DECISION DOCUMENT

3-60 Beach 79th Street
Brownfield Cleanup Program
Far Rockaway, Queens County
Site No. C241207
August 2021

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

DECLARATION STATEMENT - DECISION DOCUMENT

3-60 Beach 79th Street
Brownfield Cleanup Program
Far Rockaway, Queens County
Site No. C241207
August 2021

Statement of Purpose and Basis

This document presents the remedy for the 3-60 Beach 79th 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 3-60 Beach 79th 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:

- grossly contaminated soil, as defined in 6 NYCRR Part 375-1.2(u);
- 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), fuel dispensers, underground piping or other structures associated with a source of contamination.

In addition, all soils in the upper foot which exceed the commercial SCOs will be excavated and transported off-site for disposal.

Approximately 5,100 cubic yards of contaminated soil will be removed from the site.

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 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 the backfilling of the excavation and establish the designed grades at the site.

4. Cover System

A site cover will be required to allow for commercial use of the site in areas where the upper one foot 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 one foot 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. Groundwater Extraction and Treatment

Dewatering at the site will be required to enable the excavation and subgrade work. Contaminated groundwater from dewatering operations will be treated as necessary prior to discharge to the municipal sewer system.

6. In-Situ Chemical Reduction

In-situ chemical reduction (ISCR) will be implemented to treat chlorinated VOCs in groundwater. A reducing agent will be applied to the base of the excavation to destroy the contaminants in an approximately 9,760 square foot area located in the northern and central

portions of the site where chlorinated VOC compounds were elevated in the groundwater. The method and depth of treatment will be determined during the remedial design.

Monitoring will be required within the treatment zone. Monitoring will be conducted for chlorinated VOCs upgradient and downgradient of the treatment zone for in-situ chemical treatment remedy.

7. Monitored Natural Attenuation

Groundwater contamination remaining after active remediation will be addressed with monitored natural attenuation (MNA). Groundwater will be monitored for site related contamination and also for MNA indicators which will provide an understanding of the (biological activity) breaking down the contamination. It is anticipated that contamination will decrease by an order of magnitude in a reasonable period of time (5 to 10 years). Reports of the attenuation will be provided at 1 year, and additional active remediation will be proposed if it appears that natural processes alone will not address the contamination. The contingency remedial action will depend on the information collected, but it is currently anticipated that a hydrogen releasing compound such as lactic acid would be the expected contingency remedial action.

8. Vapor Mitigation

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

To address the off-site soil vapor impacts, an active SSDS will be installed within the commercial-use building located on the west adjoining property at 350 Beach 79th Street, Far Rockaway, NY (Block 16100, Lot 14).

9. 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 commercial 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.

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:

- Institutional Controls: The Environmental Easement discussed in Paragraph 9 above.
- Engineering Controls: The soil cover discussed in Paragraph 4 and the sub-slab depressurization system discussed in Paragraph 8 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;
- a provision should redevelopment occur to ensure no soil exceeding protection of groundwater concentrations will remain below storm water retention basin or infiltration structures.
- descriptions of the provisions of the environmental easement including any land use, groundwater, and surface water 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 one foot of exposed surface soil exceed the applicable soil cleanup objectives (SCOs)
- 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 and the affected off-site building, as may be required by the Institutional and Engineering Control Plan discussed above.

a) 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 and mitigation 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.

8/3/31 /FOR

Date

Gerard Burke, Director
Remedial Bureau B

DECISION DOCUMENT

3-60 Beach 79th Street
Far Rockaway, Queens County
Site No. C241207
August 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, where a contaminant is present at levels exceeding the soil cleanup objectives or other health-based or environmental standards, criteria or guidance, based on the reasonably anticipated use of the property.

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=C241207

Queens Library - Peninsula Branch
92-25 Rockaway Beach Boulevard
Rockaway Beach, NY 11693
Phone: 718-634-1110

Queens Community Board 14

1931 Mott Avenue-Room 311
Far Rockaway, NY 11691
Phone: (718) 471-7300

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 in an urban area at 3-60 Beach 79th Street in the Far Rockaway neighborhood of Queens, NY. The site is a 1.17-acre vacant parcel and is bounded by Barbadoes Basin to the north, a paved parking lot to the east, Beach Channel Drive to the south, and a commercial building to the west. The nearest residential area is 0.3 miles south of the site.

