DECISION DOCUMENT

Atlantic Chestnut - Lot 2
Brownfield Cleanup Program
Brooklyn, Kings County
Site No. C224235
September 2020

Prepared by
Division of Environmental Remediation
New York State Department of Environmental Conservation

DECLARATION STATEMENT - DECISION DOCUMENT

Atlantic Chestnut - Lot 2
Brownfield Cleanup Program
Brooklyn, Kings County
Site No. C224235
September 2020

Statement of Purpose and Basis

This document presents the remedy for the Atlantic Chestnut - Lot 2 site, a brownfield cleanup site. The remedial program was chosen in accordance with the New York State Environmental Conservation Law and Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York (6 NYCRR) Part 375.

This decision is based on the Administrative Record of the New York State Department of Environmental Conservation (the Department) for the Atlantic Chestnut - Lot 2 site and the public's input to the proposed remedy presented by the Department.

Description of Selected Remedy

The elements of the selected remedy are as follows:

1. Remedial Design
A remedial design program will be implemented to provide the details necessary for the construction, operation, optimization, maintenance, and monitoring of the remedial program. Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy as per DER-31. 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; and
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development.
- Additionally, to incorporate green remediation principles and techniques to the extent feasible in the future development at this site, and to be consistent with the requirements

of an e-designation by New York City, any future on-site buildings will include, at a minimum, a 20-mil vapor barrier to improve energy efficiency through the elimination of vapor transmission through the foundation as an element of construction.

2. Excavation

Excavation and off-site disposal of contaminant source areas, including:

- grossly contaminated soil, as defined in 6 NYCRR Part 375-1.2(u);
- soil with non-aqueous phase liquid;
- soils which exceed the protection of groundwater soil cleanup objectives (PGWSCOs), as defined by 6 NYCRR Part 375-6.8, for those contaminants found in site groundwater above standards; and
- any underground storage tanks (USTs), fill ports, underground piping, vents or other structures associated with a source of contamination will be removed from the site.

All on-site soils which exceed the restricted residential use soil cleanup objectives (SCOs), as defined by 6 NYCRR Part 375-6.8, in the upper 15 feet, will be excavated and transported off-site for disposal, plus deeper excavations in the source area to remove soil exceeding the PGWSCOs. If a Track 2 restricted residential cleanup is achieved, a Cover System will not be a required element of the remedy.

Approximately 41,000 cubic yards of contaminated soil will be removed from the site.

Endpoint samples will be collected from the bottom and sidewalls of the excavation areas following the soil removal to verify that all contaminant source soil has been removed.

3. Backfill

On-site soil which does not exceed the above excavation criteria or the protection of groundwater SCOs for any constituent may be used elsewhere on this site, including below the water table, to backfill the excavation or re-grade the site. Clean fill meeting the requirements of the 6 NYCRR Part 375-6.7(d) will be brought in to complete the backfilling of the excavation and establish the designed grades at the site.

4. Soil Vapor Extraction (SVE)

Soil vapor extraction (SVE) will be implemented on the south-central portion and at any sample locations identified during the RA above PGWSCOs for CVOCs that cannot be excavated to remove source material in soil. VOCs will be physically removed from the soil by applying a vacuum to wells that have been installed into the vadose zone (the area below the ground but above the water table). The vacuum draws air through the soil matrix which carries the VOCs from the soil to the SVE well. The air extracted from the SVE wells is then treated as necessary prior to being discharged to the atmosphere.

5. Vapor Mitigation

Any on-site buildings will be required to have a sub-slab depressurization system, or other acceptable measures, to mitigate the migration of vapors into the building from soil and groundwater.

6. Groundwater Treatment
In-situ chemical oxidation (ISCO) will be implemented to treat contaminants in groundwater. A chemical oxidant will be injected into the subsurface to destroy the contaminants in central and southeastern portions of the site (comprising approximately 4,400-square foot and 1,100-square foot areas) where chlorinated VOCs were elevated in the groundwater.

A total of 21 injection points will be installed, including 16 in the central portion of the site and five on the southeastern portion of the site, with a radius of influence (ROI) around each injection point anticipated to be approximately 10 feet. The treatment interval will extend from the top of the groundwater surface (approximately 28 feet below pre-remedial surface grade) to approximately 38 feet below pre-remedial surface grade. Approximately 7,200 pounds of sodium permanganate will be injected in a 15,200-gallon solution. This volume should be sufficient to provide adequate mixing and oxidant contact with the dissolved phase trichloroethylene (TCE).

Monitoring will be required up-gradient, down-gradient, and within the treatment zone prior to the initial injection event. The treatment zone will be monitored for dissolved oxygen and oxidation/reduction potential. Post-treatment sampling will be conducted 1, 3, and 6 months after the initial injection. Monitoring will be conducted for VOCs and total metals upgradient and downgradient of the treatment zone. Depending on concentrations after the initial injection event, additional treatment events may be deemed necessary. However, based on the proposed construction timeline of the new building, a permanent groundwater treatment system will be installed in the event that the system is needed in the future.

If needed, eight permanent injection wells will be installed in the treatment areas after the initial ISCO injection event is completed.

7. Petroleum Recovery
Installation and operation of vacuum-enhanced fluid recovery (VEFR) groundwater treatment system on the southwestern portion of the site to remove potentially mobile petroleum from the subsurface.

8. Institutional Control
Imposition of an institutional control in the form of an environmental easement for the controlled property that:

- requires the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);
- allows the use and development of the controlled property for restricted residential, commercial and industrial uses as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
- restricts the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or NYCDOH;
- requires compliance with the Department approved Site Management Plan.

9. Site Management Plan
A Site Management Plan is required, which includes the following:

a. an Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to ensure the following institutional and/or engineering controls remain in place and effective:
   – Institutional Controls: The Environmental Easement discussed above.
   – Engineering Controls: Groundwater treatment system, SVE system, and Vapor Mitigation system discussed above.

