DRAFT REMEDIAL ACTION WORK PLAN

for

92 AVENUE OF THE AMERICAS
92-98 Avenue of the Americas
New York, New York 10013
NYSDEC BCP Site No. C231130

Prepared for:

THE RECTOR, CHURCH-WARDENS, AND VESTRYMEN OF TRINITY CHURCH, IN THE CITY OF NEW-YORK;
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Prepared by:

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27 February 2026
Langan Project No. 190044801

CERTIFICATION

I, Paul McMahon, certify that I am currently a New York State (NYS) registered professional engineer (PE) and that this Remedial Action Work Plan was prepared in accordance with applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10) and Green Remediation (DER-31).

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

NYS Professional Engineer #095164	Date	Signature

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

TABLE OF CONTENTS

FIGURES

TABLES

APPENDICES

LIST OF ACRONYMS

Acronym	Definition
AOC	Areas of Concern
ASP	Analytical Services Protocol
BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
bgs	Below ground surface
BMP	Best Management Practices
BTEX	Benzene, Toluene, Ethylbenzene, and Xylenes
C&D	Construction and Demolition
CAMP	Community Air Monitoring Plan
CFR	Code of Federal Regulations
CHASP	Construction Health and Safety Plan
COC	Certificate of Completion
CP	Commissioner Policy
CQAP	Construction Quality Assurance Plan
CSM	Conceptual Site Model
DER	Division of Environmental Remediation
DER-10	NYSDEC Program Policy DER-10: Technical Guide for Site Investigation and Remediation
DMM	Division of Materials Management
DUSR	Data Usability Summary Report
EC	Engineering Control
ECL	Environmental Conservation Law
EE	Environmental Easement
El.	Elevation
ELAP	Environmental Laboratory Approval Program
ESA	Environmental Site Assessment
ESI	Environmental Site Investigation
FER	Final Engineering Report
GHG	Greenhouse Gas
HASP	Health and Safety Plan
IC	Institutional Control
IRM	Interim Remedial Measures
IRMWP	Interim Remedial Measures Work Plan
Langan	Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C.
NAVD88	North American Vertical Datum of 1988
NO_x	Nitrogen Oxides
NYC	New York City
NYCDCP	New York City Department of City Planning
NYCDEP	New York City Department of Environmental Protection

Acronym	Definition
NYCDOB	New York City Department of Buildings
NYCDOT	New York City Department of Transportation
NYCRR	New York Codes, Rules and Regulations
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
ORC-A	ORC Advanced®
OSHA	Occupational Safety and Health Administration
Part 375	Title 6 of the New York Codes, Rules and Regulations Part 375-1, 3.8, 6.8
PAH	Polycyclic Aromatic Hydrocarbons
PBS	Petroleum Bulk Storage
PCB	Polychlorinated Biphenyl
PCE	Tetrachloroethene
PE	Professional Engineer
PFAS	Per- and Polyfluoroalkyl Substances
PFOA	Perfluorooctanoic acid
PFOS	Perfluorooctanesulfonic acid
PGW	Protection of Groundwater
PID	Photoionization Detector
PM10	Particulate matter less than 10 micrometers in diameter
PPE	Personal Protective Equipment
ppm	Parts per million
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
QEP	Qualified Environmental Professional
RAO	Remedial Action Objective
RAWP	Remedial Action Work Plan
RCA	Recycled Concrete Aggregate
RE	Remediation Engineer
RI	Remedial Investigation
RIR	Remedial Investigation Report
RIWP	Remedial Investigation Work Plan
RURR	Restricted Use – Restricted Residential
SCG	Standards, Criteria, and Guidance
SCO	Soil Cleanup Objective
SFMP	Soil/Fill Management Plan
SGV	Standards and Guidance Values
the Site	92-98 Avenue of the Americas, New York, New York
SMP	Site Management Plan
SOE	Support of Excavation

Acronym	Definition
SO_x	Sulfur Oxides
SPDES	State Pollutant Discharge Elimination System
SVI	Soil Vapor Intrusion
SVOC	Semivolatile Organic Compound
SWPPP	Stormwater Pollution Prevention Plan
TOGS	Technical and Operational Guidance Series
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
UU	Unrestricted Use
VOC	Volatile Organic Compound
$\mu g/m^3$	Micrograms per cubic meter
1,2,4-TMB	1,2,4-trimethylbenzene
1,3,5-TMB	1,3,5-trimethylbenzene
6 NYCRR	Title 6 of the New York Codes, Rules and Regulations

EXECUTIVE SUMMARY

The Rector, Church-Wardens, and Vestrymen of Trinity Church, in the city of New-York (Trinity); 92 HH LLC; and Remainderman 92 AOA LLC (collectively, the Participants) are enrolled in the New York State (NYS) Brownfield Cleanup Program (BCP) and are responsible for the investigation and remediation of the property at 92-98 Avenue of the Americas, in New York, New York (the site). The Participants were accepted into the New York State Department of Environmental Conservation (NYSDEC) BCP to investigate and remediate the site pursuant to the NYSDEC Brownfield Cleanup Agreement (BCA) executed on 29 August 2019 (Index No. C231130-06-19). BCP Site No. C231130 was assigned to the site.

This Remedial Action Work Plan (RAWP) summarizes the nature and extent of the contamination as determined by the Remedial Investigation (RI) and the Interim Remedial Measures (IRM), identifies and evaluates remedial action alternatives, and presents the preferred Track 4 remedy. The proposed remedy was developed based on data gathered during the RI and IRM, performed by Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C. (Langan). The proposed remedy is consistent with the procedures defined in the NYSDEC Division of Environmental Remediation (DER) Program Policy: Technical Guidance for Site Investigation and Remediation (DER-10) and complies with applicable federal, state, and local standards, criteria, guidance, laws, regulations, and requirements.

Site Description/Physical Setting/Site History

The approximately 4,328-square-foot site is located at 92-98 Avenue of the Americas in the SoHo neighborhood of New York, New York (Block 476, Lot 1 on the Manhattan Borough tax map). A 16-story commercial and office building adjoins the site to the north; three six-story mixed-use commercial and residential buildings adjoin the site to the east; Grand Street followed by a one-story commercial building adjoin the site to the south; and Avenue of the Americas followed by a 25-story commercial office building and a public park adjoin the site to the west. The NYC Transit (NYCT) A-C-E subway lines are located west of the site below Avenue of the Americas. The site consists of a gravel-covered lot used for private parking and includes a chain-link fence on the eastern, southern, and western sides. The exterior wall of the northern-adjoining building abuts the site to the north. The “project north” is parallel to Avenue of the Americas (Sixth Avenue). All directions described herein are referenced to project north unless otherwise noted.

The site and surrounding area have been developed since the early 1900s and are in an urban setting historically characterized by industrial, manufacturing, and commercial development. Historical uses of the property included a chemical manufacturing facility, a confectionary and malt products company, a textile company, an automobile service station, and a filling station with at least five Underground Storage Tanks (USTs). Historical Petroleum Bulk Storage (PBS) records indicate that three closed-in-place 550-gallon gasoline USTs, one closed and removed 550-gallon waste oil UST (UST No. 4), and one 2,000-gallon gasoline UST that was converted to non-regulated uses were registered under NYSDEC PBS Nos. 2-349771 and 2-508829.

The surrounding area was historically used for industrial and manufacturing operations and PBS, and some surrounding properties are associated with documented releases. Historical operations and/or uses at surrounding properties included dry cleaning facilities; iron works; chemical, oil, trucking, and various manufacturing companies; automobile garages with PBS; and industrial facilities.

Summary of the Remedial Investigation

The findings and conclusions of the RI are as follows:

1. Stratigraphy: Non-native fill consisting of grey to olive and red- to dark-brown, fine- to medium-grained sand with varying amounts of silt, clay, gravel, brick, concrete, glass, coal, coal ash, metal fragments, and wood was encountered across the site beneath the approximately 6-inch gravel surface cover to depths ranging from about 4.5 to 16 feet below ground surface (bgs). Native soil, predominantly consisting of black- to red-brown, fine-grained sand with varying amounts of medium-grained sand, silt, clay, and gravel, was encountered beneath non-native fill. An approximately 6-inch-thick layer of peat was encountered beneath the sand layer in one soil boring in the north-central part of the site. Bedrock was not encountered during the RI, but is about 100 feet bgs and consists of schist according to a 2018 Preliminary Geotechnical Engineering Report, prepared by Langan.

2. Hydrogeology: Synoptic groundwater measurements were collected on 12 August 2021 from monitoring wells installed during the 2018 Phase II Environmental Site Investigation (ESI) and RI. Groundwater was encountered between about 10 and 13 feet below top of casing (bTOC), corresponding to about elevation (el.) -4.81 to -4.97 feet relative to the North American Vertical Datum of 1988 (NAVD88). Groundwater flow was evaluated and determined to flow south. Based on regional topography, the inferred regional groundwater flow is to the west towards the Hudson River. The NYCT subway infrastructure west of the site, underground utilities, stratigraphy, and other subsurface structures may locally influence the direction of groundwater flow.

3. Geophysical Findings: The geophysical survey identified sewer and gas utilities beneath the sidewalks fronting the site along Avenue of the Americas and Grand Street and anomalies indicative of potential utilities or segments of utilities in the northern and southern parts of the site. An anomaly associated with potential foundations of a former structure was observed in the northern part of the site. Although the geophysical survey performed during the 2018 Phase II ESI identified two geophysical anomalies, one of which resembled a UST, the geophysical survey performed during the RI did not identify anomalies consistent with USTs.

4. Non-Native Fill: Contaminants related to non-native fill include semi-volatile organic compounds (SVOCs), one pesticide, metals, and perfluorooctanesulfonic acid (PFOS) at concentrations exceeding the Unrestricted Use (UU), Restricted Use – Restricted Residential (RURR), and/or Protection of Groundwater (PGW) soil cleanup objectives (SCOs) to depths of up to 16 feet bgs. SVOCs, including benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene,

benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, naphthalene, and phenanthrene were detected in non-native fill samples at concentrations above the UU, RURR and/or PGW SCOs. One pesticide, 4,4'-DDT, was detected at a concentration above the UU SCO, but below the RURR and PGW SCO in one non-native fill sample. Metals, including barium, cadmium, trivalent chromium, lead, mercury, and zinc, were detected in non-native fill at concentrations above the UU, RURR and/or PGW SCOs. PFOS was detected in non-native fill at a concentration above the UU and PGW SCOs, but below the RURR SCO. SVOCs, one pesticide, metals, and PFOS in soil are likely related to the quality of the non-native fill. SVOCs may also be attributed to petroleum impacts, particularly in borings that correlate with observations of petroleum-like odor, staining and/or photoionization detector (PID) readings or VOC impacts. SVOCs and metals (iron, magnesium, manganese, and sodium) were detected in groundwater at concentrations above the NYSDEC Standards and Guidance Values (SGVs). SVOCs and metals in groundwater are likely attributed to entrained non-native fill sediment, on-site petroleum impacts, and/or regional groundwater quality. PFOS in soil and groundwater is attributed to non-native fill quality or an unknown regional source.

5. Petroleum Impacts in Soil, Groundwater, and Soil Vapor: Petroleum-related contamination was identified in soil and groundwater across the site. Petroleum impacts were not observed in soil borings EB-14 and EB-15 in the northeastern and northwestern parts of the site, respectively. Volatile organic compounds (VOCs), including 1,2,4-trimethylbenzene (1,2,4-TMB), 1,2-dichloroethane, 1,3,5-trimethylbenzene (1,3,5-TMB), acetone, ethylbenzene, 2-butanone, n-propylbenzene, and total xylenes were detected in soil samples at concentrations above the UU, RURR and/or PGW SCOs. Petroleum-related VOCs were also detected in soil vapor and ambient air samples. Petroleum-related contamination in soil, groundwater, and soil vapor is attributed to historical releases from former on-site PBS.

Summary of the Interim Remedial Measures

The findings and conclusions of the IRM are as follows:

1. Baseline groundwater sampling of eleven 2-inch-diameter permanent wells both on- and off-site
2. Test pitting to identify suspect USTs
3. Decommissioning and removal of one 2,000-gallon and four 550-gallon USTs
4. Field screening of excavated and exposed soil for visual, olfactory, and PID evidence of environmental impacts
5. Gauging of seven accessible 2-inch-diameter wells both on- and off-site after UST removal
6. Collection of base and sidewall confirmation soil samples from UST excavations

Qualitative Human Health Exposure Assessment

Complete exposure pathways have the following five elements: 1) a contaminant source; 2) a contaminant release and transport mechanism; 3) a point of exposure; 4) a route of exposure; and 5) a receptor

population. A discussion of the five elements comprising a complete pathway as they pertain to the site is provided below.

Current Conditions

Contaminant sources include petroleum-impacted soil, groundwater and soil vapor; and non-native fill with varying levels of SVOCs, pesticides, metals, and per- and polyfluoroalkyl substances (PFAS).

Contaminant release and transport mechanisms include potential release and transport during penetration of the site cover for soil, groundwater, and soil vapor sampling. Under current conditions, the likelihood of exposure to humans is limited by the following:

- The site is not covered by an impervious surface. Human exposure to contaminated soil through dermal absorption, inhalation, and ingestion is possible, but minimized and controlled by the site fencing, gravel surface cover, and site use as a private parking lot;
- Groundwater is not a potable water source; and
- The site is surrounded by locked chain-linked fencing and will be surrounded by locked construction fencing once construction begins, preventing access to the community. Sampling activities are completed in accordance with a health and safety plan (HASP) and community air monitoring plan (CAMP) that is designed to monitor and prevent exposure to soil, groundwater, and soil vapor contaminants.

Construction/Remediation Activities

During redevelopment and remediation, points of exposure include disturbed and exposed soil during excavation, dust and organic vapors generated during excavation, and contaminated groundwater that will be encountered during in-situ remediation. Routes of exposure include ingestion and dermal absorption of contaminated soil and groundwater, inhalation of organic vapors arising from contaminated soil and groundwater, and inhalation of dust arising from contaminated soil. The receptor populations include construction and remediation workers and, to a lesser extent, the public adjacent to the site.

The potential for complete exposure pathways is present since all five elements exist; however, the risk can be avoided or minimized by applying appropriate health and safety measures during construction and remediation, such as monitoring the air for organic vapors and dust, using vapor and dust suppression measures, cleaning truck undercarriages before they leave the site to prevent off-site soil tracking, maintaining site security, and wearing the appropriate personal protective equipment (PPE).

In accordance with the RAWP, which includes a construction health and safety plan (CHASP), a Soil/Fill Management Plan, and a CAMP, measures such as conducting an air-monitoring program, donning PPE, covering soil stockpiles, altering work sequencing, maintaining a secure construction entrance, proper housekeeping, and applying vapor and dust suppression measures to prevent off-site migration of contaminants during construction will be implemented. Such measures will prevent completion of these potential migration pathways.

Proposed Future Conditions

Under the proposed future conditions, contaminants may remain on-site, depending on the remedy, and would, to a lesser extent, include those listed under current conditions. Contaminant release and transport mechanisms include volatilization of contaminants from the groundwater matrix to the soil vapor phase and intrusion of soil vapor. If remaining impacts exist and institutional controls (IC) and/or engineering controls (EC) are not implemented, points of exposure include exposure during any future soil-disturbing activities. The receptor population includes future site occupants and employees, visitors, and maintenance workers. The possible routes of exposure can be avoided or mitigated by removal of non-native fill and petroleum-impacted soil; construction, and maintenance of, a site covering system (e.g., concrete building slab or 2 feet of clean fill); in-situ treatment of groundwater; and implementation of a Site Management Plan (SMP), if necessary.

Human Health Exposure Assessment Conclusions

1. Under current conditions, exposure is limited because the site is surrounded by a fence and buildings and access is limited to private parking lot users. The primary exposure pathways are dermal contact, ingestion, and inhalation of soil, groundwater, and/or soil vapor by site workers and, to a lesser extent, the nearby community. The exposure risks can be avoided or minimized by following the appropriate health and safety and vapor and dust suppression measures outlined in the HASP and CAMP during soil disturbance activities.
2. In the absence of mitigation measures and controls, there is potential for exposure during remediation. The primary exposure pathways are:
    a. Dermal contact, ingestion and inhalation of contaminated soil, groundwater, or soil vapor by construction/remediation workers.
    b. Dermal contact, ingestion and inhalation of soil (dust) and inhalation of soil vapor by the community in the vicinity of the site.

    These can be avoided or minimized by performing community air monitoring and by following the appropriate health and safety, vapor and dust suppression, and site security measures.
3. The existence of a complete exposure pathway for site contaminants to human receptors during proposed future conditions is unlikely, as sources of contamination will be addressed during remediation and contaminated soil remaining will be capped with an impermeable foundation or other site cover. Remaining contamination would be managed in accordance with an SMP that would be prepared, if necessary, following site remediation.
4. Regional groundwater is not used as a potable water source. Thus, exposure to groundwater contaminants is unlikely.
5. It is possible that a complete exposure pathway exists for the migration of site contaminants to off-site human receptors during current, remediation, and future conditions. Such exposure can

be prevented or mitigated by implementation of monitoring and control measures. Monitoring and control measures have been and will continue to be used during remediation to prevent completion of this pathway. Under future conditions, the site will be remediated, and ECs and ICs will be implemented, as necessary, to prevent completion of this pathway.

Summary of the Remedy

A Track 4 remedy is proposed and will include implementation of the following remedial elements:

1) Development and implementation of a CHASP and CAMP for the protection of on-site workers, visitors, and the environment during remediation activities
2) To facilitate site remediation, demolition and removal of subsurface obstructions (e.g., remnant foundation elements), as needed, by the contractor and management of removed construction and demolition (C&D) debris in accordance with Part 360 and 361 regulations. Review and certification of C&D transport and disposal methodologies is not a requirement of the Remediation Engineer (RE). The RE is responsible for documenting that C&D debris is not comingled with contaminated site soil and fill
3) Decommissioning and removal of underground storage tanks (UST), if encountered, in accordance with NYSDEC DER-10 5.5(b)(5)
4) Establishment of the Track 4 SCOs as the lower of the RURR SCOs and PGW SCOs for contaminants detected in groundwater above the NYSDEC SGVs, referred to hereafter as “relevant PGW SCOs”
5) Implementation of an on-site and off-site in-situ groundwater treatment program consisting of application of colloidal activated carbon (PetroFix) via direct push injections on-site and installation of ORC Advanced® (ORC-A) filter socks in off-site monitoring wells
6) Installation of one on-site post-treatment groundwater monitoring well (PTMW-01) and collection of post-remediation groundwater samples from the new on-site wells and existing off-site wells (MW10, MW11, and MW12) to evaluate performance of the groundwater treatment remedy
7) Excavation and removal of non-native fill/soil across the site to between el. 5 and el. 7 (2 feet bgs) to facilitate installation of a composite cover system
8) Screening for indications of contamination source areas during ground-intrusive site work by visual, olfactory, and instrumental (PID) methods
9) Appropriate off-site disposal of non-native fill and soil removed from the site in accordance with federal, state, and local rules and regulations for handling, transport, and disposal
10) Collection and analysis of documentation soil samples in accordance with DER-10 at the completion of the remedial excavation to document post-remediation soil quality
11) Placement of a physical demarcation layer where contamination remains (site-wide), consisting of orange snow fencing or equivalent material at the excavation bottom prior to backfilling

12) Import of backfill, where required, in compliance with: a) the lower of the RURR and relevant PGW SCOs, whichever is more stringent; b) Title 6 of the New York Codes, Rules and Regulations (6 NYCRR) Part 360 regulations; and c) federal, state, and local rules and regulations for handling and transport of backfill

13) Capping of site-wide excavated areas with an engineered composite cover system consisting of at least 2 feet of certified-clean fill (e.g., fill meeting the lower of relevant PGW and RURR SCOs), with the top 4 inches composed of ¾-inch virgin stone

14) Establishment of use restrictions (i.e., ICs) including prohibitions on the use of groundwater from the site and prohibitions on sensitive site uses, such as farming or vegetable gardening in remaining site soil, to prevent future exposure to remaining contamination

15) Recording of an Environmental Easement (EE) to memorialize the remedial action and the ICs to ensure that future owners of the site continue to maintain these controls as required

16) Preparation of an SMP that describes management of the ICs and ECs. Implementation of the SMP following completion of the remedy will be stipulated by the EE. If further redevelopment is implemented in the future under the SMP, future structures will require soil vapor intrusion (SVI) evaluation and possible mitigation.

