ELMWOOD PRESERVE

850 DOBBS FERRY ROAD

TOWN OF GREENBURGH, WESTCHESTER COUNTY, NEW YORK

DRAFT Remedial Action Work Plan

NYSDEC BCP Number: C360239

Prepared for:

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CERTIFICATION STATEMENT

I, Nicholas Krasnecky, P.E., certify that I am currently a NYS registered professional engineer and that this *Remedial Action Work Plan* was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER-10 / Technical Guidance for Site Investigation and Remediation and DER-31 / Green Remediation.

Engineering Seal to be applied to Final, NYSDEC-approved document.

NYS Professional Engineer #100006	01/23/25	
	Date	Signature

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

Remedial Action Work Plan

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

LIST OF ACRONYMS

Acronym	Definition
µg/m^3	micrograms per cubic meter
Applicant	Ridgewood Elmwood Owner, L.L.C., LLC
AWQS	ambient water quality standards
BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
bgs	below ground surface
BMP	best management practice
CAMP	*Community Air Monitoring Plan*
Carson Voci	Carson Voci Engineering and Geology, D.P.C.
C/D	construction and demolition
ConEd	Consolidated Edison Company of New York, Inc.
COC	Certificate of Completion
COPC	contaminants of potential concern
CSM	conceptual site model
CQAP	Construction Quality Assurance Plan
CVA	Climate Vulnerability Assessment
DER	Division of Environmental Remediation
DER-10	DER 10 / Technical Guidance for Site Investigation and Remediation
DER-31	DER-31 / Green Remediation
DOT	United States Department of Transportation
DMM	Division of Materials Management
DPT	direct-push technology
DUSR	data usability summary report

Eastern Parcel	Site property east of the Consolidated Edison Company of New York, Inc. parcel
EE	environmental easement
EC	engineering control
ECL	Environmental Conservation Law
ELAP	Environmental Laboratory Approval Program
EPA	United States Environmental Protection Agency
ESA	environmental site assessment
FER	final engineering report
FW	freshwater
FWRIA	*Fish and Wildlife Resources Impact Analysis*
GSR	Green and Sustainable Remediation
GZA	GZA GeoEnvironmental Inc.
HAP	Historically Applied Pesticide
HASP	*Health and Safety Plan*
HAZWOPER	Hazardous Waste Operations and Emergency Response
HHEA	human health exposure assessment
IC	institutional control
IDW	investigation-derived waste
mg/kg	milligrams per kilogram
MSA	material staging area
NYCRR	New York Codes, Rules, and Regulations
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYSDOT	New York State Department of Transportation
OER	Office of Environmental Remediation

OSHA	Occupational Safety and Health Administration
PAH	Polycyclic aromatic hydrocarbons
Participant	Ridgewood Elmwood Owner, L.L.C., LLC
PCB	polychlorinated biphenyl
PEcoSCOs	Protection of Ecological Resources soil cleanup objectives
PFAS	per- and polyfluoroalkyl substances
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
PID	photoionization detector
PGWSCOs	Protection of Groundwater (soil cleanup objectives)
PM-10	particulate matter with a diameter of 10 micrometers or less
PPE	personal protective equipment
ppm	parts per million
QAPP	*Quality Assurance Project Plan*
QA/QC	quality assurance/quality control
QEP	Qualified Environmental Professional
RAO(s)	remedial action objective(s)
RAWP	remedial action work plan
RI	remedial investigation
RIR	*Remedial Investigation Report*
RIWP	*Remedial Investigation Work Plan*
Roux	Roux Environmental Engineering and Geology, D.P.C
RSCO	residential soil cleanup objective
SCG	standards, criteria, and guidelines
SCO	soil cleanup objective
SCQ	Standards, Criteria and Guidelines
SEFA	*Spreadsheets for Environmental Footprint Analysis*

SEQRA	State Environment Quality Review Act
SGV	sediment guidance value
SMP	site management plan
SMMP	soil/materials management plan
Site	Site No. C203162 identified as Elmwood Preserve at 850 Dobbs Ferry Road, White Plains, New York
SRI	Supplemental remedial investigation
SV	soil vapor
SVOC	semivolatile organic compound
SWPPP	Storm Water Pollution Prevention Plan
TAL	Target Analyte List
TCL	target compound list
TOGS	Technical and Operational Guidance Series
TOGs 1.1.1	Technical and Operational Guidance Series Memorandum 1.1.1, "Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations"
USCS	Unified Soils Classification System
USGS	United State Geological Survey
UST	underground storage tank
UUSCO	unrestricted use soil cleanup objective
VOC	volatile organic compound
Western Parcel	Site property west of the Consolidated Edison Company of New York, Inc. parcel
XRF	X-ray fluorescence

EXECUTIVE SUMMARY

Ridgewood Elmwood Owner, L.L.C entered into a Brownfield Cleanup Agreement (BCA) with the New York State (NYS) Department of Environmental Conservation (NYSDEC) in April 2023 to investigate and remediate the Elmwood Preserve Site, a 106.8-acre property comprised of two parcels at 850 Dobbs Ferry Road in the Town of Greenburgh, Westchester County, New York (the Site). Ridgewood Elmwood Owner, L.L.C is a Participant in the Brownfield Cleanup Program. The Site was assigned NYSDEC Brownfield Cleanup Program Site Number C360239.

This *Remedial Action Work Plan* (RAWP) summarizes the nature and extent of contamination as determined from data gathered during the remedial investigation and evaluates and presents the selected remedy that is protective of human health and the environmental and consistent with the proposed future use of the Site.

SITE DESCRIPTION/PHYSICAL SETTING/SITE HISTORY

The Site is located in the County of Westchester, Town of Greenburgh, New York, and is identified as Parcel IDs 7.530-320.1.SG and 7.530-320-1.SE on the Town of Greenburgh Geographic Information System Tax Map. The Site is situated on an approximately 106.8-acre area bounded by residential development to the north, Dobbs Ferry Road to the south, recreational development (Frank Jazzo Field) to the east, and residential and institutional development (Fairview Fire Department – Station 2) to the west (see Figure 1).

The Site was first developed in 1924 as the Pelhamhurst Golf & Country Club golf course. In 1946, ownership transferred from John C. Von Glahn, a Trustee, to Elmwood Country Club Inc. The property continued to operate as a private club and golf course from 1946 until its closure in 2017. The Site was improved with an 18-hole golf course, a main clubhouse, and associated maintenance and storage buildings, as well as several tennis courts and a pool area. The Participant purchased the property in 2017. The buildings, formerly located on the southwest portion of the Site, were demolished in 2022. The Site is currently vacant and undeveloped.

The past use of the Site as a golf course and country club included historical applied pesticide operations for regular maintenance of the golf course and the presence of historical fill around the prior infrastructure, both of which have caused environmental impacts at the Site.

SUMMARY OF THE REMEDIAL INVESTIGATION

Data collected during the remedial investigation was used to develop a conceptual site model. The model incorporated the Site's history; source, magnitude, fate, transport of contaminants of concern (COPCs); potential exposure pathways; as well as site-specific geology,

hydrogeology, and both current and proposed future land use. The COPCs at the Site include pesticides, metals, and polyaromatic hydrocarbons, which do not readily biodegrade and therefore persist in environmental media unless actively remediated. Based on the soil, groundwater, soil vapor, sediment, and surface water results, soil is the primary impacted environmental medium at the Site.

Based on the vertical profiles of pesticides and metals in Site soil, these COPCs are attributed to legacy pesticide applications associated with the historical use of the Site as a golf course and country club. Soils containing pesticides and metals at concentrations exceeding the applicable soil cleanup objectives (SCOs) are found primarily in the upper 0.5 feet of soils, with impacts in some areas extending to 2 feet below ground surface. A limited number of locations demonstrated impacts below 2 feet below ground surface, primarily isolated to individual pesticides or metals. The occasional exceedances of polychlorinated biphenyls and semivolatile organic compounds above the applicable SCOs are not indicative of known historical Site operations and are likely due to historical fill material identified on the portion of the Site that previously contained the clubhouse and surrounding infrastructure.

The Site groundwater does not contain COPCs at levels exceeding the ambient water quality standards (AWQS), except for the per- and polyfluoroalkyl substances (PFAS) COPCs. PFAS was detected at most groundwater monitoring wells at concentrations exceeding the AWQS. Groundwater sampling results indicate the concentrations of pesticides and metals in the Site soils are not impacting groundwater.

PFAS compounds were also detected in soil at levels above the unrestricted use SCOs. However, there is currently no indication of an on-site source of PFAS and/or impacts stemming from known historical Site operations. Therefore, the presence of PFAS at the Site is likely attributable to background levels from diffuse anthropogenic deposition common to the greater New York City metropolitan area, as evidenced by PFAS detections at multiple Brownfield Cleanup Program sites throughout Westchester County.

Soil vapor is not a medium of concern at the Site since regulated soil vapor compounds are not present above applicable standards, criteria, and guidance in any other environmental medium, and detected soil vapor concentrations at the Site do not indicate a requirement for further monitoring or mitigation.

Site surface water does not contain COPCs at concentrations exceeding the AWQS, except for dieldrin at three sampling locations within the small stream channel located in the eastern part of the Site.

The sediment sample results indicated slight to moderate contamination (i.e., Class B sediment) or highly contaminated sediments (i.e., Class C sediment) when compared to the

ecologically based freshwater screening guideline values. Exceedances of chlordane (total) and/or various metals were primarily detected in the pond, with minor impacts identified in sediment samples collected in the small stream channel in the eastern part of the Site. Based on the surface water sampling results, impacts to the soil and sediment at the Site do not appear to be readily impacting surface water. The concentrations of pesticides and metals in sediment appear to be related to the impacts in soil, consistent with historical legacy pesticide application at the Site.

QUALITATIVE HUMAN HEALTH EXPOSURE ASSESSMENT

The following table summarizes the human health exposure assessment.

Environmental Media and Exposure Route	HHEA
Direct contact with soil (dermal contact and incidental ingestion; inhalation of fugitive dust)	Current: Potential trespassers can come in contact with exposed surface soil at the Site. Future: • Utility workers, construction workers, and trespassers could be exposed to contaminated surface or subsurface soil via dust inhalation, incidental ingestion, and dermal contact. Passers-by, off-site residents of neighboring residential properties, and off-site recreational users in the vicinity of the work could be exposed to contaminated soil via dust inhalation. Implementation of the *Health and Safety Plan*, *Community Air Monitoring Plan*, and dust control measures during remedial action and any future ground intrusive activities will mitigate potential exposures. • Implementation of the *Remedial Action Work Plan* will mitigate potential soil-related exposures to residents of the proposed single-family housing and recreational users on the eastern parcel. Off-Site: With the potential exception of dust generation, off-site soil migration via erosion is not expected to have occurred given the known sources of contaminants, historical practices, site vegetation, and general site topography. Erosion of soils is expected to have been limited by the presence of dense vegetation and paved/covered areas of the Site. Stormwater runoff historically was managed through stormwater management features.
Ingestion of /dermal contact with groundwater used as drinking water	Not complete. Groundwater is not currently used, nor is it expected to be used, as a source of drinking water at the site or in adjacent areas off-site. Groundwater ingestion is therefore not a complete exposure pathway for on- or off-site receptors.
Dermal contact with shallow groundwater	On- or off-site future construction/utility workers excavating into shallow groundwater potentially could be exposed to COPCs through dermal contact. Incidental ingestion is considered unlikely during excavation. The only constituents detected in groundwater from

Environmental Media and Exposure Route	HHEA
	perimeter wells were PFAS, which are assumed related to regional conditions rather than to site-related releases.
Inhalation of air (exposures related to soil vapor intrusion)	• There are currently no occupied buildings at the Site and no identified COPCs in soil vapor. • Soil vapor data at the Site do not show concentrations posing an exposure risk that would require mitigation. • It is not expected that soil vapor would migrate off-site to nearby buildings, if present.
Dermal contact with surface water	• Current: Bodies of water at the Site are not intended for recreational use, such as swimming. Trespassers could contact COPCs in surface water through dermal contact while wading along the banks. Incidental ingestion is not expected since swimming is unlikely to occur. Any exposure to surface water is expected to occur only sporadically, given that Site access is restricted. • Future: Bodies of water at the Site will tie into the overall stormwater system proposed as part of the Site development and are not intended nor anticipated for recreational use. Trespassers and incidental recreational users could potentially have dermal contact with COPCs in surface water via wading. Incidental ingestion is not expected since swimming is unlikely to occur. Any exposure to surface water is expected to be minimal, and occur only sporadically. • Off-Site: The stream runs off-site into other waterbodies and wetlands that are not recreational areas. While off-site receptors could potentially encounter COPCs in surface water downstream of the Site, exposure is expected to be limited by thick vegetation and soft marsh soils.
Dermal contact with and incidental ingestion of sediment	• Current: The bodies of water are not intended for recreational use. Trespassers could come in contact with contaminated sediment through dermal contact and incidental ingestion while wading, although this exposure is expected to be minimal, and occur only sporadically. • Future: The bodies of water at the Site will tie into the overall stormwater system proposed as part of the development and are not intended nor anticipated for recreational use. Trespassers and incidental recreational users could potentially come in contact with contaminated sediment through dermal contact and incidental ingestion, although this exposure is expected to be minimal, and occur only sporadically. • Off-Site: The stream runs off-site into other waterbodies and wetlands that are not recreational areas. While off-site receptors could potentially encounter COPCs in sediment downstream of the Site, exposure is expected to be limited by thick vegetation and soft marsh soils.

FISH AND WILDLIFE IMPACT ANALYSIS

As summarized in the *Fish and Wildlife Resource Impact Analysis* (FWRIA; provided under separate cover), the Site's vacant, undeveloped condition currently offers suitable habitat for a variety of wildlife, in contrast to its historical use as a golf course and country club from 1924 until 2022.

Currently, complete exposure pathways exist for fish and wildlife based on detected COPCs in soil and sediment. Groundwater is not considered a medium of concern for ecological receptors, due to the unlikely potential for exposure to occur. Part 1 of the FWRIA determined that a Part 2 may be warranted. However, in lieu of completing a Part 2, pond sediments will be cleaned up to NYSDEC Freshwater (FW) Class A Sediment Guidance Values (SGVs; NYSDEC 2014).

SUMMARY OF THE REMEDY

A remedial program will be implemented to define the requirements for its construction, operation, optimization, maintenance, and monitoring. Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy in accordance with NYSDEC Division of Environmental Remediation's Program Policy "DER-31 / Green Remediation." The major green remediation components are as follows:

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
- Reducing direct and indirect greenhouse gases and other emissions;
- Increasing energy efficiency and minimizing use of non-renewable energy;
- Conserving and efficiently managing resources and materials;
- Reducing waste, increasing recycling, and increasing reuse of materials which would otherwise be considered a waste;
- Maximizing habitat value and creating habitat when possible;
- Fostering green and healthy communities and working landscapes which balance ecological, economic, and social goals;
- Integrating the remedy with the end use where possible and encouraging green and sustainable redevelopment; and
- Incorporating green remediation principles and techniques to the extent feasible in future Site development. Any future on-site buildings shall be constructed, at a

minimum, to meet the *2020 Energy Conservation Construction Code of New York* (or most recent edition) to improve energy efficiency as an element of construction.

As part of the remedial program, to evaluate the remedy with respect to green and sustainable remediation principles, an environmental footprint analysis will be completed. The environmental footprint analysis will be completed using an accepted environmental footprint analysis calculator such as SEFA ("Spreadsheets for Environmental Footprint Analysis," United States Environmental Protection Agency), SiteWise™ (available in the Sustainable Remediation Forum [SURF] library) or similar NYSDEC-accepted tool. Water consumption, greenhouse gas emissions, renewable and non-renewable energy use, waste reduction and material use will be estimated, and goals for the project related to these green and sustainable remediation metrics, as well as for minimizing community impacts, protecting habitats and natural and cultural resources, and promoting environmental justice, will be incorporated into the remedial program, as appropriate. The project will include detailed requirements to achieve the green and sustainable remediation goals. Further, progress with respect to green and sustainable remediation metrics will be tracked during implementation of the remedial action and reported in the Final Engineering Report, including a comparison to the goals established during the remedial program.

Additionally, the remedial program will include a climate change vulnerability assessment to evaluate the impact of climate change on the project site and the proposed remedy. Potential vulnerabilities associated with extreme weather events (e.g., hurricanes, lightning, heat stress and drought), flooding, and sea level rise will be identified, and the remedial program will incorporate measures to minimize the impact of climate change on potential identified vulnerabilities.

The remedial program will include the following activities:

1. Conduct site preparation activities consisting of utility investigation and mark-outs; mobilization of equipment for the specific remedial activities; installation of soil erosion and sediment controls (as needed); site clearing, grubbing, and tree removal; preparation of staging and material stockpile areas; and set-up of community air monitoring equipment in accordance with the *Community Air Monitoring Plan*.
2. Excavation of soil/fill exceeding Track 2 SCOs for both the western and eastern parcels to a depth of 15 feet bgs or top of bedrock. The current estimated excavation extents to meet applicable SCOs consist of the removal of soil across the Site, the majority in the upper 0.5 feet, with select areas up to 4 feet bgs , consisting of approximately 110,000 cy of soil as shown on Figures 6 and 13 and detailed in Table 9..

3. Temporary dewatering of the pond (and treatment if necessary), excavation, stabilization (if necessary), and off-site removal of all sediments exceeding FW Class A SGVs, estimated to be approximately 4,600 cy as shown on Figure 16. Restoration of the pond and adjacent wetlands upon completion of sediment removal, as needed. An RD containing further details regarding the sediment remediation will be submitted for review and approval by the NYSDEC prior to initiating sediment remediation.
4. Screening for indications of contamination (by visual means, odor, monitoring with photoionization detector and/or X-ray fluorescence analyzer) of all excavated soil during any intrusive Site work.
5. Collection and analysis of end-point samples to evaluate the performance of the remedy with respect to attainment of Track 2 SCOs and sediment FW Class A SGVs.
6. Appropriate off-site disposal of all material removed from the Site in accordance with all federal, state, and local rules and regulations for handling, transport, and disposal.
7. Clean material movement, site regrading, and temporary stabilization of excavated areas.
8. Demobilization of all remedial equipment and removal of erosion and sediment control measures that are not scheduled to be used during redevelopment activities.
9. All responsibilities associated with the remedial action, including permitting requirements and pretreatment requirements, will be addressed in accordance with all applicable federal, state, and local rules and regulations.

Remedial Action Work Plan

1.0 INTRODUCTION

Ridgewood Elmwood Owner, L.L.C entered into a Brownfield Cleanup Agreement (BCA) with the New York State (NYS) Department of Environmental Conservation (NYSDEC) in April 2023 to investigate and remediate a 106.8-acre Site comprised of two parcels at 850 Dobbs Ferry Road in the Town of Greenburgh, Westchester County, New York. Ridgewood Elmwood Owner, L.L.C is a Participant in the Brownfield Cleanup Program. Residential and recreational use is proposed for the property. When completed, the Site will contain 113 private (single-family) residential homes. Refer to the Brownfield Cleanup Program (BCP) application for additional details.

This *Remedial Action Work Plan* (RAWP) summarizes the nature and extent of contamination as determined from data gathered during the remedial investigation (RI), performed between May 2024 and June 2025. It provides an evaluation of a Track 1 cleanup and other applicable remedial action alternatives, the associated costs, and the recommended and preferred remedy. The remedy described in this document is consistent with the procedures defined in NYSDEC Department of Environmental Remediation (DER) procedures set forth in the 2010 Program Policy "DER-10 / Technical Requirements for Site Investigation and Remediation" (DER-10), "DER-31 / Green Remediation" (DER-31), and complies with all applicable standards, criteria, and guidance. The remedy described in this document also complies with all applicable federal, state, and local laws, regulations, and requirements. The NYSDEC and NYS Department of Health (NYSDOH) have not yet determined whether this Site does/does not pose a significant threat to human health and the environment. The RI for this Site did identify fish and wildlife resources.

Per DER-10 Section 3.10, a *Fish and Wildlife Resources Impact Analysis* (FWRIA) has been performed and can be found in Section 2.6.2. This RAWP includes appropriate measures for delineating and protecting the identified resource and for monitoring construction related impacts consistent with DER-10 and the FWRIA, Part 3. These resources are identified on remedial drawings. The NYSDEC Division of Fish and Wildlife and the NYS Natural Heritage Program will be contacted, as defined in DER-10, and, at a minimum, all substantive technical requirements for applicable resource related permits (e.g., 6 NYCRR Parts 608, 661, 663) will be met.

A formal remedial design document will not be prepared.

1.1 SITE LOCATION AND DESCRIPTION

The Site is in the County of Westchester, Town of Greenburgh, New York, and is identified as Parcel IDs 7.530-320.1.SG and 7.530-320-1.SE on the Town of Greenburgh Geographic Information System Tax Map. A United States Geological Survey (USGS) topographical quadrangle or other suitable type map (Figure 1) shows the Site location. The Site is situated on an approximately 106.8-acre area bounded by residential development to the north, Dobbs Ferry Road to the south, recreational development (Frank Jazzo Field) to the east, and residential and institutional development (Fairview Fire Department – Station 2) to the west (see Figure 2). A boundary map is attached to the BCA as required by Environmental Conservation Law (ECL) Title 14, Section 27-1419.

1.2 CONTEMPLATED REDEVELOPMENT PLAN

The remedial action to be performed under the RAWP is intended to make the Site protective of human health and the environment consistent with the contemplated end use. The proposed redevelopment plan and end use is described here to provide the basis for this assessment. However, the remedial action contemplated under this RAWP may be implemented independent of the proposed redevelopment plan.

The planned redevelopment of the Site includes the construction of approximately 113 private (single-family) residential homes on the western parcel as shown on Figure 3. Each residential lot is proposed to be approximately 0.5 acres and developed with a two-story home featuring a basement upon completion of the redevelopment. The eastern parcel is proposed to be transferred to the Town of Greenburgh for future proposed use as a recreational area. The redevelopment plans are provided as Appendix A.

1.3 DESCRIPTION OF SURROUNDING PROPERTY

The Site is bounded to the north by residential development, to the east by Landers Road with recreational development (Frank Jazzo Field) beyond, to the south by Dobbs Ferry Road with commercial development (Carlson Farm Nursery & Greenhouses) and recreational development (Game on Golf Center) beyond, and to the west by residential and institutional development (Fairview Fire Department – Station 2). No sensitive receptors were identified in the immediate vicinity of the Site.