Site Features:
The site is vacant and has an asphalt parking lot and a grassy open area. The site is adjacent to the Barbados Basin.

Current Zoning and Land Use:
The current zoning designated of this site M1-1 (manufacturing use). M1-1 districts typically include light industrial uses. The site is currently utilized as parking and storage for the adjoining commercial building. The grassy area of the site is used for storage of miscellaneous material. The larger surrounding area is occupied by predominantly commercial uses.

Past Use of the Site:
Historical uses of the site from prior to 1894 to present included an ice factory, coal yard, bike corporation, and various manufacturing businesses. A gasoline tank was shown on the western portion of the site in the 1933 Sanborn Fire Insurance Map when it was utilized as a coal yard. The site is an inactive NYSDEC solid waste management facility that was used for processing of construction and demolition debris.

Site Geology and Hydrogeology:
Subsurface materials consist of historic fill (unsorted sand with gravel, concrete, brick and coal) from surface to a depth of approximately 9 feet below ground surface (bgs) across the site. The fill material is generally underlain by natural clay and soil sand deposits. The historic fill contains elevated concentrations of various metals and semi-volatile compounds, as is typical of

historic fill encountered in the New York Metropolitan Area. The site and surrounding areas are underlain by sediments of the Magothy formation, Upper Cretaceous in age. Predominant sediment types include clay, silt, sand and gravel. Bedrock was not encountered during previous site investigations.

Groundwater is present at depths of approximately five feet below grade. Groundwater flows in a northerly direction toward Barbados Basin. The perimeter of the site is located within the 100-year FEMA Zone and the center of the site is located within the 500-year FEMA Flood Zone. Groundwater in this area of Queens is not used as a source of potable water.

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 commercial use (which allows for 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:

tetrachloroethene (PCE)
trichloroethene (TCE)
cis-1,2-dichloroethene
vinyl chloride
lead
arsenic
trans-1,2-dichloroethene
barium
cadmium
copper

naphthalene
benzo(a)anthracene
benzo(b)fluoranthene
benzo(k)fluoranthene
dibenz[a,h]anthracene
indeno(1,2,3-CD)pyrene
chrysene
perfluorooctane sulfonic acid
perfluorooctanoic acid

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

- air
- groundwater
- soil vapor

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.

There were no IRMs performed at this site during the RI.

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), metals, polychlorinated biphenyls (PCBs), pesticides, and per- and polyfluoroalkyl substances (PFAS). Based upon investigations conducted to date, the primary contaminants of concern include chlorinated VOCs and metals.

Soil: Chlorinated VOCs exceeding the soil cleanup objectives for the protection of groundwater (PGWSCOs) were detected throughout the site, including PCE at a maximum concentration of 160 parts per million (ppm) compared to the PGWSCO of 1.3 ppm, TCE at 4,900 ppm (PGWSCO of 0.47 ppm), cis-DCE at 610 ppm (PGWSCO of 0.25 ppm), trans-DCE at 28 ppm (PGWSCO of 0.19 ppm), and vinyl chloride at 43 ppm (PGWSCO of 0.02 ppm). SVOCs exceeding commercial use soil cleanup objectives (CUSCOs) were detected throughout the site, including benzo(a)anthracene at a maximum concentration of 12 ppm compared to CUSCO of 5.6 ppm, benzo(a)pyrene at 13 ppm (CUSCO is 1 ppm), benzo(b)fluoranthene at 14 ppm (CUSCO is 5.6 ppm), dibenzo(a,h)anthracene at 2.2 ppm (CUSCO is 0.56 ppm), and indeno(1,2,3-cd)pyrene at 9.1 ppm (CUSCO is 5.6 ppm). Several metals were detected at concentrations exceeding the CUSCOs, including arsenic at a maximum concentration of 100 ppm (CUSCO is 16 ppm), lead at 2,400 ppm (CUSCO is 1,000 ppm), barium at 2,160 ppm (CUSCO is 400 ppm), cadmium at 13 ppm (CUSCO is 9.3 ppm), and copper at 7,400 ppm (CUSCO is 270 ppm). Levels of PFAS were detected, with PFOS at a maximum concentration

of 1.6 parts per billion (ppb) and PFOA at 0.26 ppb. Data does not indicate any off-site impacts in soil related to this site.

