Atlantic Chestnut – Lot 1

250 Euclid Avenue
BROOKLYN, NEW YORK

DRAFT SITE MANAGEMENT PLAN

AKRF Project Number: 12492
NYSDEC BCP Site Number: C224234

Prepared for:

NYSDEC Region 2
1 Hunter's Point Plaza
47-40 21st Street
Long Island City, New York 11101

On Behalf Of:

Atlantic Chestnut Affordable Housing LLC, Atlantic Chestnut I Associates L.P., and Atlantic Chestnut I Housing Development Fund Corporation
902 Broadway, 13th Floor
New York, New York 10010

Prepared by:

AKRF

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Revisions to Final Approved Site Management Plan:

Revision No.	Date Submitted	Summary of Revision	NYSDEC Approval Date

AUGUST 2022

CERTIFICATION STATEMENT

I, Michelle Lapin, P.E., certify that I am currently a NYS registered Professional Engineer as defined in 6 NYCRR Part 375 and that this Site Management Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

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

Michelle Lapin, P.E.	XX/XX/2022	
NYS Professional Engineer #073934-1	Date	Signature/Stamp

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.

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LIST OF ACRONYMS

Acronym	Definition
6 NYCRR	New York Codes, Rules and Regulations
AGV	Air Guidance Value
AWQSGVs	Ambient Water Quality Standards and Guidance Values
BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
BTEX	A group of VOCs comprising benzene, toluene, ethylbenzene, and xylenes
CAMP	Community Air Monitoring Plan
CFR	Code of Federal Regulations
COC	Contaminants of Concern
CoC	Certificate of Completion
CP	Commissioner's Policy
DER	Division of Environmental Remediation
EC	Engineering Control
ECL	Environmental Conservation Law
ECs	Engineering Controls
EPA	United States Environmental Protection Agency
EWP	Excavation Work Plan
FDNY	New York City Fire Department
FER	Final Engineering Report
HASP	Health and Safety Plan
ICs	Institutional Controls
MTA	Metropolitan Transportation Authority
MW	Monitoring Well
NY	New York
NYCOER	New York City Office of Environmental Remediation
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYSDOT	New York State Department of Transportation
PAHs	Polycyclic Aromatic Hydrocarbons
PCBS	Polychlorinated Biphenyls
PCE	Tetrachloroethylene
PGWSCOs	Protection of Groundwater Soil Cleanup Objectives
PID	Photoionization detector
PRR	Periodic Review Report

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Acronym	Definition
QA/QC	Quality Assurance/Quality Control
QEP	Qualified Environmental Professional
RAOs	Remedial Action Objectives
RAWP	Remedial Action Work Plan
RI	Remedial Investigation
RIR	Remedial Investigation Report
RRSCO	Restricted Residential Soil Cleanup Objective
RSO	Remedial Site Optimization
SB	Soil Boring
SCGS	Standards, Criteria, and Guidance
SCOs	Soil Cleanup Objectives
SMP	Site Management Plan
SPDES	State Pollutant Discharge Elimination System
SVOC	Semivolatile Organic Compound
TAL	Target Analyte List
TCE	Trichloroethylene
TCL	Target Compound List
TOGS	Technical Operational and Guidance Series
ULURP	Uniform Land Use Review Procedure
USGS	United States Geological Survey
UST	Underground Storage Tank
UUSCOs	Unrestricted Use Soil Cleanup Objectives
VOC	Volatile Organic Compound

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EXECUTIVE SUMMARY

Table T1 provides a summary of the controls implemented for the Site, as well as the inspections, monitoring, maintenance, and reporting activities required by this Site Management Plan.

Table T1
Site Management Plan Summary

Site Identification	BCP Site No. C224234 Atlantic Chestnut – Lot 1 250 Euclid Avenue, Brooklyn, New York
Institutional Controls (ICs)	1. The property may be used for restricted residential uses only, as set forth in the Environmental Easement.
	2. The property may not be used for a higher level of use, such as unrestricted use or residential use without additional remediation and amendment of the Environmental Easement, as approved by the NYSDEC.
	3. All future activities on the property that will disturb remaining contaminated material must be conducted in accordance with this SMP.
	4. The use of the groundwater underlying the property is prohibited without treatment rendering it safe for intended use.
	5. The potential for vapor intrusion must be evaluated for any new buildings developed on the Site, and any potential impacts that are identified must be monitored or mitigated.
	6. In-ground vegetable gardens and farming on the property are prohibited.
	7. The Engineering Controls (ECs) must be maintained and inspected at a frequency and in a manner defined in the NYSDEC-approved SMP.
Engineering Controls (ECs)	Sub-Slab Depressurization System (SSDS)
	Soil Vapor Extraction (SVE) System
	Groundwater Treatment Program [In-Situ Chemical Oxidation (ISCO)]
	Composite Cover System
Inspections*	**Frequency**
SSDS Inspection	Quarterly – Next Inspection in March 2023
SVE System	Quarterly – Next Inspection in March 2023
Contingency ISCO	Annual – Next Inspection in March 2023
Composite Cover Inspection	Annually - Next Inspection in 2023
Monitoring	**Frequency**
SSDS	Monthly (by Building Personnel)
SVE System	Quarterly – Next Inspection in March 2023
Contingency ISCO	Not Applicable
Composite Cover Inspection	Annually - Next Inspection in 2023

Site Identification	BCP Site No. C224234 Atlantic Chestnut – Lot 1 250 Euclid Avenue, Brooklyn, New York
Maintenance	**Frequency**
SSDS	As Required to maintain integrity/function.
SVE System	As Required to maintain integrity/function.
Cover System Maintenance	As Required to maintain integrity/function.
Reporting	**Frequency**
Quarterly Media Monitoring Report	Quarterly – Next Report Due March 2023
Periodic Review Report	16 months after receipt of Certificate of Completion (COC); Annually thereafter

Note: * - Annual inspections must be performed by a Remedial Engineer or their designated representative and certified during subsequent reporting to NYSDEC.

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1.0 INTRODUCTION

1.1 General

This Site Management Plan (SMP) was prepared on behalf of Atlantic Chestnut Affordable Housing LLC, Atlantic Chestnut I Housing Development Fund Corporation, and Atlantic Chestnut I Associates L.P. as an element of the remedial program for the Atlantic Chestnut – Lot 1 site located at 250 Euclid Avenue in the East New York neighborhood of Brooklyn, New York (hereinafter referred to as the "Site"). The Site is identified on the New York City Tax Map as Brooklyn Borough Tax Block 4143, Lot 1. Historically, Lot 1 encompassed the entirety of Block 4143. The New York City Department of Finance (NYCDOF) issued a tax lot apportionment in January 2016 to support the redevelopment of the Site, which redefined Lot 1 as Lots 1, 2, and 3.

Atlantic Chestnut Affordable Housing LLC entered into a Brownfield Cleanup Agreement (BCA) (BCA Index No. C224234-05-16) with the New York State Department of Environmental Conservation (NYSDEC or the Department) on May 26, 2016 as a Volunteer. A BCA Amendment was issued in June 2022, which documented the change of address from 3264 Fulton Street to 250 Euclid Avenue, added Atlantic Chestnut I Associates L.P. and Atlantic Chestnut I Housing Development Fund Corporation as Requestors/Volunteers, documented the change of ownership from Atlantic Chestnut Affordable Housing LLC to Atlantic Chestnut I Housing Development Fund Corporation, and provided proof that the Site is an affordable housing project. A second BCA Amendment was issued in August 2022, which added Atlantic Chestnut I Associates L.P. as a beneficial owner of the Site. A Site Location map is provided as Figure 1. A figure showing the boundaries of the Site is provided as Figure 2.

After completion of the remedial work described in the Remedial Action Work Plan (RAWP), some contamination was left at the Site, which is hereafter referred to as "remaining contamination." Institutional and Engineering Controls (ICs and ECs) have been incorporated into the Site remedy to control exposure to remaining contamination, thereby ensuring protection of public health and the environment. An Environmental Easement (EE) has been granted to NYSDEC and recorded with the NYC Office of the City County Register of the City of New York, which will require compliance with this SMP and all Engineering Controls (ECs) and Institutional Controls (ICs) placed on the Site.

This SMP was prepared to manage the remaining contamination, and remedial elements at the Site until the EE is extinguished in accordance with New York State Environmental Conservation Law (ECL) Article 71, Title 36. This plan has been approved by NYSDEC, and compliance with this plan is required by the grantor of the EE, and the grantor's successors and assigns. This SMP may be revised only with the approval of NYSDEC.

It is important to note that:

1. This SMP details the site-specific implementation procedures that are required by the EE. Failure to properly implement the SMP is a violation of the EE, which is grounds for revocation of the Certificate of Completion (COC); and

2. Failure to comply with this SMP is also a violation of ECL, 6 New York Codes, Rules, and Regulations (NYCRR) Part 375, and the BCA (Index No. C224234-05-16; Site No. C224234) for the Site, and thereby subject to applicable penalties.

All reports associated with the Site can be viewed by contacting NYSDEC or its successor agency managing environmental issues in New York State. A list of contacts for persons involved with the Site is provided in In-Text Tables T2 and T3 of this SMP.

This SMP was prepared by AKRF, Inc. (AKRF) on behalf of the Volunteer in accordance with the requirements of NYSDEC's DER-10 (Technical Guidance for Site Investigation and Remediation), dated May 2010, and the guidelines provided by NYSDEC. This SMP addresses the means for implementing the ICs and ECs that are required by the EE for the Site.

1.2 Revisions

Revisions to this plan will be proposed in writing to the NYSDEC's project manager. NYSDEC can also make changes to the SMP or request revisions from the remedial party. Revisions will be necessary upon, but not limited to, the following occurring: a change in media monitoring requirements, upgrades to or shutdown of a remedial system, post-remedial removal of contaminated sediment or soil, or other significant change to the Site conditions. In accordance with the Environmental Easement for the Site, the NYSDEC project manager will provide a notice of any approved changes to the SMP and append these notices to the SMP retained in its files.

1.3 Notifications

Notifications will be submitted by the property owner to the NYSDEC, as needed, in accordance with NYSDEC's DER – 10 for the following reasons:

1. 60-day advance notice of any proposed changes in site use that are required under the terms of the BCA, 6 NYCRR Part 375 and/or Environmental Conservation Law.
2. 7-day advance notice of any field activity associated with the remedial program.
3. 15-day advance notice of any proposed ground-intrusive activity pursuant to the Excavation Work Plan (EWP).
4. Notice within 48-hours of any damage or defect to the foundation, structures or EC that reduces or has the potential to reduce the effectiveness of an EC, and likewise, any action to be taken to mitigate the damage or defect.
5. Notice within 48 hours of any non-routine maintenance activities.
6. Verbal notice by noon of the following day of any emergency, such as a fire, flood, or earthquake that reduces or has the potential to reduce the effectiveness of ECs in place at the Site, with written confirmation within 7 days that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public.
7. Follow-up status reports on actions taken to respond to any emergency event requiring ongoing responsive action submitted to the NYSDEC within 45 days describing and documenting actions taken to restore the effectiveness of the ECs.

Any change in the ownership of the Site or the responsibility for implementing this SMP will include the following notifications:

1. At least 60 days prior to the change, the NYSDEC will be notified in writing of the proposed change. This will include a certification that the prospective purchaser/Remedial Party has been provided with a copy of the NYSDEC Order on Consent and all approved work plans and reports, including this SMP.
2. Within 15 days after the transfer of all or part of the Site, the new owner's name, contact representative, and contact information will be confirmed in writing to the NYSDEC.

In-Text Table T2 includes contact information for these notifications. The information on this table will be updated as necessary to provide accurate contact information. A full listing of site-related contact information is provided in In-Text Table T3.

Table T2
NYSDEC/NYSDOH Notifications*

Company/Regulator	Contact Name	Contact Title	Contact Number**
NYSDEC	Manfred Magloire	Project Manager	All Notifications
	Jane O' Connell	Chief, Superfund and Brownfield Cleanup Section	All Notifications
	Kelly Lewandowski	Chief, Site Control	Notifications 1 and 8
NYSDOH	Stephen Lawrence	Project Manager	Notifications 4, 6, and 7

Notes: *Notifications are subject to change and will be updated as necessary.

** Numbers in this column reference the numbered bullets in the notification list in this section.

Table T3
Site Contact List

Company	Individual Name	Title	Contact Number
AKRF	Deborah Shapiro, QEP	Principal	646-388-9544 (office)
	Michelle Lapin, P.E.	Remedial Engineer	646-388-9520 (office)
	Eric Park	Project Manager	646-388-9532 (office)
	Amy Jordan	Project Manager Alternate	646-88-9864 (office)
	Marco Balletta	Field Team Leader	646-270-7195 (cell)
Atlantic Chestnut Affordable Housing LLC, Atlantic Chestnut I Associates L.P., and Atlantic Chestnut I Housing Development Fund Corporation	Michael Wadman	Volunteer's Representative	646-388-8260 (office)

2.0 SUMMARY OF PREVIOUS INVESTIGATIONS AND REMEDIAL ACTIONS

2.1 Site Location and Description

The Site is located in the County of Kings, New York and is identified as Brooklyn Block 4143, Lot 1 on the New York City Tax Map. Historically, Lot 1 encompassed the entirety of Block 4143; the New York City Department of Finance (NYCDOF) issued a tax lot apportionment in January 2016, which redefined former Lot 1 as Lots 1, 2, and 3. The Site is zoned as M1-4 (manufacturing) with an R8A (residential) equivalent.

A boundary map is attached to the BCA, as required by Environmental Conservation Law (ECL) Title 14 Section 27-1419. The Site is fully described in the Metes and Bounds, provided as Appendix A. A Site Location map is provided as Figure 1 and a Site Plan is provided as Figure 2.

Historic records indicate that the Site was developed with residences and a road in 1887 and with industrial and manufacturing uses, including the Columbia Machine Works and Malleable Iron Company, the Columbia Cable and Electric Corporation, Blue Ridge Farms, Inc., and Chloe Foods Corp., between 1908 and 2012. Blue Ridge Farms, Inc. and Chloe Foods Corp. are listed on multiple federal and state databases. Prior uses that appear to have led to Site contamination include blacksmithing and stamping, a brass foundry, wood working, a blacksmith, a machine shop, tank and engine rooms, an iron works, wire braiding, and cable manufacturing. The Site has remained vacant since a July 2012 fire caused severe structural damage to the former Site buildings on the southern portion of the Site. Demolition of the Site buildings was completed as part of the remedial action between July and December 2016. Past owners of Block 4143, Lot 1 include: Columbia Electric Realty, Inc. in 1980; Avnal, Inc. from 1980 to 1984; Blue Ridge Farms, Inc. from 1984 to 2004; 3301 Atlantic Avenue, LLC from 2004 to 2013; Sapphire Luxury Estates, LLC from 2013 to 2014; Atlantic Chestnut, LLC from 2014 to 2015; Atlantic Chestnut Affordable Housing, LLC from 2015 to June 2021; and Atlantic Chestnut I Housing Development Fund Corporation from June 2021 to present.

2.2 Physical Setting

2.2.1 Land Use

The Site consists of a 14-story mixed-use building (under construction) comprising approximately 415,000 gross square feet of residential and commercial space. The building contains two partial cellars on the eastern and western portions of the Site; crawl spaces on the northern, northwestern, and southern portions of the Site; and an approximately 17,300-square foot central exterior courtyard. The building includes: approximately 2,000 square feet of residential amenities; approximately 19,500 square feet of retail space; four affordable residential units on the ground floor; and 399 affordable residential units on the 2nd through 14th floors. In addition to residential units, the 9th floor has roof access and community space.

The Site is located within the Cypress Hills/East New York Brownfield Opportunity Area (BOA). The objectives of the BOA include expanding affordable housing, creating green manufacturing opportunities, and improving access to public transit and open space. The proposed Site uses are consistent with the Cypress Hills/East New York BOA objectives.

2.2.2 Geology

Prior to development, the stratigraphy of the Site, from the surface down, generally consisted of fill material comprising sand, silt, and gravel with little amounts of concrete, brick, asphalt, and coal ash to varying depths up to approximately 12 feet below surface grade, underlain by apparent native sand, silt, gravel and clay up to 110 feet below surface grade. According to geologic maps of the area, bedrock is expected to be in excess of 300 feet below surface grade at the Site and surrounding area.

