NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Environmental Remediation, Remedial Bureau B
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VIA EMAIL August 23, 2017

John Petras
c/o: Douglaston Realty Management Corp.
42-01 235th Street
Douglaston, NY 11363

Re: BCP Site Name: 21-25 31st Street
Site ID No. C241167
Astoria, Queens, NY
Remedial Work Plan & Decision Document

Dear Mr. Petras:

The New York State Department of Environmental Conservation ("Department") and the New York State Department of Health (NYSDOH) have reviewed the Remedial Work Plan (RWP) for the 21-25 31st Street site dated April 7, 2017 and prepared by Tenen Environmental on behalf of the 21-25 31st LLC. The RWP is hereby approved. Please ensure that a copy of the approved RWP is placed in the document repositories. The draft plan should be removed.

Attached is a copy of the Department's Decision Document for the site. The remedy is to be implemented in accordance with this Decision Document. Please ensure that a copy of the Decision Document is placed in the document repositories.

Please contact the Department's Project Manager, MD Hoque at (518) 402-9475 or md.hoque@dec.ny.gov at your earliest convenience to discuss next steps. Please recall the Department requires seven days notice prior to the start of field work.

Sincerely,

Gerard Burke
Director
Remedial Bureau B
Division of Environmental Remediation

Enclosure

ec *w/attachments*:

R. Schick
M. Ryan
G. Burke
M. Komoroske
J. O'Connell
M. Hoque
J. Nehila
A. Krista
J. Deming
W. Kuehner
M. Carroll
S. Furman

DECISION DOCUMENT

21-25 31st Street
Brownfield Cleanup Program
Astoria, Queens County
Site No. C241167
August 2017

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

DECLARATION STATEMENT - DECISION DOCUMENT

21-25 31st Street
Brownfield Cleanup Program
Astoria, Queens County
Site No. C241167
August 2017

Statement of Purpose and Basis

This document presents the remedy for the 21-25 31st 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 21-25 31st 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; and
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development.

2. Excavation

The existing on-site building will be demolished and materials which can't be beneficially reused on site will be taken off-site for proper disposal in order to implement the remedy.

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

Excavation and off-site disposal of all on-site soils which exceed restricted-residential use soil cleanup objectives (RRUSCOs), as defined by 6 NYCRR Part 375-6.8 in the upper 15 feet. Development excavation will be extended to a depth of 30 feet-below ground surface (bgs). Following the completion of the excavation, post-excavation end-point soil samples will be collected and analyzed to ensure removal of all source areas and document site conditions. If a Track 2 cleanup is achieved, a Cover System will not be a required element of the remedy.

Any encountered underground storage tanks (USTs), underground piping or other structures associated with a source of contamination will be excavated and disposed of off-site.

Approximately 5,250 cubic yards of contaminated soil will be removed from the site.

3. Backfill

Clean fill that meets the requirements of 6 NYCRR Part 375-6.7(d) will be brought in to complete the backfilling of the excavation.

4. In-Situ Chemical Treatment

Based on post-demolition/predesign groundwater investigations, possible in-situ chemical reduction (ISCR) will be implemented to treat chlorinated-volatile organic compounds (cVOCs) in groundwater. A 3-D Microemulsion® and CRS® chemical reducing solution will be injected into the groundwater at a depth of 35 – 40 feet below ground surface (bgs) to destroy the contaminants at the northwest corner of the site where the former dry cleaner facility was located and where groundwater was impacted by cVOCs. CRS is designed to precipitate reduced iron sulfides, oxides, and/or hydroxides that are capable of breaking down chlorinated solvents. The method and depth of injection will be determined based on the sample results from additional groundwater monitoring wells to be installed during the remedial design.

5. 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). The site cover may consist of paved surface parking areas, sidewalks, or a soil cover. 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 as set forth in 6 NYCRR Part 375-6.7(d). In areas where building foundations or building slabs preclude contact with the soil, the requirements for a site cover will be deferred until such time that they are removed.

