New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Bureau B, 12th Floor
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Joe Martens
Commissioner

May 16, 2013

Mr. Marcello Porcelli
4566 Broadway, LLC
364 Maspeth Avenue
Brooklyn, New York. NY 11211

Re: 4566 Broadway Avenue (Nagle)
Site ID: C231054
Remedial Work Plan & Decision Document

Dear Mr. Porcelli:

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 4566 Broadway Avenue (Nagle) site dated December 2012 and prepared by J.C. Broderick & Associates, Inc. on behalf of the 4566 Broadway, 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, Sadique Ahmed at 518 402 9767 or sxahmed@gw.dec.state.ny.us at your earliest convenience to discuss next steps. Please recall the Department requires seven days notice prior to the start of field work.

Sincerely,

Robert J. Cozzy
Director
Remedial Bureau B
Division of Environmental Remediation

Enclosure: Decision Document, 4566 Broadway Avenue (Nagle), BCP site C231054.

ec *w/attachments*:

R. Schick
M. Ryan
R. Cozzy
J. Moras
S. Ahmed
Dana Schaefer, Esq.
Joseph P. Crua, NYS DOH
Albert J. DeMarco, NYS DOH
Marcello Porcelli, 4566 Broadway, LLC
Christopher P. Tomasello, IH, Reliant Consulting Services, Inc.
Steven Muller, J.C. Broderick & Associates, Inc.,
Seth Friedland Esq.

ver 2011-08-16

DECISION DOCUMENT

4566 Broadway Avenue (Nagle)
Brownfield Cleanup Program
New York, New York County
Site No. C231054
May 2013

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

DECLARATION STATEMENT - DECISION DOCUMENT

4566 Broadway Avenue (Nagle)
Brownfield Cleanup Program
New York, New York County
Site No. C231054
May 2013

Statement of Purpose and Basis

This document presents the remedy for the 4566 Broadway Avenue (Nagle) 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 4566 Broadway Avenue (Nagle) 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. A remedial design program will be implemented to provide the details necessary for the construction, operation, 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 gas 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. PCE contaminated soil will be excavated to pre-defined limits and will be transported off-site for disposal. The soil excavation will remove most, if not all of the soil with PCE

contamination above the restricted residential SCO (RRSCO) but, as described below (see sub-section a), physical constraints may not allow excavation of all of the soil above the RRSCO for PCE. The soil excavation will occur near the location of borings SB-8 and ASR-16 (near the eastern corner of the property, behind the one story former gasoline service station building) as follows:

a. The excavation will extend to a depth of five (5) feet below ground surface (bgs) with lateral dimensions to include contaminated soil near of SB-8 and northwest of ASR-16. The excavation is limited to 5 feet bgs due to the proximity of the excavation to the building foundation (concerns with compromising the foundation) and adjacent properties, as well as the decreasing concentrations of PCE with depth. The lateral limits of the excavation are based on the limitations imposed by the on-site one story building to the northwest, the sidewalk to the south and the neighboring property to the northeast.

b. Post-excavation samples will be collected to document the remaining PCE contamination, if any. These soil samples will not be used to determine further excavation (due to the limitations described sub-section a above).

c. The SVE system will address any remaining PCE contamination and is discussed in greater detail below.

Approximately 60 (sixty) cubic yards of soil will be removed by excavation and will be disposed at an approved off-site facility. Clean fill meeting the requirements of 6 NYCRR Part 375- 6.7(d) for restricted residential use will be brought in to replace the excavated soil and establish the designed grades at the site.

3. A Soil Vapor Extraction (SVE) system will be installed to remediate the PCE/BTEX contamination remaining in the soil and soil vapor. Soil vapor extraction (SVE) is an in-situ technology used to treat volatile organic compounds (VOCs) in soil. The process physically removes contaminants from the soil by applying a vacuum to a SVE well that has been installed into the vadose zone (the area below the ground but above the water table). The vacuum draws air through the soil matrix which carries the VOCs from the soil to the SVE well. The air extracted from the SVE wells is then run through an activated carbon treatment canister (or other air treatment process as applicable) to remove the VOCs before the air is discharged to the atmosphere.

