations exceeding GQS.

8. Soil vapor results were compared to compounds listed in Table 3.1 Air Guideline Values Derived by the New York State Department of Health (NYSDOH) located in the NYSDOH Final Guidance for Evaluating Soil Vapor Intrusion dated October 2006. Soil vapor samples collected during the RI showed petroleum related VOCs present in low concentrations. Total concentrations of petroleum-related VOCs (BTEX) ranged from 26.58 $\mu\text{g}/\text{m}^3$ to 462 $\mu\text{g}/\text{m}^3$. Chlorinated VOCs including 1,1,1-trichloroethane (max. 13 $\mu\text{g}/\text{m}^3$), tetrachloroethylene (max. 3.80 $\mu\text{g}/\text{m}^3$) and trichloroethylene (max. 0.42 $\mu\text{g}/\text{m}^3$) were also detected in the soil vapor samples. Carbon tetrachloride was not detected in any of the soil vapor samples.
9. Trenching exercise identified 4 USTs in the western portion of the Site in two tank fields; a 1080-gal fuel oil tank and 3 375-gal hydraulic oil USTs.

Summary of the Remedial Action

The Remedial Action achieved protection of public health and the environment for the intended use of the property. The Remedial Action achieved all of the Remedial Action Objectives established for the project; addressed applicable standards, criteria, and guidance; reduced mobility, toxicity and volume of contaminants; was cost effective and implementable; and used standard methods that are well established in the industry. The remedial action is effective in the short-term and long-term.

A summary of the milestones achieved in the Remedial Action is as follows:

1. A Pre-Application Meeting was held on June 30, 2017.
2. A Remedial Investigation (RI) was performed from February 7, 2015 to May 18, 2016. A RI Report was prepared to evaluate data and information necessary to develop a Remedial Action Work Plan (RAWP).
3. A Site Contact List was established. A RAWP was prepared and released with a Fact Sheet on October 15, 2015 for a 30-day public comment period.

4. The RAWP and Stipulation Lists dated October 10, 2015 and April 15, 2016 were approved by the New York City Office of Environmental Remediation (OER) on November 9, 2016 and February 21, 2017, respectively.
5. Site briefings was conducted with New York State Department of Environmental Conservation (NYSDEC) and NYC DOHMH on June 10, 2016.
6. NYC DOHMH approved remedial action on January 4, 2017.
7. A Pre-Construction meeting was held on June 17, 2016.
8. A Fact Sheet providing notice of the start of the remedial action was issued on June 2016.
9. The remedial action was begun on May 18, 2015 and completed on January 3, 2018.

Appendix 2 includes the RAWP and stipulation lists.

The remedial action consisted of the following tasks:

1. Prepared a Community Protection Statement and implemented a Citizen Participation Plan.
2. Mobilized Site security and equipment (May 2015); completed utility mark outs; and marked and staked excavation areas.
3. Additional soil investigations was performed to supplement investigation data due to change in building foundation design. Eight (8) samples were collected, and results were submitted to OER on June 6, 2016 in tabulated format.
4. Performed Waste Characterization Study prior to excavation activities. Three (3) waste characterization soil samples were collected on May 15 and June 23, 2016. In addition, eight (8) waste delineation samples of lead hot spots were collected on May 18, 2016. Waste characterization samples were collected at a frequency dictated by disposal facility(s).

5. Performed a Community Air Monitoring Program (CAMP) for particulates and volatile organic carbon compounds. CAMP was performed from May 18 to September 9, 2016 during days of soil removal. No odors, dust or vapors were generated or identified during remedial work.
6. Established NYSDEC Part 375 Track 4 Site Specific Soil Cleanup Objectives (SCOs). The following Track 4 SCOs were utilized: total SVOC (100 ppm); lead (800 ppm), mercury (1.5 ppm).
7. The following excavations were performed: soil was removed across the entire Site to the depth of 4 feet below grade established from the curb elevation along Canal Place to the west and also to the depth of 7 feet below the Site grade within the limits of three 10-foot diameter drywells installed in the rear parking area. Soil was also removed to the depth of 8.3 feet below the Site grade for the elevator pit. A total of 2,570 tons of soil/fill were excavated and removed from the property.
8. Transported and disposed all soil/fill material at permitted facilities in accordance with all applicable laws and regulations for handling, transporting, and disposing, and the RAWP. 2,570 tons of non-hazardous soil/fill were transported to Bayshore Soil Management LLC located at 75 Crows Mill Rod in Keasby, New Jersey. In addition, the 6 loads of C&D were disposed at Faztec Industries located at 200 Bloomfield Avenue in Staten Island, NY.
9. Screened excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a PID.
10. Conducted materials management of excavated materials including temporarily stockpiling and segregating in accordance with defined material types and to prevent co-mingling of contaminated material and non-contaminated materials.
11. Collected and analyzed four (4) soil end-point samples to determine attainment of SCOs. Deeper soils between 6 to 10 feet below grade contain elevated concentrations of lead and copper in exceedance of the Track 4 remedial objectives established for this Site. Track 4 SCOs were not achieved.

12. Removed thirteen (13) USTs located in four separate tank fields, UST1, UST2, UST3 and UST4. These included one (1) 1,080-gallon number 2 fuel oil UST and three (3) 375-gallon hydraulic oil USTs encountered in UST1 and UST2 during the excavation of a longitudinal trench in the western portion of the Site, five (5) 550-gallon gasoline USTs and one 550-gallon number 2 fuel oil UST encountered in UST3 during Site excavation activities in the western portion and three (3) 550-gallon number 2 fuel oil USTs encountered in UST4 during site excavation activities in the southern portion in compliance with applicable laws and regulations. All thirteen removed tanks were registered with the NYSDEC Petroleum Bulk Storage (PBS) unit as closed - removed under PBS # 2-612583.
FDNY tank removal affidavits was obtained.
13. Removed a combined total of 2,153 gallons of liquid removed from the USTs by a Vacuum Truck and disposed at a licensed facility Rapid Waste Disposal, Inc. located at 444 Tiffany Avenue in Bronx, New York. In addition, a total of nine (9) 55-gallon drums containing waste from the UST cleanup were also disposal by Rapid Waste Disposal, Inc. located at 444 Tiffany Avenue in Bronx, New York.
14. After the removal of the USTs, four sidewall and one bottom end-point soil samples were collected from each of the four tank fields with one bottom soil sample in UST4 was substituted with a groundwater end-point sample. The endpoint samples indicated the total concentrations of detected SVOCs did not exceed the Track 4 SCOs. One SVOC was detected in the groundwater end-point sample at a concentration marginally exceeding its GQS. The PAH Chrysene was detected in the groundwater endpoint sample collected at the bottom of tank field UST4. These end point samples were in addition to site wide end point samples.
15. Imported 288 cubic yards of processed 3/4-inch recycling stone aggregates (RCA) to backfill beneath the building slab and beneath the asphalt paving of the parking space in the western portion of the Site. This RCA beneath the Site was provided from Allocco Recycling Ltd. located at 540 Kingsland Avenue in Brooklyn, New York.