2.0 DESCRIPTION OF REMEDIAL INVESTIGATION FINDINGS

The Site was investigated in accordance with the scope of work presented in the NYSDEC-approved *Remedial Investigation (RI) Work Plan* (RIWP) completed by Roux Environmental

Engineering and Geology, D.P.C (Roux) dated August 2024 and Carson Voci's 2025 work plans *Supplemental Remedial Investigation Work Plan - Soil Investigation,* dated [January 31]; *Supplemental Remedial Investigation Work Plan-Groundwater,* dated [March 26]; *Supplemental Remedial Investigation Work Plan-Surface Water and Sediment,* dated [Month 28]; and the *Supplemental Remedial Investigation Work Plan-Additional Soil Delineation and Soil Vapor,* dated [June 20]. The investigation was conducted between May 2024 and June 2025. Carson Voci's *Remedial Investigation Report* (RIR) and RIR Addendum were submitted to NYSDEC in July and September, 2025, respectively, and approved by NYSDEC on [insert date].

2.1 SUMMARY OF REMEDIAL INVESTIGATIONS PERFORMED

The RI activities conducted between May 2024 and July 2025 included the following scope of work:

- Delineation of horizontal and vertical nature and extent of contamination in all media (soil, groundwater, surface water, sediment, and soil vapor) at or emanating from the Site;
- Confirmation and/or determination of the surface and subsurface characteristics of the Site (i.e., topography, geology, and hydrogeology, including depths to groundwater and bedrock);
- Identification of potential sources of contamination, migration pathways, and actual or potential receptors of contaminants in or through air, soil, groundwater, and utilities at the Site; and
- Collection of sufficient data to perform a qualitative human health exposure assessment (HHEA) for on- and off-site receptors.

The following subsections provide summary details of the RI and supplemental RI (SRI) activities completed at the Site.

2.1.1 Borings and Wells

During the RI and SRI activities, Roux and Carson Voci conducted sampling of various media throughout the Site including soil, groundwater, soil vapor, sediment, and surface water.

Roux advanced 115 soil borings to characterize soil. A grid system was developed based on prior environmental investigations, which indicated that contamination exceeding the applicable soil cleanup objectives (SCOs) was not biased to specific land-use areas associated with the former golf course (e.g., tees and greens). The boring locations corresponded to the center of each approximately 200- by 200-foot grid, with 16 additional borings collected from a potential area of historical fill. In February 2025, Carson Voci conducted SRI activities to further

characterize contaminant distribution throughout the Site. Carson Voci installed an additional 80 soil borings to refine the vertical contamination depths identified during the initial RI and provide sufficient resolution of contaminant distribution from historical surficial pesticide applications. In April 2025, Carson Voci advanced 11 shallow soil borings at each of the overburden monitoring well locations proposed in the RIWP to further characterize per- and polyfluoroalkyl substances (PFAS) in shallow soils at the Site. In June 2025, Carson Voci returned to the Site to advance 19 soil borings to delineate previously identified lithologic inconsistencies that may have contributed to analytical exceedances in soil, with the goal of refining soil characterization and reducing the estimated volume of impacted soil requiring removal from the Site as part of the anticipated remedial action. Ten additional soil borings were advanced in this mobilization to complete a visual assessment and delineation of areas with historical fill material.

During the initial RI activities, Roux installed six overburden monitoring wells via direct-push technology (DPT) drilling methods to characterize shallow groundwater at the Site. During the subsequent sampling event, only monitoring well RMW-10 contained water. Based on the lack of overburden groundwater and the presence of shallow bedrock, Carson Voci installed a network of three shallow bedrock wells at least 5 feet into competent rock via hollow-stem auger and air rotary drilling methods in April 2025 to evaluate the groundwater table quality at the Site.

In July 2024, Roux mobilized to the Site to collect three surface water samples and three collocated sediment samples from the surface water body in the southern portion of the Site as part of the RIWP implementation. Carson Voci conducted additional surface water and sediment sampling in the previous Roux locations, two additional locations at the freshwater pond, and three locations within the small creek at the northeastern portion of the Site to further evaluate the nature and extent of potential impacts in these media at the Site.

To investigate soil vapor at the Site, Roux installed 11 soil-vapor points throughout the Site. In June 2025, Carson Voci installed an additional eight soil-vapor points to further evaluate soil vapor site wide.

2.1.2 Samples Collected

The following subsections summarize the samples collected during RI activities at the Site.

2.1.2.1 Soil Samples

As part of the RIWP implementation, Roux collected and analyzed 362 soil samples from 115 soil borings advanced in a grid system. The samples were collected from 0–0.2, 0.2–2, 0–1, 2–4, 4–6, 6+ foot intervals for the analyses listed below. Soil borings were geologically logged

in accordance with Unified Soils Classification System (USCS) nomenclature, with evidence of contamination noted through visual and olfactory inspection. Boring were also continuously field screened for volatile organic compounds (VOCs) using a photoionization detector (PID) equipped with a 10.6-electron volt lamp.

During the SRI, Carson Voci collected and analyzed 243 soil samples from 101 soil borings. Samples were collected on a nominal, continuous basis using a track-mounted GeoProbe® DPT drill rig to advance a 5-foot-long, stainless-steel macrocore sampler from the surface to the targeted termination depth. Each macrocore sampler was equipped with factory-decontaminated, plastic acetate liners. Soil borings were inspected and classified in accordance with the USCS. Soil borings were field screened for impacts using a PID, along with visual and olfactory inspection. A graphic log of each soil boring was prepared with appropriate stratification lines, lithologic descriptions, sample identifications, PID readings, sample depth intervals, and dates. Representative soil samples were collected from the proposed sampling interval and/or the sampling interval exhibiting a PID reading and/or visual and olfactory indication of impacts. The appropriate soil sample volume was transferred to laboratory-supplied glassware (the VOC aliquot was placed in En Core® samplers per United States Environmental Protection Agency [EPA] Method 5035A) and immediately placed in an ice-filled cooler. Samples for PFAS were collected in accordance with NYSDEC's 2023 *Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances (PFAS)* guidance document, which requires ensuring that all materials in contact with the sampled soil are compatible. Carson Voci advanced soil borings throughout the Site based on:

- RI sample locations on the western parcel with 2-foot sampling depth intervals exceeding the residential SCOs (RSCOs).
- RI sample locations on the eastern parcel with 2-foot sampling depth intervals exceeding the unrestricted use SCOs (UUSCOs).
- Vertical delineation of RI sample locations with 2-foot sampling depth intervals exceeding the UUSCOs for soils above bedrock, without a demonstrated clean sample at a deeper interval.
- Investigation of fill material associated with the screening sample IDs denoted as TS-##, and vertical delineation below the fill material.
- Horizontal delineation of RI sample location A04 containing PFAS concentrations exceeding the UUSCOs.
- Six boring locations in the vicinity of former underground storage tanks (USTs), aboveground storage tanks, and septic tank.

The sample intervals and laboratory analyses varied at each boring location based on field inspection and screening and the prior Roux RI data. Shallow soil samples collected in February 2025 were collected using a stainless-steel hand trowel below vegetation.

In June 2025, Carson Voci advanced soil borings in select locations that were identified as having lithologic and/or analytical inconsistencies during the RI and SRI. Samples were collected based on visual observations made by a Carson Voci field geologist; in the absence of previously identified lithologic inconsistencies, a soil sample was collected to refine larger sampling intervals previously identified to be in exceedance of the applicable SCOs.

2.1.2.2 Groundwater Samples

Development of the overburden wells was attempted in the six monitoring wells installed by Roux. Of the six monitoring wells, only well RMW-10 located adjacent to the pond in the south-central portion of the Site contained water and was developed. This well was subsequently sampled by Roux as part of its RI.

All bedrock monitoring wells installed by Carson Voci were developed with the pump and surge method. Each well was sampled at least 2 weeks after the completion of well installation and development except for a well that was dry (RMW-01D).

In April 2025, Carson Voci collected samples from two of the three bedrock monitoring wells (RMW-09D and RMW-11D) and three of the overburden wells (RMW-03, RMW-07, RMW-10) using EPA low-flow sampling techniques[1] in accordance with protocols provided in the *Quality Assurance Project Plan* (QAPP). A stainless-steel submersible pump was lowered into the groundwater, setting the pump intake within the wells' screened intervals, and the pump discharge tubing was attached to a calibrated water quality meter. Groundwater quality parameters and the depth to groundwater were recorded during the well purge. Once the groundwater parameters had stabilized, a groundwater sample was collected directly from the pump effluent into the appropriate sample containers for analysis (detailed in Table 1) and immediately placed on ice. Wells were sampled for PFAS in accordance with NYSDEC's 2023 *Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances (PFAS)* guidance document. Sampling tubing (e.g., high-density polyethylene) compatible with both VOC and PFAS sample collection was used. Groundwater samples were collected to evaluate groundwater conditions throughout the Site.

[1] https://www.epa.gov/sites/default/files/2017-10/documents/eqasop-gw4.pdf

2.1.2.3 Surface Water and Sediment Samples

As part of the RI activities, Roux collected three surface water samples and three collocated sediment samples from the banks/shallows of the surface water body present at the southern portion of the Site. Carson Voci conducted additional collocated surface water and sediment sampling in the previous Roux locations, two additional locations at the freshwater pond, and three locations within the small creek at the northeastern portion of the Site, to further evaluate the nature and extent of potential impacts in these media at the Site.

Surface water at the pond banks and stream sampling locations were collected with a high-density polyethylene bailer or jar and transferred into appropriate sample containers. Surface water samples from the middle of the pond were collected with a Kemmerer Bottle at the midpoint of the water column and transferred into appropriate sample containers. Sediment samples from the pond banks and within the stream were collected on a nominal continuous basis by advancing a minimum 2-foot-long, stainless-steel barrel equipped with a slambar device from the surface to the targeted 24-inch below ground surface (bgs) termination depth. Each barrel sampler was equipped with factory-decontaminated, polyethylene core liners. Sediment samples from the middle of the pond were collected from a Jon boat on a nominal continuous basis by advancing a minimum 2-foot-long pushcore with a long pole from the pond bottom to a depth of 24 inches. Each sample was placed in laboratory-supplied bottleware and placed immediately on ice. Each pushcore sampler was equipped with factory-decontaminated, rigid plastic acetate liners and an affixed nose cone. Sediment cores and samples were inspected and classified in accordance with the USCS, and field screened using a PID as well as visual and olfactory inspection. A graphic log of each sediment core was prepared with appropriate stratification lines, lithologic descriptions, sample identifications, PID readings, sample depth intervals, and dates.

2.1.2.4 Soil-Vapor Samples

Soil-vapor points were installed by Roux and Carson Voci to facilitate soil-vapor sampling at the Site. Prior to sampling, a helium tracer gas test was conducted on each soil-vapor point. The tracer gas test verified the integrity of the soil-vapor point installation and that infiltration of ambient air was not occurring. Upon passing the tracer gas test, soil-vapor samples were collected using laboratory-evacuated, certified-clean, 6-liter Summa canisters with 2-hour laboratory-calibrated flow regulators provided by a NYSDEC Environmental Laboratory Approval Program (ELAP) certified analytical laboratory. All sampling flow rates were less than the maximum flow rate of 0.2 liters per minute. Summa canisters were completely evacuated to negative pressure (30 inches of mercury vacuum) by the laboratory prior to use.

2.1.3 Chemical Analytical Work Performed

The following table provides the laboratory analyses conducted on each sampled media. A comprehensive summary of the samples collected in each matrix/media is presented in Table 1.

Matrix/Media	Analytical Parameters
Soil	• Target Compound List (TCL) VOCs using EPA Method 8260C/D, with representative total solids analysis using EPA Method SM2540G; • TCL semivolatile organic compounds (SVOCs) using EPA Method 8270C; • TCL pesticides using EPA Method 8081B; • TCL herbicides using EPA Method 8151A; • TCL polychlorinated biphenyls (PCBs) using EPA Method 8082A; • Target Analyte List (TAL) metals and mercury using EPA Method 6010; • Total cyanide using EPA Method 9010C/9012B; and • Emerging contaminants including 1,4-dioxane and PFAS using EPA Methods 8270E-SIM and 1633, respectively.
Groundwater	• TCL VOCs using EPA Method 8260C/D; • TCL SVOCs using EPA Method 8270C; • TCL pesticides/herbicides using EPA Method 8081B/8151A; • TCL PCBs using EPA Method 8082A; • TAL metals and mercury using EPA Methods 6010D/7471B; and • Emerging contaminants including 1,4-dioxane and PFAS using EPA Methods 8270E-SIM and 1633, respectively.
Surface Water and Sediment	• TCL VOCs using EPA Method 8260D; • TCL SVOCs using EPA Method 8270E; • TCL pesticides/herbicides using EPA Method 8081B/8151A; • TCL PCBs using EPA Method 8082A; • TAL metals and mercury using EPA Methods 6010D/7471B; • Total organic carbon using EPA Method 9060A; and • Emerging contaminants including 1,4-dioxane and PFAS using EPA Methods 8270E-SIM and 1633, respectively.
Soil Vapor	VOCs using EPA Method TO-15

2.1.4 Best Management Practices

Green and sustainable remediation (GSR) principles and techniques were implemented to the extent feasible in the design, implementation, and site management of the remedial investigation per DER-31.

Best management practices (BMPs), as defined by the EPA, aim to reduce the environmental footprint of activities associated with assessing and remediating contaminated

sites. RI BMPs involved specific activities to address the core elements of greener cleanups per DER-31, including (1) reducing total energy use and increasing the percentage of energy from renewable resources, (2) reducing air pollutants and greenhouse gas emissions, (3) reducing water use and preserving water quality, (4) conserving material resources and reducing waste, and (5) protecting land and ecosystem services.

BMPs for the RI included:

- Selecting service providers, product suppliers, and analytical laboratories from the local area;
- Identifying the nearest non-hazardous and/or hazardous waste disposal facility;
- Reducing travel through increased teleconferencing;
- Integrating sources of on-site renewable energy to power hand-held devices, portable equipment, and stationery monitoring systems;
- Using non-invasive or minimally invasive technologies such as portable vapor/gas detection systems using photoionization for screening purposes.
- Choosing products, packing material, and equipment that have reuse or recycling potential;
- Minimizing the need for disposable single-use items, such as plastic bags; and
- Choosing fixed laboratories demonstrating a strong commitment to environmental performance, such as routine use of management practices identified by the International Institute for Sustainable Laboratories.

The following metrics were tracked throughout the RI to validate assumptions and assess progress towards the GSR goals:

- Materials management, including off-site disposal and on-site material import quantities;
- Greenhouse gas emissions and air pollutants; and
- Total energy use.

2.1.5 Documentation

All RI activities were documented with field notes, associated activity logs (i.e., boring logs, groundwater purge logs, etc.), and daily reports, with tables and figures created to document and summarize the results of the RI. All documentation of RI activities is included in the RIR and RIR Addendum.

2.2 SIGNIFICANT THREAT

A significant threat determination to human health and the environment has not yet been made. Upon determination, notice will be provided for public review.

2.3 SITE HISTORY

The background of the Site and the surrounding properties has been evaluated by others and detailed in several environmental assessment reports, as summarized in the following subsections.

2.3.1 Past Uses and Ownership

The Site was first developed in 1924 as the Pelhamhurst Golf & Country Club. In 1946, ownership transferred from John C. Von Glahn, a Trustee, to Elmwood Country Club Inc. The property continued to operate as a private club and golf course from 1946 until its closure in 2017. The Site was improved with an 18-hole golf course, a main clubhouse, and associated maintenance and storage buildings, as well as several tennis courts and a pool area. The Participant purchased the property in 2017. The former buildings, located at the southwest portion of the Site, were demolished in 2022. The Site is currently vacant and undeveloped.

2.3.2 Phase I and Phase II Reports

GZA GeoEnvironmental Inc. (GZA) completed a Phase I and limited Phase II environmental site assessment (ESA [2017]) and supplemental site investigation (2020) for the Site. Roux completed a Phase II ESA at the Site in May 2022 to further characterize potential and existing environmental impacts to soil based on turf management practices from the Site's historical use as a golf course and country club. The results and conclusions of the previous investigation activities completed by GZA and Roux are summarized below.

GZA Phase I and Limited Phase II ESA (2017)

The following were identified during the 2017 Phase I and limited Phase II ESA and documented in the report prepared by GZA:

- The Site was listed in the NY SPILLS database for two release events dating back to 1998. Additionally, the Site was listed in the LUSTS database for five tank test failures dating back to 1988 that were eventually addressed in accordance with applicable requirements.

- Based on Environmental Data Resources Inc. records, there were, at one point, 10 petroleum bulk storage tanks on the property.
- The documented closures and removal of USTs (Tanks 1, 2, 4, 6, 8, and 10) at the Site resolved the spills and tank test failures to the satisfaction of applicable regulatory agencies.

The listings of previous spills/releases and tank testing failures constituted a recognized environmental condition at the Site.

During Phase I of the ESA, GZA identified multiple data gaps regarding potential release areas, indicating that if the future use of the Site changes from a golf course, soil, sediment, and potentially groundwater would need to be characterized for residual impacts. As part of its limited Phase II ESA at the Site, GZA collected three soil samples, one surface water sample, and one bedrock groundwater sample to further evaluate the potential for environmental impacts around two active USTs and the former septic system. The soil sampling results indicated that VOC, SVOC, metal, pesticide, and herbicide concentrations in soil were either below the detection limits or below the UUSCOs and RSCOs per 6 NYCRR Part 375-6.8.[2] The surface water sample concentrations for VOCs, SVOCs, metals, and PCBs were either below detection limits or below the NYSDEC Division of Water Technical Operational Guidance Series Memorandum 1.1.1, "Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations" (TOGS 1.1.1). Dieldrin was detected slightly above the ambient water quality standards (AWQS) in surface water. No compounds in the groundwater sample were above the AWQS.

GZA Supplemental Site Investigation (2020)

In September 2019 and March 2020, GZA conducted supplemental site investigation activities to characterize shallow soil at the Site to assess the environmental quality of key golf course features in support of the State Environmental Quality Review Act for the proposed rezoning and redevelopment.[3] GZA collected samples from 30 soil boring locations consisting of 9 tee boxes, 18 greens, 1 pesticide storage shed, 1 pond outlet, and 1 golf cart storage area. Two soil samples were collected from each soil boring at two intervals, where feasible: one surface and one subsurface sample from 0–6 and 6–24 inches bgs, respectively. Soil samples were analyzed for pesticides, herbicides, total arsenic, and total lead.

[2] "375-6.8 Soil cleanup objectives tables." https://govt.westlaw.com/nycrr/375-6.8,

[3] https://dec.ny.gov/regulatory/permits-licenses/seqr

Analytical results indicated that arsenic was detected in 12 borings at concentrations above the UUSCO and/or RSCO. Lead was detected in 10 borings at concentrations above the UUSCO and/or RSCO. Various pesticides (i.e., 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, cis-chlordane, dieldrin) were detected in 23 borings at concentrations above the UUSCOs and/or RSCOs. Herbicide concentrations in soil were either below the detection limits or below the UUSCOs. GZA concluded that special handling of elevated soil concentrations may be required during redevelopment.

Roux Limited Phase II ESA (2022)

In May 2022, Roux conducted a limited Phase II ESA to further characterize potential and existing environmental impacts to soil based on the Site's historical use as a golf course and country club. The ESA activities consisted of collecting 20 shallow soil samples from 20 borings outside the tee/green areas but within the proposed development footprint, and 20 soil samples from 10 borings within the tee/green areas. Soil samples were analyzed for TCL pesticides, lead, and arsenic.

Analytical results indicated that soil contained arsenic and pesticide impacts, specifically dieldrin, at concentrations above the RSCOs, both within and outside of the tee/green areas. Arsenic was found at concentrations above the RSCOs in both shallow and deeper soil samples. Pesticides were found at concentrations above the RSCOs in shallow soil samples only. Lead was not detected at levels above the RSCOs in any of the soil samples.

2.3.3 Sanborn Maps

All Sanborn® maps available for this Site were reviewed prior to preparation of the RAWP and were included in the Phase I ESA report provided as an appendix to the RIWP.

2.4 GEOLOGIC AND HYDROGEOLOGIC CONDITIONS

According to the Natural Resources Conservation Service Web Soil Survey website,[4] the dominant soil composition in the vicinity of the Site is classified as Charleton fine sandy loam with 3–8, 8–15, 15–25, and 25–35 percent slopes; Charleton-Chatfield Complex with 0–15 percent slopes; Paxton fine sandy loams with 3–8 and 8–15 percent slopes; Sutton loam with 3–8 percent slopes; and Urban Land, which is characterized by a non-homogenous distribution of soil

[4] https://websoilsurvey.nrcs.usda.gov/app/

and fill types. The Site is underlain by the Fordham Gneiss formation, which consists of a garnet-biotite-quartz-plagioclase gneiss.

Soil borings from prior investigations and RI activities indicated a non-homogenous distribution of soil, primarily consisting of fine- to coarse-grained sands and silty sands, and gravels. Historical United States Geological Survey topographic maps of the Site show minimal change in elevation before and after the golf course was constructed, indicating the majority of soils currently at the Site are native or have been in place since at least 1924 when the golf course and country club were developed. Gravels consisting of concrete and other materials consistent with historical fill were commonly observed in the soil borings installed in the southwestern portion of the Site in the vicinity of the former clubhouse and associated structures. Bedrock encountered during the installation of bedrock monitoring wells was observed to be a micaceous garnet biotite gneiss. A geologic section is shown on Figure 4a and 4b.

During water level gauging conducted in July 2024 as part of the RI, groundwater was encountered in one overburden well, RMW-10, at 5.04 feet bgs. In April 2025, groundwater was encountered from 3.5–10.4 and 10.3–20.0 feet bgs in the overburden and bedrock monitoring wells, respectively. A potentiometric surface map for overburden and bedrock monitoring wells, based on well gauging conducted during the RI, implied that groundwater in the overburden flows toward the northeast, and groundwater in the bedrock flows to the northwest. The hydraulic gradient of the overburden and bedrock groundwater is 0.025 and 0.017 feet per foot, respectively. Groundwater flow maps are shown on Figures 5a and 5b.