If a Track 2 restricted-residential cleanup is achieved, a Cover System will not be a required element of the remedy.

6. 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 New York State Department of Health (NYSDOH) or New York City Department of Health (NYCDOH); and
- require compliance with the Department approved Site Management Plan.

7. 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:

Intuitional Controls: The Environmental Easement discussed in Paragraph 6 above.

Engineering Controls: The soil cover discussed in Paragraph 5.

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 descriptions of the provisions of the environmental easement including any land use, and groundwater use restrictions;
- 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;
- a provision that should a building foundation or building slab be removed in the future, a cover system consistent with that described in Paragraph 5 above will be placed in any areas where the upper two feet 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;
- monitoring for vapor intrusion for any occupied existing or future 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, inspection, and reporting of any mechanical or physical components of the active vapor mitigation system(s). The plan includes, but is not limited to:

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

Declaration

The remedy conforms to 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.

8/23/17

Date

Gerard Burke, Director
Remedial Bureau B

DECISION DOCUMENT

21-25 31st Street
Astoria, Queens County
Site No. C241167
August 2017

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:

Queens Public Library - Steinway Branch
Attn: Laurel Hicklin
21-45 31st Street
Astoria, NY 11105
Phone: 718-728-1965

Queens Community Board 1
Attn: Florence Koulouris
45-02 Ditmar Boulevard
LL Suite 125
Astoria, NY 11105
Phone: (718) 626-1021

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, Voluntary 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 on the east-southeast side of 31st Street, between 21st Ave and Ditmars Boulevard in Astoria, Queens County. The site is approximately 0.270 acres (11,762 square-feet) in area.

Site Features: The property is improved with two buildings: a larger one-and-a-half story building to the southwest and a smaller one-story building to the northeast. The buildings are connected on the first floor and have separate basements. The basement under the larger building is only partial (beneath the southeastern half of the building). A small paved and pitched asphalt parking area is located behind the smaller building. The existing buildings will be demolished and a new mixed-use building will be constructed on site.

Current Zoning and Land Use: The area where the site is located is zoned as an R6A district within a C1-3 overlay, a built-up medium density residential area allowing for commercial uses to meet local retail needs. The property is currently vacant.

Past Use of the Site: Prior to 1970, the site was used for residential purposes. From approximately 1970 to 1991, A retail chain store operated at the site. From 1967 to at least 1983, there was a dry cleaner operating on-site. From 2000 to recently, a retail store selling clothing, linens and kitchenware was located at the site.

Although none have been identified at this time, underground storage tanks, fuel dispensers, underground piping, or other structures associated with a source of contamination could be present on the site.

Site Geology and Hydrogeology: The site lies at an elevation of approximately 50 feet above mean sea level. The site and surrounding area are relatively flat with a downward slope to the northeast.

Approximately 2.5 feet of historic fill material, containing sand, asphalt and brick fragments, exists beneath the paved parking area. No fill material is below the cellar level which is present across the entire building footprint. The native material is glacial till composed of cobbles and coarse sand with some silt. Till material is assumed to extend to at least the groundwater interface.

The crystalline bedrock likely lies more than 100 feet below the ground surface at the Site. Groundwater approximately 35 - 39 feet below ground surface (ft-bgs). United States Geological Survey (USGS) regional groundwater flow contours indicate that groundwater flows to the north-northwest. The nearest surface waterbody, Steinway Creek, is approximately 2,100 feet east-northeast of the site.

A site location map is attached as Figure 1 and site plan as Figure 2.

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, an alternative that restricts 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) 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
- indoor air
- sub-slab vapor
- ambient air

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:

trichloroethene (TCE)
Cis-1,2-dichloroethene
tetrachloroethene (PCE)
lead
trans-1,2-dichloroethene
xylene (mixed)
naphthalene
acetone
ethanol
benzo(a)anthracene
benzo(a)pyrene
benzo(b)fluoranthene
toluene
vinyl chloride
dieldrin

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

- groundwater
- soil

6.2: Interim Remedial Measures

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

Soil and groundwater were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, pesticides and PCBs. Soil vapor, sub-slab soil vapor, indoor and ambient air were analyzed for VOCs.