16. Constructed an engineered Composite Cover System consisting of an 8-inch concrete slab underlain by 4 feet of RCA in building areas and a 3-inch asphalt cap underlain by 4 feet of RCA in the rear parking area. The contractor for the Composite Cover System construction was M&G Structural LLC, 3 Akenosia Avenue, Suite B in Danbury, CT.
17. Installed a Vapor Barrier System that consisted of 73-mil thick W.R. Meadows Precon vapor barrier membrane beneath building slab across the footprint of the building. All penetrations through the slab for utility lines were sealed utilizing Grace Liquid Bituthene. The contractor for the Vapor Barrier System construction was M&G Structural LLC, 3 Akenosia Avenue, Suite B in Danbury, CT.
18. Residual soil is present beneath the cover layer and will be subject to Site Management under this Remedial Action.
19. Performed all activities required for the Remedial Action, including permitting requirements and pretreatment requirements, in compliance with applicable laws and regulations.
20. Implemented storm-water pollution prevention measures in compliance with applicable laws and regulations.
21. Submitted daily and weekly reports during construction oversight activities. Daily and weekly reports were submitted from May 18, 2016 to January 3, 2018.
22. Submitted a Sustainability Report.
23. Submitted this Remedial Action Report (RAR) that describes the Remedial Action, certifies that the remedial requirements defined in the Remedial Action Work Plan have been achieved; defines the Site boundaries; describes all Engineering and Institutional Controls applicable to the Site; and describes any changes from the RAWP.
24. 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, 2024 (for the reporting period calendar year 2018-2023), July 30, 2029 (for the reporting period calendar years 2024-2028) and every five years thereafter (for the reporting period consisting of the three prior calendar years). Inspection and Certification Reports will cover all calendar years since the prior reporting period.

25. The property will continue to be registered with an E-Designation by the NYC Department of Buildings. Engineering Controls and Institutional Controls will be managed in compliance with the SMP. Institutional Controls will include prohibition of the following: (1) prohibition of vegetable gardening and farming in residual soil; (2) prohibition of the use of groundwater beneath the site without treatment rendering it safe for the intended use; (3) prohibition of disturbance of residual soil material unless it is conducted in accordance with the SMP; and (4) prohibition of higher levels of land usage than the restricted residential uses addressed by this remedial action without prior notification and approval by OER.

REMEDIAL ACTION REPORT

1.0 SITE BACKGROUND

Tahoe Development has enrolled in the New York City Voluntary Cleanup Program (NYC VCP) to investigate and remediate a property located at 221 -227 East 138th Street in the Mott Haven section in Bronx, New York. The boundary of the property subject to this Remedial Action is shown in Figure 1 and includes, in its entirety, Bronx Block 2340 and Lot 56 (former lots 56 and 58). The Remedial Action was performed pursuant to the OER-approved RAWP in a manner that has rendered the property protective of public health and the environment consistent with its intended use. This RAR describes the Remedial Action performed under the RAWP. The remedial action described in this document provides for the protection of public health and the environment and complies with applicable environmental standards, criteria and guidance (SCGs) and applicable laws and regulations.

1.1 Site Location and Background

The Site is located at 221 - 227 East 138th Street in the Mott Haven section in Bronx, New York and is identified as Block 2340, Lot 56 (former Lots 56 and 58) on the New York City Tax Map. Figure 1 shows the Site location. The Site is 10,000-square feet and is bounded by a paper storage warehouse to the north, East 138th Street to the south followed by a car wash and lube store, Rider Avenue to the east followed by mixed-use buildings, and Canal Place to the west followed by a diner. A map of the Site boundary is shown in Figure 2. Prior to development, the Site contained a vacant 1-story factory building that occupied the entirety of lots 56 and 58. The building was last occupied by a meat production facility.

1.2 Redevelopment Plan

The new development at the Site consists of a new 10-story mixed-use commercial and residential building with slab on grade. The new building is approximately 7,000 square feet in net zoning area and occupies the entirety of the property with the exception of a 30' x 100' rear yard located in the northern portion of the Site. The first floor is capped with an 8-inch thick concrete slab and the rear yard is paved with a 3-inch asphalt cover. The first floor consists of two (2) commercial retail units encompassing approximately 3,500 square feet, a residential lobby and recreation space encompassing approximately 400 square feet. The remaining area of the first floor is occupied by refuse storage, a gas meter room, an electrical meters and equipment room and a mechanical closet. The rear yard is utilized for car and bicycle parking. Floors 2 – 10 contain a total of 47 residential units. The entire Site perimeter was excavated to the depth of 4 feet below grade established from the curb elevation along Canal Place to the west and also to the depth of 7 feet below the Site grade within the limits of three 10-foot diameter drywells installed in the rear parking area. Soil was also removed to the depth of 8.3 feet below the Site grade for the elevator pit in the central portion of the Site. The Site excavation to the depth of 4 feet is a deviation from the approved RAWP stipulations.

Groundwater is found at approximately 7 feet bgs at the Site. No soil excavation occurred below the groundwater table and dewatering was not required during site development activities.

The new development at the Site is consistent with the current NYC zoning designation of M1-4/R7X for the property. Figure 3 provides the development plan.

1.3 Description of Surrounding Property

The vicinity of the Site consists of commercial and industrial properties. The ground surfaces in the vicinity of the Site consist of asphalt and concrete. The surrounding properties include a paper storage warehouse to the north, East 138th Street to the south followed by a car wash and lube store, Rider Avenue to the east followed by mixed-use buildings, and Canal Place to the west followed by a diner.

The results of the Site inspection and an evaluation of the United States Geological Survey (USGS) 7-½ Minute Topographic Map containing the properties indicate there is one sensitive receptor present within a 0.125-mile radius of the Site. The sensitive receptor is Nacro Freedom, Inc. The remedial action performed at the Site did not impact the sensitive receptor.

1.4 Summary of Past Site Uses and Areas Of Concern

Based upon the review of Sanborn Fire Rate Insurance Maps, Property Shark, the City Directory and the NYC Automated City Register Information System (ACRIS) database for the Site and its vicinity and the Phase I ESA Report prepared by Hydro Tech Environmental, Corp. during March 2015 a Site history was established. According to Sanborn Fire Rate Insurance Maps, the Site was depicted as various one- and two-story commercial buildings, including a farrier shop (1908 Map), a metal spinning factory (1908 Map), a gasoline station and auto repair shop (1935 Map), unspecified warehouse use (1944 Map) and a provision manufacturing facility (1946 – 2007 Maps). According to the City Directory, the occupants of the Site include an electroplating company, a service station, a brass foundry, an auto body shop, an auto repair shop, and a meat packing company. The historical uses of the Site as a gasoline station, an auto repair and auto body shop and various manufacturing likely involved the use of petroleum and/or hazardous materials, potentially having had an adverse impact upon the environmental quality of the Site.