2.5 CONTAMINATION CONDITIONS

The following subsections detail the contamination conditions that exist at the Site in soil, groundwater, surface water and sediment, and soil vapor based on remedial investigation findings.

2.5.1 Conceptual Model of Site Contamination

A conceptual site model (CSM) was developed based on the Site history and the source, magnitude, fate, transport, and potential exposure pathways of contaminants of potential concern (COPCs), in conjunction with site-specific geology and hydrogeology and the current and proposed future use. COPCs do not readily biodegrade and therefore persist in environmental media unless actively remediated. Based on the soil, groundwater, soil vapor, sediment, and surface water sample results, soil is the primary impacted environmental medium at the Site.

Based on the vertical profiles of pesticides and metals in Site soil, these COPCs are attributed to legacy pesticide applications associated with the historical use of the Site as a golf

course and country club. Pesticides and metals at concentrations exceeding the applicable SCOs were primarily detected in the upper 1 foot of soils, with some areas exhibiting impacts up to 2 feet bgs. A small number of locations demonstrated impacts below 2 feet bgs and were primarily isolated to individual pesticides or metals. The occasional exceedances of PCBs and SVOCs) primarily polycyclic aromatic hydrocarbons [PAHs]) above the applicable SCOs are not indicative of known historical Site operations and are likely due to historical fill material identified on the portion of the Site that previously contained the clubhouse and surrounding infrastructure.

Groundwater at the Site does not contain COPCs at levels exceeding the AWQS, except for PFAS in most groundwater monitoring wells. The groundwater sample results indicate the concentrations of pesticides and metals in the Site soils are not impacting groundwater.

PFAS compounds were also detected in soil at levels above the UUSCOs. However, there is currently no indication of an on-site source of PFAS and/or impacts stemming from known historical Site operations. Therefore, the presence of PFAS is likely due to background levels of these compounds in New York due to diffuse anthropogenic deposition consistent with the greater New York City metro area as evident by the presence of PFAS in multiple BCP sites throughout Westchester County.

New York State currently does not have standards or criteria relating to compounds found in soil vapor. Soil vapor data is reviewed in conjunction with analytical data from other sampled environmental media. Soil vapor is not a medium of concern at the Site since regulated soil-vapor compounds are not present above applicable standards, criteria, and guidance (SCGs) in any other environmental medium and soil-vapor concentrations at the Site do not indicate a requirement for further monitoring or mitigation.

Site surface water does not contain COPCs at concentrations exceeding the AWQS, except for dieldrin at three sampling locations collected from the small stream channel in the eastern part of the Site.

The sediment results indicated slight to moderate or highly contaminated sediments (Class B or C sediments, respectively) when compared to the ecologically based FW SGVs. Exceedances of chlordane (total) and/or various metals were primarily detected in the pond, with minor impacts identified in sediment samples collected from the small stream channel in the eastern part of the Site. Based on the surface water results, impacts to the soil and sediment at the Site do not appear to be readily impacting surface water. The concentrations of pesticides and metals in sediment appear to be related to the impacts in soil consistent with historical legacy pesticide application at the Site.

The areal and vertical extent of COPCs in all media are shown on Figures 6 through 10.

2.5.2 Description of Areas of Concern

Based on the results of the RI and the conceptual site model, four areas of concern (AOC) were identified as shown on Figure 11:

1. Eastern Parcel – Historical Applied Pesticide (HAP) Soil Impacts. Comprises the entire eastern parcel and consists of surface soil impacted with pesticides and metals from HAPs during former golf and country club operations.
2. Western Parcel – HAP Soil Impacts. Comprises the majority of the western parcel and consists of surface soil impacted with pesticides and metals from HAPs former golf and country club operations.
3. Western Parcel – Historical Fill. Comprises the southwestern portion of the Site where the former clubhouse, parking areas, tennis courts, maintenance buildings, and other associated infrastructure were located and consists of historical fill primarily impacted with PAHs in the upper 4 feet of soils.
4. Western Parcel – Pond Sediment Impacts. Encompasses the pond on the western parcel and the pesticide and metals impacts in a portion of the sediments above ecological sediment screening criteria from HAPs during former golf and country club operations.

The areas of concern and details of the respective contaminated media are presented in Sections 2.5.4 through 2.5.7.

2.5.3 Identification of Standards, Criteria and Guidance

Based on the proposed use of the Site, data generated during the RI were compared to SCGs, that if met, would provide no use restrictions on the currently proposed future uses of the property as designated below other than the site-wide restriction on the use and extraction of groundwater imposed by county and municipal ordinance(s) or prohibitions under the NYS Environmental Conservation Law[5] (i.e., no engineering control [EC] and no environmental easement or deed restriction or other institutional control [IC]). The proposed redevelopment of the Site is as follows:

- The property west of the ConEd parcel ("Western Parcel") will consist of single-family housing.
- The property east of the ConEd parcel ("Eastern Parcel") is proposed for transfer to the Town of Greenburgh for a future recreational area.

[5] https://www.nysenate.gov/legislation/laws/ENV

The following presents the SCGs for each environmental media at the Site based on the proposed future land uses, with no restrictions other than the site-wide restriction on the use and extraction of groundwater imposed by county and municipal ordinance(s) or prohibitions:

- **Soil.** The applicable SCGs and SCOs for soil at the Site are presented in 6 NYCRR Part 375. The RI results were compared and evaluated against UUSCOs, as required by DER-10 and the BCP to determine the nature and extent of contamination, and the following applicable 6 NYCRR Part 375-6.8 SCOs:
  - RSCOs
  - Protection of Groundwater SCOs (PGWSCOs)
  - Protection of Ecological Resources SCOs (PEcoSCOs)
- **Groundwater.** Groundwater at the Site was evaluated against the Class GA groundwater AWQS and guidance values in TOGS 1.1.1. Although groundwater is not currently used—and is not anticipated to be used—for drinking water since the Site is and will remain connected to the public water supply, the Class GA AWQS will still be used as the comparison criteria.
- **Surface Water and Sediment.** Surface water samples were evaluated against applicable AWQS SCGs provided in TOGS 1.1.1. Sediment samples were evaluated against the *Screening and Assessment of Contaminated Sediment* (NYSDEC 2014).
- **Soil Vapor.** SCGs for independent (e.g., no collocated indoor air sample) soil-vapor samples do not currently exist. Therefore, soil-vapor samples were not directly evaluated against SCGs and were reviewed in conjunction with analytical results from other environmental sampling media.

2.5.4 Soil/Fill Contamination

A summary of soil and fill contamination is presented in the subsections below.

2.5.4.1 Soil Contamination - Historical Applied Pesticides

A total of 115 soil borings were advanced at the Site, and 362 samples analyzed during the RI activities conducted by Roux between May and June 2024. Carson Voci conducted an SRI between February and May 2025 with the objective of refining the vertical extent of soil contamination identified by Roux in 2024. The 2-foot sampling intervals collected by Roux, in particular the 0.2 to 2-foot bgs interval, did not provide sufficient resolution of the distribution and concentration of contaminants from a historical surficial application of pesticides when compared to the applicable SCOs.

The objectives of the 2025 soil-based supplemental RI also included complete vertical and horizontal delineation of soils where required and confirmation that the UST/aboveground storage tank and septic tank locations have not caused an impact since the 2017 limited Phase II ESA was conducted.

2.5.4.2 Summary of Soil Data – Historical Applied Pesticides

The COPCs identified and attributed to the soils impacted by HAP (AOC 1 and 2) are pesticides, arsenic, and mercury. A summary of the RI and SRI soil data exceedances of these analytes when compared to the applicable SCOs is presented below. The summary tables demonstrate the CSM of soil impacts from HAP to be primarily detected in the upper 1 foot of soils, with some areas exhibiting impacts up to 2 feet bgs. Exceedances of the RSCOs do not extend below 2-feet bgs, except for one location (A13) that was further investigated. A portion of soils at deeper intervals contain mercury and pesticides concentrations exceeding the PEcoSCOs only. Additional detail regarding soil data can be found in the RIR.

Arsenic - Soil

Parcel	Start Depth (ft)	End Depth (ft)	Min Detected Conc (mg/kg)	Median Detected (mg/kg)	Maximum Detected (mg/kg)	Location of Max Detect	# Analyzed	# UUSCO Exceeds	# RSCO Exceeds	# PEco SCO Exceeds
Western	0	0.2	0.268	29	218	C10	98	74	**69**	74
	0.2	2	0.333	7.98	121	D11	98	31	**23**	31
	0.5	1	1.53	20.15	98.6	I10R	20	11	**11**	11
	1	1.5	0.719	13	76.7	I10R	17	8	**7**	8
	1.5	2	2.47	6.62	46	I10R	8	3	**2**	3
	2	2.5	6.29	6.29	6.29	A13SS	1	0	0	0
	2.5	3	0.742	0.742	0.742	A13SS	1	0	0	0
	3	3.5	3.44	3.44	3.44	A13SS	1	0	0	0
	3.5	4	3.11	3.11	3.11	A13SS	1	0	0	0
	2	4	0.331	2.49	12.3	D12	42	0	0	0
	4	6	0.25	1.054	9.38	G4	9	0	0	0
	6	8	0.859	1.5695	2.28	TEI-SB-02	2	0	0	0
	7	9	2.1	2.1	2.1	A13	1	0	0	0
	9	11	2.57	2.57	2.57	G12	1	0	0	0
	11	13	2.34	2.34	2.34	C13	1	0	0	0

Parcel	Start Depth (ft)	End Depth (ft)	Min Detected Conc (mg/kg)	Median Detected (mg/kg)	Maximum Detected (mg/kg)	Location of Max Detect	# Analyzed	# UUSCO Exceeds	# RSCO Exceeds	# PEco SCO Exceeds
	13	15	1.89	1.89	1.89	G5	1	0	0	0
Eastern	0	0.2	4.74	21	193	I13	17	12	**12**	**12**
	0.2	2	1.38	4.34	134	I13	17	3	**3**	**3**
	0.5	1	44.8	67	138	I13R	3	3	**3**	**3**
	1	1.5	12	12.7	154	I13R	3	1	**1**	**1**
	1.5	2	8.78	8.78	8.78	I13R	1	0	0	0
	2	4	0.984	1.89	5.99	I13	5	0	0	0
	6	8	1.54	1.54	1.54	I15	1	0	0	0

Mercury - Soil

Parcel	Start Depth (ft)	End Depth (ft)	Min Detected Conc (mg/kg)	Median Detected (mg/kg)	Maximum Detected (mg/kg)	Location of Max Detect	# Analyzed	# UUSCO Exceeds	# RSCO Exceeds	# PEco SCO Exceeds
Western	0	0.2	0.057	0.5905	75.9	E6	98	79	**39**	79
	0.2	2	0.049	0.154	49.8	E6	98	30	**13**	30
	0.5	1	0.13	1.3285	12.4	C11R	12	10	**7**	10
	1	1.5	0.104	2.305	9.53	A04S	12	11	**9**	11
	1.5	2	0.2	0.7035	3.38	A04S	11	10	**5**	10
	2	2.5	0.136	0.4245	0.713	A13SS	3	1	0	1
	2.5	3	0.061	0.061	0.061	A13R	3	0	0	0
	3	3.5	1.05	1.275	1.5	A13R	6	2	**2**	2
	3.5	4	ND	ND	ND	--	3	0	0	0
	2	4	0.047	0.104	3.15	A13	44	7	**2**	7
	4	6	0.055	0.22	0.694	G4	10	3	0	3
	7	9	ND	ND	ND	--	1	0	0	0
	9	11	ND	ND	ND	--	1	0	0	0
	11	13	ND	ND	ND	--	1	0	0	0
	13	15	ND	ND	ND	--	1	0	0	0
Eastern	0	0.2	0.062	0.731	3.91		17	14	**7**	**14**
	0.2	2	0.058	0.132	1.01		17	5	**1**	**5**
	0.5	1	0.084	0.336	0.734		5	4	0	**4**
	1	1.5	0.078	0.216	0.658		4	2	0	**2**
	1.5	2	0.067	0.067	0.067	I13R	2	0	0	0
	2	4	0.048	0.048	0.048	I12	5	0	0	0
	6	8	ND	ND	ND	--	1	0	0	0

Pesticides - Soil

Parcel	Start Depth (ft)	End Depth (ft)	# Analyzed	# UUSCO Exceeds	# RSCO Exceeds	# PEco SCO Exceeds
Western	0	0.2	98	89	**36**	27
	0.2	2	98	67	**14**	7
	0.5	1	14	12	**5**	4
	1	1.5	6	6	**3**	2
	1.5	2	4	3	**2**	2
	2	4	67	21	**1**	0
	2	2.5	2	2	0	0
	4	6	21	8	0	0
	6	8	7	1	0	0
	7	9	1	0	0	0
	9	11	1	0	0	0
	11	13	1	0	0	0
	13	15	1	0	0	0
Eastern	0	0.2	17	17	**7**	**6**
	0.2	2	17	8	**3**	**3**
	0.5	1	8	7	**3**	**3**
	1	1.5	7	6	**4**	**2**
	1.5	2	6	5	**1**	0
	2	4	9	2	0	0
	2	2.5	2	0	0	0
	2.5	3	2	0	0	0
	4	6	2	2	0	0
	6	8	2	0	0	0

2.5.4.3 Fill Contamination

Soil samples were collected from 15 boring locations in support of an investigation of the historical fill material at the Site. The soil samples collected within the historical fill material by Roux could only be used for informational purposes as that scope of work was not included in the RIWP.

Soil borings at each location were advanced into the fill material (where present) and at least 6 inches into the underlying native soils. Samples from within the historical fill and the underlying native 6-inch interval were collected and submitted for laboratory analysis to delineate the vertical extent of the fill material. The results from the samples collected from the historical fill show SVOCs, primarily PAHs as the indicator of the presence of historical fill.

In June 2025, Carson Voci conducted an additional visual assessment and delineation of areas with historical fill material, concluding that this material was only located around the former clubhouse and associated structures in the immediate vicinity. Soil borings were advanced to a maximum 8 feet bgs with a Geoprobe DPT drill rig and logged in accordance with the procedures outlined above. Visual observations were made by a Carson Voci field geologist to determine the presence of historical fill material in each soil boring.

2.5.4.4 Summary of Fill Data

The COPCs identified and attributed to the historical fill at the Site are SVOCs (primarily PAHs) and PCBs. A summary of the RI and SRI soil data exceedances of these analytes when compared to the applicable SCOs is presented below. Additional detail regarding soil data can be found in the RIR.

SVOCs and PCBs – Fill

Chemical	Min Detected Conc (mg/kg)	Median Detected (mg/kg)	Maximum Detected (mg/kg)	Location of Max Detect	# Analyzed	# UUSCO Exceeds	# RSCO Exceeds	# PEco SCO Exceeds
Benzo(a)anthracene	0.024	1	15	F2_0.2-2	18	8	**8**	0
Benzo(a)pyrene	0.072	1.085	16	F2_0.2-2	18	8	**8**	5
Benzo(b)fluoranthene	0.09	1.4	20	F2_0.2-2	19	9	**9**	0
Benzo(k)fluoranthene	0.094	1	5.8	TS-08R-0-3.5	17	7	**6**	0
Chrysene	0.05	1.3	14	F2_0.2-2	19	9	**9**	0
Dibenz(a,h)anthracene	0.034	0.35	2.2	F2_0.2-2	17	7	**7**	0
Indeno(1,2,3-cd)pyrene	0.05	0.525	9.3	F2_0.2-2	18	8	**8**	0
PCBs (total)	0.00824	0.242	3.69	F2_0.2-2	8	4	**4**	4

2.5.4.5 Comparison of Soil/Fill with SCGs

A detailed comparison of soil/fill sample data compared to applicable SCGs can be found in the RIR. Tables 2a, 2b, and 2c show exceedances from Track 1 UUSCOs and Track 2 SCOs for all soil/fill at the Site. Figures 6a through 6f are spider maps that show the location and summarize exceedances from Track 1 UUSCOs and Track 2 SCOs for all soil/fill.

2.5.5 On- and Off-Site Groundwater Contamination

2.5.5.1 Summary of Groundwater Data

The groundwater investigation conducted by Roux in July 2024 included installation of six overburden wells (RMW-03, RMW-05, RMW-07, RMW-08, RMW-10, and RMW-11), which was supplemented by the installation of three bedrock groundwater monitoring wells in April 2025 by Carson Voci. Well construction, water level gauging, and groundwater flow details are provided in Table 3 and on Figures 5a and 5b.

The groundwater monitoring wells with sufficient groundwater were sampled in July 2024 by Roux and in April and May 2025 by Carson Voci. Analytical data was compared to the AWQS as the applicable SCGs to evaluate the site-wide groundwater quality and determine the nature and extent of contamination. If applicable, analytes in soil exceeding the PGWSCOs were compared to detections in groundwater to evaluate whether, and to what extent, Site soils may be impacting groundwater quality. However, note that groundwater beneath the Site is not currently nor is it anticipated to be used for potable (i.e. drinking water source) or non-potable means.

Documentation of field parameters collected during the low-flow groundwater sampling activities are provided on the groundwater purge logs included as Appendix C to the RIR. The field parameter data was reviewed and no potential anomalies were identified in the groundwater chemistry that could influence sampling results.

2.5.5.2 Comparison of Groundwater with SCGs

A summary of the groundwater data compared against the AWQS are presented below.

Groundwater Data Summary

Compound/ Compound Group	RMW-03	RMW-07	RMW-10 (Roux)	RMW-10 (Carson Voci)	MW-09D	MW-11D
VOCs	ND	ND	ND	--	< AWQS	< AWQS
SVOCs	ND	ND	ND	--	ND	ND
PCBs	ND	ND	**1.14**	ND	ND	ND
PFOS	0.00416	< AWQS	**0.011**	< AWQS	0.00783	< AWQS
PFOA	< AWQS	**0.0113**	**0.0115**	**0.00832**	**0.0175**	**0.00917**
PFAS (all others)	< AWQS	< AWQS	< AWQS	< AWQS	< AWQS	< AWQS
Herbicides	ND	ND	ND	--	ND	ND
Pesticides	ND	ND	ND	ND	ND	ND
Metals	< AWQS	< AWQS	< AWQS	< AWQS	< AWQS	< AWQS

Note:

-- = Sample not analyzed for the specified compound group

< AWQS = All compounds in analyte group were below the AWQS (some with detections)

ND = All compounds in analyte group were non-detect

PFOA = Perfluorooctanoic acid

PFOS = Perfluorooctane sulfonate

The laboratory analytical results for the groundwater investigation are presented in Table 4 and depicted on Figure 7.

As indicated above, all VOCs, SVOCs, metals, pesticides, and herbicides listed were either non-detect or detected at concentrations below the respective AWQS. Although the groundwater sample collected at RMW-10 in July 2024 was found to have a PCBs (total) concentration above the AWQS, PCBs were found to be non-detect in the sample collected at this location in May 2025. As the Site has no documented historical use of PFAS, the presence of PFOA and PFOS is likely consistent with background levels of these compounds in NYS.

Based on these results, further action is not warranted with respect to these compounds in groundwater.

2.5.6 On- and Off-Site Soil-Vapor Contamination

The soil vapor investigation conducted by Roux in July 2024 included installation and sampling of 11 soil vapor points. In June 2025, eight soil vapor points spanning the Site were installed and sampled by Carson Voci. All samples were submitted for laboratory analysis using EPA Method TO-15.

2.5.6.1 Comparison of Soil Vapor with SCGs

The soil vapor investigation results do not have SCGs to evaluate against as they are not paired soil-vapor/indoor air samples; therefore, investigation results are evaluated in conjunction with analytical results from other environmental sampling media at the Site. All EPA Method TO-15 compounds were not detected above applicable SCGs in any other environmental media at the Site.

A table of soil vapor data collected prior to the remedy is shown in Table 5. A spider map denoting the location(s) of soil-vapor points and summarizing soil vapor data prior to the remedy is shown on Figure 8.

2.5.7 Surface Water and Sediment

RI activities conducted by Roux in 2024 included a sediment and surface water investigation. Three collocated sediment and surface water locations were sampled from the surface of the water body present at the southern portion of the Site in accordance with the RIWP. All samples were submitted for laboratory analysis of TCL pesticides and herbicides, and TAL metals.

Carson Voci conducted a supplemental sediment and surface water investigation in May 2025 to further evaluate the nature and extent of potential impacts in these media at the Site. This effort included five collocated surface water and sediment samples from the small FW pond in the south-central portion of the Site, three bank samples from the locations similar to those sampled during the RI, and two samples from the center of the pond. Three collocated surface water and sediment samples were collected from the small stream channel identified in the eastern part of the Site. The sediment boring logs are provided in Appendix E of the RIR.

Comparison of Surface Water and Sediment with SCGs

The analytical results for the surface water samples indicate that only dieldrin was found at concentrations in surface water above the AWQS at the three sampling locations (i.e., SW-06, SW-07, and SW-08) collected from the small stream channel in the eastern part of the Site. Table 6 and Figure 9 present the data and location of these samples.

As shown in Table 7 and on Figure 10, supplemental sediment samples collected by Carson Voci contained concentrations of metals and/or pesticides exhibiting slightly to moderately (Class B) or highly contaminated (Class C sediments relative to the ecologically based FW SGVs. All samples exhibiting Class B or C sediments were collected from the pond with the exception of SS-08, which contained mercury concentrations of 0.207 and 0.227 mg/kg, which are only slightly above the Class B Sediment lower bound concentration of 0.20 mg/kg.

A summary of the sediment data compared against the FW SGVs is presented below.