Groundwater: Chlorinated VOCs were detected in groundwater at concentrations exceeding the ambient water quality standards (AWQS), including PCE at a maximum concentration of 140 parts per billion (ppb) compared to the AWQS of 5 ppb, TCE at 1,900 ppb (AWQS is 5 ppb), cis-DCE at 14,000 ppb (AWQS is 5 ppb), and vinyl chloride at 1,800 ppb (AWQS is 2 ppb), naphthalene at 14 ppb (AWQS is 10 ppb), and p-isopropyltoluene at 7.4 ppb (AWQS is 5 ppb). SVOCs were detected in groundwater at concentrations exceeding the ambient AWQS, including benzo(a)anthracene at a maximum concentration of 3.2 ppb (AWQS is 0.002 ppb), benzo(b)fluoranthene at 3.3 ppb (AWQS is 0.002 ppb), benzo(k)fluoranthene at 0.0038 ppb (AWQS is 0.002 ppb), and chrysene at 3.2 ppb (AWQS is 0.002 ppb). Metals were detected in groundwater at concentrations exceeding the ambient AWQS, including arsenic at 1,100 ppb (AWQS is 25 ppb), selenium at 115 ppb (AWQS is 10 ppb), and manganese at 600 ppb (AWQS is 500 ppb). Levels of PFOS and/or PFOA were detected above the NYSDEC screening level of 10 ppt with PFOS at a maximum concentration of 79.3 ppt and PFOA at 41.7 ppt. Data does not indicate off-site impacts in groundwater related to this site.

Soil Vapor & Indoor Air: Chlorinated VOCs were detected in soil vapor across the site. The maximum concentration of PCE was 1,300 micrograms per cubic meter (ug/m3), TCE was 1,200 ug/m3, cis-DCE was 260 ug/m3, trans-DCE was 4.4 ug/m3, and VC was 6.6 ug/m3. Data indicates there are off-site impacts in soil vapor related to the site.

TCE was detected in the indoor air at a concentration of 17.6 micrograms per cubic meter (ug/m3) and was also detected in the sub-slab soil vapor at a concentration of 52,300 ug/m3 in the adjacent building (350 Beach 79th Street). PCE was also detected in the sub-slab soil vapor at a concentration of 3,000 ug/m3 and cis- DCE was detected at 1,560 ug/m3. Based on this data, mitigative actions are needed to address exposures. Additionally, the concentration of TCE detected in the indoor air is above the NYSDOH Air Guideline Value of 2 ug/m3. Based on that data and the environmental sampling conducted, actions are needed to mitigate exposures associated with soil vapor intrusion for this building

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 not fenced and persons who enter the site could contact contaminants in the soil by walking on the soil, digging or otherwise disturbing the soil. People are not drinking contaminated groundwater because the area is served by a public water supply that is not affected by this contamination. Volatile organic compounds in the subsurface may move into soil vapor (air spaces within the soil), which in turn 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. Environmental sampling indicates that the potential exists for the inhalation of site contaminants due to soil

vapor intrusion for future onsite buildings. Actions are recommended to reduce exposures at an adjacent offsite building.

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, Groundwater Treatment, and Vapor Mitigation 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

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

- grossly contaminated soil, as defined in 6 NYCRR Part 375-1.2(u);
- 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), fuel dispensers, underground piping or other structures associated with a source of contamination.

In addition, all soils in the upper foot which exceed the commercial SCOs will be excavated and transported off-site for disposal.

Approximately 5,100 cubic yards of contaminated soil will be removed from the site.

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 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 the backfilling of the excavation and establish the designed grades at the site.

