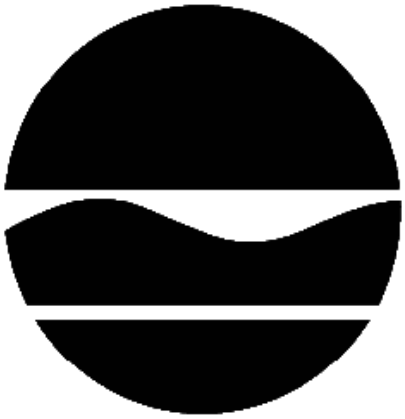
PROPOSED REMEDIAL ACTION PLAN

20 West Centennial Avenue
State Superfund Project
Roosevelt, Nassau County
Site No. 130154
February 2017



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

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SECTION 1: SUMMARY AND PURPOSE OF THE PROPOSED PLAN

The New York State Department of Environmental Conservation (the Department), in consultation with the New York State Department of Health (NYSDOH), is proposing a remedy for the above referenced site. The disposal of hazardous wastes at the site has resulted in threats to public health and the environment that would be addressed by the remedy proposed by this Proposed Remedial Action Plan (PRAP). The disposal of hazardous wastes at this site, as more fully described in Section 6 of this document, has contaminated various environmental media. The proposed remedy is intended to attain the remedial action objectives identified for this site for the protection of public health and the environment. This PRAP identifies the preferred remedy, summarizes the other alternatives considered, and discusses the reasons for the preferred remedy.

The New York State Inactive Hazardous Waste Disposal Site Remedial Program (also known as the State Superfund Program) is an enforcement program, the mission of which is to identify and characterize suspected inactive hazardous waste disposal sites and to investigate and remediate those sites found to pose a significant threat to public health and environment.

The Department has issued this document in accordance with the requirements of 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 document is a summary of the information that can be found in the site-related reports and documents in the document repository identified below.

SECTION 2: CITIZEN PARTICIPATION

The Department seeks input from the community on all PRAPs. This is an opportunity for public participation in the remedy selection process. The public is encouraged to review the reports and documents, which are available at the following repository:

Roosevelt Public Library
27 W Fulton Ave
Roosevelt, NY 11575
Phone: (516)378-0222

A public comment period has been set from:

February 24, 2017 to March 27, 2017

A public meeting is scheduled for the following date:

March 16 at 6:00PM

Public meeting location:

Roosevelt Public Library

At the meeting, the findings of the remedial investigation (RI) and the feasibility study (FS) will be presented along with a summary of the proposed remedy. After the presentation, a question-and-answer period will be held, during which verbal or written comments may be submitted on the PRAP.

Written comments may also be sent through March 27, 2017 to:

Henry Wilkie
NYS Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway
Albany, NY 12233
henry.wilkie@dec.ny.gov

The Department may modify the proposed remedy or select another of the alternatives presented in this PRAP based on new information or public comments. Therefore, the public is encouraged to review and comment on the proposed remedy identified herein. Comments will be summarized and addressed in the responsiveness summary section of the Record of Decision (ROD). The ROD is the Department's final selection of the remedy for this site.

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 at 20 West Centennial Avenue, Roosevelt, Town of Hempstead,

Nassau County. The site (Section 55/Block 415/Lot 273) is a 16,000 square foot, industrially developed property. The site is surrounded by commercial properties to the north and west. To the east of the site are two church buildings, and residences are located to the south.

Site Features: The site is comprised of a single building, paved driveway, parking lot and a small landscaped area. The on-site building, a single story concrete block slab-on-grade structure constructed circa 1955, is currently vacant. The building has a rectangular shape with an area of 9,000 square feet, and is situated in the southeast portion of the property. There is an access driveway along the west side of the building providing access to an asphalt parking lot on the north of building. Three stormwater drywells are located in the asphalt-paved areas of the subject property. Two of these stormwater drywells are located on the north side of the building, and one is located in the southern portion of the access driveway.

Current Zoning/Use: The subject property is zoned for light manufacturing use and is currently unoccupied.

Past Use of the Site: This site was used by various uniform and linen supply companies from 1955 to 1998, and has been vacant since that time. The building was used as a commercial laundry facility which may have used tetrachloroethene (PCE).

In 2002, phase I and II environmental assessments were performed at the site by the Town of Hempstead. Based on these investigations, PCE was detected in the soil immediately beneath the slab of the building and in the on-site groundwater. PCE soil concentration of up to 154 miligrams/kilograms (ppm) and groundwater concentrations of up to 7,690 micrograms/liter (ppb) were reported.

Site Geology and Hydrogeology: The site located in the Atlantic Coastal Plain physiographic province that is characterized by low hills of unconsolidated sands, gravel and silt. The near-surface consists of the Upper Glacial deposits that are characterized by southward sloping deposits of sand, gravel and silt. The aquifer of concern beneath the site is the Upper Glacial Aquifer which lies between the water table (which occurs at approximately 20 feet below grade) and the surface of the Magothy Aquifer (which is estimated to occur at 56 feet below grade).

Based on the Nassau County Water Table Elevation Map dated March, 2000, the regional groundwater flow direction across the area of the site is generally to the south, remedial investigation showed that the groundwater flows in a southerly direction, towards Baldwin Bay. Investigations at the site indicate that the depth to the water table is 20 to 23 feet below grade.

A site location map and a site boundary map are attached as Figure 1 and 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, 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) are/is being evaluated in addition to an alternative

which would allow for unrestricted use of the site.

A comparison of the results of the investigation to the appropriate standards, criteria and guidance values (SCGs) for the identified land use and the unrestricted use SCGs for the site contaminants is included in the Tables for the media being evaluated in Exhibit A.

SECTION 5: ENFORCEMENT STATUS

Potentially Responsible Parties (PRPs) are those who may be legally liable for contamination at a site. This may include past or present owners and operators, waste generators, and haulers.

The PRPs for the site, documented to date, include:

20 W. Centennial Corp

The Department and 20 W. Centennial Corp entered into a Consent Order, Index # WI-I 137-09-06, on December 29, 2009. The Order obligates the responsible parties to implement a full remedial program.

SECTION 6: SITE CONTAMINATION

6.1: Summary of the Remedial Investigation

A Remedial Investigation (RI) has been conducted. The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the site. The field activities and findings of the investigation are described in the RI Report.

The following general activities are conducted during an RI:

- Research of historical information,
- Geophysical survey to determine the lateral extent of wastes,
- Test pits, soil borings, and monitoring well installations,
- Sampling of waste, surface and subsurface soils, groundwater, and soil vapor,
- Sampling of surface water and sediment,
- Ecological and Human Health Exposure Assessments.

The analytical data collected on this site includes data for:

- groundwater
- soil
- 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. The tables found in Exhibit A list the applicable SCGs in the footnotes. 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 hazardous waste 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 in Exhibit A. Additionally, the RI Report contains a full discussion of the data. The contaminant(s) of concern identified at this site is/are:

tetrachloroethene (PCE)	vinyl chloride
trichloroethene (TCE)	cis-1,2-dichloroethene

As illustrated in Exhibit A, the contaminant(s) of concern exceed the applicable SCGs for:

- groundwater
- soil
- soil vapor intrusion

6.2: Interim Remedial Measures

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

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

IRM - On site soils

Under the December 29, 2009 Consent Order, NYSDEC approved an IRM Workplan. The IRM Workplan addressed the excavation of contamination soil from three on-site storm water drywells, excavation of the hot spots of contaminated soil beneath the central portion of the building and installation of an air sparging/soil vapor extraction system.