Pesticides

Chemical	Min Detected (mg/kg)	Max Detected (mg/kg)	Location of Max Detect	# Analyzed	Class A FW SGV (mg/kg)	# Class A Samples	Class B FW SGV (mg/kg)	# Class B Samples	Class C FW SGV (mg/kg)	# Class C Samples
Chlordane (total)	0.002258	1.887	SS-04-1-2	25	< 0.068	17	0.068	**8**	38	0

Note: mg/kg = milligrams per kilogram

Metals

Chemical	Min Detected (mg/kg)	Max Detected (mg/kg)	Location of Max Detect	# Analyzed	Class A FW SGV (mg/kg)	# Class A Samples	Class B FW SGV (mg/kg)	# Class B Samples	Class C FW SGV (mg/kg)	# Class C Samples
Arsenic	1.28	37.9	SS-04-1-2	25	< 10	18	10	**6**	33	**1**
Cadmium	0.063	1.78	SS-04-0-0.5	25	< 1.0	20	1.0	**5**	5.0	0
Copper	3.57	132	SS-04-1-2	25	< 32	15	32	**10**	150	0
Lead	2.48	132	SS-04-0-0.5	25	< 36	17	36	**7**	130	**1**
Mercury	0.07	5.23	SS-01R-0-0.5	25	< 0.20	15	0.20	**4**	1.0	**6**
Nickel	3.69	40.2	SS-05-0-0.5	25	<23	19	23	**6**	49	0
Zinc	7.85	2330	SS-05-0-0.5	25	< 120	17	120	**3**	460	**5**

Note: While zinc concentrations exhibit Class B and C sediments, zinc is not considered a COPC as it was not present in other environmental media above applicable SCOs and is not a known constituent of HAP.

2.6 ENVIRONMENTAL AND PUBLIC HEALTH ASSESSMENTS

2.6.1 Qualitative Human Health Exposure Assessment

A qualitative HHEA was performed following the collection of all RI data in accordance with Section 3.3(c)4 and Appendix 3B of DER-10. Additional information regarding impacts to fish and wildlife is discussed in the FWRIA (provided under separate cover) and summarized below.

The following table summarizes the HHEA.

Environmental Media and Exposure Route	HHEA
Direct contact with soil (dermal contact and incidental ingestion; inhalation of fugitive dust)	Current: Potential trespassers can come in contact with exposed surface soil at the Site. Future: • Utility workers, construction workers, and trespassers could be exposed to contaminated surface or subsurface soil via dust inhalation, incidental ingestion, and dermal contact. Passers-by, off-site residents of neighboring residential properties, and off-site recreational users in the vicinity of the work could be exposed to contaminated soil via dust inhalation. Implementation of the *Health and Safety Plan*, *Community Air Monitoring Plan*, and dust control measures during remedial action and any future ground intrusive activities will mitigate potential exposures. • Implementation of the *Remedial Action Work Plan* will mitigate potential soil-related exposures to residents of the proposed single-family housing and recreational users on the eastern parcel. Off-Site: With the potential exception of dust generation, off-site soil migration via erosion is not expected to have occurred given the known sources of contaminants, historical practices, site vegetation, and general site topography. Erosion of soils is expected to have been limited by the presence of dense vegetation and paved/covered areas of the Site. Stormwater runoff historically was managed through stormwater management features.
Ingestion of /dermal contact with groundwater used as drinking water	Not complete. Groundwater is not currently used, nor is it expected to be used, as a source of drinking water at the site or in adjacent areas off-site. Groundwater ingestion is therefore not a complete exposure pathway for on- or off-site receptors.
Dermal contact with shallow groundwater	On- or off-site future construction/utility workers excavating into shallow groundwater potentially could be exposed to COPCs through dermal contact. Incidental ingestion is considered unlikely during excavation. The only constituents detected in groundwater from perimeter wells were PFAS, which are assumed related to regional conditions rather than to site-related releases.
Inhalation of air (exposures related to soil vapor intrusion)	• There are currently no occupied buildings at the Site and no identified COPCs in soil vapor. • Soil vapor data at the Site do not show concentrations posing an exposure risk that would require mitigation. • It is not expected that soil vapor would migrate off-site to nearby buildings, if present.
Dermal contact with surface water	• Current: Bodies of water at the Site are not intended for recreational use, such as swimming. Trespassers could contact COPCs in surface water through dermal contact while wading along the banks. Incidental ingestion is not expected since swimming is unlikely to occur. Any exposure to surface water is expected to occur only sporadically, given that Site access is restricted.

Environmental Media and Exposure Route	HHEA
	• Future: Bodies of water at the Site will tie into the overall stormwater system proposed as part of the Site development and are not intended nor anticipated for recreational use. Trespassers and incidental recreational users could potentially have dermal contact with COPCs in surface water via wading. Incidental ingestion is not expected since swimming is unlikely to occur. Any exposure to surface water is expected to be minimal, and occur only sporadically. • Off-Site: The stream runs off-site into other waterbodies and wetlands that are not recreational areas. While off-site receptors could potentially encounter COPCs in surface water downstream of the Site, exposure is expected to be limited by thick vegetation and soft marsh soils.
Dermal contact with and incidental ingestion of sediment	• Current: The bodies of water are not intended for recreational use. Trespassers could come in contact with contaminated sediment through dermal contact and incidental ingestion while wading, although this exposure is expected to be minimal, and occur only sporadically. • Future: The bodies of water at the Site will tie into the overall stormwater system proposed as part of the development and are not intended nor anticipated for recreational use. Trespassers and incidental recreational users could potentially come in contact with contaminated sediment through dermal contact and incidental ingestion, although this exposure is expected to be minimal, and occur only sporadically. • Off-Site: The stream runs off-site into other waterbodies and wetlands that are not recreational areas. While off-site receptors could potentially encounter COPCs in sediment downstream of the Site, exposure is expected to be limited by thick vegetation and soft marsh soils.

2.6.2 Fish & Wildlife Remedial Impact Analysis

As summarized in the FWRIA (provided under separate cover), the Site's vacant, undeveloped condition currently offers suitable habitat for a variety of wildlife, in contrast to its historical use as a golf and country club from 1924 until 2022. Prior to 2022, the Site was improved with an 18-hole golf course, a main clubhouse, and associated maintenance and storage buildings, as well as several tennis courts and a pool area. Therefore, while the upland portions of the Site are currently undeveloped and provide habitat for wildlife, this condition does not reflect the long-term historical use of the Site. Much of the Site is proposed for residential redevelopment, which will provide a much lower quality of habitat than the areas that

will remain undeveloped. The pond and stream potentially provide habitat for aquatic and semi-aquatic life tolerant of warm water and/or intermittent water conditions. However, these water features are anticipated to be incorporated into the stormwater management system for the residential redevelopment.

Complete exposure pathways exist for fish and wildlife based on detected COPCs in soil and sediment. Groundwater is not considered a medium of concern for ecological receptors, due to the unlikely potential for exposure to occur. Part 1 of the FWRIA determined that a Part 2 may be warranted. However, in lieu of completing a Part 2, pond sediments will be cleaned up to FW Class A SGVs.

2.7 REMEDIAL ACTION OBJECTIVES

Based on the results of the RI, the following remedial action objectives (RAOs) have been identified for this Site.

2.7.1 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 groundwater aquifer, to the extent practicable, to pre-disposal/pre-release conditions.
- Prevent the discharge of contaminants to surface water.
- Remove the source of ground or surface water contamination.

2.7.2 Soil

RAOs for Public Health Protection:

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

RAOs for Environmental Protection:

- Prevent migration of contaminants that would result in groundwater or surface water contamination.
- Prevent impacts to biota due to ingestion/direct contact with contaminated soil that would cause toxicity or bioaccumulation through the terrestrial food chain.

2.7.3 Surface Water

RAOs for Public Health Protection:

- Prevent ingestion of contaminated water.
- Prevent contact or inhalation of contaminants from impacted water bodies.
- Prevent surface water contamination that may result in fish advisories.

RAOs for Environmental Protection:

- Restore surface water to ambient water quality standards for each contaminant of concern.
- Prevent impacts to biota due to ingestion/direct contact with contaminated surface water that would cause toxicity or bioaccumulation through the marine or aquatic food chain.

2.7.4 Sediment

RAOs for Public Health Protection:

- Prevent direct contact with contaminated sediments.
- Prevent surface water contamination that may result in fish advisories.

RAOs for Environmental Protection:

- Prevent release(s) of contaminant(s) from sediments that would result in surface water levels in excess of (ambient water quality criteria).
- Prevent impacts to biota due to ingestion/direct contact with contaminated sediments that would cause toxicity or bioaccumulation through the marine or aquatic food chain.
- Restore sediments to pre-release/background conditions to the extent feasible.

3.0 DESCRIPTION OF REMEDIAL ACTION PLAN

3.1 EVALUATION OF REMEDIAL ALTERNATIVES

The goal of the remedy selection process is to select a remedy that is protective of human health and the environment, taking into consideration the current, intended, and anticipated future use of the property. The remedy selection process begins by establishing RAOs for media in which chemical constituents were found in exceedance of applicable SCGs. A remedy is then developed based on the following criteria:

- Protection of human health and the environment;
- Compliance with SCGs;
- Short-term effectiveness and impacts;
- Long-term effectiveness and permanence;
- Reduction of toxicity, mobility, or volume of contaminated material;
- Implementability;
- Cost effectiveness;
- Community acceptance;
- Green and sustainable remediation (including climate resiliency); and
- Land use.

The following SCGs were used to develop and evaluate the remedial alternatives:

- SCOs (6 NYCRR Part 375-6) are used to develop, implement, and establish remedial programs and objectives for soil in the BCP.
- NYSDEC (2014) *Screening and Assessment of Contaminated Sediment* guidance, Freshwater Class A SCGs will be used as the remedial goals for sediment.
- TOGS 1.1.1 provides a compilation of AWQS and guidance values to use to develop and evaluate remedial alternatives for groundwater.
- DER-10 provides an overview of the investigation and remediation process for the NYSDEC remedial programs, including the BCP.
- The rules and regulations of 6 NYCRR Subpart 375-3 apply to the development and implementation of remedial programs for sites enrolled in the BCP.
- NYSDOH *Guidance for Evaluating Soil Vapor Intrusion in the State of New York* (October 2006, with updates through February 2024) provides methodology for

evaluating soil-vapor intrusion and presents guidance for vapor intrusion mitigation practices.

Two alternative remedies for the Site are summarized below:

- **Alternative 1**, a Track 1 remedy meeting the 6 NYCRR Part 375 UUSCOs, would include the following remedial tasks:
    - Implementation of a Track 1 remedy, where the remedial activities conducted would result in unrestricted future use of the Site.
    - Excavation and off-site removal of all soils above bedrock impacted above UUSCOs. The current estimated volume of soils exceeding the UUSCOs is approximately 390,000 cubic yards (cy) of soil (Table 8) and has been observed at depths ranging from 0.5-feet bgs to 8 feet bgs.
    - Temporary dewatering of the pond (and treatment if necessary), excavation, stabilization, and off-site removal of all sediments exceeding FW Class A SGVs, estimated to be approximately 4,600 cy.
    - Dewatering and treatment, as necessary, to facilitate the removal of soil below the water table may be required as part of this alternative.
- **Alternative 2**, a Track 2 remedy meeting the 6 NYCCR Part 375 RSCOs in the western parcel and the more stringent of the 6 NYCCR Part 375 RSCOs and PEcoSCOs in the eastern parcel, would include the following remedial tasks:
    - Implementation of a Track 2 remedy, where the remedial activities conducted would result in future use of the Site consistent with residential, single-family housing.
    - Excavation and removal of soils above the RSCOs in the western parcel and the more stringent of the RSCOs and PEcoSCOs in the eastern parcel to a depth of 15 feet bgs or the top of bedrock. The current estimated excavation extents consist of the removal of soil across the Site, the majority in the upper 0.5 feet, with select areas up to 4 feet bgs, consisting of approximately 110,000 cy of soil (Table 9).
    - Temporary dewatering of the pond (and treatment if necessary), excavation, stabilization, and off-site removal of all sediments exceeding FW Class A SGVs, estimated to be approximately 4,600 cy.

The following subsections evaluated the two remedial alternatives against the criteria presented above.

3.1.1 Protection of Human Health and the Environment

This criterion is an evaluation of the remedy's ability to protect public health and the environment, and an assessment of how risks posed through each existing or potential pathway of exposure are prevented, reduced, or controlled through the removal, treatment, and implementation of IC/ECs. Protection of public health and the environment must be achieved for approved remedial actions. The two alternatives proposed will protect human health and the environment by eliminating or reducing levels of contamination, and/or reducing potential pathways of exposure.

Alternative 1 would protect human health and the environment through removal of the contaminants above UUSCOs. Potable groundwater use is restricted at the Site in accordance with Westchester County municipal ordinance,[6] prohibiting exposure and ensuring protection of human health and the environment.

Alternative 2 would protect human health and the environment through removal of contaminants above RSCOs on the western parcel and the more stringent of the RSCOs and PEcoSCOs on the eastern parcel. The Westchester County municipal ordinance restricting potable groundwater use at the Site remains applicable.

3.1.2 Compliance With Standards, Criteria, and Guidance

The proposed remedies for the Site would conform to relevant and/or applicable SCGs. **Alternative 1** demonstrates conformance by eliminating source areas through removing up to 8 feet of contaminated soils/fill, meeting the UUSCOs and removing sediment exceeding the sediment FW Class A SGVs. **Alternative 2** demonstrates conformance by eliminating source areas through removal of impacted soils at the Site, meeting the RSCOs on the western parcel and the more stringent of the RSCOs and PEcoSCOs on the eastern parcel and removing sediment exceeding the sediment FW Class A SGVs. Potable groundwater use is restricted at the Site in accordance with the Westchester County municipal ordinance.

3.1.3 Short-Term Effectiveness and Impacts

This evaluation criterion assesses the effects of the alternatives during the construction and implementation phase until RAOs are met. Under this criterion, alternatives are evaluated with respect to their effects on public health and the environment during implementation of the

[6] https://library.municode.com/ny/westchester_county/codes/code_of_ordinances?nodeId=PTXISACO_CH873SACO_ARTVIIWASU

remedial action, including protection of the community, environmental impacts, time until RAOs are achieved, and protection of workers during remedial actions.

Alternatives 1 and **2** have similar short-term effectiveness during implementation, as each requires excavation of the contaminated soils. However, **Alternative 1** would take approximately three times longer of active remedial construction due the estimated soil volume to be removed from the Site. Each alternative would result in short-term dust generation impacts associated with soil excavation, handling, and load out, and truck traffic.

An additional short-term adverse impact and risk to the community associated with each remedial alternative is increased truck traffic during construction. Truck traffic will be routed on the more direct course using major thoroughfares where possible, and designated (flag) persons will be used to protect pedestrians at Site entrances and exits.

The potential adverse impact to the community, workers, and the environment for each alternative would be minimized through implementation of control plans including a HASP, CAMP, and a soil/materials management plan (SMMP) during all on-site soil disturbance activities, and would minimize the release of contaminants into the environment. Each alternative provides short-term effectiveness in protecting the surrounding community by decreasing the risk of contact with on-site contaminants. Construction workers operating under appropriate SMMP procedures and a HASP would be provided protection from on-site contaminants by using personal protective equipment, as applicable to the documented risks, within the respective work zones.

3.1.4 Long-Term Effectiveness and Permanence

This evaluation criterion considers the results of a remedial action in terms of its permanence and quantity/nature of waste or residual contamination remaining at the Site after RAOs have been met. It includes evaluating the permanence of the remedial alternative, magnitude of remaining contamination, adequacy and suitability of ECs/ICs for managing residuals, effectiveness of containment systems and ICs in preventing exposure, and long-term reliability of ECs.

Under **Alternative 1**, the contaminants in the soil and sediment at the Site would be permanently eliminated or removed resulting in an effective and permanent long-term remedy for soils at the Site. This alternative includes removal and off-site disposal of on-site impacted soil, thus permanently reducing the amount of impacted soil on Site. Groundwater use is restricted via municipal ordinance, prohibiting exposure and ensuring protection and safety of future residents.

Alternative 2 would likewise remove all contaminants in the soil and sediment at the Site at concentrations that would restrict the proposed future Site uses. No ICs or ECs would be present for the Site, as no residual contamination will remain. Municipal ordinances and zoning restrictions would ensure protection and safety of future residents by groundwater use restricted via municipal ordinance, and ensuring future Site use remains consistent with the requirements dictated by cleanup track.

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

This evaluation criterion assesses the use of remedial technologies that permanently and significantly reduce toxicity, mobility, or volume of contaminants as their principal element. The following is the hierarchy of source removal and control measures that are to be used to remediate a Site, ranked from most to least preferable: removal and/or treatment, containment, elimination of exposure, and treatment of source at the point of exposure. Treatment and/or removal are preferred to reduce contaminants at a Site, reduce the total mass of toxic contaminants, cause irreversible reduction in contaminants mobility, or reduce the total volume of contaminated media.

The proposed remedies reduce toxicity, mobility, and/or volume of contamination via removal. **Alternative 1** provides the greatest reduction of toxicity, mobility, and volume of contaminants in the soil through removal and/or treatment of all impacted soils and sediments at the Site. **Alternative 2** provides a similar reduction of toxicity, mobility, and volume of contaminants in soil through removal of soils above the RSCOs on the western parcel and the more stringent of the RSCOs and PEcoSCOs on the eastern parcel, which are the majority of soils exhibiting the most elevated contaminant impacts. Alternative 2 will also remove the same impacted sediments as Alternative 1.

3.1.6 Implementability

This evaluation criterion addresses the technical and administrative feasibility of implementing an alternative and the availability of various services and materials required during its implementation, including technical feasibility of construction and operation, reliability of the selected technology, ease of undertaking remedial action, monitoring considerations, administrative feasibility (e.g., obtaining permits for remedial activities), and availability of services and materials.

The techniques, materials, and equipment to implement each alternative are readily available and have been proven effective in remediating the contaminants associated with the Site. Excavation for the remediation of soils is a “low tech” and reliable method, which has a long and proven track record on the remediation of hazardous waste sites.

3.1.7 Cost-Effectiveness

This evaluation criterion addresses the cost of alternatives, including capital costs (such as construction costs, equipment costs, disposal costs, and engineering expenses) and Site management costs (costs incurred after remedial construction is complete) necessary to meet the continued effectiveness of a remedial action. The remedial options identified were quantitatively compared to one another in terms of overall costs including capital costs (e.g., equipment) and long-term operation and maintenance costs (e.g., monitoring and system inspections).

The total costs for **Alternatives 1** and **2** are estimated at $30,800,000 and $11,000,000, respectively. A breakdown of estimated costs is provided in Appendix C.

3.1.8 Community Acceptance

This evaluation criterion addresses community opinion and support for the remedial action. Observations herein will be supplemented by public comment received on the RAWP. Similar remedial actions to the ones proposed in this RAWP have been used elsewhere in NYS and/or at similar sites, with acceptance by local communities and regulatory authorities. No questions regarding the Site have been raised regarding remedial options to date. This RAWP will be subject to a 45-day public comment period to determine if the community has comments on the presented remedial alternatives and selected remedy. If no comments are received regarding **Alternative 1**, then **Alternative 2** as the preferred remedy will be considered acceptable to the community.

3.1.9 Green and Sustainable Remediation

GSR principles and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy per DER-31. The major green remediation components for the Site are as follows:

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
- Reducing direct and indirect greenhouse gases and other emissions;
- Increasing energy efficiency and minimizing use of non-renewable energy;
- Conserving and efficiently managing resources and materials;
- Reducing waste, increasing recycling, and increasing reuse of materials which would otherwise be considered a waste;
- Fostering green and healthy communities and working landscapes which balance ecological, economic, and social goals;

- Integrating the remedy with the end use where possible and encouraging green and sustainable redevelopment; and
- Incorporating green remediation principles and techniques to the extent feasible in future Site development. Any future on-site buildings shall be constructed, at a minimum, to meet the *2020 Energy Conservation Construction Code of New York* (or most recent edition) to improve energy efficiency as an element of construction.

As part of the evaluation of remedial alternatives, an environmental footprint analysis for each alternative was completed using EPA's "Spreadsheets for Environmental Footprint Analysis" (SEFA) environmental footprint analysis calculator. The SEFA results for both **Alternatives 1** and **2** are included in Appendix D.

The SEFA results indicated **Alternative 1** would utilize approximately 2.5 times more materials and waste, energy, and air emissions compared to **Alternative 2**. The larger environmental footprint of **Alternative 1** results from increased volume of material requiring excavation and off-site disposal.

In addition to the SEFA calculator, GSR BMPs were evaluated for use in both alternatives. Details of the BMPs to be tracked and/or implemented for the selected alternative are provided in Section 3.2.

3.1.10 Compatibility with Land Use

Following remediation, both **Alternatives 1** and **2** would render a Site suitable for redeveloped in accordance with its planned future use as single-family residential and recreational areas. Groundwater use is restricted via municipal ordinance and adherence to this ordinance will prevent future exposure to affected groundwater.

3.2 SELECTION OF THE PREFERRED REMEDY

The preferred remedy is **Alternative 2** based on the evaluation of each alternative relative to the 10 criteria, the current and future use of the Site, the absence and municipal prohibition of current and future use of groundwater, and the potential exposure scenarios for the identified impacts. The detailed remedial action scope of work is presented in the following subsections. **Alternative 2** will remove all soil from the western parcel exceeding the RSCOs, and all soil from the eastern parcel exceeding the more stringent of the RSCOs and PEcoSCOs. This will provide a Track 2 cleanup in accordance with the proposed future uses of the Site (i.e., single-family residential houses and a recreational area on the western and eastern parcels, respectively).

This section provides a detailed narrative of the preferred remedy; additional details are provided in Sections 4 and 5.

3.2.1 Green Remediation Principles and Techniques

The selected remedial alternative will implement GSR principles and techniques to the extent feasible in the design, implementation, and site management of the remedy per DER-31. As summarized in Section 3.1.9, a SEFA calculation for Alternative 2 is presented in Appendix D.

Additionally, a climate change vulnerability assessment was conducted to evaluate the impact of climate change at the project site and the proposed remedy. Potential vulnerabilities associated with extreme weather events (e.g., hurricanes, lightning, heat stress, and drought), flooding, and sea level rise were identified, and measures incorporated into the identified remedial program minimize the impact of climate change on identified potential vulnerabilities. The checklist detailing the climate change vulnerability assessment is presented in Appendix D.

A BMP analysis was conducted as part of the SEFA calculation for each component of the proposed remedy. The BMPs identified to be incorporated for each remedy component are presented in the detailed remedial action scope of work section for each component.

The following metrics have been identified to be tracked throughout the environmental cleanup to truth test assumptions and assess progress towards the GSR goals:

- Materials management, including off-site disposal and on-site material import quantities;
- Greenhouse gas emissions and air pollutants; and
- Total energy use.