At this site approximately 10 SVE wells (number of wells may change based upon results of the pilot test to be performed) will be installed in the vadose zone and screened from 2 feet below the ground surface to a depth of approximately 12 feet. The air containing VOCs extracted from the SVE wells will be treated using activated carbon (or other air treatment as applicable) and monitored to ensure effluent air meets SCGs.

The SVE system will focus on the following four areas of soil contamination:

- the area of elevated PCE in the eastern end of the site (SB-8, ASR-16 and ASR-17);

• the area of elevated BTEX near the former gasoline tanks (ASR-5, SB-5);

• the area of elevated BTEX along the northern site boundary (ASR-4, ASR-14 and SB-4); and

• the area of elevated BTEX along the southeastern property boundary close to ASR-7. The operation of the SVE system will continue until the remedial objectives have been achieved, or until the Department determines that continued operation is technically impracticable or not feasible.

4. Once the SVE system is operational an evaluation of the potential for soil vapor intrusion for the on-site building will be performed. This evaluation will include a provision for implementing actions recommended to address exposures related to soil vapor intrusion.

5. A site cover currently exists and will be maintained to allow for restricted residential use of the site. Any site redevelopment will maintain a site cover, which may consist either of the structures such as buildings, pavement, sidewalks comprising the site development or a soil cover in areas where the upper two feet of exposed surface soil will exceed the applicable soil cleanup objectives (SCOs). Where a soil cover is required it will be a minimum of two feet of soil, meeting the SCOs for cover material as set forth in 6 NYCRR Part 375-6.7(d) for restricted residential use. The soil cover will be placed over a demarcation layer, with the upper six inches of the soil of sufficient quality to maintain a vegetation layer. Any fill material brought to the site will meet the requirements for the identified site use as set forth in 6 NYCRR Part 375-6.7(d).

6. If the site redevelopment and construction of new building begins during this remedial process before the remedy is completed a vapor barrier and sub-slab depressurization (SSDS) system must be incorporated in the building foundation during construction and deemed effective at reducing/ eliminating air impacts as a result of SVI prior to occupation.

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

• requires the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);
• allows the use and development of the controlled property for restricted residential, commercial and industrial use as defined by Part 375-1.8(g), although land use is subject to local zoning laws;

• restricts the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or County DOH;

• requires compliance with the Department approved Site Management Plan.

8. 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 under the point number 7 above.

Engineering Controls: The SVE system discussed in Paragraph 3, the Cover System discussed in Paragraph 5 and the vapor barrier and the sub-slab depressurization system 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, which will include a provision to implement a NYSDOH CAMP (Community Air Monitoring Program) for any future ground intrusive activity including utility work;

- descriptions of the provisions of the environmental easement including any land use and/or groundwater use restrictions;

- a provision for evaluation of the potential for soil vapor intrusion for any buildings developed on the site, including provision for implementing actions recommended to address exposures related to soil vapor intrusion;

- provisions for the management and inspection of the identified engineering controls;

- maintaining site access controls and Department notification; and

- the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.

b. a Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:

- monitoring of groundwater and soil vapor 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 developed on the site, as may be required by the Institutional and Engineering Control Plan discussed in item 8a above.

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

- compliance monitoring of treatment systems to ensure proper O&M as well as providing the data for any necessary permit or permit equivalent reporting;

- maintaining site access controls and Department notification; and

- providing the Department access to the site and O&M records.

9. A contingency plan (in case construction of the new building begins after implementing the above remedy but prior to complete remediation of the site) for groundwater remediation of BTEX, PCE and degradation products of PCE prior to building construction:

a. as the groundwater contaminant plume is currently decreasing in concentration and extent, a contingency plan will be developed and implemented should monitoring of the groundwater plume indicate that contaminants are not continuing the decreasing trend towards achieving groundwater standards after the above remedy has been operated for two years;

b. if needed, the contingency plan will be comprised of the most appropriate and cost effective measures available at the time when the contingency plan is required; and

c. structures to be built on the site must not inhibit the implementation of the contingency plan for as long as it may be needed.

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.