Drywell Soil Removal

On June 17-18, 2013 contaminated soil was excavated and removed by Laurel Environmental Associates, Ltd, on behalf of the PRP, from the three storm water drywells (DW-1, DW-2 and DW-3). A total of nineteen cubic yards of soil was removed. Upon completion of the removal of the impacted material, confirmatory end point samples were collected and submitted for laboratory analysis. The results of the analysis indicated that volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) and metal were not detected in any of the samples at a concentration exceeding the New York State unrestricted use soil cleanup objectives (SCOs). An IRM Completion Report, documented the IRM activities were performed and completed in accordance with the approved IRM Workplan.

Air Sparging and Soil Vapor Extraction

An Air Sparging and Soil Vapor Extraction System (AS/SVE) was installed by Laurel Environmental Associates, Ltd, on behalf of the PRP, in January 2014, the full system became operational on June 11, 2014. The AS/SVE system was added to remove contaminants in the groundwater underneath the on-site building and to ensure that soil vapor intrusion in the building and the adjacent church to the east was controlled. Upon system installation, sampling was completed demonstrating a significant decrease in cis-1,2-DCE, PCE and TCE concentrations over the course of the first year, reflecting an overall reduction in contaminants within soil and groundwater beneath the site. The Air Sparging system was shut down late 2015. The SVE system continues to operate.

Building Interior Soil Excavation

In October 2014, the concrete floor was saw-cut by Laurel Environmental Associates, Ltd, on behalf of the PRP, at two locations within the on-site building, which represented the areas identified as containing the most heavily impacted soil. The first location was a 15’ x 25’; area in the central portion of the building ("Excavation 1"). The second location was an l0’ x l0’; area in the northwestern portion of the building ("Excavation 2"). Excavation 1 was completed to a depth of nine feet and Excavation 2 was completed to a depth of five feet, and approximately 50 cubic yards of impacted soil was removed and stockpiled for off-site disposal. Prior to backfilling the excavations, a total of seven endpoint soil samples were collected, PCE, TCE, cis-1,2-DCE and vinyl chloride were not detected in any of the samples at a concentration exceeding the New York State unrestricted use soil cleanup objectives (SCOs), the excavations were backfilled utilizing clean material and with clean fill. The excavations were backfilled to approximately 5" below the finished floor height to allow for replacement of the concrete floor. A new concrete slab was subsequently installed over the excavated areas.

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.

Based upon the resources and pathways identified and the toxicity of the contaminants of ecological concern at this site, a Fish and Wildlife Resources Impact Analysis (FWRIA) was deemed not necessary.

Nature and Extent of Contamination:

Prior to the IRM activities, soil and groundwater were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, polychlorinated biphenyls (PCBs). Soil samples (from 0 up to 28 feet below grade) were collected from below the slab within the building, paved driveway, parking lot north side of the building, to the south of the building in µthe vicinity of the suspected location of a former UST and current stormwater drywells. Investigations show that PCE is the primary constituent detected in the shallow soil at concentrations above the unrestricted SCOs. The primary area of soil contamination is beneath the concrete floor of the building. Some minor contamination is also present in the west driveway. No off-site upgradient contamination appears to be impacting the on-site groundwater.

Soil – Investigations performed at the site identified elevated levels of SVOC and metals (arsenic, cadmium and chromium) in all three drywells. These drywells were remediated during the IRM to address the known SVOC and metals contamination. In 2010 prior to IRM activities, PCE was the only analyte to be detected at concentrations in exceedance of the Unrestricted SCOs. The exceedances occurred at SB-22 (14 ppm at 0 to 2 feet below grade), SB-23 (4.2 ppm at 0 to 2 feet below grade), and SB-24 (1.8 ppm at 0 to 2 feet below grade). Data does not indicate any off-site impacts in soil related to this site.

Groundwater - Prior to the IRM, PCE was detected in all of the groundwater samples collected at concentrations exceeding NYSDEC Class GA Ambient Water Quality Standards Value of 5.0 µg/L (ppb) from 11 ppb beneath the concrete floor in the central portion of the building, to 540 ppb in the shallow down gradient monitoring well in 2013, which decreased to 120 ppb in samples taken in 2015. The decrease in PCE concentration between 2013 and 2015 was the result of AS/SVE System in operation and the removal of impacted soil. During 2008, an off-site groundwater investigation was conducted. Based on the off-site groundwater sampling results, PCE sample concentrations ranged from 6.2 to 11 ppb and were compared to the NYSDEC Ambient Water Quality Standards and Guidance Value of 5 ppb. No other VOCs were detected at concentrations exceeding their groundwater standards.

Sub-Slab Vapor and Indoor Air – In response to the discovery of soil impacted by PCE beneath the on-site building, the NYSDOH requested in October 2013 that the Nassau County Department of Health screen for the presence of PCE in indoor air using passive air monitoring badges at two buildings located adjacent to the on-site building (Building A and Building B). PCE concentrations as high as 140 micrograms per cubic meter (µg/m^3), which exceed the State's guideline for PCE

in air of 30 µg/m^3 were found within the Building B basement and were non-detect (less than 5 µg/m^3) in the Building A. In December 2013, four indoor air and two sub-slab samples were collected by the responsible party's consultant at Building B and at a building down gradient to the site (Building C) using SUMA canisters and analyzed for VOC's by method TO-15. PCE concentrations in the Building B sub slab environment were 39,000 µg/m^3 and 490 µg/m^3 in the basement indoor air and TCE concentrations were 940 µg/m^3 in sub-slab and 11 µg/m^3 in indoor air. PCE in the Building C sub slab environment was 2,300 µg/m^3 and 3.4 µg/m^3 in the indoor air and TCE was non-detect in the sub-slab at a detection limit of 110 µg/m^3 and non-detect in indoor air at a detection limit of 0.27 µg/m3. While contaminants in the sub-slab vapor of Building C have the potential of impacting the indoor air of the building, it appeared that the indoor air was similar to what was found in the outdoor air (3.1 µg/m^3) and NYSDOH determined that immediate actions similar to the Building B were not needed at that time. Actions taken in early January 2014 to reduce indoor air concentrations at the Building B included sealing a floor drain in the basement and recommending that basement widows be opened and that ventilation in the basement be increased. Indoor air samples taken following these actions showed PCE concentrations of 160 µg/m^3 in the basement. Following the installation of the Air Sparge/Soil Vapor Extraction System in the on-Site building in July of 2014 as part of the IRM indoor air concentrations in the Building B basement were further reduced to 1.2 µg/m^3. Additional evaluations of the potential for soil vapor intrusion to affect indoor air is necessary at a number of buildings surrounding the 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.*

Direct contact with contaminants in the soil is unlikely because the contaminant source is covered by the on-site building. People are not expected to come into direct contact with contaminated groundwater unless they dig below the ground surface. 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 people to inhale site contaminants in indoor air due to soil vapor intrusion in the existing on-site building. Indoor air sampling identified potential site-related impacts in indoor air quality in a building on an adjacent property, and additional soil vapor intrusion evaluations of off-site buildings are necessary.

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: SUMMARY OF THE PROPOSED REMEDY

To be selected, the remedy must be protective of human health and the environment, be cost-effective, comply with other statutory requirements, and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable. The remedy must also attain the remedial action objectives identified for the site, which are presented in Section 6.5. Potential remedial alternatives for the Site were identified, screened and evaluated in the FS report.

