

DECISION DOCUMENT

473 President Street
Brownfield Cleanup Program
Brooklyn, Kings County
Site No. C224220
October 2020



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

DECLARATION STATEMENT - DECISION DOCUMENT

473 President Street
Brownfield Cleanup Program
Brooklyn, Kings County
Site No. C224220
October 2020

Statement of Purpose and Basis

This document presents the remedy for the 473 President Street 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 473 President Street 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

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

- Source area excavation of 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. These soils are expected at 4 feet and 8 feet in the southeastern and northwestern corners, respectively.

In addition, all soils in the upper two feet which exceed the restricted residential soil cleanup objectives (SCOs) will be excavated and transported off-site for disposal. Approximately 1,700 cubic yards of contaminated soil will be removed from the site. Excavation and removal of any underground storage tanks (USTs), fuel dispensers, underground piping or other structures associated with a source of contamination.

3. Backfill

Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be brought in to replace the excavated soil 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 soil cleanup objectives (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 set 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 the tangible property to be placed as part of site redevelopment. Such components may include, but are not necessarily limited to: pavement, concrete, paved surface parking areas, sidewalks, building foundations and building slabs.

5. Sub-Membrane Depressurization (SMD) and Air Sparge with Soil Vapor Extraction (SVE)

Air sparging and soil vapor extraction and a sub-membrane depressurization system will be implemented to address the groundwater plume contaminated by petroleum-related volatile organic compounds (VOCs) and chlorinated organic compounds (CVOCs). VOCs and CVOCs will be physically removed from the groundwater and soil below the water table (saturated soil) by injecting air into the subsurface. The injected air rising through the groundwater will volatilize and transfer the VOCs and CVOCs from the groundwater and/or soil into the injected air. The VOCs and CVOCs are carried with the injected air into the vadose zone (the area below the ground surface but above the water table) where a soil vapor extraction (SVE) system designed to remove the injected air will be installed. The SVE system will apply a vacuum to wells that have been installed into the vadose zone to remove the VOCs and CVOCs along with the air introduced by the sparging process. The air extracted from the SVE wells will be treated as necessary prior to

being discharged to the atmosphere. The SMD and SVE system will also mitigate the migration of vapors into the on-site building from soil and groundwater

6. In-Situ Chemical Reduction

In-situ chemical reduction (ISCR) will be implemented to treat contaminants in groundwater if AS/SVE is not incorporated. A chemical reducing agent will be injected into the subsurface to destroy the contaminants in an area located throughout the site where petroleum-related and chlorinated VOCs, including TCE and its degradation byproducts, were elevated in the groundwater. The method and depth of injection will be determined during the remedial design.

7. Institutional Control

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 NYCDOHMH; and
- require compliance with the Department approved Site Management Plan.

8. 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 in Paragraph 7 above
 - Engineering Controls: The cover system discussed in Paragraph 4, the AS/SVE system discussed in Paragraph 5, and the In-Situ Chemical Reduction discussed in Paragraph 6 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; Note: an excavation plan is not needed for a remedy that achieves residential SCOs in the upper 15 ft;
- descriptions of the provisions of the environmental easement including any land use, and groundwater use restrictions;
- a provision that should a building foundation or building slab be removed in the future, a cover system consistent with that described in Paragraph 4 above will be placed in any areas where the upper two feet of exposed surface soil exceed the applicable soil cleanup objectives (SCOs)
- 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.

2. 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;
- monitoring for vapor intrusion for any buildings on the site, as may be required by the Institutional and Engineering Control Plan discussed above.

3. An Operation and Maintenance (O&M) Plan to ensure continued operation, maintenance, inspection, and reporting of any mechanical or physical components of the active vapor mitigation system. The plan includes, but is not limited to:

- procedures for operating and maintaining the system; and
- compliance inspection of the system to ensure proper O&M as well as providing the data for any necessary reporting.

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.

October 9, 2020

Date



Gerard Burke, Director
Remedial Bureau B

DECISION DOCUMENT

473 President Street
Brooklyn, Kings County
Site No. C224220
October 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=C224220>

Carroll Gardens Branch Library
396 Clinton Street
Brooklyn, NY 11231
Phone: 718-596-6972

Brooklyn Community Board 6
250 Baltic Street

Brooklyn, NY 11201-6401
Phone: (718) 643-3027

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 473 President Street site is located in an urban area in Brooklyn, NY. It is located in the southern portion of Block 440, Lot 12. The Gowanus Canal is approximately 350 ft to the west of the site. The site is bounded by a shuffleboard club to the north, a former electronics-waste recycler to the west, President Street to the south, and a former casket company to the east.