May 16, 2013

Date

Robert J. Cozzy, Director
Remedial Bureau B

DECISION DOCUMENT

4566 Broadway Avenue (Nagle)
New York, New York County
Site No. C231054
May 2013

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:

The New York Public Library, Inwood Branch
4790 Broadway Ave
New York, NY 10034-4916
Phone: (212) 942-2445

Community Board 12
Attn: Pamela Palanque-North
711 W 168th Street
New York, NY 10032
Phone: 212-568-8500

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 urban area on a triangularly shaped parcel in the upper west side of Manhattan, at the northeast corner of Broadway and Nagle Avenue. The area is referred as the "Inwood" section of upper Manhattan and the site is approximately 0.36 acres in size.

Site Features: The whole footprint of the site is now paved and fenced with a lockable gate. There is a small one story building at the east corner which is used by the parking attendant.

Current Zoning/Uses: The site's zoning district is C2-2/R-7-2 which is used for commercial and residential purposes. Currently, the site is used for a 24 hour parking facility, but until 2005 was used as a gasoline service station. The surrounding parcels are currently used for a combination of commercial and residential purposes. Adjacent to the site on the north side is an eight story residential apartment building; Intermediate School (IS) #218 is located further north; an open space and outdoor recreation area for IS #218 is located just northeast of the site. Fort Tryon Park is located west of the site across Broadway.

Historic Uses: From the 1920's through the 1950's, the site was used as a gasoline service station and auto repair shop. After that period until 2005, the site was used as only a gasoline service station under several ownerships. Prior use that appears to have led to site contamination includes leaks and spills from gasoline service operations and auto repair activities. During October 2005 all underground storage tanks (USTs) which had been used for gasoline/petroleum products, were removed for disposal off-site. During this removal noticeable petroleum staining of subsurface soil was detected. A Brownfield Cleanup Agreement was executed in September 2006.

Site Geology and Hydrogeology: The site is located approximately 30 feet above mean sea level. The site stratigraphy (from the ground surface down) consists of six inches of concrete or asphalt followed by a layer of six inches of sand; below that there is fill material which consists of coarse and fine sand, some silt, with varying amounts of coal, brick, wood and glass, encountered to a depth of approximately 11 feet below ground surface (bgs). Depth of groundwater ranges from 7 feet to 12 feet bgs and flows towards the east, southeast.

A site location map is attached as Figure 1.

SECTION 4: LAND USE AND PHYSICAL SETTING

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

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

SECTION 5: ENFORCEMENT STATUS

The Applicant under the Brownfield Cleanup Agreement is a Participant. The Applicant has an obligation to address on-site and off-site contamination. 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:

- air
- groundwater
- soil
- soil vapor

- indoor 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	MTBE (METHYL-TERT-BUTYL ETHER)
ETHYLBENZENE	TETRACHLOROETHYLENE (PCE)
TOLUENE	VINYL CHLORIDE
XYLENE (MIXED)	TRICHLOROETHENE (TCE)

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.

The RI report presents a detailed discussion of any existing and potential impacts from the site to fish and wildlife receptors.

Nature and Extent of Contamination: Based upon investigations conducted to date, the primary contaminants of concern at the site include the petroleum related contaminants benzene, toluene, ethylbenzene, xylene (BTEX) and methyl tertiary butyl ether (MTBE), as well as the chlorinated solvent tetrachloroethene (PCE) in soil, groundwater and in soil vapor. The highest concentrations of petroleum contamination were found in the soil samples collected from near the bottom of the underground storage tank (UST) excavation located in the southwest side of the site. Benzene was detected at concentrations up to 7.3 parts per million (ppm), which exceeds the soil cleanup objective (SCO) for unrestricted use (0.06 ppm). Ethylbenzene (1 ppm to 150 ppm), toluene (0.7 ppm to 290 ppm), xylenes (mixed) (0.26 to 950 ppm) and MTBE (0.93 ppm to 23 ppm) were also detected at the site. Concentrations of PCE were found in on-site shallow (2.5 to 5 feet below grade) soil samples near the eastern corner of the site, behind the one story structure, at concentrations (1.3 ppm to 120 ppm) that exceed the soil cleanup objectives for the protection of groundwater (1.3 ppm).