1.0 INTRODUCTION

This Remedial Action Work Plan (RAWP) was prepared on behalf of The Rector, Church-Wardens, and Vestrymen of Trinity Church, in the city of New-York; 92 HH LLC; and Remainderman 92 AOA LLC (collectively, the Participants) in the SoHo neighborhood of New York, New York (the site). The Participants were accepted into the New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP) to investigate and remediate the site pursuant to the NYSDEC Brownfield Cleanup Agreement (BCA) executed on 29 August 2019 (Index No. C231130-06-19). BCP Site No. C231130 was assigned to the site.

This RAWP summarizes the nature and extent of contamination as determined from data gathered during the Remedial Investigation (RI) and Interim Remedial Measures (IRM), identifies and evaluates remedial action alternatives, and presents the proposed Track 4 remedy. The remedy described in this document is consistent with the procedures defined in Division of Environmental Remediation (DER)-10, DER-31, and complies with applicable standards, criteria and guidance. The remedy described in this document also complies with applicable federal, state, and local laws, regulations, and requirements.

1.1 Site Location and Description

The site is approximately 4,328 square feet in area and is located at 92-98 Avenue of the Americas in the SoHo neighborhood of New York, New York (Block 476, Lot 1 on the Manhattan Borough tax map). A 16-story commercial and office building adjoins the site to the north; three six-story mixed-use commercial and residential buildings adjoin the site to the east; Grand Street followed by a one-story commercial building adjoin the site to the south; and Avenue of the Americas followed by a 25-story commercial office building and a public park adjoin the site to the west. The NYC Transit (NYCT) A-C-E subway lines are located west of the site below Avenue of the Americas. The site consists of a gravel-covered lot used for private parking and includes a chain-link fence on the eastern, southern, and western sides. The exterior wall of the northern-adjoining building abuts the site to the north.

The “project north” is parallel to Avenues of the Americas (Sixth Avenue). All directions described herein are referenced to project north unless otherwise noted. A site location map is provided as Figure 1 and a site plan is provided as Figure 2.

The site is in an urban setting characterized by residential, commercial, and industrial buildings. According to the New York City Department of City Planning (NYCDCP) Zoning Map 12A, dated 15 December 2021, the site is in special SoHo-NoHo Mixed Use District (SNX) comprised of M1-6 and R10 light manufacturing/residential zoning districts. A site survey is included in Appendix A.

1.2 Redevelopment Plan

The proposed remedy is intended to make the site protective of human health and the environment consistent with the contemplated end use. The Participants anticipate that the remediation will be performed in advance of redevelopment. The proposed redevelopment plan and end use are described

herein to provide the basis for this assessment; however, the contemplated remedy may be implemented independent of the proposed redevelopment plan.

The contemplated end use will be consistent with zoning laws for restricted-residential use.

1.3 Description of Surrounding Properties

The site is in an urban setting characterized by residential, commercial, and industrial buildings. According to the NYCDCP Zoning Map 12A, dated 15 December 2021, the site is in the "Special SoHo-NoHo Mixed Use" (SNX) district comprised of M1-6 and R10 light manufacturing and residential zoning districts. The following is a summary of surrounding property usage:

Direction	Parcel Number	Adjoining Properties	Surrounding Properties
North	Block 476, Lot 7	16-story commercial/office building (100 Avenue of the Americas)	Watts Street followed by institutional, multi-family residential, and multi-story mixed-use commercial and residential buildings
East	Block 476, Lot 42	Six-story mixed-use residential and commercial building (23 Thompson Street)	Thompson Street followed by multi-family residential buildings, mixed-use commercial and residential buildings, and light-industrial buildings
	Block 476, Lot 45	Six-story mixed-use commercial and residential buildings (30 Grand Street)	
South	Block 227, Lot 50	Grand Street followed by a two-story commercial building (23 Grand Street)	Public park followed by Canal Street, multi-family residential buildings, and mixed-use residential and commercial buildings
West	Block 477, Lot 11	Avenue of the Americas followed by a 25-story commercial office building (101 Avenue of the Americas)	Multi-story, multi-family residential buildings followed by Varick Street

Land use within a half-mile radius is urban and includes commercial, industrial, institutional (e.g., schools and churches), manufacturing, office, residential buildings, outdoor recreational spaces/public parks, parking facilities, transportation and utility facilities, and vacant lots. The adjoining parcels are used for residential and commercial purposes, with the surrounding area generally consisting of residential, commercial, light industrial, and institutional uses (e.g., schools and churches). The closest ecological receptor is the Hudson River, which is located approximately 2,000 feet west of the site.

No schools or day care facilities are located on or adjoining the site. Sensitive receptors, as defined in NYSDEC DER Program Policy: Technical Guidance for Site Investigation and Remediation (DER-10), within a half-mile of the site include those listed below:

Name (Approximate Distance from Site)	Address
Broome Street Academy Charter High School/Springport (approximately 0.07 miles north of the site)	121 Avenue of the Americas New York, NY 10013
New York City (NYC) iSchool/Chelsea High School (approximately 0.08 miles north of the site)	131 Avenue of the Americas New York, NY 10013

Name (Approximate Distance from Site)	Address
Vivvi I Child Care and Early Learning (approximately 0.08 miles west of the site)	75 Varick Street New York, NY 10013
Day Care Council Local 205 DC (approximately 0.08 miles west of the site)	75 Varick Street New York, NY 10013
The Montessori School in SoHo (approximately 0.10 miles northeast of the site)	75 Sullivan Street New York, NY 10012
CPC Tribeca Early Childhood Learning Center (approximately 0.10 miles south of the site)	21 St Johns Lane New York, NY 10013
TriBeCa Community School (approximately 0.22 miles west of the site)	22 Ericsson Place New York, NY 10013
LREI-High School (approximately 0.25 miles north of the site)	40 Charlton Street New York, NY 10014
Bright Horizons at TriBeCa (approximately 0.27 miles southeast of the site)	129 Hudson Street New York, NY 10013
The Citi Children's Center at 388 Greenwich + Back-Up Care (approximately 0.27 miles southeast of the site)	129 Hudson Street, Building 3, Suite T-100 New York, NY 10013
Church St School for Music and Art (approximately 0.31 miles southeast of the site)	41 White Street New York, NY 10013
Cooke Transitions (approximately 0.33 miles northeast of the site)	60 MacDougal Street #62 New York, NY 10012
Playto: Childcare & Daycare Center in New York (0.35 miles southwest of the site)	90 Hudson Street New York, NY 10013
City As School (approximately 0.41 miles north of the site)	16 Clarkson Street New York, NY 10014
Buckle my Shoe Preschool (approximately 0.42 miles southwest of the site)	40 Worth Street New York, NY 10013
The Washington Market School – Hudson Street (approximately 0.44 miles southwest of the site)	55 Hudson Street New York, NY 10013
P.S. 130 Hernando De Soto (approximately 0.44 miles east of the site)	143 Baxter Street New York, NY 10013
LREI – Lower and Middle School (approximately 0.45 miles north of the site)	272 Avenue of the Americas New York, NY 10012
Chung Pak Day Care Center (approximately 0.46 miles north of the site)	125 Walker Street #3 New York, NY 10013
Sompit Child Care Center (approximately 0.47 miles northeast of the site)	3 Washington Square Village New York, NY 10012

Name (Approximate Distance from Site)	Address
Creative Steps Early Care & Education (approximately 0.49 miles northeast of the site)	4 Washington Square Village New York, NY 10012

1.4 Environmental History

Historical site uses include the following: a chemical manufacturing facility (1922); a confectionary and malt products company (1927); a textile company (1973); an automobile service station (1938-2005); and a filling station with at least five underground storage tanks (USTs) (1950-2005). Historical Petroleum Bulk Storage (PBS) records indicate that three closed-in-place 550-gallon gasoline USTs, one closed and removed 550-gallon waste oil UST, and one 2,000-gallon gasoline UST that was converted to non-regulated uses were registered under NYSDEC PBS Nos. 2-349771 and 2-508829. During implementation of an Interim Remedial Measures Work Plan (IRMWP), five USTs were decommissioned and removed from the site (see Section 2.3).

1.4.1 Previous Environmental Reports

The following previous environmental reports and work plans were reviewed as part of the RAWP and are included in Appendix B.

- *Phase I Environmental Site Assessment (ESA), prepared by Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C. (Langan), dated 12 November 2018*
- *Draft Preliminary Geotechnical Engineering Study, prepared by Langan, dated 19 November 2018*
- *Phase II Environmental Site Investigation (ESI) Report, prepared by Langan, dated 21 November 2018*
- *Remedial Investigation Work Plan (RIWP), prepared by Langan, dated 30 June 2020*
- *Interim Remedial Measures Work Plan (IRMWP), prepared by Langan, dated 28 May 2024*
- *PBS Registration and Tank Closure Notification, prepared by Langan, dated 11 June 2025*
- *Remedial Investigation Report (RIR), prepared by Langan, dated 17 April 2023 and revised 27 October 2025*
- *Construction Completion Report, prepared by Langan, dated 27 October 2025*

2.0 DESCRIPTION OF REMEDIAL INVESTIGATIONS FINDINGS

The RI for 92 Avenue of the Americas was completed between 20 April and 12 August 2021 to investigate potential areas of concern (AOCs) and to determine, to the extent practical, the nature and extent of contamination in soil, groundwater, and soil vapor. The data from the RI was used to define the AOCs that are addressed by the NYSDEC-approved IRMWP and this RAWP, and are summarized in Section 2.1. The RI included the advancement of soil borings; installation of groundwater monitoring wells; installation of soil vapor probes; and collection of soil, groundwater, and soil vapor samples. Sample locations, including AOCs discussed in the previous environmental reports, are presented on Figure 3.

The RI consisted of the following:

- A geophysical survey to clear sample locations and to identify potential subsurface utilities, structures, and significant subsurface anomalies
- Advancement of 12 soil borings (eight on-site and four off-site) between 16 and 25 feet below ground surface (bgs) and collection of 35 soil samples (including quality assurance/quality control [QA/QC] samples) for laboratory analysis
- Installation and development of eight permanent groundwater monitoring wells (four on-site and four off-site) and collection of one groundwater sample from each newly installed monitoring well, and from three previously installed monitoring wells (total of 12 groundwater samples, including one duplicate sample) for laboratory analysis
- Surveying and gauging monitoring wells to establish groundwater elevation (el.) and flow direction to develop a groundwater contour map
- Installation of four soil vapor points and collection of one soil vapor sample from each soil vapor point and one ambient air sample for laboratory analysis

The RI was conducted in accordance with the NYSDEC-approved 30 June 2020 RIWP prepared by Langan.

The RI was conducted in accordance with Title 6 of the New York Codes, Rules and Regulations (NYCRR) Part 375-1, 3.8, 6.8 (Part 375); NYSDEC DER-10; and the New York State Department of Health (NYSDOH) Guidance for Evaluating Soil Vapor Intrusion (SVI) in the State of New York, October 2006 (with updates).

2.1 Areas of Concern

The following AOCs were identified and are described below.

2.1.1 AOC-1: Non-Native Fill

Non-native fill is present across the site from surface grade to between 4.5 and 16 feet bgs. Semivolatile organic compounds (SVOCs), one pesticide, metals, and perfluorooctanesulfonic acid (PFOS) detected in soil samples at concentrations above Unrestricted Use (UU), Restricted Use – Restricted Residential (RURR), and/or relevant Protection of Groundwater (PGW) soil cleanup objectives (SCOs) are attributed to the quality of non-native fill. SVOCs and metals detected in groundwater samples at concentrations above NYSDEC Standards and Guidance Values (SGVs) are attributed to entrained non-native fill, on-site petroleum impacts, and/or regional groundwater quality. PFOS in soil and groundwater is not associated with an on-site source, and is attributed to non-native fill quality or an unknown regional source.

2.1.2 AOC-2 and AOC-3: On-site PBS and NYSDEC Petroleum Spill No. 1808357

Before implementation of the IRMWP, historical PBS records documented three closed-in-place 550-gallon gasoline USTs, one closed and removed 550-gallon waste oil UST, and one 2,000-gallon gasoline UST that was converted to non-regulated uses (NYSDEC PBS Nos. 2-349771 and 2-508829). The geophysical survey performed during the 2018 Phase II ESI identified two geophysical anomalies, one of which resembled a UST.

Petroleum-like impacts, as evidenced by staining, odors, and photoionization detector (PID) readings above background, were observed in all three borings advanced during the 2018 Phase II ESI. Petroleum-related volatile organic compounds (VOCs) were detected in soil samples at concentrations above the UU, RURR, and relevant PGW SCOs and in groundwater samples above the NYSDEC SGVs. Petroleum-related VOCs were also detected in soil vapor samples. In response to the observed petroleum-like impacts and the reported occurrence of petroleum-related VOCs in soil and groundwater, a spill was reported to the NYSDEC and Spill No. 1808357 was assigned on 6 November 2018.

Petroleum-related contamination was identified in soil and groundwater across the site during the RI. Petroleum impacts were not observed in soil borings EB-14 and EB-15 in the northeastern and northwestern parts of the site, respectively. As summarized in Section 2.3, five USTs were decommissioned and removed from the subsurface during implementation of the IRMWP. Petroleum-related contamination in soil, groundwater, and soil vapor is attributed to historical releases from former on-site PBS.

2.2 Summary of the Remedial Investigation

The RI is documented in the 17 April 2023 (revised 27 October 2025) RIR for 92 Avenue of the Americas, prepared by Langan. Soil boring, monitoring well, and soil vapor probe locations are shown on Figure 3. Soil sample analytical results from the RI are presented on Figures 4A, 4B, and 4C. Groundwater sample

analytical results are presented on Figure 5A and 5C. Soil vapor sample analytical results are presented on Figure 6. Groundwater elevation data is summarized in Figure 7.

The findings and conclusions of the RI are as follows:

1. Stratigraphy: Non-native fill consisting of grey to olive and red- to dark-brown, fine- to medium-grained sand with varying amounts of silt, clay, gravel, brick, concrete, glass, coal, coal ash, metal fragments, and wood was encountered across the site beneath the approximately 6-inch gravel surface cover to depths ranging from about 4.5 to 16 feet bgs. Native soil, predominantly consisting of black- to red-brown, fine-grained sand with varying amounts of medium-grained sand, silt, clay, and gravel, was encountered beneath non-native fill. An approximately 6-inch-thick layer of peat was encountered beneath the sand layer in one soil boring in the north-central part of the site. Bedrock was not encountered during the RI, but is about 100 feet bgs and consists of schist according to a 2018 Preliminary Geotechnical Engineering Report, prepared by Langan.
2. Hydrogeology: Synoptic groundwater measurements were collected on 12 August 2021 from monitoring wells installed during the 2018 Phase II ESI and RI. Groundwater was encountered between about 10 and 13 feet below top of casing (bTOC), corresponding to about el. -4.81 to -4.97 feet relative to the North American Vertical Datum of 1988 (NAVD88). Groundwater flow was evaluated and determined to flow south. Based on regional topography, the inferred regional groundwater flow is to the west towards the Hudson River. The NYCT subway infrastructure west of the site, underground utilities, stratigraphy, and other subsurface structures may locally influence the direction of groundwater flow.
3. Geophysical Findings: The geophysical survey identified sewer and gas utilities beneath the sidewalks fronting the site along Avenue of the Americas and Grand Street and anomalies indicative of potential utilities or segments of utilities in the northern and southern parts of the site. An anomaly associated with potential foundations of a former structure was observed in the northern part of the site. Although the geophysical survey performed during the 2018 Phase II ESI identified two geophysical anomalies, one of which resembled a UST, the geophysical survey performed during the RI did not identify anomalies consistent with USTs.
4. Non-Native Fill: Contaminants related to non-native fill include SVOCs, one pesticide, metals, and PFOS at concentrations exceeding the UU, RURR, and/or relevant PGW SCOs to depths of up to 16 feet bgs. SVOCs, including benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, naphthalene, and phenanthrene were detected in non-native fill samples at concentrations above the UU, RURR and/or relevant PGW SCOs. One pesticide, 4,4'-DDT, was detected at a concentration above the UU SCO, but below the RURR and relevant PGW SCO in one non-native fill sample. Metals, including barium, cadmium, trivalent chromium, lead, mercury, and zinc, were detected in non-native fill at concentrations above the UU, RURR and/or relevant PGW SCOs. PFOS was detected in non-native fill at a concentration above the UU and relevant PGW SCOs, but below the RURR SCO. SVOCs, one pesticide, metals, and PFOS in soil are

likely related to the quality of the non-native fill. SVOCs may also be attributed to petroleum impacts, particularly in borings that correlate with observations of petroleum-like odor, staining and/or PID readings or VOC impacts. SVOCs and metals (iron, magnesium, manganese, and sodium) were detected in groundwater at concentrations above the NYSDEC SGVs. SVOCs and metals in groundwater are likely attributed to entrained non-native fill sediment, on-site petroleum impacts, and/or regional groundwater quality. PFOS in soil and groundwater is attributed to non-native fill quality or an unknown regional source.

5. Petroleum Impacts in Soil, Groundwater, and Soil Vapor: Petroleum-related contamination was identified in soil and groundwater across the site. Petroleum impacts were not observed in soil borings EB-14 and EB-15 in the northeastern and northwestern parts of the site, respectively. VOCs, including 1,2,4-trimethylbenzene (1,2,4-TMB), 1,2-dichloroethane, 1,3,5-trimethylbenzene (1,3,5-TMB), acetone, ethylbenzene, 2-butanone, n-propylbenzene, and total xylenes were detected in soil samples at concentrations above the UU, RURR and/or relevant PGW SCOs. Petroleum-related VOCs were also detected in soil vapor and ambient air samples. Petroleum-related contamination in soil, groundwater, and soil vapor is attributed to historical releases from former on-site PBS.

2.3 Summary of Interim Remedial Measures

The objective of the NYSDEC-approved 28 May 2024 IRMWP was to address known environmental conditions and contaminant sources at the site in advance of implementation of this NYSDEC-approved RAWP.

The IRMWP was implemented between 16 October 2024 and 7 March 2025 and consisted of the following tasks:

1. Baseline groundwater sampling of eleven 2-inch-diameter permanent wells both on- and off-site
2. Test pitting to identify suspect USTs
3. Decommissioning and removal of one 2,000-gallon and four 550-gallon USTs
4. Field screening of excavated and exposed soil for visual, olfactory, and PID evidence of environmental impacts
5. Gauging of seven accessible 2-inch-diameter wells both on- and off-site after UST removal
6. Collection of base and sidewall confirmation soil samples from UST excavations

The above IRMs are fully described in the 27 October 2025 CCR. Baseline groundwater sample analytical results are presented in Table 1, Figure 5B, and Appendix G. Soil sample analytical results from the IRM are presented on Figures 8A and 8B.

2.4 Significant Threat Determination

A determination of whether the site poses a significant threat to human health and the environment will be made upon NYSDEC and NYSDOH review of the RAWP. A copy of the significant threat determination will be provided as Appendix C in the final RAWP.

2.5 Geological Conditions

2.5.1 Regional and Site Geology

According to the 2018 Phase II ESI, RI, and Preliminary Geotechnical Engineering Study (Section 3.3) conducted by Langan, non-native fill was identified across the site, extending to about 4.5 to 16 feet bgs. The non-native fill generally consists of grey to olive and red- to dark-brown, fine- to medium-grained sand with varying amounts of silt, clay, gravel, brick, concrete, glass, coal, coal ash, metal fragments, and wood. Native soil, predominantly consisting of black- to red-brown, fine-grained sand with varying amounts of medium-grained sand, silt, clay, and gravel, was encountered beneath non-native fill. An approximately 6-inch-thick layer of peat was encountered beneath the sand layer in one RI soil boring in the north-central part of the site.