4. Cover System

A site cover will be required to allow for commercial use of the site in areas where the upper one foot 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 one foot 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. Groundwater Extraction and Treatment

Dewatering at the site will be required to enable the excavation and subgrade work. Contaminated groundwater from dewatering operations will be treated as necessary prior to discharge to the municipal sewer system.

6. In-Situ Chemical Reduction

In-situ chemical reduction (ISCR) will be implemented to treat chlorinated VOCs in groundwater. A reducing agent will be applied to the base of the excavation to destroy the contaminants in an approximately 9,760 square foot area located in the northern and central portions of the site where chlorinated VOC compounds were elevated in the groundwater. The method and depth of treatment will be determined during the remedial design.

Monitoring will be required within the treatment zone. Monitoring will be conducted for chlorinated VOCs upgradient and downgradient of the treatment zone for in-situ chemical treatment remedy.

7. Monitored Natural Attenuation

Groundwater contamination remaining after active remediation will be addressed with monitored natural attenuation (MNA). Groundwater will be monitored for site related contamination and also for MNA indicators which will provide an understanding of the (biological activity) breaking down the contamination. It is anticipated that contamination will decrease by an order of magnitude in a reasonable period of time (5 to 10 years). Reports of the attenuation will be provided at 1 year, and additional active remediation will be proposed if it appears that natural processes alone will not address the contamination. The contingency remedial action will depend on the information collected, but it is currently anticipated that a hydrogen releasing compound such as lactic acid would be the expected contingency remedial action.

11. Vapor Mitigation

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

To address the off-site soil vapor impacts, an active SSDS will be installed within the commercial-use building located on the west adjoining property at 350 Beach 79th Street, Far Rockaway, NY (Block 16100, Lot 14).

8. 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 commercial 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.

9. Site Management Plan

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

b) 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 9 above.
– Engineering Controls: The soil cover discussed in Paragraph 4 and the sub-slab depressurization system discussed in Paragraph 8 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;
- a provision should redevelopment occur to ensure no soil exceeding protection of groundwater concentrations will remain below storm water retention basin or infiltration structures.
- descriptions of the provisions of the environmental easement including any land use, groundwater, and surface water 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 one foot of exposed surface soil exceed the applicable soil cleanup objectives (SCOs)
- 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.

c) 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 and the affected off-site building, as may be required by the Institutional and Engineering Control Plan discussed above.

d) 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 and mitigation 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 Location Map