The AOCs identified for this site include:

1. The historical use of the Subject Property as a gasoline station and various manufacturing purposes;
2. The historical use of the adjacent properties as a drain pipe yard, coal yard, manufacturing facility, iron foundry and scrap yard, auto junk yard, filling station and auto repair shop;
3. The presence of an adjacent spill #9101008, which was closed on June 24, 2015;

4. The listing of an adjacent property as an Inactive Hazardous Waste Disposal Site;
5. The presence of a Potential Vapor Encroachment Condition;
6. The presence of underground storage tanks.

1.5 Summary of Work Performed Under the Remedial Investigation

Hydro Tech Environmental, Corp. performed the following scope of work:

1. Conducted a Site inspection to identify AOCs and physical obstructions (i.e. structures, buildings, etc.);
2. Installed five (5) soil borings across the entire project Site and collected ten (10) soil samples for chemical analysis from the soil borings to evaluate soil quality during the initial February 2015 Remedial Investigation. Installed an additional four (4) soil borings and collected eight (8) soil samples in May 2016 during a supplemental investigation as outlined in the RAWP;
3. Installed two (2) longitudinal trenches to the depth of 4 feet across the Site to determine the presence of USTs;
4. Installed three (3) groundwater monitoring wells throughout the Site to establish groundwater flow and collected three (3) groundwater samples for chemical analysis to evaluate groundwater quality;
5. Installed five (5) soil vapor probes throughout the Site and collected five (5) soil gas samples for chemical analysis.

1.6 Summary of Findings of Remedial Investigation

1. Elevation of the property is 17 feet.
2. Depth to groundwater ranges from 7.30 to 8.34 feet at the Site.
3. Groundwater flow is generally toward the southwest beneath the Site.
4. Bedrock was not encountered at the Site.

5. The stratigraphy of the site, from the surface down to about 12 feet bgs, is classified as fill consisting of a mixture of gravel, sand, rocks, wood and possibly other construction debris. Drilling did not occur deeper than 12 feet bgs and bedrock was not encountered.
6. Soil/fill samples results were compared to NYSDEC Unrestricted Use Soil Cleanup Objectives and Restricted Residential Soil Cleanup Objectives as presented in 6NYCRR Part 375-6.8 and CP51. No PCBs were detected in any soil samples. Trace concentrations of one VOC, acetone (max. 0.10 mg/kg), exceeded Unrestricted Use SCOs. Seven semi-volatile organic compounds (SVOCs) consisting of PAH compounds including benzo(a)anthracene (max. 12.3 mg/kg), benzo(a)pyrene (max. 6.25 mg/kg), benzo(b)fluoranthene (max. 9.88 mg/kg), benzo(k)fluoranthene (max. 8.23 mg/kg), dibenzo(a,h)anthracene (max. 1.49 mg/kg), chrysene (max. 10.6 mg/kg) and indeno(1,2,3-cd)pyrene (max. 2.32 mg/kg) were detected in shallow and deep soil samples at concentrations exceeding Restricted Residential Use SCOs. One pesticide, 4,4'-DDE (max. 0.0079 mg/kg) was detected in one shallow and one deep soil sample at a concentration exceeding Unrestricted Use SCOs. Seven metals including barium (max. 712 mg/kg), cadmium (max. 13.50 mg/kg), copper (max. 4,810 mg/kg), lead (max. 1,450 mg/kg), mercury (max. 2.54 mg/kg), nickel (max. 145 mg/kg) and zinc (max. 4,620) were detected in shallow and deep samples at concentrations exceeding Restricted Residential Use SCOs. The metal selenium (max. 7.68 mg/kg) was detected in shallow and deep samples at concentrations exceeding Unrestricted Use SCOs. As noted in the soil logs, oily sheens were observed in SP-2 and SP-3 at a depth of 10 to 12 feet bgs. Overall, soil chemistry is consistent with sites with historic fill in New York City.

7. Groundwater sample results were compared to New York State 6NYCRR Part 703.5 Class GA groundwater quality standards (GQS). Groundwater collected during the investigation showed no VOCs, pesticides or PCBs at concentrations exceeding their respective GQS. The SVOCs benzo(a)anthracene (max. 1.62 µg/L), benzo(b)fluoranthene (max. 0.90 µg/L), benzo(k)fluoranthene (max. 1.45 µg/L), chrysene (max. 1.75 µg/L) and indeno(1,2,3-cd)pyrene (max. 1.05 µg/L) were detected in MW-1 at concentrations exceeding their respective GQS. Several dissolved metals were identified and of those, antimony (max. 32 µg/L), magnesium (max. 39,200 µg/L), manganese (max. 1,580 µg/L) and sodium (max. 334,000 µg/L) were detected in all groundwater samples at concentrations exceeding GQS.
8. Soil vapor results were compared to compounds listed in Table 3.1 Air Guideline Values Derived by the New York State Department of Health (NYSDOH) located in the NYSDOH Final Guidance for Evaluating Soil Vapor Intrusion dated October 2006. Soil vapor samples collected during the RI showed petroleum related VOCs present in low concentrations. Total concentrations of petroleum-related VOCs (BTEX) ranged from 26.58 µg/m³ to 462 µg/m³. Chlorinated VOCs including 1,1,1-trichloroethane (max. 13 µg/m³), tetrachloroethylene (max. 3.80 µg/m³) and trichloroethylene (max. 0.42 µg/m³) were also detected in the soil vapor samples. Carbon tetrachloride was not detected in any of the soil vapor samples.
9. Trenching exercise identified 4 USTs in the western portion of the Site in two tank fields; a 1080-gal fuel oil tank and 3 375-gal hydraulic oil USTs.

Appendix I includes RIR. The results of the supplemental soil investigation are shown in Table 3.

2.0 DESCRIPTION OF REMEDIAL ACTIONS

The Remedial Action was performed in accordance with an OER-approved Remedial Action Work Plan and achieved the Remedial Action Objectives established for the project. The Remedial Action was evaluated in an alternatives analysis and was determined to be protective of human health and the environment, compliant with standards, criteria, and guidelines (SCGs), effective in the short-term, effective in the long-term, capable of attaining appropriate levels of reduction of toxicity, mobility, or volume of contaminated material, implementable, cost effective, acceptable to the community, consistent with land uses, and sustainable.