2.2.3 Hydrogeology

Based on Site-specific groundwater measurements, groundwater beneath the Site ranges from approximately 8.6 feet to 8.7 feet NGVD, or approximately 30 feet below sidewalk grade. Based on groundwater measurements at the Site and the south-adjacent lots [Atlantic Chestnut – Lot 2 (BCP Site No. C224235) and Atlantic Chestnut – Lot 3 (BCP Site No. C223236)], depth to groundwater ranges from approximately 8.0 feet to 8.7 feet NGVD on the Site block. Groundwater flows in a southerly direction beneath the Site and south-adjacent lots.

2.3 Investigation and Remedial History

The following narrative provides a remedial history timeline and a brief summary of the available project records to document key investigative and remedial milestones for the Site. Full titles for each of the reports referenced below are provided in Section 8 – References.

Subsurface Investigation Report – Blue Ridge Farms, 3301 Atlantic Avenue, 84 Dinsmore Place, and 111 Dinsmore Place, Brooklyn, New York, AKRF, Inc. (AKRF), May 2001

AKRF conducted a Site Investigation (SI) of a larger area including the Site in May 2001. At the time of this investigation, the Site was developed with food processing and storage buildings. The SI included the performance of a geophysical survey across exterior portions of the Site and the advancement of four soil borings with the collection and analysis of soil samples, and the installation of temporary groundwater monitoring wells with the collection and analysis of groundwater samples. The scope of the investigation was based on a December 2000 Phase I Environmental Site Assessment (ESA) of the Site by IVI Environmental, Inc.

Due to reinforced concrete across the Site, the geophysical survey was inconclusive. Soil consisted of fill material (brick, concrete, asphalt, clay, silt, sand, and gravel) up to 6 feet below grade, underlain by native soil (sand, gravel, silt, and clay) to 16 feet below grade. Groundwater was encountered at approximately 32 feet below grade.

Petroleum-related VOCs and the SVOC naphthalene were detected above NYSDEC Recommended Soil Cleanup Objectives (RSCOs) listed in the NYSDEC Technical and Administrative Guidance Memorandum (TAGM) in the soil samples collected, the applicable soil cleanup objectives at the time of the investigation. Solvent and petroleum-related VOCs and metals were detected above AWQSGVs in the groundwater sample collected from the south-adjacent property. VOCs were detected above AWQSGVs in pre- and post- process water samples. Based on elevated PID detections and laboratory analytical data from the soil

borings surrounding the on-site tank system, Spill No. 0101620 was assigned to the historic address 3301 Atlantic Avenue.

AKRF recommended the preparation of a work plan to be submitted to the NYSDEC to further delineate, excavate, and dispose of petroleum-contaminated soil at the south-adjacent property to close Spill No. 0101620.

Phase I Environmental Site Assessment (ESA) – 3301 Atlantic Avenue, 3238 Fulton Street, 226-296 Euclid Avenue, and 215-279 Chestnut Street, Brooklyn, New York, Property Solutions, Inc. (PSI), June 2010

PSI conducted a Phase I ESA of a larger area including the Site in April 2014. The Phase I ESA identified historical uses at the Site including: a machine and iron works facility, an electrical cable manufacturer, and a food processing plant; records indicating that five USTs were previously located on the Site; and Historic Recognized Environmental Conditions (HRECs) at the Site, including the Site's listing in the Leaking Underground Storage Tank (LUST) and Spills databases. PSI recommended conducting an SI, including a geophysical survey, to investigate the potential impacts associated with historic operations and fuel oil storage at the Site.

Asbestos Investigation and Bulk Sample/Laboratory Analysis – 3301 Atlantic Avenue, Brooklyn, New York, Safety Environmental, Co. of NY, Inc. (Safety), July 2013

Safety conducted an asbestos survey of the buildings located on the southern portion of the Site and south-adjacent to the Site in July 2013. A total of 131 samples were collected for laboratory analysis from on- and off-site portions of the building. Asbestos-containing material (ACM) was identified within the former buildings at the following locations: boiler No. 4 door insulation, boiler No. 3 caulking, first floor pipe insulation, roof transite shingles, roof membranes, roof flashing, and roof vent membranes. Safety recommended removal of all ACM prior to demolition of the former Site buildings.

Phase I Environmental Site Assessment (ESA) Report – 3301 Atlantic Avenue (Block 4143, Lot 1), Brooklyn, New York, Legette, Brashears, & Graham, Inc. (LBG), March 2014

LBG conducted a Phase I ESA of the Site and the south-adjoining lots in April 2014. The Phase I ESA identified Recognized Environmental Conditions (RECs) associated with former uses at the Site, including: blacksmithing and stamping, a machine and iron works shop, an electric cable manufacturer, a gasoline filling station, and listings in the Spills database. The report noted the following de Minimis conditions: nearby hazardous materials/waste storage, use, or releases; and the potential presence of ACM, lead based paint (LBP), and fluorescent lighting at the Site. LBG recommended that any contaminated soil discovered during redevelopment of the Site should be handled according to applicable federal, state, and local regulations.

Chain of Title Summary Report – 3301 Atlantic Avenue and 242 Chestnut Street, Brooklyn, New York, Phipps Houses, 2015

A Chain of Title Summary Report was compiled by Phipps Houses, which outlined ownership of the Site and south-adjacent and nearby properties between 2004 and 2015. The report showed the transfer of ownership from Blue Ridge Farms, Inc. to 3301 Atlantic Avenue, LLC in May 2004; from 3301 Atlantic Avenue, LLC to Sapphire Luxury Estates, LLC in July 2013; a foreclosure and sale judgement for the Site and north-adjacent properties to be sold at public

auction in September 2013; and an agreement for assignment of rights and claims from Blue Ridge Farms, Inc. to 3301 Atlantic Partners, LLC in March 2014.

Phase I Environmental Site Assessment (ESA) Report – 3301 Atlantic Avenue and 242 Chestnut Street, Brooklyn, New York, AKRF, Inc. (AKRF), September 2015

AKRF conducted a Phase I ESA of a larger area including the Site in September 2015. The Phase I ESA identified the following RECs at the Site:

- Historic on-site industrial operations, including the Columbia Machine Works and Malleable Iron Company, and the Columbia Cable and Electric Corporation. It was concluded that undocumented releases from historic industrial uses may have affected subsurface conditions at the Site.
- The address 3301 Atlantic Avenue was formerly associated with the entirety of Block 4143. At the time of the Phase I ESA, 3301 Atlantic Avenue was listed in the following databases: petroleum bulk storage (PBS) database for the storage of several USTs and ASTs; Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS); chemical bulk storage (CBS); Spill database for Spill No. 0101620; Toxic Release Inventory System (TRIS); and Air Discharge Facility (ADF) databases. It was reported that these listings may have been related to the Site and/or south-adjoining property(ies).
- The former interconnected factory buildings were damaged by a fire in 2012. Abundant debris, including metal, wood, and ash were observed throughout the buildings during the Site inspection. Based on the documented storage of petroleum and chemicals, it was concluded that undocumented discharges due to the fire may have affected subsurface conditions at the Site, including high concentrations of metals and SVOCs in the ash.
- Two July 2013 Asbestos Reports identified ACM throughout the former building interiors and on exterior built-up roofing materials. Interior and exterior building materials were observed to be in fair to poor condition, with the majority of the eastern portion of the former Site buildings damaged by fire. Observed painted surfaces were generally in fair to poor condition. Based on the age of the former Site buildings, it was concluded that LBP may have been present and the fluorescent lighting fixtures and remaining electrical equipment may have contained mercury and/or PCBs. No evidence of leaks or stains from these fixtures and equipment was observed; however, it was noted that releases may have occurred during the fire that were not able to be investigated due to inaccessibility and/or debris throughout the Site buildings.

AKRF recommended an SI to characterize subsurface conditions of soil, groundwater, and soil vapor at the Site prior to redevelopment.

Subsurface (Phase II) Investigation Report – 3264 Fulton Street, Brooklyn, New York, AKRF, Inc. (AKRF), January 2016

AKRF conducted an SI at the Site in December 2015. The SI included the advancement of three soil borings with the collection and laboratory analysis of six soil samples; the installation of one temporary, one-inch diameter PVC groundwater monitoring well at one of the boring locations with the collection and laboratory analysis of one groundwater sample; and the installation of one temporary soil vapor point with the collection and laboratory analysis of one soil vapor sample. An ambient air sample was collected for comparison purposes. The scope of the investigation was based on the findings of AKRF's September 2015 Phase I ESA.

Soil beneath the Site consisted of fill material (sand, gravel, silt, concrete, brick, ash, and asphalt) to depths up to approximately 11 feet below grade, underlain by apparent native soil

(sand and gravel) up to 40 feet below grade (the extent of the soil borings). Groundwater was encountered at approximately 30 feet below grade.

The VOC trichloroethylene (TCE) was detected in two soil samples at concentrations above its UUSCO. Arsenic, copper, lead, and zinc were detected in soil samples at concentrations above respective UUSCOs and/or RRSCOs. The VOC chloroform was detected in the groundwater sample at a concentration slightly above its TOGS. Sodium was detected in the unfiltered and filtered groundwater sample at concentrations above its TOGS. VOCs associated with petroleum were detected in soil vapor samples at individual concentrations up to 161 micrograms per cubic meter (µg/m3). Solvent-related VOCs were detected at individual concentrations up to 903 µg/m3.

AKRF concluded that the soil, groundwater, and soil vapor contaminants appear to be associated with former industrial operations at the Site.

Remedial Investigation (RI) Work Plan (RIWP) – Atlantic Chestnut – Lot 1, 3264 Fulton Street, Brooklyn, New York, AKRF, Inc. (AKRF), November 2016

AKRF prepared an RIWP in November 2016 based on the results of previous environmental investigations. The proposed scope of work detailed in the RIWP included: the performance of a geophysical survey across accessible portions of the Site; advancement of 14 soil borings with continuous sample collection and laboratory analysis of two to three soil samples per boring; installation of five groundwater monitoring wells with the collection and analysis of five groundwater samples, and the installation of seven temporary soil vapor points with the collection and analysis of seven soil vapor samples and one ambient air sample. The RIWP included a QAPP and a HASP. The RIWP was approved in a November 30, 2016 NYSDEC-issued letter.

Remedial Investigation (RI) Report (RIR) – Atlantic Chestnut – Lot 1, 3264 Fulton Street, Brooklyn, New York, AKRF, Inc. (AKRF), April 2017

AKRF conducted an RI at the Site in December 2016 in accordance with the NYSDEC-approved November 2016 RIWP. The RI included: the performance of a geophysical survey across accessible portions of the Site; the advancement of 14 soil borings and the collection of 26 soil samples for chemical analysis; the installation of 5 permanent, 2-inch diameter groundwater monitoring wells and the collection of 5 groundwater samples for chemical analysis; the installation of 6 temporary soil vapor probes across the Site and the collection of 6 soil vapor samples and one ambient air samples for chemical analysis; and the survey of groundwater monitoring well elevations on the Site and south-adjoining lots to develop Site-specific and local groundwater contour maps to determine groundwater flow beneath the Site and surrounding area.

The stratigraphy of the Site, from the surface down, generally consisted of fill comprising sand, silt, gravel, concrete, brick, and metal up to a maximum depth of 6 feet below grade, underlain by apparent native sand with varying amounts of gravel and silt to boring termination depths (up to 35 feet below grade). Groundwater was encountered at depths ranging from approximately 30.5 feet to 32.7 feet below sidewalk grade, or 8.6 to 8.7 feet above national geodetic vertical datum (NGVD), an approximate of mean sea level, in groundwater monitoring wells on the northern and southern portions of the Site, respectively. Based on the well elevation survey, groundwater flows in a southerly direction beneath the Site and surrounding area.

The RIR concluded that contaminated soil, groundwater, and soil vapor present at the Site were likely attributable to historic Site usage, including industrial and manufacturing uses. The presence of copper, hexavalent chromium, lead, mercury, and zinc in shallow fill and the

elevated detections of PAHs in soil/fill were attributed to historic filling, undocumented discharges due to a fire in 2012, and/or historic operations at the Site. The presence of petroleum-related compounds in soil vapor were likely related to the former storage tanks and/or historic Site usage. The presence of the chlorinated solvent-related compounds TCE (in soil, groundwater, and soil vapor), PCE (in groundwater and soil vapor), chloroform (in groundwater), and carbon tetrachloride (in soil vapor) were likely related to the historic manufacturing operations at the Site.

Remedial Design Investigation Work Plan – Atlantic Chestnut – Lot 1, 3264 Fulton Street, Brooklyn, New York, AKRF, Inc. (AKRF), April 2017

AKRF prepared an RDIWP in April 2017. The RDIWP was prepared to further delineate known soil and groundwater contamination at the Site to aid in the design of the remedy. The RDIWP included: the advancement of 22 soil borings with continuous soil sampling from surface grade to boring termination depths with the laboratory analysis of soil samples from each boring; installation of 4 nested groundwater monitoring wells with the collection and laboratory analysis of 12 groundwater samples from the newly installed wells and from the 5 groundwater wells installed during the RI; and the performance of a groundwater monitoring well elevation and location survey. The RDIWP was approved by NYSDEC on July 3, 2017.

Interim Remedial Measure Work Plan (IRMWP) – Atlantic Chestnut – Lot 1, 3264 Fulton Street, Brooklyn, New York, AKRF, Inc., July 2018

AKRF prepared an IRMWP in July 2018. The IRMWP was prepared to address the potential for off-site migration of soil vapor until the selected remedy is implemented under a NYSDEC-approved RAWP. The IRMWP was approved by NYSDEC on July 2, 2018.

Soil/Fill Waste Classification Report – Atlantic Chestnut – Lot 1, 3264 Fulton Street, Brooklyn, New York, AKRF, Inc., March 2019

AKRF prepared a Soil/Fill Waste Classification Report in March 2019. The Soil/Fill Waste Classification Report documented the sampling and laboratory analytical data for in-situ soil waste classification sampling conducted by AKRF on August 11, 2017 and December 26 and 27, 2018. The sampling was performed to obtain representative analytical data from the subsurface soil/fill that will be excavated and disposed of during remediation. The report was intended to be used as a supplement to applications for disposal approval at facilities considering accepting Site soil/fill.

Draft Interim Remedial Measure Report (IRMR) – Atlantic Chestnut – Lots 1,2, and 3, 3264 Fulton Street, 254 Euclid Avenue, and 275 Chestnut Street, Brooklyn, New York, AKRF, Inc., September 2019

AKRF prepared a Draft IRMR for the Site and two south-adjoining lots (BCP Site Nos. C224235 and C224236) in September 2019. The Draft IRMR was prepared to describe the installation, startup, and operation of the IRM SVES. The report summarized fieldwork, including a pilot study, and SVE well and vapor monitoring point installation, system startup, vapor sampling, and long-term system monitoring. The Draft IRMR included three Operation, Maintenance, and Monitoring (OM&M) Plans (one for each BCP site) as appendices, which provide directions for operation and maintenance of the SVES.

Remedial Design Investigation Report – Atlantic Chestnut – Lot 1, 3264 Fulton Street, Brooklyn, New York, AKRF, Inc., February 2020

AKRF prepared an RDIR in February 2020. The RDI was conducted in accordance with the NYSDEC-approved RDIWP and included: the advancement of 23 soil borings with continuous soil sampling from surface grade to boring termination depths with the laboratory analysis of

92 soil samples; installation of 4 nested groundwater monitoring wells with the collection and laboratory analysis of 12 groundwater samples from the newly installed wells and from the 5 groundwater wells installed during the RI; and the performance of a groundwater monitoring well elevation and location survey. Lithological and hydrological observations made during the RDI was consistent with observations made during the RI.

The conclusions of the RDIR were consistent with the findings made in the RIR. Soil/fill sampling identified the greatest concentrations of TCE were detected in on the southern portion of the Site from shallow soil to the groundwater interface, encountered at approximately 30 feet below surface grade. CVOCs were detected at concentrations above respective UUSCOs, RRSCOs, and PGWSCOs; and SVOCs and metals were detected at concentrations above UUSCOs and/or RRSCOs up to approximately 30 feet below grade. The horizontal extent of the TCE groundwater plume corresponds to the extent of the TCE contamination in soil, with the greatest concentrations detected on the south-central portion of the Site. TCE concentrations decreased significantly vertically, with no exceedances of TOGS standards in the intermediate- and deep-screened wells. PCE and chloroform were also detected at concentrations above their respective TOGS in shallow groundwater on the southern and northern portions of the Site, respectively.