Soil: The primary contaminants of concern detected in soil included VOCs, SVOCs and lead. Tetrachloroethene (PCE) was detected in one shallow soil sample at a concentration of 1.4 parts per million (ppm), exceeding unrestricted use soil cleanup objectives (UUSCOs) of 1.3 ppm but below the residential use soil cleanup objectives (RSCOs) of 5.5 ppm. SVOCs including benzo(a)anthracene (from 2.6 ppm to 3.6 ppm), benzo(a)pyrene (from 2.3 ppm to 3.4 ppm) and benzo(b)fluoranthene (from 3.1 ppm to 4.9 ppm) exceeded both the restricted-residential use and the unrestricted use SCOs. of 1 ppm. Highest concentration of naphthalene was 38 ppm detected at a depth of 40-42 feet deep which exceeded the unrestricted use SCOs of 12 ppm. Lead was detected at 180 ppm at a depth of 3-5 feet exceeding the unrestricted use SCOs of 63 ppm.
Data does not indicate any off-site impacts in soil related to this site.

Groundwater: Chlorinated volatile organic compounds (cVOCs) were the primary contaminants found in groundwater. Highest concentrations of PCE and TCE were found of 57 parts per billion (ppb) and 140 ppb, respectively at the northeast corner of the site (GW-2D & GW-2S) which exceeded the groundwater standards of 5 ppb. Highest concentrations of cis-1,2-DCE of 300 ppb (GW-3), trans-1,2-DCE of 230 ppb (GW-4), and vinyl chloride of 110 ppb (GW-4) were detected off-site along 31st street above the groundwater standards of 5 ppb. It was concluded this contamination is related to an off-site, upgradient source. Naphthalene was detected of 340 ppb (GW-8) at the southeast corner of the site, above the groundwater standards of 10 ppb. One pesticide, dieldrin of 0.02 ppb (GW-3) and 0.01 ppb (GW-5S) were detected above the groundwater standards of 0.004 ppb.
Data does not indicate any off-site impacts in groundwater related to this site.

Soil Vapor, Sub-slab Vapor, Indoor Air and Ambient Air: Petroleum-related compounds and chlorinated VOCs were detected in soil vapor throughout the site, especially near the vicinity of the former dry-cleaners. Highest concentrations of PCE and TCE detected in soil vapor were at 766 micrograms per cubic meter (µg/m3) and 14.8 µg/m3, respectively on the eastern side (SV-9) of the site. PCE and TCE were also detected at 348 µg/m^3 and 13.9 µg/m^3 , respectively in

soil vapor on the northern side (SV-8) along 31st Street, which is an off-site location. It was concluded this contamination is related to an off-site, upgradient source. Several petroleum-related compounds, including acetone (463 µg/m3), ethanol (394 µg/m3), toluene (139 µg/m3), and xylenes (54.6 µg/m3) were detected in soil vapor throughout the site. PCE was detected in sub slab samples with a high of 71.9 µg/m3 in SV-6 located under the former drycleaner establishment. PCE was detected in indoor air at a high of 4.96 µg/m3 in IA-3, also located in the former drycleaner establishment. No indoor air guidelines were exceeded. One ambient air sample was collected in March 2016 and two additional ambient air samples were collected in October 2016. PCE was detected in ambient air at a high of 0.51 µg/m3.

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*.

People may contact contaminated soil or groundwater if 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 the groundwater may move into the soil vapor (air spaces within the soil), which in turn may move into overlying 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. The potential exists for the inhalation of site contaminants due to soil vapor intrusion for any future on-site redevelopment and occupancy. Additional investigation of the potential for soil vapor intrusion to occur off-site is needed.

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, in-situ chemical treatment, and vapor intrusion evaluation remedy.