A summary of the milestones achieved in the Remedial Action is as follows:

1. A Pre-Application Meeting was held on June 30, 2015.
2. A Remedial Investigation (RI) was performed from February 7, 2015 to May 18, 2016. A RI Report was prepared to evaluate data and information necessary to develop a Remedial Action Work Plan (RAWP).
3. A Site Contact List was established. A RAWP was prepared and released with a Fact Sheet on October 15, 2015 for a 30-day public comment period.
4. The RAWP and Stipulation Lists dated October 10, 2015 and April 15, 2016 were approved by the New York City Office of Environmental Remediation (OER) on April 26, 2016.
5. Site briefings was conducted with New York State Department of Environmental Conservation (NYSDEC) and NYC DOHMH on June 10, 2016.
6. NYC DOHMH approved remedial action on January 4, 2017.
7. A Pre-Construction meeting was held on June 17, 2016.
8. A Fact Sheet providing notice of the start of the remedial action was issued on June 2016.
9. The remedial action was begun on May 18, 2015 and completed on January 3, 2018.

Appendix 2 includes the RAWP and stipulation lists.

The remedial action consisted of the following tasks:

1. Prepared a Community Protection Statement and implemented a Citizen Participation Plan.
2. Mobilized Site security and equipment (May 2015); completed utility mark outs; and marked and staked excavation areas.
3. Additional soil investigations were performed to supplement investigation data due to change in building foundation design. Eight (8) samples were collected, and results were submitted to OER on June 6, 2016 in tabulated format.
4. Performed Waste Characterization Study prior to excavation activities. Three (3) waste characterization soil samples were collected on May 15 and June 23, 2016. In addition, eight (8) waste delineation samples of lead hot spots were collected on May 18, 2016. Waste characterization samples were collected at a frequency dictated by disposal facility(s).
5. Performed a Community Air Monitoring Program (CAMP) for particulates and volatile organic carbon compounds. CAMP was performed from May 18 to September 9, 2016 during days of soil removal. No odors, dust or vapors were generated or identified during remedial work.
6. Established NYSDEC Part 375 Track 4 Site Specific Soil Cleanup Objectives (SCOs). The following Track 4 SCOs were utilized: total SVOC (100 ppm); lead (800 ppm), mercury (1.5 ppm).
7. The following excavations were performed: soil was removed across the entire Site to the depth of 4 feet below grade established from the curb elevation along Canal Place to the west and also to the depth of 7 feet below the Site grade within the limits of three 10-foot diameter drywells installed in the rear parking area. Two trenches were excavated along the length of the Site to 4 feet below grade to investigate the presence of USTs. Four UST fields were identified during remediation, requiring excavation in those areas down to 5-7 feet below grade.

Soil was also removed to the depth of 8.3 feet below the Site grade for the elevator pit. A total of 2,570 tons of soil/fill were excavated and removed from the property.

8. Transported and disposed all soil/fill material at permitted facilities in accordance with all applicable laws and regulations for handling, transporting, and disposing, and the RAWP. 2,570 tons of non-hazardous soil/fill were transported to Bayshore Soil Management LLC located at 75 Crows Mill Rod in Keasby, New Jersey. In addition, the 6 loads of C&D were disposed at Faztec Industries located at 200 Bloomfield Avenue in Staten Island, NY.
9. Screened excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a PID.
10. Conducted materials management of excavated materials including temporarily stockpiling and segregating in accordance with defined material types and to prevent co-mingling of contaminated material and non-contaminated materials.
11. Collected and analyzed four (4) soil end-point samples to determine attainment of SCOs. Deeper soils between 6 to 10 feet below grade contain elevated concentrations of lead and copper in exceedance of the Track 4 remedial objectives established for this Site. Track 4 SCOs were not achieved.
12. Removed thirteen (13) USTs located in four separate tank fields, UST1, UST2, UST3 and UST4, in compliance with applicable laws and regulations. These included a one (1) 1,080-gallon number 2 fuel oil UST in field UST1 and three (3) 375-gallon hydraulic oil USTs encountered UST2 during the excavation of a longitudinal trench in the western portion of the Site, five (5) 550-gallon gasoline USTs and one 550-gallon number 2 fuel oil UST encountered in UST3 during Site excavation activities in the western portion and three (3) 550-gallon number 2 fuel oil USTs encountered in UST4 during site excavation activities in the southern portion.

All thirteen removed tanks were registered with the NYSDEC Petroleum Bulk Storage (PBS) unit as closed - removed under PBS # 2-612583. FDNY tank removal affidavits were obtained.

13. Removed a combined total of 2,153 gallons of liquid from the USTs by a Vacuum Truck and disposed at a licensed facility Rapid Waste Disposal, Inc. located at 444 Tiffany Avenue in Bronx, New York. In addition, a total of nine (9) 55-gallon drums containing waste from the UST cleanup were also disposal by Rapid Waste Disposal, Inc located at 444 Tiffany Avenue in Bronx, New York.
14. After the removal of the USTs, four sidewall and one bottom end-point soil samples were collected from each of the four tank fields with one bottom soil sample in UST4 was substituted with a groundwater end-point sample. The endpoint samples indicated the total concentrations of detected SVOCs did not exceed the Track 4 SCOs. One SVOC was detected in the groundwater end-point sample at a concentration marginally exceeding its GQS. The PAH Chrysene was detected in the groundwater endpoint sample collected at the bottom of tank field UST4. These end point samples were in addition to site wide end point samples.
15. Imported 288 cubic yards of processed 3/4-inch recycling stone aggregates (RCA) to backfill beneath the building slab and beneath the asphalt paving of the parking space in the western portion of the Site. This RCA beneath the Site was provided from Allocco Recycling Ltd. located at 540 Kingsland Avenue in Brooklyn, New York.
16. Constructed an engineered Composite Cover System consisting of an 8-inch concrete slab underlain by 4 feet of RCA in building areas and a 3-inch asphalt cap underlain by 4 feet of RCA in the rear parking area. The contractor for the Composite Cover System construction was M&G Structural LLC, 3 Akenosia Avenue, Suite B in Danbury, CT.
17. Installed a Vapor Barrier System that consisted of 73-mil thick W.R. Meadows Precon vapor barrier membrane beneath building slab across the footprint of the building.