A summary of the remedial alternatives that were considered for this site is presented in Exhibit B. Cost information is presented in the form of present worth, which represents the amount of money invested in the current year that would be sufficient to cover all present and future costs associated with the alternative. This enables the costs of remedial alternatives to be compared on a common basis. As a convention, a time frame of 30 years is used to evaluate present worth costs for alternatives with an indefinite duration. This does not imply that operation, maintenance, or monitoring would cease after 30 years if remediation goals are not achieved. A summary of the Remedial Alternatives Costs is included as Exhibit C.

The basis for the Department's proposed remedy is set forth at Exhibit D.

The proposed remedy is referred to as the Excavation/Off-site disposal of Impacted Soil remedy.

The estimated present worth cost to implement the remedy is $166,390. The cost to construct the remedy is estimated to be $154,530 and the estimated average annual cost is $1,260.

The elements of the proposed 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

All on-site soils which exceed unrestricted SCOs, as defined by 6 NYCRR Part 375-6.8 will be excavated and transported off-site for disposal. Approximately 500 cubic yards of contaminated soil underneath the building and driveway will be removed from the site and transported to a permitted disposal facility.

3. Backfill

On-site soil which does not exceed the above excavation criteria may be used to backfill the excavation to the extent that a sufficient volume of on-site is available at 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. Vapor Intrusion Re-Evaluation

As part of the unrestricted cleanup, a soil vapor intrusion re-evaluation, at the site building, the Parish Hall/Rectory, St. Paul's Episcopal Church and four residential buildings, will be completed. The re-evaluation will include a provision for implementing actions recommended to address exposures related to soil vapor intrusion. The soil vapor extraction system (SVE) installed as part

of the IRM will continue to operate until the soil vapor intrusion re-evaluation is performed and Department approval is granted to shut down the SVE.

5. 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 or industrial 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 County DOH; and
- require compliance with the Department approved Site Management Plan.

6. 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 5 above.

   Engineering Controls: Operation of any vapor mitigation system identified as a result of the evaluations required in remedy element number 4 above.

   This plan includes, but may not be limited to:

   - descriptions of the provisions of the environmental easement including any land use, and groundwater use restrictions;
   - a provision for evaluation of the potential for soil vapor intrusion before re-occupancy of the existing on-site building, for any future buildings on the site and some off-site buildings as referenced, 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. 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, as may be required by the Institutional and Engineering Control Plan discussed above.

Exhibit A

Nature and Extent of Contamination

This section describes the findings of the Remedial Investigation for all environmental media that were evaluated. As described in Section 6.1, samples were collected from various environmental media to characterize the nature and extent of contamination.

For each medium for which contamination was identified, a table summarizes the findings of the investigation. The tables present the range of contamination found at the site in the media and compares the data with the applicable SCGs for the site. The contaminants are arranged into volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), PCBs and metals. For comparison purposes, the SCGs are provided for each medium that allows for unrestricted use. For soil, if applicable, the Restricted Use SCGs identified in Section 4 and Section 6.1.1 are also presented.

Groundwater

The evaluation of on-site groundwater at the 20 West Centennial Avenue Site included sampling of seven monitoring wells (three on-site wells and two clusters of two wells each in the sidewalk right of way). Refer to Figure 3 for a view of the site with all groundwater results. In 2015, all groundwater samples were analyzed for the presence of VOCs. Only one contaminant, PCE exceeded its Ambient Water Quality Standards and Guidance Value of 5.0 parts per billion (ppb) in the following wells: MW-20-7 (5.5 ppb), MW-2S (10 ppb) and MW-1D (120 ppb).

The groundwater samples collected during the RI investigation were analyzed for VOCs, SVOCs, and inorganics (metals and cyanide). No SVOC was found to exceed the Ambient Water Quality Standards and Guidance Value, inorganics found to exceed the standard were sodium and iron, however this sample was unfiltered, therefore the soil in the water contributed to the exceedance. The primary VOC found to exceed the standard throughout the site is PCE, a dry-cleaning chemical.

The former source area of the contamination at the site is beneath the on-site building. In addition to the groundwater sampling stated above and in the table below, significant on-site and off-site groundwater sampling was conducted in 2010. Based on the off-site groundwater sampling results, PCE sample concentrations ranged from 6.2 to 11 ppb and were compared to the NYSDEC Ambient Water Quality Standards and Guidance Value of 5 ppb. No other VOCs were detected at concentrations exceeding their groundwater standards.

Table 1 – Groundwater (Post IRM)

Detected Constituents	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)	Frequency Exceeding SCG
VOCs			
Tetrachloroethene (PCE)	ND-120	5	3/7
Trichloroethene (TCE)	ND-0.74	5	0/7
1,2-Dichloroethene	ND	5	0/7
Vinyl Chloride	ND	2	0/7
SVOCs			

Detected Constituents	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)	Frequency Exceeding SCG
None Above SCG			
Inorganics			
None Above SCG			
Pesticides/PCBs			
None Above SCG			

a - ppb: parts per billion, which is equivalent to micrograms per liter, ug/L, in water.
b- SCG: Standard Criteria or Guidance - Ambient Water Quality Standards and Guidance Values (TOGs 1.1.1), 6 NYCRR Part 703, Surface water and Groundwater Quality Standards, and Part 5 of the New York State Sanitary Code (10 NYCRR Part 5).
ND –No Detected

Based on the findings of the RI, the past disposal of hazardous waste has resulted in the contamination of groundwater. The site contaminants that are considered to be the primary contaminant of concern which will drive the remediation of groundwater to be addressed by the remedy selection process is PCE.

Soil

Surface and subsurface soil samples were collected at the site during the RI. Two surface soil samples (SS-1 and SS-2) were collected from 0-2" within the grassy area to the south of the site building. Subsurface soil samples were collected from a depth of 2 - 20 feet to assess soil contamination impacts to groundwater. The results indicate that soils at the site exceed the unrestricted SCG for volatile, semi-volatile organics and metals. The primary soil contaminants are PCE and its degradation products from the former laundry operation. As noted on Figure 4, the primary soil contamination is associated with the former laundry equipment.

Three drywells and two areas inside the building identified at the site were addressed by the IRM(s) described in Section 6.2. The remaining areas of contaminated soil identified during the RI will be addressed in the remedy selection process. As noted on Figure 5, only the hot spots of soil contamination identified during the RI were addressed during the IRM described in Section 6.2.

Table 2 – Soil (Prior to IRM)

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Protection of Groundwater SCG[c] (ppm)	Frequency Exceeding Restricted SCG
VOCs					
Tetrachloroethene (PCE)	ND - 154	1.3	12-93	1.3	12-93
Trichloroethene (TCE)	ND – 0.8	0.47	1-93	0.47	1-93
cis1,2-Dichloroethene	ND - 0.4	0.25	1-93	0.25	1-93

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Protection of Groundwater SCG[c] (ppm)	Frequency Exceeding Restricted SCG
Vinyl Chloride	ND – 0.02	0.02	1-93	0.02	1-93
SVOCs					
None Above USCG					
Inorganics					
None Above USCG					
Pesticides/PCBs					
None Above USCG					

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;
b - SCG: Part 375-6.8(a), Unrestricted Soil Cleanup Objectives.
c - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Groundwater.