Site Features: The site is comprised of a 1 story warehouse that is fully utilized.

Current Zoning and Land Use: The site is vacant and was a former bicycle retailer, a furniture maker, and a showroom for a light designer. It is currently zoned M1-2 (commercial and light industrial uses). The proposed development project calls for demolition of the existing structures and the construction of a mixed-use residential and commercial building, in accordance with zoning laws for that area, with ground floor retail and parking. The development will coincide with the development activities at the neighboring site, President St. Portfolio, BCP Site No. C224309. The nearest residential area is across President Street, but the proposed redevelopment will be largely residential.

Past Use of the Site: The site has an industrial history dating to the 1880s. From 1886 to 1928, the site was a sash and door factory, and later a mill with a machine shop and boilers. In 1938 the Coca-Cola Bottling Co. operated two gasoline underground storage tanks (USTs) as part of their site activities. From 1969 to the 1990s, the site was occupied by Dolin Metal Manufacturing Co. From 1993 to 2007, the building was occupied by manufacturing and storage. There is an open spill from a failed tank test which resulted in petroleum-contaminated soils on-site. The spill number is 9412605.

Site Geology and Hydrogeology: The soils of the area consist of urban fill in the upper 10 feet. The fill consists of brown, medium to fine sand with varying amounts of gravel, brick, concrete, asphalt, coal fragments, coal ash, slag, and wood. Hardened coal tar was observed within the fill layer in a boring located in the southeastern portion of the site. The fill layer was underlain mainly by brown fine sand with varying amounts of silt and clay. Groundwater is approximately 10 foot below ground surface. The regional groundwater table is relatively flat with a slight gradient to the west towards the Gowanus Canal.

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 Applicants under the Brownfield Cleanup Agreement are Volunteers. The Volunteers do not have an obligation to address off-site contamination. The Department and the NYSDOH have determined that this site poses a significant threat to human health and the environment. Since the Volunteer owns the building north of the site and the site poses a significant threat to human health and the environment, the Department has required the Volunteer to perform a Soil Vapor Intrusion investigation in that building.

The Department has sought to identify any parties (other than the Volunteers) known or suspected to be responsible for contamination at or emanating from the site, referred to as Potentially Responsible Parties (PRPs). The Department has attempted to 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
- indoor air
- outdoor air
- sub-slab 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:

benzene	mercury
ethylbenzene	polycyclic aromatic hydrocarbons (PAHs), total
toluene	tetrachloroethene (PCE)
xylene (mixed)	dichloroethene (1,2-)
trichloroethene (TCE)	1,2,4-trimethylbenzene
arsenic	1,3,5-trimethylbenzene
lead	

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

Soil Vapor Intrusion Mitigation in Current Building

Interim Remedial Measures were implemented to address the elevated TCE concentrations in indoor air. Indoor air treatment units were installed in the eastern portion of the building, which had been occupied by a bicycle retail company. Five indoor air treatment units were installed on August 3, 2018, and three additional units were installed on November 19, 2018. A total of three indoor air documentation sampling events were conducted on August 17, September 7, and December 20, 2018.

Two indoor air samples and one ambient air sample were collected at about 3 to 4 feet above ground during each sampling event. The building was screened using a hand-held air monitoring device to identify potential sources of VOCs that may interfere with sampling. Indoor air and ambient air samples were collected into laboratory-supplied 6-liter Summa canisters with flow controllers calibrated for an 8-hour sampling period. Air samples were analyzed for VOCs by EPA Method TO-15.

The total VOC concentration in the indoor air documentation samples ranged from 150.2 micrograms per cubic meter (ug/m³) to 716.029 ug/m³. The total VOC concentration in the ambient air samples collected across three documentation sampling events ranged from 34.674 ug/m³ to 71.976 ug/m³. Twenty-six VOCs were detected in the indoor air samples at concentrations greater than in outdoor ambient air. One compound, TCE, was detected in all indoor air samples at concentrations exceeding the NYSDOH AGV, 2 ug/m³, ranging from 9.03 ug/m³ to 31.4 ug/m³.

Based on the findings, the indoor air treatment units did not reduce the indoor air concentrations to below the NYSDOH guideline values. The owner informed the tenants that the building can only be used for storage and cannot be continuously occupied. The building was fully vacated on December 31, 2019.

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 was analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, polychlorinated biphenyls (PCBs), pesticides, emerging contaminants, and metals. Groundwater was analyzed for VOCs, SVOCs, pesticides, emerging contaminants, and metals. Based upon investigations conducted to date, the primary contaminants of concern for the site include petroleum-related and chlorinated VOCs, SVOCs consisting primarily of Polycyclic Aromatic Hydrocarbons (PAHs), lead, mercury, and arsenic.