- All penetrations through the slab for utility lines were sealed utilizing Grace Liquid Bituthene. The contractor for the Vapor Barrier System construction was M&G Structural LLC, 3 Akenosia Avenue, Suite B in Danbury, CT.
18. Residual soil is present beneath the cover layer and will be subject to Site Management under this Remedial Action.
 19. Performed all activities required for the Remedial Action, including permitting requirements and pretreatment requirements, in compliance with applicable laws and regulations.
 20. Implemented storm-water pollution prevention measures in compliance with applicable laws and regulations.
 21. Submitted daily and weekly reports during construction oversight activities. Daily and weekly reports were submitted from May 18, 2016 to January 3, 2018.
 22. Submitted a Sustainability Report.
 23. Submitted this Remedial Action Report (RAR) that describes the Remedial Action, certifies that the remedial requirements defined in the Remedial Action Work Plan have been achieved; defines the Site boundaries; describes all Engineering and Institutional Controls applicable to the Site; and describes any changes from the RAWP.
 24. 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, 2024 (for the reporting period calendar year 2018-2023), July 30, 2029 (for the reporting period calendar years 2024-2028) and every five years thereafter (for the reporting period consisting of the three prior calendar years). Inspection and Certification Reports will cover all calendar years since the prior reporting period.
 25. The property will continue to be registered with an E-Designation by the NYC Department of Buildings. Engineering Controls and Institutional Controls will be managed in compliance with the SMP.

Institutional Controls will include prohibition of the following: (1) prohibition of vegetable gardening and farming in residual soil; (2) prohibition of the use of groundwater beneath the site without treatment rendering it safe for the intended use; (3) prohibition of disturbance of residual soil material unless it is conducted in accordance with the SMP; and (4) prohibition of higher levels of land usage than the restricted residential uses addressed by this remedial action without prior notification and approval by OER.

3.0 COMPLIANCE WITH REMEDIAL ACTION WORK PLAN

3.1 Construction HEALTH & SAFETY PLAN

The remedial construction activities performed under this program were in compliance with the Construction Health and Safety Plan and applicable laws and regulations. The Site Safety Coordinators were Paul I. Matli and Anthony Gurino.

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 from May 18 to September 9, 2016 in compliance with the Community Air Monitoring Plan in the approved RAWP. The results of Community Air Monitoring are shown in Appendix 3.

3.3 Soil/Materials Management Plan

The Soil/Materials Management Plan provided detailed plans for managing all soil/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 full compliance with methods and processes defined in the RAWP for storm water prevention and applicable laws and regulations.

3.5 Deviations from the Remedial Action Work Plan

1. For the purpose of Site development, the entire Site was excavated to the depth of 4 feet below the Site grade established from the curb elevation along Canal Place to the west. This deviation was communicated to OER.
2. Hotspots and soil exceeding Track 4 SCOs identified during the remedial investigation were not removed as stated in the RAWP. The RAWP stated that SP-3 and the northwest corner of the site would be removed as hotspots, but soil in these areas was not handled as hotspots during remediation. In addition, remedial investigation data from samples SP-2, SP-3, and SP-4 indicated that deep soils between 6 to 10 feet below grade across the majority of the Site contain elevated concentrations of lead and copper in exceedance of the Track 4 remedial objectives established for this Site. Based on this data, the DEC requested that copper be removed to below 1,200 mg/kg across the Site. However, soil containing lead and copper above respective Track 4 (for lead) and Track 2 RRSCOs (for copper) was not removed during the remediation. In addition, the post-excavation end-point soil sample EP-2 taken at 5 feet below grade in the west central portion of the Site indicated elevated levels of arsenic above Track 2 Restricted Residential SCOs. Although the RI data and endpoint sample EP-2 indicate that elevated metals remain onsite, these three metals were not present in any dissolved groundwater samples collected at this property, indicating that they are not affecting the surrounding environment. Since the entire property will be protected with a concrete slab on-grade placed on top of a vapor barrier, there will not be any potential for exposure pathways to occupants of the building. Potential future exposures from soil excavation after the completion of the Remedial Action will be addressed by the development and implementation of the Site Management Plan. On the basis of this evaluation, management of these three residual soil hot spots in place is determined to be protective of public health and the environment. This deviation was coordinated with OER. Overall, Track 4 SCOs established for

this Site were not achieved.

3. According to the RAWP, daily reports frequency can be reduced in consultation with OER in the event no invasive work or remedial activities are performed for extended time period. The daily report frequency was in fact reduced to a weekly report without OER approval to document the installation of vapor barrier during the third quarter of December 2016. Daily reports were only prepared during periods of invasive or remedial work for a number of days during May, July, August, September and November 2016 and January 2018.
4. The total quantity of soil/fill proposed in the RAWP to be excavated and disposed of off-Site was estimated at 1,100 tons. A total of 2,570 tons of soil/fill was excavated and disposed of the property due to the change in development and excavation plans.
5. According to the RAWP, all imported backfill at the Site needed proper documentation. However, two tickets of two loads of RCA brought to the Site on January 3, 2018 were misplaced and could not be retrieved. This RCA was brought from Allocco Recycling Ltd. located at 540 Kingsland Avenue in Brooklyn, New York and was placed in rear parking area.
6. Three drywells were installed in the eastern portion of the rear parking space that were not documented in the RAWP. The design of the three dry wells was shown on the final building plans of the new development. This excavation was performed to the depth of 7 feet within the limits of three isolated 10-foot diameter drywell prior to backfill placement and asphalt capping. The excavation did not generate a significant amount of soil, which was reused on-site for grading activities in rear parking area. This deviation was not communicated with OER for approval. In addition, this excavation work was not overseen by an environmental consultant nor documented in daily reports, and the soil reuse was not accepted by OER.
7. 47.2-mil Grace PrePrufe 300R waterproofing vapor barrier was proposed to be installed horizontally beneath the building slab throughout the full building area

and a 32-mil Grace PrePrufe 160R waterproofing vapor barrier was proposed to be installed vertically on all sub-grade foundation sidewalls.

The vapor barrier installed beneath the building slab was changed following the change in the sub-grade building design, which no longer included a basement. This new vapor consisted of 73-mil thick W.R. Meadows Precon vapor barrier membrane beneath building slab across the footprint of the building. All penetrations through the slab for utility lines were sealed utilizing Grace Liquid Bituthene. This change in the type of vapor barrier used was discussed with and approved by OER.

8. The non-hazardous waste disposal manifests of the nine 55-gallon drums containing waste from the UST cleanup in Appendix 8 should be properly signed by the receiving facility. These drums were removed from the Site by Rapid Waste Disposal, Inc. located at 444 Tiffany Avenue in Bronx, New York and were transported to a permitted waste disposal facility. Rapid Waste Disposal, Inc. did not provide the signed copies of these manifests by the receiving facility and could not be reached by phone to provide an affidavit of proper disposal as this transporter was no longer in business.

Appendix 4 provides correspondences with OER regarding approved deviations.