Based on the findings of the Remedial Investigation, the past disposal of hazardous waste has resulted in the contamination of surface and subsurface soil. The site contaminants identified in soil which are considered to be the primary contaminants of concern, to be addressed by the remedy selection process are: PCE, TCE, cis-1,2-DCE and vinyl chloride.

Sub-Slab Vapor

Sub-Slab Vapor and Indoor Air – In response to the discovery of soil impacted by PCE beneath the on-site building, the NYSDOH requested in October 2013 that the Nassau County Department of Health screen for the presence of PCE in indoor air using passive air monitoring badges at two buildings located adjacent to the on-site building (Building A and Building B). PCE concentrations as high as 140 micrograms per cubic meter ($\mu g/m^3$), which exceed the State's guideline for PCE in air of 30 $\mu g/m^3$ were found within the Building B basement and were non-detect (less than 5 $\mu g/m^3$) in the Building A. In December 2013, four indoor air and two sub-slab samples were collected by the responsible party's consultant at Building B and at a building down gradient to the site (Building C) using SUMA canisters and analyzed for VOC's by method TO-15. PCE concentrations in the Building B sub slab environment were 39,000 $\mu g/m^3$ and 490 $\mu g/m^3$ in the basement indoor air and TCE concentrations were 940 $\mu g/m^3$ in sub-slab and 11 $\mu g/m^3$ in indoor air. PCE in the Building C sub slab environment was 2,300 $\mu g/m^3$ and 3.4 $\mu g/m^3$ in the indoor air and TCE was non-detect in the sub-slab at a detection limit of 110 $\mu g/m^3$ and non-detect in indoor air at a detection limit of 0.27 µg/m3. While contaminants in the sub-slab vapor of Building C have the potential of impacting the indoor air of the building, it appeared that the indoor air was similar to what was found in the outdoor air (3.1 $\mu g/m^3$) and NYSDOH determined that immediate actions similar to the Building B were not needed at that time. Actions taken in early January 2014 to reduce indoor air concentrations at the Building B included sealing a floor drain in the basement and recommending that basement widows be opened and that ventilation in the basement be increased. Indoor air samples taken following these actions showed PCE concentrations of 160 $\mu g/m^3$ in the basement. Following the installation of the Air Sparge/Soil Vapor Extraction System in the on-Site building in July of 2014 as part of the IRM indoor air concentrations in the Building B basement were further reduced to 1.2 $\mu g/m^3$. Additional evaluations of the potential for soil vapor intrusion to affect indoor air is necessary at a number of buildings surrounding the site.

Based on the findings of the Remedial Investigation, the presence of tetrachloroethene has resulted in the contamination of sub-slab vapor. A soil vapor intrusion re-evaluation will be addressed by the remedy selection process.

Exhibit B

Description of Remedial Alternatives

The following alternatives were considered based on the remedial action objectives (see Section 6.5) to address the contaminated media identified at the site as described in Exhibit A.

Alternative 1: No Further Action

The No Further Action Alternative recognizes the remediation of the site completed by the IRM(s) described in Section 6.2. This alternative leaves the site in its present condition and does not provide any additional protection of the environment.

Alternative 2: No Further Action with Site Management

The No Further Action with Site Management Alternative recognizes the remediation of the site completed by the IRM(s) described in Section 6.2 and Site Management and Institutional Controls and Engineering Controls are necessary to confirm the effectiveness of the IRM. This alternative maintains engineering controls which were part of the IRM and includes institutional controls, in the form of and environmental easement and site management plan, necessary to protect public health and the environment from contamination remaining at the site after the IRMs. The estimate cost for this alternative is:

Present Worth: $169,000
Capital Cost:..... $0
Annual Costs:..... $16,900

Alternative 3: Excavation/Off-site disposal of Impacted Soil

This alternative would include excavation and off-site disposal of shallow soils (a depth of 3-5 feet below grade) from areas inside the building and areas on the access driveway west side of the building. This alternative achieves all of the SCGs discussed in Section 6.1.1 and Exhibit A and soil meets the unrestricted soil clean objectives listed in Part 375-6.8 (a). As noted on Figure 6, this alternative will involve excavation and off-site disposal of all waste and soil contamination above the unrestricted soil cleanup objectives. After completion of soil excavation and backfill, a soil vapor intrusion re-evaluation, at the site building, the Parish Hall/Rectory, St. Paul's Episcopal Church and four residential buildings, will be completed. The Re-evaluation will include a provision for implementing actions recommended to address exposures related to soil vapor intrusion. Groundwater sampling will be conducted to confirm that PCE concentrations in groundwater continue to remain at acceptable levels or decrease. A site management plan will be required to be developed and will contain requirements for implementation of any actions to address exposures related to soil vapor intrusion found to be required as well as continued monitoring of groundwater contaminant concentrations. The estimate cost for this alternative is:

Present Worth: $166,390
Capital Cost:..... $154,530
Annual Costs:..... $1,260

Alternative 4: Soil Vapor Extraction

The existing SVE system would continue to operate with possible modification or reconfiguration of portions of the system to focus the remediation and mitigation efforts to achieve the most effective results with implementation of the following elements: Site Management Plan (SMP) which includes groundwater monitoring, operations and maintenance schedule for the SVE system, and engineering and institutional controls (ICs/ECs). It is estimated that the SVE would continue to operate for five (5) additional years to remove residual contamination so as to achieve the USCO and to eliminate vapor intrusion concern. It is assume for estimating cost that the annual groundwater monitoring will be conducted for a period of seven (7) years to confirm that PCE concentrations in groundwater continue to remain at acceptable levels or decrease, and that no rebound occurs after shutdown of the SVE. It is further assume that monitoring will be conducted at the Site Building, and the Parish Hall/Rectory at St. Paul's Episcopal Church, to verify that additional actions are not needed to address exposures related to soil vapor intrusion. The estimate cost for this alternative is:

Present Worth: $261,410
Capital Cost:..... $6,851
Annual Costs:..... $131,200

Alternative 5: Electrokinetic and Electrochemical Reduction

This alternative will employ electrokinetic and electrochemical reactions, using a low-level electrical current and optimized pulsed voltage pattern, to remove contaminants from impacted soil and groundwater. The current is transmitted from a control unit to impacted media within the treatment area via an engineered electrode grid. The treatment process utilized by this method is based on a well-documented remediation method (i.e., oxidation). The innovation lies in the optimizing and maintaining the oxidation process and in creating the optimal conditions for oxidation of different contaminants, based on Site-specific conditions (soil types, contaminant depths, etc.) by using different types of pulse patterns. It is assumed that the system comprised of approximately 30 individual points will be installed at the Site, and that the system will operate for a period of two (2) years. The existing SVE system would continue to operate during the 2-year operational period to continue controlling the potential for vapor intrusion at the Site Building, and the Parish Hall/Rectory at St. Paul's Episcopal Church. It is further assume that annual sub-slab soil vapor monitoring and indoor air monitoring will be conducted at the Site Building, and the Parish Hall/Rectory at St. Paul's Episcopal Church for a period of four (4) years (the 2-year operational period and a 2-year period following system shut-down), to verify that additional actions are not needed to address exposures related to soil vapor intrusion. It is assume that the annual groundwater monitoring will be conducted for a period of four (4) years (the 2-year operational period and a 2-year period following system shut-down) to confirm that PCE concentrations in groundwater continue to remain at acceptable levels or decrease. The estimate cost for this alternative is:

Present Worth: $262,520
Capital Cost:..... $110,000
Annual Costs:..... $82,000

Exhibit C

Remedial Alternative Costs

Remedial Alternative	Capital Cost ($)	Annual Costs ($)	Total Present Worth ($)
1. No Action	0	0	0
2. No Further Action with Site Management	0	16,900	169,100
3. Excavation/Off-site disposal of Impacted Soil	154,530	1,260	166,300
4. Soil Vapor Extraction	6,851	131,200	261,410
5. Electrokinetic and Electrochemical Reduction	110,000	82,000	262,520

Exhibit D

SUMMARY OF THE PROPOSED REMEDY

The Department is proposing Alternative 3, Excavation/Off-site disposal of Impacted Soil as the remedy for this site. Alternative 3 would achieve the remediation goals for the site by excavation and off-site disposal of shallow soils (a depth of 3-5 feet below grade) from areas inside the building and areas on the access driveway west side of the building and implementation of engineering and institutional controls. The elements of this remedy are described in Section 7. The proposed remedy is depicted in Figure 6.

