

DECISION DOCUMENT

Formerly ACCO Brands, Inc.
Operable Unit No. 1 and 2
Voluntary Cleanup Program
Long Island City, Queens County
Site No. V00331
June 2015



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

DECLARATION STATEMENT - DECISION DOCUMENT

Formerly ACCO Brands, Inc.
Operable Unit No. 1 and 2
Voluntary Cleanup Program
Long Island City, Queens County
Site No. V00331
June 2015

Statement of Purpose and Basis

This document presents the remedy for Operable Unit (OU) No. 1 (on-site areas) and OU No. 2 (off-site areas) of the Formerly ACCO Brands, Inc. site, a voluntary cleanup site. The remedial program was chosen in accordance with the New York State Environmental Conservation Law and applicable guidance.

This decision is based on the Administrative Record of the New York State Department of Environmental Conservation (the Department) for the Formerly ACCO Brands, Inc. site and the public's input to the proposed remedy presented by the Department.

Description of Selected Remedy

For OU: 01 (On-site)

The elements of the 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. In-Situ Thermal Treatment with Soil Vapor Extraction

In-Situ Thermal Treatment will be implemented to volatilize volatile organic compounds (VOCs) in the source area located in the central portion of Operable Unit (OU) 1 (on-site) to achieve TCE levels of 100 ppb or less in shallow and intermediate groundwater. Electric Resistance Heating (ERH) will be utilized to perform the treatment. An electrical current will be produced in the treatment area between electrodes installed underground. Heat will be generated as movement of the current meets resistance from the soil. The volatilized VOCs produced by the thermal treatment will be collected by soil vapor extraction (SVE) wells and treated in an ex-situ treatment unit. Extracted vapors will be treated by adsorption on granular activated carbon.

Operation of the ERH system is expected to continue for approximately 6 to 8 months. The anticipated treatment area is 9,700 square feet and at a depth from 10 ft. to 40 ft. below ground surface, with a treatment volume of approximately 11,000 cubic yards.

3. Enhanced Bioremediation

Following completion of the ERH treatment, in-situ enhanced biodegradation will be employed to treat the remaining dissolved phase TCE in the groundwater. The biological breakdown of contaminants through anaerobic reductive dechlorination will be enhanced by adding KB-1® Culture, containing a strain of reductive dechlorinating bacteria (Dehalococcoides), via injection wells. Electron Donor Solution – Extended Release (EDS-ER), a water soluble vegetable oil, and Nutrimens™, a metabolic bioremediation nutrient, will be injected concurrently into the treatment zone. Additionally, a small amount L-Cysteine base will be supplied for making anaerobic water. The exact amounts of substrate, volumes and ratios will be determined during a pilot test. The anticipated combined OU-1 and OU-2 treatment area is approximately 65,400 sq. ft. and at a depth from 10 ft. to 40 ft. below ground surface, with a treatment volume of approximately 60,300 cu. yd.

4. Cover System

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).

5. Vapor Mitigation

Any on-site buildings will be required to have a sub-slab depressurization system (SSDS), or a similar engineered system, to prevent the migration of vapors into the building from contamination in groundwater. After ERH treatment is concluded, the SVE wells used during treatment will be retrofitted into the SSDS to provide adequate coverage throughout the building. Two off-site buildings have sub-slab depressurization systems (SSDS) installed to prevent the migration of

vapors into the building from contamination in groundwater. These systems have been operating since 2008, and will continue to operate until DEC and DOH approve discontinuing their use.

6. Institutional Control

Imposition of an institutional control in the form of a declaration of covenants and restrictions for the 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 uses 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; and
- requires compliance with the Department approved Site Management Plan.

7. Site Management Plan

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

- a. an Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to ensure the following institutional and/or engineering controls remain in place and effective:
 - Institutional Controls: The declaration of covenants and restrictions discussed in bullet 6 above.
 - Engineering Controls: The ERH/SVE system discussed in bullet 2 above, the Cover System discussed in bullet 4 above, and the Vapor Mitigation system discussed in bullet 5 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;
 - descriptions of the provisions of the environmental easement including any land use and groundwater use restrictions;
 - provisions for the management and inspection of the identified engineering controls;
 - maintaining site access controls and Department notification; and
 - the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.
- b. a Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:
 - monitoring of groundwater to assess the performance and effectiveness of the remedy;
 - a schedule of monitoring and frequency of submittals to the Department.
 - 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.