4.0 REMEDIAL PROGRAM

4.1 Project Organization

Principal personnel who participated in the remedial action included Paul I. Matli, Project Geologist. The Professional Engineer (PE) and Qualified Environmental Professionals (QEP) for this project are Shaik Saad (Mr. Saad was involved in the design and implementation but is no longer available to certify the work) and Mark E. Robbins, respectively. The General Contractor who oversaw all phases of Site remedial excavation and construction was M&G Structural LLC, 3 Akenosia Avenue, Suite B in Danbury, CT.

Remedial activities at the Site were overseen by NYCOER under the VCP in accordance with the October 2015 RAWP and RAWP stipulations dated April 2016 and February 2017 addressing the HAZMAT E-designation (E-227; CEQR 08DCP071K) (NYC VCP Project Number 16CVCP011X and E-Designation Project Number 16EHAZ014K). The NYC OER Project Manager is Colin Sullivan.

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 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.

Prior to the start of remedial activities, a pre-construction meeting was held with all contractors on June 17, 2016. Fencing around the site perimeter was performed following acquisition of necessary NYCDOB permits during May 2016. An OER Project Notice was erected at the project entrance and was in place during all phases of the Remedial Action.

Soil Screening

All excavated soil was examined for visual/olfactory evidence of petroleum contamination and for organic vapors utilizing a Photoionization Detector (PID). The soil screening was performed on soil samples collected randomly from the excavator bucket during live loading or stockpiling of excavated material. No organic vapors (<0.1 ppm) or visual/olfactory evidence of contamination were identified in the excavated soil at the Site.

Stockpile Management

Soil excavated during remedial Site development was either live-loaded directly into trucks and transported off-site or temporarily stockpiled in the vicinity of open excavations until it was then loaded into trucks for off-site disposal. Soil stockpiles were 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

Truck Inspection

Truck inspection and cleaning was performed for all trucks prior to exiting the site. A trucking pad consisting of minimum 3/4 inches of RCA aggregates was laid at the entrance to the Site from Canal Place to the west. Trucks hauling contaminated soil/fill material were inspected prior to leaving the Site for any debris adhering to their surface. Trucks also went through 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 and the closure and removal of USTs. Such measures included shrouding stockpiled material with plastic tarp and a supply of water from the nearest fire hydrant to apply sprinkled water over dry surfaces to reduce dust generation. Provisions for mist applications of odor chemical solutions to suppress potential odor and vapors were made available.

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 by Paul I. Matli. The daily report frequency was reduced to a weekly report documenting the installation of vapor barrier during the first quarter of December 2016. Daily reports were only prepared during periods of invasive or remedial work for a number of days during May, July, August, September and November 2016 and January 2018 and excluded periods of no invasive activities.

All daily and weekly reports are included in Appendix 5. Digital photographs of the Remedial Action are included in Appendix 6.

4.3 Materials Excavation and Removal Action

Soil/Fill Excavation and Removal

Soil removed during remediation was done utilizing a Hitachi U225 hydraulic excavator. Two trenches were excavated to four feet below grade along the length of the Site to investigate for the presence of USTs prior to Site-wide excavation. The soil across the entire perimeter was excavated to a depth of 4 feet below Site grade established from the curb elevation along Canal Street to the west.

Additional excavations occurred within the limits of three 10-foot diameter drywells installed in the eastern portion of the rear parking area to a depth of 7 feet below grade and in the area of elevator pit in the central portion of the Site to the depth of 8.3 feet below Site grade. Excavation was required to remove four UST fields identified during remediation work; these areas were excavated between 5 and 7 feet below grade surface. All excavation activities except for the trenching and UST removal were done for development purposes. A total of 2,570 tons of soil/fill impacted with SVOCs and metals were excavated and removed from the property during the Removal Action. The Removal Action was performed under the oversight of Shaik Saad P.E., and Mark E. Robbins.

The Site excavation proceeded by first investigating for the presence of USTs by digging two longitudinal trenches four feet deep along the length of the Site. During trenching, two UST fields were identified: one (1) 1080-gallon number 2 fuel oil UST (tank field UST1) and three 375-gallon hydraulic oil USTs (tank field UST2). After these tanks were removed on May 20, 2016, excavation then continued toward the central and northern portions until August 2016. Additionally, localized excavations were performed for the removal of USTs to the depths of 5 feet and 7 feet below Site grade in the western portion on August 4, 2016 to remove tank field UST3 and in the southern portion on September 9, 2016 to remove tank field UST4. Localized excavation also occurred in the areas of drywells to the depth of 7 feet below grade in the rear parking space on February 9, 2016. The drywell excavation generated minor volume of soil that was re-reused for grading activities in the rear parking space. Groundwater was encountered during the soil excavation at 7 feet. End points samples were collected over 24 hours after completing the excavation.

Table 1 provides disposal quantities and disposal facilities. A map showing the approximate locations where excavations were performed and approximate depth of excavated material is shown in Figure 4.

Onsite Reuse

Reuse of on-site soil occurred in the rear parking space with material removed during the excavation of three drywells. The drywell excavation occurred in the area of cadmium hot spot in the vicinity of soil probe SP-3 installed during the RI. This drywell excavation generated a minor volume of soil that was re-reused for grading activities in the rear parking space prior to backfilling with RCA. The estimated quantity of reused on-site soil is approximately 10 cubic yards. The reuse of this soil in this area was not coordinated with OER and was not tested prior this action. As indicated in Section 3.5, potential future exposures from residual soil remaining at the Site after the completion of the Remedial Action will be addressed by the implementation of the Site Management Plan in the RAR.

UST Removal

One (1) 1080-gallon number 2 fuel oil UST (tank field UST1) and three 275-gallon hydraulic oil USTs (tank field UST2) were closed on May 20, 2016 and removed from the western portion of the Site. Five (5) 550-gallon gasoline USTs and one (1) 550-gallon number 2 fuel oil UST (tank field UST3) were closed on August 4, 2016 and removed from the western portion of the Site. Three (3) 550-gallon number 2 fuel oil USTs (tank field UST4) were closed on September 9, 2016 and removed from the southern portion of the Site. All thirteen tanks were closed by Hydro Tech Environmental, Corp. during remedial soil excavation activities. All tanks were buried at 2-3 feet bgs. Following the exposure of the tanks, their interior was inspected through their fill ports. Tanks located in tank field UST3 were found empty while the remaining tanks in the remaining tank fields were found to contain water. All liquid was removed from the USTs through their fill ports utilizing a Vacuum Truck. Following content removal, the tanks were excavated utilizing the bucket excavator and placed on poly sheeting and securely covered until disposal. No visible evidence of holes associated with corrosion was noted on the tanks. No evidence of petroleum contamination was identified during the removal of the USTs. The tanks carcasses were disposed of as scrap metal at TNT Scrap Metal located at 340 Maspeth Avenue in Brooklyn, New York.