Basis for Selection

The proposed remedy is based on the results of the RI and the evaluation of alternatives. The criteria to which potential remedial alternatives are compared are defined in 6 NYCRR Part 375. A detailed discussion of the evaluation criteria and comparative analysis is included in the FS report.

The first two evaluation criteria are termed "threshold criteria" and must be satisfied in order for an alternative to be considered for selection.

1. Protection of Human Health and the Environment. This criterion is an overall evaluation of each alternative's ability to protect public health and the environment.

The proposed remedy (Alternative 3) would satisfy this criterion by removing all soil contaminated above the unrestricted soil cleanup objective, meets the threshold criteria. Alternative 1 (No Action) does not provide any protection to public health and the environment and will not be evaluated further. Alternatives 2 also complies with this criterion but to a lesser degree or with lower certainty. Alternatives 2, 4 and 5 also comply with this criterion rely on a restriction of groundwater use at the site to protect human health. Alternatives 4 and 5 may require a short-term restriction on groundwater use; however, it is expected the restriction will be able to be removed in approximately three years. The potential for soil vapor intrusion will be significantly reduced by Alternative 4 and, to a somewhat lesser extent, Alternative 5. The potential for soil vapor intrusion will remain high under Alternatives 2.

2. Compliance with New York State Standards, Criteria, and Guidance (SCGs). Compliance with SCGs addresses whether a remedy will meet environmental laws, regulations, and other standards and criteria. In addition, this criterion includes the consideration of guidance which the Department has determined to be applicable on a case-specific basis.

Alternative 2 (Site Management through Institutional and Engineering Controls) will not meet the SCGs and will not satisfy RAOs. Alternatives 1 and 2 will not be evaluated further. Alternative 3, by removing all soil contaminated above the unrestricted soil cleanup objectives, would be the most protective of the alternatives. Alternatives 4 and 5 will comply with these criteria also. Because Alternatives 3, 4, and 5 satisfy the threshold criteria, the remaining criteria are particularly important in selecting a final remedy for the site.

The next six "primary balancing criteria" are used to compare the positive and negative aspects of each of the remedial strategies.

3. Long-term Effectiveness and Permanence. This criterion evaluates the long-term effectiveness of the remedial

alternatives after implementation. If wastes or treated residuals remain on-site after the selected remedy has been implemented, the following items are evaluated: 1) the magnitude of the remaining risks, 2) the adequacy of the engineering and/or institutional controls intended to limit the risk, and 3) the reliability of these controls.

Long-term effectiveness is equally accomplished by Alternative 3, 4 and 5. All of them, Electrokinetic and Electrochemical, SVE and excavation are considered reliable technologies and capable of achieving the RAOs in the long-term. Alternative 5 would achieve the greatest long-term effectiveness because it would remove the greatest amount of contaminated soil above SCGs. All of them would achieve the removal of the source area contamination and IC/ECs would be implemented for both remedies. All reduce the potential for soil vapor intrusion through the implementation of mandatory mitigation, although Alternative 4 and 5 would require long-term SVI monitoring.

4. Reduction of Toxicity, Mobility or Volume. Preference is given to alternatives that permanently and significantly reduce the toxicity, mobility or volume of the wastes at the site.

Alternatives 3, 4, and 5 are equally capable of reducing the toxicity, mobility, and volume of VOCs assuming each remedial technology is implemented effectively.

5. Short-term Impacts and Effectiveness. The potential short-term adverse impacts of the remedial action upon the community, the workers, and the environment during the construction and/or implementation are evaluated. The length of time needed to achieve the remedial objectives is also estimated and compared against the other alternatives.

Alternatives 3 through 5 all have short-term impacts which could easily be controlled, however, Alternative 3 is the most effective because it is capable of achieving the RAOs in the short-term and it is protective of human health and site conditions in the short term. Alternatives 4 and 5 takes the longest to achieve the remediation goals.

6. Implementability. The technical and administrative feasibility of implementing each alternative are evaluated. Technical feasibility includes the difficulties associated with the construction of the remedy and the ability to monitor its effectiveness. For administrative feasibility, the availability of the necessary personnel and materials is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, institutional controls, and so forth.

Alternatives 3 and 4 are favorable in that they are readily implementable. As per Alternative 4, the system is already in operation but may need to be modified. Alternative 5 is also implementable, but the complete removal of contaminants may be slower than other remedial alternatives, due to creation and breakdown of intermediate by-product compounds.

7. Cost-Effectiveness. Capital costs and annual operation, maintenance, and monitoring costs are estimated for each alternative and compared on a present worth basis. Although cost-effectiveness is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the other criteria, it can be used as the basis for the final decision.

The costs of the alternatives vary significantly. Alternative 2 has a low cost, but the contaminated soil would not be addressed other than by institutional controls. With its large volume of soil to be handled, Alternative 3 (excavation and off-site disposal) would have the highest present work cost. SVE (Alternative 4) would be much less expensive than Alternative 3, yet it would provide equal protection of the groundwater resource. The present

worth costs of Alternatives 4 and 5 are similar to each other, although the capital cost for Alternative 5 would be higher than that of Alternative 4. The long-term maintenance cost of the capped area with Alternative 4 would be higher than long-term maintenance under Alternative 5. However, Alternative 3 present worth cost will be less than Alternatives 4 and 5.