For OU: 02 (Off-site)

The elements of the 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. Enhanced Bioremediation

Following completion of the ERH treatment on OU-1, in-situ enhanced biodegradation will be employed to treat the residual dissolved phase TCE in groundwater in OU-2 (off-site). The biological breakdown of contaminants through anaerobic reductive dechlorination will be enhanced by adding KB-1® Culture, containing a strain of reductive dechlorinating bacteria (Dehalococcoides), via injection wells. Electron Donor Solution – Extended Release (EDS-ER), a water soluble vegetable oil, and Nutrimens™, a metabolic bioremediation nutrient, will be injected concurrently into the treatment zone. Additionally, a small amount L-Cysteine base will be supplied for making anaerobic water. The exact amounts of substrate, volumes and ratios will be determined during a Pilot Test. The anticipated combined OU-1 and OU-2 treatment area is approximately 65,400 sq. ft. and at a depth from 10 ft. to 40 ft. below ground surface, with a treatment volume of approximately 60,300 cu. yd.

3. Vapor Mitigation

Two off-site buildings have sub-slab depressurization systems (SSDS) installed to prevent the migration of vapors into the building from residual contamination in groundwater. These systems

have been operating since 2008, and will continue to operate as needed.

4. 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:
 - Engineering Controls: The Vapor Mitigation systems discussed in bullet 3 above.

This plan includes, but may not be limited to:

- 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 engineering controls.
- b. a Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:
 - monitoring of groundwater to assess the performance and effectiveness of the remedy;
 - a schedule of monitoring and frequency of submittals to the Department.
- 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.

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.

June 23, 2015



Date

Robert J. Cozy, Director
Remedial Bureau B

DECISION DOCUMENT

Formerly ACCO Brands, Inc.
Operable Unit No. 1 and 2
Long Island City, Queens County
Site No. V00331
June 2015

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 Voluntary Cleanup Program (VCP) is a voluntary program. The goal of the VCP is to enhance private sector cleanup of brownfields by enabling parties to remediate sites using private rather than public funds and to reduce the development pressures on "greenfields." 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 repository:

Queensborough Public Library
43-06 Greenpoint Avenue
Sunnyside, NY 11104
Phone: (718) 784-3033

Receive Site Citizen Participation Information By Email

Please note that the Department's Division of Environmental Remediation (DER) is "going paperless" relative to citizen participation information. The ultimate goal is to distribute citizen participation information about contaminated sites electronically by way of county email listservs. Information will be distributed for all sites that are being investigated and cleaned up in a particular county under the State Superfund Program, Environmental Restoration Program, Brownfield

Cleanup Program, Voluntary Cleanup Program, and Resource Conservation and Recovery Act Program. We encourage the public to sign up for one or more county listservs at <http://www.dec.ny.gov/chemical/61092.html>

SECTION 3: SITE DESCRIPTION AND HISTORY

Location:

The Site is located in an urban area of Long Island City, Queens at 32-00 Skillman Avenue and is surrounded by mixed commercial, industrial and residential uses. The former ACCO Brands, Inc. (ACCO) facility is bounded by Skillman Avenue and the Sunnyside Rail Yard to the north; 32nd Place to the east; Queens Blvd. to the south; and Van Dam Street to the west. Surrounding land uses include multi-family residential properties, community and educational institutions, and various commercial, industrial, and retail uses.

Site Features:

The Site is approximately 0.72 acres in size and consists of the footprint of the basement of the on-site 1.8 acre 3-story building.

Current Zoning and Land Use:

The site is located in an industrial zoned area and is zoned M1-4. The upper floors of the Site are currently used for commercial and light industrial purposes, the basement is unoccupied, and a penthouse which houses a private racquet club, fitness center, spa and restaurant occupies the rooftop of the Site.

Past Use of the Site:

The facility was constructed in 1950 and ACCO (or its predecessor corporations) occupied the facility from 1952 to 1999. The site was reportedly occupied by several automotive service centers and gasoline stations prior to 1950. During their occupancy of the facility, ACCO manufactured staplers and stapler components. Paints, thinners, solvents and cleaners were used as part of the manufacturing process and have led to site contamination. Wastes generated included paint filters, sludge, rags, and paint.

Operable Units:

The Site was divided into two operable units. An operable unit represents a portion of a remedial program for a site that for technical or administrative reasons can be addressed separately to investigate, eliminate or mitigate a release, threat of release or exposure pathway resulting from the site contamination. Operable unit 1 (OU-1) is the on-Site source area in the basement of the building. Operable unit 2 (OU-2) consists of the off-Site dissolved groundwater plume and associated soil vapor.

Site Geology and Hydrogeology:

The site is underlain by silty sand with varying amounts of gravel, silts and clays. Soil borings indicate a laterally pervasive low permeability layer beneath the entire footprint of and to the west of the Site. Parts of the low permeability layer, which dips to the south-southeast, are compromised by a layer of organic peat. TCE has been detected in the shallow, intermediate and deep aquifer zones at the Site. Depth to groundwater in the shallow aquifer is approximately 10 ft. below grade

with a flow to the northwest. Depth to groundwater in the intermediate aquifer is 35 ft. below grade with a flow to the west-northwest. Depth to groundwater in the deep aquifer is 60 ft. below grade with a flow to the north-northwest.