This plan includes, but may not be limited to:
- descriptions of the provisions of the environmental easement including any land use, and groundwater use restrictions;
- provisions for the management and inspection of the identified engineering controls;
- maintaining site access controls and Department notification; and
- the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.

b. a Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:
   - monitoring of groundwater, soil vapor and/or indoor air to assess the performance and effectiveness of the remedy; and
   - a schedule of monitoring and frequency of submittals to the Department.

c. an Operation and Maintenance (O&M) Plan to ensure continued operation, maintenance, optimization, monitoring, inspection, and reporting of any mechanical or physical components of the remedy. The plan includes, but is not limited to:
   - Compliance monitoring of treatment systems to ensure proper O&M as well as providing the data for any necessary permit or permit equivalent reporting;
   - maintaining site access controls and Department notification; and
   - providing the Department access to the site and O&M records.

Contingent Track 4

In the event that Track 2 restricted residential use is not achieved or soil vapor remedial actions objectives are not met, the remedy will achieve a Track 4, site-specific cleanup at a minimum and will include a site cover as described below.

10. Cover System

A site cover will be required to allow for restricted residential use of the site. The cover will consist of a minimum two-foot clean fill buffer with demarcation barrier in all landscaped and non-covered areas, asphalt paved areas, and concrete building foundations, sidewalks, and pathways to prevent human exposure to residual contaminated soil/fill remaining under the Site. Where cover is required it will be a minimum of two foot of material, meeting the SCOs for cover material as set forth in 6 NYCRR Part 375-6.7(d) for restricted residential use. Any fill material brought to the site will meet the requirements for the identified site use as set forth in 6 NYCRR Part 375-6.7(d).

Declaration

The remedy conforms with promulgated standards and criteria that are directly applicable, or that are relevant and appropriate and takes into consideration Department guidance, as appropriate. The remedy is protective of public health and the environment.

September 22, 2020

Date

Gerard Burke, Director
Remedial Bureau B

DECISION DOCUMENT

Atlantic Chestnut - Lot 2
Brooklyn, Kings County
Site No. C224235
September 2020

SECTION 1: SUMMARY AND PURPOSE

The New York State Department of Environmental Conservation (the Department), in consultation with the New York State Department of Health (NYSDOH), has selected a remedy for the above referenced site. The disposal of contaminants at the site has resulted in threats to public health and the environment that would be addressed by the remedy. The disposal or release of contaminants at this site, as more fully described in this document, has contaminated various environmental media. Contaminants include hazardous waste and/or petroleum.

The New York State Brownfield Cleanup Program (BCP) is a voluntary program. The goal of the BCP is to enhance private-sector cleanups of brownfields and to reduce development pressure on "greenfields." A brownfield site is real property, the redevelopment or reuse of which may be complicated by the presence or potential presence of a contaminant.

The Department has issued this document in accordance with the requirements of New York State Environmental Conservation Law and 6 NYCRR Part 375. This document is a summary of the information that can be found in the site-related reports and documents.

SECTION 2: CITIZEN PARTICIPATION

The Department seeks input from the community on all remedies. A public comment period was held, during which the public was encouraged to submit comment on the proposed remedy. All comments on the remedy received during the comment period were considered by the Department in selecting a remedy for the site. Site-related reports and documents were made available for review by the public at the following document repositories:

DECInfo Locator - Web Application
https://gisservices.dec.ny.gov/gis/dil/index.html?rs=C224235

Brooklyn Public Library - Cypress Hills Branch
1197 Sutter Avenue
Brooklyn, NY 11208
Phone: (718) 277-6004

Brooklyn Community Board 5
127 Pennsylvania Avenue

Brooklyn, NY 11207
Phone: (718) 498-5711

Receive Site Citizen Participation Information By Email

Please note that the Department's Division of Environmental Remediation (DER) is "going paperless" relative to citizen participation information. The ultimate goal is to distribute citizen participation information about contaminated sites electronically by way of county email listservs. Information will be distributed for all sites that are being investigated and cleaned up in a particular county under the State Superfund Program, Environmental Restoration Program, Brownfield Cleanup Program and Resource Conservation and Recovery Act Program. We encourage the public to sign up for one or more county listservs at http://www.dec.ny.gov/chemical/61092.html

SECTION 3: SITE DESCRIPTION AND HISTORY

Location: The site is located at 235 Chestnut Street in an urban area in the East New York neighborhood of Brooklyn, NY. The site is a rectangular-shaped parcel and is denoted on New York City tax maps as Block 4143, Lot 2. The site is bounded to the north by a vacant lot (BCP Site No. C224234); to the east by Euclid Avenue, followed by residential properties; to the south by a vacant lot (BCP Site No. C224236) and to the west by Chestnut Street, followed by vacant land, Dinsmore Place, and commercial and residential properties.

Site Features: The site is approximately 1.72 acres in size and consists of a concrete and asphalt-paved parcel with a former cellar area in the northeastern portion of the site and was previously developed with vacant, interconnected, fire-damaged factory buildings that extended across two south-adjoining properties. The buildings were demolished between July and December 2016.

Current Zoning and Land Use: The site is currently vacant and is zoned as M1-1 (manufacturing) and C8-2 (commercial). The surrounding area is developed with residential, commercial, manufacturing, transportation, and industrial uses. The elevated J and Z MTA subway tracks are located above Fulton Street to the north and the LIRR tracks are located beneath Atlantic Avenue to the south.

Past Use of the Site: The site was developed for industrial and manufacturing uses, including the Columbia Machine Works and Malleable Iron Company, the Columbia Cable and Electric Corporation, Blue Ridge Farms, Inc., and Chloe Foods Corp. between 1908 and 2012. Other previous uses include blacksmithing and stamping, a brass foundry, wood working, a blacksmith, a machine shop, tank and engine rooms, an iron works, wire braiding, and cable manufacturing.

Site Geology and Hydrogeology: Surface topography at the site is generally level. The site lies at an elevation of approximately 39 feet above mean sea level. Historic fill materials (including sand, gravel, silt, ash, slag, concrete, and asphalt) extend to depths of approximately 7 feet below ground surface (bgs). The fill is underlain by native sand and gravel to approximately 40 feet below grade. Bedrock was not encountered during any of the investigations conducted at the site. The surrounding area slopes down to the south. Groundwater was encountered approximately 30

feet below grade and flows to the south. Jamaica Bay is the nearest water body and is located approximately 2.5 miles south of the site.