Remedial Action Work Plan – Atlantic Chestnut – Lot 1, 3264 Fulton Street, Brooklyn, New York, AKRF, Inc., February 2020

AKRF prepared a RAWP which outlined the remedial activities and cleanup objectives for the Site. The RAWP proposed excavation and removal of soil/fill to a maximum depth of approximately 20 feet below ground surface (bgs) to achieve a Track 2 Cleanup; and excavation and removal of any unknown USTs and associated piping encountered during the excavation in accordance with applicable federal, state, and local laws and regulations, as defined by 6 NYCRR Part 375-6.8. The remedy also included the installation of ICs/ECs, including the installation of an active sub-slab depressurization system (SSDS), soil vapor extraction (SVE) system, and groundwater treatment system into the proposed building design as part of construction.

RAWP approval and the NYSDEC Decision Document were both issued in February 2020.

Construction Completion Report – Atlantic Chestnut – Lots 1, 2, and 3 - 250 Euclid Avenue, 254 Euclid Avenue, and 275 Chestnut Street, Brooklyn, New York, AKRF, Inc., August 2022

AKRF prepared an IRM Construction Completion Report (CCR) to describe interim remedial SVE systems installed at Lots 1, 2, and 3 to address the potential for off-site migration of soil vapor until source removal under the NYSDEC-approved RAWP could commence. The Lot 1 IRM SVE was installed in accordance with a dedicated IRM Work Plan (IRMWP) dated July 2018. The CCR detailed the installation, startup, operation, maintenance, and shutdown of the Lot 1 IRM SVE system. In March 2021, the northern and eastern portions of the SVES on Lot 1 were shut down and dismantled to facilitate waste classification sampling and the western portion remained operational until the start of remedial construction in July 2021.

Remedy Addendum Letter – Atlantic Chestnut – Lot 1, 250 Euclid Avenue, Brooklyn, New York, AKRF, Inc., August 2022

AKRF prepared a Remedy Addendum Letter (RAL) in August 2022. The RAL summarized additional soil analytical data collected after selection and approval of a Track 4 remedy for the Site, which indicates that a dual Track 2/Track 4 remedy was achieved. The additional data

required the off-site disposal of soil containing hazardous concentrations of CVOCs across the southern and central portions of the Site. The RAL requested NYSDEC concurrence.

2.4 Remedial Action Objectives

The Remedial Action Objectives (RAOs) for the Site based on the results of the SI, RI, and RDI are as follows:

Soil

RAOs for Public Health Protection:

- Prevent ingestion/direct contact with contaminated soil.
- Prevent inhalation of, or exposure to, contaminants volatilizing from contaminants soil.

RAOs for Environmental Protection

- Prevent migration of contaminants that would result in groundwater contamination.

Groundwater

RAOs for Public Health Protection

- Prevent ingestion of groundwater containing contaminant levels exceeding drinking water standards.
- Prevent contact with, or inhalation of, volatiles emanating from contaminated groundwater.

RAOs for Environmental Protection

- Restore ground water aquifer to pre-release conditions, to the extent practicable.
- Remove the source of groundwater contamination.

Soil Vapor

RAOs for Public Health Protection

- Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion into buildings at a Site.
- Prevent the off-site migration of contaminants.

2.5 Summary of Remedial Actions

Remedial actions were performed at the Site in accordance with the NYSDEC-approved RAWP dated February 2020, the Decision Document dated April 2, 2020, the RAL dated August 2022, and all applicable federal, state, and local rules and regulations. Remedial activities were completed in September 2022.

The Remedial Actions performed at the Site included:

1. Excavation and management of on-site soils that exceeded the PGWSCOs for CVOCs, and RRSCOs, as defined by 6 NYCRR Part 375-6.8, (refer to Figure 2 for the extent of remedial excavation). An approximate total of 21,300 tons of soil were excavated as part of the remedial activities.
2. Removal of one 10,000-gallon AST during building demolition.
3. Removal of two USTs (one 550-gallon gasoline tank and one 250-gallon tank with unknown oil/sludge contents) and related contaminated soil during remedial excavation.

4. Installation of support of excavation (SOE) necessary to enable excavation of contaminated soil.
5. Off-site disposal of all materials removed from the Site in accordance with all federal, state, and local rules and regulations for handling, transport, and disposal.
6. Implementation of a Community Air Monitoring Plan (CAMP) during all ground-intrusive Site activities, which included soil disturbance and loading activities, to monitor levels of VOCs and airborne particulates within the active work zones and around the perimeter of the Site.
7. Field screening for indications of contamination [by visual means, odor, and monitoring with photoionization detector (PID)] during all ground-intrusive Site work, including soil disturbance and loading activities.
8. Import and on-site placement of 6,430 tons clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) to replace the excavated soil and/or establish the designed development grades as necessary.
9. Collection and analysis of 72 confirmatory endpoint samples across the remedial excavation area to document remaining concentrations of contaminants in soil after excavation was completed. Additional endpoint sampling occurred around hotspots and additional areas of concern (AOCs) identified during the remedial action (RA) based on the sampling frequency outlined in Section 5.4 of DER-10.
10. Installation of an active sub-slab depressurization system (SSDS) below the new building foundation to prevent vapor intrusion into the proposed building. The SSDS will be operational prior to building occupancy.
11. Installation and operation of a soil vapor extraction (SVE) system on the south-central portion of the Site to remove residual source material in soil that could not be feasibly excavated and disposed of off-site.
12. Implementation of an in-situ groundwater treatment program including installation of a contingency in-situ chemical oxidation (ISCO) system on the south-central portion of the Site, which shall be used only in the event that post-remediation groundwater contaminant concentrations are detected above the comparison criteria.
13. Installation of post-remedial groundwater monitoring wells and groundwater monitoring to confirm attainment of the remedy with respect to groundwater contamination.
14. Imposition of two Institutional Controls (ICs) in the form of an Environmental Easement (EE) and a Site-specific NYSDEC-approved Site Management Plan (SMP). The EE will: require the remedial parties/Site owners to complete and submit a periodic certification of ICs and Engineering Controls (ECs) to the Department in accordance with Part 375-1.8 (h)(3); allow the use and development of the controlled property for Restricted Residential use as defined by Part 375-1.8(g), although land use is subject to local zoning laws; restrict the use of groundwater as a source of potable or process water without necessary water quality treatment, as determined by NYSDOH; and require compliance with a Site-specific NYSDEC-approved SMP.
15. Recording of an EE, including ECs and ICs, with the City Registrar to prevent future exposure to any residual contamination remaining at the Site.

16. Preparation of an SMP for long term management of residual contamination as required by the Environmental Easement, including plans for: (1) ICs and ECs, (2) monitoring, (3) operation and maintenance, and (4) reporting.

2.6 Remaining Contamination

2.6.1 Soil

Soil quality was characterized during previous investigations prior to entering the BCP, and during the RI, RDI, and hazardous waste delineation/waste classification sampling conducted as part of the BCP. Following the completion of the soil excavation and removal, endpoint soil sampling (Sitewide and area of concern sampling) was conducted throughout the Site at the bottom of the remedial excavation. Sitewide sidewall samples could not be collected due to the presence of the SOE; however, area of concern sidewall samples were collected where feasible.

Results of the soil endpoint samples indicated that all soil exceeding the Track 2 RRSCOs within the upper 15 feet was excavated, with the exception of two Site-wide endpoint samples on the south-central portion of the Site, which contained low levels of PAHs, and the samples collected from the two UST tank graves, which contained PAHs and metals. In addition, one sample from the RI where CVOCs were detected above PGWSCOs could not be excavated. The remaining soil endpoint samples did not include CVOCs above PGWSCOs.

Analytical results for all soil samples remaining at the Site after the completion of the Remedial Action that exceeded the PGWSCOs and RRSCOs are identified in In-Text Table T4. Figure 3 shows the locations of soil samples at the Site after the completion of the Remedial Action that exceeded the PGWSCOs and RRSCOs. The analytical results from the Site-wide, and Area of Concern, and UST endpoint samples are provided in Attached Tables 1 through 4, 5, and 6 through 9, respectively.

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TABLE T4
Remaining Soil Contamination Summary

ANALYTE	SAMPLE/BORING ID	NYSDEC UUSCO (mg/kg)	NYSDEC RRSCO (mg/kg)	NYSDEC PGWSCO (mg/kg)	CONCENTRATION (mg/kg)
Cadmium	L1-UST-2E_4_20211217	2.5	4.3	N/A	3.1
Copper	L1-UST-1B_8_20220125	50	270	N/A	150
	L1-UST-1BX_8_20220125				173
	L1-UST-1E_5_20211216				123
	L1-UST-1N_5_20211216				114
	L1-UST-1NX_5_20211216				73.3
	L1-UST-1S_5_20211216				154
	L1-UST-2B_5_20211217				65.8
	L1-UST-2E_4_20211217				208
	L1-UST-2N_4_20211217				96.5
	L1-UST-2S_4_20211217				70.9
	L1-UST-2W_4_20211217				120
	L1-UST-2WX_4_20211217				99.4
Lead	L1-UST-1B_8_20220125	63	400	N/A	71.3 J
	L1-UST-1BX_8_20220125				124 J
	L1-UST-1N_5_20211216				89.2 J
	L1-UST-1S_5_20211216				89.5
	L1-UST-2B_5_20211217				74.1
	L1-UST-2E_4_20211217				181
	L1-UST-2N_4_20211217				85.4
	L1-UST-2S_4_20211217				68.7
	L1-UST-2WX_4_20211217				72.7
Mercury	L1-UST-2E_4_20211217	0.18	0.81	N/A	0.19
Zinc	L1-UST-1B_8_20220125	109	10,000	N/A	242
	L1-UST-1BX_8_20220125				254
	L1-UST-1N_5_20211216				191 JL
	L1-UST-1NX_5_20211216				194 JL
	L1-UST-1S_5_20211216				128
	L1-UST-2B_5_20211217				1,280
	L1-UST-2E_4_20211217				9,320
	L1-UST-2N_4_20211217				896
	L1-UST-2S_4_20211217				648
	L1-UST-2W_4_20211217				328
	L1-UST-2WX_4_20211217				575
Benzo(a)Anthracene	L1-UST-1BX_8_20220125	1	1	N/A	2.3 J
	L1-UST-2B_5_20211217				11 D
	L1-UST-2E_4_20211217				26 D
	L1-UST-2N_4_20211217				5.7
	L1-UST-2S_4_20211217				21 D
	L1-UST-2W_4_20211217				3.1
	L1-UST-2WX_4_20211217				4.1
Benzo(a)Pyrene	L1-UST-1BX_8_20220125	1	1	N/A	2 J
	L1-UST-2B_5_20211217				9.1 D
	L1-UST-2E_4_20211217				22 D
	L1-UST-2N_4_20211217				4.9
	L1-UST-2S_4_20211217				16 D
	L1-UST-2W_4_20211217				2.5
	L1-UST-2WX_4_20211217				3.5
Benzo(b)Fluoranthene	L1-UST-1BX_8_20220125	1	1	N/A	2.8 J
	L1-UST-1N_5_20211216				1.2
	L1-UST-2B_5_20211217				13 D
	L1-UST-2E_4_20211217				32 D
	L1-UST-2N_4_20211217				6.5
	L1-UST-2S_4_20211217				22 D
	L1-UST-2W_4_20211217				3.9
	L1-UST-2WX_4_20211217				5.1
Benzo(k)Fluoranthene	L1-UST-1BX_8_20220125	0.8	3.9	N/A	1.1 J
	L1-UST-2B_5_20211217				4.7 D
	L1-UST-2E_4_20211217				10 D
	L1-UST-2N_4_20211217				2.8
	L1-UST-2S_4_20211217				7.5
	L1-UST-2W_4_20211217				1.2
	L1-UST-2WX_4_20211217				1.8
Chrysene	L1-UST-1BX_8_20220125	1	3.9	N/A	2.2 J
	L1-UST-2B_5_20211217				9.9 D
	L1-UST-2E_4_20211217				23 D
	L1-UST-2N_4_20211217				5.4
	L1-UST-2S_4_20211217				17 D
	L1-UST-2W_4_20211217				2.9
	L1-UST-2WX_4_20211217				4
Dibenz(a,h)Anthracene	L1-UST-1BX_8_20220125	0.33	0.33	N/A	0.38 J
	L1-UST-2B_5_20211217				1.7
	L1-UST-2E_4_20211217				3.6
	L1-UST-2N_4_20211217				0.87
	L1-UST-2S_4_20211217				2.6
	L1-UST-2W_4_20211217				0.45
	L1-UST-2WX_4_20211217				0.61
Indeno(1,2,3-c,d)Pyrene	L1-UST-1B_8_20220125	0.5	0.5	N/A	0.51 JK
	L1-UST-1BX_8_20220125				1.3 JK
	L1-UST-1N_5_20211216				0.62 JK
	L1-UST-2B_5_20211217				6.9
	L1-UST-2E_4_20211217				19 D
	L1-UST-2N_4_20211217				3.7
	L1-UST-2S_4_20211217				13 D
	L1-UST-2W_4_20211217				2
	L1-UST-2WX_4_20211217				2.5
	L1-EP-57_3_20220118				0.53
	L1-EP-59_4_20220118				0.57
TCE	L1-RI-SB-11/L1-RDI-SB-11 (varying depths up to 32 feet below grade)	0.47	21	0.47	2.3 to 930

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2.6.2 Groundwater

Groundwater quality was characterized during previous investigations prior to entering the BCP and during the RI and RDI conducted as part of the BCP. The groundwater beneath the Site was found to have concentrations of CVOCs (specifically TCE) above the AWQSGVs; therefore groundwater treatment was included as a component of the Decision Document. A groundwater treatment program was completed at the Site to treat elevated concentrations of TCE; however, low-level concentrations exceeding the AWQSGVs still remain. The pre-remediation and post-remediation concentrations of CVOCs are provided in Attached Tables 6 and 7, respectively.

Groundwater use at the Site is also subject to the ICs documented within the Environmental Easement and is restricted for use as a source of potable or process water without necessary water quality treatment as determined by NYSDOH.

2.6.3 Sub-Slab Soil Vapor

Based on the findings of the RI and RDI, contaminated soil vapor remains at the Site. The contaminated soil vapor will be treated by the SVE system and the vapor mitigation system, which consists of a vapor barrier membrane and the SSDS installed below the entire building footprint (see Figures 4a and 4b for details), which will prevent vapor intrusion into the new building.

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3.0 INSTITUTIONAL AND ENGINEERING CONTROL PLAN

3.1 General

Since remaining contamination exists at the Site, ICs and ECs are required to protect human health and the environment. This IC/EC Plan describes the procedures for the implementation and management of all ICs/ECs at the Site. The IC/EC Plan is one component of the SMP and is subject to revision by the NYSDEC project manager.

This plan provides:

- A description of all ICs/ECs on the Site;
- The basic implementation and intended role of each IC/EC;
- A description of the key components of the ICs set forth in the Environmental Easement;
- A description of the controls to be evaluated during each required inspection and periodic review;
- A description of plans and procedures to be followed for implementation of ICs/ECs, such as the implementation of the EWP (provided in Appendix C) for the proper handling of remaining contamination that may be disturbed during maintenance or redevelopment work on the Site; and
- Any other provisions necessary to identify or establish methods for implementing the ICs/ECs required by the Site remedy, as determined by the NYSDEC project manager.

3.2 Institutional Controls

A series of ICs is required by the Decision Document to: (1) implement, maintain and monitor EC systems; (2) prevent future exposure to remaining contamination; and (3) limit the use and development of the Site to restricted residential, commercial, and/or industrial uses only. Adherence to these ICs on the Site is required by the Environmental Easement and will be implemented under this SMP. ICs identified in the Environmental Easement may not be discontinued without an amendment to or extinguishment of the Environmental Easement. The IC boundaries are shown on Figure 2. These ICs are:

- The Site may be used for restricted residential, or lesser uses;
- All ECs must be operated and maintained as specified in this SMP;
- All ECs must be inspected at a frequency and in a manner defined in the SMP;
- The use of groundwater underlying the Site is prohibited without necessary water quality treatment as determined by NYSDOH to render it safe for use as drinking water or for industrial purposes, and the user must first notify and obtain written approval to do so from NYSDEC;
- Data and information pertinent to site management must be reported at the frequency and in a manner as defined in this SMP;
- All future activities that will disturb remaining contaminated material must be conducted in accordance with this SMP;
- Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in this SMP;
- Operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical component of the remedy shall be performed as defined in this SMP;

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- Access to the Site must be provided to agents, employees, or other representatives of the State of New York with reasonable prior notice to the property owner to assure compliance with the restrictions identified by the Environmental Easement;
- The potential for vapor intrusion must be evaluated for any buildings developed in the area within the IC boundaries noted on Figure 2, and any potential impacts that are identified must be monitored or mitigated;
- In-ground vegetable gardens and farming on the Site are prohibited; and
- An evaluation shall be performed to determine the need for further investigation and remediation should large scale redevelopment occur, if any of the existing structures are demolished, or if the subsurface is otherwise made accessible.