According to the United States Geological Survey (USGS) "Bedrock and Engineering Geologic Maps of New York County and Parts of Kings and Queens Counties, New York, and parts of Bergen and Hudson Counties, New Jersey" (Baskerville, 1994), the site is underlain by Manhattan Schist bedrock described as gray sillimanite-muscovite-tourmaline schist. According to the Preliminary Geotechnical Engineering Study (Section 3.3) prepared by Langan and dated 19 November 2018, bedrock was encountered about 100 feet bgs and consists of gray schist with coarse to fine particles of muscovite, quartz, and feldspar, with slight to fresh weathering and steep to shallow dipping fractures.

2.5.2 Regional and Site Hydrogeology

Groundwater flow is typically topographically influenced, as shallow groundwater tends to originate in areas of topographic highs and flows toward areas of topographic lows such as rivers, stream valleys, ponds, and wetlands. A broader, interconnected hydrogeologic network often governs groundwater flow at depth or in the bedrock aquifer. Groundwater depth and flow direction are also subject to hydrogeologic and anthropogenic variables such as precipitation, evaporation, extent of vegetation cover, coverage by impervious surfaces, and subsurface structures. Other factors influencing groundwater include depth to bedrock, the presence of anthropogenic fill, and variability in local geology and groundwater sources or sinks.

Langan completed a groundwater elevation survey as part of the RI and collected synoptic groundwater measurements from monitoring wells at the site and on the sidewalks fronting the site along Avenue of the Americas and Grand Street on 12 August 2021. Groundwater was encountered from about el. -4.81 to -4.97 (about 10 to 13 feet bTOC) and groundwater flow was determined to flow to the south. Based on regional topography, the inferred regional groundwater flow is to the west towards the Hudson River, which is about 2,000 feet west of the site. The NYCT subway infrastructure west of the site, underground

utilities, stratigraphy, and other subsurface structures may locally influence the direction of groundwater flow. A groundwater elevation contour map is included as Figure 7.

2.6 Contamination Conditions

2.6.1 Conceptual Model of Site Contamination

A conceptual site model (CSM) was developed based on the findings of the RI and previous investigations to produce a simplified framework for understanding the distribution of impacted materials, potential migration pathways, and potentially complete exposure pathways, as discussed below.

2.6.1.1 Potential Sources of Contamination

Potential sources of contamination include non-native fill and historical releases from PBS. Non-native fill was encountered beneath surface cover to between about 4.5 and 16 feet bgs. On-site non-native fill contains SVOCs, one pesticide, metals, and PFOS at concentrations above the UU, RURR, and/or relevant PGW SCOs. The presence of SVOCs in soil samples may also be related to petroleum impacts (where their presence is co-located with VOC detections and/or observations of staining, odor and/or PID readings in soil). Evidence of petroleum-related contamination in soil, groundwater, and soil vapor throughout the site is likely related to releases from historical PBS and historical site operations.

2.6.1.2 Exposure Media

The impacted media include soil, groundwater, and soil vapor. Analytical data indicates that the non-native fill across the site contains SVOCs, one pesticide, metals, and PFOS. Petroleum-related impacts were identified in soil, groundwater, and soil vapor as evidenced by concentrations of VOCs and SVOCs.

2.6.1.3 Receptor Populations

Current receptor populations include the community surrounding the site and individuals using the site for private parking. During site remediation, human receptors will include construction and remediation workers and, to a lesser extent, the public adjacent to the site. Under future conditions, receptors will include the site occupants and employees, visitors, and maintenance workers.

2.6.2 Nature and Extent of Contamination

This section evaluates the nature and extent of soil, groundwater, and soil vapor contamination. The nature and extent of the contamination is derived from a combination of field observations and analytical data that was discussed in the RIR.

2.6.3 Soil Contamination

Soil contamination, characterized by field observations and soil sample analytical results exceeding UU, relevant PGW, and/or RURR SCOs, is attributed to historical site uses, historical on-site PBS and the presence of non-native fill.

Petroleum-Impacted Soil

Petroleum impacts were initially observed in 2018 Phase II ESI soil borings EB-01, EB-02, and EB-03 from 11 to 19 feet bgs and subsequently in RI borings EB-04 through EB-08 and EB-10 through EB-13. Field evidence of petroleum impacts include odors, staining, and/or PID readings above background concentrations. The maximum PID reading of 15,000 parts per million (ppm) was detected in 2018 Phase II ESI soil boring EB-01 from 11 to 16 feet bgs and 1,757 ppm in the RI soil boring EB-12 from a depth of 10 to 18.5 feet bgs. Analytical evidence of petroleum impacts consists of detections of petroleum-related VOCs above the UU, RURR, and/or relevant PGW SCOs in soil borings EB-01, EB-03, EB-05 through EB-08, EB-10, EB-11, EB-12, and EB-15 at the groundwater interface or in saturated soil. One petroleum-related SVOC, naphthalene, was detected at a concentration above the UU SCO in RI soil boring EB-06 at the groundwater interface. Petroleum impacts are likely related to historical releases from former on-site PBS.

Petroleum-related impacts to soil were horizontally delineated to the northeast by EB-14 and northwest by EB-15 and EB-09, as evidenced by a lack of field evidence of petroleum impacts and a lack of petroleum-related VOCs and SVOCs above the UU SCOs in soil samples. Petroleum-related impacts were vertically delineated to between 16 and 22 feet bgs, as evidenced by a lack of field evidence of petroleum impacts and a lack of petroleum-related VOCs above the UU SCOs in soil samples.

Non-Native Fill

Non-native fill consisting of grey to olive and red- to dark-brown, fine- to medium-grained sand with varying amounts of silt, clay, gravel, brick, concrete, glass, coal, coal ash, metal fragments, and wood was encountered across the site beneath the approximately 6-inch gravel surface cover to depths ranging from about 4.5 to 16 bgs. SVOCs and metals were detected in non-native fill samples at concentrations above the UU, RURR, and/or relevant PGW SCOs, and one pesticide was detected in one non-native fill sample at a concentration above the UU SCO, but below the RURR and relevant PGW SCOs. Additionally, PFOS was detected in one soil sample above the UU and relevant PGW SCOs, but below the RURR SCO. The detected concentrations of SVOCs, one pesticide, metals, and PFOS are generally consistent with those observed in urban fill in New York City. The presence of SVOCs in soil samples may also be related to petroleum impacts (where their presence is co-located with VOC detections and/or observations of staining, odors and/or high PID readings in soil). The presence of PFOS in soil is attributed to non-native fill quality or an unknown regional source.

2.6.4 Groundwater Contamination

Groundwater contamination, characterized by field observations and groundwater sample analytical results exceeding Class GA SGVs, is attributed to historical site uses, historical on-site PBS and the presence of non-native fill.

SVOCs were detected at concentrations greater than the NYSDEC SGVs in on-site monitoring wells MW-01, MW-02, MW-03, MW-06 and MW-07 and off-site monitoring well MW-10 during the Phase II ESI. SVOCs (with the exception of naphthalene) were not detected above the NYSDEC SGVs during the RI. Overall, turbidity readings during the Phase II ESI did not reach stability and were higher than those collected at the time of the RI. Metals were detected at concentrations greater than the NYSDEC SGVs in

monitoring wells MW-04 through MW-07. SVOCs (with the exception of naphthalene) and metals detected in groundwater samples at concentrations above NYSDEC SGVs are attributed to entrained non-native fill sediment and/or regional groundwater quality.

LNAPL was encountered in on-site monitoring well MW-01 during the RI well gauging event. The LNAPL was identified as motor oil with potential mineral spirits and/or weathered gasoline via fingerprint analysis. Petroleum-like impacts, as evidenced by odors, a sheen, and/or PID headspace readings above background were observed during the RI in on-site monitoring wells MW-01, MW-05, MW-06, and MW-07 and off-site monitoring wells MW-10, MW-11, and MW-12. A maximum PID headspace reading of 16.6 ppm was detected in on-site monitoring well MW-06 and 324.7 ppm was detected in off-site monitoring well MW-11. Petroleum-related VOCs were detected at concentrations above the NYSDEC SGVs in monitoring wells MW-03, MW-05, MW-06, MW-07, MW-10, MW-11, and MW-12. One petroleum-related SVOC, naphthalene, was detected at concentrations above the NYSDEC SGV in monitoring wells MW-06, MW-07, and MW-10.

Petroleum impacts are attributed to former on-site PBS and/or historical release(s). Petroleum-related impacts to groundwater were horizontally delineated to the northwest by off-site monitoring well MW-09, as evidenced by a lack of field evidence of petroleum impacts and a lack of petroleum-related VOCs and SVOCs above the NYSDEC SGVs in groundwater samples.

PFOS and Perfluorooctanoic acid (PFOA) were detected in groundwater samples collected from on-site monitoring wells MW-04 through MW-07 at concentrations above the Guidance Values. PFOS was also detected in a soil sample collected from non-native fill. PFOS and PFOA in groundwater are thus attributed to entrained non-native fill sediment or an unknown regional source.

2.6.5 Soil Vapor Contamination

Petroleum-related VOCs (including benzene, toluene, ethylbenzene, and xylenes [BTEX], and other constituents) were detected in soil vapor and ambient air samples across the site. BTEX concentrations in 2018 Phase II ESI soil vapor samples ranged from 115 $\mu g/m^3$ in SV-01 to 2,766.8 $\mu g/m^3$ in SV-02. BTEX concentrations in RI soil vapor samples ranged from 54.1 $\mu g/m^3$ in SV-03 to 213.7 $\mu g/m^3$ in SV-06. BTEX concentrations in ambient air samples were 1.02 $\mu g/m^3$ and 2.68 $\mu g/m^3$ during the Phase II ESI and RI, respectively. PCE was detected in soil vapor samples collected during the 2018 Phase II ESI and RI at concentrations from 8.48 $\mu g/m^3$ to 27 $\mu g/m^3$.

Petroleum impacts are attributed to historical releases from former on-site PBS. An on-site source of PCE was not identified.

Soil analytical results from the RI are presented on Figures 4A, 4B, and 4C. Groundwater analytical results are presented on Figure 5A and 5C. Soil vapor analytical results are presented on Figure 6. A groundwater elevation contour map is included as Figure 7.

2.7 Qualitative Human Health Exposure Assessment

Based on the CSM and the review of environmental data, complete on-site and off-site exposure pathways appear to be present, in the absence of institutional controls (IC) and engineering controls (EC), under current, construction and remediation, and future conditions. The complete exposure pathways indicate there is a risk of exposure to humans from site contaminants via exposure to soil, groundwater, and soil vapor if mitigation and controls are not implemented.

Complete exposure pathways have the following five elements: 1) a contaminant source; 2) a contaminant release and transport mechanism; 3) a point of exposure; 4) a route of exposure; and 5) a receptor population. A discussion of the five elements comprising a complete pathway as they pertain to the site is provided below.

2.7.1 Current Conditions

Contaminant sources include petroleum-impacted soil, groundwater and soil vapor; and non-native fill with varying levels of SVOCs, pesticides, metals, and PFAS.

Contaminant release and transport mechanisms include potential release and transport during penetration of the site cover for soil, groundwater, and soil vapor sampling. Under current conditions, the likelihood of exposure to humans is limited by the following:

- The site is not covered by an impervious surface. Human exposure to contaminated soil through dermal absorption, inhalation, and ingestion is possible, but minimized and controlled by the site fencing, gravel surface cover, and site use as a private parking lot;
- Groundwater is not a potable water source; and
- The site is surrounded by locked chain-linked fencing and will be surrounded by locked construction fencing once construction begins, preventing access to the community. Sampling activities are completed in accordance with a health and safety plan (HASP) and community air monitoring plan (CAMP) that is designed to monitor and prevent exposure to soil, groundwater, and soil vapor contaminants.

2.7.2 Construction/Remediation Activities

During redevelopment and remediation, points of exposure include disturbed and exposed soil during excavation, dust and organic vapors generated during excavation, and contaminated groundwater that will be encountered during in-situ remediation. Routes of exposure include ingestion and dermal absorption of contaminated soil and groundwater, inhalation of organic vapors arising from contaminated soil and groundwater, and inhalation of dust arising from contaminated soil. The receptor populations include construction and remediation workers and, to a lesser extent, the public adjacent to the site.

The potential for complete exposure pathways is present since all five elements exist; however, the risk can be avoided or minimized by applying appropriate health and safety measures during construction and remediation, such as monitoring the air for organic vapors and dust, using vapor and dust suppression

measures, cleaning truck undercarriages before they leave the site to prevent off-site soil tracking, maintaining site security, and wearing the appropriate personal protective equipment (PPE).

In accordance with the RAWP, which includes a construction health and safety plan (CHASP), a Soil/Fill Management Plan, and a CAMP, measures such as conducting an air-monitoring program, donning PPE, covering soil stockpiles, altering work sequencing, maintaining a secure construction entrance, proper housekeeping, and applying vapor and dust suppression measures to prevent off-site migration of contaminants during construction will be implemented. Such measures will prevent completion of these potential migration pathways.

2.7.3 Proposed Future Conditions

Under the proposed future conditions, contaminants may remain on-site, depending on the remedy, although the number of contaminants and the contaminant concentrations would decrease. Contaminant release and transport mechanisms include volatilization of contaminants from the groundwater matrix to the soil vapor phase and intrusion of soil vapor. If remaining impacts exist and ECs/ICs are not implemented, points of exposure include exposure during any future soil-disturbing activities. The receptor population includes future site occupants and employees, visitors, and maintenance workers. The possible routes of exposure can be avoided or mitigated by removal of non-native fill and petroleum-impacted soil; construction and maintenance of a site covering system (e.g., concrete building slab or 2 feet of clean fill); in-situ treatment of groundwater; and implementation of a Site Management Plan (SMP), if necessary.

2.7.4 Human Health Exposure Assessment Conclusions

1. Under current conditions, exposure is limited because the site is surrounded by a fence and buildings and access is limited to private parking lot users. The primary exposure pathways are dermal contact, ingestion, and inhalation of soil, groundwater, and/or soil vapor by site workers and, to a lesser extent, the nearby community. The exposure risks can be avoided or minimized by following the appropriate health and safety and vapor and dust suppression measures outlined in the HASP and CAMP during soil disturbance activities.
2. In the absence of mitigation and controls, there is potential for exposure during construction and remediation. The primary exposure pathways are:
    a. Dermal contact, ingestion and inhalation of contaminated soil, groundwater, or soil vapor by construction workers
    b. Dermal contact, ingestion and inhalation of soil (dust) and inhalation of soil vapor by the community in the vicinity of the site

    These can be avoided or minimized by performing community air monitoring and by following the appropriate health and safety, vapor and dust suppression, soil erosion and sediment control, and site security measures.

3. The existence of a complete exposure pathway for site contaminants to human receptors during proposed future conditions is unlikely, as sources of contamination will be addressed during remediation and contaminated soil remaining will be capped with an impermeable foundation or other site cover. Remaining contamination would be managed in accordance with an SMP that would be prepared, if necessary, following site remediation.
4. Regional groundwater is not used as a potable water source. Thus, exposure to groundwater contaminants is unlikely.
5. It is possible that a complete exposure pathway exists for the migration of site contaminants to off-site human receptors during current, remediation, and future conditions. Such exposure can be prevented or mitigated by implementation of monitoring and control measures. Monitoring and control measures have been and will continue to be used during investigation and remediation to prevent completion of this pathway. Under future conditions, the site will be remediated, and ECs and ICs will be implemented, as necessary, to prevent completion of this pathway.

2.8 Remedial Action Objectives

Based on the results of previous investigations and the RIs, the following Remedial Action Objectives (RAO) were identified:

RAOs	RAOs for Public Health Protection	RAOs for Environmental Protection
Soil	• Prevent ingestion/direct contact with contaminated soil • Prevent inhalation of or exposure to contaminants volatilizing from contaminants in soil	• Prevent migration of contaminants that would result in groundwater or surface water contamination
Groundwater	• Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards • Prevent contact with, or inhalation of, volatiles emanating from contaminated groundwater	• Restore on-site groundwater aquifer to pre-disposal/pre-release conditions, to the extent practicable • Remove the source of groundwater contamination
Soil Vapor	• Mitigate impacts to public health resulting from existing, or the potential for, SVI into future buildings at the site	

3.0 DESCRIPTION OF REMEDIAL ACTION

This section presents an evaluation of the proposed remedial action. The proposed remedial alternatives are a Track 1 remedy for Alternative I and a Track 4 remedy for Alternative II. Both alternatives are expected to achieve the established RAOs.

This section is organized as follows:

- Section 3.1 provides an explanation of the Standards, Criteria, and Guidance
- Sections 3.2 and 3.3 provide technical descriptions of:
    - Alternative I, a Track 1 Unrestricted Use remedy
    - Alternative II, a Track 4 Restricted-Residential Use remedy
- Section 3.4 provides an evaluation of the Green Remediation Program
- Section 3.5 evaluates the remedial alternatives based on the BCP Remedy Selection Evaluation Criteria
- Section 3.6 summarizes the recommended remedial alternative

3.1 Standards, Criteria, and Guidance

In accordance with Environmental Conservation Law (ECL) § 27-1415 and DER-10, the objectives of the remedial action are to: 1) reduce the concentrations of contaminants of concern at the site to meet those levels that will protect public health and the environment, and 2) isolate the site from migration of contaminated groundwater and soil vapor, to the extent feasible, from potential off-site sources. In accordance with DER-10, the Participants will have no remedial responsibilities with respect to groundwater contamination migrating to the site from an off-site source; however, remedial alternatives will be developed for such a case that eliminate or mitigate on-site human exposures, to the extent feasible, resulting from potential off-site contamination entering the site since there are other suspect and known contaminated sites in the vicinity of this site. Where identifiable sources of contamination are found on the site, to the extent practical, the sources will be removed, treated, or contained.