3.2.2 Site Preparation

Prior to initiating ground intrusive remedial activities, site preparation activities will be conducted consisting of utility investigation and mark-outs; mobilization of equipment for the specific remedial activities; installation of soil erosion and sediment controls (as needed); site clearing, grubbing, and tree removal; preparation of staging and material stockpile areas; and set-up of community air monitoring equipment in accordance with the CAMP. In addition, a pre-construction kick-off call will be conducted with NYSDEC, the Applicant, the Remedial Engineer, and the remedial contractor.

The BMPs to be incorporated during site preparation activities are:

- Minimize the total number of round trips to mobilize equipment to the Site;

- Select work and materials staging areas to minimize the overall footprint, thus limiting the potential for impacted media to migrate out of the work zone(s);
- Utilize haybales and other biodegradable erosion controls where applicable;
- Evaluate the reuse of suitable material from grubbing and clearing (i.e. woodchipped trees) on Site; and
- Evaluate use of solar-powered devices for community air monitoring equipment.

The following subsections detail Site preparation activities.

3.2.2.1 Utility Clearance

Prior to initiating ground intrusive activities, a public and private utility investigation and mark-out will be conducted. The remedial contractor will notify NYS 811 at least 3 business days in advance of ground intrusive and conduct a geophysical survey in the areas of former Site buildings and utility connections. All on-site utilities have been disconnected; however, active utility stubs remain extending from Dobbs Ferry Road to the Site boundary. The NYS 811 notification will be updated as needed throughout the duration of ground intrusive activities.

3.2.2.2 Site Clearing, Grubbing, and Tree removal

To facilitate the remedial excavation activities, the entire Site will be grubbed and trees removed by the remedial contractor. Brush will be mulched or grinded for on-site reuse or off-site recycling. Felled trees will be managed accordingly by the remedial contractor, either chipped and reused on Site or removed for off-site recycling as chips or cut logs. Tree stumps will be ground, not removed; the associated root balls will be removed and managed with the soil remedial activities. Due to the observed impacts in surface soils, residual soil trapped in the root balls is expected to prohibit chipping for on-site reuse or off-site recycling.

3.2.2.3 Soil Erosion and Sediment Controls

Soil erosion and sediment controls will be installed in accordance with the *Stormwater Pollution Prevention Plan* (SWPPP), as shown on Figure 12 and detailed in Section 4.3.3, after clearing and grubbing provides access to requisite areas.

3.2.2.4 Mobilization of Remedial Equipment

Mobilization of remedial equipment will occur concurrent with clearing, grubbing, and soil erosion and sediment control installation activities. The southwest portion of the Site contains

paved parking and flat gravel areas suitable for temporarily staging remedial equipment while constructing the long-term equipment and material staging area (MSA).

3.2.2.5 Equipment and Material Staging

The remedial contractor will prepare the following to facilitate Site access and equipment and materials staging and loadout:

- A designated area for Site parking and construction trailers in the southwest portion of the Site, either on existing asphalt parking areas or on a surface prepared with a geotextile demarcation layer and clean cover material to provide a barrier from potentially impacted soils.
- An MSA in the southwest portion of the Site that will serve as the location for stockpiling excavated impacted soils for characterization and loadout for off-site disposal. This area will be constructed as detailed in Section 4.3.7.

3.2.2.6 Community Air Monitoring Stations

Community air monitoring stations will be set up and run throughout the duration of remedial ground intrusive and soil disturbance activities in accordance with the CAMP (Appendix E). In addition to the air monitoring stations, dust control and suppression will be implemented throughout the duration of the work as detailed in Section 6.1.13.

3.2.2.7 Survey and Mark-out of Excavation Limits

The proposed excavation grid (Figure 13) will be surveyed by a NYS Licensed Surveyor and the corners and intersection of each grid staked prior to ground intrusive remedial activities. The staked grid boundaries will remain intact until all surrounding excavation grids are determined to be remediated through end-point sampling results.

3.2.3 Surface End-Point Sampling

After clearing, grubbing, and mark-out of the excavation limits, end-point sampling will be conducted within the grids that are not designated for excavation based on the RI data. The end-point sampling will be conducted consistent with Sections 3.2.6 and 5.2. The end-point sampling results will be utilized to confirm that the soil in the grid meets the applicable SCOs. Should end-point samples exceed the applicable SCOs, the area(s) governed by those end-point samples will be added to the proposed excavation areas and soil removed consistent with Section 3.2.4.

The BMPs to be incorporated during surface end-point sampling are:

- Select service providers, product suppliers and analytical laboratories from the local area and consolidate the service and delivery schedules;
- Select facilities with green policies for worker accommodations and meetings;
- Choose products with recycled and biobased contents such as agricultural or forestry waste instead of petroleum-based ingredients;
- Choose products, packing material and equipment that have reuse or recycling potential;
- Choose products manufactured through processes involving nontoxic chemical alternatives;
- Minimize the need for disposable single-use items such as plastic bags;
- Designate collection points for items that are locally recyclable, such as metal, plastic or glass containers and paper or cardboard;
- Select test kits that generate less waste, such as soil samplers with reusable handles for coring syringes;
- Maximize use of environmentally friendly additives such as ascorbic acid to preserve or stabilize collected samples, if compatible with target analytes and anticipated analytical methods;
- Specify EPA analytical methods involving procedures that need relatively low volumes of samples or solvents and generate less waste, such as solid phase micro extraction, pressurized fluid extraction, microwave extraction, and supercritical fluid extraction when possible; and
- Choose fixed laboratories demonstrating a strong commitment to environmental performance, such as routine use of management practices identified by the International Institute for Sustainable Laboratories.

3.2.4 Excavation and Management of Impacted Soil

The excavation grid and proposed excavation depths shown on Figure 13 are based on the RI data presented in Section 2.5, the RAOs, and the applicable SCOs for the western and eastern parcels. In instances where the only individual grid sample exceeding applicable SCOs is from 0 to 0.2 feet bgs (0 to 2 inches), the proposed excavation depth in that grid extends to 0.5 feet bgs. Each grid or associated polygon will be treated as an individual excavation "cell" for the purposes of individual excavation depth and boundary. The estimated volume of material to be excavated from each grid and for the overall remediation is provided in Table 9.

Once material has been removed to the proposed excavation depth, the excavation will be considered clean and access will be restricted from equipment and personnel, except for the Qualified Environmental Professional (QEP), following dry decontamination procedures, to collect end-point samples. The removal of material impacted above the applicable SCOs in each grid or polygon will be verified with confirmation end-point sampling detailed in Sections 3.2.6 and 5.2.

The excavation and off-site disposal of impacted soil will be conducted by the remedial contractor with traditional construction equipment including bulldozers, front end loaders, excavators, and off-road dump trucks. Impacted soil will be loaded and transported to the MSA along temporary construction roads, where it will be stockpiled, managed, and loaded for off-site disposal.

The BMPs to be incorporated during excavation and management of impacted soil are:

- Minimize the total number of round trips to mobilize equipment to the Site;
- Utilize haybales and other biodegradeable erosion controls where applicable;
- Evaluate use of solar-powered devices for community air monitoring equipment.
- Develop advanced schedules for anticipated onsite activities, to minimize traffic between onsite contaminated and clean zones and the days in which work is actively performed in the field;
- Choose service providers with local offices, to minimize the distance of worker commutes and machinery transport;
- Choose equipment and product vendors with nearby production or distribution centers, to minimize delivery-related fuel use;
- Deploy machinery that is suitably sized; use of undersized or oversized equipment can decrease efficiencies considerably;
- Use machine models capable of performing assorted tasks, whenever feasible, to avoid field deployment of multiple types of machines;
- Use solar power packs to recharge batteries in small electronic devices such as cell phones, laptop computers and sensors;
- Limit the speed of trucks and other vehicles traversing the site to 10 miles per hour;
- Spray water onto surfaces of vulnerable work areas, in conjunction with water conservation and runoff management techniques;
- Emplace a fabric cover over excavated material that is loaded into open trucks for onsite or offsite hauling;

- Consider covering soil in work areas with biodegradable cover fabric for dust suppression, instead of periodically spraying water onto exposed surfaces. Use of biodegradable cover fabric will help control erosion and provide a substrate for future plant growth;
- Restrict machinery, vehicle and worker traffic to well-defined corridors that are minimally obtrusive; and
- Inspect equipment left onsite before renewing field activities, to avoid harming animals potentially nesting in the equipment. Operation of equipment with nest debris also could cause equipment inefficiency or breakdown.
- Use a mobile laboratory or portable analytical equipment, particularly for screening purposes and when rapid analytical results are needed.

The overall remedial soil excavation will be conducted in three phases as detailed in the following subsections.

3.2.4.1 Western Parcel – Historical Applied Pesticide Impacts

HAP impacts extend across most of the western parcel, excluding the southwestern most portion where the prior clubhouse and associated building infrastructure were located. This area will be further split into four, sub-phase areas (HAP-1 thru HAP-4), as shown on Figure 15, to limit the overall area disturbed at one time. Excavation of impacted soil will generally proceed from an upland to downland direction to limit potential recontamination of already remediated grids from soil tracking or sedimentation. A silt fence or equivalent, installed in accordance with Section 4.3, will be used to prevent recontamination of remediated areas. Additional silt fences will be installed, as needed, based on topography and sequencing.

Temporary on-site construction haul roads will be constructed, with the exact route and layout determined by Site access and topography after clearing and grubbing. Haul roads constructed to access remediation areas will be removed as excavation progresses. One central haul road, constructed along the northern border of HAP-2, is anticipated to remain through the remediation of the western parcel's HAP-impacted soil, and removed upon completion of the excavation of HAP-4.

The excavations will be conducted on a per grid basis, with all material proposed to be excavated and removed from one grid (e.g., grid A04) before proceeding to the next, with the following additional considerations:

- Soil in each grid will be combined and temporarily stockpiled within the excavation in approximately 175 cy piles (equivalent to an approximately 0.5-foot-deep excavation across 10,000 square feet). The temporary stockpiles will be screened

with a calibrated X-ray fluorescence (XRF) analyzer to evaluate arsenic and mercury concentrations, the primary COPCs driving off-site disposal. The QEP will use XRF results to direct the remedial contractor to the appropriate MSA stockpile for subsequent waste characterization sampling prior to off-site disposal.

- In the grids proposed to be excavated and any additional portions of grids identified to be excavated during sampling conducted per Section 3.2.3, the upper 0.5 feet of soil will be removed and transported to the MSA. In grids where the associated RI sample contained exceedances of the RSCOs deeper than 0.5 feet, the soil in a 5,000 square foot area centered around the RI sample location will also be removed to the proposed depth and transported to the MSA[7]. The locations of the proposed end-point base and sidewall samples (See Figure 15a) will then be screened for arsenic and mercury using XRF (identified in the RI as the two metals driving remediation below 0.5 feet in the western parcel, based on the RSCOs). The XRF analyzer will be placed directly against the base or sidewall of the excavation, or a representative soil sample removed and placed in a plastic Ziploc bag, and the test will be conducted for approximately 30-90 seconds in accordance with equipment recommendations. Concentrations of the driver compounds will be recorded and used to further direct the excavation as appropriate (i.e. if field screened concentrations are above the RSCOs excavation in that area would continue deeper or horizontally as appropriate)[8]. Should the XRF screening results indicate these compounds are below the RSCOs, end-point soil samples will be collected consistent with the end-point sampling frequency detailed in Figure 15a and Section 5.2 to provide analytical laboratory data to evaluate against the RSCOs.
    - If all end-point sample analytical results are below the RSCOs, the grid will be considered remediated, and the remainder of the grid will not be excavated to the proposed depth. Note the RI results indicate that Site impacts are limited to surficial HAP; therefore, once a sample meets the applicable SCOs, all soil below that depth is also compliant.

[7] The supplemental RI soil sampling identified that deeper impacts may be spatially isolated and/or not encompass an entire grid. Therefore, the excavation, screening, and sampling approach proposed for deeper impacts allows for an iterative excavation approach which will demonstrate all soil exceeding the applicable SCOs is removed while potentially reducing the amount of soil transported and disposed offsite, which aligns with GSR principles and provides the opportunity to reduce overall remedial costs.

[8] The XRF analyzer field screening concentrations will be regularly compared to laboratory analytical data from the collected associated samples. This will provide a general correlation between the two methods and further inform and provide confidence the evaluation of the XRF analyzer data for field screening purposes.

- If any end-point sample analytical results exceed the RSCOs, further excavation will be conducted in the associated 5,000 square foot area, following a similar XRF screening and end-point sampling process until all soil exceeding the RSCOs is excavated and confirmed with end-point sample data.

Once end-point sampling has confirmed all soil above the RSCOs has been removed from a sub-phase area, the area will be considered free of residual impacts and may be graded and temporarily stabilized, as detailed in Section 3.2.6.

3.2.4.2 Western Parcel – Historical Fill

The western parcel historical fill area consists of the southwestern portion of the Site where the former clubhouse, parking areas, tennis courts, maintenance buildings, and other associated infrastructure were located. Figure 13 identifies proposed limits and depths of excavation based on analytical and visual delineation of the extents of the historical fill. Impacted soil excavation in this area will generally proceed from an upland to downland direction to limit potential recontamination of already remediated grids.

During the excavation of this area, the QEP will screen the material visually and with a PID to identify historical fill and direct stockpiling of this material separately at the MSA. The historical fill material is visually distinct; therefore, the screening will be used to adjust the excavations depth and extents to ensure its removal.

Upon excavation of this material to the proposed depth and/or field-screened excavation extents, end-point samples will be collected in accordance with Section 5.2 to provide analytical data to confirm soil exceeding the applicable SCOs has been removed. The primary COPCs in the historical fill are PAHs; therefore, screening by XRF would not provide suitable information to inform excavation end-points.

3.2.4.3 Eastern Parcel – Historical Applied Pesticide Impacts

The eastern parcel HAP impacts cover the entire parcel (Figures 13 and 14). Impacted soil excavation will generally proceed from the north to south and upland to downland direction to limit potential recontamination of already remediated grids from soil tracking or sedimentation. A silt fence or equivalent, installed in accordance with Section 4.3, will be utilized to prevent recontamination of remediated areas; additional silt fences will be installed as needed, based on topography and sequencing.

A separate MSA may be constructed on the eastern parcel depending on sequencing of the remediation and topography, and access across the ConEd property. A proposed location for the

MSA is shown on Figure 12, should it be needed. Access to Dobbs Ferry Road is available from the eastern parcel through an already existing gate, which will have a stabilized construction entrance added, as needed.

A temporary construction haul road will be constructed running north to south, with the exact route and layout determined by Site access and topography after clearing and grubbing. Haul roads constructed to access remediated areas will be removed as excavation progresses.

The excavations will be conducted on a per grid basis, with all material proposed to be excavated and removed from one grid (e.g., grid F13) before proceeding to the next. Soil in each grid will be combined and temporarily stockpiled within the excavation in approximately 175 cy piles (equivalent to an approximately 0.5-foot-deep excavation across 10,000 square feet). The temporary stockpiles will be screened with a calibrated XRF analyzer to evaluate arsenic and mercury concentrations, the primary driving COPCs driving off-site disposal. The QEP will use XRF results to direct the remedial contractor of the appropriate MSA stockpile for subsequent waste characterization sampling prior to off-site disposal.

The excavation of each grid will be conducted similar to the HAP excavations in the western parcel (Section 3.2.4.1) as detailed below:

- In the grids proposed to be excavated the upper 0.5 feet of soil will be removed and transported to the MSA. In grids where the associated RI sample contained exceedances of the more stringent of the RSCOs and PEcoSCOs deeper than 0.5 feet, the soil in a 5,000 square foot area centered around the RI sample location will also be removed to the proposed depth and transported to the MSA[9]. The locations of the proposed end-point base and sidewall samples (See Figure 15b) will then be screened for arsenic and mercury using XRF as detailed in Section 3.2.4.1. Concentrations of the driver compounds will be recorded and used to further direct the excavation as appropriate (i.e. if field screened concentrations are above the RSCOs/PEcoSCOs excavation in that area would continue deeper or horizontally as appropriate). Should the XRF screening results indicate these compounds are below

[9] As noted in Section 3.2.4.1 the supplemental RI soil sampling identified that deeper impacts may be spatially isolated and/or not encompass an entire grid with respect to the RSCOs. The more stringent UUSCOs for the eastern parcel soils may not present this case as true on the eastern parcel. Therefore, while the excavation, screening, and sampling approach is still proposed for deeper impacts to allow for an iterative excavation approach, the current estimated removal volumes still assume the entire grid is to be excavated to the proposed depth and not just the smaller 5,000 square foot area as is shown for the western parcel. The iterative excavation approach will still provide the opportunity to demonstrate all soil exceeding the applicable SCOs is removed while potentially reducing the amount of soil transported and disposed offsite, which aligns with GSR principles and provides the opportunity to reduce overall remedial costs, but without the initial reduction in estimated soil volume as part of this RAWP.

the RSCOs/PEcoSCOs, end-point soil samples will be collected consistent with the end-point sampling frequency detailed in Figure 15b and Section 5.2 to provide analytical laboratory data to and evaluate against the RSCOs/PEcoSCOs.

- If all end-point sample analytical results are below the more stringent of the RSCOs and PEcoSCOs, the grid will be considered remediated, and the remainder of the grid will not be excavated to the proposed depth. Note the RI results indicate that Site impacts are limited to surficial HAP; therefore, once a sample meets the applicable SCOs, all soil below that depth is also compliant.
- If any end-point sample analytical results exceed the more stringent of the RSCOs and PEcoSCOs, further excavation will be conducted in the associated 5,000 square foot area, following a similar XRF screening and end-point sampling process until all soil exceeding the more stringent of the RSCOs and PEcoSCOs is excavated and confirmed with end-point sample data.

Once end-point sampling has confirmed all soil above the more stringent of the RSCOs and PEcoSCOs has been removed from the area, the area will be considered free of residual impacts and may be graded and temporarily stabilized, as detailed in Section 3.2.7.

3.2.5 Material Management, Loadout, and Offsite Disposal

As detailed in Section 3.2.4, all excavated material will be screened and designated a stockpile by the QEP prior to moving it to the MSA. The MSA will contain up to four distinct stockpiles, separating material by anticipated final disposition pending confirmation through characterization sampling. The stockpiles will be physically separated and managed in accordance with Section 6.1.2. The four distinct stockpiles are expected to consist of materials meeting the following final off-site disposal criteria:

1. Export and reuse to a site with a 6 NYCRR Part 360 Beneficial Use Determination (DER-10, Table 5.4(e)4)
2. Facilities with the most stringent criteria (i.e., New Jersey Residential) (This material may be combined with the material above if the disposal criteria is equivalent.)
3. Facilities with regulated criteria
4. Facilities accepting elevated metals or Toxicity Characteristic Leaching Procedure non-hazardous waste

Each stockpile will be between 500 to 750 cy, depending on the characterization and profiling requirements for the anticipated receiving facility. Stockpiles will be sampled in accordance with the following requirements of the anticipated receiving facility:

- Sample procedures (e.g., grab vs. composite samples)
- Frequency (i.e., no. of samples per cy)
- Laboratory analysis

Soil anticipated for export and reuse to a site with a 6 NYCRR Part 360 Beneficial Use Determination will be sampled in accordance with DER-10, Table 5.4(e)10 and any additional requirements of identified receiving sites.

Each distinct material will have at least two stockpiles consisting of the following:

1. Material sampled, characterized, and approved by the receiving site or facility, and actively being loaded out.
2. Material accumulating and/or sampled and awaiting characterization data for facility approval.

These stockpiles will rotate (i.e. once the stockpile being actively loaded out is completely removed, material from the Site will be place in that bin to accumulate while the other stockpile is then loaded out). Should one stockpile type be identified as the majority of the material excavated, a third stockpile of this type may be added to ensure efficient accumulation, load out, and off-site reuse/disposal.

Additional details regarding material management, loadout, and off-site transport and disposal are provided in Sections 6.1.3 through 6.1.5.

The BMPs to be incorporated during material management, loadout, and offsite disposal are generally consistent with those listed in Section 3.2.4. In addition to those listed above, BMPs related to the reduction of emissions during transportation are:

- Manually shut down engines of vehicles not actively engaged for more than 10 seconds, except for work requiring intermittent engine use or when in traffic;
- Engage automatic shut-down devices, which typically can be programmed to cut an engine after as little as five consecutive minutes of idling;
- Ensure sufficient inflation and tread and proper alignment of tires, to minimize rolling resistance;
- Replace filters in air and fuel systems in accordance with the vehicle manufacturer's recommended frequencies, which typically distinguish between a normal-duty cycle

versus a severe-duty cycle that accounts for usage conditions such as unpaved roads or high levels of dust or pollen;

- Downsize energy-intensive equipment that has become oversized as cleanup progresses.
- Use a suitably sized vehicle for the task at hand.
- Avoid rapid acceleration, excessive speed and repetitive hard braking, which lowers gas mileage by as much as 30 percent;
- Refrain from using a jake brake in or near residential neighborhoods and other sensitive communities; and
- Use a reliable navigation system that enables selecting the shortest route to destinations and avoiding traffic events that may trigger vehicle idling.

3.2.6 Excavation End-Point Sampling

Upon completion of the remedial excavation in each grid or "cell," end-point samples will be collected to confirm the removal of all materials exceeding the applicable SCOs. The end-point sampling will be performed at a frequency (i.e., number of samples per excavation base area and/or sidewall length) and for analytes sufficient to demonstrate the completeness of the remedial excavation activities. Details regarding end-point samples are presented in Section 5.2.

Once end-point sampling confirms that all impacted soil exceeding applicable SCOs has been removed, the Site will be considered free of residual impacts and may be graded and temporarily stabilized, as detailed in Section 3.2.7.

The BMPs to be incorporated during excavation end-point sampling are consistent with those listed in Section 3.2.3.

3.2.7 Clean Material Movement, Site Grading, and Stabilization

Grading and temporary stabilization will be performed in accordance with the SWPPP. RI results indicate that, based on surficial HAP and historical fill impacts, once a sample meets applicable SCOs, all soil below that depth is also compliant.