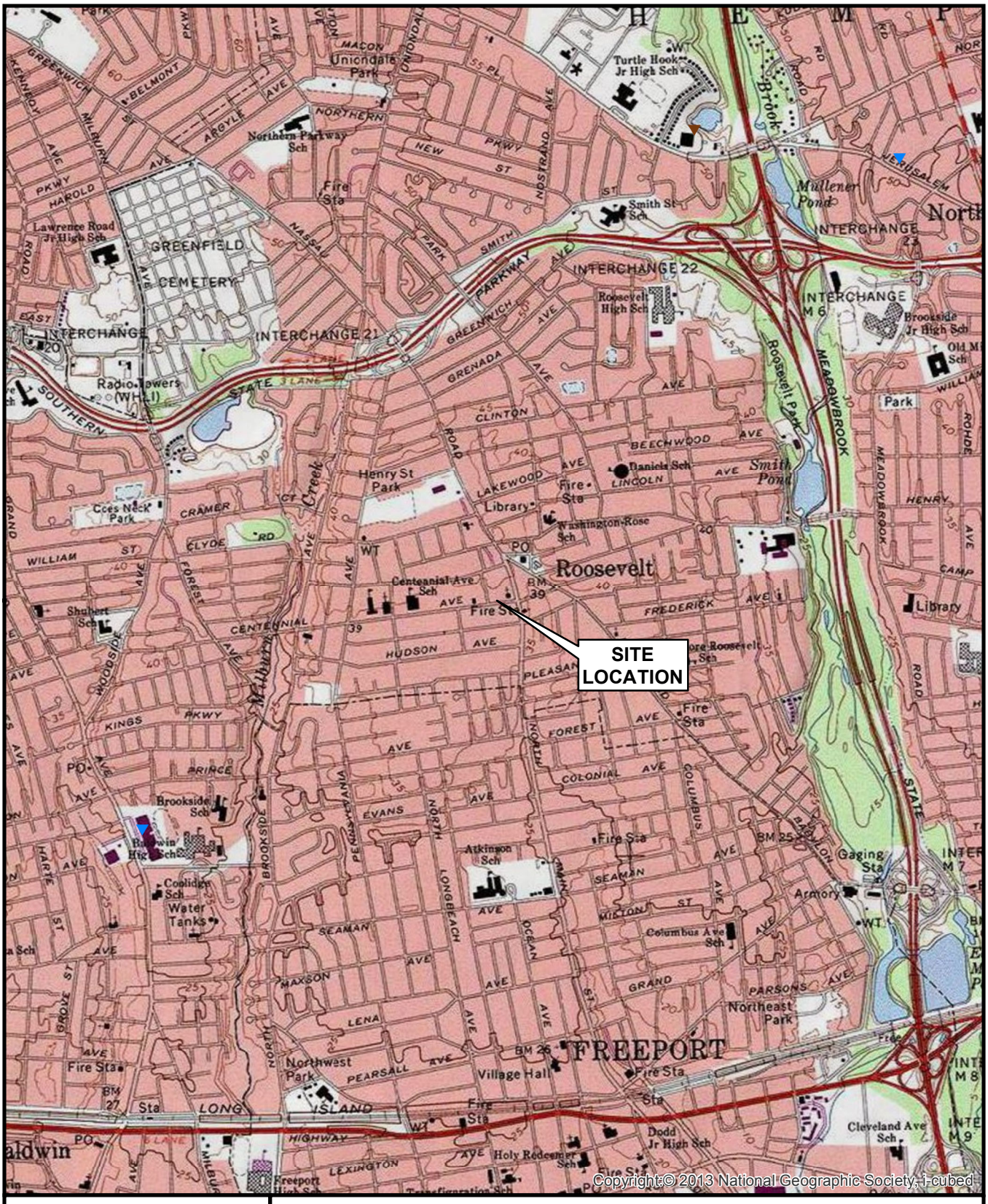
8. Land Use. When cleanup to pre-disposal conditions is determined to be infeasible, the Department may consider the current, intended, and reasonable anticipated future land use of the site and its surroundings in the selection of the soil remedy.

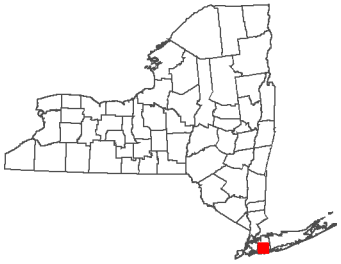
The current and in the foreseeable future land use of the site is commercial. The site and surrounding property are covered by building or parking lot. Alternative 3 would remove the contaminated soil and Alternative 4 and 5 would treat the contaminated soil. Alternatives 4 and 5 require on-site groundwater use restrictions. Therefore all the Alternatives under consideration would have similar impact on the land use as the groundwater use restriction would be required to stay in place for at least the next four years. With Alternative 3, the impacted soil would be removed and restrictions on the site use would not be necessary.

The final criterion, Community Acceptance, is considered a "modifying criterion" and is taken into account after evaluating those above. It is evaluated after public comments on the Proposed Remedial Action Plan have been received.

9. Community Acceptance. Concerns of the community regarding the investigation, the evaluation of alternatives, and the PRAP are evaluated. A responsiveness summary will be prepared that describes public comments received and the manner in which the Department will address the concerns raised. If the selected remedy differs significantly from the proposed remedy, notices to the public will be issued describing the differences and reasons for the changes.

Alternative 3 is being proposed because, as described above, it satisfies the threshold criteria and provides the best balance of the balancing criterion.