A site location map is attached as Figure 1.

SECTION 4: LAND USE AND PHYSICAL SETTING

The Department may consider the current, intended, and reasonably anticipated future land use of the site and its surroundings when evaluating a remedy for soil remediation. For this site, alternatives (or an alternative) that restrict(s) the use of the site to restricted-residential use (which allows for commercial use and industrial use) as described in Part 375-1.8(g) were/was evaluated in addition to an alternative which would allow for unrestricted use of the site.

A comparison of the results of the Remedial Investigation (RI) to the appropriate standards, criteria and guidance values (SCGs) for the identified land use and the unrestricted use SCGs for the site contaminants is available in the RI Report.

SECTION 5: ENFORCEMENT STATUS

The Applicant under the Brownfield Cleanup Agreement is a Volunteer. The Applicant does not have an obligation to address off-site contamination. However, the Department in consultation with NYSDOH, has determined that this site poses a significant threat to public health or the environment; accordingly, an enforcement action is necessary.

The Department will seek to identify any parties (other than the Volunteer(s)) known or suspected to be responsible for contamination at or emanating from the site, referred to as Potentially Responsible Parties (PRPs). The Department will bring an enforcement action against the PRPs. If an enforcement action cannot be brought, or does not result in the initiation of a remedial program by any PRPs, the Department will evaluate the off-site contamination for action under the State Superfund. The PRPs are subject to legal actions by the State for recovery of all response costs the State incurs or has incurred.

SECTION 6: SITE CONTAMINATION

6.1: Summary of the Remedial Investigation

A remedial investigation (RI) serves as the mechanism for collecting data to:

- characterize site conditions;
- determine the nature of the contamination; and
- assess risk to human health and the environment.

The RI is intended to identify the nature (or type) of contamination which may be present at a site and the extent of that contamination in the environment on the site, or leaving the site. The RI reports on data gathered to determine if the soil, groundwater, soil vapor, indoor air, surface water or sediments may have been contaminated. Monitoring wells are installed to assess

groundwater and soil borings or test pits are installed to sample soil and/or waste(s) identified. If other natural resources are present, such as surface water bodies or wetlands, the water and sediment may be sampled as well. Based on the presence of contaminants in soil and groundwater, soil vapor will also be sampled for the presence of contamination. Data collected in the RI influence the development of remedial alternatives. The RI report is available for review in the site document repository and the results are summarized in section 6.3.

The analytical data collected on this site includes data for:

- groundwater
- soil
- soil vapor

6.1.1: Standards, Criteria, and Guidance (SCGs)

The remedy must conform to promulgated standards and criteria that are directly applicable or that are relevant and appropriate. The selection of a remedy must also take into consideration guidance, as appropriate. Standards, Criteria and Guidance are hereafter called SCGs.

To determine whether the contaminants identified in various media are present at levels of concern, the data from the RI were compared to media-specific SCGs. The Department has developed SCGs for groundwater, surface water, sediments, and soil. The NYSDOH has developed SCGs for drinking water and soil vapor intrusion. For a full listing of all SCGs see: http://www.dec.ny.gov/regulations/61794.html

6.1.2: RI Results

The data have identified contaminants of concern. A "contaminant of concern" is a contaminant that is sufficiently present in frequency and concentration in the environment to require evaluation for remedial action. Not all contaminants identified on the property are contaminants of concern. The nature and extent of contamination and environmental media requiring action are summarized below. Additionally, the RI Report contains a full discussion of the data. The contaminant(s) of concern identified at this site is/are:

copper
tetrachloroethene (PCE)
barium
lead
trichloroethene (TCE)
benzo(a)anthracene
benzo(a)pyrene
benzo(b)fluoranthene
dibenz[a,h]anthracene
indeno(1,2,3-CD)pyrene
mercury

The contaminant(s) of concern exceed the applicable SCGs for:

- groundwater
- soil

6.2: Interim Remedial Measures

An interim remedial measure (IRM) is conducted at a site when a source of contamination or exposure pathway can be effectively addressed before issuance of the Decision Document.

The following IRM(s) has/have been completed at this site based on conditions observed during the RI.

Perimeter Soil Vapor Extraction System IRM

A Soil Vapor Extraction System (SVES) was installed around the perimeter of the site. The SVES applies a negative pressure (vacuum) to the subsurface to recover and treat vapor at the site boundaries. Recovered vapors are directed to an above-ground vapor treatment system, consisting of granulated activated carbon (GAC), and subsequently discharged to the atmosphere in accordance with 6 New York Code of Rules and Regulations (NYCRR) Part 212. The SVES is currently in operation and includes two vapor recovery systems, with one system treating vapors from the site and the other system treating vapors from the Atlantic Chestnut - Lot 1 (C224234) and Atlantic Chestnut - Lot 3 (C224236). The SVES was designed to accommodate the phasing out/dismantling portions of the system based on the proposed development schedules. The remaining operational portions of the SVES will be rebalanced after partial dismantling. Completion of the SVES system is documented in the draft September 2019 Construction Completion Report.

6.3: Summary of Environmental Assessment

This section summarizes the assessment of existing and potential future environmental impacts presented by the site. Environmental impacts may include existing and potential future exposure pathways to fish and wildlife receptors, wetlands, groundwater resources, and surface water. The RI report presents a detailed discussion of any existing and potential impacts from the site to fish and wildlife receptors.

Nature and Extent of Contamination:
Soil and groundwater were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, polychlorinated biphenyls (PCBs), and pesticides. Groundwater was also analyzed for emerging contaminants. Soil vapor samples were analyzed for VOCs. Based upon the investigations performed to date the primary contaminants of concern are volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) and metals.