The Site will be graded as needed to fill any deeper excavations and tie ground surface elevations into existing Site contours. Any disturbed areas on steep slopes requiring a less steep slope for proper temporary stabilization will be regraded, in accordance with the SWPPP. All equipment entering a "clean" area will be verified to have not tracked through an impacted area and will be dry decontaminated to remove and any visible soil from tracks or tires.

Because the remediation and proposed redevelopment will result in a net export of material, clean on-site soil is proposed to be redistributed around the Site, as needed, to achieve the proposed final grades for redevelopment shown in the Redevelopment Plans included as Appendix A. This material movement and any associated activities are not part of this RAWP and any associated cost will not be attributed to BCP activities. As noted, all material remaining on Site after end-point sampling will have been demonstrated to meet applicable SCOs with no residual contamination; therefore, it may be moved as needed without restriction or QEP oversight.

The BMPs to be incorporated during clean material movement, site grading, and stabilization are consistent with those listed in Sections 3.2.4 and 3.2.5.

3.2.8 Pond Sediment Remediation

As summarized in Section 2.5.7, the majority of the sediments in upper 2 feet of the 1.43-acre pond contain concentrations of arsenic, mercury, and pesticides which exceed the sediment FW Class A SGVs and pose a risk to the environment. The FW Class A SGV exceedances are currently estimated be present in the upper 2 feet of sediment across the majority of the 1.43-acre pond, for a total volume of 4,600 cy as shown on Figure 16 and its inset table. Due to the thickness of the sediments impacted above FW Class A SGVs, the relatively small size of the pond, and no observed impacts to the pond surface water, the removal will be conducted by temporarily dewatering the pond and the sediments removed by traditional excavation means. When compared to hydraulic dredging, this method provides more efficient access and removal to deeper sediments and limits suspended sediment in the pond surface water that can occur during hydraulic dredging and negatively impact associated fish and wildlife and future water quality.

The pond sediment remediation incorporates multiple activities which are similar to those conducted as part of the overall soil remedy including sample collection and material excavation, management, loadout, and offsite disposal. As such, many of the BMPs listed in sections 3.2.3, 3.2.4, and 3.2.5 are applicable to this scope of work and will be implemented. In addition to the applicable BMPs listed in the aforementioned sections, BMPs to be incorporated which are unique to the pond sediment remediation are:

- Lay synthetic barriers and fluid collection systems on ground surfaces of staging and work areas, to avoid introducing toxic materials to underlying groundwater;
- Avoid use of dewatering coagulants or flocculants containing chemicals that are potentially toxic to aquatic life;

- Use a passive rather than active mechanical process to dewater sediment when possible. A passive process relies on natural gravity flow and evaporation of the water rather than equipment such as filter presses powered by slurry pumps;
- Use geotextile bags or nets when possible to assure containment of excavated sediment during dewatering and to increase efficiency when handling and transporting the dewatered sediment;
- Allocate greenspace as a buffer to the pond to reduce or prevent stormwater runoff;
- Revegetate disturbed areas along the pond banks as quickly as possible through use of a diverse mix of fast-growing and spreading grasses, sedges, shrubs, forbs and/or trees specific to the habitat;
- Seed or install native rather than non-native species, which typically increases the rate of plant survival and minimizes the need for irrigation. Include plant species that promote colonization of bees and other pollinators;
- Monitor and manage the establishment and spreading of non-native, invasive plant species.
- Substitute chemical fertilizers, herbicides or pesticides with non-synthetic inputs, integrated pest management methods, and soil solarizing techniques during vegetation planting or transplanting

The remediation of sediments is summarized in the following sections and a separate Remedial Design (RD) document detailing at minimum, the remedial design and approach, Best Management Practices, and a restoration plan will be prepared and submitted to NYSDEC for review and approval prior to implementation of the sediment remediation.

3.2.8.1 Permitting and Restoration Plan

If required, a permit package(s) will be prepared and submitted to the applicable NYSDEC department(s) in conjunction with the RD to facilitate implementation of removal of the pond sediments.

3.2.8.2 Pre-Design Investigation

A pre-design investigation may be implemented to further delineate the sediment impacts to more accurately determine the extent and volume of sediment to be removed. The pre-design investigation would consist of the advancement of additional sediment cores and collection of samples, to be analyzed for the sediment COPCs identified in the RIR. If warranted, the pre-

design investigation would include additional assessment and/or investigation related to fish and wildlife resources.

3.2.8.3 Sediment Removal, Management, and Stabilization

The pond sediment will be removed by temporary dewatering of the pond and excavation of the impacted pond sediment to be managed at a location adjacent to the pond. The means and methods of the temporary pond dewatering will be determined by the remedial contractor and any permits required for the temporary discharge acquired prior to initiating dewatering. The sediment will be excavated and managed within the footprint of the pond to allow additional natural dewatering as needed, then loaded into the off-road dump trucks for transport to the MSA, for further waste characterization and off-site disposal consistent with the procedure detailed in Section 3.2.5 for soils.

If the excavated sediment is anticipated to require additional dewatering (i.e. does not pass a pint filter test) a bermed and lined sediment staging area will be constructed, and all dredged sediment placed in the staging area to dewater. The staging area will sloped to direct all water to one collection location and the water pumped out of the staging area and into a settling frac tank. The collected water will be run through a treatment system, designed to meet permit requirements for discharge back to the pond and/or a publicly owned treatment works (POTW) system. Once the sediment has dewatered to the extent practicable, solidification agents (i.e. cement, lime, fly ash) will be added to the sediment at quantities sufficient for the material to pass a paint filter test and be acceptable for off-site transport and disposal.

3.2.8.4 End-Point Sampling

Upon completion of the sediment removal end-point samples will be collected to confirm the removal of all sediment exceeding the applicable FW Class A SGVs. The end-point sampling will be performed at a at a frequency (i.e., number of samples per dredged area) and for analytes sufficient to demonstrate the completeness of the sediment remediation activities. Details regarding end-point samples are presented in Section 5.2.

3.2.8.5 Restoration

Once end-point sampling confirms that all impacted sediment exceeding applicable FW Class A SGVs has been removed, restoration activities will commence. A restoration plan will be provided as part of the RD..

3.2.9 Site Demobilization and Removal of Material Staging Areas

After all impacted material has been excavated and removed from the Site, the remedial contractor will dismantle the MSAs and address any impacted soil that may be present beneath them. For MSAs on asphalt, the asphalt surface will be inspected and decontaminated or removed if necessary. Any reusable materials (e.g., jersey barriers, concrete blocks, etc.) will be cleaned of visible soil and managed by the remedial contractor. The MSA base material and liner will be removed and stockpiled for load-out to a suitable off-site facility. If impacted soil is identified beneath the MSA, it will be excavated and transported for off-site disposal, progressing towards the Site entrance. End-point samples will then be collected in accordance with Section 5.2 to confirm removal.

Upon the completion of all remedial activities the remedial contractor will demobilize all equipment and trailers from the Site. Specific soil erosion and sediment control components will stay in place for future redevelopment site work that will be conducted outside of the BCP.

The BMPs to be incorporated during site demobilization and removal of material staging areas are generally consistent with those associated with end-point sampling, material excavation, management, loadout, and offsite disposal, as listed in sections 3.2.3, 3.2.4, and 3.2.5.

3.2.10 Municipal Ordinances – Groundwater Use and Zoning

Upon completion of the proposed remedial activities, no residual contamination will remain at the Site. As part of a Track 2 cleanup for future single-family residential use, no use restrictions will be placed on the proposed future uses of the property, other than the site-wide prohibition on groundwater use imposed by county and municipal ordinance(s) or prohibitions under the NYS Environmental Conservation Law (i.e., no ECs and no environmental easement or deed restriction or other ICs). Accordingly, county and municipal ordinances will govern groundwater use at the Site and ensure that redevelopment remains consistent with the designated One Family Residence District (R-30) zoning designation. Additional details regarding these restrictions are provided in Section 8.

3.3 LAND USE EVALUATION

3.3.1 Zoning

The Site is currently zoned by the Westchester County Department of Planning as One Family Residence District (R-30) within a suburban area surrounded by residential, institutional, and recreational properties. The preferred remedy will comply with current zoning requirements.

3.3.2 Applicable Comprehensive Community Master Plans or Land Use Plans

The proposed selected remedy is consistent with comprehensive master and land use plans. The Town of Greenburgh has granted preliminary approval for the Site's redevelopment. The preferred remedy will fully comply with the applicable land use plan.

3.3.3 Surrounding Property Uses

The Site is bounded to the north by residential development; to the east by Landers Road with recreational development (Frank Jazzo Field) beyond; to the south by Dobbs Ferry Road with commercial development (Carlson Farm Nursery & Greenhouses) and recreational development (Game on Golf Center) beyond, and to the west by residential development and institutional development (Fairview Fire Department – Station 2). No sensitive receptors were identified in the immediate vicinity of the Site. The proposed remedy will not interfere with surrounding property uses and considers the short-term effects to neighboring properties.

3.3.4 Citizen Participation

A certification of mailing will be sent by the Participant to the NYSDEC Project Manager following the distribution of all fact sheets and notices that include: (1) certification and dates the fact sheet(s) were mailed; (2) a copy of the fact sheet(s); (3) a list of recipients/contacts; and (4) a statement that the repository was inspected on a specific date and that it contained all applicable project documents.

Document repositories have been established at the following location and contain all applicable project documents:

Greenburgh Public Library
300 Tarrytown Road
Elmsford, New York 07932
(914) 721-8200

Hours:
Sunday and Monday: Closed
Tuesday and Wednesday: 9:30 a.m. – 8:30 p.m.
Thursday through Saturday: 9:30 a.m. – 5 p.m.

An electronic repository may be accessed via DECInfo Locator at the following link: https://extapps.dec.ny.gov/data/DecDocs/C360239/

No changes will be made to fact sheets authorized for release by NYSDEC without written consent of NYSDEC. No other information, such as brochures and flyers, will be included with

the fact sheet mailing. The *Citizen Participation Plan* prepared for this project is provided in Appendix F.

3.3.5 Environmental Justice

The Site is located within a potential environmental justice area. The NYSDEC defines a potential environmental justice area as a "minority or low-income community that may bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies."

Environmental justice means the fair treatment and meaningful involvement of all people regardless of race, color, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including a racial, ethnic, or socioeconomic group, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies.

The remedy is designed to protect public health and the environment by removing contaminated materials from the community; therefore, the remedy poses no environmental justice concerns.

3.3.6 Land Use Designations

The proposed remedy is consistent with land use designations.

3.3.7 Population Growth Patterns

The proposed plan to develop the Site for residential use will provide additional housing for potential population growth.

3.3.8 Accessibility to Existing Infrastructure

The Site has access to existing infrastructure, with Dobbs Ferry Road and Landers Road providing direct access to local facilities and state highways. The preferred remedy will not alter or impede accessibility to existing infrastructure.

3.3.9 Proximity to Cultural Resources

The proposed remedy will not negatively impact cultural resources.

3.3.10 Proximity to Natural Resources

The proposed remedy will improve the local environment and will not negatively impact or affect natural resources.

3.3.11 Off-Site Groundwater Impacts

Based on the most recent data, there is no indication of off-site migration of groundwater impacts from the Site. The proposed remedy will not negatively impact or affect natural resources.

3.3.12 Proximity to Floodplains

According to the Federal Emergency Management Agency Flood Insurance Rate Map, the Site is located within Zone X, an area of minimal flood hazard, usually depicted as above the 500-year flood level or 0.2 percent annual chance flood hazard, and protected by levee from the 100-year flood level. The proposed remedy will not affect the floodplains at the Site.

3.3.13 Geography and Geology of the Site

Site geography and geology is consistent with the surrounding area. See Section 2.4.

3.3.14 Current Institutional Controls

There are currently no ICs at the Site.

3.4 SUMMARY OF SELECTED REMEDIAL ACTIONS

This section includes a comprehensive and concise summary of the remedial action proposed for the Site with the following remedial elements:

1. Conduct site preparation activities consisting of utility investigation and mark-outs; mobilization of equipment for the specific remedial activities; installation of soil erosion and sediment controls (as needed); site clearing, grubbing, and tree removal; preparation of staging and material stockpile areas; and set-up of community air monitoring equipment in accordance with the CAMP.
2. Excavation of soil/fill exceeding Track 2 SCOs for both the western and eastern parcels to a depth of 15 feet bgs or top of bedrock. The current estimated excavation extents to meet applicable SCOs consist of the removal of soil across the Site, the majority in the upper 0.5 feet, with select areas up to 4 feet bgs, consisting of

approximately 110,000 cy of soil as shown on Figures 6 and 13 and detailed in Table 9.

3. Temporary dewatering of the pond (and treatment if necessary), excavation, stabilization (if necessary), and off-site removal of all sediments exceeding FW Class A SGVs, estimated to be approximately 4,600 cy as shown on Figure 16. Restoration of the pond and adjacent wetlands upon completion of sediment removal, as needed. An RD containing further details regarding the sediment remediation will be submitted for review and approval by the NYSDEC prior to initiating sediment remediation.
4. Screening for indications of contamination (by visual means, odor, and monitoring with PID and/or XRF analyzer) of all excavated soil during any intrusive Site work.
5. Collection and analysis of end-point samples to evaluate the performance of the remedy with respect to attainment of Track 2 SCOs and sediment FW Class A SGVs.
6. Appropriate off-site disposal of all material removed from the Site in accordance with all federal, state, and local rules and regulations for handling, transport, and disposal.
7. Clean material movement, site regrading, and temporary stabilization of excavated areas.
8. Demobilization of all remedial equipment and removal of erosion and sediment control measures that are not scheduled to be used during redevelopment activities.
9. All responsibilities associated with the remedial action, including permitting and pretreatment requirements, will be addressed in accordance with all applicable federal, state, and local rules and regulations.

Remedial activities will be performed at the Site in accordance with this NYSDEC-approved RAWP and the NYSDEC-issued Decision Document. All deviations from the RAWP and/or Decision Document will be promptly reported to NYSDEC for approval and fully explained in the Final Engineering Report (FER).

4.0 REMEDIAL ACTION PROGRAM

4.1 GOVERNING DOCUMENTS

Governing documents and procedures included in the RAWP include a site-specific HASP, a CAMP, a citizen participation plan, an SMMP, and a QAPP. Highlights of these documents and procedures are provided in the following subsections.

4.1.1 Standards, Criteria and Guidance

The following SCGs are typically applicable to remedial action projects in NYS, and will be consulted and adhered to as applicable:

- 6 NYCRR Part 364 - NYS Waste Transporter Permits
- 6 NYCRR Part 360 - NYS Solid Waste Management Requirements
- 6 NYCRR Part 371 - Identification and Listing of Hazardous Wastes
- 6 NYCRR Part 372 - Hazardous Waste Manifest System and Related Standards for Generators, Transporters and Facilities
- 6 NYCRR Part 375 - Environmental Remediation Programs
- 6 NYCRR Part 376 - Land Disposal Restrictions
- 6 NYCRR Part 613 - Petroleum Bulk Storage
- 6 NYCRR Part 663 - Freshwater Wetlands - Permit Requirements
- 6 NYCRR Parts 700-706 – Classes and Standards of Quality and Purity
- 6 NYCRR Part 750 - State Pollutant Discharge Elimination System (SPDES) Permits
- 29 CFR Part 1910.120 - Hazardous Waste Operations and Emergency Response
- NYSDEC Commissioner Policy "CP-43: Groundwater Monitoring Well Decommissioning Policy" (2009)
- NYSDEC Commissioner Policy "CP-49 / Climate Change and DEC Action" (2022)
- NYSDEC Commissioner Policy "CP-51 / Soil Cleanup Guidance" (2010)
- NYSDEC Commissioner Policy "CP-60: Screening and Assessment of Contaminated Sediment" (2014)
- NYSDEC DER Program Policy "DER-2 / Making Changes to Selected Remedies" (April 2008)
- NYSDEC DER Program Policy DER-10 (2010)
- NYSDEC DER Program Policy "DER-13 / Strategy for Evaluating Soil Vapor Intrusion at Remedial Sites in New York" (2006)
- NYSDEC DER Program Policy "DER-23 / Citizen Participation Handbook for Remedial Programs" (2010)
- NYSDEC DER Program Policy DER-31 (2010)
- NYSDEC DER Program Policy "DER-32 / Brownfield Cleanup Program Applications and Agreements" (2017)

- NYSDEC DER Program Policy "DER-33 / Institutional Controls: A Guide to Drafting and Recording Institutional Controls" (2010)
- NYSDEC Technical Administrative Guidance Memorandum "TAGM 3028 - "Contained In" Criteria for Environmental Media: Soil Action Levels" (1997)
- NYSDEC Division of Water TOGS 1.1.1 (1998; Addenda 2000, 2004 and 2023)
- *New York State Standards and Specifications for Erosion and Sediment Control* (2016)
- NYSDOH *Generic Community Air Monitoring Plan*
- NYSDOH *Guidance for Evaluating Soil Vapor Intrusion in the State of New York* (2006)
- NYS Climate Act (2019)
- NYSDEC *Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances* (2023)

4.1.1.1 Green and Sustainable Remediation and Climate Resiliency

The selected remedial alternative will implement GSR principles and techniques to the extent feasible in the design, implementation, and site management of the remedy per DER-31. The following SCGs are specifically applicable to GSR and climate resiliency remedial action projects in NYS, and will be consulted and adhered to as applicable:

- NYSDEC Green and Sustainable Remediation and Climate Resiliency Fact Sheet (2023)
- NYSDEC DEC Program Policy DER-31/Green Remediation (2010)
- USEPA Green Remediation Best Management Practices: Excavation and Surface Restoration (2019)

4.1.2 Site-Specific Health and Safety Plan (HASP)

All remedial work performed under this RAWP will be in full compliance with governmental requirements, including Site and worker safety requirements mandated by the United States Department of Labor's Occupational Safety and Health Administration.

The Participant and associated parties preparing the remedial documents submitted to NYS and those performing the construction work are completely responsible for the preparation of an appropriate HASP and for the appropriate performance of work according to that plan and applicable laws.

The HASP and requirements defined in this RAWP pertain to all remedial and invasive work performed at the Site until the issuance of a Certificate of Completion.

The Site Safety Coordinator will be identified, and associated resume provided, prior to the start of remedial construction. The parties performing the remedial work will document that performance of the work will follow the HASP and applicable laws and regulations. Personnel entering any remediation work area (exclusion zone) will be trained in the provisions of the HASP and required to sign a HASP acknowledgement form. Site-specific training will be provided, as needed, to field personnel and additional safety training may be provided depending on the tasks performed on Site. A safety meeting will be held before each shift or day begins and will be documented in a logbook or other specific or electronic forms. Additionally, an emergency contact sheet with names and phone numbers will be included in the HASP. This document will define the specific project contacts for use in case of emergency.

Confined space entry is not anticipated to occur in association with the remedial action.

4.1.3 Quality Assurance Project Plan

A QAPP has been prepared in accordance with DER-10, outlining the quality control components to ensure the proposed remedy achieves the RAOs. The QAPP is provided as Appendix G.

4.1.4 Construction Quality Assurance Plan

A Construction Quality Assurance Plan (CQAP) describes the quality assurance (QA)/quality control (QC) methodologies applied in the field and in the laboratory(ies) to ensure successful performance and implementation of the remedial action. The following CQAP procedures will be implemented to ensure the selected remedy will meet the proposed remedial goals and RAOs in accordance with design specifications:

- The remedial action will be directed by the Remedial Engineer and Carson Voci personnel, with regulatory oversight by NYSDEC and NYSDOH. Carson Voci personnel will direct the remedial contractor during implementation of the remedial action. A list of personnel involved in the implementation of the CQAP and their responsibilities is provided in Section 4.2.1.
- Carson Voci personnel will meet with the remedial contractor superintendent (or equivalent) daily to review the scope of work and schedule for upcoming activities. Additional meetings with Carson Voci, the Applicant, and the remedial contractor will be conducted, as needed.

- Carson Voci personnel will document all remedial activities in a project field book or separate logs and provide daily reports/updates to the Remedial Engineer/QEP. Daily reports will also be submitted to NYSDEC and NYSDOH in accordance with Section 4.4.1.
- Carson Voci personnel will field screen excavated soil in accordance with this RAWP for appropriate soil management. End-point confirmation sampling will be conducted by field personnel under the direct supervision of the Remedial Engineer and/or QEP in accordance with this RAWP. Waste characterization samples will be collected in accordance with the designated receiving facility. All samples will be collected and submitted to the analytical laboratory in accordance with the QAPP.
- Carson Voci personnel and/or the remedial contractor will retain all waste disposal documents (i.e., bills of lading, waste manifests, etc.) and create an electronic table for waste disposal tracking.
- End-point sample locations will be surveyed by a NYS Licensed Surveyor to document the depth and extents of impacted soil removal.

4.1.5 Soil/Materials Management Plan

Soil removal will follow the SMMP provided in Section 6. The SMMP includes detailed plans for managing soils/materials that are disturbed at the Site, including excavation, handling, staging, transport, and disposal, as well as controls that will be applied to these efforts to assure effective and environmentally protective performance in compliance with applicable federal, state, and local requirements.

4.1.6 Storm Water Pollution Prevention Plan

The two SWPPPs have been prepared for the Site (western and eastern parcels, respectively) in conformance with requirements presented in the *New York State Standards and Specifications for Erosion and Sediment Control*. The SWPPPs are provided in Appendix H.

4.1.7 Community Air Monitoring Plan

A CAMP will be implemented during any ground intrusive activities to conduct monitoring and protection for potential off-site receptors. The CAMP scope of work will include the use of at minimum one downwind air monitoring station and one upwind air monitoring station, each equipped with one PID and one particulate meter. An additional air monitoring station may be placed between the work zone and the nearest downwind residence. As residences exist adjacent to and potentially within 20 feet of the proposed work areas, special requirements will be

implemented as applicable. Upwind concentrations will be measured at the start of each workday, and periodically throughout the day, to establish background concentrations. Daily reporting of any exceedances will be provided to NYSDEC and NYSDOH. The results of the CAMP data will be provided to NYSDEC and NYSDOH on a weekly basis. CAMP data results will be included in the FER along with locations of monitoring stations, monitoring equipment, procedures, and contaminant action levels. The NYSDOH *Generic Community Air Monitoring Plan* is included as Appendix E.