Also, in accordance with DER-10, the RAOs for this site are defined as medium-specific objectives for the protection of public health and the environment and are developed based on contaminant-specific Standards, Criteria, and Guidance (SCG), which include:

- 6 NYCRR Part 175 – Special Licenses and Permits--Definitions and Uniform Procedures
- 6 NYCRR Part 360 – Solid Waste Management Facilities General Requirements
- 6 NYCRR Part 361 – Material Recovery Facilities
- 6 NYCRR Part 364 – Waste Transporters
- 6 NYCRR Part 370 – Hazardous Waste Management System
- 6 NYCRR Part 371 – Identification and Listing of Hazardous Wastes

- 6 NYCRR Part 372 – Hazardous Waste Manifest System and Related Standards for Generators, Transporters and Facilities
- 6 NYCRR Subpart 374-1 – Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities
- 6 NYCRR Subpart 374-2 – Standards for the Management of Used Oil
- 6 NYCRR Subpart 374-3 – Standards for Universal Waste
- 6 NYCRR Part 375 – Environmental Remediation Programs
- 6 NYCRR Part 376 – Land Disposal Restrictions
- 6 NYCRR Part 612 – Registration for Petroleum Storage Facilities (February 1992)
- 6 NYCRR Part 613 – Petroleum Bulk Storage
- 6 NYCRR Part 700-706 – Surface Water and Groundwater Classification Standards
- 6 NYCRR Part 750 – State Pollutant Discharge Elimination System (SPDES) Regulations
- 10 NYCRR Part 67 – Lead Poisoning Prevention and Control
- 12 NYCRR Part 56 – Industrial Code Rule 56 (Asbestos)
- Code of Federal Regulations (CFR) Title 29 Part 1910.120 – Hazardous Waste Operations and Emergency Response
- CFR Title 29 Part 1926 – Safety and Health Regulations for Construction
- 40 CFR Part 280 – Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks
- DAR-1 (formerly Air Guide 1) (1997) – Guidelines for the Control of Toxic Ambient Air Contaminants
- NYSDEC Title 6 of the New York Codes, Rules, and Regulations
- NYSDEC – Permanent Closure of Petroleum Storage Tanks (July 1988)
- NYSDEC – Sampling, Analysis, and Assessment of PFAS Under NYSDEC's Part 375 Remedial Programs (April 2023)
- NYSDEC – Spill Response Guidance Manual
- NYSDEC Commissioner Policy (CP)-43 – Groundwater Monitoring Well Decommissioning Policy (2009)
- NYSDEC CP-51 – Soil Cleanup Guidance (2010)
- NYSDEC DER-2 – Making Changes to Selected Remedies (Revised April 2008)
- NYSDEC DER-10 – Technical Guidance for Site Investigation and Remediation (2010)
- NYSDEC DER-23 – Citizen Participation Handbook for Remedial Programs (March 2010)
- NYSDEC DER-31 – Green Remediation (August 2010)

- NYSDEC DER-32 – Brownfield Cleanup Program Applications and Agreements (June 2017)
- NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1 – Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations (1998)
- NYSDEC TOGS 1.3.8 – New Discharges to Publicly Owned Treatment Works
- TOGS 2.1.2 – Underground Injection/Recirculation at Groundwater Remediation Sites
- NYSDEC TOGS 5.1.8 – New York State Stormwater Management Design Manual (2008)
- NYSDEC TOGS 5.1.10 – New York Standards and Specifications for Erosion and Sediment Controls (2005)
- NYSDOH – Guidance for Evaluating Soil Vapor Intrusion in the State of New York (2006), and Subsequent Updates (2024)
- NYSDOH Environmental Health Manual CSFP-530 – "Individual Water Supplies - Activated Carbon Treatment Systems"
- NYSDEC Permanent Closure of Petroleum Storage Tanks (2003)
- NYSDEC Spill Response Guidance Manual (1995)
- Technical and Administrative Guidance Memorandum 3028 – "Contained In" Criteria for Environmental Media: Soil Action Levels (August 1997)
- TOGS 1.1.1 – Ambient Water Quality Standards & Guidance Values and Groundwater Effluent Limitations (1998, Addenda 2000, 2004, and 2023)
- Title 10 of the Official Compilation of Codes, Rules and Regulations of the State of New York, Chapter 1, Part 5-1 – Drinking Water Supplies, Public Water Systems
- United States Environmental Protection Agency (USEPA) Title 40, CFR

3.2 Alternative I – Technical Description

Alternative I, a Track 1 remedy, will include implementation of the following remedial elements:

1) Development and implementation of a CHASP and CAMP for the protection of on-site workers, visitors, and the environment during remediation

2) To facilitate site remediation, demolition and removal of subsurface obstructions (e.g., remnant foundation elements) and the gravel cover by the contractor and management of removed construction and demolition (C&D) debris in accordance with Part 360 and 361 regulations. Review and certification of C&D transport and disposal methodologies is not a requirement of the Remediation Engineer (RE). The RE is responsible for documenting that C&D debris is not comingled with contaminated site soil and fill

3) Excavation and removal of all non-native fill/soil exceeding UU SCOs to depths up to about 20 feet bgs or until UU SCOs are achieved

4) Screening for indications of contamination source areas during any intrusive site work by visual, olfactory, and instrumental methods (e.g., PID)

5) Decommissioning and removal of USTs, if encountered, in accordance with NYSDEC DER-10 5.4(b)(5)

6) Installation of support of excavation (SOE) necessary to facilitate remedial excavation

7) Dewatering, as necessary, to accommodate remedial excavation below the groundwater table and remediation of petroleum impacted groundwater

8) Collection and analysis of confirmation soil samples in accordance with DER-10 to evaluate the performance of the remedy with respect to attainment of Track 1 SCOs

9) If necessary pending the results of the post-excavation sampling, application of Oxygen Release Compound (ORC®) and/or granular activated carbon to the open excavation to reduce remaining petroleum-related VOC concentrations in groundwater to pre-release or asymptotic concentrations;

10) Implementation of an off-site in-situ groundwater treatment program (e.g., installation of Oxygen Release Compound [ORC] filter socks off-site)

11) Import of backfill, where required, in compliance with: a) UU SCOs; b) 6 NYCRR Part 360 regulations; and c) federal, state, and local rules and regulations for handling and transport of backfill

If a Track 1 remedy is not achieved before issuance of a Certificate of Completion (COC), an SMP and Environmental Easement (EE) will be required, and a Track 2 or Track 4 RURR remedy will be achieved. Short-term ECs will be considered until the Track 1 remedy is achieved and will be in effect for no more than 5 years from the date of the COC.

The Alternative I remediation extent is shown on Figure 9 and the requirements for each of the Track 1 tasks are described below.

3.2.1 On-Site Worker, Public Health and Environmental Protection

A site-specific CHASP has been developed and will be implemented during excavation and foundation construction to protect on-site workers from accidents and acute/chronic exposures to the identified contaminated media. Each contractor performing RAWP operations will be required to develop and enforce their own HASP that is consistent with Occupational Safety and Health Administration (OSHA) requirements and, at a minimum, meets the requirements of the CHASP in Appendix D. Public health will be protected by implementing and enforcing dust, odor, and organic vapor control and monitoring procedures included in the CAMP. The CAMP will include continuous perimeter monitoring of dust and organic vapor using DustTrak aerosol monitors and PIDs capable of recording data and calculating 15-minute averages. Field personnel will monitor perimeters for visible dust and odors. The environment will be protected by implementing and enforcing soil erosion prevention measures.

The CHASP is included in Appendix D. A site-specific CAMP was developed in accordance with the NYSDOH Generic CAMP and is included as Appendix E.

3.2.2 Demolition and Removal of Construction and Demolition Debris

C&D debris generated during the remedial excavation will be handled, transported and disposed of in accordance with federal, state, and city regulations (including 6 NYCRR Part 360 Series regulations). Review and certification of hazardous building materials, C&D transport and disposal methodologies will be the responsibility of contractors performing demolition and off-site transportation and disposal of C&D debris. The RE is responsible for documenting that C&D debris is not commingled with contaminated site soil and fill.

3.2.3 Fill and Soil Removal

Remedial excavation will include the removal of non-native fill/soil exceeding the UU SCOs across the site. The estimated volume of non-native fill and soil requiring removal and off-site disposal for a Track 1 cleanup is about 2,900 cubic yards. The estimated depth of excavation required to achieve a Track 1 ranges from about 18 to 20 feet bgs (el. -10 to -13). The extent of the Track 1 remedial excavation is shown on Figure 9. An SOE system and a dewatering system will be designed, constructed and operated (dewatering only) to accommodate Track 1 excavation depths. See Section 3.2.8 for more detail on dewatering.

3.2.4 Off-Site In-Situ Groundwater Treatment

A remediation product, ORC-A filter socks, will be deployed in off-site monitoring wells (MW-10, MW-11, and MW-12) to remediate petroleum-impacted groundwater. Injections of in-situ remediation products within the adjoining sidewalks will not be feasible due to the proximity of underground utilities and NYCTA structures. Oxygen release compounds produce a controlled-release of molecular oxygen for an extended period of time to treat localized, dissolved-phase petroleum hydrocarbons. ORC-A is a formulation of calcium oxy-hydroxide that produces a controlled-release of molecular oxygen for a period of up to 12 months upon hydration. The application of ORC-A to the subsurface will enhance biological activity, which accelerates the rate of naturally-occurring aerobic biodegradation of petroleum compounds in groundwater. The ORC-A filter socks are permeable fabric sleeves filled with pure ORC-A material and an inert carrier matrix inserted into a Naltex™ Flex-Guard for ease-of-application and maximum durability.

3.2.5 Screening for Indications of Contamination

Visual, olfactory, and instrumental (PID) soil screening and assessment will be performed by field personnel under the direction of the RE during all remedial and development excavations into known or potentially contaminated non-native fill and soil. Soil screening will be performed regardless of when the invasive work is done and will include all excavation and invasive work performed during the remedy (prior to issuance of the COC).

Field screening will be performed by field personnel under the direct supervision of the RE or qualified environmental professional (QEP). Résumés will be provided for all personnel responsible for field screening (i.e., those representing the RE) of invasive work for known or unknown contaminant sources during remediation and development work.

3.2.6 UST Removal

All known USTs were removed during the IRM, however, if a UST and/or associated appurtenances are identified during remediation, they will be decommissioned, disposed of off-site, and registered with the NYSDEC PBS unit in accordance with 6 NYCRR Part 613.9, NYSDEC CP-51, and other applicable NYSDEC tank closure requirements including DER-10 Section 5.5. If encountered, petroleum-impacted soil in the unsaturated zone will be excavated for off-site disposal. Petroleum-impacts at the groundwater table will be addressed through excavation and dewatering. Excavated petroleum-impacted non-native fill and soil will be stockpiled separately, characterized, and disposed of off-site at permitted disposal facilities in accordance with applicable regulations. Endpoint samples will be collected from the base and sidewalls of the tank removal area(s), if required, in accordance with DER-10.

3.2.7 Support of Excavation

An SOE system would be constructed to accommodate removal of non-native fill and soil required for the attainment of RAOs under a Track 1 cleanup. Remedial excavation along the site perimeter would extend below the water table in some areas to an estimated maximum depth of 20 feet bgs. Dewatering would be implemented to maintain a water level at least 2 feet below working grade. See Section 3.2.8 for more detail on dewatering. The site contractor would install excavation support and bracing to permit excavation to the requisite remedial depth. The SOE required under Track 1 will consist of a sealed-seam sheet pile system and likely underpinning of the building to the north and retaining wall to the east.

3.2.8 Excavation Dewatering and Treatment

Dewatering of groundwater will be required to accommodate excavation of soil exceeding UU SCOs and will also act as a method of groundwater remediation through source removal. Prior to mobilization, the contractor will follow the Rules of the City of New York (RCNY) Title 15, Chapter 19, Use of the Public Sewers and the New York City Department of Environmental Protection (NYCDEP) “Procedure for Obtaining Letter of Approval for Groundwater Discharge to Sanitary or Combined Sewer” and will use the approval to obtain a Temporary Discharge of Groundwater into the City Sewer System Permit. The dewatering system will include pretreatment (e.g., settling tank, bag filters, carbon filtration) to reduce contaminant concentrations below NYCDEP effluent limitations prior to discharge to the NYC sewer system. If the contractor will discharge more than 10,000 gallons per day, the site contractor will also have to obtain approval from the NYCDEP’s Bureau of Water and Sewer Operations, Chief of Permitting and Compliance. The dewatering and treatment system will be designed, operated and maintained by the Contractor’s NYS-licensed Professional Engineer (PE). If the dewatering system has a capacity to withdraw 100,000 gallons per day or more, the contractor will have to obtain a Water Withdrawal Permit or its equivalent from the NYSDEC.

3.2.9 Confirmation Soil Sampling

Confirmation soil samples will be collected from the excavation base at a frequency of one per 900 square feet per NYSDEC DER-10 5.4(b)(5)(ii). Sidewall samples will not be collected from the site perimeter because SOE measures (e.g., sheeting and underpinning) will preclude access to soil sidewalls. Sidewall

samples will be collected at a frequency of one sidewall sample per 30 linear feet between varying excavation depths. An estimated five confirmation endpoint and two sidewall soil samples, plus QA/QC samples, will be collected to confirm remedial performance and will be analyzed for the Part 375 (31 December 2025) list of VOCs, SVOCs, polychlorinated biphenyls (PCBs), pesticides, herbicides, metals (including hexavalent and trivalent chromium), cyanide, PFAS, and 1,4-dioxane. Over-excavation may be required as necessary to remove soil that does not comply with the SCOs. If over-excavation is completed, additional confirmation samples will be required.

3.2.10 Excavation Backfill

In areas that are excavated deeper than development grade for remedial purposes, the excavation areas will be backfilled to raise the site to development grade. Backfill material will consist of soil/fill meeting the UU SCOs. All imported fill must be sourced from appropriately licensed facilities with no history of environmental contamination. If sampling of the proposed soil/fill is required, qualified environmental personnel will collect representative samples at a frequency consistent with DER-10. The samples will be analyzed for 6 NYCRR Part 375 VOCs, SVOCs, pesticides, herbicides, PCBs, metals, and emerging contaminants, including PFAS, and 1,4-dioxane, by a NYSDOH Environmental Laboratory Approval Program (ELAP)-certified laboratory. Virgin crushed stone with less than 10% by weight passing through a No. 80 sieve will not require sampling prior to import.

An estimated 3,850 cubic yards of backfill would be required to raise the site to development grade upon completion of the Track 1 remediation.

3.3 Alternative II – Technical Description

A Track 4 remedy is proposed and will include implementation of the following remedial elements:

1) Development and implementation of a CHASP and CAMP for the protection of on-site workers, visitors, and the environment during remediation activities
2) To facilitate site remediation, demolition and removal of subsurface obstructions (e.g., remnant foundation elements), as needed, by the contractor and management of removed C&D debris in accordance with Part 360 and 361 regulations. Review and certification of C&D transport and disposal methodologies is not a requirement of the RE. The RE is responsible for documenting that C&D debris is not comingled with contaminated site soil and fill
3) Decommissioning and removal of USTs, if encountered, in accordance with NYSDEC DER-10 5.4(b)(5)
4) Establishment of the Track 4 SCOs as the lower of the RURR SCOs and relevant PGW SCOs;
5) Implementation of an on-site and off-site in-situ groundwater treatment program consisting of application of colloidal activated carbon (PetroFix) via direct push injections on-site and installation of ORC Advanced® (ORC-A) filter socks in off-site monitoring wells

6) Installation of one on-site post-treatment groundwater monitoring well (PTMW-01) and collection of post-remediation groundwater samples from the new on-site wells and existing off-site wells (MW10, MW11, and MW12) to evaluate performance of the groundwater treatment remedy

7) Excavation and removal of non-native fill/soil across the site to between el. 5 and el. 7 (2 feet bgs) to facilitate installation of a composite cover system

8) Screening for indications of contamination source areas during ground-intrusive site work by visual, olfactory, and instrumental (PID) methods

9) Appropriate off-site disposal of non-native fill and soil removed from the site in accordance with federal, state, and local rules and regulations for handling, transport, and disposal

10) Collection and analysis of documentation soil samples in accordance with DER-10 at the completion of the remedial excavation to document post-remediation soil quality

11) Placement of a physical demarcation layer where contamination remains (site-wide), consisting of orange snow fencing or equivalent material at the excavation bottom prior to backfilling

12) Import of backfill, where required, in compliance with: a) the lower of the RURR and relevant PGW SCOs, whichever is more stringent; b) Title 6 of the New York Codes, Rules and Regulations (6 NYCRR) Part 360 regulations; and c) federal, state, and local rules and regulations for handling and transport of backfill

13) Capping of site-wide excavated areas with an engineered composite cover system consisting of at least 2 feet of certified-clean fill (e.g., fill meeting the lower of relevant PGW and RURR SCOs), with the top 4 inches composed of ¾-inch virgin stone

14) Establishment of use restrictions (i.e., ICs) including prohibitions on the use of groundwater from the site and prohibitions on sensitive site uses, such as farming or vegetable gardening in remaining site soil, to prevent future exposure to remaining contamination

15) Recording of an EE to memorialize the remedial action and the ICs to ensure that future owners of the site continue to maintain these controls as required

16) Preparation of an SMP that describes management of the ICs and ECs. Implementation of the SMP following completion of the remedy will be stipulated by the EE. If further redevelopment is implemented in the future under the SMP, future structures will require SVI evaluation and possible mitigation.

3.3.1 On-Site Worker, Public Health and Environmental Protection

A site-specific CHASP was developed and will be enforced to protect on-site workers from accidents and acute and chronic exposures from the identified contaminated media. The site CHASP is included as Appendix D. Each contractor performing RAWP operations will have and enforce a HASP that, at a minimum, meets the CHASP criteria. Public health will be protected by implementing and enforcing dust, odor, and vapor control as specified in the CAMP. The CAMP includes continuous perimeter monitoring

of dust and organic vapors as discussed in section 5.4.13, using DustTrak aerosol monitors and PIDs capable of recording data and calculating 15-minute averages. Field personnel, supervised by the RE, will monitor site perimeters for visible dust and odors. In addition, field personnel will be equipped with a handheld PID during excavation. The environment will be protected by implementing and enforcing the appropriate soil erosion prevention measures.

3.3.2 Demolition and Removal of Construction and Demolition Debris

C&D debris generated during remediation will be handled, transported, and disposed of in accordance with federal, state, and city regulations (including 6 NYCRR Part 360 Series regulations). Review and certification of C&D debris transport and disposal methodologies will be the responsibility of contractors performing demolition and off-site transportation and disposal of C&D debris. The RE is responsible for documenting that C&D debris is not commingled with contaminated site soil and fill.

3.3.3 Fill and Soil Removal

To achieve a Track 4 cleanup, site-wide excavation will extend between el. 5 and el. 6 feet NAVD88 across the site (about 2 feet bgs).

Known source material and USTs were removed during the IRMWP implementation, as documented in the CCR, and additional source material is not expected to be encountered or excavated during RAWP implementation. Remaining contaminated soil and groundwater extending below remedial excavation depth will be treated in-situ, as described in Section 3.3.6.

The estimated volume of non-native fill and soil requiring removal and off-site disposal for a Track 4 cleanup is about 330 cubic yards. This estimate is based on site-wide excavation to remove non-native fill and soil between el. 5 and el. 6 (about 2 feet bgs). The extent of the Track 4 remedial excavation is shown on Figure 10A.

3.3.4 Screening for Indications of Contamination

Visual, olfactory, and PID soil screening and assessment will be performed by field personnel under the direction of the RE during all remedial excavations into known or potentially contaminated soil/fill. Soil screening will be performed regardless of when the invasive work is done and will include all excavation and invasive work performed during the remedy (prior to issuance of the COC).

Field screening will be performed by field personnel under the direct supervision of the RE or QEP. Résumés will be provided for all personnel responsible for field screening (i.e., those representing the RE) of invasive work for known or unknown contaminant sources during remediation and development work.

3.3.5 UST System Removal

All known USTs were removed during the IRM, however, if a UST and/or associated appurtenances is identified during remedial construction, they will be decommissioned, disposed of off-site, and registered with the NYSDEC PBS unit in accordance with 6 NYCRR Part 613.9, NYSDEC CP-51, and other applicable NYSDEC tank closure requirements including DER-10 Section 5.5. If encountered, petroleum-impacted

soil in the unsaturated zone will be excavated for off-site disposal. Petroleum-impacts at the groundwater table will be addressed through in-situ treatment. Excavated petroleum-impacted non-native fill and soil will be stockpiled separately, characterized, and disposed of off-site at a permitted disposal facility in accordance with applicable regulations. Endpoint samples will be collected from the base and sidewalls of the tank removal area(s), if required, in accordance with DER-10.

3.3.6 In-Situ Groundwater Treatment

The treatment will be divided into on- and off-site areas. The on-site area will include injections to be performed through a series of temporary locations using direct-push drilling with retractable stainless steel injection tooling. A remediation product, PetroFix, will be applied in-situ via direct push injections to remediate petroleum-impacted groundwater across the site (see Figure 10B). Injections will be performed in rows across the former UST source areas, spaced closer together within the source areas and further apart downgradient of the source areas. PetroFix is manufactured by Regenesis, a remediation product vendor based in San Clemente, California. The PetroFix mixture consists of water, micron-scale activated carbon (corn-syrup-like black fluid) and an anaerobic electron acceptor blend (sodium nitrate/ammonium sulfate as white powder). After injection, dissolved phase hydrocarbons will sorb onto the activated carbon particles, while the fast- and slow-release electron acceptors stimulate prolonged biodegradation of petroleum-related compounds.

The below table summarizes the planned quantity of PetroFix to be injected within the on-site treatment area. The injection volume and dilution factor of PetroFix reagent will be evaluated based on field conditions observed during implementation of in-situ injections.

Area (SF)	Injection Points	Injection Interval (feet bgs)	PetroFix Amount (lbs)	Electron Acceptor (lbs)	Injection Volume (gallons)
2,700	42	12 to 22	6,800	340	16,382

The off-site area will include installation of a second remediation product, ORC-A filter socks, in off-site monitoring wells (MW-10, MW-11, and MW-12) to remediate petroleum-impacted groundwater where injections are not feasible due to the proximity of underground utilities and NYCTA structures. Oxygen release compounds produce a controlled-release of molecular oxygen to treat localized, dissolved-phase petroleum hydrocarbons. ORC-A is a formulation of calcium oxy-hydroxide that produces a controlled-release of molecular oxygen for a period of up to 12 months upon hydration. The application of ORC-A to the subsurface can enhance biological activity, which accelerates the rate of naturally-occurring aerobic biodegradation in groundwater. The ORC-A filter socks are permeable fabric sleeves filled with pure ORC-A material and an inert carrier matrix inserted into a Naltex™ Flex-Guard for ease-of-application and maximum durability.