Soil - In soil, chlorinated VOCs were detected at concentrations above the applicable protection of groundwater soil cleanup objectives (PGWSCOs) at shallow and deep intervals across the southern and southwestern portions of the site. Trichloroethene (TCE) was detected in shallow soil on the southern portion of the site at a maximum concentration of 293 parts per million (ppm) compared to the PGWSCO of 0.47 ppm. TCE also was detected in deep soil (20 to 22 feet below grade) at 93.5 ppm. Free-phase petroleum was identified in soil and groundwater in the southwestern portion of the site. The historic fill layer, which extends in some parts of the site to approximately 20 feet below surface grade, contains SVOCs and metals at concentrations

exceeding the restricted residential soil cleanup objectives (RRSCOs). SVOCs include benzo(a)anthracene detected at a maximum concentration of 2.6 ppm (RRSCO is 1 ppm), benzo(a)pyrene at a maximum concentration of 2.4 ppm (RRSCO is 1 ppm), benzo(b)fluoranthene at a maximum concentration of 3.2 ppm (RRSCO is 1 ppm) dibenz(a,h)anthracene a maximum concentration of 0.37 ppm, (RRSCO is 0.33 ppm); and indeno(1,2,3-cd)pyrene at a maximum concentration of 2.2 ppm (RRSCO is 0.5 ppm). Metal concentrations were detected above their respective RRSCOs including copper at a maximum concentration of 3,820 ppm (RRSCO is 270 ppm), barium at a maximum concentration of 3,980 ppm (RRSCO is 400 ppm), mercury at a maximum concentration of 0.82 ppm (RRSCO of 0.81 ppm) and lead at a maximum concentration of 2,490 ppm (RRSCO is 400 ppm). Data does not indicate any off-site impacts in soil related to this site.

Groundwater - In groundwater, chlorinated VOCs exceeding their respective ambient water quality standards (AWQS) include PCE at 20.5 parts per billion, or ppb (AWQS is 5 ppb) and TCE at 179 ppb (AWQS is 5 ppb). Chloroform was detected at a maximum concentration of 30.1 ppb, which exceeds its AWQS of 7 ppb. For emerging contaminants, perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS) were reported at concentrations of up to 20.6 and 33.2 parts per trillion (ppt), respectively, exceeding the 10 ppt screening levels for groundwater for each. Elevated concentrations of contaminants are present in groundwater at the site boundaries, indicating a potential for off-site migration.

Soil Vapor - Petroleum and chlorinated solvent VOCs were identified at elevated concentrations in on-site soil vapor. PCE was detected as high as 179 micrograms per cubic meter (ug/m3) and TCE as high as 17,100 ug/m3. Elevated concentrations are present at the site boundaries, indicating a potential for off-site migration.

6.4: Summary of Human Exposure Pathways

This human exposure assessment identifies ways in which people may be exposed to site-related contaminants. Chemicals can enter the body through three major pathways (breathing, touching or swallowing). This is referred to as *exposure.*

The site is completely fenced, which restricts public access. However, persons who enter the site could contact contaminants in the soil by walking on the site, digging or otherwise disturbing the soil. People are not drinking the contaminated groundwater because the area is served by a public water supply that is not affected by this contamination. Volatile organic compounds in soil vapor (air spaces within the soil) may move into buildings and affect the indoor air quality. This process, which is similar to the movement of radon gas from the subsurface into the indoor air of buildings, is referred to as soil vapor intrusion. Because the site is vacant, the inhalation of site related contaminants due to soil vapor intrusion does not represent a current concern. The potential exists for the inhalation of site contaminants due to soil vapor intrusion for offsite structures and for any future onsite redevelopment and occupancy.

6.5: Summary of the Remediation Objectives

The objectives for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375. The goal for the remedial program is to restore the site to pre-disposal conditions to the extent feasible. At a minimum, the remedy shall eliminate or mitigate all significant threats to public health and the environment presented by the contamination identified at the site through the proper application of scientific and engineering principles.

The remedial action objectives for this site are:

Groundwater

RAOs for Public Health Protection

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

RAOs for Environmental Protection

- Restore ground water aquifer to pre-disposal/pre-release conditions, to the extent practicable.
- Remove the source of ground or surface water contamination.

Soil

RAOs for Public Health Protection

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

RAOs for Environmental Protection

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

Soil Vapor

RAOs for Public Health Protection

- Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion into buildings at a site.

SECTION 7: ELEMENTS OF THE SELECTED REMEDY

The alternatives developed for the site and the evaluation of the remedial criteria are presented in the Alternative Analysis. The remedy is selected pursuant to the remedy selection criteria set forth in DER-10, Technical Guidance for Site Investigation and Remediation and 6 NYCRR Part 375.

The selected remedy is a Track 2: Restricted use with generic soil cleanup objectives remedy.

The selected remedy is referred to as the Excavation, In-Situ Groundwater Treatment, SVE and Vapor Mitigation remedy.

The elements of the selected remedy, as shown in Figures 2 through 5, are as follows:

1. Remedial Design
A remedial design program will be implemented to provide the details necessary for the construction, operation, optimization, maintenance, and monitoring of the remedial program. Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy as per DER-31. 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;
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- Maximizing habitat value and creating habitat when possible;
- Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals; and
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development.
- Additionally, to incorporate green remediation principles and techniques to the extent feasible in the future development at this site, and to be consistent with the requirements of an e-designation by New York City, any future on-site buildings will include, at a minimum, a 20-mil vapor barrier to improve energy efficiency through the elimination of vapor transmission through the foundation as an element of construction.

2. Excavation
Excavation and off-site disposal of contaminant source areas, including:

- grossly contaminated soil, as defined in 6 NYCRR Part 375-1.2(u);
- soil with non-aqueous phase liquid;
- soils which exceed the protection of groundwater soil cleanup objectives (PGWSCOs), as defined by 6 NYCRR Part 375-6.8, for those contaminants found in site groundwater above standards; and
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Approximately 41,000 cubic yards of contaminated soil will be removed from the site.

Endpoint samples will be collected from the bottom and sidewalls of the excavation areas following the soil removal to verify that all contaminant source soil has been removed.

3. Backfill
On-site soil which does not exceed the above excavation criteria or the protection of groundwater SCOs for any constituent may be used elsewhere on this site, including below the water table, to backfill the excavation or re-grade the site. Clean fill meeting the requirements of the 6 NYCRR Part 375-6.7(d) will be brought in to complete the backfilling of the excavation and establish the designed grades at the site.

