DECISION DOCUMENT

2840 Atlantic Avenue
Brownfield Cleanup Program
Brooklyn, Kings County
Site No. C224255
March 2021

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

DECLARATION STATEMENT - DECISION DOCUMENT

2840 Atlantic Avenue
Brownfield Cleanup Program
Brooklyn, Kings County
Site No. C224255
March 2021

Statement of Purpose and Basis

This document presents the remedy for the 2840 Atlantic Avenue 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 2840 Atlantic Avenue 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;
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development; and
- Additionally, to incorporate green remediation principles and techniques to the extent

feasible in the future development at this site, any future on-site buildings will include, at a minimum, a 20-mil vapor barrier/waterproofing membrane on the foundation to improve energy efficiency as an element of construction.

2. Excavation

A. Excavation and off-site disposal of contaminant source areas to a minimum of 25 feet below ground surface, including:
- grossly contaminated soil, as defined in 6 NYCRR Part 375-1.2(u);
- non-aqueous phase liquids;
- soil with visual waste material or non-aqueous phase liquid;
- soil containing total SVOCs exceeding 500 ppm;
- 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
- soils that create a nuisance condition, as defined in Commissioner Policy CP-51 Section G.

B. Excavation and off-site disposal of all on-site soils which exceed Track 1 unrestricted SCOs, as defined by 6 NYCRR Part 375-6.8, with the exception of the underground storage tank (UST) area (see figure 2), which will be subject to the source material excavation criteria above. In areas where the Track 1 cleanup is achieved, a cover system will not be a required element of the remedy.

Collection and analysis of confirmatory samples to evaluate the performance of the remedy with respect to attainment of Track 1 unrestricted SCOs.

C. In the Track 4 UST area, all soils in the upper two feet which exceed restricted residential SCOs will be excavated and transported off-site for disposal.

D. Excavation and removal of any USTs, fuel dispensers, underground piping or other structures associated with a source of contamination.

E. Approximately 14,000 cubic yards of contaminated soil will be removed from the site.

3. Backfill

On-site soil which does not exceed the above excavation criteria and the protection of groundwater SCOs for any constituent may be used anywhere beneath the cover system, including below the water table, to backfill the excavation or re-grade the site.

Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be brought in to complete backfilling of the excavation and establish the designed grades at the site.

4. Cover System

A site cover will be required to allow for restricted residential use of the site in areas where the upper two feet of exposed surface soil will exceed the applicable SCOs. Where a soil cover is to be used it will be a minimum of two feet of soil placed over a demarcation layer, with the upper six inches of soil of sufficient quality to maintain a vegetative layer. Soil cover material, including any fill material brought to the site, will meet the SCOs for cover material for the use of the site as site forth in 6 NYCRR Part 375-6.7(d). Substitution of other materials and components may be allowed where such components already exist or are a component of tangible property to be placed as part of site redevelopment. Such components my include, but are not necessarily limited to: pavement, concrete, paved surface parking areas, sidewalks, building foundations and building slabs.

5. Petroleum Recovery

Installation and operation of petroleum recovery wells in the Track 4 UST area to remove potentially mobile petroleum from the subsurface. The number, depth, type and spacing of the recovery wells is detailed in the Remedial Action Work Plan. Petroleum will be collected alternately from the recovery wells *via* two automated collection systems.

6. Vapor Intrusion Evaluation

As part of the Track 1 remedy, a soil vapor intrusion (SVI) evaluation will be completed. The evaluation will include a provision for implementing actions recommended to address exposures related to soil vapor intrusion.

7. Conditional Track 1

The intent of the remedy is to achieve a partial Track 1 unrestricted use remedy outside of the Track 4 UST area. Therefore, no environmental easement (EE) or site management plan (SMP) is anticipated outside of the Track 4 UST area. If the SVI evaluation is not completed prior to the completion of the Final Engineering Report, then a sitewide EE and SMP will be required to address the SVI evaluation and implement actions as needed. If a mitigation or monitoring action is needed, a partial Track 1 cleanup can only be achieved if the mitigation system or other required action is no longer needed within five years of the date of the Certificate of Completion. In the event that a Track 1 unrestricted use is not achieved in this area, including achievement of groundwater and soil vapor remedial objectives, the following sitewide remedial elements will be required, and the remedy will achieve a Track 4 restricted residential cleanup:

- an environmental easement as discussed below;
- a Site Management Plan as discussed below; and
- a cover system discussed above.