Groundwater is contaminated at concentrations above groundwater standards. Groundwater samples taken on-site (or immediately adjacent to the site) had maximum concentrations of BTEX and MTBE of: 204 ppb for benzene (standard is 1 ppb); 26 ppb for toluene (standard is 5 ppb); 118 ppb for ethylbenzene (standard is 5 ppb); 240 ppb for xylene (standard is 5 ppb); and 21 ppb for MTBE (standard is 10 ppb). PCE was detected above its groundwater standard (5 ppb) in one on-site groundwater sample near the eastern corner of the site at a concentration of 17.1 ppb. PCE was also detected above its groundwater standard at one off-site location on the south side of Nagle Avenue at a concentration of 10.8 ppb; this detection was determined to not be site related because it is sidegradient from the site and there are groundwater samples between the site and this location where PCE was not detected. Degradation products of PCE (cis-1,2 dichloroethene and vinyl chloride) were also found in groundwater. The maximum on-site concentration of cis-1,2 dichloroethene was 7.12 ppb (standard 5 ppb). Vinyl chloride (44 ppb vs. the standard of 2 ppb) was detected at an off-site location (sidewalk) immediately adjacent to the site.

The highest concentration of PCE detected in on-site soil vapor samples was 5,280,0000 micrograms per cubic meter (µg/m3). Elevated, but significantly lower concentrations of PCE and its associated degradation products were also detected in off-site soil vapor samples. Approximately 100 feet downgradient (southeast) from the site along the northern sidewalk of Nagle Avenue the PCE and vinyl chloride concentrations in soil vapor were 136 and 187 µg/m3 respectively. The highest PCE concentration in off-site soil vapor detected was on the south side of Nagle Avenue at a concentration of 1,051 µg/m3; as discussed for the groundwater contamination above, the detection of PCE on the south side of Nagle Avenue is not site related. BTEX and MTBE were also detected in on-site soil vapor and their concentrations were 230,650 and 9,660 µg/m3 respectively.

Sub-slab and indoor air sample results were compared with New York State's Soil Vapor Intrusion Guidance to evaluate the Soil Vapor Intrusion (SVI) in four surrounding structures. Results indicate that 'No Further Action' is recommended for two structures, and 'Take

reasonable and practical actions to identify sources and reduce exposures' is recommended for one structure. 'Monitor/Mitigate' is recommended for another structure (based on sub-slab vapor sample results) but this structure is located on the south side of Nagle Avenue. As discussed above, the detection of PCE on the south side of Nagle Avenue is not site related.

Special Resources Impacted/Threatened: The site is located in the urban area and a Fish and Wildlife Impact Analysis is not warranted.

6.4: Summary of Human Exposure Pathways

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

Since the site is covered with asphalt and concrete, contact with contaminated soils and groundwater is unlikely unless persons dig below the ground surface. People are not drinking the contaminated groundwater because the area is served by a public water system 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 development. Vapor intrusion concerns are limited to one off-site building and are due to a contaminant source unrelated to this site.

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.

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 installation of Soil Vapor Extraction (SVE) system and hot spot excavation remedy.

The elements of the selected remedy, as shown in Figure 2 and 3, are as follows:

1. A remedial design program will be implemented to provide the details necessary for the construction, operation, 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 gas 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. PCE contaminated soil will be excavated to pre-defined limits and will be transported off-site for disposal. The soil excavation will remove most, if not all of the soil with PCE contamination above the restricted residential SCO (RRSCO) but, as described below (see sub-section a), physical constraints may not allow excavation of all of the soil above the RRSCO for PCE. The soil excavation will occur near the location of borings SB-8 and ASR-16 (near the eastern corner of the property, behind the one story former gasoline service station building) as follows:

a. The excavation will extend to a depth of five (5) feet below ground surface (bgs) with lateral dimensions to include contaminated soil near of SB-8 and northwest of ASR-16. The excavation is limited to 5 feet bgs due to the proximity of the excavation to the building foundation (concerns with compromising the foundation) and adjacent properties, as well as the decreasing concentrations of PCE with depth. The lateral limits of the excavation are based on the limitations imposed by the on-site one story building to the northwest, the sidewalk to the south and the neighboring property to the northeast.

b. Post-excavation samples will be collected to document the remaining PCE contamination, if any. These soil samples will not be used to determine further excavation (due to the limitations described sub-section a above).

c. The SVE system will address any remaining PCE contamination and is discussed in greater detail below.