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6. Groundwater Treatment
In-situ chemical oxidation (ISCO) will be implemented to treat contaminants in groundwater. A chemical oxidant will be injected into the subsurface to destroy the contaminants in central and southeastern portions of the site (comprising approximately 4,400-square foot and 1,100-square foot areas) where chlorinated VOCs were elevated in the groundwater.

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Monitoring will be required up-gradient, down-gradient, and within the treatment zone prior to the initial injection event. The treatment zone will be monitored for dissolved oxygen and oxidation/reduction potential. Post-treatment sampling will be conducted 1, 3, and 6 months after the initial injection. Monitoring will be conducted for VOCs and total metals upgradient and downgradient of the treatment zone. Depending on concentrations after the initial injection event, additional treatment events may be deemed necessary. However, based on the proposed construction timeline of the new building, a permanent groundwater treatment system will be installed in the event that the system is needed in the future.

If needed, eight permanent injection wells will be installed in the treatment areas after the initial ISCO injection event is completed.

7. Petroleum Recovery
Installation and operation of vacuum-enhanced fluid recovery (VEFR) groundwater treatment system on the southwestern portion of the site to remove potentially mobile petroleum from the subsurface.

8. Institutional Control
Imposition of an institutional control in the form of an environmental easement for the controlled property that:

- requires the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);
- allows the use and development of the controlled property for restricted residential, commercial and industrial uses as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
- restricts the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or NYCDOH;
- requires compliance with the Department approved Site Management Plan.

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a. an Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to ensure the following institutional and/or engineering controls remain in place and effective:
   - Institutional Controls: The Environmental Easement discussed above.
   - Engineering Controls: Groundwater treatment system, SVE system, and Vapor Mitigation system discussed above.

   This plan includes, but may not be limited to:
   - descriptions of the provisions of the environmental easement including any land use, and groundwater use restrictions;
   - provisions for the management and inspection of the identified engineering controls;
   - maintaining site access controls and Department notification; and
   - the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.

b. a Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:
   - monitoring of groundwater, soil vapor and/or indoor air to assess the performance and effectiveness of the remedy; and
   - a schedule of monitoring and frequency of submittals to the Department.

c. an Operation and Maintenance (O&M) Plan to ensure continued operation, maintenance, optimization, monitoring, inspection, and reporting of any mechanical or physical components of the remedy. The plan includes, but is not limited to:

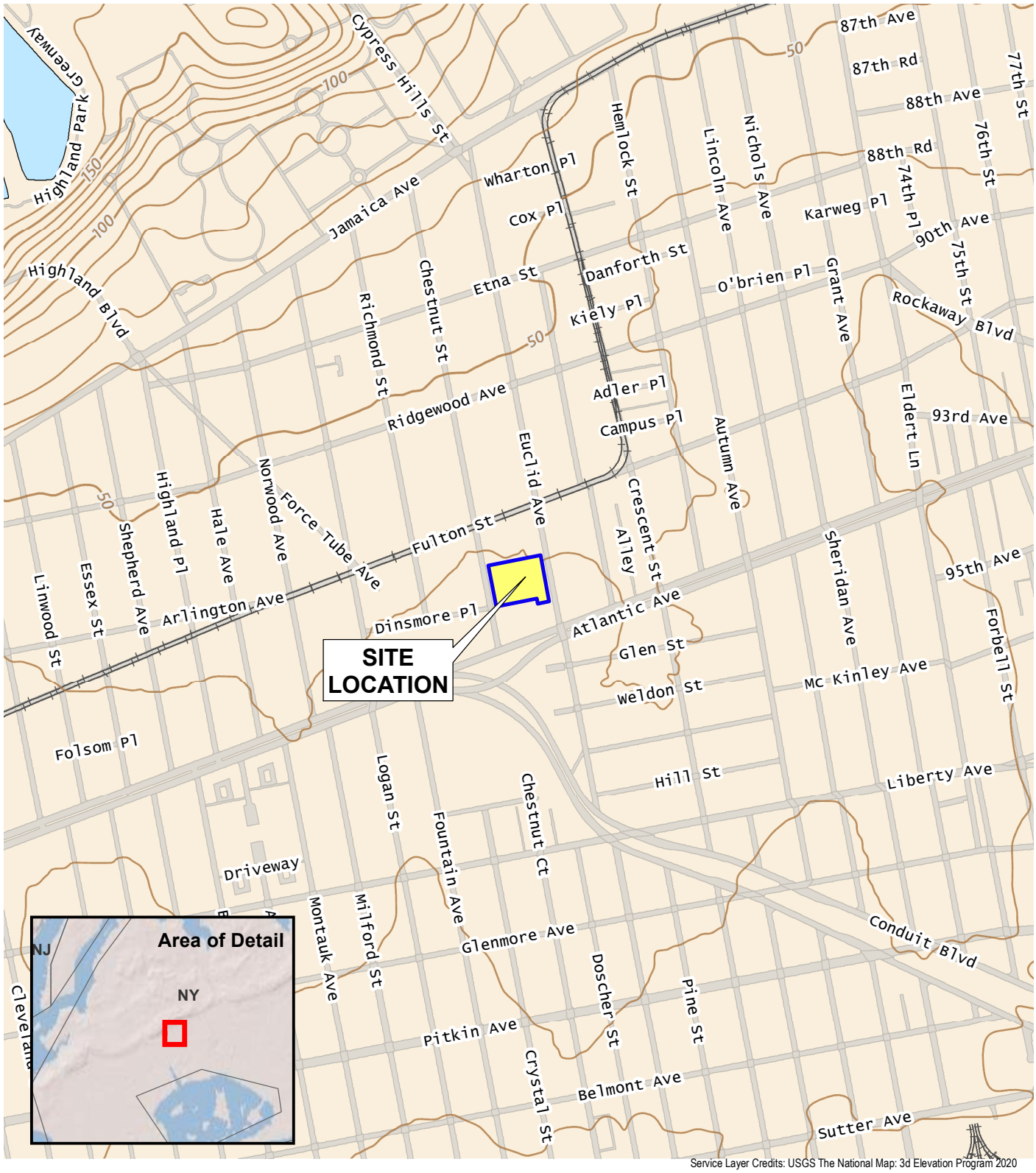
- Compliance monitoring of treatment systems to ensure proper O&M as well as providing the data for any necessary permit or permit equivalent reporting;
- maintaining site access controls and Department notification; and
- providing the Department access to the site and O&M records.