The elements of the selected remedy, as shown in Figure 3, are as follows:

1. Remedial Design

A remedial design program will be implemented to provide the details necessary for the construction, operation, optimization, maintenance, and monitoring of the remedial program. Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy as per DER-31. The major green remediation components are as follows;

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
- Reducing direct and indirect greenhouse gases and other emissions;
- Increasing energy efficiency and minimizing use of non-renewable energy;
- Conserving and efficiently managing resources and materials;

- Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;
- Maximizing habitat value and creating habitat when possible;
- Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals; and
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development.

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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

Excavation and off-site disposal of all on-site soils which exceed restricted-residential use soil cleanup objectives (RRUSCOs), as defined by 6 NYCRR Part 375-6.8 in the upper 15 feet. Development excavation will be extended to a depth of 30 feet-below ground surface (bgs). Following the completion of the excavation, post-excavation end-point soil samples will be collected and analyzed to ensure removal of all source areas and document site conditions. If a Track 2 cleanup is achieved, a Cover System will not be a required element of the remedy.

Any encountered underground storage tanks (USTs), underground piping or other structures associated with a source of contamination will be excavated and disposed of off-site.

Approximately 5,250 cubic yards of contaminated soil will be removed from the site.

3. Backfill

Clean fill that meets the requirements of 6 NYCRR Part 375-6.7(d) will be brought in to complete the backfilling of the excavation.

4. In-Situ Chemical Treatment

Based on post-demolition/predesign groundwater investigations, possible in-situ chemical reduction (ISCR) will be implemented to treat chlorinated-volatile organic compounds (cVOCs) in groundwater. A 3-D Microemulsion® and CRS® chemical reducing solution will be injected into the groundwater at a depth of 35 – 40 feet below ground surface (bgs) to destroy the contaminants at the northwest corner of the site where the former dry cleaner facility was located and where groundwater was impacted by cVOCs. CRS is designed to precipitate reduced iron sulfides, oxides, and/or hydroxides that are capable of breaking down chlorinated solvents. The method and depth of injection will be determined based on the sample results from additional groundwater monitoring wells to be installed during the remedial design.

5. Cover System

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If a Track 2 restricted-residential cleanup is achieved, a Cover System will not be a required element of the remedy.

6. 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 New York State Department of Health (NYSDOH) or New York City Department of Health (NYCDOH); and
- require compliance with the Department approved Site Management Plan.

7. 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:

Intuitional Controls: The Environmental Easement discussed in Paragraph 6 above.

Engineering Controls: The soil cover discussed in Paragraph 5.

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 descriptions of the provisions of the environmental easement including any land use, and groundwater use restrictions;