Appendix F includes a groundwater treatment design document prepared by Regenesis, product specifications, application instructions and safety data sheets (SDS). Figure 10B shows the proposed injection and ORC-A locations based on the anticipated radius of influence during injections.

To support future performance evaluation of the groundwater treatment remedy, baseline groundwater samples were collected from on- and off-site monitoring wells as part of a pre-design investigation performed during the IRMWP implementation.

The previously installed monitoring wells were advanced using a track-mounted drill rig and consist of 2-inch-diameter, schedule 40, 0.02-inch-slotted polyvinyl chloride (PVC) screens. The monitoring wells are screened in 10-foot intervals across the groundwater interface from 7 to 20 feet bgs. A baseline groundwater sampling event was conducted between 16 and 18 October 2024 for analysis of VOCs. Analytical results of the baseline groundwater sampling event are presented in Table 1 and Figures 5A and 5B. The baseline groundwater laboratory analytical reports and a Data Usability Summary Report (DUSR) are included in Appendix G.

During the IRM period, four previously installed monitoring wells (MW-03, MW-04, MW-06, and MW-07) were damaged and removed from the subsurface. An additional baseline groundwater sampling event will occur on monitoring wells PTMW-01, MW-10, MW-11, and MW-12 prior to treatment to evaluate pre-treatment conditions.

Future groundwater samples will be collected from PTMW-01, MW-10, MW-11, and MW-12 on a quarterly basis for the first year post-treatment to evaluate the effectiveness of the remedy. Quarterly groundwater sampling may be implemented after the issuance of the COC under the NYSDEC-approved SMP. All baseline and post-treatment groundwater samples will be analyzed for VOCs, calcium, magnesium, aluminum, sulfate and QuantArray-Petro functional genes. Groundwater quality parameters, including pH, dissolved oxygen, oxidation reduction potential (ORP), and conductivity will be measured prior to groundwater sample collection.

The baseline, pre-treatment, and quarterly groundwater samples will be used to evaluate performance of the groundwater treatment remedy.

3.3.7 Documentation Soil Sampling

Documentation soil samples will be collected from the excavation base at a frequency of one per 900 square feet per NYSDEC DER-10 5.4(b)(5)(ii). An estimated 5 documentation endpoint soil samples, plus QA/QC samples, will be collected to document remaining contamination and will be analyzed for the Part 375 list of VOCs, SVOCs, PCBs, pesticides, herbicides, metals (including hexavalent and trivalent chromium), cyanide, PFAS, and 1,4-dioxane.

3.3.8 Engineered Cover System and Excavation Backfill

An engineered cover system consisting of a minimum of 2 feet of approved clean fill, would be installed and left in place until potential redevelopment starts at a later date. For the soil cover system, the top 4 inches will consist of virgin ¾-inch crushed stone to serve as dust and vegetation suppression and to mitigate erosion. Imported fill will consist of soil/fill meeting the lower of the RURR and relevant PGW SCOs, whichever is more stringent. All imported fill must be sourced from appropriately licensed facilities with no history of environmental contamination. If sampling of the proposed soil/fill is required, qualified

environmental personnel will collect representative samples at a frequency consistent with DER-10. The samples will be analyzed for 6 NYCRR Part 375 VOCs, SVOCs, pesticides, herbicides, PCBs, metals (including hexavalent and trivalent chromium), cyanide, and emerging contaminants, including PFAS, and 1,4-dioxane, by a NYSDOH ELAP-certified laboratory. Virgin crushed stone or recycled concrete aggregate (RCA) with less than 10% by weight passing through a No. 80 sieve will not require sampling prior to import.

An estimated 420 cubic yards of backfill would be required to raise the site to sidewalk grade upon completion of the Track 4 remediation.

3.3.9 Site Management Plan and Environmental Easement

An EE would be recorded referencing ICs that are part of the selected remedy, which would be binding upon all subsequent owners and occupants of the property. The ICs would: 1) restrict the site use to residential and commercial uses, although land use is subject to local zoning laws; 2) restrict the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDEC or NYSDOH; 3) require the completion and submission to the NYSDEC of periodic certifications of ICs in accordance with Part 375; and 4) include notice-of-use restrictions of the site soil. The SMP would identify all use restrictions and long-term monitoring and maintenance requirements to ensure the ICs and ECs remain in place and are effective.

An SVI evaluation will be conducted after remedial elements are completed and in the case of a future building being constructed. As a building will not be constructed during the RAWP implementation, an SVI will be implemented under the SMP, if necessary, based on the proposed development plan.

3.4 Green Remediation Program

The green and sustainable remediation (GSR) components that would be considered for the selected alternative are as follows:

- Environmental impacts of treatment technologies and remedy stewardship over the long term
- Reducing direct and indirect greenhouse gas (GHG) and other emissions
- Increasing energy efficiency and minimizing use of non-renewable energy
- Conserving and efficiently managing resources and materials
- Reducing waste, increasing recycling, and increasing reuse of materials that would otherwise be considered a waste
- Maximizing habitat value and creating habitat when possible, including maximizing the planting of trees, shrubs, and other carbon dioxide sinks in redevelopment
- Fostering green and healthy communities and working landscapes which balance ecological, economic, and social goals
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development with respect to the remedy

- Incorporating the GSR principles and techniques to the extent feasible in the future development at this site

To evaluate the remedy with respect to GSR principles as part of the remedial program, a best management practices (BMP) assessment was conducted in accordance with the ASTM Guide for Standard Cleanups, and an environmental footprint analysis was conducted for each remedial alternative using SiteWise. The results of the environmental footprint analysis are provided in Appendix H.

BMPs for the project related to these GSR metrics, and BMPs for minimizing community impacts, protecting habitats and natural and cultural resources, and promoting environmental justice, would be incorporated into the remedial program, as appropriate. The project design specifications would include detailed requirements, including implementation of the BMPs described in Section 4.1.2. A BMP assessment and an environmental footprint analysis would also be conducted at the completion of the remedy. As practicable, water consumption, GHG emissions, renewable and non-renewable energy use, waste reduction, and material use would be estimated at the end of the remediation phase. Progress with respect to GSR metrics would be tracked during implementation of the remedial action and reported in the Final Engineering Report (FER).

A climate screening assessment was conducted for the site and concluded that the site is vulnerable to severe storms, flooding, and sea level rise; however, the proposed redevelopment would reduce these vulnerabilities and mitigate the effects of climate change at the site. The climate screening checklist is provided in Appendix I.

3.5 Evaluation of Remedial Alternatives

The following is an evaluation of the proposed remedy based on the NYSDEC BCP remedy evaluation criteria listed below. The first two criteria are considered “threshold criteria” and the remaining criteria are “balancing criteria”. A remedial alternative must meet the threshold criteria to be considered and evaluated further under the balancing criteria.

A. Protection of human health and the environment

B. Compliance with standards, criteria, and guidance

C. Short-term effectiveness and impacts

D. Long-term effectiveness and permanence

E. Reduction of toxicity, mobility, or volume of contaminated material

F. Implementability

G. Cost effectiveness

H. Community acceptance

I. Land use

3.5.1 Protection of Public Health and the Environment

Alternative I – The Track 1 remedy will completely mitigate the potential for complete exposure pathways through the complete removal of on-site contaminated media. Remediating the site to Track 1 standards will result in the removal of soil exceeding Track 1 SCOs. Groundwater contamination will also be remediated through dewatering and treatment of off-site impacts after the remedial excavation is complete. It is anticipated that soil vapor will be remediated through the removal of contaminated soil and groundwater source areas. The RAOs for public health and environmental protection will be met through the complete removal of contaminated soil and remediation of groundwater, which will eliminate the possibility for ingestion and inhalation of, or dermal contact with contaminated soil, groundwater and/or soil vapor.

Alternative II – Under Alternative II, future exposure will be limited by the establishment ICs, including an EE, governed by an SMP. The RAOs for public health and environmental protection will be met through a combination of contaminant removal and in-situ treatment, ECs, and ICs (including an EE and SMP). Remediating the site to Track 4 standards will mitigate exposure pathways to on-site contaminated media by removing shallow non-native fill, implementing in-situ groundwater treatment, and installing an engineered composite cover system that will preclude direct contact, ingestion, and inhalation of remaining contaminated soil particles.

Public health will be protected during remediation under all remedial alternatives by implementing and enforcing dust, odor, and organic vapor control and mitigation procedures when needed. The environment will be protected by implementing and enforcing a soil erosion and sediment control plan.

3.5.2 Compliance with Standards, Criteria, and Guidance

Alternative I – Remediating the site to Track 1 UU standards will demonstrate compliance with all applicable SCGs through the removal of impacted on-site soil, dewatering, and in-situ treatment of off-site petroleum-impacted groundwater.

Alternative II – The Track 4 remedy includes removal of shallow non-native fill exceeding the RURR and relevant PGW SCOs, as set forth in DER-10 Technical Guidance for Site Investigation and Remediation, CP-51, and 6 NYCRR Part 375, and in-situ treatment of source material. Alternative II complies with the SCGs.

All remedial alternatives will also comply with SCGs that involve protection of the public health and environment during the remedial action by implementing and enforcing a site-specific CHASP. OSHA requirements for on-site construction safety will be followed by the site contractors. Both Alternatives would comply with the GSR requirements in DER-31.

3.5.3 Short-Term Effectiveness and Impacts

All Alternatives – Short-term adverse impacts from migration of contaminants carried in dewatering fluids, soil, vapor, and dust to the community, site workers, and the environment will be minimized by implementing appropriate control plans (including the CHASP, CAMP, Soil/Fill Management Plan [SFMP],

and dust, odor, and vapor control measures). Additional short-term adverse impacts include increased noise, potential obstructions on roadways, and pedestrian traffic associated with construction.

Both alternatives will require 25-cubic-yard capacity truck trips to haul excavated fill required for the baseline remediation program. A Track 1 remedy will require about 118 truck trips and a Track 4 remedy will require about 13 truck trips. Truck traffic under both remedies will be routed on the most direct course by the Contractor using major thoroughfares where possible, and flaggers will be used to protect pedestrians at site entrances and exits.

3.5.4 Long-Term Effectiveness and Impacts

Alternative I – The Track I remedy will remove soil exceeding UU SCOs from the site and remediate impacted groundwater through the dewatering system and off-site treatment of petroleum-impacted groundwater in-situ. Because an EE and SMP are not required as part of the Track 1 remedy, Article 141 of the NYSDOH code will be relied upon to prevent ingestion of groundwater, which prohibits potable use of groundwater without prior approval. Future site use will be unrestricted; therefore, the long-term effectiveness of this remedy will eliminate potential environmental exposure and satisfy the objectives of this criterion.

Alternative II – Under a Track 4 remedy, shallow non-native fill soil above RURR and relevant PGW SCOs will be removed to between el. 5 and el. 6 (about 2 feet bgs). Contaminated groundwater will be treated in-situ in the petroleum-impacted areas both on- and off-site. An SMP and EE will restrict the use of groundwater on the site. Long-term effectiveness and permanence of this alternative will be achieved through the implementation of the SMP and through enforcement of an EE, which will require annual inspections and reporting in perpetuity. The long-term effectiveness of the Track 4 remedy will mitigate potential exposure to site contaminants and satisfy the objectives of this criterion.

3.5.5 Reduction of Toxicity, Mobility, or Volume of Contaminated Material

Alternative I – The Track 1 remedy will permanently and completely reduce the toxicity, mobility, and volume of contamination through excavation and removal of on-site non-native fill/soil exceeding the UU SCOs. Extensive dewatering required by this remedy will be expected to also remediate VOCs in groundwater above SGVs on-site, and remaining off-site impacts will be treated in-situ. Extensive removal of soil and groundwater from the site under a Track 1 remedy is expected to significantly reduce soil vapor contamination. Therefore, Alternative I provides the greatest reduction of the toxicity, mobility, and volume of contaminated non-native fill and soil.

Alternative II – The Track 4 remedy will also reduce the toxicity, mobility, and volume of soil contamination across the site through the excavation of shallow non-native fill exceeding RURR and relevant PGW SCOs to between el. 5 and el. 6 (about 2 feet bgs). In-situ groundwater treatment will be expected to also remediate VOCs in groundwater above SGVs both on-site and off-site. The removal of contaminated soil and treatment of groundwater from the site under the Track 4 remedy is expected to improve soil vapor conditions at the site. The future SMP would include a provision to perform an SVI evaluation for any future buildings to be constructed at the site.

3.5.6 Implementability

Alternative I – Implementing the Track 1 remedy is feasible; however, it is more technically challenging to design and achieve because of the significant increase in excavation depth, which would require dewatering and a SOE system (e.g., steel sheetpiles, underpinning of adjoining structures) next to NYCT subway infrastructure to reach the remedial excavation depths (up to 20 feet bgs compared to 2 feet bgs). Dewatering wells would have to be installed and a treatment system installed to allow for excavation about 7 to 10 feet below the groundwater table. Due to these technical challenges, the duration of a Track 1 remedy would be greater and would be far more challenging to implement than a Track 4 remedy.

Alternative II – Implementing the Track 4 remedy is feasible and more easily implementable because the depth of remedial excavation is shallower than a Track 1 excavation, and excavation support and dewatering is not necessary. The resulting duration of the remedy will be lower than a Track 1 remedy. For these reasons, the Track 4 remedy is easier to implement than the Track 1 remedy.

Contractors experienced in implementing both described remedies are readily available in the area of the site.

3.5.7 Cost Effectiveness

The estimated remediation cost of each cleanup track is as follows:

- Track 1 remedy: approximately $5 million
- Track 4 remedy: approximately $1.2 million

The estimated remediation cost of a Track 1 cleanup is $5 million. As the site will be remediated to a UU level, there will not be any long-term operations, maintenance, or monitoring costs associated with the proposed remedy. This alternative is the most costly because of the additional time and costs associated with handling and disposal of fill/soil above UU SCOs, installation of SOE, dewatering, and importing and placing additional backfill.

The estimated remediation cost of a Track 4 cleanup is $1.2 million. This alternative is 66% less expensive over the long term than a Track 1 cleanup because the costs for handling and disposal of fill/soil, SOE, dewatering, and importing and placing backfill are significantly reduced. In this scenario, long-term operations, maintenance, or monitoring costs associated with ICs and ECs are required. This alternative is the most cost-effective alternative available to meet the applicable RAOs.

3.5.8 Community Acceptance

Both alternatives should be acceptable to the community because the potential complete exposure pathways will be eliminated through source removal and/or mitigated upon completion of the remedial actions. The Track 1 remedy may be less acceptable to the community because of the increased short-term impacts and remediation duration associated with complete removal of soil above Track 1 SCOs. The Track 4 remedy may be more acceptable to the community because of decreased short-term impacts and

remediation duration and achieve the RAOs through removal of contaminated fill and the use of ECs and/or ICs.

The selected remedy will be subject to a 45-day public comment period. Any substantive public comments received will be addressed before the remedy is approved.

3.5.9 Green and Sustainable Remediation (including Climate Resiliency)

To assess potential remedial alternatives with respect to GSR principles, an environmental footprint analysis was conducted for each remedial alternative using SiteWise. The environmental footprint analyses assess the environmental footprint at each stage of remediation (site preparation, excavation, and restoration). The following metrics were quantified:

1. GHG Emissions
2. Total Energy Use
3. Water Consumption
4. Electrical Usage
5. Total Nitrogen Oxides (NO_x) Emissions
6. Total Sulphur Oxides (SO_x) Emissions
7. Total Particulate Matter Emissions (specifically particulate matter less than 10 microns in diameter [PM10])

The Alternative II remedy would generate less environmental impact than the Alternative I remedy, as lower GHGs, electricity, total energy usage, and water impacts would be generated throughout remediation.

3.5.10 Land Use

The current, intended, and reasonably anticipated future land use of the site and its surroundings are compatible with the selected remedy. The proposed development consists of an open-air gravel-covered parking lot. Review of previous environmental and public documents for the site reflect the following conclusions:

1. The current and proposed use of the site and its surroundings will be compatible with the selected remedy.
2. The proposed site use conforms to applicable zoning requirements.
3. The proposed site use conforms to historical and/or recent development patterns in the area.
4. The site is in an urban area characterized by residential, commercial, and industrial uses.
5. There are no federal or state land designations.
6. The population growth patterns and projections support the proposed land use.
7. The site is accessible to existing infrastructure.
8. Groundwater is not used as a potable water source in NYC. Potable water provided to the City of New York is derived from surface impoundments in the Croton, Catskill, and Delaware watersheds.

9. The nearest ecological receptor is Hudson River, which is approximately 2,000 feet to the west of the site.
10. According to the Effective National Flood Insurance Rate map for the City of New York published by the Federal Emergency Management Agency (Community Panel No. 3604970182F, dated 5 September 2007), the site is located in a Zone AE special flood hazard area with a base flood elevation of 10.

3.6 Summary of the Proposed Remedy

While both alternatives would be protective of human health and the environment, the Track 4 (Alternative II) remedy achieves the RAOs established for the project with less short-term impacts on the community and at a substantially lower cost. The selected remedy will effectively reduce the mobility, toxicity, and volume of contaminants. ICs and ECs are designed to make the remedy protective of human health and the environment in the future. The remedy is considered feasible and cost effective because the excavation depths do not present significant technical challenges (e.g., depth of excavation, lack of SOE and dewatering) and can be achieved through conventional construction measures. Alternative II can be feasibly and practically implemented and should be acceptable to the community because it eliminates complete exposure pathways. Alternative II is the recommended remedial alternative for this site.

4.0 REMEDIAL ACTION PROGRAM

4.1 Governing Documents

The primary documents governing the remedial action are summarized in this section. Where referenced, copies of the full plans are provided in the appendices.

4.1.1 Green Remediation Principals and Best Management Practices

The NYSDEC DER-31 Green Remediation Policy requires that green remediation concepts and techniques be considered during all stages of the remedial program, with the goal of improving the sustainability of the cleanup and summarizing the net environmental benefit of any implemented green technology.

Green remediation principles and techniques will be implemented to the extent feasible in the remediation phase of the remedy per DER-31. The green remediation components that will be evaluated are as follows:

- Waste Generation
- Energy Usage
- Emissions
- Water Usage
- Land and/or Ecosystems

The remedy will include the implementation of several BMPs related to these green remediation components. The BMPs are outlined below.

Waste Generation

Waste generation considers the management of waste associated with remedial activities and any waste reduction projects including, but not limited to, material reuse and recycling. Several waste streams will be generated during implementation of the remedy (e.g. soil, polyethylene sheets used for stockpile coverage and separating types of contamination, nitrile gloves for endpoint sampling, disposable sampleware, acetate liners from drilling operations, tubing and buckets from groundwater performance monitoring, decontamination materials). When possible, an effort will be made to minimize consumption/generation of such materials. If possible, decontamination and reuse of applicable materials will be considered. Electronic methods of data collection (e.g., tablets) will also be used to reduce paper consumption when possible.

Electrical Energy Use

Energy usage considers the electricity usage needed for remediation activities. Energy will be required for charging equipment (e.g., PIDs, air monitoring equipment, groundwater sampling equipment). Battery-powered equipment will be turned off when not in use to limit charging activities.

Emissions

Emissions tracking considers fuel usage for transportation of personnel to and from the site, trucks used for export of contaminated material or import of backfill material, equipment and laboratory sample couriers, and construction equipment.

To reduce fuel usage, trucks and heavy machinery operators will be encouraged to reduce idling time and shut down vehicles or equipment when not in use. Ultra-low sulfur diesel (ULSD) fuel and the best available technology for reducing emissions will be used for construction vehicles. The Contractor will also be encouraged to perform routine, on-time maintenance such as oil changes to improve fuel efficiency.

When possible, personnel will be encouraged to take public transport and equipment/sample deliveries and pickups will be consolidated to reduce transport needs.

Water Usage

Water usage considers sources of water for tasks such as decontamination, irrigation, etc. The public water supply will be used when water is required for decontamination activities or dust suppression. This will be required for effective implementation of the remedy and the protection of human health. Water will only be consumed when necessary, and consumption will be in accordance with local regulations.

Land and/or Ecosystems

The site is within a heavily urbanized area, and no ecosystems will be disturbed during construction.

Environmental footprint summaries are provided in Appendix H.