The above controls will be required, as needed, for the Track 4 UST area.

8. Local Institutional Controls

If no EE or SMP is needed to achieve soil or soil vapor remedial action objectives, then the following local use restriction will be relied upon to prevent ingestion of groundwater: Article 141 of the NYCDOH code, which prohibits potable use of groundwater without prior approval.

Engineering and Institutional Controls

Imposition of an institutional control in the form of an environmental easement and a Site Management Plan, as described below, will be required. The remedy will achieve a combined conditional Track 1 and a Track 4 restricted residential cleanup at a minimum, and will include placement of a sitewide site cover (as a contingency if soil in the top 15 feet does not meet the restricted residential SCOs following of the excavation and backfill discussed above).

9. Institutional Controls

Imposition of an institutional control in the form of an environmental easement for the controlled property which will:

- require 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);
- allow the use and development of the controlled property for restricted residential use as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
- restrict the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or NYCDOH; and
- require compliance with the Department approved Site Management Plan.

10. 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. The Site Management Plan (SMP) covers the Track 4 UST area portion of the site and, as necessary, the remainder of the site (*e.g.*, sub-slab depressurization systems) for long term maintenance of the Engineering Controls.

    - Institutional Controls: The Environmental Easement discussed in Paragraph 9 above.
    - Engineering Controls: The Cover System discussed in Paragraph 4 above, and the Petroleum Recovery System discussed in Paragraph 5 above.

    This plan includes, but may not be limited to:

- an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination (an Excavation Plan will not be needed if the remedy achieves residential SCOs in the upper 15 feet);
- a provision for removal or treatment of the remaining source area in the Track 4 UST area;
- descriptions of the provisions of the environmental easement including any land use, and/or groundwater use restrictions;
- a provision for evaluation of the potential for soil vapor intrusion for any occupied buildings on the site, including provision for implementing actions recommended to address exposures related to soil vapor intrusion;
- 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 to assess the performance and effectiveness of the remedy;
   - a schedule of monitoring and frequency of submittals to the Department; and
   - monitoring for vapor intrusion for any buildings on the site, as may be required by the Institutional and Engineering Control Plan discussed above.

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:
   - procedures for operating and maintaining the remedy;
   - 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.

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.

March 25, 2021

Date

Richard A. Mustico, Director
Remedial Bureau A

DECISION DOCUMENT

2840 Atlantic Avenue
Brooklyn, Kings County
Site No. C224255
March 2021

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=C224255

Brooklyn Public Library - New Lots Branch
665 New Lots Avenue at Barbey Street
Brooklyn, NY 11207
Phone: 718-649-0311

Brooklyn Community Board 5
404 Pine Street, 3rd Floor

Brooklyn, NY 11208
Phone: 929-221-8261

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 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 2840 Atlantic Avenue site is located in an urban area of Brooklyn with a mix of industrial, commercial, and residential buildings. The site is comprised of one tax parcel identified as Block 3964, Lot 8 and is located on the south side of Atlantic Avenue, the east side of Schenck Avenue, and the west side of Barbey Street.

Site Features:
The 0.70-acre site is currently developed with a vacant three-story former industrial building that is a historic landmark on the northern portion of the site. The remainder of the site is vacant with no structures, which were previously demolished. A 5,000-gallon No. 4 fuel oil underground storage tank was emptied and temporarily closed in-place in 2016.

Current Zoning and Land Use:
The site is zoned for manufacturing (M1-4) and residential uses (R6A and R8A) and is currently vacant.

Past Use of the Site:
The earliest identified use of the site included a lumber yard, retail buildings, and residences dating back to 1887. The main building was constructed and operated as a dairy and food product manufacturing facility from approximately 1908 to the mid-to-late 1970s. The site was operated as a plastics and floor tile products manufacturing facility from the 1980s until 2016.

Site Geology and Hydrogeology:
Subsurface soils at the site consist of historic fill to a depth of approximately five feet below grade. Below the fill, soil consists of brown sands, gravel, and silts. Bedrock was not encountered to a depth of 55 feet.

Groundwater was encountered at depths between approximately 35 to 39 feet below grade. The groundwater flow direction at the site is towards the south-southwest.

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(s) under the Brownfield Cleanup Agreement is a/are Volunteer(s). The Applicant(s) does/do not have an obligation to address off-site contamination. However, the Department has determined that this site does not pose a significant threat to public health or the environment; accordingly, no enforcement actions are necessary.