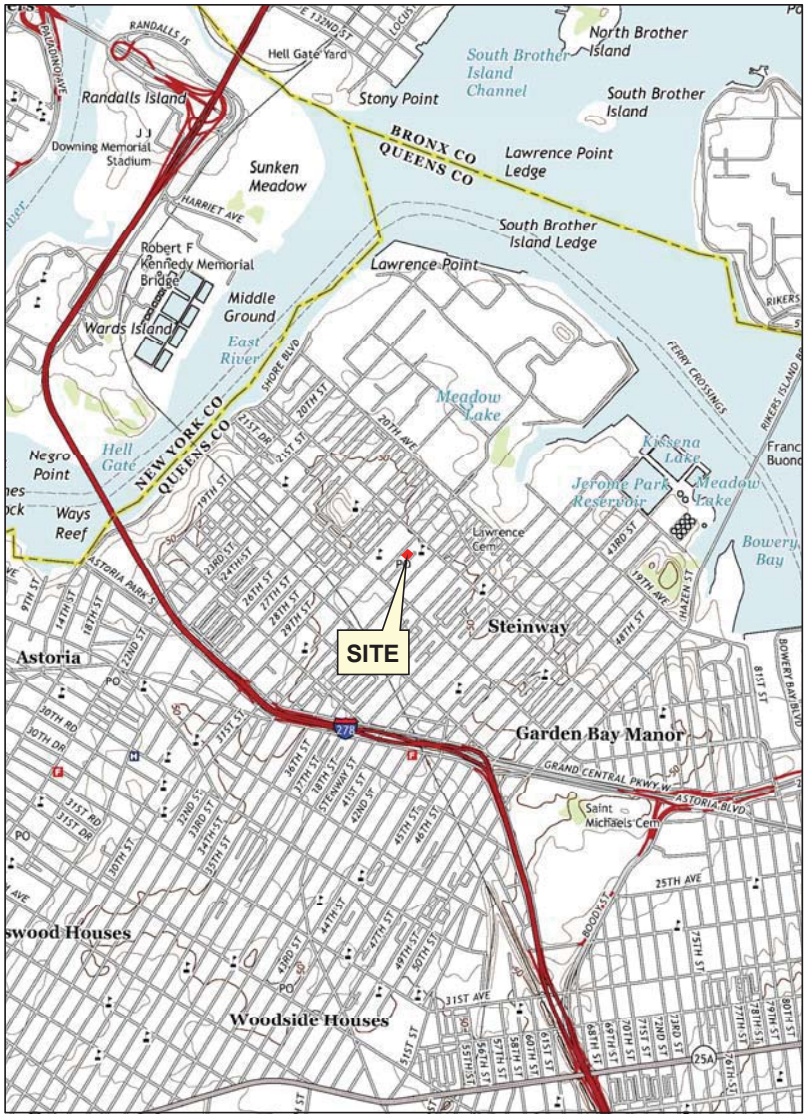
- provision for evaluation of the potential for soil vapor intrusion for any occupied buildings on the site, including provision for implementing actions recommended to address exposures related to soil vapor intrusion;
- a provision that should a building foundation or building slab be removed in the future, a cover system consistent with that described in Paragraph 5 above will be placed in any areas where the upper two feet 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;
- monitoring for vapor intrusion for any occupied existing or future 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, inspection, and reporting of any mechanical or physical components of the active vapor mitigation system(s). The plan includes, but is not limited to:

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



Basemap: USGS Central Park - NY-NJ Quandrangle, 2013
http://www.usgs.gov

Site Location

0 1,000 2,000 4,000 Feet

http://gis.nyc.gov/taxmap/map.htm

Department of Finance Digital Tax Map

0 50 100 200 Feet

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Department of City Planning MapPLUTO - 2016 v2