Soil: Benzene was found in soil at a maximum concentration of 2.1 parts per million (ppm), exceeding the protection of groundwater soil cleanup objective (SCO) of 0.06 ppm. Ethyl benzene was found in soil at a maximum concentration 32 ppm, exceeding the protection of groundwater standard of 1 ppm. Toluene was found in soil at a maximum concentration of 5.5 ppm, exceeding the protection of groundwater standard of 0.7 ppm. Xylenes (total) were found in soil at a maximum concentration of 250 ppm, exceeding the protection of groundwater standard of 0.26 ppm. Trichloroethene (TCE) was found in soil at a maximum concentration of 5.1 ppm, exceeding the protection of groundwater standard of 0.47 ppm. Cis-1,2-Dichloroethylene was found in soil at a maximum concentration of 3.7 ppm, exceeding the protection of groundwater standard of 0.25 ppm. 1,2,4-Trimethylbenzene was found in soil at a maximum concentration of 100 ppm, exceeding the protection of groundwater standard of 3.4 ppm. 1,3,5-Trimethylbenzene was found in soil at a maximum concentration of 29 ppm, exceeding the protection of groundwater standard of 8.4 ppm. Arsenic was found in soil at a maximum concentration of 203 ppm, exceeding the restricted residential standard of 16 ppm. Lead was found in soil at a maximum concentration of 1080 ppm, exceeding its restricted residential standard of 400 ppm. Mercury was found in soil at a maximum concentration of 18 ppm, exceeding its restricted residential standard of 0.73 ppm. Benzo(a)anthracene was found at a maximum concentration of 34 ppm, exceeding its restricted residential standard of 1 ppm. Benzo(a)pyrene was found at a maximum concentration of 29 ppm, exceeding its restricted residential standard of 1 ppm. Benzo(b)fluoranthene was found at a maximum concentration of 35 ppm, exceeding its restricted residential standard of 1 ppm. Diben(a,h)anthracene was found at a maximum concentration of 2.6 ppm, exceeding its restricted residential standard of 0.33 ppm. Indeno(1,2,3-cd)pyrene was found at a maximum concentration of 17 ppm, exceeding its restricted residential standard of 0.5 ppm. Data does not indicate any off-site impacts in soil related to this site.

Groundwater: TCE and its associated degradation products are found in groundwater on the northern half of the site at levels exceeding groundwater standards (5 parts per billion - ppb) with a maximum concentration of 1,300 ppb. Benzene was found exceeding its groundwater standard (1 ppb) at a maximum concentration of 3,500 ppb. Ethylbenzene was found exceeding its groundwater standard (5 ug/L) at a maximum concentration of 2,000 ppb. Toluene was found exceeding its groundwater standard (5 ppb) at a maximum concentration of 740 ppb. Xylene (total) was found exceeding its groundwater standard (5 ppb) at a maximum concentration of 6,900 ppb. Cis-1,2-Dichloroethylene was found exceeding its groundwater standard (5 ppb) at a maximum concentration of 4,900 ppb. 1,2,4-Trimethylbenzene was found exceeding its groundwater standard (5 ppb) at a maximum concentration of 1,600 ppb. 1,3,5-Trimethylbenzene was found exceeding its groundwater standard (5 ppb) at a maximum concentration of 470 ppb. Arsenic was

found exceeding its groundwater standard (25 ppb) at a maximum concentration of 38.2 ppb. Naphthalene was found exceeding its groundwater standard (10 ppb) at a maximum concentration of 427 ppb. Data does not indicate any off-site impacts in groundwater related to this site.

Sub-Slab Soil Vapor and Indoor Air: Trichloroethene (TCE) was detected at a maximum concentration of 39,000 micrograms per cubic meter (ug/m^3) in the soil vapor, and $23.9 \text{ ug}/\text{m}^3$ in indoor air. Tetrachloroethene (PCE) was detected at a maximum concentration of $440 \text{ ug}/\text{m}^3$ in the soil vapor, and $2.81 \text{ ug}/\text{m}^3$ in indoor air. Cis-1,2-dichloroethene (DCE) was detected at a maximum concentration of $95 \text{ ug}/\text{m}^3$ in the soil vapor, and $0.218 \text{ ug}/\text{m}^3$ in indoor air. Data indicates there is the potential for 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*.

People will not come into contact with contaminated soil or groundwater since the site is covered with a building and concrete unless they dig below the ground 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. 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 future onsite development. Environmental sampling indicates that soil vapor intrusion is a concern for offsite 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 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 4: Restricted use with site-specific soil cleanup objectives remedy.