Approximately 60 (sixty) cubic yards of soil will be removed by excavation and will be disposed at an approved off-site facility. Clean fill meeting the requirements of 6 NYCRR Part 375- 6.7(d) for restricted residential use will be brought in to replace the excavated soil and establish the designed grades at the site.

3. A Soil Vapor Extraction (SVE) system will be installed to remediate the PCE/BTEX contamination remaining in the soil and soil vapor. Soil vapor extraction (SVE) is an in-situ technology used to treat volatile organic compounds (VOCs) in soil. The process physically removes contaminants from the soil by applying a vacuum to a SVE well that has been installed into the vadose zone (the area below the ground but above the water table). The vacuum draws air through the soil matrix which carries the VOCs from the soil to the SVE well. The air extracted from the SVE wells is then run through an activated carbon treatment canister (or other air treatment process as applicable) to remove the VOCs before the air is discharged to the atmosphere.

At this site approximately 10 SVE wells (number of wells may change based upon results of the pilot test to be performed) will be installed in the vadose zone and screened from 2 feet below the ground surface to a depth of approximately 12 feet. The air containing VOCs extracted from the SVE wells will be treated using activated carbon (or other air treatment as applicable) and monitored to ensure effluent air meets SCGs.

The SVE system will focus on the following four areas of soil contamination:

- the area of elevated PCE in the eastern end of the site (SB-8, ASR-16 and ASR-17);

- the area of elevated BTEX near the former gasoline tanks (ASR-5, SB-5);

- the area of elevated BTEX along the northern site boundary (ASR-4, ASR-14 and SB-4); and

- the area of elevated BTEX along the southeastern property boundary close to ASR-7. The operation of the SVE system will continue until the remedial objectives have been achieved, or until the Department determines that continued operation is technically impracticable or not feasible.

4. Once the SVE system is operational an evaluation of the potential for soil vapor intrusion for the on-site building will be performed. This evaluation will include a provision for implementing actions recommended to address exposures related to soil vapor intrusion.

5. A site cover currently exists and will be maintained to allow for restricted residential use of the site. Any site redevelopment will maintain a site cover, which may consist either of the structures such as buildings, pavement, sidewalks comprising the site development or a soil cover in areas where the upper two feet of exposed surface soil will exceed the applicable soil cleanup objectives (SCOs). Where a soil cover is required it will be a minimum of two feet of soil, meeting the SCOs for cover material as set forth in 6 NYCRR Part 375-6.7(d) for restricted residential use. The soil cover will be placed over a demarcation layer, with the upper six inches of the soil of sufficient quality to maintain a vegetation layer. Any fill material brought to the site will meet the requirements for the identified site use as set forth in 6 NYCRR Part 375-6.7(d).

6. If the site redevelopment and construction of new building begins during this remedial process before the remedy is completed a vapor barrier and sub-slab depressurization (SSDS) system must be incorporated in the building foundation during construction and deemed effective at reducing/ eliminating air impacts as a result of SVI prior to occupation.

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

- requires the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);
- allows the use and development of the controlled property for restricted residential, commercial and industrial use as defined by Part 375-1.8(g), although land use is subject to local zoning laws;

• restricts the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or County DOH;

• requires compliance with the Department approved Site Management Plan.

8. 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 under the point number 7 above.

Engineering Controls: The SVE system discussed in Paragraph 3, the Cover System discussed in Paragraph 5 and the vapor barrier and the sub-slab depressurization system 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, which will include a provision to implement a NYSDOH CAMP (Community Air Monitoring Program) for any future ground intrusive activity including utility work;

• descriptions of the provisions of the environmental easement including any land use and/or groundwater use restrictions;

• a provision for evaluation of the potential for soil vapor intrusion for any buildings developed on the site, including provision for implementing actions recommended to address exposures related to soil vapor intrusion;

• provisions for the management and inspection of the identified engineering controls;

• maintaining site access controls and Department notification; and

• the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.

b. a Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:

• monitoring of groundwater and soil vapor 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 developed on the site, as may be required by the Institutional and Engineering Control Plan discussed in item 8a above.