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:

polycyclic aromatic hydrocarbons (PAHs)
PCB Aroclor 1254
arsenic
lead
tetrachloroethene (PCE)
trichloroethene (TCE)
benzene
ethylbenzene

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

- groundwater
- soil
- soil vapor intrusion

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 has been completed at this site based on conditions observed during the RI:

Building Demolition and Aboveground Storage Tank IRM:
Field work for the demolition of all site buildings, excluding the historic landmark building, commenced in February 2020 and was completed in December 2020. This IRM also included the removal of a 10,000-gallon aboveground fuel oil storage tank, boilers and other equipment from the basement of the building. All of the demolition materials were removed from the site, and no site soils were removed as part of this IRM.

This IRM was intended to facilitate remediation of the site by allowing the future excavation of contaminated soil south of the landmarked building. A construction completion report has yet to be submitted to the Department for review and approval.

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.

Soil and groundwater were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), pesticides, metals, per- and polyfluoroalkyl substances (PFAS) and 1,4-dioxane during the remedial investigation. Soil vapor, indoor air and sub-slab vapor were analyzed for VOCs during the investigation.

Soil:
Sample results from all soil borings were compared to the NYSDEC Part 375 unrestricted use soil cleanup objectives (UUSCO), protection of groundwater soil cleanup objectives (PGSCO) or restricted residential soil cleanup objectives (RRSCOs), as applicable.

Petroleum-related VOCs and polycyclic aromatic hydrocarbons (PAHs), a subset of SVOCs, were detected at concentrations above their applicable SCOs down to 55 feet below ground surface in the vicinity of the temporarily closed-in-place 5,000-gallon No. 4 fuel oil UST (Track 4 UST area). Maximum detections of contaminants include: benzene detected at 0.47 parts per million (ppm) (PGSCO - 0.06 ppm); ethylbenzene detected at 6.1 ppm (PGSCO – 1 ppm); benz(a)anthracene detected at 6 ppm (RRSCO – 1 ppm); benzo(a)pyrene detected at 3.2 ppm (RRSCO – 1 ppm); benzo(b)fluoranthene at 1.6 ppm (RRSCO – 1 ppm); chrysene detected at 6.7 ppm (PGSCO – 1 ppm); and naphthalene detected at 66 ppm (PGSCO – 12 ppm). In addition, lead was also detected in this area at a maximum concentration of 429 ppm, exceeding the RRSCO of 400 ppm.

The remainder of the site soil sample results that were compared to UUSCOs. PAHs, PCB Aroclor 1254 and metals were detected at concentrations above their respective NYSDEC Part 375 UUSCOs from zero to five feet below ground surface. Maximum exceedances of PAHs include: benz(a)anthracene detected at 36 ppm (UUSCO – 1 ppm); benzo(a)pyrene detected at 30 ppm (UUSCO – 1 ppm); benzo(b)fluoranthene at 27 ppm (UUSCO – 1 ppm); benzo(k)fluoranthene detected at 23 ppm (UUSCO – 0.8 ppm); chrysene detected at 34 ppm (UUSCO – 1 ppm); dibenz(a,h)anthracene was detected at 4.6 ppm (UUSCO – 0.33 ppm); and indeno(1,2,3-cd)pyrene was detected at 19 ppm (UUSCO – 0.5 ppm). PCB Aroclor 1254 was detected as high as 2.2 ppm (UUSCO – 0.1 ppm). Metals include lead detected at a maximum concentration of 713 ppm (UUSCO - 63 ppm), and arsenic detected at a maximum concentration of 63.5 ppm (UUSCO - 13 ppm).

Data does not indicate any off-site impacts in soil related to this site.

Groundwater:
Groundwater contamination is primarily limited to petroleum-related compounds with the most significant contamination found in the vicinity of the of the temporarily closed-in-place 5,000-gallon No. 4 fuel oil UST. Maximum exceedances of Ambient Water Quality Standards and Guidance Values (AWGSGV) are as follows: benzene at 14 parts per billion (ppb) (AWQSGV – 1 ppb); ethylbenzene at 15 ppb (AWQSGV – 5 ppb); benz(a)anthracene at 6.5 ppb (AWQSGV – 0.002 ppb); benzo(a)pyrene at 5.5 ppb (AWQSGV – non detect); benzo(b)fluoranthene at 3.2 ppb (AWQSGV – 0.002 ppb); chrysene at 14 ppb (AWQSGV – 0.002 ppb); naphthalene at 54 ppb (AWQSGV – 10 ppb); and phenanthrene at 60 ppb (AWQSGV – 50 ppb).