0 50 100 200 Feet

Client

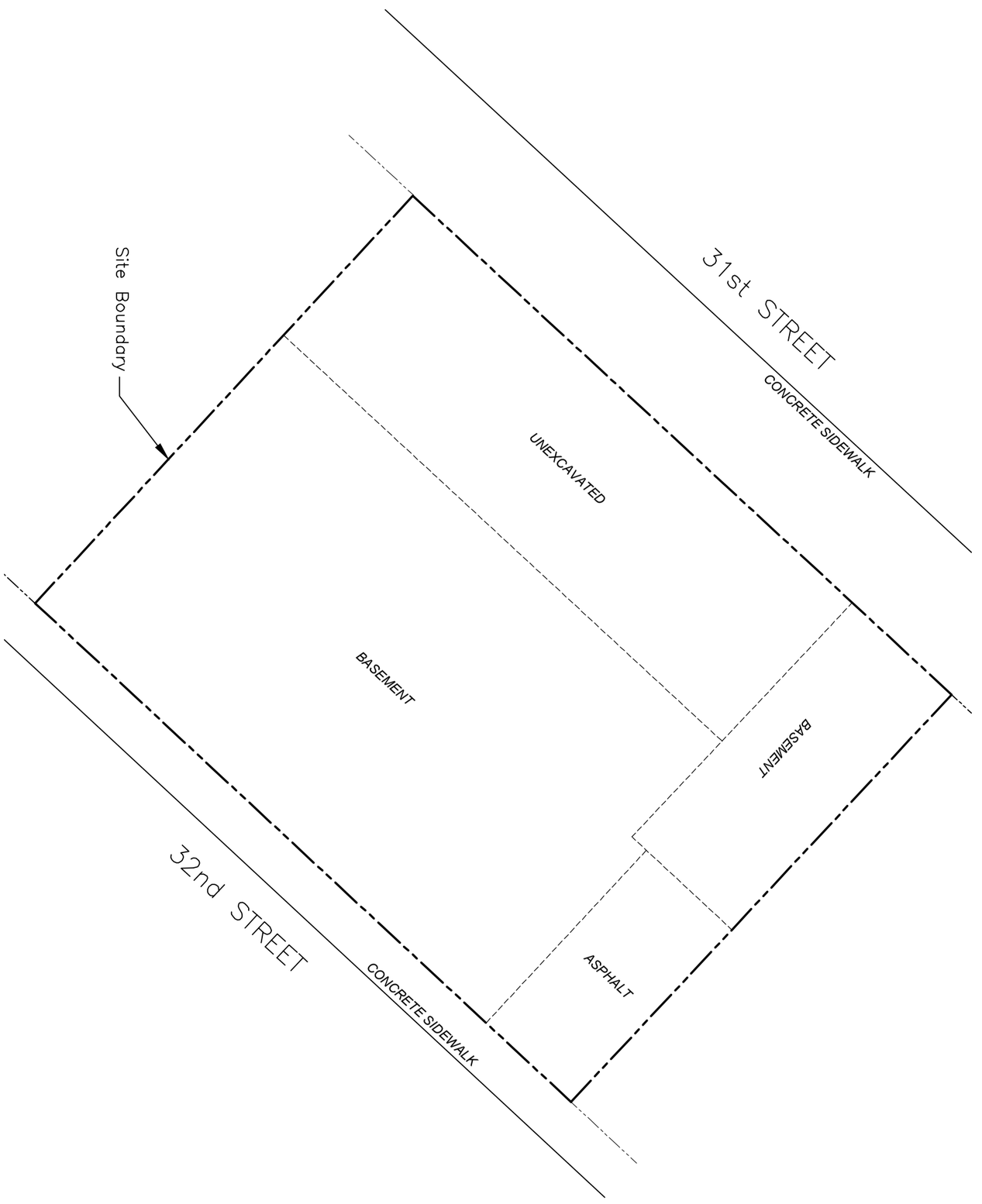
21-25 31st Street
Queens, New York
Block 831, Lot 20

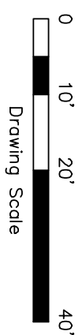
Tenen Environmental, LLC
121 West 27th Street
Suite 702
New York, NY 10001
O: (646) 606-2332
F: (646) 606-2379