Contingent Track 4

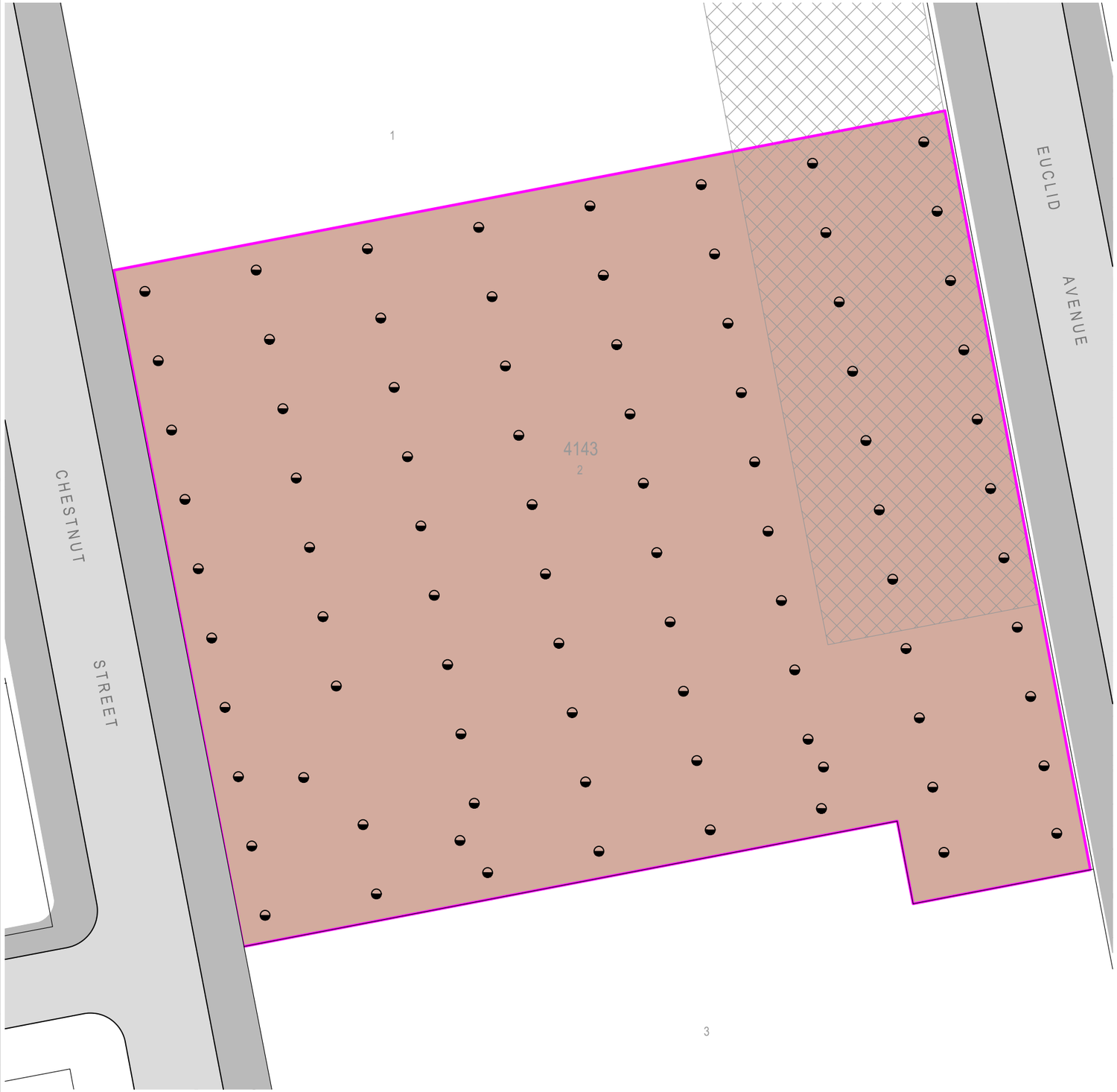
In the event that Track 2 restricted residential use is not achieved or soil vapor remedial actions objectives are not met, the remedy will achieve a Track 4, site-specific cleanup at a minimum and will include a site cover as described below.

10. Cover System

A site cover will be required to allow for restricted residential use of the site. The cover will consist of a minimum two-foot clean fill buffer with demarcation barrier in all landscaped and non-covered areas, asphalt paved areas, and concrete building foundations, sidewalks, and pathways to prevent human exposure to residual contaminated soil/fill remaining under the Site. Where cover is required it will be a minimum of two foot of material, meeting the SCOs for cover material as set forth in 6 NYCRR Part 375-6.7(d) for restricted residential use. Any fill material brought to the site will meet the requirements for the identified site use as set forth in 6 NYCRR Part 375-6.7(d).



	Atlantic Chestnut - Lot 2 **254 Euclid Avenue** Brooklyn, New York	DATE **4/29/2020**
		PROJECT NO. **12493**
	SITE LOCATION	FIGURE **1**



LEGEND

- BCP SITE BOUNDARY
- 2 — LOT BOUNDARY
- 4143 — BLOCK NUMBER
- APPROXIMATE EXTENT OF FORMER PARTIAL CELLAR
- PROPOSED REMEDIAL EXCAVATION TO 15 FEET BELOW SIDEWALK GRADE
- PROPOSED POST-EXCAVATION ENDPOINT SAMPLE LOCATION

0 20 40 80

SCALE IN FEET

Map Source:
- NYCDCP (NYC Dept. of City Planning) GIS database.