The selected remedy is referred to as the Excavation, Soil Vapor Mitigation, In-Situ Chemical Reduction, and Cover System 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;
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- 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.

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

- Source area excavation of 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. These soils are expected at 4 feet and 8 feet in the southeastern and northwestern corners, respectively.

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VOCs and CVOCs are carried with the injected air into the vadose zone (the area below the ground surface but above the water table) where a soil vapor extraction (SVE) system designed to remove the injected air will be installed. The SVE system will apply a vacuum to wells that have been installed into the vadose zone to remove the VOCs and CVOCs along with the air introduced by the sparging process. The air extracted from the SVE wells will be treated as necessary prior to being discharged to the atmosphere. The SMD and SVE system will also mitigate the migration of vapors into the on-site building from soil and groundwater.

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7. Institutional Control

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

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- require compliance with the Department approved Site Management Plan.

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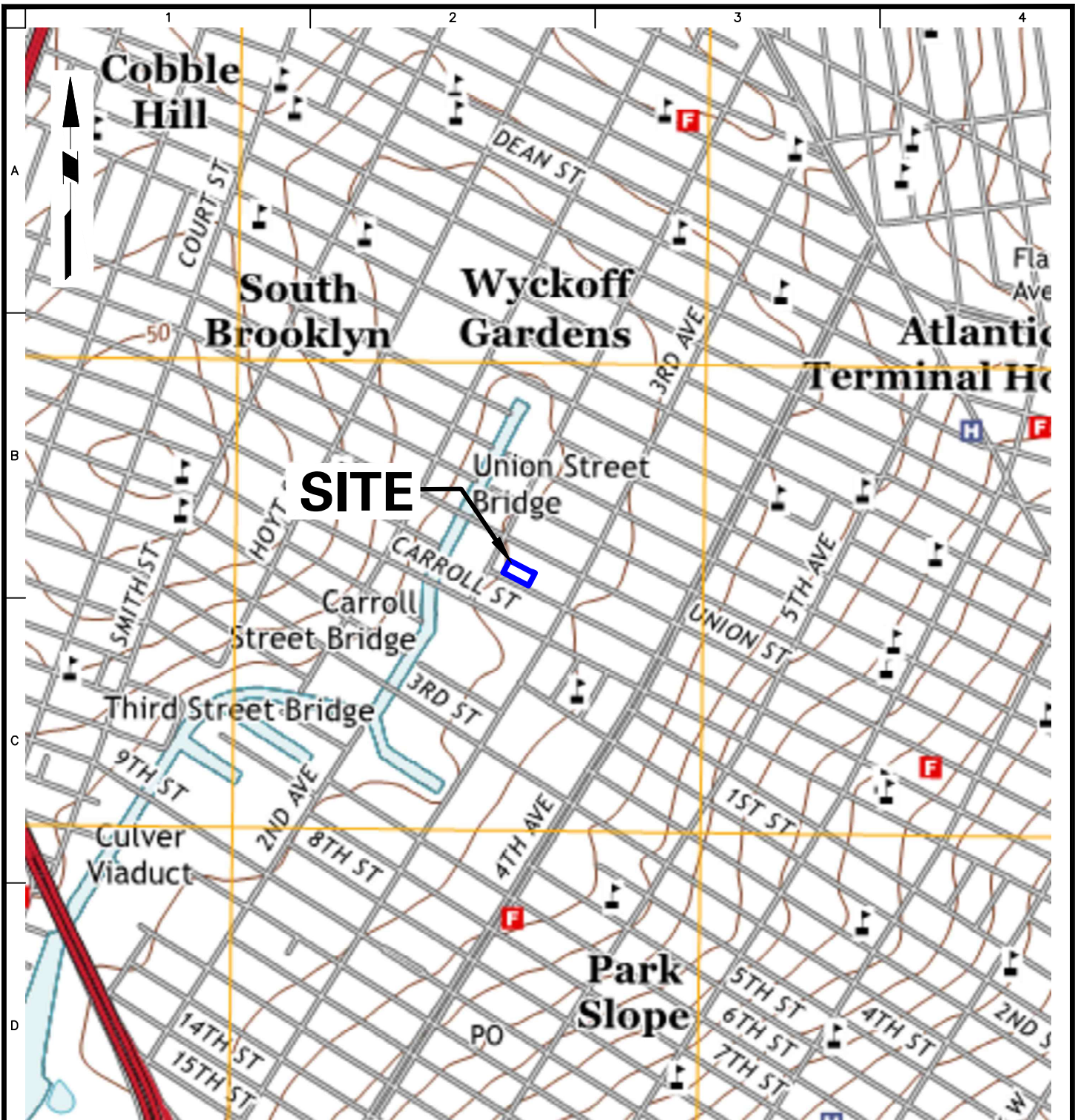
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- a. An Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to ensure the following institutional and/or engineering controls remain in place and effective:
 - Institutional Controls: The Environmental Easement discussed in Paragraph 7 above
 - Engineering Controls: The cover system discussed in Paragraph 4, the AS/SVE system discussed in Paragraph 5, and the In-Situ Chemical Reduction discussed in Paragraph 6 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; Note: an excavation plan is not needed for a remedy that achieves residential SCOs in the upper 15 ft;
- descriptions of the provisions of the environmental easement including any land use, and groundwater use restrictions;