N
W E
S

0 950 1,900
Feet

Figure 1

Site Location Map

20 West Centennial Avenue
Town of Hempstead, Nassau
Site No. 130154

DEPARTMENT OF ENVIRONMENTAL CONSERVATION • NEW YORK STATE •

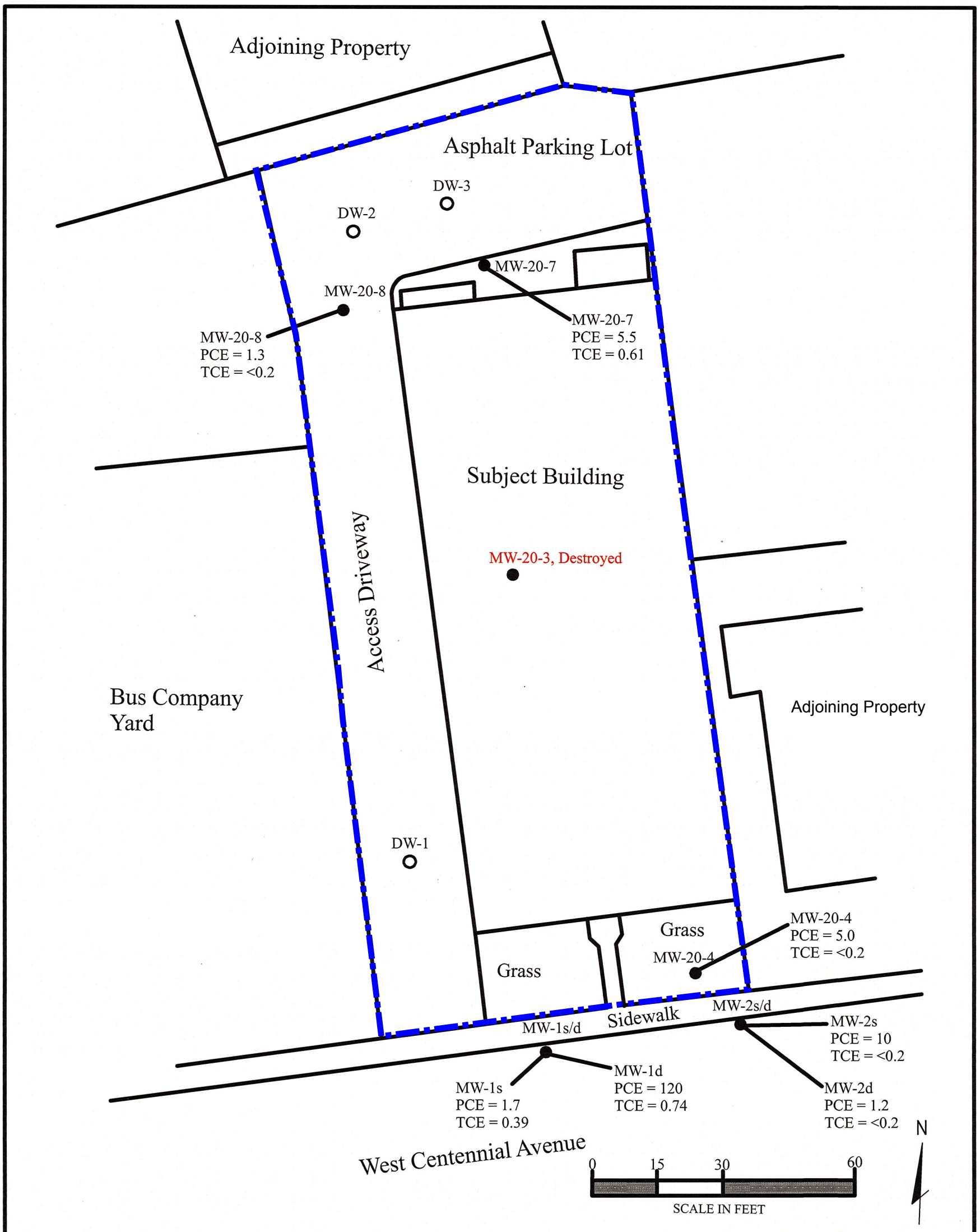
N
W E
S

0 40 80
Feet

Figure 2
Site Perimeter Map

20 West Centennial Avenue
Town of Hempstead, Nassau
Site No. 130154

DEPARTMENT OF ENVIRONMENTAL CONSERVATION • NEW YORK STATE •



NEW YORK STATE

Department of Environmental Conservation

FIGURE 3

MONITORING WELL LOCATIONS

20 WEST CENTENNIAL AVENUE
ROOSEVELT, NEW YORK

LEA makes no guarantees to the accuracy of this drawing and it should only be used for informational purposes

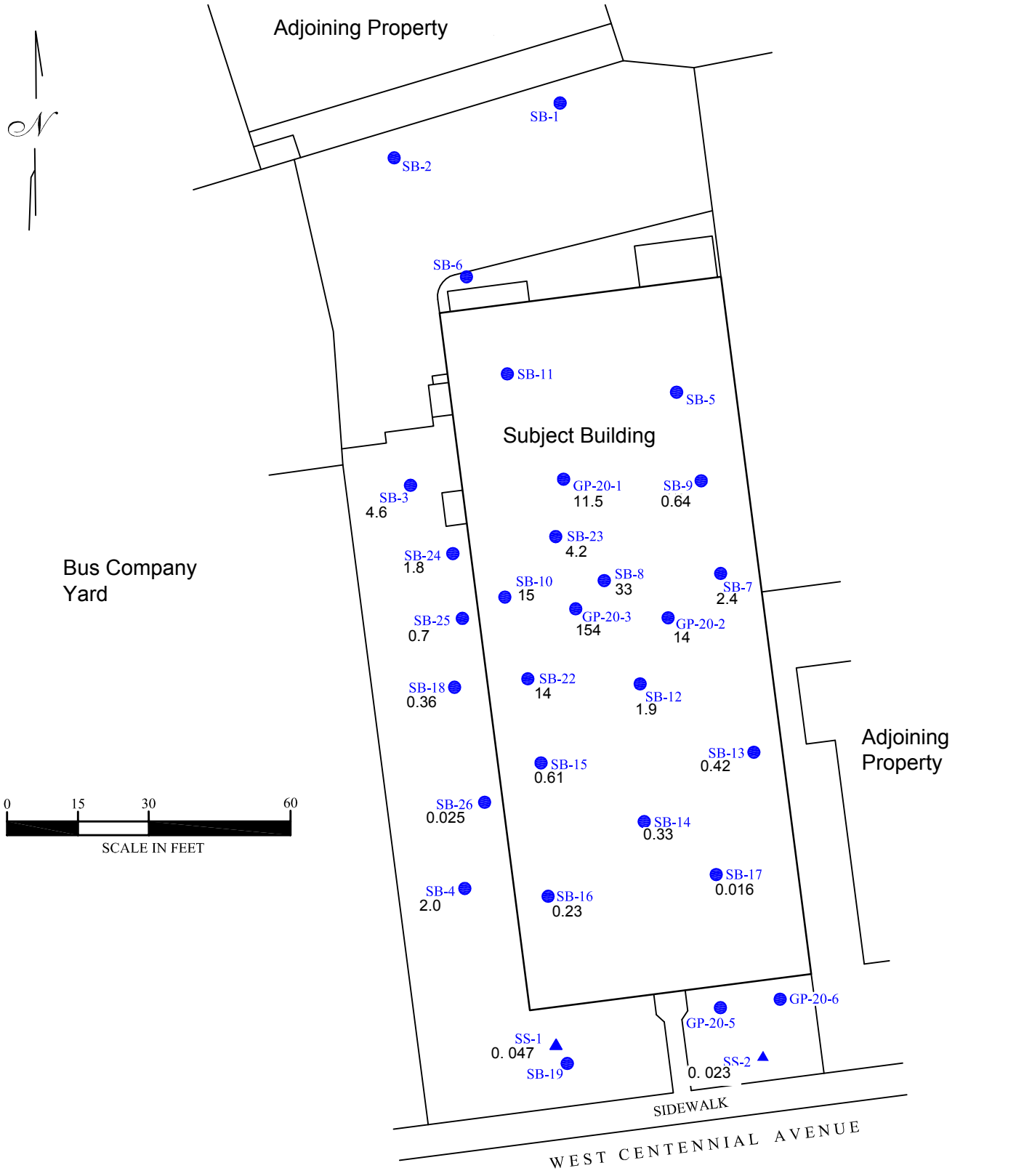
PROJECT NO.: 12-260
DRAWING DATE: 8/24/12
DRAWN BY: BMC
CHECKED BY: DP
REVISIONS: 10/08/12
REVISIONS: 10/15/15
SCALE: 1 : 30