BCP Site: C241207, 3-60 Beach 79th Street

Far Rockaway, Queens, New York

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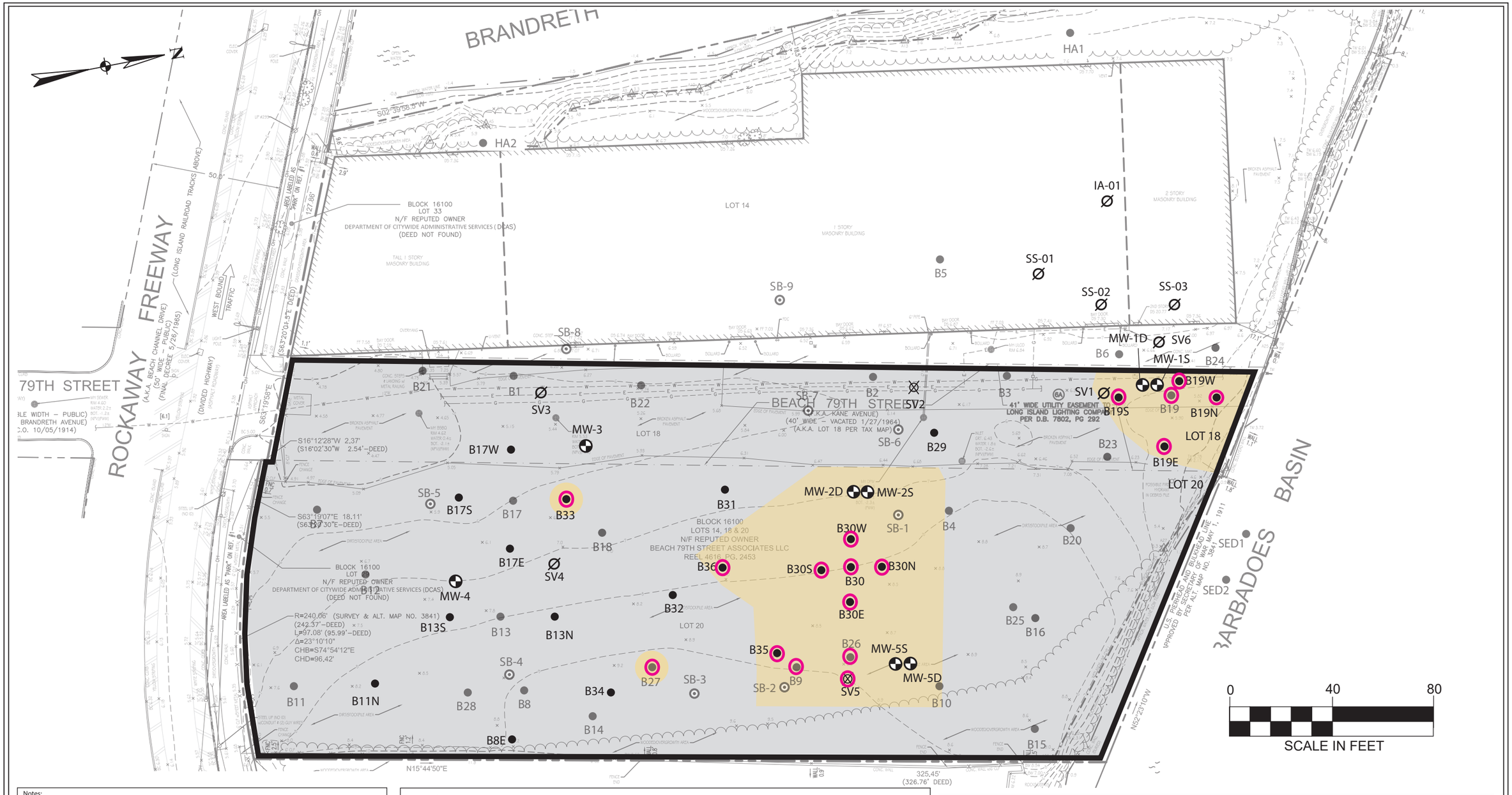


Notes:

1. Final extent of excavation areas to be determined based on results of pre-design investigation and confirmatory endpoint sampling.
2. All soil removal to be limited to depths above the Site-wide restrictive clay layer.
3. In-situ soil/groundwater treatment to be conducted at base of excavations for CVOC impacted soil.
4. All excavated soil to be disposed off-Site (estimated volume 5,075 CY), unless otherwise approved by NYSDEC for on-Site re-use.
5. Site to be remediated as Track 4 Restricted Commercial Use cleanup, with use of Protection of Groundwater SCOs fo CVOCs.
6. A cover system will be installed across the Site, comprised of building foundations, imported clean backfill, paved areas and exterior plantings. Soil excavation will be conducted such that the elevation of the installed cover system (excluding building components) does not exceed existing grades. Excavation outside of AOC-1 is generally expected to result in removal of the upper 1 foot of existing fill materials.

Base map provided by Gallas Surveying Group dated 10-23-2017.