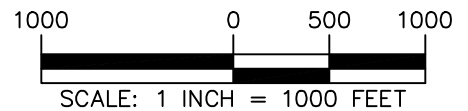
- a provision that should a building foundation or building slab be removed in the future, a cover system consistent with that described in Paragraph 4 above will be placed in any areas where the upper two feet of exposed surface soil exceed the applicable soil cleanup objectives (SCOs)
 - a provision 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.
2. 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;
 - monitoring for vapor intrusion for any buildings on the site, as may be required by the Institutional and Engineering Control Plan discussed above.
3. An Operation and Maintenance (O&M) Plan to ensure continued operation, maintenance, inspection, and reporting of any mechanical or physical components of the active vapor mitigation system. The plan includes, but is not limited to:
- procedures for operating and maintaining the system; and
 - compliance inspection of the system to ensure proper O&M as well as providing the data for any necessary reporting.



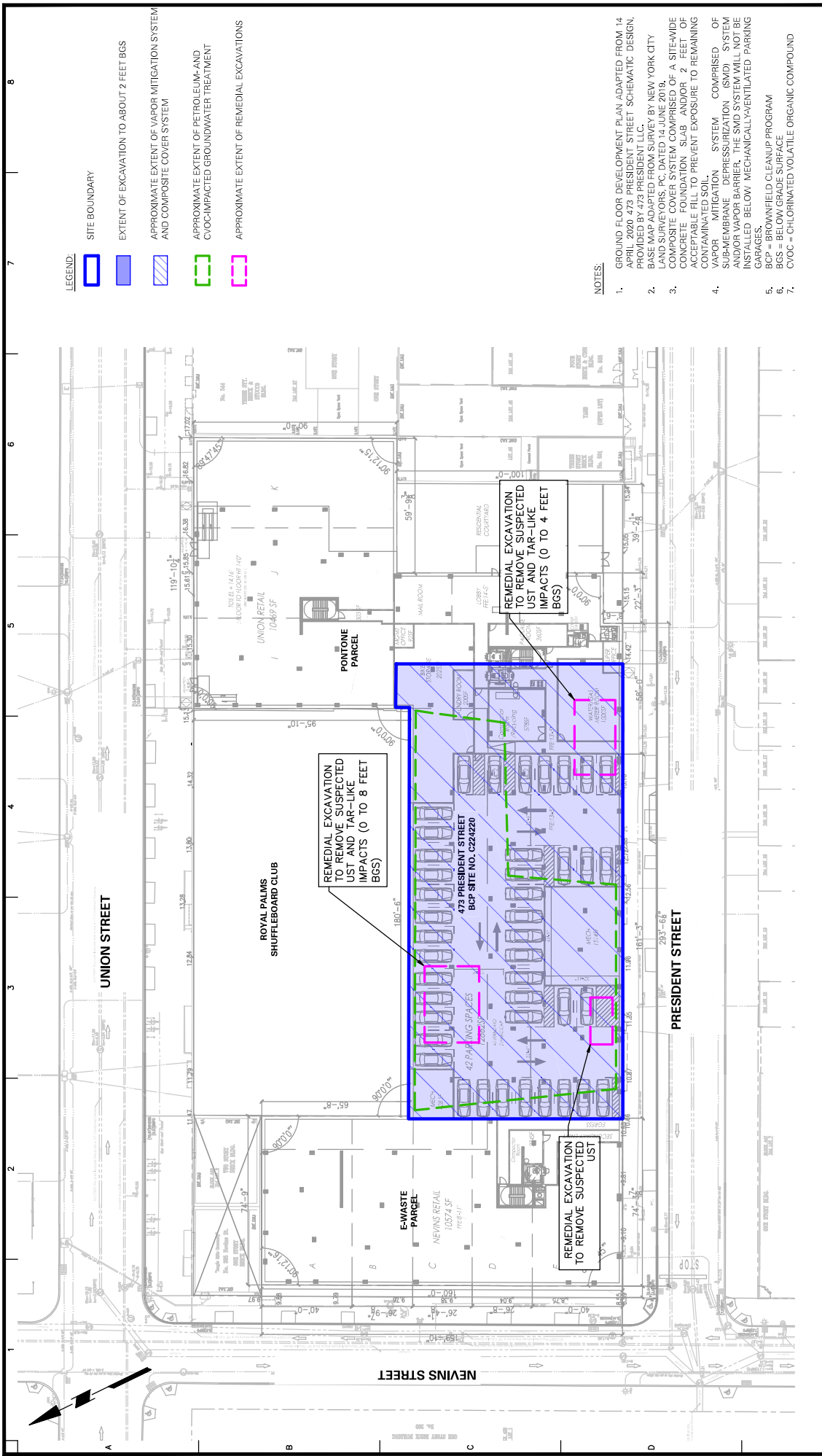
NOTES:

1. BASEMAP ADAPTED FROM UNITED STATES GEOLOGICAL SURVEY (USGS) 7.5-MINUTE SERIES TOPOGRAPHICAL MAPS, JERSEY CITY, NJ AND BROOKLYN, NY QUADRANGLES, DATED 2016.

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	473 PRESIDENT STREET	SITE LOCATION MAP	170361303	1
	BLOCK No. 440, p/o LOT No. 1 BROOKLYN		Date 02/19/2020	
	KINGS NEW YORK		Drawn By EMS	
			Checked By VDP	Sheet 1 of 13



- LEGEND:**
- SITE BOUNDARY
 - EXTENT OF EXCAVATION TO ABOUT 2 FEET BGS
 - APPROXIMATE EXTENT OF VAPOR MITIGATION SYSTEM AND COMPOSITE COVER SYSTEM
 - APPROXIMATE EXTENT OF PETROLEUM-AND CYCLOIMPACTED GROUNDWATER TREATMENT
 - APPROXIMATE EXTENT OF REMEDIAL EXCAVATIONS

- NOTES:**
- GROUND FLOOR DEVELOPMENT PLAN ADAPTED FROM 14 APRIL 2020 473 PRESIDENT STREET SCHEMATIC DESIGN, PROVIDED BY 473 PRESIDENT LLC.
 - BASE MAP ADAPTED FROM SURVEY BY NEW YORK CITY LAND SURVEYORS, PC, DATED 14 JUNE 2019.
 - COMPOSITE COVER SYSTEM COMPRISED OF A SITE-WIDE CONCRETE FOUNDATION SLAB AND/OR 2 FEET OF ACCEPTABLE FILL TO PREVENT EXPOSURE TO REMAINING VAPOR MITIGATION SYSTEM COVERED SUBMEMBRANE DEPRESSURIZATION (SMD) SYSTEM AND/OR VAPOR BARRIER. THE SMD SYSTEM WILL NOT BE INSTALLED BELOW MECHANICALLY VENTILATED PARKING GARAGES.
 - BCP = BROWNFIELD CLEANUP PROGRAM
 - BGS = BELOW GRADE SURFACE
 - CYOC = CHLORINATED VOLATILE ORGANIC COMPOUND