4.1.8 Contractor Site Operations Plan

The Remedial Engineer will review all plans and submittals for this remedial project (including those listed above and contractor and subcontractor document submittals) and confirm compliance with this RAWP. The Remedial Engineer is also responsible for ensuring that all future submittals comply with this RAWP. All remedial documents will be submitted to NYSDEC and NYSDOH in a timely manner and prior to the start of work.

4.1.9 Citizen Participation Plan

A certification of mailing will be sent by the Participant to the NYSDEC Project Manager following the distribution of all fact sheets and notices that includes: (1) certification and dates the fact sheet(s) were mailed; (2) a copy of the fact sheet(s); (3) a list of recipients (contact list); and (4) a statement that the repository was inspected on a specific date and that it contained all of applicable project documents.

No changes will be made to approved fact sheets authorized for release by NYSDEC without written consent of the NYSDEC. No other information, such as brochures and flyers, will be included with the fact sheet mailing.

The approved *Citizen Participation Plan* for this project is included in Appendix F.

Document repositories have been established at the following locations and contain all applicable project documents:

Greenburgh Public Library
300 Tarrytown Road
Elmsford, New York 07932
(914) 721-8200

Hours:
Sunday and Monday: Closed
Tuesday and Wednesday: 9:30 a.m. – 8:30 p.m.
Thursday through Saturday: 9:30 a.m. – 5 p.m.

In addition, an electronic repository can be accessed via DECInfo Locator at the following link: https://extapps.dec.ny.gov/data/DecDocs/C360239/

4.2 GENERAL REMEDIAL CONSTRUCTION INFORMATION

4.2.1 Project Organization

Primary personnel for implementation of the remedial action include staff of Carson Voci, as the Environmental Consultants. The Environmental Consultants will have primary oversight of all remedial activities implemented at the Site. Subcontractors will be identified upon approval of this RAWP.

The following project personnel are proposed for RAWP implementation:

- NYSDEC Case Manager: Oliver Wolfe
- NYSDOH Case Manager: Renata Ockerby
- Remedial Engineer: Nicholas Krasnecky, P.E.
- Principal/QEP: Chris Voci, P.G.
- Project Manager: Alex Strohl
- Field Personnel: TBD
- Carson Voci Health and Safety Officer: Daren Roth
- Remedial Contractor: TBD

Resumes of key personnel involved in the remedial action are included in Appendix I.

4.2.2 Remedial Engineer

The Remedial Engineer for this project will be Nicholas Krasnecky, P.E. The Remedial Engineer is a registered professional engineer licensed by the state of New York. The Remedial Engineer will have primary direct responsibility for implementation of the remedial program for the Elmwood Preserve Site (NYSDEC BCA Index No. C360239-08-23, Site No. C360239). The Remedial Engineer will certify in the FER that the remedial activities were observed by QEPs under his supervision and that the remediation requirements set forth in this RAWP and any other relevant provisions of ECL 27-1419 have been achieved in full conformance with the RAWP. Other Remedial Engineer certification requirements are listed later in this RAWP.

The Remedial Engineer will coordinate the work of other contractors and subcontractors involved in all aspects of remedial construction, including soil excavation, stockpiling, characterization, removal and disposal; air monitoring; emergency spill response procedures;

import of back fill material; and management of waste transport and disposal. The Remedial Engineer will be responsible for all appropriate communication with NYSDEC and NYSDOH.

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

The Remedial Engineer will provide the certifications listed in Section 10 in the FER.

4.2.3 Remedial Action Construction Schedule

The proposed remedial action schedule presented below is contingent upon NYSDEC and NYSDOH approval of this RAWP and remedial action tasks by the dates noted below:

Task	Description	Anticipated Dates
1	NYSDEC Approval of RAWP	April 1, 2026
2	Initiate Remedial Action	May 2026
3	Complete Remedial Action	February 2027

A more detailed remedial schedule is provided in Section 11.

4.2.4 Work Hours

The hours for operation of remedial construction will conform to the Town of Greenburgh Building Department construction code requirements or according to specific variances issued by that agency. NYSDEC will be notified by the Participant of any variances issued by the Building Department. NYSDEC reserves the right to deny alternate remedial construction hours.

4.2.5 Site Security

A perimeter fence exists around the property boundary. The fence will be maintained as required and secured at the end of each workday. Additional health and safety measures for on-site workers will be implemented, as necessary, in excavation areas.

4.2.6 Traffic Control

Site traffic will enter through the gated entrances on Dobbs Ferry Road and Landers Road. The access points will be monitored, with flag services and cones provided as needed to ensure safe entry to and exit from the Site. Traffic will adhere to applicable local, state, and federal rules and regulations.

More details regarding traffic control and truck routes are presented in Section 6.1.4.

4.2.7 Contingency Plan

The remedial alternative selected for the Site is a Track 2 remedy to allow future use as single-family housing. A contingency plan is not considered for this Site and selected cleanup, as the proposed future Site use would not be allowed under a less-stringent cleanup track.

4.2.8 Worker Training and Monitoring

Site workers will be required, at a minimum, to have completed Hazardous Waste Operations and Emergency Response (HAZWOPER) site safety and medical monitoring training in accordance with 29 CFR § 1910.120.

4.2.9 Agency Approvals

The Participant has addressed all State Environment Quality Review Act requirements for this Site. All permits or government approvals required for remedial construction have been, or will be, obtained prior to the start of remedial construction.

The planned end use for the Site is in conformance with the current zoning for the property as determined by the Westchester County Department of Planning. A Certificate of Completion will not be issued for the project until conformance with zoning designation is demonstrated.

A complete list of all federal, state, and local governmental permits, certificates or other approvals or authorizations required to perform the remedial and development work is attached in Table 10. This list includes a citation of the law, statute, or code to be complied with, the originating agency, and a contact name and phone number for that agency. This list will be updated in the FER.

All planned remedial or construction work in regulated wetlands and adjacent areas will be specifically approved by the NYSDEC Division of Fish and Wildlife to ensure that it meets the requirements for substantive compliance with those regulations prior to the start of construction. Nothing in the approved RAWP or its approval by NYSDEC should be construed as an approval for this purpose.

4.2.10 NYSDEC BCP Signage

A project sign is not anticipated to be installed at the Site.

4.2.11 Pre-Construction Meeting with NYSDEC

A pre-construction meeting with NYSDEC will take place prior to the initiation of any major remedial activities or as required by the NYSDEC.

4.2.12 Emergency Contact Information

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

4.2.13 Remedial Action Costs

The total estimated cost of the remedial action is $10,800,000. An itemized and detailed summary of estimated costs for all remedial activity is attached as Appendix C. This will be revised based on actual costs and submitted as an Appendix to the FER.

4.3 SITE PREPARATION

4.3.1 Mobilization

Mobilization will be conducted as necessary for each phase of work at the Site. Mobilization includes field personnel orientation; equipment mobilization; marking excavation areas, sampling locations, and injection points; and utility mark-outs.

4.3.2 Monitoring Well / Vapor Probe Decommissioning

Existing groundwater monitoring wells will either be protected during remediation and development for use in post-remedial monitoring or will be properly decommissioned in accordance with NYSDEC Commissioners Policy CP-43. The only exception to this is if the full length of the well is to be excavated during remediation.

Similarly, existing soil-vapor probes will be properly decommissioned unless they are to be fully removed during remediation or used for post-remedial monitoring.

4.3.3 Erosion and Sedimentation Controls

Soil erosion and sediment control measures for management of storm water will be installed as necessary in accordance with the NYS *Guidelines for Urban Erosion and Sediment Control* and Site BMPs. The anticipated BMPs to be installed include straw/haybales, coir wattles, and/or silt fences surrounding the excavation areas and within the Site perimeter fencing, as needed, to control stormwater and surface water runoff at areas of ground disturbance and stockpiles. These control measures will be installed prior to initiating soil excavation.

4.3.4 Stabilized Construction Entrance(s)

A stabilized construction entrance will be installed at the locations shown on Figure 12. No vehicles entering or exiting the Site are expected to come in contact with contaminated soils/material, except for the inside of the dump box or roll-off container. A decontamination area will be utilized to remove any soil/material observed on trucks prior to departure from the Site. Measures will be taken to keep the Site pavement free of soil, and within the vicinity of the excavation areas only.

4.3.5 Utility Marker and Easements Layout

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

The presence of utilities and easements on the Site has been investigated by the Remedial Engineer. It has been determined that no risk or impediment to the planned work under this RAWP is posed by utilities or easements on the Site.

Proper safety and protective measures pertaining to utilities and easements, and compliance with laws and regulations, will be employed during invasive and other work contemplated under this RAWP, including at minimum the use of the One-Call System (811).

4.3.6 Sheeting and Shoring

No sheeting or shoring is anticipated to be required for implementation of the remedial action. Should sheeting and shoring be determined to be necessary, appropriate management of structural stability of off-site structures during on-site activities, including on-site excavation, is the sole responsibility of the Participant and its contractors. The Participant and its contractors are solely responsible for safe execution of all invasive and other work performed under this RAWP. The Participant and its contractors must obtain any local, state, or federal permits or approvals that may be required to perform work under this RAWP. Further, the Participant and its contractors are solely responsible for the implementation of all required, appropriate, or necessary health and safety measures during performance of work under the approved RAWP.

4.3.7 Equipment and Material Staging

Equipment and materials will be stored and staged in a manner that complies with applicable laws, guidelines, and regulations. The location of the proposed equipment and MSAs will remain on Site to the extent possible. It is anticipated that the equipment and MSAs will be temporary and located in the immediate vicinity of the work areas.

4.3.8 Decontamination Area

A decontamination area will be set up for all personnel and outbound vehicles close to the Site exits. All personnel and vehicles will be examined for evidence of contaminated media to be decontaminated and/or removed. Decontamination will be conducted via "dry" methods only for removal from personnel protective equipment, vehicles, and equipment, as necessary.

4.3.9 Site Fencing

A perimeter fence exists around the property boundary. The fence will be maintained as required and secured at the end of each workday. Additional orange construction fencing or equivalent will be installed as deemed necessary for the safety of the on-site workers.

4.3.10 Demobilization

Demobilization will include:

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

All equipment used on Site will be decontaminated and demobilized at the completion of all field activities. Investigation equipment and large equipment (e.g., soil excavators) will be decontaminated in the decontamination area as necessary prior to exiting the Site. All investigation- and remediation-derived waste will be appropriately disposed.

4.4 REPORTING

Reporting of the implementation of the RAWP will be conducted in accordance with the following subsections. All daily and monthly reports will be included in the FER.

4.4.1 Daily Reports

Daily reports summarizing the previous day's *active remedial work* will be submitted to NYSDEC and NYSDOH Project Managers by the end of the following day and will include:

- An update of progress made during the reporting day;
- Locations of work and quantities of material imported and exported from the Site;
- References to an alpha-numeric map for Site activities;
- A summary of any and all complaints with relevant details (names, phone numbers);
- A summary of CAMP findings, including excursions;
- Photographs of site activities; and
- An explanation of notable Site conditions.

The frequency of the reporting period may be revised in consultation with the NYSDEC Project Manager based on planned project tasks. Daily reports are not intended to be the mode of communication for notification to the NYSDEC of emergencies (accident, spill), requests for changes to the RAWP or other sensitive or time critical information. However, such conditions must also be included in the daily reports. Emergency conditions and changes to the RAWP will be addressed directly to NYSDEC Project Manager via personal communication.

Daily reports will include a description of daily activities keyed to an alpha-numeric map for the Site that identifies work areas. These reports will include a summary of CAMP results, odor and dust excursions and corrective actions, and all complaints received from the public.

A Site map that shows a predefined alpha-numeric grid for use in identifying locations described in reports submitted to NYSDEC is attached on Figure 17.

The NYSDEC assigned project number will appear on all reports.

4.4.2 Monthly Reports

Monthly reports will be submitted to NYSDEC and NYSDOH Project Managers by the 10th day of each month following the reporting period and will include:

- Activities relative to the Site during the previous reporting period and those anticipated for the next reporting period, including a quantitative presentation of work performed (e.g., tons/cy of material exported and imported, etc.);
- Description of approved activity modifications, including changes of work scope and/or schedule;
- Sampling results received following internal data review and validation, as applicable; and
- An update of the remedial schedule including the percentage of project completion, unresolved delays encountered or anticipated that may affect the future schedule, and efforts made to mitigate such delays.

Tracking of GSR metrics determined during the design process should be included in monthly reports.

4.4.3 Other Reporting

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

Progress with respect to green and sustainable remediation metrics will be tracked during implementation of the remedial action and reported in the FER, including a comparison to the goals established during the remedial program. Regular updates to the metrics used (SEFA, SiteWise™, or otherwise approved method) should be included.

The climate screening process and results will be documented in the form of a completed checklist and brief letter report. If the climate screening results indicate that a Climate Vulnerability Assessment (CVA) is necessary, a complete CVA report will be developed. The CVA report will be included as an appendix or attachment in relevant documents and/or submitted as a standalone report.

Job-site record keeping for all remedial work will be appropriately documented. These records will be maintained on Site at all times during the project and be available for inspection by NYSDEC and NYSDOH staff.

4.4.4 Complaint Management Plan

All citizen complaints will be promptly reported to NYSDEC and addressed, as needed, based on the complaint. Notices to NYSDEC, reported as part of the daily reports, will include the nature of the complaint, the party providing the complaint, and the actions taken to resolve any issues.

4.4.5 Deviations from the Remedial Action Work Plan

Any significant and material deviations from the RAWP will be presented to the NYSDEC Project Manager for approval prior to implementation and will be documented in the daily reports and in the FER. Minor deviations that do not alter the overall scope of work presented in the RAWP will be approved by the Remedial Engineer and documented in the daily reports and in the FER.

The process for presenting significant and material deviations to the RAWP will include a request for approval for the changes from NYSDEC including following:

- Reasons for deviating from the approved RAWP;
- Approval process to be followed for changes/editions to the RAWP;
- Determination that the remedial action with the deviation(s) is protective of public health and the environment in the area; and
- Effect of the deviations on overall remedy.

5.0 REMEDIAL ACTION: MATERIAL REMOVAL FROM SITE

The remedial alternative selected for the Site is Track 2. The Track 2 alternative will involve excavation and off-site disposal of soils above RSCOs in the western parcel and the more stringent of RSCOs and PEcoSCOs in the eastern parcel, as shown on Figures 6a through 6f. Additional details regarding volume and removal methods is discussed in Section 3.2.

End-point samples will be collected at each excavation grid as detailed in Section 5.2. The QAPP, included as Appendix G, describes the proposed sampling, handling, and analytical methods for remedial activities involving soil removal.

5.1 SOIL CLEANUP OBJECTIVES

The SCOs for the selected Track 2 remedial alternative are the RSCOs for the western parcel and the more stringent of the RSCOs and PEcoSCOs for the eastern parcel listed in Tables 2a, 2b, and 2c. Tables 2a, 2b, and 2c summarize all soil samples that exceed the SCOs proposed for

this remedial action. A spider map denoting all soil samples that exceed the SCOs proposed for this remedial action is shown on Figures 6a through 6f.

The cleanup objectives for the pond sediment for the selected Track 2 remedial alternative are the FW Class A SGVs listed in Table 7. Table 7 summarizes all sediment samples that exceed the FW Class A SGVs proposed for this remedial action. A spider map denoting all soil samples that exceed the FW Class A SGVs proposed for this remedial action is shown on Figure 10.

Soil and materials management on Site will be conducted in accordance with the SMMP described in Section 6.

5.2 REMEDIAL PERFORMANCE EVALUATION (POST EXCAVATION END-POINT SAMPLING)

In accordance with DER-10, alternate end-point sampling frequencies and methodologies can be proposed for large sites or excavations, of which this Site and proposed remedial action applies. As detailed in the RIR, and Sections 2.5, 2.6, and 3.2 of this RAWP, the source of the soil contamination is from surficial HAP and historical fill at the Site. Based on an understanding of the physical and chemical properties of the low-mobility contaminants in HAPs and how they interact with soils as a relatively homogenous and surficial application, investigation, remediation, and post remediation sampling best practices can be developed and implemented.

Consistent with other HAP sites, RI data indicate a relatively homogenous contaminant distribution across the Site, with the most COPC impacts above applicable SCOs occurring in the upper 0.5 feet of soil. Where impacts extended deeper, COPC concentrations were generally below applicable SCOs by 2 feet bgs. The data demonstrates that once a sample is collected that meets applicable SCOs, all soil below that depth is also compliant. Areas impacted by historical fill exhibit similar physical and chemical characteristics (i.e., low-mobility contaminants) and demonstrate vertical delineation once a compliant sample is collected below the fill; therefore, these areas will be treated the same as the HAP areas for end-point sampling.

5.2.1 End-Point Sampling Frequency

Based on the RI findings and the well-defined nature and source of the contamination at the Site, end-point sampling will be conducted at the following frequency, within each grid area:

1. One base sample for every 5,000 square feet of excavated area.
2. One sidewall sample for every 75 linear feet of sidewall, with a minimum of one sample collected from each sidewall.

As detailed in DER-10, Section 5.4(b)5.v, smaller excavations extending to a deeper depth within a grid will be considered a separate excavation and sampled in accordance with the frequency stated above.

The end-point sampling detailed above is consistent with the New Jersey Department of Environmental Protection's Site Remediation and Waste Management Program *Historically Applied Pesticide Technical Guidance* (2022). The selected frequency is sufficient to confirm removal of all soils exceeding applicable SCOs and to ensure protection of public health and the environment.

5.2.2 Methodology

End-point soil and sediment samples will be collected from the locations identified in Section 5.2.1 and as depicted on Figures 15a and 15b at the following intervals:

- Base Samples – Collected from the 0 to 0.5 feet bgs from the base of the excavation.
- HAP Excavation Sidewall Samples – Collected from each 0.5 foot interval of the exposed sidewall (i.e. a 1-foot deep sidewall would have samples collected from 0 to 0.5 and 0.5 to 1 feet).
- Fill Excavation Sidewall Samples – Collected from the top of the sidewall (surface soil) and one from the bottom of the sidewall (subsurface soil).

Each end-point sample will be analyzed for the COPCs identified in the RIR, based on the areas described in Section 3.2.4, as follows:

- HAP Impacted Areas (including the pond sediment)
  - TCL pesticides using EPA Method 8081B/8151A
  - TAL metals using EPA Method 6010
- Historical Fill Impacted Areas
  - TCL SVOCs using EPA Method 8270C
  - TCL pesticides using EPA Method 8081B/8151A
  - TAL metals using EPA Method 6010
  - TCL PCBs using EPA Method 8082A at Grids F02 and TS-11

End-point samples will be collected in accordance with the procedures detailed in the QAPP, with the aliquot for each analytical parameter homogenized and placed in a laboratory-provided glass sample jar and immediately placed on ice. One sample will be collected from each of the proposed end-point sampling locations. Samples will be submitted to a NYSDOH

ELAP certified laboratory for analysis of the specified parameters in accordance with holding times and chain-of-custody procedures.

5.2.3 Reporting of Results

The preliminary end-point sampling results (i.e., prior to third-party data validation) will be shared with NYSDEC and NYSDOH upon receipt, either within daily or monthly reports or under separate cover. The QAPP designated QA officer will review the analytical laboratory results and report narrative to confirm all holding times and general laboratory QA/QC components were met prior to providing the data to NYSDEC and NYSDOH. With NYSDEC and NYSDOH concurrence, preliminary end-point sampling results meeting hold times and general laboratory QA/QC requirements that are below applicable SCOs will be used to confirm excavated areas have been remediated. When the data-usability summary report prepared by the third-party data validator indicates non-usable data, the area considered to be remediated will be revisited and addressed, as needed.

Analytical results will be provided with NYS Analytical Services Protocol Category B deliverables. All data will be submitted to NYSDEC in electronic format in accordance with DER-10, Section 1.15.

5.2.4 Quality Assurance / Quality Control

QA/QC samples, including field duplicates and field blanks, shall be collected in accordance with the QAPP. Blind duplicates will be collected at a frequency of 1 blind duplicate per 20 samples. Field blanks will be collected at a frequency of once per day. A laboratory-prepared trip blank will be provided and analyzed alongside field samples collected for VOC analysis. Details regarding sampling methods and analyses are provided in the QAPP (Appendix G).

5.2.5 Data Usability Summary Reports and Electronic Data Deliverables

NSY Analytical Services Protocol Category B deliverables will be reviewed and validated by a third-party data validator who will prepare a data-usability summary report for each deliverable. Verification, documentation, and/or performance monitoring samples collected under this RAWP will be reviewed and evaluated in accordance with the *Guidance for the Development of Data Usability Summary Reports* as presented in Appendix 2B of DER-10. The completed data usability summary reports will be included in the FER.

5.2.6 Reporting of End-Point Data in FER

End-point sampling, including bottom and sidewall sampling, will be performed in accordance with the sample frequency detailed in Section 5.2.1. Sidewall samples will be collected a minimum of every 75 linear feet. Bottom samples will be collected at a rate of one for every 5,000 square feet from the base of the remedial excavation. The FER will provide a tabular and map summary of all end-point sample results and exceedances of SCOs. Chemical laboratories used for all end-point sample results and contingency sampling will be NYSDOH ELAP certified.

5.3 ESTIMATED MATERIAL REMOVAL QUANTITIES

The estimated quantity of soil/fill to be removed from the Site to meet the applicable SCOs presented in Section 5.1 is 111,000 cy, which is approximately 144,300 tons at an estimated 1.3 tons per cy.

The estimated quantity of soil for import (backfill/cover) and on-site reuse/relocation is 0 cy.

Figure 13 shows the horizontal and vertical extents of the proposed excavation(s), including cut and fill depths with elevation contours.

6.0 SOIL/MATERIALS MANAGEMENT PLAN

Soil removal will follow the SMMP, which details plans for managing soils/materials that are disturbed at the Site, including excavation, handling, storage, transport, and disposal, and controls that will be applied for effective and environmentally protective performance in compliance with applicable federal, state, and local requirements. Containment source removal areas will be surveyed at the completion of excavation. This information will be provided on plans in the FER.

6.1.1 Soil Screening Methods

Visual, olfactory, and PID soil screening and assessment will be performed by a QEP or experienced field geologist under the direction of the Remedial Engineer during all remedial and development excavations into known or potentially contaminated material.