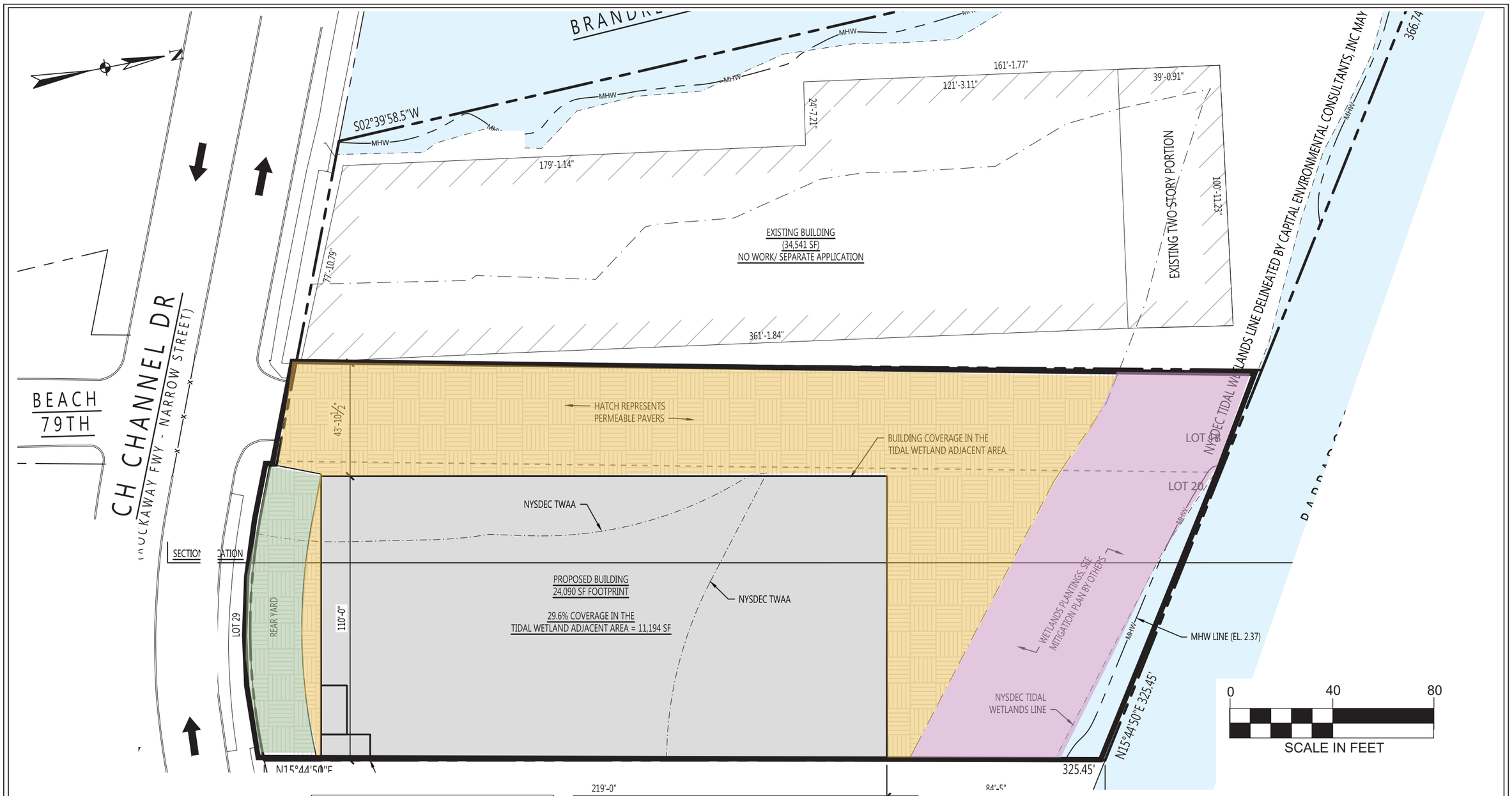
Legend:

- subject property border
- lot line
- previous WCD sample location
- previous Envirotrac Phase II boring locations (2016)
- soil vapor location
- soil vapor and soil sample location
- monitoring well location
- soil sample location
- CVOCs > Protection of Groundwater SCOs
- AOC-1 Excavation Area (CVOCs)
- Excavation of additional soils to accommodate Site development and installation of Site cover system

Figure 2: Soil Excavation Plan

BCP: Site C241207
3-60 Beach 79th Street
Far Rockaway, Queens, New York

Scale as shown



Notes:

Engineering drawings for cover system details to be provided in Remedial Design Document