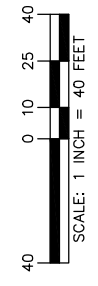
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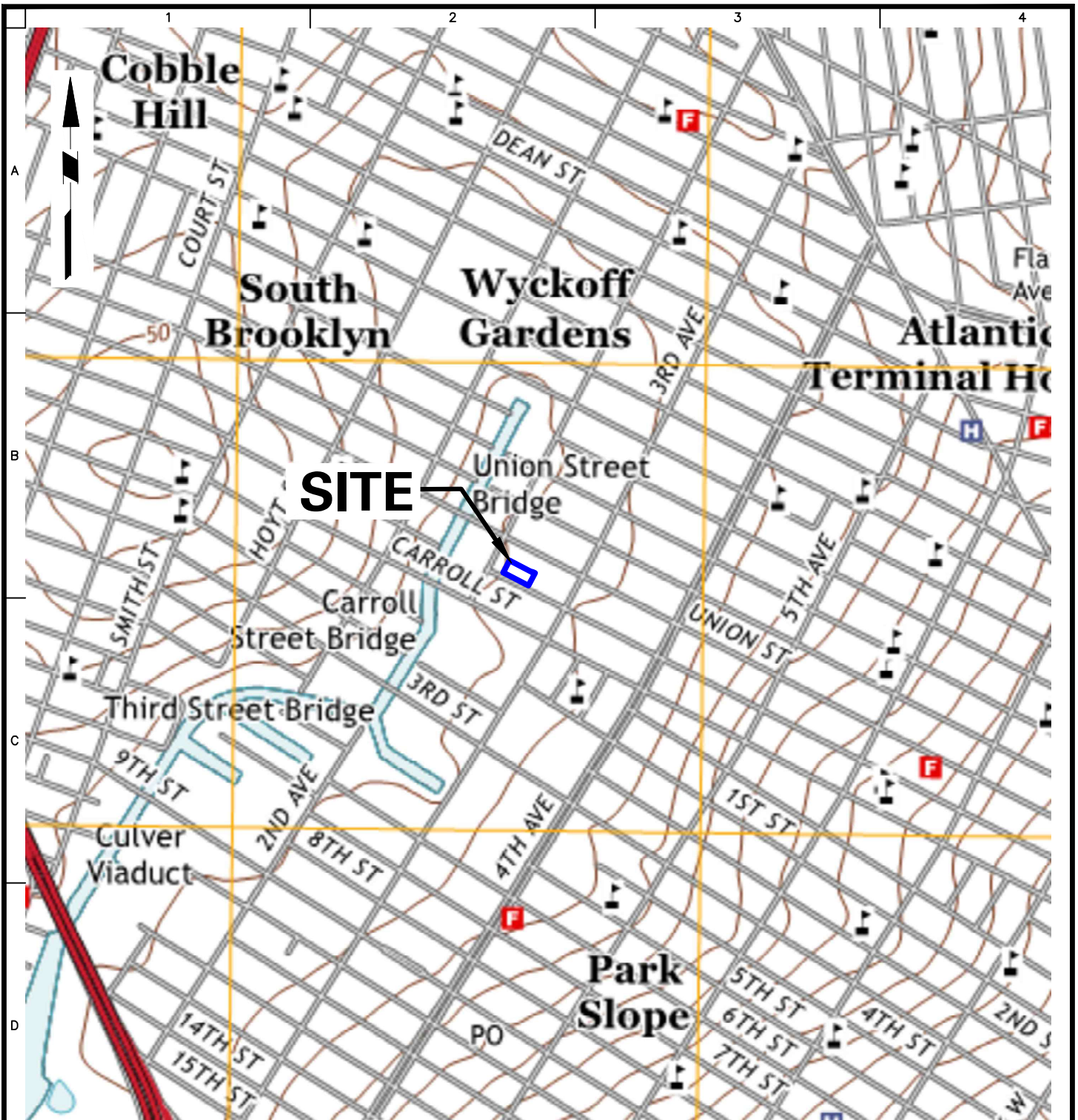
Figure Title
**ALTERNATIVE II:
 TRACK 4 REMEDY**