LEGEND

= Fence

= open grate manhole

Concentration in parts per billion (ppb), samples collected during the IRM



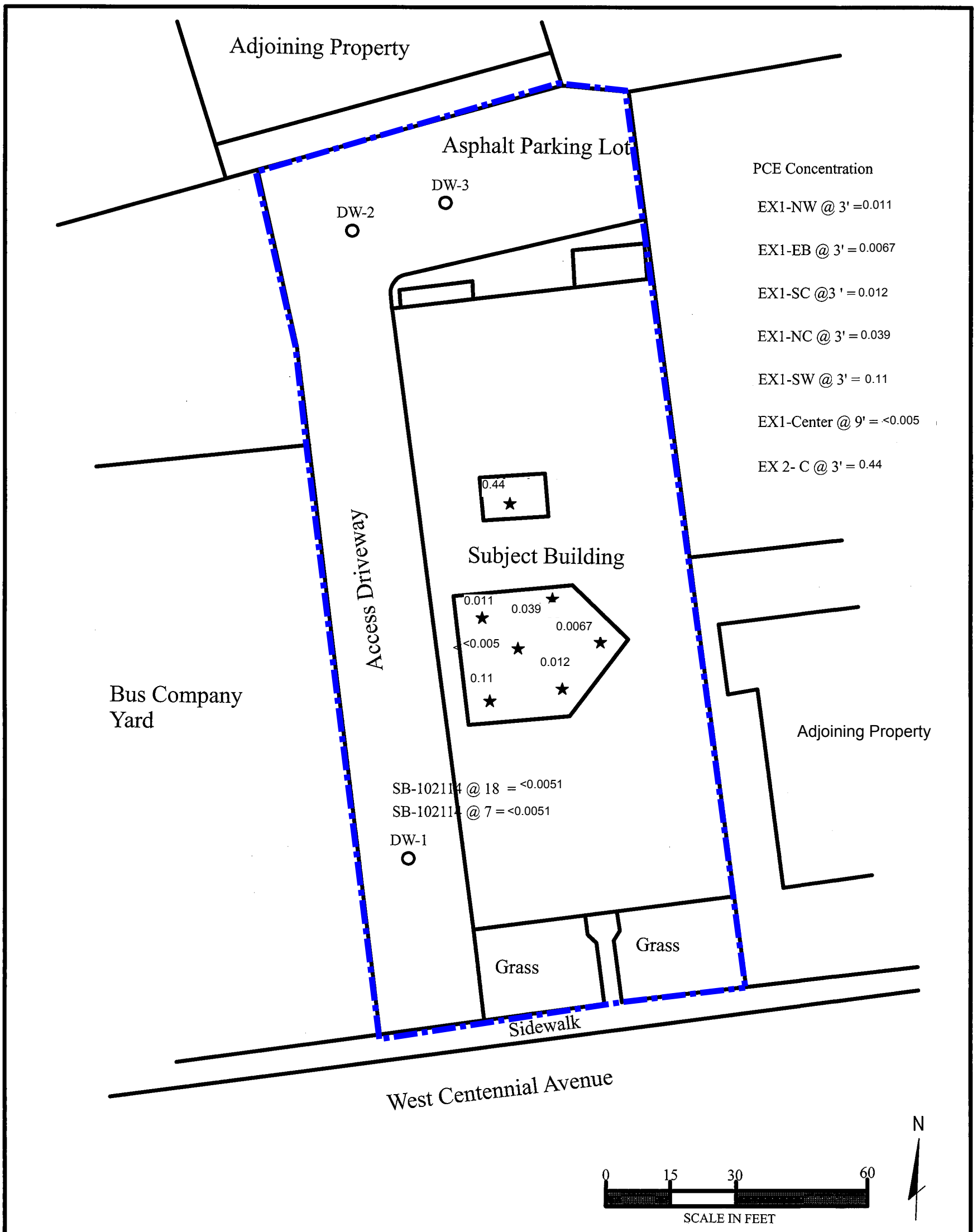
LEGEND

●,▲ SOIL SAMPLING LOCATIONS WITH SHALLOW (RANGING FROM 0 TO 8 FEET BELOW GRADE) TETRACHLOROETHYLENE CONCENTRATIONS IN parts per million (ppm)

Samples collected prior to the IRM

FIGURE 4

SUMMARY OF
SOIL SAMPLING RESULTS
20 WEST CENTENNIAL AVENUE
ROOSEVELT, NEW YORK



NEW YORK STATE

Department of Environmental Conservation

FIGURE 5

IRM Excavation Bottom Endpoint Sampling Results

20 WEST CENTENNIAL AVENUE
ROOSEVELT, NEW YORK

LEA makes no guarantees to the accuracy of this drawing and it should only be used for informational purposes

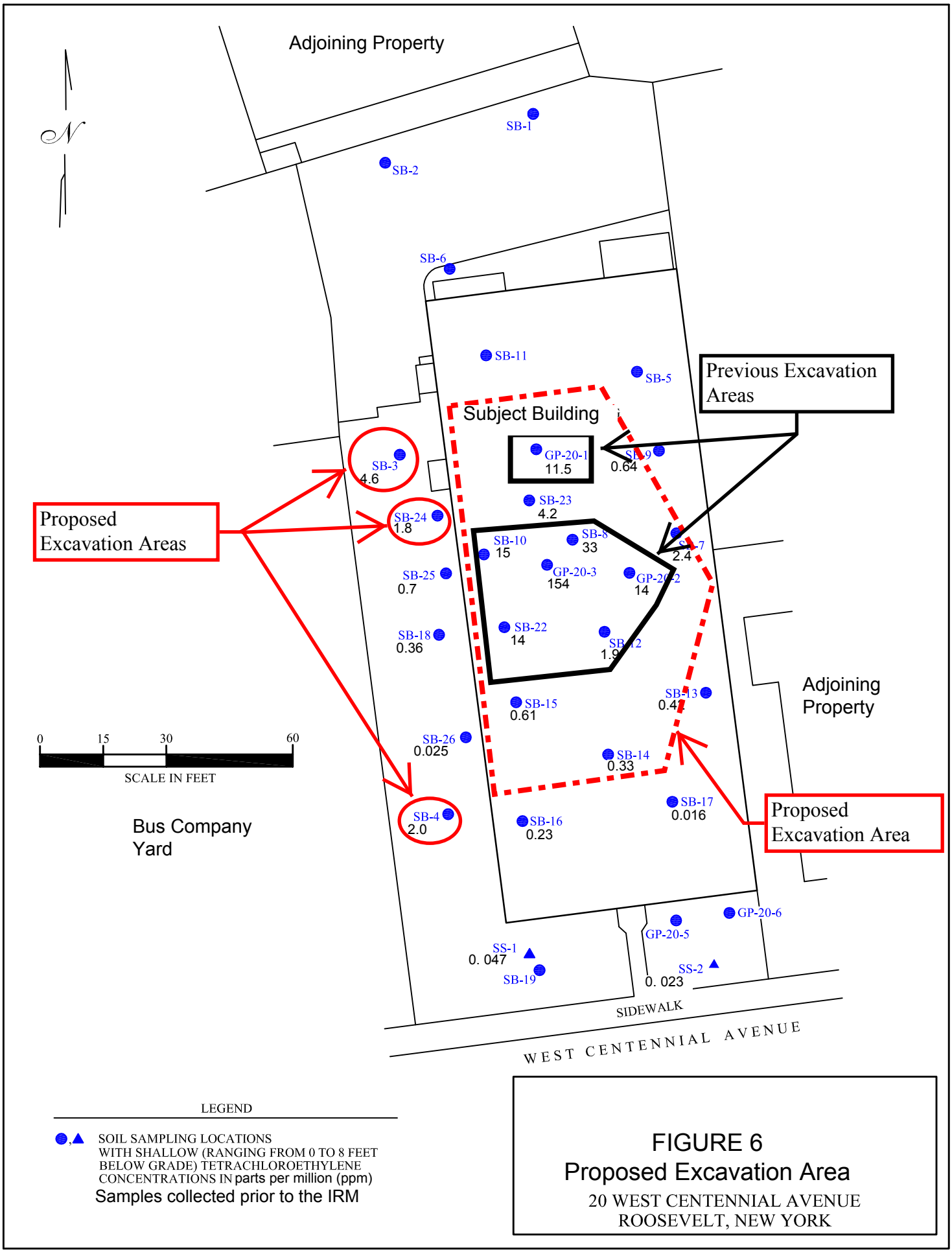
PROJECT NO.: 12-260
DRAWING DATE: 8/24/12
DRAWN BY: BMC
CHECKED BY: THJ
REVISIONS: 10/08/12
REVISIONS:
SCALE: 1 : 30

LEGEND

= Fence

= open grate manhole

★ = End point sample location with PCE conenctrations in parts per million (ppm)



LEGEND

●,▲ SOIL SAMPLING LOCATIONS WITH SHALLOW (RANGING FROM 0 TO 8 FEET BELOW GRADE) TETRACHLOROETHYLENE CONCENTRATIONS IN parts per million (ppm)

Samples collected prior to the IRM

FIGURE 6
Proposed Excavation Area

20 WEST CENTENNIAL AVENUE
ROOSEVELT, NEW YORK