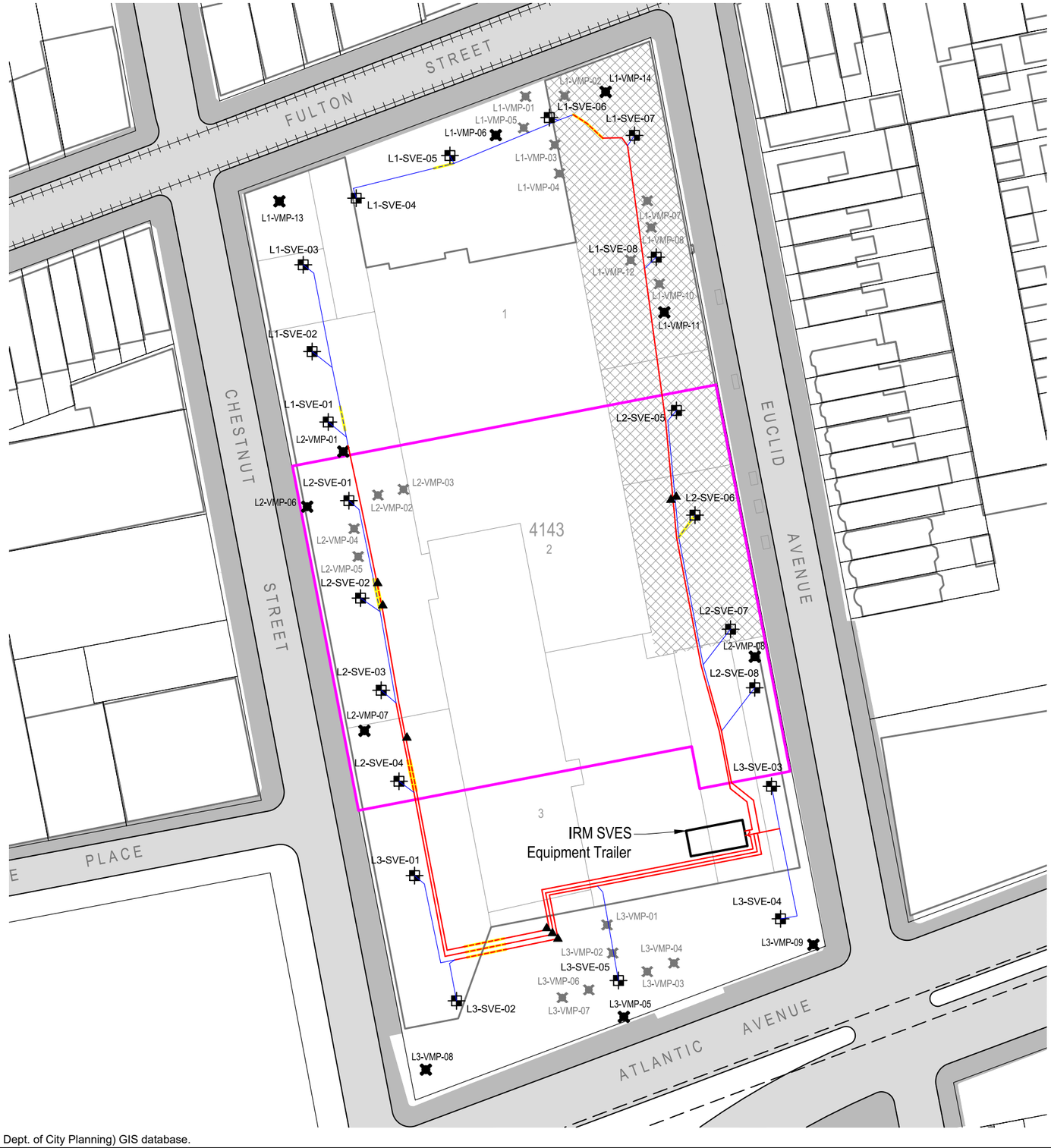
Atlantic Chestnut - Lot 2
254 Euclid Avenue
Brooklyn, New York

PROPOSED REMEDIAL EXCAVATION AND ENDPOINT SAMPLE LOCATION PLAN

DATE
6/11/2020

PROJECT NO.
12493

FIGURE
2



LEGEND

- BCP SITE BOUNDARY
- 2 — LOT BOUNDARY
- 4143 — BLOCK NUMBER
- FORMER BUILDING LINE
- LIRR SUBTERRANEAN TRACKS
- MTA RAILROAD ELEVATED TRACKS
- APPROXIMATE EXTENT OF FORMER PARTIAL CELLAR
- IRM SOIL VAPOR EXTRACTION WELL LOCATION
- 4-INCH Ø PVC SVE PIPING
- 6-INCH Ø PVC SVE PIPING
- 4-INCH Ø FLEXIBLE SVE HOSE
- 6-INCH Ø FLEXIBLE SVE HOSE
- IRM SVES SYSTEM TRAILER
- L1-VMP-05 — VAPOR MONITORING POINT (FOR SYSTEM DESIGN PURPOSED ONLY)
- L1-VMP-06 — VAPOR MONITORING POINT (FOR SYSTEM DESIGN AND MONITORING PURPOSES)
- ▲ CONDENSATE DRAIN

0 40 80 160

SCALE IN FEET

Map Source:
- NYCDCP (NYC Dept. of City Planning) GIS database.