4.1.2 Site-Specific Construction Health & Safety Plan

The RE prepared a site-specific CHASP (Appendix D). The CHASP will apply to all remedial and construction-related work on site. The CHASP provides a mechanism for establishing a site safety office, on-site safe working conditions, safety organization, procedures, and PPE requirements. The CHASP meets the requirements of 29 CFR 1910 and 29 CFR 1926 (which includes 29 CFR 1910.120 and 29 CFR 1926.65). The CHASP includes, but is not limited to, the following components:

- Summary of work tasks
- Organization and identification of key personnel
- Task/operation safety and health risk analyses
- Training requirements
- Medical surveillance requirements
- Personal protective equipment
- Air quality monitoring and action levels
- Work zones and decontamination

- Nearest medical assistance
- Standing orders and safe work practices
- Site security
- Underground utilities
- Site safety inspection
- Hand and power tools
- Emergency response
- Special conditions
- Recordkeeping
- Confined space entry
- CHASP acknowledgement form

Remedial work performed under this plan will be in full compliance with governmental requirements, including site and worker safety requirements mandated by OSHA.

The Participants and its representatives preparing the remedial documents submitted to the State and those performing the construction work are responsible for the preparation of an appropriate CHASP and for the appropriate performance of work according to the CHASP and applicable laws. All contractors performing work on the site must prepare their own CHASP that, at a minimum, meets the requirements of the CHASP in Appendix D.

The CHASP and requirements defined in this RAWP pertain to all remedial and invasive work performed at the site until the issuance of a COC. Confined space entry will comply with all OSHA requirements to address the potential exposure posed by combustible and toxic gases.

4.1.3 Quality Assurance Project Plan

The RE prepared a Quality Assurance Project Plan (QAPP) that describes the quality control components employed so that the proposed remedy accomplishes the remedial goals, RAOs and is completed in accordance with the design specifications. The QAPP is provided as Appendix J and includes:

- Responsibilities of key personnel and their organizations for the proposed remedy
- Qualifications of the quality assurance officer
- Sampling requirements including methodologies, quantity, volume, locations, frequency, and acceptance and rejection criteria
- Description of the reporting requirements for quality assurance activities including weekly quality assurance review reports, periodic quality assurance and quality control audits, and other report and data submissions

4.1.4 Construction Quality Assurance Plan

The RE prepared a Construction Quality Assurance Plan (CQAP) that describes the quality control components employed that support the proposed remedy in accomplishing the remedial goals and RAOs. The contractor and construction manager will have the primary responsibility to provide construction quality. A list of engineering personnel involved in implementation of the CQAP and procedures that will be carried out by the remedial engineering team are identified below.

Role	Contact
RE:	Paul McMahon, PE
Project Manager:	Elizabeth Adkins, PE
Langan Health & Safety Officer:	Tony Moffa Jr., CHMM
Site Safety Coordinator:	William Bohrer, PG
Quality Assurance Officer:	Michael Burke, PG, CHMM
Field Team Leader:	Gabriella DeGennaro

Project personnel résumés are provided in Appendix K.

The RE will directly supervise field personnel that will be on-site during the remedial action to monitor particulates and organic vapor in accordance with the CAMP. Daily reports will be submitted to NYSDEC and NYSDOH and will include reporting of CAMP results that exceed the specified action levels (if any).

A QEP or the RE will directly supervise field personnel that will meet with the Construction Superintendent on a daily basis to discuss the plans for that day and schedule upcoming activities. The field personnel will document remedial activities in daily reports.

A QEP or the RE will directly supervise field personnel that will screen the excavation with a PID during intrusive activities. All readings will be noted in the record. PID readings that exceed the action levels will be reported to NYSDEC and NYSDOH in the daily reports. The field personnel will collect documentation soil samples in accordance with this RAWP.

A photo log will be kept to document construction activities by still photos. The photo log may also be used to record activities recorded in the daily report.

The project field notebook will be used to document all sampling activities and how they correspond to the RAWP. All observations and field and laboratory tests will be recorded in the project field notebook or on separate logs. Recorded field observations may take the form of notes, charts, sketches, or photographs.

The Field Team Leader will maintain the current field book and original field paperwork during the performance of work. The Project Manager will maintain the field paperwork after completion and will maintain submittal document files.

4.1.5 Soil/Fill Management Plan

The RE prepared an SFMP that includes detailed plans for managing soil/fill that is disturbed at the site, including excavation, handling, storage, transport and disposal. It also includes controls that will be

applied to these efforts to facilitate effective, nuisance-free performance in compliance with applicable federal, state and local laws and regulations (see Section 5.4).

4.1.6 Stormwater Pollution Prevention Plan

Because this project does not involve soil disturbance of more than 20,000 square feet, a stormwater pollution prevention plan (SWPPP) will not be required under NYC regulations. BMPs will be employed to mitigate erosion and prevent the migration of sediment off site throughout remediation.

4.1.7 Community Air Monitoring Plan (CAMP)

A site-specific CAMP was developed in accordance with the NYSDOH Generic CAMP included as Appendix E. Community air monitoring will be conducted as outlined in Section 5.4.13.

4.1.8 Contractors Site Operations Plan (SOP)

The RE will review plans and submittals for this remedial project (including those listed above as well as contractor and sub-contractor document submittals) and document their compliance with this RAWP. The RE is responsible for documenting that contractor and subcontractor document submittals are in compliance with this RAWP. Remedial documents will be submitted to NYSDEC and NYSDOH in a timely manner and before the start of work.

4.1.9 Citizen Participation Plan

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

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

The approved Citizen Participation Plan for this project is filed with the document repositories.

Document repositories were established at the following locations, as proposed in the BCP Application, and will contain all applicable project documents:

New York Public Library

New York Public Library – Hudson Park Branch

66 Leroy Street

New York, NY 10014

(212) 243-6876

Manhattan Community Board 2

3 Washington Square Village #1A

New York, NY 10012

(212) 979-2272

In addition, an electronic repository can be accessed via DECInfo Locator at the following link: https://extapps.dec.ny.gov/data/DecDocs/C231130/

4.2 General Remedial Construction Information

4.2.1 Project Organization

This section presents the anticipated project organization and associated roles, including key personnel, descriptions of duties and lines of authority in the management of the RAWP. Information regarding the organization/personnel and their associated responsibilities is provided below.

Project personnel résumés are provided in Appendix K.

4.2.2 Remedial Engineer

The RE for this project will be Paul McMahon, PE. The RE is a registered PE licensed by the State of New York. The RE will have primary direct responsibility for implementation of the remedial program for the 92 Avenue of the Americas project (BCP Site No. C231130). The RE will certify in the FER that the remedial activities were observed by qualified environmental professionals under his supervision and that the remediation requirements set forth in the RAWP and any other relevant provisions of ECL 27-1419 have been achieved in accordance with this RAWP. Other RE certification requirements are listed later in this RAWP.

The RE and his team will document the work of remediation contractors and subcontractors involved in all aspects of remedial construction, including soil excavation, stockpiling, characterization, removal and disposal, groundwater treatment, air monitoring, emergency spill response services, import of backfill, and management of waste transport and disposal. Deviations from the procedures identified in the RAWP that are observed by the RE or his team will be brought to the attention of the Contractor, who will remedy the deviation(s). The RE, the QEP, or the Project Manager under supervision of the RE, will be responsible for all communication with NYSDEC and NYSDOH.

The RE will review all pre-remedial plans submitted by remediation contractors for compliance with this RAWP and will certify compliance in the FER.

In the FER, the RE will provide the certifications listed in Section 7.5 of this RAWP.

4.2.3 Project/Remediation Schedule

The anticipated project remediation schedule is provided in Appendix L. Proposed changes, delays, or deviations will be promptly communicated to the NYSDEC.

4.2.4 Work Hours

The hours of operation for remedial construction will either conform to the requirements of the New York City Department of Buildings (NYCDOB) construction code or to a site-specific variance issued by the NYCDOB. The NYSDEC will be notified by the Participants or their agent of any variances issued by the NYCDOB. The NYSDEC reserves the right to deny alternate remedial construction hours.

4.2.5 Site Security

The site perimeter will be secured with gated, signed, plywood fencing with points of entry in accordance with the NYCDOB and New York City Department of Transportation (NYCDOT) permits and requirements. The purpose of the fencing is to limit site access to authorized personnel, protect pedestrians from site activities, and maintain site security.

Once remedial excavation begins, the site entrance will be manned during working hours. The project will be guarded in accordance with the NYCDOB codes and requirements.

4.2.6 Traffic Control

Site traffic will be controlled through designated points of access as determined by the selected remediation contractor. Access points will be continuously monitored and, if necessary, a flagging system will be used to protect workers, pedestrians, and authorized guests. Traffic will also adhere to applicable local, state, and federal laws.

4.2.7 Contingency Plans

The contingency plans described below have been developed to address unexpected discoveries of additional contaminated media and/or USTs.

4.2.7.1 Discovery of Additional Contaminated Soil

During remediation, soil will be continuously monitored by the RE's field representative(s) using a PID as well as visual and olfactory field screening to identify previously unknown contamination and soil that may not be suitable for the selected disposal facility(ies). Impacted soil/fill will be segregated and sampled for lab analysis in accordance with disposal facility requirements (typically VOCs, SVOCs, PCBs, pesticides, herbicides, and metals). If the facility is not permitted to receive the sampled soil/fill, the soil/fill will be disposed of off-site at a permitted facility able to receive it based on the characterization data. Identification of unknown or unexpected contaminated media identified by screening during invasive site work will be promptly communicated by phone to the NYSDEC Project Manager. These findings will be detailed in daily reports and subsequent monthly BCP progress reports. Potential additional remedial measures will be coordinated with NYSDEC.

4.2.7.2 Discovery of Unexpected USTs

Previously unidentified USTs may be encountered during excavation. Unexpected USTs encountered during remediation will be decommissioned in accordance with 6 NYCRR Parts 612.2 and 613 and NYSDEC DER-10 Section 5.5. Following removal of the UST(s), post-excavation soil samples will be collected per

the NYSDEC DER-10 requirements, if deemed necessary by the NYSDEC and the RE. Post-excavation soil sampling is not expected where the remedial excavation will extend below the UST. Excavated petroleum impacted soil/fill will be stockpiled separately from non-petroleum-impacted soil/fill, characterized, and disposed of off-site at a permitted disposal facility in accordance with applicable regulations. UST closure documentation, including contractor affidavits, waste manifests, and tank disposal receipts, will be included as appendices to the FER. USTs will be registered and decommissioned with the NYSDEC PBS unit, as necessary.

If USTs are encountered during invasive site work, the findings will be promptly communicated to the NYSDEC Project Manager and detailed in daily reports and subsequent monthly BCP progress reports.

4.2.8 Worker Training and Monitoring

Worker training and monitoring will be conducted in accordance with the site-specific CHASP (Appendix D).

4.2.9 Agency Approvals

Permits or government approvals required for remedial construction will be obtained before the start of remedial construction. The planned end use for the site as an open-air gravel-covered parking lot until redevelopment of the site into a potential residential building conforms to the current zoning for the property as determined by the NYCDCP. A Certificate of Occupancy will not be issued for the project unless conformance with the zoning designation is demonstrated.

4.2.10 NYSDEC BCP Signage

Signs are optional for BCP sites and should be discussed with the NYSDEC Project Manager. If a sign is to be displayed, it must follow NYSDEC specifications for design and content. The NYSDEC Project Manager can provide details on signage protocol.

4.2.11 Pre-Construction Meeting with the NYSDEC

Prior to the onset of construction, a meeting will be held between the NYSDEC, RE, Participants, construction manager, and the selected remediation contractor to discuss project roles, responsibilities, and expectations associated with this RAWP. Notice will be provided to the NYSDEC at least seven days prior to site mobilization.

4.2.12 Emergency Contact Information

An emergency contact sheet with names and phone numbers is included in the CHASP (Appendix D). That document will define the specific project contacts for use by the NYSDEC and NYSDOH in the case of a day or night emergency.

4.2.13 Remedial Action Costs

The estimated engineering and contractor cost of the preferred Track 4 remedy is about $1.2 million.

4.3 Site Preparation

The RE will work with the Participants and their site development contractors so that any site development activities will not interfere with, or otherwise impair or compromise, remedial activities proposed in this RAWP.

4.3.1 Mobilization

Before commencing site remediation, the selected remediation contractors will mobilize to the site and prepare for remedial activities. Mobilization and site preparation activities may include the following:

- Identifying the location of all aboveground and underground utilities (e.g., power, gas, water, sewer, telephone), equipment, and structures (as necessary to implement the remediation)
- Mobilizing necessary remediation personnel, equipment, and materials to the site
- Constructing one or more stabilized construction entrances consisting of virgin crushed stone or RCA at or near the site exit, which takes into consideration the site setting and site perimeter
- Constructing a decontamination pad for trucks, equipment, and personnel that come into contact with impacted materials during remedial activities, as necessary
- Installing erosion and sedimentation control measures, as necessary
- Installing temporary fencing or other temporary barriers to limit unauthorized access to areas where remediation activities will be conducted

4.3.2 Erosion and Sedimentation Controls

BMPs will be employed to mitigate erosion and prevent the migration of sediment off-site throughout construction. Discharge of water generated during remedial construction to surface waters (e.g., New York Harbor) is prohibited without a SPDES permit.

4.3.3 Monitoring Well Decommissioning

Existing groundwater monitoring wells will be properly decommissioned in accordance with NYSDEC CP-43 when no longer required. The only exception to this is if the full length of the well is to be excavated during remediation. Well decommissioning will be performed by an experienced driller and logged by Langan field personnel. Decommissioning documentation will be provided in the FER.

4.3.4 Stabilized Construction Entrance(s)

At a minimum, a temporary gravel construction entrance and exit will be installed for all vehicles exiting the BCP site. The gravel pads will be graded so that runoff water will be directed back into the site. Additional stabilized construction entrances may be added depending on the sequencing and location of remedial excavations. This will be detailed in the Contractors Site Operations/Site Logistics Plan. The Contractor will protect and maintain the existing sidewalks and roadway at site entrance points.

4.3.5 Utility Marker and Easements Layout

The Participants and the selected remediation contractors are solely responsible for the identification of utilities that might be affected by work under this RAWP; the implementation of required, appropriate or necessary health and safety measures during performance of work under this RAWP; and the safe execution of invasive and other work performed under this RAWP. The Participants and selected remediation contractors must obtain local, state, or federal permits and/or approvals that may be required to perform work under this RAWP. Approval of this RAWP by the NYSDEC does not constitute satisfaction of these requirements.

The presence of utilities and easements on the site will be investigated by the Participants and selected remediation contractors. No impediments to the planned work under this RAWP are expected by known utilities or easements on the site.

4.3.6 Sheeting and Shoring

Appropriate management of structural stability of on-site or off-site structures during on-site activities, including excavation, is the sole responsibility of the Participants and selected remediation contractors. The Participants and selected remediation contractors are solely responsible for safe execution of all invasive and other work performed under this RAWP. The Participants and selected remediation contractors must obtain any local, state, or federal permits or approvals that may be required to perform work detailed in this RAWP. Further, the Participants and selected remediation contractors are responsible for the implementation of all required, appropriate, or necessary health and safety measures during performance of work under the approved RAWP.

4.3.7 Equipment and Material Staging

The selected remediation contractor will notify the RE and the Participants in writing with receipt confirmed, of pending site work mobilization at least 30 calendar days in advance. During mobilization, construction equipment will be delivered to the site, temporary facilities constructed, and temporary utilities installed. The selected remediation contractor will place and maintain temporary toilet facilities within the work areas for usage by all site personnel. The selected remediation contractor will provide drinking water for all site personnel.

4.3.8 Truck Inspection/Decontamination Area

The selected remediation contractor will construct decontamination pads/truck inspection stations at each site entrance/exit planned for construction vehicle usage. Before exiting the site, trucks will be required to stop at a truck inspection station and will be examined for evidence of contaminated soil on the undercarriage, body, and wheels. If observed, soil or debris will be removed. Brooms, shovels, and/or potable water will be utilized for the removal of soil from vehicles and equipment, as necessary. The location of decontamination pads may change periodically to accommodate the contractor's sequencing of work. When required, the pads will be constructed by the selected remediation contractor to collect wastewater for off-site disposal, if generated during decontamination activities. The design will consider

adequate space to decontaminate site equipment and vehicles and sloping and liners to facilitate collection of wastewater. Any collected truck rinsate and decontamination wastewater shall be tested and transported to an off-site disposal facility that is permitted to accept this waste, in accordance with applicable local, state, and federal regulations. The selected remediation contractor is responsible for collecting soil that is tracked immediately off-site and returning the soil to the site. The RE's on-site representative will document that trucks leaving the site are properly decontaminated. The selected remediation contractor will maintain the decontamination pad(s) throughout the duration of site work. Prior to demobilization, the selected remediation contractor will deconstruct the pads and dispose of materials as required.

If the selected remediation contractor uses high pressure washing methods, the selected remediation contractor shall provide splash protection around the vehicle decontamination facility to prevent splatter and mist migrating off-site during the vehicle decontamination process. Splash protection shall be temporary and stable and capable of being dismantled in the event of high winds.

4.3.9 Site Fencing

The site perimeter will be secured with gated, signed, plywood fencing. The purpose of the fencing is to limit site access to authorized personnel, protect pedestrians from site activities and maintain site security.

4.3.10 Demobilization

The selected remediation contractor will be responsible for demobilizing all labor, equipment, and materials not designated for off-site disposal. The RE will be responsible to document that the selected remediation contractor performs follow-up coordination and maintenance for the following activities:

- Restoration of areas that may have been disturbed to accommodate support areas (e.g., staging areas, decontamination areas, storage areas, temporary water management areas, and access areas)
- Removal of temporary access areas (whether on-site or off-site) and restoration of disturbed access areas to pre-remediation conditions
- Removal of sediment and erosion control measures and disposal of materials in accordance with acceptable rules and regulations
- Equipment decontamination
- General refuse disposal

4.4 Reporting

Daily and monthly reports and an FER will be submitted to the NYSDEC as required to document the remedial action. Copies of daily and monthly reports will be included in the FER. The Project RE responsible for certifying all reports will be an individual licensed to practice engineering in NYS; Paul McMahon, PE of Langan, will have this responsibility. Should Mr. McMahon become unable to fulfill this

responsibility, another qualified PE will take his place. In addition to the periodic reports and the FER, copies of all relevant contractor documents will be submitted to the NYSDEC.

4.4.1 Daily Reports

Daily reports will be submitted to the NYSDEC and NYSDOH Project Managers by the end of the following business day, or at a frequency acceptable to them, and will include:

- An update of progress made during the reporting day
- Locations of work and quantities of soil/fill imported to and exported from the site
- References to map for site activities
- A summary of any and all complaints with relevant details (names, phone numbers)
- A summary of CAMP findings, including any exceedances and actions taken to address the exceedances
- An explanation of notable site conditions
- A description of anticipated site activities
- The NYSDEC-assigned project number will appear on all reports

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

Daily Reports will include a description of daily activities keyed to a site map for the site that identifies work areas. These reports will include a summary of air sampling results, odor and dust problems and corrective actions, and all complaints received from the public, if any.

4.4.2 Monthly Reports

Monthly reports will be submitted to the NYSDEC and NYSDOH Project Managers by the tenth of the following month of the reporting period and will include the following information, as well as the information required in the BCA:

- Activities relative to the site during the previous reporting period and those anticipated for the next reporting period, including a quantitative presentation of work performed (i.e., tons of non-native fill/soil exported and material imported)
- Description of approved activity modifications, including changes to the scope of work and/or schedule
- Sampling results received following internal data review and validation, as applicable

- An update of the remedial schedule including the percentage of project completion, unresolved delays encountered or anticipated that may affect the future schedule, and efforts made to mitigate such delays

4.4.3 Other Reporting

Photographs will be taken of all remedial activities and submitted to NYSDEC in digital format. Photographs will illustrate all remedial program elements and will be of acceptable quality. Representative photos of the site before any remedial actions and of each contaminant source, source area, and site structure before, during, and after remediation will be provided. Photographs will be included in the daily reports as needed, and a comprehensive collection of photos will be included in the FER.

Progress with respect to green and sustainable remediation metrics will be tracked during implementation of the remedial action and reported in the FER. Regular updates to the metrics used (Spreadsheets for Environmental Footprint Analysis [SEFA], SiteWise, or another Department-approved method) should be included.