For PFAS, perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS) were detected at concentrations in groundwater up to 91.6 and 19.3 parts per trillion (ppt), respectively, exceeding the Maximum Contaminant Level (drinking water standard) of 10 ppt for each of the two compounds. These compounds were present in the upgradient monitoring wells, indicating that the PFAS contamination is not site-related. Groundwater analytical results for 1,4-dioxane were all non-detect.

Based on the data from the remedial investigation, it appears that site-related contaminated groundwater is not migrating off-site.

Soil Vapor:
Soil vapor sample results ranged from 1.18 to 12.0 micrograms per cubic meter (ug/m^3) for 1,2,4-trimethylbenzene; 2.72 to 49.5 ug/m^3 for 2-butanone; 25.2 to 208.0 ug/m^3 for acetone; non-detect (ND) to 1.23 ug/m^3 for benzene; 1.42 to 1.69 ug/m^3 for dichlorodifluoromethane; 1.06 to 1.96 ug/m^3 for trichlorofluoromethane (Freon 11); ND to 2.08 ug/m^3 for n-heptane; ND to 1.14 ug/m^3 for n-hexane; 4.14 to 42.2 ug/m^3 for xylenes; 3.72 to 12.7 ug/m^3 for toluene; 7.86 to 922 ug/m^3 for tetrachloroethene (PCE); 55.0 to 148.0 ug/m^3 trichloroethene (TCE); and 49.5 to 177.0 ug/m^3 for tetrahydrofuran.

Data does not indicate any off-site impacts in soil vapor related to this site.

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.*

Since the site is fenced and covered by asphalt or concrete, people will not come into contact with site-related soil and groundwater contamination unless they dig below the surface. Contaminated groundwater at the site is not used for drinking or other purposes and the site is served by a public water supply that obtains water from a different source 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. Currently there are no occupied buildings on the site so soil vapor intrusion is not a current concern, however the potential exists for indoor air impacts via the soil vapor intrusion pathway should the use of the

site change. Environmental sampling indicates soil vapor intrusion is not a concern for off-site buildings.

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 chosen 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,
- Prevent the discharge of contaminants to surface water.
- Remove the source of ground or surface water contamination.

Soil

RAOs for Public Health Protection

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

RAOs for Environmental Protection

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

Soil Vapor

- 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 Conditional Track 1: Unrestricted use, and a Track 4: Restricted use generic soil cleanup objectives in the vicinity of the temporarily closed-in-place underground storage tank, remedy.

The selected remedy is referred to as the Excavation, Cover System, Petroleum Recovery and Vapor Intrusion Evaluation remedy.

The elements of the selected remedy, as shown in Figure 2, 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;
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development; and
- Additionally, to incorporate green remediation principles and techniques to the extent feasible in the future development at this site, any future on-site buildings will include, at a minimum, a 20-mil vapor barrier/waterproofing membrane on the foundation to improve energy efficiency as an element of construction.

2. Excavation

A. Excavation and off-site disposal of contaminant source areas to a minimum of 25 feet below ground surface,including:
   - grossly contaminated soil, as defined in 6 NYCRR Part 375-1.2(u);
   - non-aqueous phase liquids;
   - soil with visual waste material or non-aqueous phase liquid;
   - soil containing total SVOCs exceeding 500 ppm;
   - 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

- soils that create a nuisance condition, as defined in Commissioner Policy CP-51 Section G.

B. Excavation and off-site disposal of all on-site soils which exceed Track 1 unrestricted SCOs, as defined by 6 NYCRR Part 375-6.8, with the exception of the underground storage tank (UST) area (see figure 2), which will be subject to the source material excavation criteria above. In areas where the Track 1 cleanup is achieved, a cover system will not be a required element of the remedy.

   Collection and analysis of confirmatory samples to evaluate the performance of the remedy with respect to attainment of Track 1 unrestricted SCOs.

C. In the Track 4 UST area, all soils in the upper two feet which exceed restricted residential SCOs will be excavated and transported off-site for disposal.

D. Excavation and removal of any USTs, fuel dispensers, underground piping or other structures associated with a source of contamination.