3.3 Engineering Controls

The Controlled Property (the Site) includes four primary ECs. The ECs are (1) an SSDS; (2) a soil vapor extraction system (SVES); (3) contingency in-situ groundwater treatment; and (4) a composite cover system.

3.3.1 Active Sub-Slab Depressurization System (SSDS)

An active SSDS was installed and will be operated to mitigate the potential for sub-slab vapor intrusion into the new building. The SSDS applies negative pressure beneath the building slab. The SSDS was not installed beneath the central portion of the Site at the open air exterior courtyard. SSDS effluent vapors are exhausted to the atmosphere via discharge stacks.

The SSDS layout is shown on Figure 4A. A preliminary proposed process and instrumentation diagram (P&ID) for the SSDS is provided as Figure 4B. Appendix B contains the as-built SSDS design details. The major components of the SSDS include:

1. Five 0.02-inch slotted and solid, 4-inch diameter Schedule 40 polyvinyl chloride (PVC) pipe lengths (L1-VR-1A, L1-VR-1B, L1-VR-1C, L1-VR-1D, and L1-VR-1E) beneath the northern crawlspace building slabs and beneath the western partial cellar and crawlspace building slabs;
2. Four 0.02-inch slotted, 4-inch diameter Schedule 40 PVC pipe sections (L1-VR-2A, L1-VR-2B, L1-VR-2C, and L1-VR-2D) beneath the southern crawlspace building slab and beneath the eastern partial cellar slab;
3. Two pipe manifolds, which combine L1-VR-1A through VR-1E into a 6-inch galvanized streel riser pipe (L1-VR-1), in the northwestern portion of the Site; and L1-VR-2A through L1-VR-2D into a 6-inch galvanized steel riser pipe (L1-VR-2) in the southeastern portion of the Site;
4. Riser pipes VR-1 and VR-2, which extend from the manifolds to the 3rd and 5th floor roofs, respectively;
5. Two roof-mounted fans (L1-SF-1 and L1-SF-2);
6. Two 10-foot tall, 6-inch diameter galvanized steel rooftop exhaust stacks fitted with rain caps;
7. Communication and pipe sleeves through concrete foundation elements;
8. A minimum 6-inch thick gas-permeable aggregate stratum underlain by a non-woven geotextile fabric beneath the entire SSDS treatment area, with the exception of an areas beneath the groundwater table;

9. Two sub-slab condensate drains installed on lines L1-VR-1A and L1-VR-1B;
10. Four vacuum monitoring points (VMPs), L1-MP-01 through L1-MP-04, installed beneath the building slabs;
11. Accessories, including cleanouts, sample ports, vacuum indicators/pressure gauges, flow meters, butterfly valves, and differential pressure switches;
12. A control panel equipped with a local alarm station to notify select personnel of alarm conditions; and
13. A vapor barrier (Drago Wrap®, and Grace Bituthene® 3000) installed over the full extent of the building slab and on subsurface foundation walls.

Procedures for monitoring the SSDS are included in the Monitoring Plan (Section 4 of this SMP). Procedures for operating and maintaining the SSDS are documented in the Operation and Maintenance Plan (Section 5 of this SMP). The Monitoring Plan also addresses severe condition inspections in the event that a severe condition occurs, which may affect controls at the Site.

3.3.2 Soil Vapor Extraction (SVE) System

An SVE system consisting of two SVE wells was installed on the south-central portion of the Site to remove CVOC contaminant mass in deeper soil that could not be excavated. The two SVE wells were screened from 15 to 28 feet below grade at each proposed well location. Based on pilot testing conducted as part of the IRM, each SVE well is expected to have a lateral radius of influence (ROI) of approximately 35 feet and will operate at an approximate air flow rate of 95 inches of water (in H_2O) and 400 cubic feet per minute (cfm).

The target area for the SVES is the vadose zone (unsaturated soil above the groundwater table) on the south-central portion of the Site. SVE well L1-SVE-02 was installed at the approximate location of soil boring L1-RI-SB-11/L1-RDI-SB-11 where subsurface soil sampling identified concentrations of TCE in soil above its PGWSCO at depths up to 32 feet below surface grade. SVE well SVE-01 was installed northwest of SVE-02 to provide overlapping ROIs across the south-central portion of the Site where contaminant mass in soil and groundwater was historically detected at the greatest concentrations (to date, the only CVOC concentrations above PGWSCOs is at historic soil boring L1-RI-SB-11/L1-RDI-SB-11). The contaminated vapor extracted from the SVE wells will be treated using a granular activated carbon (GAC) system and discharged to the atmosphere in accordance with the emission requirements set forth in 6NYCRR Part 212.

The SVES Plan showing the locations of the system components and SVES P&ID showing the primary system components are provided as Figures 5A, and 5B, respectively. Appendix B contains the as-built SVE system design details.

The SVES installed consists of:

1. Two 4-inch diameter SVE wells (L1-RA-SVE-01 and L1-RA-SVE-02) constructed with 10 feet of screen directly above the observed groundwater interface on the south-central portion of the Site and 4-inch diameter SVE wells screened above the groundwater table around the Site perimeter.
2. 4-inch diameter solid PVC piping connecting the SVE wells from the subsurface to the building interior.

3. A manifold, which combines the two SVE lines into a single 6-inch diameter CPVC pipe (L1-VR-3) on the southeastern portion of the Site.
4. A vertical riser (L1-VR-3) consisting of a 6-inch galvanized steel pipe extending from the equipment room to the 5th floor roof.
5. Accessories on the individual SVE lines, including throttling valves, sample ports, vacuum/pressure gauges, air flow rate gauges, temperature sensors, reducers, unions, etc., to be confirmed during final design and installation.
6. One SVE blower, with a variable-frequency drive (VFD) to throttle blower operation to appropriate conditions (vacuum and air flow rate).
7. A control panel equipped with a telemetry system to notify select personnel of alarm conditions.
8. A GAC vapor treatment unit comprising two 400-pound carbon units in series.
9. One 10-foot tall, 6-inch diameter galvanized steel rooftop exhaust stack fitted with a rain cap.
10. Communication and pipe sleeves through concrete foundation elements.

Procedures for monitoring the SVE system are included in the Monitoring Plan (Section 4 of this SMP). Procedures for operating and maintaining the SVE system are documented in the Operation and Maintenance Plan (Section 5 of this SMP). The Monitoring Plan also addresses severe condition inspections in the event that a severe condition occurs, which may affect controls at the Site.

3.4 Contingency ISCO System

Based on elevated concentrations of TCE (up to 130 µg/L) in groundwater detected during the RI and RDI, a groundwater treatment program was implemented as part of the RA to reduce contaminant concentrations in shallow groundwater across an approximately 1,900-square foot treatment area on the south-central portion of the Site.

If deemed necessary by post-injection groundwater monitoring results, subsequent polishing treatment round(s) will be implemented using a network of permanent injection points that were installed within the proposed new building foundation. The groundwater treatment will occur in accordance with applicable federal, state, and local laws and guidelines, including proper notification of relevant governmental and regulatory agencies.

The contingency ISCO system was proposed in the Contingency Groundwater Treatment In-Situ Design Document (ISDD), provided in Appendix B, and comprises the following components:

1. Three permanent injection wells comprising 2-inch diameter, 10-foot long, 20-slot milled PVC well screen installed directly below the groundwater interface.
2. Underground conveyance tubing comprising dedicated 1-inch schedule 40 HDPE piping installed beneath the crawlspace slab, and into an equipment room in the southeastern portion of the building's eastern partial cellar.
3. Aboveground tubing manifold comprising a wall-mounted hose manifold and individual line valves, threaded caps, flow meters, pressure gauges, and totalizers to control and document injection parameters during any potential future injection event.

The contingency ISCO System Site Plan is provided in Figure 6A and system details are provided in Figure 6B. Complete details on the Contingency injection system are included in the ISDD, provided in Appendix B.

3.5 Media Monitoring Program

If necessary, based upon 2022 post-injection groundwater sampling event results, post-remediation groundwater monitoring may continue, as specified in this SMP.

3.5.1 Groundwater Monitoring

The Site includes a network of five monitoring wells located in the vicinity of the ISCO treatment zone. The location of all monitoring wells, including injection wells and recovery wells, are shown on Figure 6A.

Future groundwater monitoring will be performed on a frequency approved by NYSDEC/NYSDOH to assess the performance of the remedy.

The network of groundwater monitoring wells selected for inclusion at the start of Site Management includes upgradient plume area(s) and downgradient locations to confirm overburden groundwater conditions at the Site.

Groundwater monitoring will continue as determined in consultation with NYSDEC and NYSDOH until residual groundwater concentrations are found to be below NYSDEC standards or have become asymptotic over an extended period. The groundwater monitoring program will include gauging from all accessible monitoring wells on a quarterly basis to confirm groundwater flow elevations and inferred groundwater flow direction in the overburden aquifer.

3.5.1.1. Groundwater Sampling Protocol

All monitoring well sampling activities will be recorded by taking applicable notes in a field book and by collecting the readings listed on the groundwater sampling field log presented in Appendix D. Pertinent observations or Site conditions at the time of the sampling (e.g., well integrity, etc.) will be noted on the well sampling log. One well sampling log will be filled out for each of the wells sampled and serve as the inspection form associated with the groundwater monitoring well network.

Groundwater samples will be collected using low flow sampling techniques as described in U.S. EPA's Ground-Water Sampling Guidelines for the collection of groundwater samples from monitoring wells. Sampling will be conducted according to the following procedures, and as detailed in the Quality Assurance Project Plan (QAPP) included as Appendix E:

- Slowly remove the access manhole and locking cap and immediately measure the vapor concentrations in the well with a PID calibrated to the manufacturer's specifications.
- Measure the depth to water and total well depth of all accessible monitoring wells prior to conducting any purging, and check for the presence of NAPL using an oil/water interface probe. Measure the thickness of NAPL, if any, and record in field book and the well sampling field log. Groundwater samples will not be collected from wells containing measurable non-aqueous phase liquid (NAPL).
- Use the water level and total well depth measurements to calculate the length of the mid-point of the water column within the screened interval. For example, for a well where the total depth is 30 feet, screened interval is 20 to 30 feet, and depth to water is 24 feet, the mid-point of the water column within the screened interval would be 27 feet.

- For all wells requiring sampling under the approved monitoring program, connect dedicated tubing to a submersible bladder pump and lower the pump such that the intake of the pump is set at the mid-point of the water column within the screened interval of the well. Connect the discharge end of the tubing to the flow-through cell of a YSI multi-parameter (or equivalent) meter. Connect tubing to the output of the cell and place the discharge end of the tubing into a 5-gallon bucket.
- Activate the pump at the lowest flow rate setting of the pump.
- Measure the depth to water within the well. The pump flow rate may be increased such that the water level measurements do not change by more than 0.3 foot as compared to the initial static reading. The well-purging rate should be adjusted to produce a smooth, constant (laminar) flow rate and so as not to produce excessive turbulence in the well. The expected targeted purge rate will be approximately 0.5 liter/minute and will be no greater than 3.8 liters/minute.
- Transfer discharged water from the 5-gallon buckets to LNAPL remediation system.
- During purging, collect periodic samples and analyze for water quality indicators [e.g., turbidity, pH, temperature, dissolved oxygen (DO), reduction-oxidation potential (ORP), and specific conductivity] with measurements collected approximately every five minutes.
- Continue purging the well until turbidity is less than 50 NTU and water quality indicators have stabilized to the extent practicable. The criteria for stabilization will be three successive readings for the following low-flow groundwater stabilization parameters and criteria:

Parameter	Stabilization Criteria
PH	+/- 0.1 pH units
Specific Conductance	+/- 3% mS/cm
ORP/Eh	+/- 10mV
Turbidity	<50 NTU
Dissolved Oxygen	+/- 0.3 mg/l

Notes: mS/cm = millisievert per centimeter
mV = millivolts
NTU = nephthalometric turbidity units
mg/l = milligrams per liter

- If the water quality parameters do not stabilize and/or turbidity is greater than 50 NTU within two hours, purging may be discontinued. Efforts to stabilize the water quality for the well must be recorded in the field book, and samples may then be collected as described herein.
- After purging, disconnect the tubing to the inlet of the flow-through cell. Collect groundwater samples directly from the discharge end of the tubing and place into the required sample containers as described in Section 4.2 of the QAPP. Label the containers as described in Section 4.9.2 of the QAPP and place in a chilled cooler.

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- Collect one final field sample and analyze for turbidity and water quality parameters (pH, temperature, dissolved oxygen, reduction-oxidation potential, and specific conductivity).
- Once sampling is complete, remove the pump and/or tubing from the well. Dispose of the sample tubing and any associated PPE used for sampling in a 55-gallon drum designated for disposable sampling materials and PPE. The purge water will be managed as described in Section 3.4 of the QAPP included as Appendix E.
- Decontaminate the pump, oil/water interface probe, and flow-through cell, as described in Section 3.3 of the QAPP included as Appendix E.
- Record all measurements (depth to water, depth to NAPL, water quality parameters, turbidity), calculations (well volume), and observations in the project field book and the well sampling field log included in Appendix D.

These groundwater well sampling procedures will be adjusted to adhere to the NYSDEC guidance on sampling for emerging contaminants, as needed.

3.5.2 Monitoring Well Repairs, Replacement, and Decommissioning

If biofouling or silt accumulation occurs in the on-site and/or off-site monitoring wells, the wells will be physically agitated/surged and redeveloped. Additionally, monitoring wells will be properly decommissioned and replaced, as necessary (as per the requirements of this Monitoring Plan), if an event renders the wells unusable.

Repairs and/or replacement of wells in the monitoring well network will be performed based on assessments of structural integrity and overall performance.

The NYSDEC will be notified prior to any repair or decommissioning of monitoring wells for the purpose of replacement, and the repair or decommissioning and replacement process will be documented in the subsequent Periodic Review Report. Well decommissioning without replacement will be done only with the prior approval of NYSDEC. Well abandonment will be performed in accordance with NYSDEC's CP-43: Groundwater Monitoring Well Decommissioning Policy. Monitoring wells that are decommissioned because they have been rendered unusable will be reinstalled in the nearest available location, unless otherwise approved by the NYSDEC.

3.6 Composite Cover System

A composite cover system was installed at the Site to prevent direct contact with any residually-contaminated soil. The composite cover system comprises the following elements to prevent human exposure to residual contamination soil at the Site: (1) concrete building elements overlaying soil such as sidewalks, and pathways, and concrete foundation elements (such as crawl space/basement slabs, and foundation walls) with a minimum 20-mil vapor barrier/waterproofing membrane as a demarcation barrier; and (2) a minimum two-foot clean soil layer with a demarcation barrier in all landscaped and non-covered areas. The manufacturers' specifications for the proposed vapor barriers are included as Appendix B. The composite cover system plan is provided as Figure 2.

The composite cover system is a permanent control and the quality and integrity of the system will be inspected at defined, regular intervals in perpetuity. Composite cover system maintenance and inspection requirements are discussed in Section 4.

An Excavation Work Plan is included as an appendix to this SMP (Appendix C) to outline the procedures to be followed in the event that the composite cover system and any underlying residual contamination are disturbed in the future.

3.7 Criteria for Completion of Remediation/Termination of Remedial Systems

Generally, remedial processes are considered completed when monitoring indicates that the remedy has achieved the RAOs identified by the Decision Document. The framework for determining when remedial processes are complete is provided in Section 6.4 of NYSDEC DER-10. Unless waived by NYSDEC, confirmation samples of applicable environmental media are required before terminating any remedial actions at the Site. Confirmation samples require Category B deliverables and a Data Usability Summary Report (DUSR).

The remedial party will also conduct any needed Site restoration activities, such as asphalt patching and decommissioning of treatment system equipment. In addition, the remedial party will conduct any necessary restoration of vegetation coverage, trees, and wetlands, and will comply with NYSDEC and the United States Army Corps of Engineers regulations and guidance. Also, the remedial party will ensure that no ongoing erosion is occurring on the Site.