Site records for remedial work will be appropriately documented and maintained on-site during the project and be available for inspection by NYSDEC and NYSDOH staff.

4.4.4 Complaint Management Plan

The management plan for documenting complaints is detailed below.

Item	Description
Approach	Complaints regarding remediation or construction activities/operations will be minimized and mitigation measures will be implemented to reduce the incidence of complaints.
Objective	To manage environmental complaints from the community regarding construction or remediation.
Implementation Strategy/Mitigation Measures	All complaints will be documented on a complaint register. The register will be maintained as an ongoing record. Each entry will include the following information: • Time, date and nature of complaint; • Type of communication (telephone, letter, personal, etc.); • Name, contact address and contact number; and • Response and investigation undertaken as a result of the complaint and action taken with the signature of the responsible person. Each complaint will be investigated as soon as practicable in relation to the requirements.
Monitoring	A representative from the RE will follow up on the complaint within two weeks of receipt to ensure it has been resolved.
Reporting	Upon receipt, the NYSDEC will be notified. Complaints and resolutions will be documented in the daily reports.

Item	Description
Corrective Action	Should an incident or failure to comply occur in relation to the management of environmental complaints, one or more of the following corrective actions will be undertaken as appropriate: • Conduct additional training of staff to handle environmental complaints; • Investigate why the environmental complaint was not addressed within the specified time frame; and • Investigate the complaint and action follow-up according to the investigation results.

4.4.5 Deviations from the RAWP

Necessary deviations from the RAWP will be coordinated with the NYSDEC in advance. Notification will be provided to the NYSDEC by telephone/email for conditions requiring immediate action (e.g., conditions judged to be a danger to the surrounding community). Addendums to the RAWP will be prepared, as necessary, and will include:

- Reasons for deviating from the approved RAWP
- Approval process to be followed for changes/additions to the RAWP
- Effect of the deviations on the overall remedy

5.0 REMEDIAL ACTION

5.1 Soil Cleanup Objectives

A Track 4 remediation is proposed; therefore, the applicable SCOs are the lower of the NYSDEC RURR and relevant PGW SCOs listed in 6 NYCRR Part 375-6.8(b). The relevant PGW SCOs will include PGW SCOs for contaminants also detected in groundwater above the SGVs, with the exception of six polycyclic aromatic hydrocarbons (PAHs) that were only detected in Phase II ESI groundwater samples above the SGVs and are attributed to entrained non-native fill and not a source of groundwater contamination. Remaining soil contamination above the RURR and relevant PGW SCOs will be treated through in-situ groundwater treatment and managed in-place subject to ongoing ICs and ECs. Imported fill will meet the SCOs for the proposed site use as set forth in Part 375-6.7(d).

Soil and non-native fill management on- and off-site will be conducted in accordance with the SFMP described in Section 5.4. UST closures will conform to the criteria defined in 6 NYCRR Part 613.9, NYSDEC CP-51, and other applicable NYSDEC UST closure requirements including DER-10 Chapter 5.5. The site-specific Track 4 SCOs are provided in Table 2.

5.2 Remedial Performance Evaluation

5.2.1 Soil

Documentation soil samples will be collected from the bottom of excavation at a frequency of one per 900 square feet per NYSDEC DER-10 5.4(b)(5)(ii). Documentation samples have the purpose of documenting remaining contamination and additional excavation will only be conducted if source material is identified. The proposed documentation endpoint sampling locations are presented on Figure 11.

Documentation samples will be transported under standard chain-of-custody protocol to an NYSDOH ELAP-approved laboratory for 6 NYCRR Part 375 VOCs, SVOCs, PCBs, pesticides, cyanide, metals (including hexavalent and trivalent chromium), cyanide, PFAS and 1,4-dioxane. Laboratory analyses will be conducted in accordance with USEPA SW-846 methods and NYSDEC Analytical Services Protocol (ASP) Category B deliverable format. QA/QC procedures required by the NYSDEC ASP and SW-846 methods will be followed, including instrument calibration, standard compound spikes, surrogate compound spikes, and analysis of quality control samples. The laboratory will provide sample bottles that are pre-cleaned and preserved. Where there are differences in the SW-846 and NYSDEC ASP requirements, the NYSDEC ASP shall take precedence.

5.2.2 Groundwater

To evaluate performance of the groundwater treatment remedy, baseline performance groundwater samples were collected from previously installed monitoring wells across the site. Prior to the start of the in-situ groundwater treatment remedy, a new 2-inch-diameter monitoring well (PTMW-01) will be installed in the central part of the site with a 10-foot-long well screen across the proposed treatment

interval. An additional baseline groundwater sampling event will be performed on monitoring wells PTMW-01, MW-10, MW-11, and MW-12.

For the first year post-treatment, quarterly groundwater samples will be collected from monitoring wells PTMW-01, MW-10, MW-11, and MW-12. All baseline and post-treatment groundwater samples will be analyzed for VOCs, calcium, magnesium, aluminum, sulfate and QuantArray-Petro functional genes. Groundwater quality parameters, including pH, dissolved oxygen, ORP, and conductivity will be measured prior to groundwater sample collection. The baseline and quarterly groundwater samples will be used to evaluate performance of the groundwater treatment remedy. If the in-situ groundwater treatment does not indicate the groundwater RAOs will be achieved, future supplemental treatment during site management may be necessary.

After significant contaminant reduction has been demonstrated, Langan will make a request to the NYSDEC and NYSDOH to discontinue sampling and decommission the performance monitoring wells. Well decommissioning will be performed by an experienced driller and logged by Langan field personnel.

Laboratory analyses will be conducted in accordance with USEPA SW-846 methods and NYSDEC ASP Category B deliverable format. QA/QC procedures required by the NYSDEC ASP and SW-846 methods will be followed, including instrument calibration, standard compound spikes, surrogate compound spikes, and analysis of quality control samples. The laboratory will provide sample bottles that are pre-cleaned and preserved. Where there are differences in the SW-846 and NYSDEC ASP requirements, the NYSDEC ASP shall take precedence.

5.2.3 Data Usability Summary Report

ASP Category B deliverables will be prepared for all remedial performance samples (e.g., endpoint soil samples and groundwater samples) collected during implementation of this RAWP. DUSRs will be prepared by a qualified data validator and the findings will be reported in the FER.

5.2.4 Reporting

Analytical laboratories that analyze endpoint soil samples and groundwater samples, prepare results, and perform contingency sampling will be NYSDOH ELAP-certified laboratories. The FER will provide a tabular and map summary of all sample results and exceedances of SCOs and SGVs, if any.

5.3 Estimated Soil/Fill Removal Quantities

The estimated quantity of soil/fill to be removed from the site for a Track 4 cleanup is approximately 330 cubic yards. The remedial excavation extents are shown on Figure 10A.

5.4 Soil/Fill Management Plan

This section presents the approach to management, disposal, and reuse of soil and fill excavated from the site. This plan is based on the current knowledge of site conditions, and will be augmented with the additional data collected during remediation. Langan field personnel, under the direction of the RE or

QEP, will monitor and document the handling and transport of contaminated soil and non-native fill removed from the site for disposal as a regulated solid waste. Field personnel, under the direction of the RE or QEP, will assist the selected remediation contractor in identifying impacted soil and non-native fill during excavation, determining soil and non-native fill suitable for direct load-out versus temporary on-site stockpiling, selection of samples for waste characterization, and determining the proper off-site disposal facility for soil and non-native fill. Separate stockpile areas will be constructed as needed to stage various excavated materials with the intent to more efficiently manage and characterize the soil and non-native fill and to avoid commingling of impacted soil and non-native fill with non-impacted soil.

5.4.1 Soil Screening Methods

Visual, olfactory, and PID screening and assessment will be performed by Langan field personnel under the direct supervision of the RE or QEP during excavations into known or potentially contaminated soil and non-native fill. Soil screening will be performed regardless of when the invasive work is done and will include all excavation and invasive work performed during the remedy and during any development phase, such as excavations for foundations and utility work before issuance of the COC.

Field screening for evidence of contamination will be performed by field personnel under the direct supervision of the RE or QEP. Résumés will be provided for personnel responsible for field screening (i.e., those representing the RE) of invasive work for known or unknown contaminant sources during remediation and any development work.

5.4.2 Stockpile Methods

Soil stockpile areas, if needed for the different types of soil and non-native fill, will be constructed for staging of site soil, pending loading or waste characterization testing. Separate stockpile areas will be constructed to avoid commingling gravel, soil, and non-native fill of differing waste types. All stockpile areas will meet the following minimum requirements:

- The excavated gravel, soil, and non-native fill will be placed onto an impermeable surface or on minimum thickness of 8-mil low-permeability plastic sheeting or tarps of sufficient strength to prevent puncture during use; separate stockpiles will be created where soil and non-native fill types are different. The use of multiple layers of thinner liners is permissible.
- Equipment and procedures will be used to place and remove the soil to minimize the potential to jeopardize the integrity of the liner.
- Stockpiles will be covered at the designated times (see below) with minimum 8-mil plastic sheeting or tarps, which will be securely anchored to the ground. Stockpiles will be routinely inspected and broken sheeting covers will be promptly replaced.
- Stockpiles that have reached their capacity will be appropriately covered until they are ready for loading for off-site transport.
- Active stockpiles (e.g., stockpiles that have not reached their capacity) will be covered at the end of each workday.

- Each stockpile area will be encircled with silt fences and hay bales, as needed, to contain and filter particulates from rainwater that has drained off the soils, and to mitigate the potential for surface water run-off off-site.
- Stockpiles will be inspected at a minimum once each day and after every storm event. Results of inspections will be recorded in a logbook and maintained at the site and available for inspection by the NYSDEC.

5.4.3 Soil/Fill Characterization, Excavation and Loading

Excavated soil and non-native fill will be characterized for off-site disposal in a manner suitable to the receiving facility and in conformance with applicable permits. Sampling and analytical methods, sampling frequency, analytical results and QA/QC data will be reported in the FER. All data available for soil or subsurface material to be disposed of at a given facility must be submitted to the disposal facility for review and approval before shipment and receipt.

The selected remediation contractors are solely responsible for safe execution of invasive work, the excavation support, structures that may be affected by excavations, and other work performed under this RAWP. Field personnel under the direct supervision of the RE or QEP will observe and document all invasive work and the excavation and loading of excavated soil and non-native fill. Development-related grading cuts and fills will not be performed without NYSDEC approval of the RAWP, and the RE will provide that any site development activities will not interfere with, or otherwise impair or compromise, remedial activities proposed in this RAWP.

The RE's field personnel will be responsible for monitoring egress points for truck and equipment transport from the site and ensuring that the contractor is notified of their obligation to immediately clean the sidewalks and streets of dirt and other materials derived from the site during site remediation and development. Non-compliance will be reported to the NYSDEC. Locations where vehicles enter or exit the site shall be inspected daily for evidence of off-site sediment tracking. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to site-derived materials. Loaded vehicles leaving the site will be appropriately lined, securely covered, manifested, and placarded in accordance with appropriate federal, state, and local NYCDOT requirements, and all other applicable transportation requirements. On-site, mechanical processing of non-native fill and contaminated soil is prohibited unless otherwise approved by the NYSDEC.

5.4.4 Soil/Fill Transport Off-Site

Transport of soil and non-native fill will be performed by licensed haulers in accordance with appropriate local, state, and federal regulations, including 6 NYCRR Part 364. Trucks entering or leaving the site will be securely covered with tight fitting covers. Haulers will be appropriately licensed and trucks properly placarded. Trucks will enter and exit the site using dedicated ingress/egress points. Trucks loaded with site soil and non-native fill will exit the vicinity of the site using only approved truck routes. Proposed inbound and outbound truck routes to the site are shown on Figure 12. These routes take into account:

- Limiting transport through residential areas and past sensitive sites
- Use of city-mapped truck routes
- Minimization of off-site queuing of trucks entering the facility, to the extent possible
- Limiting total distance to major highways
- Promoting safety in access to highways
- Overall safety in transport

Trucks will be prohibited from excessive stopping and idling in the neighborhood outside of the site. Egress points for truck and equipment transport from the site will be kept clean of soil and non-native fill during remediation and development. To the extent possible, queuing of trucks will be performed on-site to minimize off-site disturbance. Off-site queuing will be minimized.

Soil and non-native fill transported by trucks exiting the site will be secured with opaque, tight-fitting covers. Loose-fitting canvas-type or mesh truck covers will be prohibited. If loads contain wet soil and non-native fill capable of producing free liquid, truck liners will be used.

5.4.5 Soil/Fill Disposal Off-Site

Excavated soil/fill and other solid wastes removed from the site will be handled, transported, and disposed of in accordance with local, state (including 6 NYCRR Parts 360 and 361) and federal regulations. If disposal of fill is proposed for unregulated disposal (i.e., clean soil removed for development purposes), a formal request with an associated plan will be made to the NYSDEC's Project Manager. Unregulated off-site management of materials from this site is prohibited without formal NYSDEC approval.

Excavated fill must be disposed of at an in-state or out-of-state facility licensed to accept the material. Non-hazardous fill and contaminated soil transported off-site will be handled, at a minimum, as a solid waste per 6 NYCRR Part 360. Non-hazardous fill and contaminated soil excavated from the site are prohibited from being disposed of at Part 360 Registration Facilities (also known as Soil Recycling Facilities). Non-hazardous fill can be sent to a C&D debris handling and recovery facility only with written approval from the NYSDEC. Hazardous waste is prohibited from being sent to a C&D debris handling and recovery facility (6 NYCRR Part 361-5). Hazardous wastes derived from the site will be managed, transported and disposed of in full compliance with applicable local, state, and federal regulations.

The following documentation will be obtained and reported by the RE for each off-site disposal location used in this project to fully demonstrate and document that the disposal of soil and non-native fill derived from the site conforms to applicable laws:

1) A letter from the RE to the receiving facility describing the soil or non-native fill to be disposed of and requesting formal written acceptance of the material. This letter will state that the soil or non-native fill to be disposed of is contaminated material generated at an environmental remediation site in NYS. The letter will provide the project identity and the name and phone

number of the RE. The letter will include, as an attachment, a summary of all chemical data for the soil or non-native fill being transported (including waste characterization and RIs data).

2) A letter from each receiving facility stating it is in receipt of the correspondence (above) and is approved. These documents will be included in the FER.

Soil that is contaminated but non-hazardous and is removed from the site is considered by the NYSDEC Division of Materials Management (DMM) to be C&D with contamination not typical of virgin soil. Soil and non-native fill will be considered a regulated solid waste unless a BUD is processed stating otherwise. This soil may be sent to a permitted Part 360 landfill in New York or other appropriate out-of-state disposal facility permitted to accept contaminated soil from a brownfield site. This soil may be sent to a permitted C&D processing facility without permit modifications only upon prior notification of NYSDEC Region 2 DMM. This material is prohibited from being sent or redirected to a New York Part 361.5 or 360-15 Registration Facility. In this case, as dictated by DMM, special procedures will include, at a minimum, a letter to the C&D facility that provides a detailed explanation that the material is derived from an NYSDEC DER remediation site, that the material is contaminated, and that the material must not be redirected to on-site or off-site Soil Recycling Facilities. The letter will provide the project identity and the name and phone number of the RE. The letter will include as an attachment a summary of chemical data for the material being transported.

The FER will include an accounting of the destination of soil removed from the site during implementation of the remedy, including excavated soil, contaminated soil, fill, solid waste, and hazardous waste, if identified. Demolition operations, including characterization, handling and disposal of associated waste and C&D debris will not be overseen or reviewed by the RE. These operations should be performed by the site remediation contractor in accordance with applicable guidance and regulations. Documentation associated with disposal of each soil type must also include records and approvals for receipt of the soil. This information will also be presented in a table to be included in the FER.

A “Bill of Lading” system or equivalent will be used for off-site movement of non-hazardous wastes and contaminated soil. This information will be reported in the FER. Hazardous wastes derived from the site, if any, will be stored, transported, and disposed of in compliance with applicable local, state, and federal regulations.

Appropriately licensed haulers, in compliance with applicable local, state, and federal regulations, will be used to transport the material removed from this site.

5.4.6 On-Site Reuse

Where a ¾-inch virgin stone/gravel cover was previously installed on the site surface during implementation of the IRMWP, the gravel cover will be segregated from underlying soil/fill for on-site reuse. We propose reuse of the previously imported ¾-inch clean gravel cover without additional testing, provided that the gravel can be segregated from underlying soil/fill. Gravel proposed for on-site reuse will be used as general backfill within the 2-foot-thick engineered composite cover system.

Excavated soil and non-native fill is not proposed for reuse on the site under the proposed remedy without appropriate analytical testing. Soil removed during the implementation of the remedy or removed for grading or other purposes will not be reused within a cover soil layer, within landscaping berms, or as backfill for subsurface utility lines. Organic matter (wood, roots, stumps, etc.) or other solid waste derived from clearing and grubbing of the site is prohibited for reuse on-site. If excavated soil/fill is proposed for on-site reuse, a Request to Import/Reuse Fill or Soil form, which can be found at http://www.dec.ny.gov/regulations/67386.html will be prepared and submitted to the NYSDEC project manager allowing a minimum of 5 business days for review. Soil acceptable for reuse must be non-hazardous and meet the lower of the RURR and relevant PGW SCOs.

5.4.7 Fluids Management

Dewatering is not anticipated under the proposed remedy, as the excavation depth does not extend below the groundwater table.

During remedial excavation, sediment and erosion controls will be implemented to prevent surface or stormwater encountered during excavation from flowing outside of the site. Trucks will be lined to contain free liquids in saturated soils, if encountered, from leaking out of truck beds.

5.4.8 Demarcation

After the completion of in-situ groundwater treatment and soil removal and prior to backfilling with reused site fill or imported clean fill, a land survey will be performed by a NYS licensed surveyor. The survey will define the top elevation of remaining contaminated soil. A physical demarcation layer, consisting of orange snow fencing material or equivalent will be placed on this surface as a visual reference layer separating the two-foot-thick site cover. This demarcation layer will constitute the top of the 'Residuals Management Zone', the zone that requires adherence to special conditions for disturbance of contaminated remaining soil defined in the SMP. This survey and the demarcation layer placed on this grade surface will constitute the physical and written record of the upper surface of the 'Residuals Management Zone' in the FER and SMP.

5.4.9 Backfill from Off-site Sources

Materials proposed for import will be approved by the RE and will be in compliance with provisions in this RAWP prior to receipt at the site. Imported soil for backfill must meet the lower of the RURR and PGW SCOs (as set forth in Table 375-6.7(d) of 6 NYCRR Part 375) or be comprised of other acceptable fill material, such as RCA or crushed virgin stone from a permitted mine or quarry. Material from industrial sites, spill sites, other environmental remediation sites, or other potentially contaminated sites will not be imported to the site. Solid waste will not be imported to the site.

The FER will include the following certification by the RE: "I certify that all import of soil from off-site, including source evaluation, approval and sampling, has been performed in a manner that is consistent with the methodology defined in the RAWP".

Backfill material will consist of clean fill (as described in the following paragraph) or other acceptable fill material such as virgin stone from a quarry or RCA. If RCA is imported to the site, it will be from a NYSDEC-registered facility in compliance with 6 NYCRR Part 360 registration and permitting requirements for the period of acquisition of RCA. Import of RCA will require a site-specific Beneficial Use Determination (BUD), if required by NYSDEC. RCA imported from compliant facilities will not require chemical testing, unless required by the NYSDEC under the terms for operation of the facility. RCA imported to the site must be derived from recognizable and uncontaminated concrete. RCA is not acceptable for and will not be used as cover or drainage material. RCA or virgin stone must contain less than 10% by weight passing a No. 80 sieve to be excluded from NYSDEC DER-10 sampling requirements. Virgin stone must originate from a mine or quarry and contain less than 10% by weight passing a No. 80 sieve to be excluded from NYSDEC DER-10 sampling requirements. Sampling may be required by NYSDEC under the terms for operation of the facility.