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

• compliance monitoring of treatment systems to ensure proper O&M as well as providing the data for any necessary permit or permit equivalent reporting;

• maintaining site access controls and Department notification; and

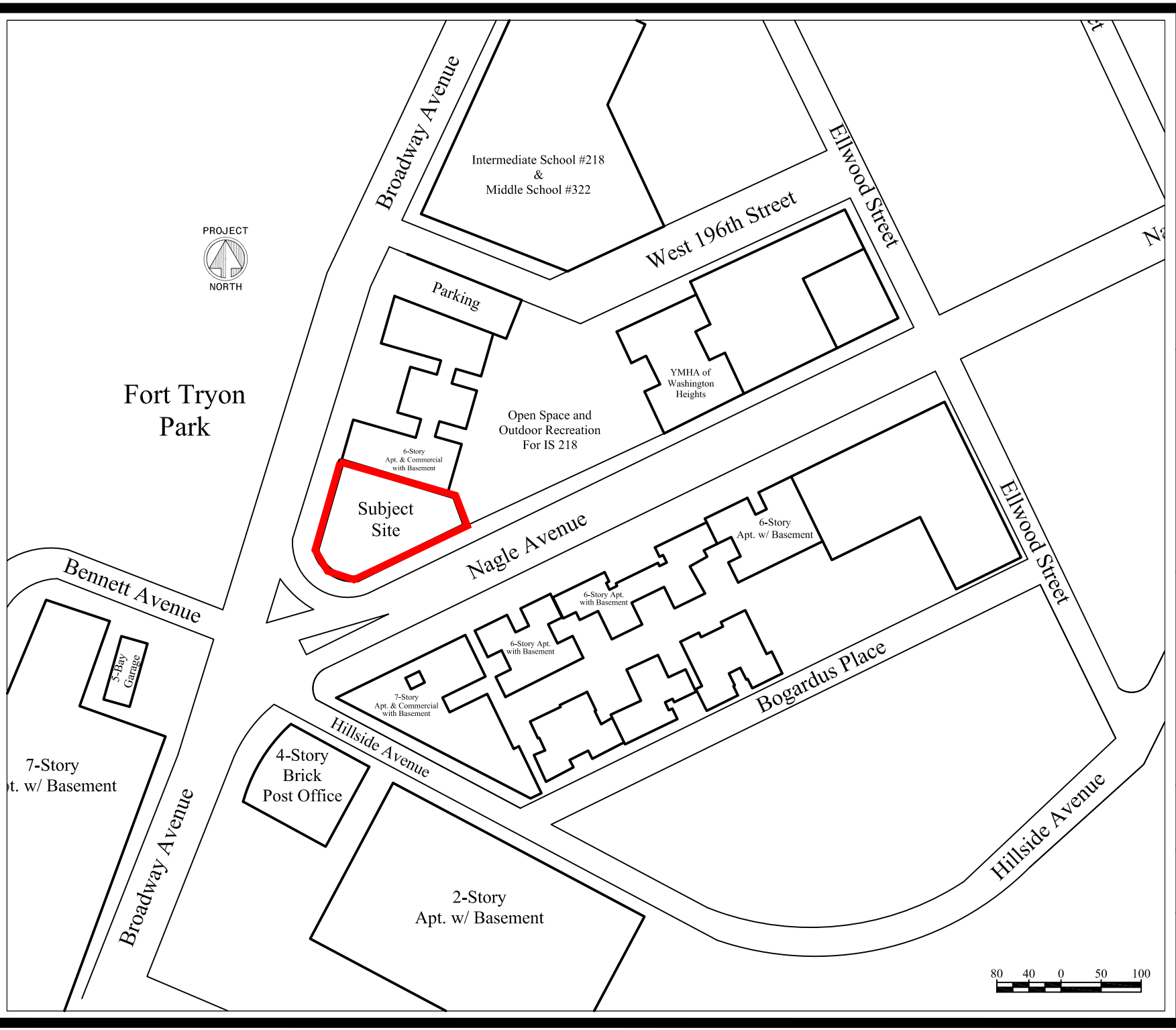
• providing the Department access to the site and O&M records.

9. A contingency plan (in case construction of the new building begins after implementing the above remedy but prior to complete remediation of the site) for groundwater remediation of BTEX, PCE and degradation products of PCE prior to building construction:

a. as the groundwater contaminant plume is currently decreasing in concentration and extent, a contingency plan will be developed and implemented should monitoring of the groundwater plume indicate that contaminants are not continuing the decreasing trend towards achieving groundwater standards after the above remedy has been operated for two years;

b. if needed, the contingency plan will be comprised of the most appropriate and cost effective measures available at the time when the contingency plan is required; and

c. structures to be built on the site must not inhibit the implementation of the contingency plan for as long as it may be needed.