Drawn By	Checked By	Date	Scale
LM	MC	March 2017	As Noted

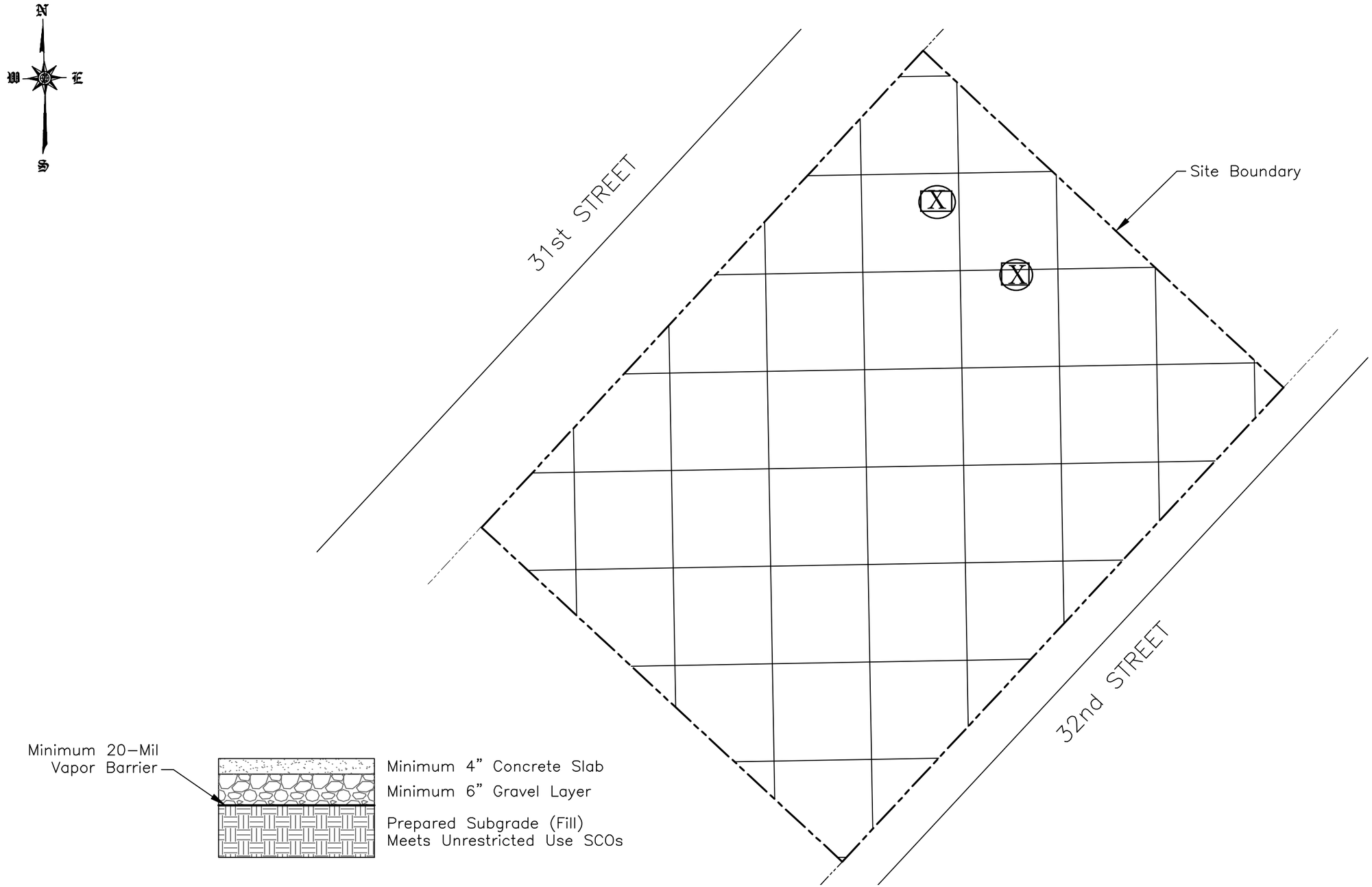
Drawing Title: **Site Location Map**

Drawing No: **Figure 1**





DRAWING TITLE. Site Layout	DRAWN BY LM CHECKED BY SB	CONSULTANT TENEN ENVIRONMENTAL TENEN ENVIRONMENTAL, LLC 121 West 27th Street Suite 702 New York, NY 10001 O: 646-606-2332 F: 646-606-2379	SITE BCP Site #C241167 21-25 31st Street Queens, New York
DRAWING NO. Figure 2	DATE July 2017 SCALE: AS NOTED		



Minimum 20–Mil Vapor Barrier

Minimum 4" Concrete Slab
Minimum 6" Gravel Layer
Prepared Subgrade (Fill) Meets Unrestricted Use SCOs

(A) Typical Concrete or Asphalt Detail – Side View (Not to Scale)

Designation

(X) Pre-Design Groundwater Investigation

0 10' 20' 40'
Drawing Scale

SITE
BCP Site #C241167
21–25 31st Street
Queens, New York

CONSULTANT
TENEN ENVIRONMENTAL
TENEN ENVIRONMENTAL, LLC
121 West 27th Street
Suite 702
New York, NY 10001
O: 646–606–2332
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DRAWN BY	CHECKED BY	DATE	SCALE:
LM	SB	July 2017	AS NOTED

DRAWING TITLE: Remedial Cover Type

DRAWING NO. Figure 3