At the conclusion of the UST closure activity, four (4) sidewall and one (1) bottom end-point soil sample were collected from each tank field accordance with DER-10. Since the tank excavation in tank field UST4 extended to the water table, the bottom soil sample in this tank excavation was substituted with a groundwater sample. The end-point samples were analyzed for VOCs by EPA Method 8260 and SVOCs by EPA Method 8270. The VOC acetone, which is reported as a laboratory contaminant was detected in three end-point soil samples from tank field UST4 at concentrations exceeding Track 1 UUSCOs. Four SVOCs identified as PAHs were detected in four sidewall endpoint samples from tank field UST2 and tank field UST4 at concentrations exceeding the Restricted Residential. None of the Total VOCs from any end-point soil samples exceeded the Track 4 SCO. The PAH Chrysene was detected in the groundwater endpoint sample collected at the bottom of tank field UST4 at a concentration marginally exceeding its GQS.

A combined total of 2,153 gallons of liquid was removed from the USTs by a Vacuum Truck and disposed at a licensed facility Rapid Waste Disposal, Inc. located at 444 Tiffany Avenue in Bronx, New York. In addition, a total of nine (9) 55-gallon drums containing waste from the UST cleanup were also disposal by Rapid Waste Disposal, Inc. located at 444 Tiffany Avenue in Bronx, New York.

The thirteen closed and removed tanks during Site remedial activities were properly registered with the NYSDEC Petroleum Bulk Storage (PBS) unit as closed - removed under PBS # 2-612583.

The approximate location of the USTs is shown in Figure 4. FDNY tank removal affidavits and PBS registration of the tanks are included in Appendix 7. Copies of the liquid disposal and drum manifest are provided in Appendix 8. A tabular summary of UST end-point sampling results is included in Table 2. Laboratory report of the UST end-point samples is provided in Appendix 9.

Soil Cleanup Objectives

The SCOs for this Site are listed included in 6 NYCRR Part 375, Table 6.8(b) as amended by the following Track 4 Site-Specific SCOs:

<u>Contaminant</u>	<u>Site-Specific SCOs</u>
Total SVOCs	100 ppm
Lead	800 ppm
Mercury	1.5 ppm

Based on results of endpoint samples, Track 4 Restricted Residential SCOs were achieved.

End Point Sample Results

Four (4) post excavation end-point samples designated EP-1 to EP-4 were collected from the bottom of excavation in compliance with the RAWP stipulation list dated April 25, 2016. All four endpoint samples were analyzed for SVOCs by EPA Method 8270 and Target Analyte List metals TAL metals. Track number 4 SCOs were achieved for analytes with established Track 4 SCOs; however, arsenic (max 45.8 mg/kg) was detected above its Restricted Residential SCO in EP-2.

The RI provided data for soil that remains onsite including five (5) soil samples at depths between 8 and 10 feet below site grade surface. The RI addendum provided data for eight (8) soil samples collected to the depth of 4 feet below Site grade surface, and all this soil was entirely removed during this remedial action except for soil represented by SB6 (4-6'). Analytical results for all these samples were compared to the 6NYCRR Part 375, Table 6.8(b) Track 1 UUSCOs and Track 2 Restricted Residential Use SCOs amended with the site-specific Track 4 SCOs. The RI showed that soils that remain on site contain elevated metals with concentrations above Track 4 and Track 2 Restricted Residential SCOs: SP-2 (lead at 933 mg/kg), SP-3 (copper at 1,780 mg/kg), and SP-4 (copper at 1,410 mg/kg). These metals did not occur in any dissolved groundwater samples collected at this property, so remaining soils do not pose a threat to the environment. Since the entire property is protected with a concrete slab on-grade placed on top of a vapor barrier, there should not be any potential for exposure pathways to occupants of the building. Potential future exposures from soil excavation after the completion of the Remedial Action will be addressed by the development and implementation of the Site Management Plan in the RAR.

On the basis of this evaluation, management of these three residual soil hot spots in place is determined to be protective of public health and the environment.

A map of end-point sample locations is shown in Figure 5. A tabular summary of the results of RI Addendum and the post-excavation end-point samples and also the RI samples collected at depths below the floor of excavation were compared to SCOs and included in Table 3, and Table 4 and Table 5, respectively. Full laboratory reports of RI Addendum are included in Appendix 10. Full laboratory reports of post-excavation soil end-point samples results are included in Appendix 11.

4.4 Materials Disposal

A total of 2,270 tons of non-hazardous soil/fill and transported it to Bayshore Soil Management LLC located at 75 Crows Mill Rod in Keasby, New Jersey. A total of 6 loads of former concrete footings were disposed as construction and demolition (C&D) material at Faztec Industries located at 200 Bloomfield Avenue in Staten Island, New York.

Disposal Location/Address	Type of Material	Quantity
Bayshore Soil Management LLC located at 75 Crows Mill Rod in Keasby, New Jersey	Non-Hazardous Soil	2,270 tons
Faztec Industries located at 200 Bloomfield Avenue in Staten Island, New York	Construction & Demolition Waste	6 loads

Correspondence from Tahoe Development via Hydro Tech to disposal facilities providing materials type, source, RI soil data and soil waste characterization data, and acceptance letters from disposal facilities stating it is approved to accept above materials are attached in Appendix 12. Soil waste characterization data report is provided in Appendix 13.

Soil disposal manifests and C&D Disposal Tickets are included in Appendix 14. A table of individual truck transport and material disposal quantities is included in Table 5.

4.5 Backfill Import

As part of remedial construction activities, backfill consisting of $\frac{3}{4}$ inch Recycling Stone Aggregate (RCA) was required to restore the Site elevation following excavation in order to place the building slab and asphalt pavement in the rear parking area at grade level.

Sixteen (16) loads with a total of 288 cubic yards of $\frac{3}{4}$ -inch recycling stone aggregates (RCA) were brought to the Site to backfill between the pile caps beneath the building and also to backfill in the rear parking area. The recycling stone aggregates was provided from Allocco Recycling Ltd. Located at 540 Kingsland Avenue in Brooklyn, New York.

Table 6 provides backfill quantity and sources. Appendix 15 provides information on the import of recycling stone aggregates and RCA backfill. A map showing backfill placement locations at the Site is shown in Figure 6 and also in as-build plans in Appendix 16.

4.6 Demarcation

The 4-foot layer of RCA used at the Site as backfill is considered a permanent demarcation layer above the residual soil that will be addressed by Site Management under this Remedial Action.