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Drawing Title

Figure 1

Surrounding Area Use Map

Scale	Project No.	Date
As Noted	11-21567	12-09-11

Drawn By	Checked By	Page No.
J.V.N.	S.W.M.	2 of 8

Drawing No.

2

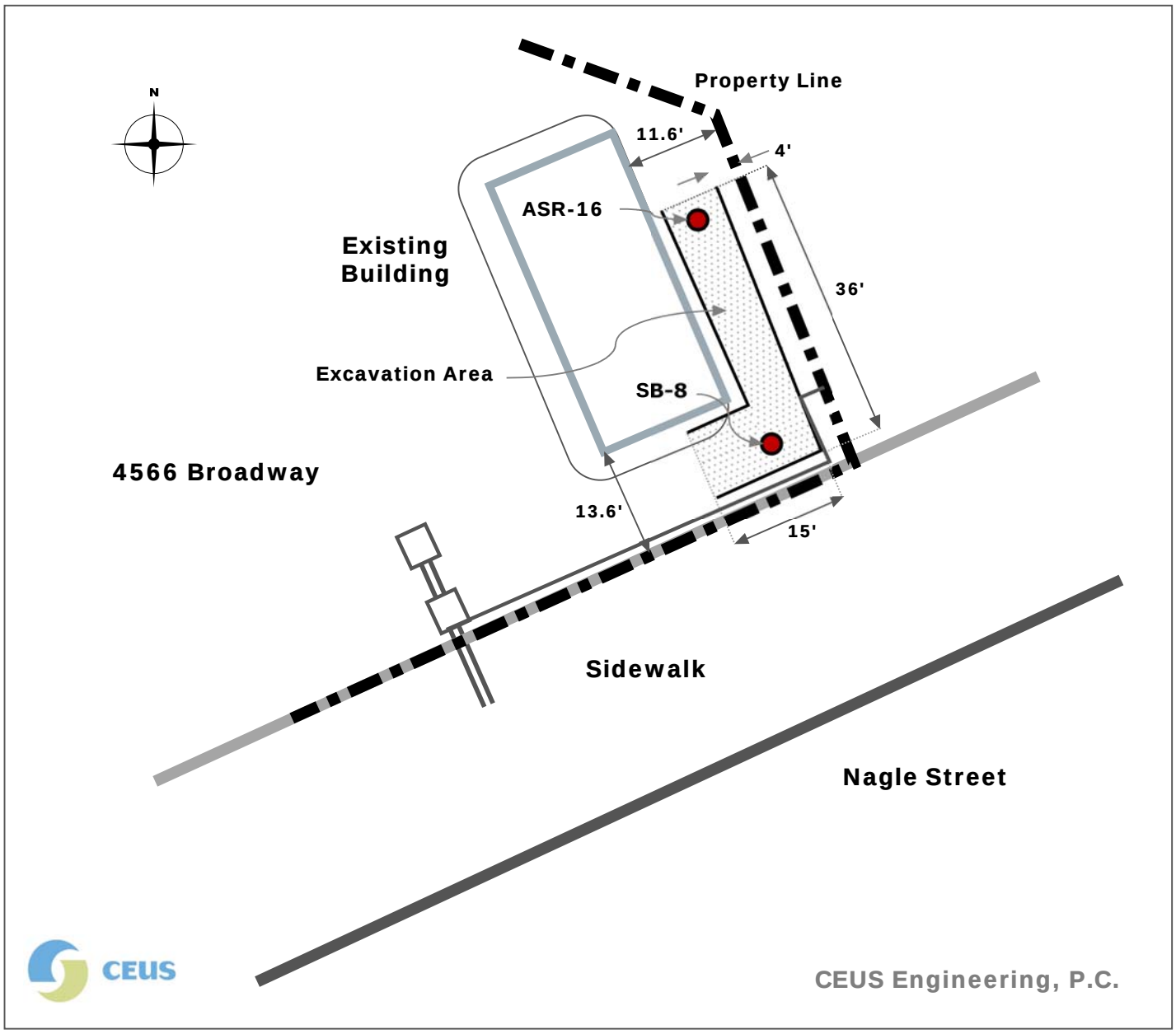

Figure 2: Excavation Near Borings SB-8 and ASR-16

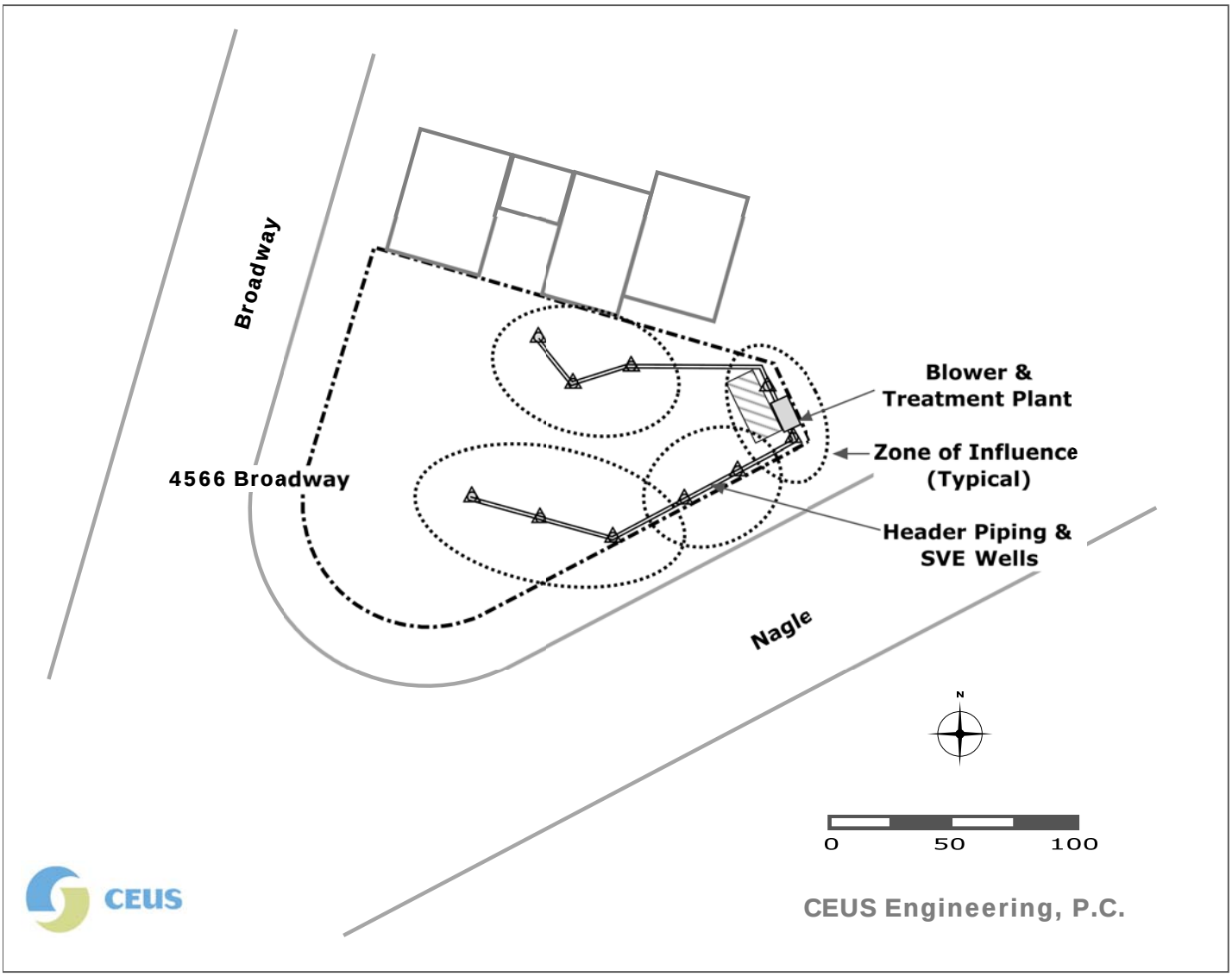

Figure 3: Soil Vapor Extraction Areas