3.7.1 SSDS

The SSDS will remain in operation as designed until a soil vapor intrusion assessment is conducted to assess soil vapor and indoor air conditions at the Site. Protocol for such a sampling event would be outlined in a request letter to NYSDEC.

The SSDS will not be discontinued unless prior written approval is granted by the NYSDEC and NYSDOH project managers. If monitoring data indicates that the SSDS may no longer be required, a proposal to discontinue the SSDS will be submitted by the remedial party to the NYSDEC and NYSDOH project managers.

Vapor Barrier System

The vapor barrier system is a permanent control, and the quality and integrity of this system will remain intact (but will not require visual inspection due to the location of the system beneath the composite cover system) in accordance with this SMP in perpetuity.

3.7.2 SVE System

The SVE system will not be discontinued unless prior written approval is granted by the NYSDEC project manager. In the event that monitoring data indicates that the SVE system may no longer be required, a proposal to discontinue the system will be submitted by the remedial party to the NYSDEC project manager. Conditions that warrant discontinuing the SVE system include contaminant concentrations in soil vapor from the SVE system that: (1) reach levels that are consistently below NYSDOH Vapor Intrusion Guidance Matrix Values, (2) have become asymptotic to a low level over an extended period of time as accepted by NYSDEC, or (3) NYSDEC has determined that the SVE system has reached the limit of its effectiveness. This assessment will be based in part on post-remediation contaminant levels in soil vapor collected from sampling ports installed on the SVE manifold legs. Systems will remain in place and operational until permission to discontinue their use is granted in writing by the NYSDEC project manager.

3.7.3 Contingency ISCO System

The contingency ISCO system will not be decommissioned unless prior written approval is granted by the NYSDEC project manager. In the event that monitoring data indicates that the contingency ISCO system may no longer be required, a proposal to remove the system will be submitted by the remedial party to the NYSDEC project manager. Conditions that warrant discontinuing the contingency ISCO system include contaminant concentrations in groundwater that: (1) reach levels that are consistently below NYSDEC Class GA Ambient Water Quality Standards and Guidance Values (AWQSGVs), and/or (2) have become asymptotic to a low level over an extended period of time as accepted by NYSDEC. Systems will remain in place and operational until permission to discontinue their use is granted in writing by the NYSDEC project manager.

3.7.4 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 accordance with this SMP in perpetuity.

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4.0 MONITORING AND SAMPLING PLAN

4.1 General

This Monitoring and Sampling Plan describes the measures for evaluating the overall performance and effectiveness of the remedy. This Monitoring and Sampling Plan may only be revised with the approval of the NYSDEC project manager. Details regarding the sampling procedures, data quality usability objectives, analytical methods, etc. for all samples collected as part of site management for the Site are included in the Quality Assurance Project Plan (QAPP), provided in Appendix E.

This Monitoring and Sampling Plan describes the methods to be used for:

- Sampling and analysis of all appropriate media (e.g., soil vapor and soil);
- Assessing compliance with applicable NYSDEC standards, criteria, and guidance (SCGs), particularly groundwater standards and Part 375 SCOs for soil; and
- Evaluating Site information periodically to confirm that the remedy continues to be effective in protecting public health and the environment.

To adequately address these issues, this Monitoring and Sampling Plan provides information on:

- Sampling locations, protocol, and frequency;
- Information on all designed monitoring systems;
- Analytical sampling program requirements; and
- Annual inspection and periodic certification.

Reporting requirements are provided in Section 7 of this SMP.

4.2 Site-Wide Inspection

Site-wide inspections will be performed at a minimum of once per year. These periodic inspections must be conducted when the ground surface is visible (i.e., no snow cover). Site-wide inspections will be performed by a qualified environmental professional (QEP) as defined in 6 NYCRR Part 375, a P.E. who is licensed and registered in New York State, or a qualified person who directly reports to a P.E. who is licensed and registered in New York State. Modification to the frequency or duration of the inspections will require approval from the NYSDEC project manager. Site-wide inspections will also be performed after all severe weather conditions that may affect ECs or monitoring devices. During these inspections, an inspection form will be completed, as provided in Appendix D – Site Management Forms. The form will compile sufficient information to assess the following:

- Compliance with all ICs, including Site usage;
- An evaluation of the condition and continued effectiveness of ECs;
- General Site conditions at the time of the inspection;
- Whether stormwater management systems, such as basins and outfalls, are working as designed;
- The site management activities being conducted, including, where appropriate, confirmation sampling and a health and safety inspection; and

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- Confirm that Site records are up to date.

Inspections of all remedial components installed at the Site will be conducted. A comprehensive Site-wide inspection will be conducted and documented according to the SMP schedule, regardless of the frequency of the Periodic Review Report (PRR). The inspections will determine and document the following:

- Whether ECs continue to perform as designed;
- If these controls continue to be protective of human health and the environment;
- Compliance with requirements of this SMP and the Environmental Easement;
- Achievement of remedial performance criteria; and
- If Site records are complete and up to date.

Reporting requirements are outlined in Section 7 of this SMP.

Inspections will also be performed in the event of an emergency. If an emergency, such as a natural disaster or an unforeseen failure of any of the ECs occurs that reduces or has the potential to reduce the effectiveness of ECs in place at the Site, verbal notice to the NYSDEC project manager must be given by noon of the following day. In addition, an inspection of the Site will be conducted within 5 days of the event to verify the effectiveness of the ICs/ECs implemented at the Site by a QEP, as defined in 6 NYCRR Part 375. Written confirmation must be provided to the NYSDEC project manager within 7 days of the event that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public.

Table T5
Monitoring/Inspection Schedule

EC Monitored	Frequency*	Location (s)	Matrix	Analysis
SSDS	Quarterly	Manifolds, vertical risers, monitoring points, fans	NA	System balancing, documentation of operating conditions Pressure/Vacuum Measurements from Monitoring Points
SVE System	Quarterly	SVE equipment room - manifold, vertical riser, blower, carbon	Soil Vapor	System Balancing, Documentation of Operating Conditions; Carbon Pressure Reading, and PID Field Screening
SVE Carbon	Semi-annually for first year, annually thereafter	SVE carbon	Soil Vapor/ Indoor Air	Visual Inspection of Equipment Conditions; Pressure/Vacuum Measurements
Contingency ISCO System	Annually	SVE equipment room	NA	Visual Inspection of Equipment Conditions

EC Monitored	Frequency*	Location (s)	Matrix	Analysis
Site Cover System	Annually	First floor and all exterior areas	NA	Visual Inspection of Site Cap (including vapor barrier if visible), and all groundwater monitoring wells, SVE wells, and VMPs

***** The frequency of events will be conducted as specified until otherwise approved in writing by NYSDEC and NYSDOH

VOCs – Volatile Organic Compounds

4.2.1 SSDS

After the initial month of operation, the SSDS will be inspected on a quarterly basis. The inspections will consist of individual SSDS line gauge readings, fan inspections, alarm checks, and monitoring point readings.

A visual inspection of the complete system will be conducted during each monitoring event. Unscheduled inspections and/or sampling may take place when a suspected failure of the SSDS has been reported or an emergency occurs that is deemed likely to affect the operation of the system. SSDS components to be monitored include, but are not limited to, the components included in In-text Table T6 below.

Table T6
SSDS Monitoring Requirements and Schedule

Remedial System Component	Monitoring Parameter	Operating Range	Monitoring Schedule
Manifolds and Riser Pipes	Integrity, and operating conditions	See log sheets	Quarterly, and as necessary
Alarms	Vacuum in Riser	See log sheets	Quarterly, and as necessary
Monitoring Points	Integrity, and induced vacuum	$\geq$ -0.04 in. H_2O	Quarterly, and as necessary

A complete list of components to be inspected is provided in the EC component manual in Appendix F. Any equipment that is observed to be malfunctioning maintenance and repair, as per the O&M Plan, would be conducted immediately.

4.2.2 SVE System

Two SVE wells were installed in the vadose zone to remediate residual CVOC contamination in deep soil.

A visual inspection of the complete system will be conducted during each monitoring event. Unscheduled inspections and/or sampling may take place when a suspected failure of the SVE system has been reported or an emergency occurs

that is deemed likely to affect the operation of the system. SVE system components to be monitored include, but are not limited to, the components included in In-text Table T7:

Table T7
SVE Monitoring/Inspection Requirements and Schedule

Remedial System Component	Monitoring Parameter	Operating Range	Monitoring Schedule
Manifolds and Riser Pipes	Integrity, and operating conditions	See log sheets	Quarterly, and as necessary
Alarms	Vacuum in Riser	See log sheets	Quarterly, and as necessary
Carbon Vessel Operation	Integrity, pressure, PID readings	See log sheets	Quarterly, and as necessary
SVE Vapor Sampling	VOC laboratory analysis of SVE individual lines, and carbon influent, intermediate, effluent	See log sheets	Semi-annually for first year, annually/ as necessary thereafter

A complete list of components to be inspected is provided in the EC component manual in Appendix F. Any equipment that is observed to be malfunctioning maintenance and repair, as per the O&M Plan, would be conducted immediately.

4.2.3 System Monitoring and Vapor Sampling

After the initial month of operation, the SVE system will be inspected on a quarterly basis. The inspections will consist of individual SVE line gauge readings, blower and carbon inspections, alarm checks, and monitoring point readings.

Sampling of the SVE wells, and carbon influent, intermediate, and effluent ports will be performed as identified in the SVE Monitoring/Inspection Schedule included as In-Text Table T7. Confirmatory extracted vapor sampling will be conducted following startup to reassess VOC emissions calculations, and to provide baseline VOC concentrations at the onset of system operation. Influent, intermediate, and effluent vapor samples will be collected using 1-Liter Tedlar® bags in accordance with the QAPP and analyzed for VOCs by EPA Method TO-15 by a NYSDOH-ELAP-certified laboratory. Additional sampling for scheduling of carbon change-outs will be conducted as described in Section 5.5.5.

All effluent vapor VOC concentrations will be compared to the NYSDEC Division of Air Resources (DAR-1) publication Air Guide-1 (AG-1): Annual Guideline Concentrations (AGC)/Short-term Guideline Concentrations (SGC) Tables, updated October 18, 2010. The analysis will be performed using NYSDEC DAR-1 Air Guide-1 Policy (Policy DAR-1: Guidelines for the Control of Toxic Ambient Air Contaminants, November 12, 1997), which simulates the atmospheric processes that disperse pollutants from an emissions source to predict concentrations at selected downwind receptor locations. The procedures in the

DAR-1 policy are used to model conservative, worst-case annual and short-term concentrations based on the laboratory analytical results and exhaust stack parameters to compare against the NYSDOH AGCs and SGCs.

4.2.4 Sampling Protocol

All sampling activities will be recorded by taking applicable notes in a field book and by collecting the readings listed on the sampling logs presented in Appendix D. Pertinent observations or Site conditions at the time of the sampling (e.g., monitoring point integrity, etc.) will also be noted on the sampling logs. One sampling log will be filled out for each monitoring point and will serve as the inspection form associated with the monitoring point network.

4.2.5 Composite Cover System

Exposure to residual contaminated soil remaining at the Site is being prevented by a composite cover system that is made up of: concrete pavement on walkways and sidewalks; concrete building slabs; and minimum of 2 feet of clean gravel or soil, as shown on Figure 2. The composite cover system will remain intact 24-hours a day, 7 days a week, for 365 days a year.

Disturbance of the composite cover system or EC components is prohibited by the Environmental Easement. In the unlikely event of an unanticipated accidental or required disturbance of the composite cover system, the response procedure is outlined in the Excavation Work Plan enclosed as Appendix C.

Monitoring of the composite cover system will occur on an annual basis as long as the Environmental Easement is in effect to ensure the system's integrity. Monitoring will consist of visual inspection, which shall evaluate the structural integrity of the concrete floor slab on the first floor, support columns into the floors and the wall joints.

If any cracks or openings are identified, they shall be screened for organic vapors with a photoionization detector (PID) and any readings shall be noted. In addition, any cracks or openings in the floor shall be properly sealed.

The results of the inspection will be included in the PRR. In addition, the composite cover system must be inspected and certified any time a disturbance in the system occurs. The inspection frequency is subject to change with the approval of the NYSDEC. Unscheduled inspections and/or sampling may take place when a suspected failure of the composite cover system has been reported or an emergency occurs that is deemed likely to affect the operation of the system.

4.2.6 Monitoring and Sampling Protocol

All sampling and analyses will be performed in accordance with the requirements of the QAPP prepared for the Site (Appendix E). Main Components of the QAPP include:

- Quality assurance/quality control (QA/QC) Objectives for Data Measurement;
- Sampling Program:
  - Samples will be collected into laboratory-supplied containers;
  - Sample holding times will be in accordance with the NYSDEC Analytical Services Protocol requirements; and
  - Field QC samples (e.g., trip blanks, coded field duplicates, and matrix spike/matrix spike duplicates) will be collected as necessary.

- Sample Tracking and Custody;
- Calibration Procedures:
  - All field analytical equipment will be calibrated immediately prior to each day's use and will follow all calibration procedures and schedules as specified in EPA SW-846 and subsequent updates that apply to the instruments used for the analytical method.
- Analytical Procedures;
- Preparation of a DUSR, which will present the results of data validation, including a summary assessment of laboratory data packages, sample preservation and chain of custody procedures, and a summary assessment of precision, accuracy, representativeness, comparability, and completeness for each analytical method;
- Internal QC and Checks;
- QA Performance and System Audits;
- Preventative Maintenance Procedures and Schedules; and
- Corrective Action Measures.

The monitoring of remedial systems must be conducted by a QEP as defined in 6 NYCRR Part 375, a P.E. who is licensed and registered in NYS, or a qualified person who directly reports to a P.E. who is licensed and registered in NYS.

Modification to the frequency or sampling requirements will require approval from the NYSDEC Project Manager.

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5.0 OPERATION AND MAINTENANCE PLAN

5.1 General

This O&M Plan provides a brief description of the measures necessary to operate, monitor and maintain the mechanical components of the remedy selected for the Site. This O&M Plan:

1. Includes the procedures necessary to allow individuals unfamiliar with the Site to operate and maintain the active SSDS and SVE system; and
2. Will be updated periodically to reflect changes in Site conditions or themanner in which the active SSDS and SVE system are operated and maintained.

Further detail regarding the O&M of the active SSDS and SVE system are provided in the O&M Manual included as Appendix F. A copy of this O&M Manual, along with the complete SMP, is to be maintained at the Site. The O&M Plan is not to be used as a stand-alone document, but as a component document of this SMP.

5.2 Scope

Once completed, the SSDS and SVE system are designed to operate continuously, 24 hours a day, 7 days a week, 365 days a year, without any required adjustments or repairs beyond the routine maintenance items discussed in Sections 5.4.3 and 5.5.3, respectively. Manufacturers' specifications for each of the SSDS and SVE components (included in Appendix F) should be consulted prior to any repairs or adjustments that may become necessary. Regular system inspections, operation parameter documentation, and performance assessment guidelines are detailed in Sections 4.3 and 4.4 of this SMP.

5.3 Performance Criteria

An SSDS was installed at the Site to prevent the potential for vapor intrusion into the building and will operate continuously in conjunction with the SVE wells to treat residual CVOC-contaminated soil left in place at the Site. The SVE system began operating at the Site on September X, 2022. The SSDS will be activated upon completion of the new building construction and prior to building occupancy. As-built drawings for the SSDS and SVE wells are included in Appendix B and the SSDS and SVE component manuals are included in Appendix F. Details pertaining to the performance monitoring of these ECs are outlined below.

5.4 SSDS Operation and Maintenance

An SSDS was installed to mitigate the potential for soil vapor intrusion by applying negative pressure beneath the concrete slab, minimizing the potential for vapor intrusion into the Site building. The major components of the SSDS include:

- Nine slotted 4-inch PVC horizontal SSDS pipes embedded in a GPA layer (¾-inch stone) above the soil vapor extraction area;
- Four sub-slab VMPs throughout the Site building;
- One appropriately-sized 1.5 horsepower (HP) blower to vent soil vapor with a variable-frequency drive (VFD) to throttle blower operation to acceptable conditions;
- A control panel equipped with a remote audio/visual alarm system to notify select personnel of alarm conditions; and

- Effluent stack consisting of a 6-inch cast iron riser pipe extending from the manifold through the roof and terminating a minimum 7 feet above the finished roof, measured from the highest point where the vent intersects the roof, and a minimum 25 feet away from air intakes and operable windows and off-Site buildings that will be installed at a later date after building completion.