Project No. 170361003
 Date 04/16/2020
 Drawn By BMS
 Checked By Pd

Figure No. **10**
 Sheet 11 of 13



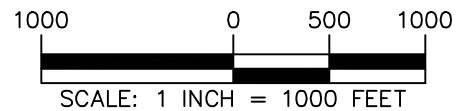
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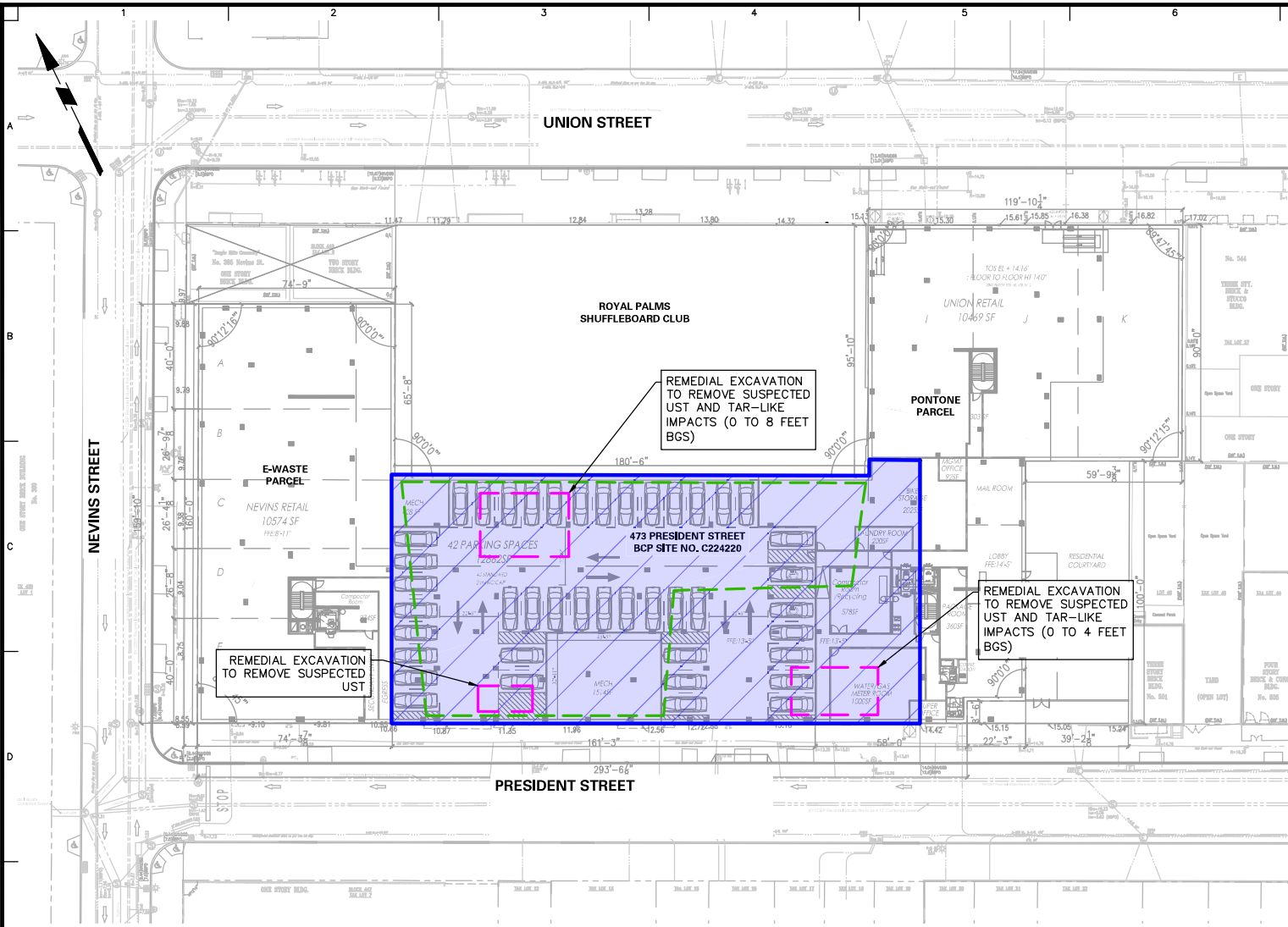
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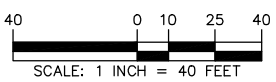
<p>Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.F.C. 21 Penn Plaza, 360 West 31st Street, 8th Floor New York, NY 10001 T: 212.479.5400 F: 212.479.5444 www.langan.com</p>	Project	Figure Title	Project No.	Figure No.
	473 PRESIDENT STREET	SITE LOCATION MAP	170361303	1
	BLOCK No. 440, p/o LOT No. 1 BROOKLYN		Date 02/19/2020	
	KINGS NEW YORK		Drawn By EMS	
			Checked By VDP	Sheet 1 of 13



- LEGEND:**
- SITE BOUNDARY
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 - APPROXIMATE EXTENT OF REMEDIAL EXCAVATIONS

- NOTES:**
1. GROUND FLOOR DEVELOPMENT PLAN ADAPTED FROM 14 APRIL 2020 473 PRESIDENT STREET SCHEMATIC DESIGN, PROVIDED BY 473 PRESIDENT LLC.
 2. BASE MAP ADAPTED FROM SURVEY BY NEW YORK CITY LAND SURVEYORS, PC, DATED 14 JUNE 2019.
 3. COMPOSITE COVER SYSTEM COMPRISED OF A SITE-WIDE CONCRETE FOUNDATION SLAB AND/OR 2 FEET OF ACCEPTABLE FILL TO PREVENT EXPOSURE TO REMAINING CONTAMINATED SOIL.
 4. VAPOR MITIGATION SYSTEM COMPRISED OF SUB-MEMBRANE DEPRESSURIZATION (SMD) SYSTEM AND/OR VAPOR BARRIER, THE SMD SYSTEM WILL NOT BE INSTALLED BELOW MECHANICALLY-VENTILATED PARKING GARAGES.
 5. BCP = BROWNFIELD CLEANUP PROGRAM
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	<small>File name: \\langan.com\data\N\Ydata\31170361301\Cadd Data - 170361301\Sheef\Fee\Environmental\473 President RAW\Figure 10 - Alternative II - Track 4 Remedy.dwg Date: 4/23/2020 Time: 15:54 User: vdepaule Style Table: Langan.sbt Layout: ANSB-6L</small>			