E. Approximately 14,000 cubic yards of contaminated soil will be removed from the site.

3. Backfill

On-site soil which does not exceed the above excavation criteria and the protection of groundwater SCOs for any constituent may be used anywhere beneath the cover system, including below the water table, to backfill the excavation or re-grade the site.

Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be brought in to complete backfilling of the excavation and establish the designed grades at the site.

4. Cover System

A site cover will be required to allow for restricted residential use of the site in areas where the upper two feet of exposed surface soil will exceed the applicable SCOs. Where a soil cover is to be used it will be a minimum of two feet of soil placed over a demarcation layer, with the upper six inches of soil of sufficient quality to maintain a vegetative layer. Soil cover material, including any fill material brought to the site, will meet the SCOs for cover material for the use of the site as site forth in 6 NYCRR Part 375-6.7(d). Substitution of other materials and components may be allowed where such components already exist or are a component of tangible property to be placed as part of site redevelopment. Such components my include, but are not necessarily limited to: pavement, concrete, paved surface parking areas, sidewalks, building foundations and building slabs.

5. Petroleum Recovery

Installation and operation of petroleum recovery wells in the Track 4 UST area to remove potentially mobile petroleum from the subsurface. The number, depth, type and spacing of the

recovery wells is detailed in the Remedial Action Work Plan. Petroleum will be collected alternately from the recovery wells *via* two automated collection systems.

6. Vapor Intrusion Evaluation

As part of the Track 1 remedy, a soil vapor intrusion (SVI) evaluation will be completed. The evaluation will include a provision for implementing actions recommended to address exposures related to soil vapor intrusion.

7. Conditional Track 1

The intent of the remedy is to achieve a partial Track 1 unrestricted use remedy outside of the Track 4 UST area. Therefore, no environmental easement (EE) or site management plan (SMP) is anticipated outside of the Track 4 UST area. If the SVI evaluation is not completed prior to the completion of the Final Engineering Report, then a sitewide EE and SMP will be required to address the SVI evaluation and implement actions as needed. If a mitigation or monitoring action is needed, a partial Track 1 cleanup can only be achieved if the mitigation system or other required action is no longer needed within five years of the date of the Certificate of Completion. In the event that a Track 1 unrestricted use is not achieved in this area, including achievement of groundwater and soil vapor remedial objectives, the following sitewide remedial elements will be required, and the remedy will achieve a Track 4 restricted residential cleanup:

- an environmental easement as discussed below;
- a Site Management Plan as discussed below; and
- a cover system discussed above.

The above controls will be required, as needed, for the Track 4 UST area.

8. Local Institutional Controls

If no EE or SMP is needed to achieve soil or soil vapor remedial action objectives, then the following local use restriction will be relied upon to prevent ingestion of groundwater: Article 141 of the NYCDOH code, which prohibits potable use of groundwater without prior approval.

Engineering and Institutional Controls

Imposition of an institutional control in the form of an environmental easement and a Site Management Plan, as described below, will be required. The remedy will achieve a combined conditional Track 1 and a Track 4 restricted residential cleanup at a minimum, and will include placement of a sitewide site cover (as a contingency if soil in the top 15 feet does not meet the restricted residential SCOs following of the excavation and backfill discussed above).

9. Institutional Controls

Imposition of an institutional control in the form of an environmental easement for the controlled property which will:

- require 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);
- allow the use and development of the controlled property for restricted residential use as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
- restrict the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or NYCDOH; and
- require compliance with the Department approved Site Management Plan.

10. 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. The Site Management Plan (SMP) covers the Track 4 UST area portion of the site and, as necessary, the remainder of the site (*e.g.*, sub-slab depressurization systems) for long term maintenance of the Engineering Controls.

   - Institutional Controls: The Environmental Easement discussed in Paragraph 9 above.
   - Engineering Controls: The Cover System discussed in Paragraph 4 above, and the Petroleum Recovery System discussed in Paragraph 5 above.

   This plan includes, but may not be limited to:
   - an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination (an Excavation Plan will not be needed if the remedy achieves residential SCOs in the upper 15 feet);
   - a provision for removal or treatment of the remaining source area in the Track 4 UST area;
   - descriptions of the provisions of the environmental easement including any land use, and/or groundwater use restrictions;
   - a provision for evaluation of the potential for soil vapor intrusion for any occupied buildings on the site, including provision for implementing actions recommended to address exposures related to soil vapor intrusion;
   - 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 to assess the performance and effectiveness of the remedy;
   - a schedule of monitoring and frequency of submittals to the Department; and

- monitoring for vapor intrusion for any buildings on the site, as may be required by the Institutional and Engineering Control Plan discussed above.