As-built drawings for the SSDS are included in Appendix B and SSDS, and component manuals are included in Appendix F.

5.4.1 SSDS Start-Up and Testing

SSDS startup testing will comprise:

- Aboveground SSDS line pressure testing;
- Individual line applied vacuum and air flow rate readings;
- Combined riser applied vacuum readings;
- VFD operation reading; and
- VMP induced vacuum readings.

Further adjustments to the blower and individual SSDS lines may be necessary after any alterations to the overall system. SSDS equipment, including individual valves on SSDS lines, will be throttled to rebalance the system, adjusting air flow rates and vacuum/pressure readings to acceptable values.

Table T8
SSDS Startup/Repair Protocols

	Following SSDS startup, pipe addition, repair, or replacement	Following SSDS fan repair or replacement
SSDS line pressure testing	Yes	No
SSDS fan inspection	Yes	Yes

Note: Pressure testing and fan inspection procedures are described in full in the QAPP.

At a minimum, the findings and conclusions following system restart activities will be reported in the subsequent quarterly media monitoring report. In addition, depending on the nature of the adjustment to the system, the process and instrumentation diagram (P&ID) and/or Site figures may need to be updated to reflect the work completed. Such revisions shall be completed and submitted to NYSDEC with the media monitoring report.

All further modifications, adjustments, or additions to the SSDS must be completed in accordance with the equipment specifications provided by the manufacturer. This SMP will be maintained on-site and includes manufacturers' specifications for all system components as part of the manuals provided in Appendix F.

5.4.2 SSDS Operation: Routine Operation Procedures

The SSDS is designed to operate continuously without any required adjustments or repairs beyond the routine maintenance items discussed in Section 5.4.3. No adjustments to the operating schedule or other intentional interruptions to operation (other than those required for routine maintenance) shall be permitted without written approval by NYSDEC and NYSDOH.

The effectiveness of the SSDS components will be confirmed via quarterly system inspections to be conducted by personnel under the supervision of a QEP. The check will consist of confirming that the blowers are operating properly, taking instantaneous PID readings at the blower influent and system effluent sample ports, and taking vacuum readings at the six VMPs. The inspection log will also document any unusual conditions (e.g., unusual odors, spills, leaks, excessive blower noise, etc.). A copy of the SSDS Inspection Log is provided in Appendix D.

Individual flow rate and vacuum readings will be recorded for each of the nine SSDS pipe runs and sub-slab vacuum will be confirmed in each of the four VMPs. This operational data will be used as needed to adjust controls for individual branches and any faulty gauges will be repaired or replaced as needed. SSDS inspections will be conducted on a quarterly basis.

Care shall be taken during inspections to identify and repair any system malfunctions or problems (i.e., leaks, cracks, collection of condensation, etc.). Manufacturer's specifications, included as Appendix F, should be consulted prior to any repairs or adjustments that may become necessary.

If shutdown of the SSDS is considered, a proposal to discontinue the SSDS will be submitted by the property owner and/or property owner's consultant for NYSDEC and NYSDOH approval. The SSDS will remain in place and operational until permission to discontinue use is granted in writing by NYSDEC and NYSDOH.

5.4.3 SSDS Operation: Routine Equipment Maintenance

A schedule for SSDS routine equipment maintenance work is provided in In-Text Table T9:

Table T9
SSDS Inspection/Maintenance Schedule

Operations Monitoring Tasks	Frequency
SSDS Inspection and Monitoring	Quarterly and as necessary
System Component Maintenance	As necessary

Typical routine maintenance items that should be checked during inspections are listed in the SSDS Inspection Log provided in Appendix F and include:

- Confirmation that the blower is operating and air is discharging through the exhaust piping to the roof;
- Confirmation that the pressure and air flow rate gauges on each SSDS fan are clean and within normal ranges;
- Confirmation that the blower effluent PID readings and temperatures are within acceptable ranges; and
- Confirmation that the exterior of the SSDS control panel is clean.

Some routine maintenance will require intentional interruptions to SSDS operation. Both unexpected and deliberate alterations to and/or shutdowns of the system will be recorded in the field book and documented on the SSDS Inspection Log, provided in Appendix D. A cumulative shutdown log, provided in Appendix

D, will be maintained separately to track any atypical system activity, including but not limited to alarm conditions and responses, and to track scheduled shutdowns for system maintenance.

Routine System Component Maintenance

The SSDS consists of a blower and motor pair. Each piece of equipment requires routine maintenance that is dictated either by runtimes or operating conditions, as defined by manufacturer's specifications, with most maintenance items being required on a quarterly basis. The pertinent material cut sheets and manuals are provided as Appendix F. A binder containing complete paper copies of manufacturer's specifications for all system components is maintained on-site.

Reporting

Barring any unusual findings, the system inspections and maintenance described above will be reported per the requirements of Section 7 of this SMP. In the event that an unexpected condition is noted, such as a critical malfunction or extreme weather condition that may hinder system operations, NYSDEC will be alerted promptly.

5.4.4 SSDS Operation: Non-Routine Equipment Maintenance

In most instances, non-routine maintenance will be required due to operating conditions that are monitored by the SSDS alarm system. The primary objective of system alarm system is to notify personnel when operating conditions are likely to reduce or otherwise compromise SSDS efficiency.

The SSDS alarm will provide both an audible and visual notification for a low vacuum condition from the differential pressure switch. The audible alarm will be an 85 to 95 decibel horn or buzzer with a manual acknowledge off switch. An alarm condition may be indicative of damage to, or deterioration of, the SSDS pipes. Damage to the individual SSDS lines may be noticeable only by interpreting unusually high or low vacuum readings or air flow rates, which will be noted in the routine system inspections and remedied upon identification.

5.5 SVE System Operation and Maintenance

An SVE system was installed to remediate residual CVOC-contaminated soil and in the vadose zone beneath the southern portion of the building. The VOC-contaminated air extracted from the SVE wells will be treated using granular activated carbon (GAC) and discharged to the atmosphere in accordance with 6 NYCRR Part 212.

The SVE system collects and treats contaminated vapor, and subsequently discharges the vapor through a dedicated exhaust stack. The major components of the SVE system include:

- Two 4-inch-diameter PVC SVE wells, which target the vadose zone treatment interval;
- One 3 HP blower to extract soil vapor, with a VFD to throttle blower operation to acceptable conditions;
- A control panel equipped with a telemetry system to notify select personnel of alarm conditions;
- Two 300-pound GAC treatment units located in the SVE equipment room to treat contaminated soil vapor;

- A control panel equipped with a telemetry system to notify select personnel of alarm conditions; and
- Effluent stack consisting of a 4-inch galvanized steel riser pipe extending from the SVE equipment room through the roof and terminating a minimum 7 feet above the finished roof, measured from the highest point where the vent intersects the roof, and a minimum 25 feet away from air intakes and operable windows and off-site buildings that will be installed at a later date after building completion.

5.5.1 SVE System Start-Up and Testing

Initial startup of the SVE system occurred on September X, 2022. If, in the course of the SVE system lifetime, significant changes are made to the system and the system must be restarted, some or all of the following initial startup testing protocols shall be implemented and documented in addition to ongoing routine maintenance and monitoring activities. Since initial startup of the SVE system was completed successfully, these procedures need not be followed after routine system restarts, such as those needed after alarm resets or following routine system maintenance.

Table T10
SVE System Startup/Repair Protocols

	Following SVE startup, pipe addition, repair, or replacement	Following SVE blower repair or replacement	Following carbon vessel repair or replacement
SVE line pressure testing	Yes	No	No
SVE blower inspection	Yes	Yes	Yes

Note: Pressure testing and blower inspection procedures are described in full in the QAPP.

As described in the QAPP, SVE blower inspections shall comprise confirmation of:

- SVE monitoring point induced vacuum readings;
- PID, vacuum, and air flow rates at each SVE well during active operation in that zone;
- SVE blower-related readings including VFD operation reading, pre-/post-particulate filter blower vacuum and air flow rate readings; and
- Carbon influent, intermediate, and effluent pressure, temperature, and PID readings.

Appropriate values for these confirmation readings are outlined in the SVE Inspection Log provided in Appendix D.

Further adjustments to the blower and individual SVE lines may be necessary after any alterations to the overall system. SVE equipment, including individual valves on SVE lines, will be throttled to rebalance the system, adjusting air flow rates and vacuum/pressure readings to acceptable values.

At a minimum, the findings and conclusions following system restart activities will be reported in the subsequent quarterly media monitoring report. In addition, depending on the nature of the adjustment to the system, the P&ID and/or Site

figures may need to be updated to reflect the work completed. Such revisions shall be completed and submitted to NYSDEC with the quarterly media monitoring report.

All further modifications, adjustments or additions to the SVE system should be completed in accordance with the equipment specifications provided by the manufacturer. This SMP will be maintained on-site and includes manufacturers' specifications for all system components in Appendix F.

5.5.2 SVE System Operation: Routine Operation Procedures

The SVE system is designed to operate continuously without any required adjustments or repairs beyond the routine maintenance items discussed in Sections 5.5.3 and 5.5.4. No adjustments to the operating schedule or other intentional interruptions to operation (other than those required for routine maintenance) shall be permitted without written approval by NYSDEC and NYSDOH.

The operation of the SVE system components will be confirmed by quarterly system inspections (monitoring during the first quarter) by an environmental professional. The check will consist of confirming the blower is operating properly with individual flow rate and vacuum readings for each of the SVE wells within designated ranges, and confirming instantaneous PID readings at the influent, intermediate, and effluent sample ports on the carbon treatment units. The check will also note any unusual conditions (e.g., unusual odors, spills, leaks, blower noise, etc.). A copy of the SVE Inspection Log is provided in Appendix D.

Care shall be taken during inspections to identify and repair any system malfunctions or problems (i.e., leaks, cracks, collection of condensation, etc.). Manufacturer's specifications, included as Appendix F, should be consulted prior to any repairs or adjustments that may become necessary.

If, in consultation with NYSDEC and NYSDOH, shutdown of the SVE system and/or carbon treatment system is considered, a proposal to discontinue the SVE system and/or carbon treatment system will be submitted by the property owner and/or property owner's consultant for NYSDEC and NYSDOH approval. The SVE and/or carbon treatment system will remain in place and operational until permission to discontinue use is granted in writing by NYSDEC and NYSDOH.

5.5.3 SVE System Operation: Routine Equipment Maintenance

A tentative schedule for SVE system routine equipment maintenance work is provided in the following table:

Table T11
SVE System Inspection/Maintenance Schedule

Operations Monitoring Tasks	Frequency
SVE System Inspection	Quarterly
Carbon System Vapor Sampling	Semi-annual during first year, annual thereafter, and as necessary
Wellhead and External System Component Maintenance	Annually and as necessary

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Typical routine maintenance items that should be addressed during monthly inspections are listed in the SVE Inspection Log provided in Appendix D and include:

- Confirmation that the blower is operating and air is discharging through the exhaust piping to the roof;
- Confirmation that the pressure and air flow rate gauges on each manifold leg are clean and within normal ranges;
- Confirmation that the blower effluent PID readings and temperatures are within acceptable ranges; and
- Confirmation that the exterior of the SVE system control panel is clean.

Some routine maintenance will require intentional interruptions to SVE system operation. Both unexpected and deliberate alterations to and/or shutdowns of the system will be recorded in the field book and documented on the SVE Inspection Log provided in Appendix D. A shutdown log, also provided in Appendix D, will be maintained separately to track any atypical system activity, including but not limited to alarm conditions and responses and scheduled shutdowns for system maintenance.

Routine System Component Maintenance

The SVE system consists of one blower and motor pair. Each piece of equipment requires routine maintenance dictated either by runtimes or operating conditions, as defined by manufacturer's specifications. However, most maintenance items are required on a quarterly basis, assuming continuous operation. The pertinent material cut sheets and manuals are provided as Appendix F. A binder containing complete manufacturer's specifications for all system components will be maintained on-site.

Wellhead and External System Component Maintenance

Individual wellheads and manholes will be inspected, at a minimum, on an annual basis. All SVE wells are accessible via flush-mount well covers. In the event of a damaged or out-of-service SVE well, the well will be properly decommissioned. Repairs and/or replacement of SVE wells will be performed based on assessments of structural integrity and overall performance.

NYSDEC will be notified prior to any repair or decommissioning of any SVE well for the purpose of replacement, and the repair or decommissioning and replacement process will be documented in the subsequent PRR. The decommissioning of SVE wells without replacement will be done only with the prior approval of NYSDEC. SVE well abandonment will be performed in accordance with NYSDEC's CP-43: Groundwater Monitoring Well Decommissioning Policy. If the SVE wells are decommissioned because they have been rendered unusable, replacement SVE wells will be reinstalled in the nearest available location, unless directed otherwise by NYSDEC.

Wellhead and external system component inspections should be conducted as detailed in the QAPP provided in Appendix E.

Reporting

Barring any unusual findings, the system inspections and maintenance previously described will be reported per the requirements of Section 7 of this SMP. In the event that an unexpected condition is noted, such as a critical malfunction or extreme weather condition that may hinder system operations, NYSDEC will be alerted promptly.

5.5.4 SVE System Operation: Non-Routine Equipment Maintenance

In most instances, non-routine maintenance will be required due to operating conditions that are governed by the SVE alarm system and system telemetry. The primary objective of system telemetry is to notify personnel when operating conditions are likely to reduce or otherwise compromise SVE efficiency, which could lead to the potential uncontrolled migration of volatile soil vapor.

The system telemetry will also notify the current owner's environmental professional when operating conditions may be indicative of damage to the SVE equipment. SVE alarm conditions are detailed in In-Text Table T12. Potential damage to the SVE pipes or carbon units should trigger one of the alarm conditions. Damage to the individual SVE lines may be noticeable only by interpreting unusually high or low vacuum readings or air flow rates, which will be noted in the system inspections and remedied upon identification.

The SVE system was also designed with particulate and moisture separators on the blower skid to prevent solids from reaching the blowers. The particulate and moisture separators are shown in the P&ID provided as part of the manual in Appendix B. Procedures for maintaining the particulate separators and all SVE components are provided in the operation and maintenance manuals provided in Appendix F and the QAPP provided in Appendix E.

Table T12
SVE System Alarm Conditions

Alarm Condition	Response Measure
Moisture Separator High Level	Drain/containerize moisture, identify and address/eliminate cause of moisture influx
Blower Outlet High Temperature	Identify and address/eliminate cause of high temperature condition
Blower Inlet Low Vacuum	Identify and address/eliminate cause of low pressure condition

5.5.5 SVE System Sampling Event Protocol

5.5.5.1 – Effluent Vapor Sampling Protocol

Though theoretical calculations have been made to approximate the anticipated carbon usage rate, carbon replacement frequency will be based on field screening using a PID and laboratory analytical results. Individual lines are not anticipated to be sampled in the routine sampling events; however, there are sampling ports for each line, prior to manifolding, to facilitate field screening or sampling, as necessary, at the discretion of the remedial engineer, in consultation with NYSDEC and NYSDOH.

The influent, intermediate, and effluent vapor from the set of SVE system carbon vessels will be field-screened quarterly and sampled as described below to provide an estimate of carbon usage. Confirmatory SVE system sampling will be conducted following startup to more accurately assess the VOC concentrations in extracted soil vapor from the entire Site, and the condition and lifespan of the carbon units. Samples of the SVE system air will be collected as part of initial startup and again 6 months and 12 months following start-up. Subsequent SVE system vapor sampling will be performed annually, and as needed, to evaluate system operating conditions and support the calculations of contaminant mass removal.

The vapor samples will be collected using a peristaltic pump to fill a one-liter Tedlar bag, in accordance with the sampling procedure detailed in the QAPP provided as Appendix E. All samples for laboratory analysis will be submitted to a NYSDOH ELAP-certified laboratory for analysis of VOCs by EPA Method TO-15.

All sampling activities will be recorded in a field book and in the SVE Vapor Sampling Log presented in Appendix D. Field observations (e.g., visual observations and PID readings of effluent, etc.) will be noted on the sampling log, which will be subject to the reporting requirements and system checks discussed in Section 7. Complete effluent vapor sampling procedures are detailed in the QAPP.