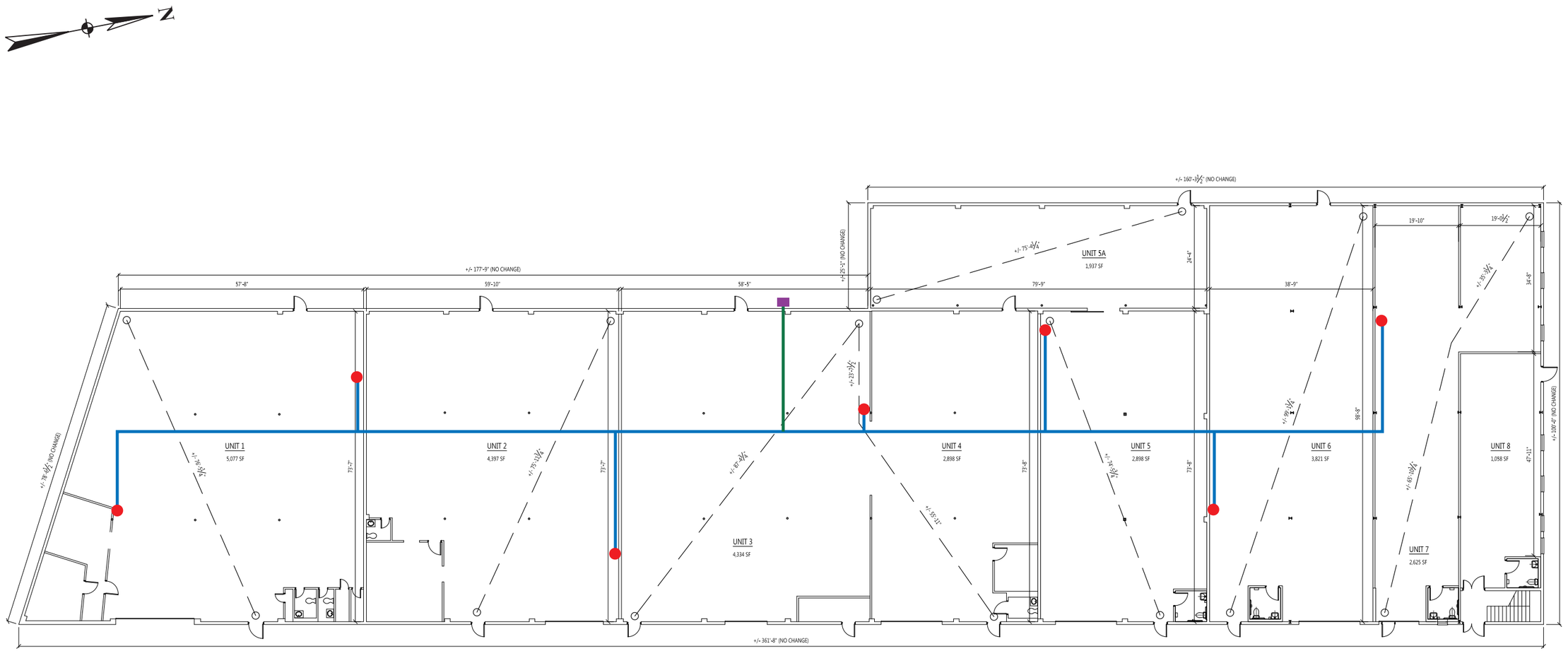
Legend:

- subject property border
- lot line
- permeable-paver system, minimum 1 foot stone sub-base
- wetlands planting, minimum 1 foot approved clean soil
- building foundation (minimum 6 inches concrete) and grade-level parking (minimum 4 inches asphalt or 1 foot paver/sub-base system)
- landscaping, minimum 1 foot of approved clean soil

Figure 3: Cover System Components

BCP: Site C241207
3-60 Beach 79th Street
Far Rockaway, Queens, New York

Scale as shown



Legend:

- 3" non-perforated pipe @ ceiling manifolded into central 3" pipe
- 3" non-perforated pipe to exterior riser
- suction pits & 3" risers with butterfly valves to ceiling
- 3" riser to roof-top mounted fan

Figure 4: Conceptual Design of SSDS at Off-Site Structure (Lot 14)

BCP: Site C241207
3-60 Beach 79th Street
Far Rockaway, Queens, New York

Scale as shown