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:
   - procedures for operating and maintaining the remedy;
   - 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.

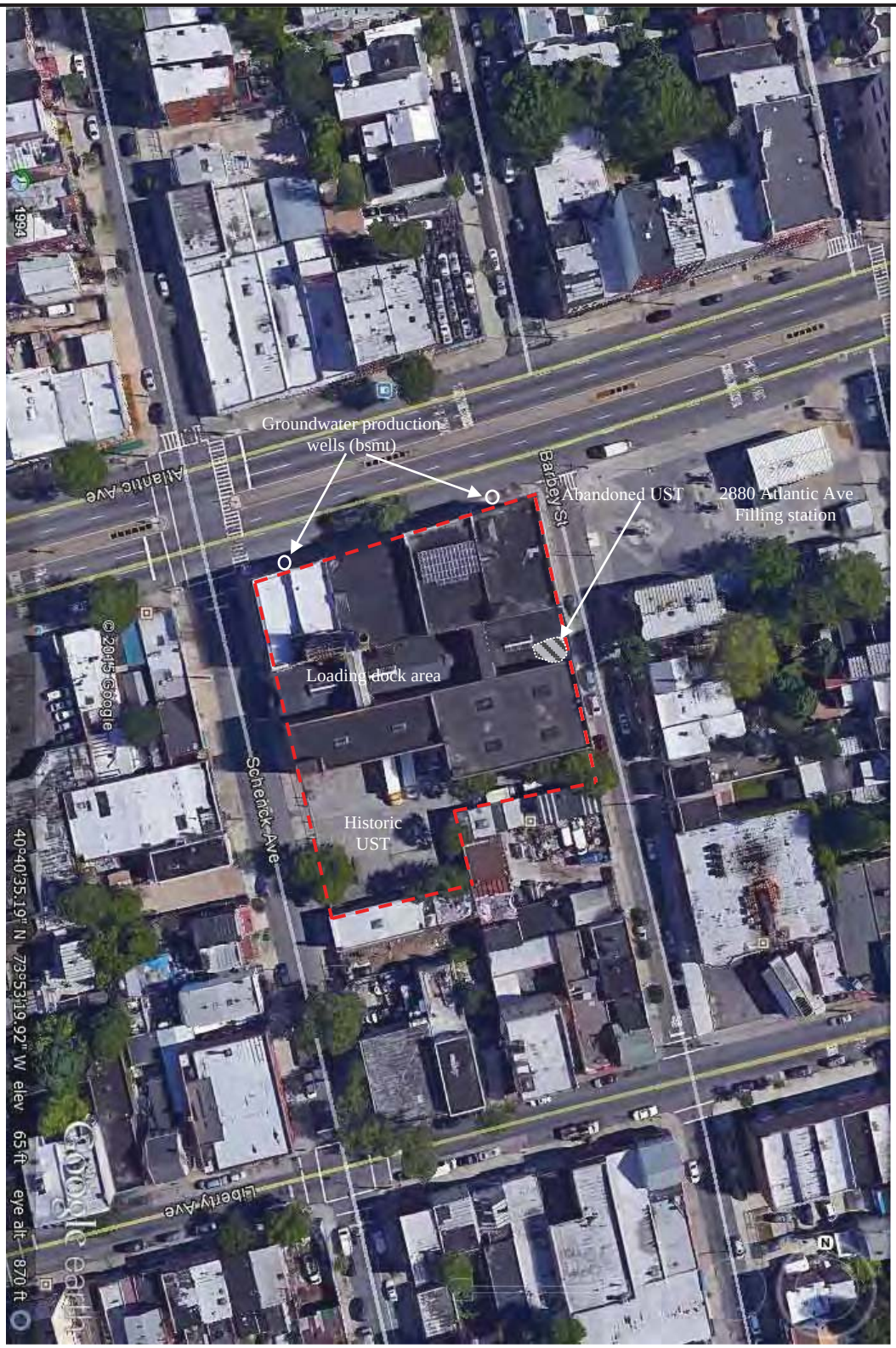
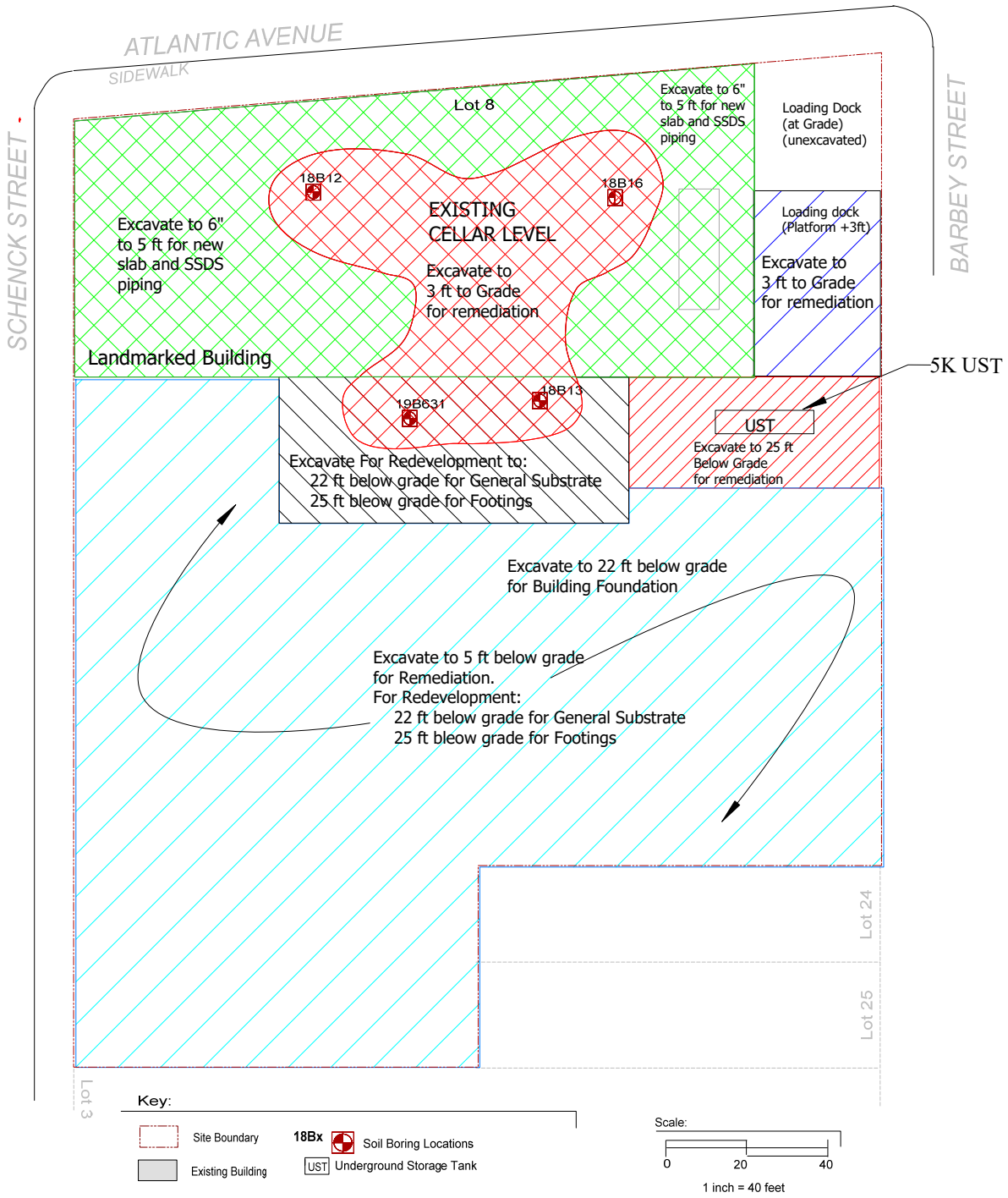


Figure 1: SITE DIAGRAM	SCALE: (Not to Scale)	N
----- Site Boundary UST- Underground Storage Tank	**Project:** 2840 Atlantic Avenue **Location:** Brooklyn, NY **Project No.:** C224255	



AMC Engineering, PLLC
1836 42nd Street
Astoria, NY 11105
718.545.0474

FIGURE 2

3/15/2021

Site Name: 2840 ATLANTIC

Site Address: 2840 ATLANTIC AVENUE, BROOKLYN NY

Drawing Title: EXCAVATION PLAN