5.5.5.2 – Spent Carbon Sampling Protocol

All spent carbon will be disposed of or recycled off-site in accordance with all applicable local, state, and federal regulations. Based on the requirements of the disposal/recycling facility and waste disposal contractor, a carbon sample may need to be collected for facility acceptance purposes. If so, a representative sample of the spent carbon will be collected and submitted for laboratory analysis based on the requirements of the receiving facility, as detailed in the QAPP provided as Appendix E. Spent carbon will be handled as a listed hazardous waste unless a contained-in request is approved by NYSDEC.

All sampling activities will be recorded in a field book. Field observations (e.g., visual observations and PID reading of carbon, etc.) will be noted on the sampling log, which will be subject to the reporting requirements and system checks discussed in Sections 5.5.6 and 7.

5.5.5.3 – Condensate Water Sampling

All condensate water collected from the SVE water knock-out vessel will disposed of in accordance with all applicable local, state and federal regulations on an as-needed basis. A representative condensate water sample will be collected from each 55-gallon drum and submitted for laboratory analysis, as detailed in the QAPP provided as Appendix E. Documentation associated with condensate water disposal will be subject to the reporting requirements and system checks discussed in Sections 5.5.6 and 7.

5.5.6 SVE System Maintenance and Performance Monitoring Reporting Requirements

Any unexpected or critical issues identified during the monitoring tasks will be reported via email or phone notification to the NYSDEC project manager.

Maintenance reports and any other information generated during regular operations at the Site will be kept on-file on-site. All reports, forms, and other relevant information generated will be available to NYSDEC upon request and submitted as part of the PRR, as specified in Section 7.2 of this SMP.

5.5.6.1 – Routine Maintenance Forms

Checklists or forms (see Appendix D) will be completed during each maintenance event. Checklists/forms will include, but not be limited to, the following information:

- Date;
- Name, company, and position of person(s) conducting maintenance activities;
- Maintenance activities conducted;
- Any modifications to the system;
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents noted (included either on the checklist/form or on an attached sheet); and
- Other documentation, such as copies of invoices for maintenance work, receipts for replacement equipment, etc. (attached to the checklist/form).

5.5.6.2 – Non-Routine Maintenance Forms

During each non-routine maintenance event, a form will be completed which will include, but not be limited to, the following information:

- Date;
- Name, company, and position of person(s) conducting non-routine maintenance/repair activities;
- Presence of leaks;
- Date of leak repair;
- Other repairs or adjustments made to the system;
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents (included either on the form or on an attached sheet); and
- Other documentation such as copies of invoices for repair work, receipts for replacement equipment, etc. (attached to the checklist/form).

5.6 Contingency ISCO System

In the event that post-remediation groundwater sampling results indicate that additional ISCO injections are necessary, a dedicated Injection Work Plan shall be drafted (to detail injection work utilizing the permanent injection wells installed as part of the remedy) and submitted to NYSDEC and NYSDOH for review and approval. Reagent volumes will be determined based upon the post-remediation groundwater sampling data and are expected to vary, as contaminant concentrations may not decrease linearly over the duration of Site management.

The sodium permanganate will be mobilized to the Site in totes or 55 -gallon drums, and potable water from the building will be used to further dilute the permanganate to the target

concentration and injection volume. A centrifugal or diaphragm pump will be used to conduct any follow up injection events.

During any potential future injection events, geochemical indicator parameter readings, including pH, DO, ORP, and specific conductivity will be collected from each well on a daily basis during injections, using a portable water quality meter. Baseline and post-treatment groundwater samples will be collected from the same wells and will be analyzed for CVOCs and total metals.

Post-treatment sampling will be conducted 1, 3, and 6 months after each subsequent injection event. The wells will be screened for active sodium permanganate by inspecting the color of the water recovered from the wells.

Any planning, field findings, and/or summaries of completed work will be provided in future Quarterly Reports and Periodic Review Reports.

5.7 Contingency Plan

Emergencies may include injury to personnel, fire or explosion, environmental release, or serious weather conditions.

The appropriate actions for on-site emergencies are detailed in the attached Health and Safety Plan (HASP) and Community Air Monitoring Plan (CAMP), provided as Appendix G.

5.8 Emergency Telephone Numbers

In the event of any environmentally related situation or unplanned occurrence requiring assistance, the owner or owner's representative(s) should contact the appropriate party from the contact list below. For emergencies, appropriate emergency response personnel should be contacted. Prompt contact should also be made to AKRF's project principal or project manager or the current property manager/owner's representative for the Site. Emergency contact lists must be maintained in an easily accessible location at the Site. In-Text Table T13 includes contact information for the emergency response personnel.

Table T13
Emergency Contact Numbers

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

5.9 Directions to Nearest Health Facility

Table T14
Hospital Directions

Hospital Name:	Brookdale University Hospital
Phone Number:	718-240-5363
Address/Location:	1 Brookdale Plaza, Brooklyn, New York 11212
Directions:	1. Turn right to head south on Euclid Avenue.

	2. Turn right onto Atlantic Avenue. 3. Turn left onto Miller Avenue. 4. Turn right onto Glenmore Avenue. 9. Turn left onto Granville Payne Avenue. 10. Turn left onto New Lots Avenue. 11. Turn left onto East 98th Street/Brookdale Plaza. 12. Destination will be on the left.

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6.0 PERIODIC ASSESSMENTS/EVALUATIONS

6.1 Climate Change Vulnerability Assessment

Increases in both the severity and frequency of storms/weather events, an increase in sea level elevations along with accompanying flooding impacts, shifting precipitation patterns and wide temperature fluctuation, resulting from global climactic change and instability, have the potential to significantly impact the performance, effectiveness and protectiveness of a given site and associated remedial systems. Vulnerability assessments provide information so that the Site and associated remedial systems are prepared for the impacts of the increasing frequency and intensity of severe storms/weather events and associated flooding.

A vulnerability assessment will be conducted for the Site during periodic assessments to ensure resilience of engineering controls to severe storms/weather events and associated flooding.

6.2 Green Remediation Evaluation

NYSDEC's DER-31 Green Remediation requires consideration of green remediation concepts and techniques during all stages of the remedial program including site management, with the goal of improving the sustainability of the cleanup and summarizing the net environmental benefit of any implemented green technology. This SMP does not require any green remediation evaluations to be completed for the Site during site management. Any updates or related site improvements will be incorporated in the Periodic Review Report (PRR).

6.3 Remedial System Optimization

A Remedial System Optimization (RSO) study will be conducted any time that NYSDEC or the remedial party requests in writing that an in-depth evaluation of the remedy is needed. An RSO may be appropriate if any of the following occur:

1. The remedial actions are no longer meeting the RAOs noted in Section 2.5 of this SMP;
2. The management and operation of the remedial system is exceeding the estimated costs;
3. The remedial system is not performing as expected or as designed;
4. Previously unidentified source material may be suspected;
5. Plume shift has potentially occurred;
6. Site conditions change due to development, change of use, change in groundwater use, etc.;
7. There is an anticipated transfer of the Site management to another remedial party or agency; or
8. A new and applicable remedial technology becomes available.

An RSO will provide a critique of a site's conceptual model, give a summary of past performance, document current cleanup practices, summarize progress made toward the site's cleanup goals, gather additional performance or media specific data and information and provide recommendations for improvements to enhance the ability of the present system to reach RAOs or to provide a basis for changing the remedial strategy.

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7.0 REPORTING REQUIREMENTS

7.1 Site Management Reports

All Site management inspection, maintenance and monitoring events will be recorded on the appropriate Site management forms provided in Appendix D. These forms are subject to NYSDEC revision.

All applicable inspection forms and other records, including media sampling data and system maintenance reports, generated for the site during the reporting period will be provided in electronic format to the NYSDEC in accordance with the requirements of In-Text Table T15 and summarized in the PRR.

Table T15
Monitoring/Inspection Report Deliverables

Task/Report	Reporting Frequency*
Quarterly Monitoring Reports	Quarterly
Periodic Review Report # 1	16 months after receipt of Certificate of Completion
Periodic Review Report #2 +	Annually after submittal of inaugural PRR

* The frequency of events will be conducted as specified until otherwise approved by the NYSDEC.

All monitoring/inspections reports will include, at a minimum:

1. Date of event or reporting period;
2. Name, company, and position of person(s) conducting monitoring/inspection activities;
3. Description of the activities performed;
4. Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents noted (included either on the checklist/form or on an attached sheet);
5. Type of samples collected (e.g., sub-slab vapor, indoor air, outdoor air, etc.);
6. Copies of all field forms completed (e.g., chain-of-custody documentation, etc.);
7. Sampling results in comparison to appropriate standards/criteria;
8. A figure illustrating sample type and sampling locations;
9. Copies of all laboratory data sheets and the required laboratory data deliverables required for all points sampled (to be submitted electronically in the NYSDEC-identified format);
10. Any observations, conclusions, or recommendations; and
11. A determination as to whether contaminant conditions have changed since the last reporting event.

Routine maintenance event reporting forms will include, at a minimum:

1. Date of event;
2. Name, company, and position of person(s) conducting maintenance activities;

3. Description of maintenance activities performed;
4. Any modifications to the system;
5. Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents noted (included either on the checklist/form or on an attached sheet); and
6. Other documentation such as copies of invoices for maintenance work, receipts for replacement equipment, etc., (attached to the checklist/form).

Non-routine maintenance event reporting forms will include, at a minimum:

1. Date of event;
2. Name, company, and position of person(s) conducting non-routine maintenance/repair activities;
3. Description of non-routine activities performed;
4. Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents (included either on the form or on an attached sheet); and
5. Other documentation such as copies of invoices for repair work, receipts for replacement equipment, etc. (attached to the checklist/form).

Data will be reported in digital format as determined by the NYSDEC. Currently, data is to be supplied electronically and submitted to the NYSDEC EQuIS™ database in accordance with the requirements found at this link http://www.dec.ny.gov/chemical/62440.html.

7.2 Periodic Review Report

A PRR shall be submitted annually to NYSDEC or at another frequency as may be required by the Department. In the event that the Site is subdivided into separate parcels with different ownership, a single PRR will be prepared that addresses the Site described in the Environmental Easement enclosed as Appendix A. The report will be prepared in accordance with NYSDEC's DER-10 and submitted within 30 days of the end of each certification period. The report will include:

1. Identification, assessment and certification of all ECs/ICs required by the remedy for the Site.
2. Results of the required annual Site inspections and severe condition inspections, if applicable.
3. All applicable Site management forms and other records generated for the Site during the reporting period in the NYSDEC-approved electronic format, if not previously submitted.
4. A summary of any discharge monitoring data and/or information generated during the reporting period, with comments and conclusions.
5. Data summary tables and graphical representations of contaminants of concern by media (groundwater, soil vapor, etc.), which include a listing of all compounds analyzed, along with the applicable standards, with all exceedances highlighted. These will include a presentation of past data as part of an evaluation of contaminant concentration trends.

6. Results of all analyses, copies of all laboratory data sheets, and the required laboratory data deliverables for all samples collected during the reporting period will be submitted in digital format as determined by the NYSDEC. Currently, data is supplied electronically and submitted to the NYSDEC EQuIS™ database in accordance with the requirements found at this link: http://www.dec.ny.gov/chemical/62440.html.
7. A Site evaluation, which includes the following:
    - The compliance of the remedy with the requirements of the Site-specific Decision Document (DD);
    - The operation and the effectiveness of all treatment units, etc., including identification of any needed repairs or modifications;
    - Any new conclusions or observations regarding site contamination based on inspections or data generated by the Monitoring and Sampling Plan for the media being monitored;
    - Recommendations regarding any necessary changes to the remedy and/or Monitoring and Sampling Plan;
    - Trends in contaminant levels in the affected media will be evaluated to determine whether the remedy continues to be effective in achieving remedial goals as specified by the DD; and
    - The overall performance and effectiveness of the remedy.

If explicitly requested or required by NYSDEC, a summary of the Green Remediation evaluation will be included in the PRR.

7.2.1 Certification of Institutional and Engineering Controls

Certification of ICs/ECs will be included in the PRR.

Following the last inspection of the reporting period, a QEP or P.E. licensed to practice in NYS will prepare, and include in the PRR, the following certification as per the requirements of NYSDEC DER-10:

"For each institutional or engineering control identified for the Site, I certify that all of the following statements are true:

- The inspection of the Site to confirm the effectiveness of the ICs/ECs controls required by the remedial program was performed under my direction;
- The ICs/ECs employed at this Site are unchanged from the date the control was put in place, or last approved by the Department;
- Nothing has occurred that would impair the ability of the control to protect the public health and environment;
- Nothing has occurred that would constitute a violation or failure to comply with any Site management plan for this control;
- Access to the Site will continue to be provided to the Department to evaluate the remedy, including access to evaluate the continued maintenance of this control;

- If a financial assurance mechanism is required under the oversight document for the Site, the mechanism remains valid and sufficient for the intended purpose under the document;
- Use of the Site is compliant with the Environmental Easement;
- The ECs are performing as designed and are effective;
- To the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the Site remedial program and generally accepted engineering practices; and
- The information presented in this report is accurate and complete.

I certify that all information and statements in this certification form 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. I, [name], of [business address], am certifying as [Owner/Remedial Party or Owner's/Remedial Party's Designated Site Representative] for the Site."

The signed certification will be included in the PRR.

The PRR will be submitted, in electronic format, to the NYSDEC Central Office, Regional Office in which the Site is located, and the NYSDOH Bureau of Environmental Exposure Investigation. The PRR may need to be submitted in hard-copy format, as requested by the NYSDEC project manager.

7.3 Corrective Measures Work Plan

If any component of the remedy is found to have failed, or if the periodic certification cannot be provided due to the failure of an IC/EC, a Corrective Measures Work Plan will be submitted to NYSDEC for approval. This plan will explain the failure and provide the details and schedule for performing work necessary to correct the failure. Unless an emergency condition exists, no work will be performed pursuant to the Corrective Measures Work Plan until it has been approved by NYSDEC.

7.4 Remedial System Optimization Report

If a Remedial System Optimization (RSO) is to be performed, an RSO report must be submitted to NYSDEC for approval. The RSO report will document the research/investigation and data gathering that was conducted, evaluate the results and facts obtained, present a revised conceptual Site model and present recommendations. RSO recommendations are to be implemented upon approval from NYSDEC. Additional work plans, design documents, HASPs etc., may be required to implement the recommendations, based upon the actions that need to be taken. A final engineering report (FER) and update to the SMP may also be required.

The RSO report will be submitted in electronic format to the NYSDEC Central Office, Regional Office in which the Site is located, and the NYSDOH Bureau of Environmental Exposure Investigation.

8.0 REFERENCES

1. 6 NYCRR Part 375, Environmental Remediation Programs. December 14, 2006.
2. NYSDEC DER-10 – "Technical Guidance for Site Investigation and Remediation".
3. NYSDEC, 1998. Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1. June 1998 (April 2000 addendum).

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TABLES

FIGURES

APPENDIX A

ENVIRONMENTAL EASEMENT AND SITE SURVEY

APPENDIX B

AS-BUILT SURVEYS, VAPOR BARRIER MANUFACTURER'S SPECIFICATIONS, AND IN-SITU DESIGN DOCUMENTS

APPENDIX C
EXCAVATION WORK PLAN

EXCAVATION WORK PLAN (EWP)

C-1 Notification

At least 15 days prior to the start of any activity that is anticipated to encounter remaining contamination, the Site owner or their representative will notify the NYSDEC. Currently, this notification will be made to:

Table C-1
Notifications*

Manfred Magliore NYSDEC DER Project Manager	(718) 482-4078 / manfred.magliore@dec.ny.gov
Jane H. O'Connell, P.G. NYSDEC DER Project Manager's Supervisor	(718) 482-4599 / jane.oconnell@dec.ny.gov
Kelly Lewandowski, NYSDEC Site Control	(518) 402-9569 / kelly.lewandowski@dec.ny.gov

* Note: Notifications are subject to change and will be updated as necessary.

This notification will include:

1. A detailed description of the work to be performed, including the location and areal extent, plans for site re-grading, intrusive elements or utilities to be installed below the soil cover, estimated volumes of contaminated soil to be excavated and any work that may impact an engineering control;
2. A summary of environmental conditions anticipated in the work areas, including the nature and concentration levels of contaminants of concern, potential presence of grossly contaminated media, and plans for any pre-construction sampling;
3. A schedule for the work, detailing the start and completion of all intrusive work;
4. A summary of the applicable components of this EWP;
5. A statement that the work will be performed in compliance with this EWP and 29 Code of Federal Regulations (CFR) 1910.120;
6. A copy of the contractor's health and safety plan, in electronic format, if it differs from the HASP provided in the Site Management Plan (SMP);
7. Identification of disposal facilities for potential waste streams; and
8. Identification of sources of any anticipated backfill, along with all required chemical testing results.