All primary contaminant sources (including but not limited to tanks and hotspots) identified during Site characterization, RI, and remedial action will be surveyed by a NYS Licensed Surveyor. This information will be provided on maps in the FER.

Screening will be performed by QEPs. Resumes will be provided for all personnel responsible for field screening (e.g., those representing the Remedial Engineer) of invasive work for unknown contaminant sources during remediation and development work.

6.1.2 Stockpile Methods

All excavated soil will be loaded and transported to the MSA at the southwestern portion of the Site where it will be stockpiled, managed, and loaded for off-site disposal. Soil will be stockpiled on plastic sheeting and covered by tarps or other means when not in use. Whenever possible, dump trucks will be scheduled and made available to load stockpiles approved by the receiving facility(ies). Appropriate procedures and measures will be taken whenever stockpiling excavated soil on Site.

Stockpiles will be inspected at a minimum once each week and after every storm event. Results of inspections will be recorded in a logbook maintained at the Site and available for inspection by NYSDEC. At a minimum, a storm event should be considered a rainfall of 3 inches or greater in 12 hours. Judgement should be used to evaluate water infiltration, nearby waterbodies where runoff is likely, and ECs that may be affected.

Soil 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.

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

Water will be available on Site at suitable supply and pressure for use in dust control.

6.1.3 Materials Excavation and Load Out

The Remedial Engineer or designated QEP will oversee all invasive work and the excavation and load-out of all excavated material.

The Participant and its contractors are solely responsible for safe execution of all invasive and other work performed under this RAWP.

The presence of utilities and easements on the Site has been investigated by the Remedial Engineer. It has been determined that no risk or impediment to the planned work under this RAWP is posed by utilities or easements on 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 NYS Department of Transportation requirements (and all other applicable transportation requirements).

Vehicles leaving the Site will not be overloaded. The Remedial Engineer's representative will make reasonable efforts to ensure that vehicles are not loaded beyond their NYS Department of Transportation weight rating and all material is secured beneath the truck bed cover.

The Remedial Engineer will be responsible for ensuring that all outbound trucks will be decontaminated and free of soil before leaving the Site until the remedial construction is complete.

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

The Remedial Engineer will be responsible for ensuring that all egress points for truck and equipment transport from the Site will be clean of dirt and other materials derived from the Site during Site remediation and development. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to Site-derived materials.

The Participant and associated parties preparing the remedial documents submitted to NYS, and parties performing this work, are completely responsible for the safe performance of all invasive work and the structural integrity of excavations.

The Remedial Engineer will ensure that Site development activities will not interfere with, or otherwise impair or compromise, remedial activities proposed in this RAWP.

Each hotspot and structure to be remediated (USTs, vaults and associated piping, transformers, etc.) will be removed and end-point remedial performance sampling completed before excavations related to Site development commence proximal to the hotspot or structure.

Development-related grading cuts and fills will not be performed without NYSDEC approval and will not interfere with, or otherwise impair or compromise, the performance of remediation required by this RAWP.

Mechanical processing of historical fill and contaminated soil on Site is prohibited.

All primary contaminant sources (including but not limited to tanks and hotspots) identified during Site characterization, RI, and remedial action will be surveyed by a NYS Licensed Surveyor. The survey information will be shown on maps to be reported in the FER.

6.1.4 Materials Transport Off-Site

All transport of materials will be performed by licensed haulers using properly placarded trucks in accordance with appropriate local, state, and federal regulations, including 6 NYCRR Part 364.

Truck transport routes are provided on Figure 18. All trucks loaded with Site materials will exit the vicinity of the Site using only these approved truck routes.

Proposed in-bound and out-bound truck routes to the Site are shown on Figure 18. This is the most appropriate route and takes into account: (a) limiting transport through residential areas and past sensitive sites; (b) use of city-mapped truck routes; (c) minimizing off-site queuing of trucks entering the facility; (d) limiting total distance to major highways; (e) promoting safety in access to highways; (f) overall safety in transport; and (g) community input, where necessary.

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 in order to minimize off-site disturbance. Off-site queuing will be minimized as much as possible.

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

All trucks will be inspected and any soil removed by dry decontamination methods, collected, and transported to the stockpiles in the MSA.

6.1.5 Materials Disposal Off-Site

The disposal locations will be established prior to initiating remedial activities Once established, disposal locations will be reported to the NYSDEC Project Manager.

The total quantity of material expected to be disposed off Site is 111,000 cy.

All soil/fill/solid waste excavated and removed from the Site will be treated as contaminated and regulated material and disposed in accordance with all local, state (including 6 NYCRR Part 360), and federal regulations. If soil/fill from this Site is proposed for unregulated disposal (i.e., clean soil removed for development purposes), a formal request with an associated plan will be made to NYSDEC's Project Manager. Unregulated off-site management of materials from this Site is prohibited without formal NYSDEC approval.

Material that does not meet Track 1 unrestricted SCOs is prohibited from being taken to a NYS recycling facility (6 NYCRR Part 360.15 Registration Facility).

The following documentation will be obtained and reported by the Remedial Engineer for each disposal location used in this project to fully demonstrate and document that the disposal of material derived from the Site conforms with all applicable laws: (1) a letter from the Remedial Engineer or BCP Participant to the receiving facility describing the material to be disposed and

requesting formal written acceptance of the material. This letter will state that material to be disposed is contaminated material generated at an environmental remediation Site in NYS. The letter will provide the project identity and the name and phone number of the Remedial Engineer. The letter will include as an attachment a summary of all chemical data for the material being transported (including Site characterization data), and a letter from all receiving facilities stating it is in receipt of the correspondence (above) and is approved to accept the material. These documents will be included in the FER.

Non-hazardous historic fill and contaminated soils taken off Site will be handled, at minimum, as municipal solid waste per 6 NYCRR Part 360.2. The Remedial Engineer is responsible for assuring material is properly characterized and determining the appropriate disposal methods based on the characterization results.

Historical fill and contaminated soils from the Site are prohibited from being disposed at 6 NYCCR Part 360.15 Registration Facilities (also known as Soil Recycling Facilities).

Soils that are contaminated but non-hazardous and are being removed from the Site are considered by the NYSDEC Division of Materials Management (DMM) to be Construction and Demolition (C/D) materials with contamination not typical of virgin soils. These soils may be sent to a 6 NYCRR Part 360 permitted landfill. They may be sent to a permitted C/D processing facility without permit modifications only upon prior notification of NYSDEC DMM. This material is prohibited from being sent or redirected to a 6 NYCRR Part 360.15 Registration Facility. In this case, as dictated by DMM, special procedures will include, at a minimum, a letter to the C/D facility that provides a detailed explanation that the material is derived from a DER remediation Site, that the soil material is contaminated and that it must not be redirected to on- or off-site soil recycling facilities. The letter will provide the project identity and the name and phone number of the Remedial Engineer. The letter will include as an attachment a summary of all chemical data for the material being transported.

The FER will include an accounting of the destination of all material removed from the Site during this remedial action, including excavated soil, contaminated soil, historic fill, solid waste, and hazardous waste, non-regulated material, and fluids. Documentation associated with disposal of all material must also include records and approvals for receipt of the material. This information will also be presented in a tabular form in the FER.

A bill of lading system or equivalent will be used for off-site movement of non-hazardous wastes and contaminated soils. This information will be reported in the FER.

Hazardous wastes derived from on Site will be stored, transported, and disposed of in full compliance with applicable local, state, and federal regulations.

Appropriately licensed haulers will be used for material removed from this Site and will be in full compliance with all applicable local, state, and federal regulations.

Waste characterization sampling will be performed exclusively for the purposes of off-site soil disposal in a manner suitable to receiving facilities and in conformance with applicable federal, state, and local laws rules and regulations and facility-specific permits. Sampling and analytical methods, sampling frequency, analytical results and QA/QC associated with waste characterization activities will be reported in the FER. All data available for soil/material to be disposed at a given facility must be submitted to the disposal facility with suitable explanation prior to shipment and receipt. Waste characterization data will be used solely for complying with requirements for off-site disposal. Waste characterization sampling cannot be utilized for:

- Delineating the extent of contamination required for remediation at a Site.
- Replacing or substituting data collected as part of Site characterization and/or RI.
- Replacing or substituting confirmation or documentation sampling as described in DER-10, Section 5.4.
- To modify remedial decisions as formalized in a NYSDEC approved Decision Document or Record of Decision.

6.1.6 Materials Reuse On-Site

Reuse of Site soils is not anticipated as part of the selected remedy.

On-site material for reuse will meet the RSCOs in the Western Parcel and the lower of the RSCOs or PEco SCOs in the Eastern Parcel. The Remedial Engineer will ensure that procedures defined for materials reuse in this RAWP are followed and that unacceptable material will not remain on Site.

A "Request to Import/Reuse Fill Material" form will be filed with the NYSDEC Project Manager for review and approval prior to material reuse on the Site. A copy of the form is presented in Appendix K. Acceptable demolition material proposed for reuse on Site, if any, will be sampled for asbestos.

Concrete crushing or processing on Site is prohibited, unless NYSDEC has specifically approved on-site processing and reuse of acceptable demolition material.

Organic matter (wood, roots, stumps, etc.) or other solid waste derived from clearing and grubbing of the Site is further discussed in Section 3.2.2.2.

6.1.7 Fluids Management

Dewatering is not anticipated to be required to facilitate the proposed remediation. If dewatering is conducted, all liquids to be removed from the Site, including dewatering fluids, will be handled, transported, and disposed in accordance with applicable local, state, and federal regulations..

Dewatered fluids will not be recharged back to the land surface or subsurface of the Site. Dewatering fluids will be managed off Site. Discharge of water generated during remedial construction to surface waters (i.e., a local pond, stream, river and/or storm sewer) is prohibited without a State Pollutant Discharge Elimination System permit.

6.1.8 Demarcation

After the completion of soil removal and any other invasive remedial activities and prior to backfilling, a land survey will be performed by a NYS Licensed Surveyor. The survey will define the final elevation of the remedial extactions. A map showing the survey results will be included in the FER.

6.1.9 Backfill from Off-Site Sources

All materials proposed for import onto the Site will be approved by the Remedial Engineer and will be in compliance with provisions in this RAWP prior to receipt at the Site.

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

The FER will include the following certification by the Remedial Engineer: “I certify that all import of soils from off Site, including source evaluation, approval and sampling, has been performed in a manner that is consistent with the methodology defined in the Remedial Action Work Plan.”

All imported soils will meet NYSDEC approved backfill or cover soil quality objectives for this Site. These NYSDEC approved backfill or cover soil quality objectives are the lower of the protection of groundwater or the protection of public health SCOs for residential use as set forth in Table 375-6.8(b) of 6 NYCRR Part 375Non-compliant soils will not be imported onto the Site without prior approval by NYSDEC. Nothing in the approved RAWP or its approval by NYSDEC should be construed as an approval for this purpose.

Soils that meet ‘general fill’ requirements under 6 NYCRR Part 360.13, but do not meet backfill or cover soil objectives for this Site, will not be imported onto the Site without prior

approval by NYSDEC. Nothing in this RAWP should be construed as an approval for this purpose.

A "Request to Import/Reuse Fill Material" form will be filed with the NYSDEC Project Manager for review and approval prior to import to the Site. A copy of the form is presented in Appendix K.

6.1.10 Stormwater Pollution Prevention

Straw/haybales, coir wattles, and/or silt fence will be installed around the entire perimeter of the remedial excavation and soil loading area. Barriers and hay bale checks 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 barrier and hay bale check 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 RAWP 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.

Silt fencing or hay bales will be installed around the entire perimeter of the remedial construction area.

6.1.11 Contingency Plan

If USTs or other previously unidentified contaminant sources are found during on-site remedial excavation- or development-related construction, sampling will be performed on product, sediment and surrounding soils, etc. in accordance with DER-10. Chemical analytical work will be for full scan parameters (TAL metals; TCL VOCs and SVOCs, TCL pesticides, PCBs, and PFAS). Analyses will not be otherwise limited without NYSDEC approval.

Identification of unknown or unexpected contaminated media identified by screening during invasive Site work will be promptly communicated by phone to NYSDEC's Project Manager. These findings will be also included in daily and periodic electronic media reports.

6.1.11.1 Extreme Storm Preparedness and Response Contingency Plan

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

Storm Preparedness

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

Storm Response

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

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

Dewatering will be performed in compliance with existing laws and regulations and consistent with emergency notifications, if any, from proper authorities. Eroded areas of soil including unsafe slopes will be stabilized and fortified. Dislocated materials will be collected and appropriately managed. Support of excavation structure will be inspected and fortified, as necessary. Impacted stockpiles will be contained and damaged stockpile covers will be replaced. Stormwater control systems and structures will be inspected and maintained, as necessary.

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

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

Storm Response Reporting

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

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

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

6.1.12 Community Air Monitoring Plan

Real-time air monitoring for VOCs and particulate levels at the perimeter of the exclusion zone or work area will be performed in accordance with the CAMP provided as Appendix E. As residences exist adjacent to and potentially within 20 feet of the proposed work areas, special requirements will be implemented as applicable.

Continuous air monitoring will be required during ground intrusive activities and other activities where equipment is disturbing the ground surface. Ground-intrusive activities include but are not limited to soil/fill excavation and handling, test pitting or trenching, grading of existing Site soils, and installation of soil borings/monitoring wells.

Periodic monitoring for VOCs and particulates will be required during non-intrusive activities, such as collection of soil/sediment samples. Periodic monitoring during sample collection would generally consist of taking a reading upon arrival at a sample location, monitoring while overturning soil, and taking a reading prior to leaving a sample location.

VOCs will be monitored at the Site perimeter on a continuous basis during excavation activities unless otherwise specific in the CAMP. Upwind concentrations will be measured at the start of each working day and periodically thereafter to establish background conditions, particularly if wind direction changes during the day. The VOC monitoring work will be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment will be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment will be capable of calculating 15-minute running average concentrations, which will be compared to levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities will be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities will resume with continued monitoring.
2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels exceeding 5 ppm over background but less than 25 ppm, work activities will be halted, the source of vapors will be identified, corrective actions will be taken to abate emissions, and monitoring will be continued. After these steps, work activities will resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less—but in no case less than 20 feet—is below 5 ppm over background for the 15-minute average.

3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities will be shut down until the source of the problem is identified and corrective action is taken to reduce organic vapor levels.
4. Fifteen-minute readings will be recorded and be available for state (NYSDEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes will also be recorded.
5. Particulate concentrations will be monitored at the Site perimeter and in work zones on a continuous basis during excavation and injection activities. The particulate monitoring will be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment will be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration will be visually assessed during all work activities. Visible dust from the work area will trigger the initiation of dust suppression procedures. Dust suppression equipment will be on Site, functional, and available at the work zone prior to commencing work at the Site.
6. If the downwind PM-10 particulate level is 100 micrograms per cubic meter ($\mu g/m^3$) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques will be employed. Work will continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 $\mu g/m^3$ above the upwind level and provided that no visible dust is migrating from the work area.
7. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 $\mu g/m^3$ above the upwind level, work will be stopped, and a re-evaluation of activities initiated. Work will resume if dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 $\mu g/m^3$ of the upwind level and in preventing visible dust migration.

Additional CAMP requirements may need to be met depending on the location and timing of ground intrusive activities. When work areas are within 20 feet of potentially exposed populations or occupied structures, the continuous monitoring locations for particulates must reflect the nearest potentially exposed individuals and the location of ventilation system intakes for nearby structures. The use of engineering controls such as vapor/dust barriers, temporary negative-pressure enclosures, or special ventilation devices may be considered to prevent exposures related to the work activities and to control dust and odors. The following additional activities will be implemented:

1. Additional air monitoring stations will be installed as needed if any ground intrusive work takes place within 20 feet of an occupied property.
2. If total VOC concentrations opposite the walls of occupied structures or next to intake vents exceed 1 ppm, monitoring should occur within the occupied structure(s). Background readings in the occupied spaces must be taken prior to commencement of the planned work. Any unusual background readings should be discussed with NYSDOH prior to commencement of the work.

If total particulate concentrations opposite the walls of occupied structures or next to intake vents exceed 150 µg/m3 , work activities should be suspended until controls are implemented and are successful in reducing the total particulate concentration to 150 µg/m3 or less at the monitoring point.Readings will be recorded and available for NYSDEC and NYSDOH personnel to review. A map showing the location of the sampling stations will be provided with each CAMP, based on the location of daily work activities and wind direction. Exceedances observed in the CAMP will be reported to NYSDEC and NYSDOH Project Managers and included in the daily report.

6.1.13 Odor, Dust and Nuisance Control Plan

Dust, odor, and nuisance control will be accomplished by the Participant as described in this section. The FER will include the following certification by the Remedial Engineer: "I certify that all invasive work during the remediation and all invasive development work were conducted in accordance with dust and odor suppression methodology defined in the Remedial Action Work Plan."

6.1.13.1 Odor Control Plan

Odors are not anticipated to be generated during remedial activities as none of the contaminants to be remediated are volatile compounds. Should nuisance odors be generated, an odor control plan will be enacted capable of controlling emissions of nuisance odors off Site. Specific odor control methods to be used on a routine basis will include application of foam suppressants or tarps over the odor of VOC source areas, as necessary. If nuisance odors are identified, work will be halted and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. NYSDEC and NYSDOH will be notified of all odor events and of all other complaints about the project. Implementation of all odor controls, including the halt of work, will be the responsibility of the Participant's Remedial Engineer, who is responsible for certifying the FER.

All necessary means will be employed to prevent on- and off-site nuisances. At a minimum, procedures will include: (a) limiting the area of open excavations; (b) shrouding open

excavations with tarps and other covers; and (c) 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.

Where odor nuisances have developed during remedial work and cannot be corrected, or where the release of nuisance odors cannot otherwise be avoided due to on-site conditions or proximity to sensitive receptors, odor control will be achieved by sheltering excavation and handling areas under tented containment structures equipped with appropriate air venting/filtering systems.

6.1.13.2 Dust Control Plan

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

- Dust suppression will be achieved through the use of 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.
- Clearing and grubbing of larger sites will be done in stages to limit the area of exposed, unvegetated soils vulnerable to dust production.
- Gravel will be used on roadways to provide a clean and dust-free road surface.
- On-site roads will be limited in total area to minimize the area required for water spraying.

6.1.13.3 Other Nuisances

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

A plan will be developed and utilized by the contractor for all remedial work and will conform, at a minimum, to NYCDEP noise control standards.

7.0 RESIDUAL CONTAMINATION

No residual contamination will remain at the Site upon completion of the remediation, as the proposed future use of the Site as single-family housing does not allow for ICs or ECs.

8.0 ENGINEERING AND INSTITUTIONAL CONTROLS

As no residual contamination will remain at the Site upon completion of a Track 2 residential use remediation, an environmental easement (EE) or site management plan (SMP) is not anticipated to be required. In the absence of an EE or SMP, local use restriction Chapter 873, Article VII, of the Laws of Westchester County that prohibits potable use of groundwater without prior approval may be relied on to prevent the ingestion of groundwater.

9.0 FINAL ENGINEERING REPORT

The FER will be submitted to NYSDEC following implementation of the remedial action defined in this RAWP. The FER provides the documentation that the remedial work required under this RAWP has been completed and has been performed in compliance with this plan. The FER will provide a comprehensive account of the locations and characteristics of all material removed from the Site including the surveyed map(s) of all sources. The FER will include as-built drawings for all constructed elements, calculation and manufacturer documentation for treatment systems, certifications, manifests, and bills of lading, as well as the complete SMP. The FER will provide a description of the changes in the remedial action from the elements provided in the RAWP and associated design documents. The FER will provide a tabular summary of all performance evaluation sampling results and all material characterization results and other sampling, and chemical analysis performed as part of the remedial action. The FER will provide test results demonstrating that all mitigation and remedial systems are functioning properly. The FER will be prepared in conformance with DER-10.

Where determined to be necessary by NYSDEC, a financial assurance plan will be required to ensure the sufficiency of revenue to perform long-term operations, maintenance, and monitoring tasks defined in the SMP and EE. This determination will be made by NYSDEC in the context of the FER review.

The FER will include written and photographic documentation of all remedial work performed under this remedy.

The FER will include an itemized tabular description of actual costs incurred during all aspects of the remedial action.

The FER will provide a thorough summary of all residual contamination left on the Site after the remedy is complete. Residual contamination includes all contamination that exceeds the Track 1 UUSCO in 6 NYCRR Part 375-6. A table and map that summarize exceedances and locations, respectively, from Track 1 UUSCOs for all soil/fill remaining at the Site after the remedial action will be included in the FER.

The FER will provide a thorough summary of all residual contamination that exceeds the SCOs defined for the Site in the RAWP and must provide an explanation for why the material was not removed as part of the remedial action. A table and map that show residual contamination exceeding Site SCOs will be included in the FER.

The FER will include an accounting of the destination of all material removed from the Site, including excavated contaminated soil, historical fill, solid waste, hazardous waste, non-regulated material, and fluids. Documentation associated with disposal of all material must also include records and approvals for receipt of the material. It will provide an accounting of the origin and chemical quality of all material imported onto the Site.

The FER must include a discussion of the green remediation practices/technologies employed throughout the remedial program. A final footprint analysis using a DER accepted model, and any tracking methods used through the construction including restoration activities. Before approval of a FER and issuance of a Certificate of Completion, all project reports must be submitted in digital form on electronic media (PDF).

10.0 CERTIFICATIONS

The following certification will appear in front of the executive summary of the FER. The FER will be prepared, stamped and the following certification signed by an individual licensed or otherwise authorized in accordance with NYS Education Department, Article 145, Profession Engineering, Land Surveying and Geology. The certification will include the following statements:

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

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

I certify that all use restrictions, institutional controls, engineering controls, and/or any operation and maintenance requirements applicable to the Site are contained in an environmental easement created and recorded pursuant ECL 71-3605 and that all affected local governments, as defined in ECL 71-3603, have been notified that such easement has been recorded.

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

I certify that any financial assurance mechanisms required by the Department pursuant to Environmental Conservation Law have been executed.

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

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

It is a violation of Article 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.

11.0 SCHEDULE

The implementation of the proposed remedy is anticipated to take approximately nine months. An estimated overall remedial schedule is provided as Appendix L, presenting tasks through receipt of the Certificate of Completion.