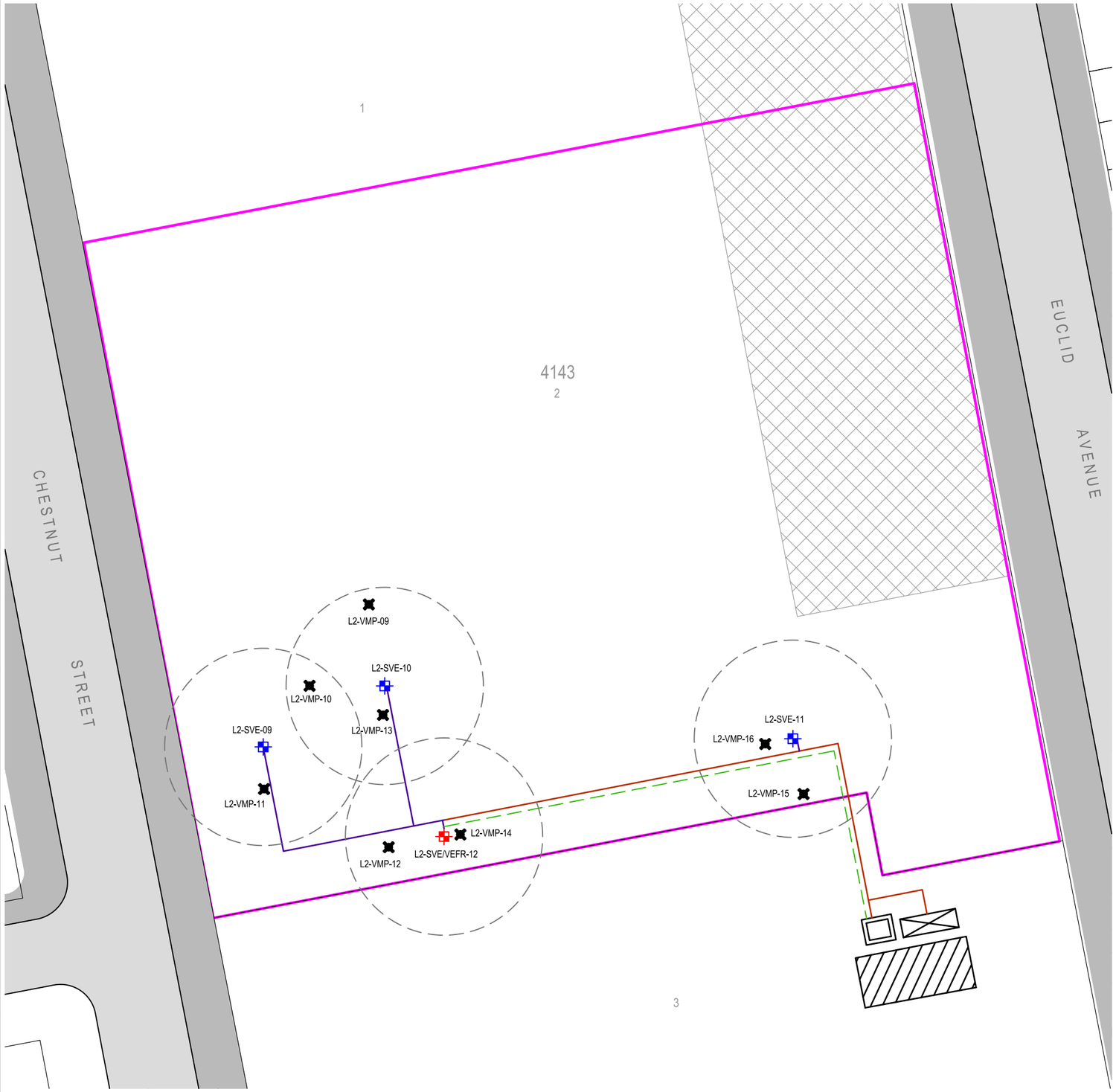
Atlantic Chestnut - Lot 2
254 Euclid Avenue
Brooklyn, New York

IRM SVES PLAN

DATE
03/03/2020

PROJECT NO.
12493

FIGURE
3



LEGEND

- BCP SITE BOUNDARY
- 2 — LOT BOUNDARY
- 4143 — BLOCK NUMBER
- APPROXIMATE EXTENT OF FORMER PARTIAL CELLAR
- PROPOSED SOIL VAPOR EXTRACTION WELL WITH 35-FOOT RADIUS OF INFLUENCE
- PROPOSED SOIL VAPOR EXTRACTION AND VAPOR ENHANCED FLUID RECOVERY WELL WITH 35-FOOT RADIUS OF INFLUENCE
- PROPOSED 4" Ø SUBSURFACE SVES PIPING
- PROPOSED 6" Ø SUBSURFACE SVES PIPING
- PROPOSED LNAPL RECOVERY TUBING
- EXISTING IRM SVES EQUIPMENT SHED
- PROPOSED VEFR NAPL RECOVERY SYSTEM
- PROPOSED REMEDIAL SVES EQUIPMENT SKID
- PROPOSED VACUUM MONITORING POINT LOCATION

0 20 40 80

SCALE IN FEET

Map Source:
- NYCDCP (NYC Dept. of City Planning) GIS database.

PROPOSED SVES LAYOUT PLAN

Atlantic Chestnut - Lot 2
254 Euclid Avenue
Brooklyn, New York

DATE
6/11/2020

PROJECT NO.
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FIGURE
4

LEGEND

- BCP SITE BOUNDARY
- 2 — LOT BOUNDARY
- 4143 — BLOCK NUMBER
- APPROXIMATE EXTENT OF FORMER PARTIAL CELLAR
- REMEDIAL INVESTIGATION GROUNDWATER MONITORING WELL LOCATION (2016)
- SUPPLEMENTAL REMEDIAL INVESTIGATION GROUNDWATER MONITORING WELL LOCATION (2017)
- SUPPLEMENTAL REMEDIAL INVESTIGATION NESTED GROUNDWATER MONITORING WELL LOCATION (2017)
- SUBSURFACE INVESTIGATION TEMPORARY GROUNDWATER MONITORING WELL LOCATION (REMOVED) (2015)
- REMEDIAL INVESTIGATION GROUNDWATER MONITORING WELL LOCATION (2016)/ PROPOSED PERMANENT POST-REMEDIAL MONITORING WELL LOCATION
- PROPOSED PERMANENT POST-REMEDIAL MONITORING WELL LOCATION
- PROPOSED IN-SITU CHEMICAL OXIDATION (ISCO) MONITORING WELL LOCATION
- PROPOSED VACUUM-ENHANCED FLUID RECOVERY (VEFR) WELL LOCATION
- PROPOSED ISCO TEMPORARY GROUNDWATER INJECTION POINT LOCATION AND RADIUS OF INFLUENCE
- APPROXIMATE EXTENT OF PETROLEUM SPILL NO. 1708008

NOTE: MONITORING WELL L2-SRI-MW-12(S) WILL BE REMOVED AND A VEFR WELL WILL BE INSTALLED AT THE SAME LOCATION.

0 30 60 120
SCALE IN FEET

Map Source:
- NYCDCP (NYC Dept. of City Planning) GIS database.

Atlantic Chestnut - Lot 2
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Brooklyn, New York

EXTENT OF PETROLEUM CONTAMINATION AND PROPOSED GROUNDWATER TREATMENT PLAN

DATE
6/15/2020

PROJECT NO.
12493

FIGURE
5