5.0 ENGINEERING CONTROLS

Engineering Controls were employed in the Remedial Action to address residual soil, groundwater, and soil vapor remaining at the site. The Site has two primary Engineering Control Systems. These are:

1. A Composite Cover System; and
2. Vapor Barrier System

Composite Cover System

Exposure to residual soil/fill is prevented by an engineered Composite Cover System that has been built on the Site. The Composite Cover System is comprised of a concrete building slab, which consists of an 8-inch thick slab on grade poured on top of a 4-foot thick recycling stones aggregates in the perimeter of the new building and a 3-inch thick asphalt pavement installed on top of 4-foot thick RCA layer in the rear parking area. The contractor for the cover construction was M&G Structural LLC, 3 Akenosia Avenue, Suite B in Danbury, CT. The as-built design for each cover type used in the Composite Cover System on this Site is shown in Figure 6 and also in Appendix 16. Photographs of construction of the Composite Cover System are included in Appendix 6.

Vapor Barrier System

Exposure to soil vapor is prevented by a Vapor Barrier System that has been built on the Site. The Vapor Barrier System consists of a 73-mil thick W.R. Meadows Precon vapor barrier membrane beneath building slab across the footprint of the building. All penetrations through the slab for utility lines were sealed utilizing Grace Liquid Bituthene. The contractor for the cover construction was M&G Structural LLC, 3 Akenosia Avenue, Suite B in Danbury, CT.

The as-built engineering diagram for the Vapor Barrier System used on this Site is shown in Figure 6 and also in Appendix 16. Photographs of installation of the Vapor Barrier System are included in Appendix 6.

6.0 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 ICs 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 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 operation, maintenance, inspection, and certification of performance of ECs and ICs. The property owner and property owner's successors and assigns will inspect ECs and ICs 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 ECs and ICs;
- (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.

7.0 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 providing notice of the revocation to the NYC DOB.

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, ECs provide physical protective measures and ICs 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 ECs and ICs 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 ECs and ICs; and (3) certification of performance of ECs and ICs.

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;
- (2) Vapor Barrier 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 **Vapor Barrier System**

Chapter 5 describes the Vapor Barrier System utilized in this Remedial Action and provides as-built design details and the system location. The Vapor Barrier 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.

The Vapor Barrier 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 vapor barrier layers and sealing the newly constructed materials with existing barrier materials in accordance with manufacturer specifications.

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 ICs 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, restricting higher uses of the property than those addressed by the Remedial Action and establishing 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 operation, maintenance, inspection, and certification of performance of ECs and ICs. The property owner and property owner's successors and assigns will inspect ECs and ICs 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 ECs and ICs;
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.

INSPECTIONS

Engineering Controls and Institutional Controls will be inspected on a periodic basis at a frequency established in this plan. 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 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 30 days to evaluate the Engineering Controls, and a letter report of findings will be submitted to OER.

Inspection of Composite Cover System

Composite cover inspection shall include observations of the conditions of the concrete building slab and the asphalt pavement in rear parking space. The composite covers will be inspected for cracks, holes or other openings. Any cracks, holes, openings or other alterations in the composite cover that are observed during the EC inspection will be recommended to be immediately filled and/or sealed as necessary.

Inspection of Vapor Barrier System

The Vapor Barrier System is completely enclosed and unless the concrete slab above the vapor barrier is removed, EC inspections of the vapor barrier cannot be made. Observations of the concrete slab will be made to determine if cracks and gaps are visible.

The seams and edges of exposed sections of vapor barrier, if any, shall be inspected in addition to the presence of holes in the vapor barrier. Additional vapor barrier tape or sealant will be recommended to repair holes in the vapor barrier or if there is missing sealant along the vapor barrier edges or seams. The concrete slab shall be replaced over the exposed sections of vapor barrier once necessary repairs have been made.

Site Use Prohibitions

Inspections to evaluate the status of site use prohibitions will include an evaluation of all of the ICs listed above, including:

- 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 2018, 2019 and every three years thereafter. Inspection and Certification Letter Reports will be submitted by July 30, 2024 (for the reporting period calendar years 2018-2023), July 30, 2029 (for the reporting period calendar years 2024-2028) and every five years thereafter (for the reporting period consisting of the three 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 utilize a form established by OER. This form includes, at a minimum:

- Date of inspections;
- Personnel conducting inspections;
- Description of the inspection activities performed;
- Observations, conclusions, or recommendations;
- Copy of any monthly inspection forms;
- Photographs; and
- Certification of the performance of Engineering Controls and Institutional Controls executed by the P.E. or QEP responsible for this Inspection and Certification Letter Report, as discussed below.

The certification of the performance of ECs and ICs will establish:

- If Engineering Controls and Institutional Controls employed at the Site continue to be in place, 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;
- OER may enter the Site upon notice for the purpose of evaluating the performance of ECs and ICs.

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 residential 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 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

If stockpiles are used to isolate excavated soil they 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 7. 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) an OER Historical Fill Notification Form and letter from the PE/QEP or property owner 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 City 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 non-hazardous 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 to 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 include 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 Letter 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, is non-hazardous, and lacks petroleum contamination, the material will be loaded onto trucks for delivery to the Site.

Recycled concrete aggregate (RCA) without fines 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 feasible, the dewatering fluids will be managed by transportation and disposal at an off-Site treatment facility or some other means compliant with applicable laws and regulations. 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 storm-water 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 be controlled by these means, 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.

The odor control plan must be 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.

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 soil/fill stockpiles;
- Exercise extra care during dry and high-wind periods; and
- Use of asphalt millings, 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 dust 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. 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 shut down.

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 ($\mu\text{g}/\text{m}^3$) 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 $150 \mu\text{g}/\text{m}^3$ 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 $150 \mu\text{g}/\text{m}^3$ 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 $150 \mu\text{g}/\text{m}^3$ of the upwind level and in preventing visible dust migration.

All readings will be recorded and 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 E 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 mark-out	(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 E. Robbins (Hydro Tech Environmental Engineering and Geology, DPC)	(631) 462-5866
Office of Environmental Remediation	(212) 788-8841; 311

8.0 SUSTAINABILITY REPORT

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

Reuse of Clean, Recyclable Materials and Conservation of Natural Resources. Reuse of clean, recyclable materials reduces consumption of non-renewable virgin resources and can provide energy savings and greenhouse gas reduction since these materials can be locally-derived.

Conservation of non-renewable resources was achieved by importing RCA. An estimate of the quantity of RCA material reused on this project is approximately 252 cubic yards.

Conversion to Clean Fuels. Use of clean fuel improves NYC's air quality by reducing harmful emissions.

Natural gas is utilized as the principal fuel in the new building.

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 contamination from off-Site.

The area of the Site that utilizes recontamination controls under this plan is 10,000 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 area of the property for which enhanced storm-water retention capability has been established for the redevelopment project is 10,000 square feet.

Paperless Brownfield Cleanup Program. Tahoe Development participated in OER's paperless Voluntary 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 200 pounds.

Low-Energy Project Management Program. Tahoe Development 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 250 miles.

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. The number of trees planted as part of this redevelopment is two trees.