The New York State Department of Environmental Conservation (NYSDEC) project manager will review the notification and may impose additional requirements for the excavations that are not listed in this EWP.

C-2 Soil Screening Methods

Visual, olfactory, and instrument-based soil screening will be performed by a qualified environmental professional during all remedial and development excavations into known or potentially contaminated material (remaining contamination). Soil screening will be performed regardless of when the invasive work is done and will include all excavation and invasive work performed during development, such as excavations for foundations and utility work, after issuance of the Certificate of Completion (CoC).

Soil will be segregated based on previous environmental data and screening results into material that requires off-site disposal, material that requires testing, material that can be returned to the subsurface, and

material that can be used as cover soil. Further discussion of off-site disposal of materials and on-site reuse is provided in Sections C-6 and C-7 of this EWP.

C-3 Stockpile Methods

Soil stockpiles will be continuously encircled with a berm and/or silt fence. Hay bales will be used as needed near catch basins, surface waters and other discharge points.

Stockpiles will be kept covered at all times with appropriately anchored tarps. Stockpiles will be routinely inspected, and damaged tarp covers will be promptly replaced.

Stockpiles will be inspected at a minimum once each week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the site and available for inspection by NYSDEC.

C-4 Materials Excavation and Load Out

A qualified environmental professional or person under their supervision will oversee all invasive work and the excavation and load-out of all excavated material.

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

The presence of utilities and easements on the Site will be investigated by the qualified environmental professional. It will be determined whether a risk or impediment to the planned work under this SMP is posed by utilities or easements on the Site. A Site utility stakeout will be completed for all utilities prior to any ground intrusive activities at the Site.

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

A truck wash will be operated on-site if deemed appropriate by NYSDEC. The qualified environmental professional will be responsible for ensuring that all outbound trucks will be washed at the truck wash before leaving the site until the activities performed under this section are complete.

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

The qualified environmental professional will be responsible for ensuring that all egress points for truck and equipment transport from the Site are clean of dirt and other materials derived from the Site during intrusive excavation activities. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to Site-derived materials.

C-5 Materials Transport Off-Site

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

Material transported by trucks exiting the Site will be secured with tight-fitting covers. Loose-fitting canvas-type truck covers will be prohibited. If loads contain wet material capable of producing free liquid, truck liners will be used.

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

Truck transport routes are described as follows:

- For Trucks Heading North and South: Head west on Atlantic Avenue and turn right onto the Brooklyn-Queens Expressway east (to head north) or turn left onto the Brooklyn-Queens Expressway west (to head south).

This is the most appropriate route and considers: (a) limiting transport through residential areas and past sensitive sites; (b) use of city mapped truck routes; (c) prohibiting off-site queuing of trucks entering the facility; (d) limiting total distance to major highways; (e) promoting safety in access to highways; (f) overall safety in transport; and (g) community input.

All trucks loaded with Site materials will exit the vicinity of the Site using these truck routes; however, the truck route is subject to change depending on available truck routes at the time of the work (pending road closures, etc.), and trucking company input related to the allowable truck routes.

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

Queuing of trucks will be performed on-site to the extent practicable to minimize off-site disturbance. Off-site queuing will be prohibited.

C-6 Materials Disposal Off-Site

All soil/fill/solid waste excavated and removed from the Site will be treated as contaminated and regulated material and will be transported and disposed in accordance with all local, State (including 6 NYCRR Part 360) and Federal regulations. If disposal of soil/fill from this Site is proposed for unregulated off-site disposal (i.e., clean soil removed for development purposes), a formal request with an associated plan will be made to the NYSDEC. Unregulated off-site management of materials from this Site will not occur without formal NYSDEC approval.

Off-site disposal locations for excavated soils will be identified in the pre-excavation notification. This will include estimated quantities and a breakdown by class of disposal facility if appropriate, i.e., hazardous waste disposal facility, solid waste landfill, petroleum treatment facility, Construction and Demolition (C&D) debris recycling facility, etc. Actual disposal quantities and associated documentation will be reported to the NYSDEC in the Periodic Review Report. This documentation will include waste profiles, test results, facility acceptance letters, manifests, bills of lading and facility receipts.

Non-hazardous historic fill and contaminated soils taken off-site will be handled, at minimum, as a Municipal Solid Waste per 6 NYCRR Part 360-1.2. Material that does not meet Track 1 unrestricted SCOs is prohibited from being taken to a New York State recycling facility (6 NYCRR Part 360-16 Registration Facility).

C-7 Materials Reuse On-Site

The qualified environmental professional as defined in 6 NYCRR Part 375 will ensure that procedures defined for materials reuse in this SMP are followed and that unacceptable material (i.e., contaminated) does not remain on-site. Contaminated on-site material, including historic fill and contaminated soil, that is acceptable for reuse on-site will be placed below the demarcation layer or impervious surface, and will not be reused within a cover soil layer, within landscaping berms, or as backfill for subsurface utility lines.

Proposed materials for reuse on-site must be sampled for full suite analytical parameters, including per- and polyfluoroalkyl substances (PFAS) and 1,4-dioxane. The sampling frequency will be in accordance with DER-10 Table 5.4(e)10 unless prior approval is obtained from the NYSDEC project manager for modification of the sampling frequency. The analytical results of soil/fill material testing must meet the Site use criteria presented in NYSDEC DER-10 Appendix 5 – Allowable Constituent Levels for Imported Fill or Soil for all constituents listed, and the NYSDEC Sampling, Analysis, and Assessment of PFAS June 2021 guidance values. Approvals for modifications to the analytical parameters must be obtained from the NYSDEC project manager prior to the sampling event.

Soil/fill material for reuse on-site will be segregated and staged as described in Sections C-2 and C-3 of this EWP. The anticipated size and location of stockpiles will be provided in the 15-day notification to the NYSDEC project manager. Stockpile locations will be based on the location of Site excavation activities and proximity to nearby Site features. Material reuse on-site will comply with requirements of NYSDEC Division of Environmental Remediation (DER)-10 Section 5.4(e)4. Any modifications to the requirements of DER-10 Section 5.4(e)4 must be approved by the NYSDEC project manager.

Any demolition material proposed for reuse on-site will be sampled for asbestos and the results will be reported to the NYSDEC for acceptance. Concrete crushing or processing on-site will not be performed without prior NYSDEC approval. Organic matter (wood, roots, stumps, etc.) or other solid waste derived from clearing and grubbing of the site will not be reused on-site.

C-8 Fluids Management

All liquids to be removed from the Site, including excavation dewatering, and groundwater monitoring well purge and development waters, will be handled, transported, and disposed in accordance with applicable local, State, and Federal regulations. Dewatering, purge, and development fluids will not be recharged back to the land surface or subsurface of the site but will be managed off-site.

Discharge of water generated during large-scale construction activities to surface waters (i.e., a local pond, stream, or river) will be performed under a SPDES permit.

C-9 Cover System Restoration

After the completion of soil removal and any other invasive activities the cover system will be restored in a manner that complies with this SMP and the CoC. An appropriate demarcation layer will be replaced to provide a visual reference to the top of the 'Remaining Contamination Zone', the zone that requires adherence to special conditions for disturbance of remaining contaminated soils defined in this SMP. If the type of cover system changes from that which exists prior to the excavation (i.e., a soil cover is replaced by asphalt), this will constitute a modification of the cover element of the remedy and the upper surface of the 'Remaining Contamination'. A figure showing the modified surface will be included in the subsequent PRR and in any updates to the SMP.

C-10 Backfill from Off-Site Sources

All materials proposed for import onto the Site will be approved by the qualified environmental professional and will follow provisions in this SMP prior to receipt at the Site. 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. A copy of the form is presented in Appendix F of the SMP.

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

All imported soils will meet the backfill and cover soil quality standards established in 6 NYCRR 375-6.7(d). Based on an evaluation of the land use, protection of groundwater and protection of ecological resources criteria, the resulting soil quality standards to be used at the Site are listed in Table 1 (included in Section 1 of this SMP). Soils that meet 'exempt' fill requirements under 6 NYCRR Part 360, but do not meet backfill or cover soil objectives for this Site, will not be imported onto the Site without prior approval by NYSDEC. Solid waste will not be imported onto the Site.

Trucks entering the Site with imported soils will be securely covered with tight fitting covers. Imported soils will be stockpiled separately from excavated materials and covered to prevent dust releases.

C-11 Stormwater Pollution Prevention

Barriers and hay bales will be installed and inspected once a week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the site and available for inspection by NYSDEC. All necessary repairs shall be made immediately.

Accumulated sediments will be removed as required to keep the barriers and hay bales functional.

All undercutting or erosion of the silt fence toe anchor shall be repaired immediately with appropriate backfill materials.

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

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

C-12 Contingency Plan

If underground tanks or other previously unidentified contaminant sources are found during post-remedial subsurface excavations or development related construction, excavation activities will be suspended until sufficient equipment is mobilized to address the condition.

Sampling will be performed on product, sediment, and surrounding soils, etc. as necessary to determine the nature of the material and proper disposal method. Chemical analysis will be performed for full a full list of analytes (TAL metals, TCL volatiles and semi-volatiles, TCL pesticides and PCBs), unless the Site history and previous sampling results provide a sufficient justification to limit the list of analytes. In this case, a reduced list of analytes will be proposed to the NYSDEC for approval prior to sampling.

Identification of unknown or unexpected contaminated media identified by screening during invasive site work will be promptly communicated by phone to NYSDEC's Project Manager. Reportable quantities of petroleum product will be reported to the NYSDEC spills hotline. These findings will be also included in the periodic reports prepared pursuant to Section 7 of the SMP.

C-13 Community Air Monitoring Plan

During any excavation activity initiated under the SMP, air monitoring will be conducted in accordance with the Community Air Monitoring Plan (CAMP) included in Appendix G of this SMP. Work zone monitoring will be performed for the health and safety of workers during interior intrusive work activities in accordance with action levels and guidance outlined in the Site-specific HASP. In summary, CAMP calls for real-time monitoring for VOCs and particulates (i.e., dust) at the downwind perimeter of each designated work area when intrusive activities are in progress at the Site. Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas. Continuous monitoring is required for all ground intrusive activities to the extent practicable (e.g., air monitoring may not be conducted during precipitation events).

VOC and particulate monitoring equipment will consist of a photoionization detector (PID) capable of detecting the VOCs found in the excavated soil and real-time aerosol or particulate monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM_{10}). VOC monitoring equipment will be calibrated and the particulate monitoring equipment zeroed on a daily basis and documented in a dedicated field logbook. Both VOC and particulate monitoring equipment will be capable of calculating 15-minute running average concentrations, which will be compared to the prescribed action levels.

If VOC monitoring results in the ambient air concentration of total organic vapors in excess of 5 parts per million (ppm) above background for the 15-minute average, work activities will be temporarily halted and monitoring continued. If the total organic vapor level readily decreases below 5 ppm over background,

work activities can resume with measures taken to reduce vapors and continue monitoring. If total organic vapor levels persist at levels more than 5 ppm over background, work activities will be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. If the organic vapor level is repeatedly over 25 ppm above background, activities will be shut down and the engineering controls and the Site work plan re-evaluated.

If particulate monitoring results in a 15-minute average concentration measurement that is between 100 micrograms per cubic meter µg/m^3 and 150 µg/m^3 above the background level, additional dust suppression techniques will be implemented to reduce the generation of fugitive dust and corrective action taken to protect Site personnel and reduce the potential for contaminant migration. Should dust suppression measures being utilized not lower particulates to an acceptable level (e.g., below 150 µg/m^3 above the background level, and no visible dust from the work area), work will be suspended until appropriate corrective measures are implemented to remedy the situation.

Details regarding work zone and community air monitoring are outlined in the HASP attached in Appendix G. Exceedances of action levels listed in the CAMP will be reported to NYSDEC and NYSDOH Project Managers.

C-14 Special Requirements for Work Within 20 Feet of Potentially Exposed Individuals or Structures

When 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. The use of ECs such as vapor/dust barriers, temporary negative-pressure enclosures, or special ventilation devices should be considered to prevent exposures related to the work activities and to control dust and odors. Consideration should be given to implementing the planned activities when potentially exposed populations are at a minimum, such as during weekends or evening hours in non-residential settings.

- If total VOC concentrations opposite the walls of occupied structures or next to intake vents exceed 1 part per million, monitoring should occur within the occupied structure(s). Depending upon the nature of contamination, chemical-specific colorimetric tubes of sufficient sensitivity may be necessary for comparing the exposure point concentrations with appropriate pre-determined response levels (response actions should also be pre-determined). 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 micrograms per cubic meter (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.
- Depending upon the nature of contamination and remedial activities, other parameters (e.g., explosivity, oxygen, hydrogen sulfide, carbon monoxide) may also need to be monitored. Response levels and actions should be pre-determined, as necessary, for each site.

C-15 Special Requirements for Indoor Work with Co-Located Residences or Facilities

Unless a self-contained, negative-pressure enclosure with proper emission controls will encompass the work area, all individuals not directly involved with the planned work must be absent from the room in which the work will occur. Monitoring requirements shall be as stated above under "Special Requirements for Work Within 20 Feet of Potentially Exposed Individuals or Structures" except that in this instance "nearby/occupied structures" would be adjacent occupied rooms. Additionally, the location of all exhaust vents in the room and their discharge points, as well as potential vapor pathways (openings, conduits, etc.)

relative to adjoining rooms, should be understood and the monitoring locations established accordingly. In these situations, it is strongly recommended that exhaust fans or other ECs be used to create negative air pressure within the work area during remedial activities. Additionally, it is strongly recommended that the planned work be implemented during hours (e.g., weekends or evenings) when building occupancy is at a minimum.

C-16 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 (a) through (f), as outlined in the following paragraph. If nuisance odors are identified at the Site boundary, or if odor complaints are received, work will be halted and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. NYSDEC and NYSDOH will be notified of all odor events and of any other complaints about the project. Implementation of all odor controls, including the halt of work, is the responsibility of the property owner's QEP, and any measures that are implemented will be discussed in the Periodic Review Report.

All necessary means will be employed to prevent on- and off-site nuisances. At a minimum, these measures will include: (a) limiting the area of open excavations and size of soil stockpiles; (b) shrouding open excavations with tarps and other covers; and (c) using foams to cover exposed odorous soils. If odors develop and cannot be otherwise controlled, additional means to eliminate odor nuisances will include: (d) direct load-out of soils to trucks for off-site disposal; (e) use of chemical odorants in spray or misting systems; and (f) use of staff to monitor odors in surrounding neighborhoods.

If nuisance odors develop during intrusive work that cannot be corrected, or where the control of nuisance odors cannot otherwise be achieved due to on-site conditions or proximity to sensitive receptors, odor control will be achieved by sheltering the excavation and handling areas in a temporary containment structure equipped with appropriate air venting/filtering systems.

C-17 Dust Control Plan

Particulate monitoring must be conducted according to the CAMP provided in Section C-13. If particulate levels at the Site exceed the thresholds listed in the CAMP or if airborne dust is observed on the Site or leaving the Site, the dust suppression techniques listed below will be employed. The remedial party will also take measures listed below to prevent dust production on the Site.

A dust suppression plan that addresses dust management during invasive on-Site work will include, at a minimum, the following items:

1. Dust suppression will be achieved by a dedicated on-site water truck for road wetting. The truck will be equipped with a water cannon capable of spraying water directly onto off-road areas including excavations and stockpiles.
2. Clearing and grubbing of larger Sites will be done in stages to limit the area of exposed, unvegetated soils vulnerable to dust production.
3. Gravel will be used on unpaved roadways to provide a clean and dust-free road surface.
4. On-site roads will be limited in total area to minimize the area required for water truck sprinkling.

C-18 Other Nuisances

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

A plan will be developed and utilized by the contractor for all remedial work to ensure compliance with local noise control ordinances.

APPENDIX D

INSPECTION AND SAMPLING LOGS

APPENDIX E

QUALITY ASSURANCE PROJECT PLAN

APPENDIX F

ENGINEERING CONTROL SYSTEM COMPONENT MANUALS AND TROUBLESHOOTING GUIDES

APPENDIX G

HEALTH AND SAFETY PLAN AND COMMUNITY AIR MONITORING PLAN