Imported soil (e.g., clean fill) will meet the lower of RURR and PGW SCOs. Non-compliant soil will not be imported to the site. Clean fill will be segregated at a source/facility that is free of environmental contaminants. Qualified environmental personnel will collect representative samples at a frequency consistent with NYSDEC CP-51 and DER-10 5.4(e). The samples will be analyzed for Part 375 VOCs, SVOCs, pesticides, herbicides, PCBs, cyanide, metals (including trivalent and hexavalent chromium), PFAS, and 1,4-dioxane by a NYSDOH ELAP-certified laboratory with the requirement for NYSDEC ASP Category B deliverable format. Upon meeting these criteria, the certified-clean fill will be transported to the site and segregated from impacted material, as necessary, on plastic sheeting until the certified-clean fill is used as backfill.

Soil that meets ‘exempt’ fill requirements under 6 NYCRR Part 360, but do not meet backfill or cover soil objectives, will not be imported to the site without prior approval by NYSDEC. The contents of this RAWP and NYSDEC approval of this RAWP should not be construed as an approval for this purpose.

Import facilities will be identified in the FER. A PE or QEP will review the 6 NYCRR Part 360 registrations and permits for the facilities for the period of acquisition of RCA. Imported RCA, virgin gravel, or rock or stone from mines or quarries must have no more than 10% by weight passing through a No. 80 sieve and will not require additional testing unless required by NYSDEC under its terms for operation of the facility. Additional exemptions from testing requirements may be approved by NYSDEC Project Manager based on their review of requests by the PE/QEP. Prior to material import, the RE will review documentation from each import facility, including the facility name, address, permit/registration, and site history, if necessary, in accordance with DER-10. Proposed import material will be approved by both the RE and the NYSDEC. Upon arrival, import material will be screened for visual, olfactory, and instrumental evidence of contamination.

Trucks entering the site with imported soil will be securely covered with tight-fitting covers.

5.4.10 Contingency Plan

If USTs or other previously unidentified contaminant sources are found during on-site remedial excavation or development-related construction, sampling will be performed on the source material, if encountered, and surrounding subsurface materials (e.g., sediment, soil, stone). Chemical analytical work will be for full scan Part 375 parameters (Target Compound List VOCs and SVOCs, Target Analyte List metals, PCBs, pesticides, herbicides, and PFAS). Analyses will not be otherwise limited without NYSDEC approval.

Identification of unknown or unexpected contaminated media identified by screening during invasive site work will be promptly communicated to NYSDEC's Project Manager. These findings will be also detailed in daily and subsequent monthly BCP progress reports.

5.4.11 Extreme Storm Preparedness and Response Contingency Plan

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

5.4.11.1 Storm Preparedness

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

5.4.11.2 Storm Response

At the conclusion of an extreme storm event, as soon as it is safe to access the property, a complete inspection of the property will be performed. A site inspection report will be submitted to NYSDEC at the completion of site inspection and after the site security is assessed. Site conditions will be compared to the inventory of site conditions and material performed prior to the storm event and significant differences will be noted. Damage from storm conditions that result in acute public safety threats, such as downed power lines or imminent collapse of buildings, structures or equipment will be reported to public safety authorities via appropriate means such as calling 911.

Petroleum spills will be reported to NYSDEC within 2 hours of identification and as consistent with State regulations. Public safety structures, such as construction security fences will be repaired promptly to eliminate public safety threats. Debris will be collected and removed.

If soil or fill materials are discharged off site to adjacent properties, property owners and NYSDEC will be notified, and a corrective measure plan designed to remove and clean dislocated material will be submitted to NYSDEC and implemented following approval by NYSDEC and granting of site access by the property owner. Impacted off-site areas may require characterization based on site conditions, at the discretion of NYSDEC.

If onsite petroleum spills are identified, a QEP will determine the nature and extent of the spill and report to NYSDEC's spill hotline at (800) 457-7362 within statutory defined timelines. If the source of the spill is ongoing and can be identified, it should be stopped if this can be done safely. Potential hazards will be addressed immediately, consistent with guidance issued by NYSDEC.

5.4.11.3 Storm Response Reporting

A site inspection report will be submitted to NYSDEC at the completion of site inspection. An inspection report will be used for this purpose. Site conditions will be compared to the inventory of site conditions and material performed prior to the storm event and significant differences will be noted. The site inspection report will be sent to the NYSDEC project manager and will include the site name, address, tax block and lot, site primary and alternate contact name and phone number.

Damage and soil release assessment will include: whether the project had stockpiles; whether stockpiles were damaged; photographs of damage and notice of plan for repair; report of whether soil from the site was dislocated and whether any of the soil left the site; estimates of the volume of soil that left the site, nature of impact, and photographs; description of erosion damage; description of equipment damage; description of damage to the remedial program or the construction program, such as presence of on-site or off-site exposure pathways caused by the storm; presence of petroleum or other spills and status of spill reporting to NYSDEC; description of corrective actions; and schedule for corrective actions.

This report should be completed and submitted to the NYSDEC project manager with photographs within 24 hours of the time of safe entry to the property after the storm event.

5.4.12 Community Air Monitoring Plan

Community air monitoring will be conducted in compliance with the NYSDOH Generic CAMP outlined below and included in Appendix E. CAMP will be implemented during intrusive work within site soil/fill. CAMP will cease after completion of the defined remedial excavation, unless another source of contamination is identified.

The CAMP includes real-time monitoring for VOCs and particulates at the downwind perimeter of ground-intrusive activities. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling and advancement of trenches and test pits. Periodic monitoring for VOCs is required during non-intrusive activities such as the collection of groundwater samples from existing monitoring wells.

"Periodic" monitoring during sample collection might reasonably consist of collecting a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well bailing/purging, and collecting a reading before leaving a sample location.

CAMP monitoring for VOC levels will be conducted with PIDs, and monitoring for dust/particulates will be conducted with particulate sensors equipped with filters to detect particulate matter less than PM10. Monitoring for particulates and odors will be conducted during all ground intrusive activities by the RE's field inspector. The work zone is defined as the general area in which machinery is operating in support of remediation. A portable PID will be used to monitor the work zone and for periodic monitoring of VOCs during activities such as soil and groundwater sampling. The site perimeter will be visually monitored for fugitive dust emissions.

The following actions will be taken based on measured VOC levels:

- If total VOC levels exceed 5 ppm above background for the 15-minute average at the perimeter, work will be temporarily halted and monitoring continued. If levels readily decrease (per instantaneous readings) below 5 ppm above background, work will resume with continued monitoring.
- If total VOC levels at the downwind perimeter of the work zone persist at levels in excess of 5 ppm above background but less than 25 ppm, work will be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps work will resume provided that the total organic vapor level 200 feet downwind of the work 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 above background for the 15-minute average.
- If the total VOC level is above 25 ppm at the perimeter of the work zone, work will be shut down.

The following actions will be taken based on measured particulate levels and visual dust observations:

- If the downwind particulate level is 100 µg/m³ greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work zone, then dust suppression must be employed. Work may continue with dust suppression techniques provided that 15-minute average downwind PM10 levels do not exceed 150 µg/m³ above the background level and provided that no visible dust is migrating from the work zone.
- If, after implementation of dust suppression techniques, 15-minute average downwind PM10 levels are greater than 150 µg/m³ above the background level, work must be stopped and a re-evaluation of work initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind 15-minute average PM10 concentration to within 150 µg/m³ of the upwind level and in preventing visible dust migration.

Due to VOC impacts present at the site, special requirements for work within 20 feet of potentially exposed individuals or structures have been established. If work areas are within 20 feet of potentially

exposed populations or occupied structures, the continuous monitoring locations for VOCs and particulates must reflect the nearest potentially exposed individuals and the location of ventilation system intakes for nearby structures.

- If total VOC concentrations opposite the walls of occupied structures or next to intake vents exceed 1 ppm, monitoring should occur within the occupied structure(s). Background readings in the occupied spaces must be taken prior to commencement of the planned work. Any unusual background readings should be discussed with NYSDOH prior to commencement of the work.

If total particulate concentrations opposite the walls of occupied structures or next to intake vents exceed 150 µg/m^3, work activities should be suspended until controls are implemented and are successful in reducing the total particulate concentration to 150 µg/m^3 or less at the monitoring point.

Sustained concentrations of VOCs or PM10 will be reported to the NYSDEC and NYSDOH Project Managers and included in the daily report. In addition, a map showing the locations of the downwind and upwind CAMP stations will be included in the daily report.

5.4.13 Odor, Dust, and Nuisance Control Plan

Dust, odor, and nuisance control will be accomplished by the site remediation contractor as described in this section. Invasive development work will be conducted in accordance with dust and odor suppression methodology defined in the RAWP.

5.4.13.1 Odor Control Plan

This odor control plan is capable of controlling emissions of nuisance odors off-site. Specific odor control methods to be used on a routine basis will include application of foam suppressants or tarps over any odorous or VOC source areas. If nuisance odors are identified, work will be halted and the source of odors will be identified and corrected. Work will not resume until nuisance odors are abated. The NYSDEC and NYSDOH will be notified of all odor events and of all other odor complaints about the project. Implementation of odor monitoring, including notifying the contractor of a condition that warrants the halt of work, will be the responsibility of the RE, who is responsible for certifying the FER. Application of odor controls is the responsibility of the contractor.

All necessary means will be employed to prevent on- and off-site nuisances. If odors develop and cannot be otherwise controlled, means to eliminate nuisance conditions may include: (a) shrouding open excavations with tarps and other covers; (b) use of odor-suppressing foam; (c) use of chemical odorants in spray or misting systems; and, (d) use of staff to monitor odors in the surrounding neighborhood.

5.4.13.2 Dust Control Plan

The dust suppression plan that addresses dust management during ground-intrusive on-site work will include, at a minimum, the items listed below:

- Dust suppression will be achieved through the use of dedicated on-site water spraying for road wetting. Where required, the water source will be equipped with a water cannon, as required, capable of spraying water directly onto off-road areas including excavations and stockpiles.
- Gravel will be used on roadways to provide a clean and dust-free road surface.
- On-site roads will be limited in total area to minimize the area required for water spraying.

5.4.13.3 Other Nuisances

A plan for rodent control will be developed and used by the selected remediation contractor during site preparation (including clearing and grubbing) and during remedial work.

A plan for noise control will be developed and used by the selected remediation contractor during site preparation and remedial work and will conform, at a minimum, to the NYCDEP noise control standards.

6.0 CONTAMINATION TO REMAIN ON SITE

Since remaining contaminated soil, groundwater, and soil vapor will exist beneath the site after the Track 4 remedy is complete, ECs and ICs are required to protect human health and the environment. These ECs and ICs are described hereafter. Long-term management of EC and ICs and of remaining contamination will be executed under a site-specific SMP that will be developed and included in the FER.

ECs will be implemented to protect public health and the environment by appropriately managing remaining contamination. The site will have one primary EC system: a site-wide composite cover system.

The FER will provide tables and figures documenting remaining contamination. This will include presentation of concentrations exceeding UU, RURR, and relevant PGW cleanup standards.

7.0 ENGINEERING AND INSTITUTIONAL CONTROLS

Following completion of the remedy, it is anticipated that the site will achieve a Track 4 remedy and will require ECs and ICs. As part of development, a composite cover system will be constructed site wide.

The proposed ECs and ICs are detailed below.

7.1 Engineering Controls

7.1.1 Composite Cover System

Exposure to remaining contaminated soil and groundwater would be prevented by an engineered composite cover system. The composite cover system will consist of two feet of approved soil or gravel overlying a highly visible demarcation barrier, and will occupy the entire site footprint. The top 4 inches will consist of virgin ¾-inch crushed stone to serve as dust and vegetation suppression and mitigate erosion. Imported soil will meet the lower of the RURR and PGW SCOs.

The SMP will outline the procedures to be followed in the event that the composite cover system and underlying remaining soil is disturbed after the remedial action is complete. Maintenance of this composite cover system will be described in the SMP.

7.2 Criteria for Completion of Remediation/Termination of Remedial Systems

7.2.1 Composite Cover System

The composite cover system is a permanent control, and the quality and integrity of this system will be inspected at defined, regular intervals in perpetuity, and following any significant storm and/or flooding events that have the potential to compromise the system. The frequency of inspections will be defined in the SMP.

7.2.2 Groundwater Monitoring

After implementation of the groundwater treatment remedy, groundwater samples will be collected on a quarterly basis for the first year (four quarters) post-treatment as described in Section 5.2.2. Quarterly groundwater sampling may be implemented after the issuance of the COC under the NYSDEC-approved SMP. The decision to discontinue groundwater sampling after implementation of the groundwater remedy will be made in consultation with NYSDEC and NYSDOH and will consider whether the remaining contaminants of concern have:

- Decreased to levels below applicable NYSDEC standards, as practicable; and/or
- Become asymptotic over an extended period of time.

The results of long-term performance monitoring will be used to determine whether additional future groundwater treatment will be necessary. Proposed pre- and post-treatment groundwater monitoring well locations are shown on Figure 10B.

7.3 Institutional Controls

After the remedy is complete, the site will have remaining contamination. ECs have been incorporated into the remedy to render the overall site remedy protective of public health and the environment. An SMP will be prepared, and a site-specific EE will be recorded with the New York City Office of the City Register to provide an enforceable means for continual and proper management of remaining contamination and protection of public health and the environment in perpetuity or until released in writing by the NYSDEC. The easement will require that the grantor and the grantor's successors and assigns adhere to all ECs and ICs placed on this site. ICs provide restrictions on site usage and mandate operation, maintenance, monitoring and reporting measures for all ECs and ICs. The SMP will describe appropriate methods and procedures to maintain and protect ECs and ICs that are required by the EE. Once the SMP is approved by the NYSDEC, compliance with the SMP will be required by the grantor of the EE and grantor's successors and assigns.

7.3.1 Environmental Easement

An EE, as defined in Article 71, Title 36 of the ECL, is required when remaining contamination is left on-site after the remedy is complete. A Track 4 cleanup requires that an EE approved by the NYSDEC be filed and recorded with the New York City Office at the City Register before the COC can be issued by the NYSDEC. The recorded EE will be submitted as part of the FER.

The EE renders the site a Controlled Property. The easement will list the ECs and ICs required under this remedy to prevent future exposure to remaining contamination, including controlling disturbances of the subsurface remaining contamination and restricting the use of the site to commercial or industrial uses only. The ICs are generally subdivided between controls that support ECs and those that place general restrictions on site usage or other requirements. ICs in both of these groups are closely integrated with the SMP, which provides the methods and procedures to be followed to comply with this remedy.

The ICs that support ECs are:

- Compliance with the EE by the grantor and the grantor's successors and adherence of all elements of the SMP is required
- ECs must be operated and maintained as specified in the SMP
- A site cover system consisting of a soil/gravel cover must be inspected, certified, and maintained as required in the SMP
- ECs on the Controlled Property must be inspected and certified at a frequency and in a manner defined in the SMP
- Data and information pertinent to site management must be reported at the frequency and in a manner defined in the SMP
- ECs may not be discontinued without an amendment or extinguishment of the EE

Adherence to these ICs is mandated by the EE and will be implemented under the SMP (discussed in the next section). The site restrictions that apply to the site are:

- Vegetable gardens and farming in remaining on-site soil are prohibited
- Use of groundwater underlying the site is prohibited without treatment rendering it safe for intended purpose
- All future activities on the site that will disturb remaining contaminated material are prohibited unless they are conducted in accordance with the soil management provisions in the SMP
- The site may be used for industrial, commercial, and residential use only, provided the long-term ECs and ICs included in the SMP are employed
- The site may not be used for a higher level of use without an amendment or extinguishment of the EE

Grantor agrees to submit to the NYSDEC a written statement that certifies, under penalty of perjury, that: (1) controls employed at the site are unchanged from the previous certification or that any changes to the controls were approved by the NYSDEC; and, (2) nothing has occurred that impairs the ability of the controls to protect public health and environment or that constitute a violation or failure to comply with the SMP. This certification shall be submitted annually, or at a specified frequency allowed by the NYSDEC. The NYSDEC retains the right to access the site at any time to evaluate the continued maintenance of any and all controls.

7.3.2 Site Management Plan

A Track 4 cleanup requires an SMP. Site management is the last phase of remediation and begins with the approval of the FER and issuance of the COC for the remedy. The SMP is submitted as part of the FER, but will be written in a manner that allows its removal and use as a complete and independent document. Site management continues in perpetuity or until released in writing by the NYSDEC. If further redevelopment is implemented in the future under the SMP, future structures will require SVI evaluation and possible mitigation. The property owner is responsible for all site management responsibilities defined in the EE and performance of the SMP.

The SMP is intended to provide a detailed description of the procedures required to manage remaining contamination left in place at the site following completion of the remedy in accordance with the NYSDEC BCA. This includes: (1) development, implementation, and management of all ECs and ICs; (2) development and implementation of monitoring systems and a Monitoring Plan; (3) development of a plan to operate and maintain any treatment, collection, containment, or recovery systems (including, where appropriate, preparation of an Operation and Maintenance Manual); (4) submittal of Site Management Reports, performance of inspections and certification of results, and demonstration of proper communication of site information to the NYSDEC; and (5) defining criteria for termination of treatment system operation.

To address these needs, the SMP will include four plans: (1) an EC and IC Plan for implementation and management of EC/ICs; (2) a Monitoring Plan for implementation of Site Monitoring; (3) an Operation and Maintenance Plan for implementation of remedial collection, containment, treatment, and recovery systems; and (4) a Site Management Reporting Plan for submittal of data, information, recommendations, and certifications to NYSDEC. The SMP will be prepared in accordance with the requirements in NYSDEC DER-10 and the guidelines provided by the NYSDEC.

Site management activities, reporting, and EC/IC certification will be scheduled on a certification period basis. The certification period will be annual, and the first Periodic Review Report will be due for submission to the NYSDEC starting 16 months after issuance of the COC.

No exclusions for handling of remaining contaminated soils will be provided in the SMP. All handling of remaining contaminated soil and non-native soil will be subject to provisions contained in the SMP.

7.4 Final Engineering Report

An FER, prepared in accordance with DER-10, will be submitted to NYSDEC after implementation of the remedial action defined in this RAWP. The FER documents that the remedial work required under this RAWP has been completed and performed in compliance with this plan. The FER will provide a comprehensive account of the locations and characteristics of all soil/fill removed from the site including the surveyed map(s) of all sources. The FER will include the following documentation:

1. A written and photographic documentation (via daily field reports) of the completed remedy
2. A description of any deviations from the RAWP
3. An account of fill/soil material exported from the site, including waste types and volumes, waste characterization documentation, facility-signed manifests and scale tickets, facility approvals and other waste disposal documentation
4. An account of materials imported to the site
5. A tabular summary of post-excavation documentation sampling results and other sampling and laboratory analysis completed as part of the remedial action
6. As-built drawings for the EC

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

7.5 Certification

The following certification will appear in front of the Executive Summary of the FER. The certification will be signed by the RE, Paul McMahon, who is a PE registered in New York State. This certification will be appropriately signed and stamped. The certification will include the following statements:

I, _____, am currently a registered professional engineer licensed by the State of New York. I had primary direct responsibility for implementation of the remedial program activities, and I certify that the Remedial Action Work Plan was implemented and that all construction activities were completed in substantial conformance with the Department-approved Remedial Action Work Plan.

I certify that the data submitted to the Department with this Final Engineering Report demonstrates that the remediation requirements set forth in the Remedial Action Work Plan and in all applicable statutes and regulations have been or will be achieved in accordance with the time frames, if any, established for the remedy.

I certify that all use restrictions, ICs, ECs, and all operation and maintenance requirements applicable to the site are contained in an EE created and recorded pursuant ECL 71-3605 and that all affected local governments, as defined in ECL 71-3603, have been notified that such easement has been recorded. An SMP has been submitted by the Participants for the continual and proper operation, maintenance, and monitoring of all ECs employed at the site, including the proper maintenance of all remaining monitoring wells, and that such plan has been approved by the NYSDEC.

I certify that a Site Management Plan has been submitted for the continual and proper operation, maintenance, and monitoring of all Engineering Controls employed at the Site, including the proper maintenance of all remaining monitoring wells, and that such plan has been approved by Department.

I certify that all data generated in support of this report have been submitted in accordance with the Department's electronic data deliverable and have been accepted by the Department.

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

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

8.0 SCHEDULE

Implementation of the remedy is anticipated to begin in summer 2026 and be completed in early 2027. After completion of remediation, an FER will be submitted to the NYSDEC as detailed in Section 7.4. A remedial action construction schedule is included in Appendix L.