Operable Unit (OU) Numbers 01 and 02 are the subject of this document.

A site location map is attached as Figure 1 and 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, at a minimum, 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 DER-10, Technical Guidance for Site Investigation and Remediation were/was evaluated.

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 voluntary cleanup agreement is with a Potentially Responsible Party (PRP). 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. If the PRP elects not to complete the remedial program under the VCP, the Department will evaluate the site for further action under the State Superfund. The PRPs are subject to legal actions by the state for recovery of all response costs the state has incurred.

SECTION 6: SITE CONTAMINATION

6.1: Summary of the Remedial Investigation

A remedial investigation (RI) serves as the mechanism for collecting data to:

- characterize site conditions;
- determine the nature of the contamination; and
- assess risk to human health and the environment.

The RI is intended to identify the nature (or type) of contamination which may be present at a site and the extent of that contamination in the environment on the site, or leaving the site. The RI reports on data gathered to determine if the soil, groundwater, soil vapor, indoor air, surface water or sediments may have been contaminated. Monitoring wells are installed to assess groundwater and soil borings or test pits are installed to sample soil and/or waste(s) identified. If other natural resources are present, such as surface water bodies or wetlands, the water and sediment may be sampled as well. Based on the presence of contaminants in soil and groundwater, soil vapor will

also be sampled for the presence of contamination. Data collected in the RI influence the development of remedial alternatives. The RI report is available for review in the site document repository and the results are summarized in section 6.3.

The analytical data collected on this site includes data for:

- groundwater
- soil
- soil vapor
- indoor air

6.1.1: Standards, Criteria, and Guidance (SCGs)

The remedy must conform to promulgated standards and criteria that are directly applicable or that are relevant and appropriate. The selection of a remedy must also take into consideration guidance, as appropriate. Standards, Criteria and Guidance are hereafter called SCGs.

To determine whether the contaminants identified in various media are present at levels of concern, the data from the RI were compared to media-specific SCGs. The Department has developed SCGs for groundwater, surface water, sediments, and soil. The NYSDOH has developed SCGs for drinking water and soil vapor intrusion. For a full listing of all SCGs see: <http://www.dec.ny.gov/regulations/61794.html>

6.1.2: RI Results

The data have identified contaminants of concern. A "contaminant of concern" is a contaminant that is sufficiently present in frequency and concentration in the environment to require evaluation for remedial action. Not all contaminants identified on the property are contaminants of concern. The nature and extent of contamination and environmental media requiring action are summarized below. Additionally, the RI Report contains a full discussion of the data. The contaminant(s) of concern identified at this site is/are:

For OU: 01

trichloroethene (TCE)

For OU: 02

trichloroethene (TCE)

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

- groundwater
- soil
- soil vapor intrusion

6.2: Interim Remedial Measures

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

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

Off-site Vapor Mitigation

During the course of the Remedial Investigation, two off-site properties were identified that had soil vapor intrusion impacts. Both buildings were retrofitted with sub-slab depressurization systems (SSDSs) which were installed and began operating in 2008. The SSDSs will continue to be operated and maintained until written permission to shut them down is granted by the Department and the New York State Department of Health.

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:

Soil and groundwater were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, polychlorinated biphenyls (PCBs), and pesticides.

OU-1 Soil – Based upon investigations conducted to date, the primary contaminant of concern for soil is trichloroethene (TCE) that was identified in the soil in an unlined pit in the basement of the facility. The extent of impacted soils is confined to the western half of the footprint of the basement. Concentrations of TCE found in soil on site ranged from 56.9 parts per million (ppm) to 256 ppm, which exceeds the soil cleanup objectives (SCO) for the protection of groundwater (0.47 ppm) and restricted residential use (21 ppm). Data does not indicate any off-site impacts in soil related to this site.

OU-1 Groundwater – TCE was encountered in shallow groundwater samples collected at approximately 15 ft. below ground surface (bgs), intermediate groundwater samples collected at approximately 32 ft. bgs and deep groundwater samples collected at approximately 49 ft. bgs. Concentrations of TCE in shallow groundwater on-site ranged from 108 parts per billion (ppb) to 129,000 ppb, which exceeds the groundwater standard of 5 ppb. Concentrations of TCE found in intermediate groundwater on-site ranged from 2.1 ppb to 417,000 ppb and in deep groundwater on-site ranged from 700 ppb to 1,280 ppb. Maximum groundwater contaminant concentrations are encountered in the western half of the Site. High concentrations of contaminants above groundwater standards are migrating off-site (see below).

OU-1 Soil Vapor – The maximum sub-slab soil vapor concentration of TCE found in samples collected beneath the on-site building were 160,000 ug/m³ in the eastern portion of the basement and 260,000 ug/m³ in the northern portion of the basement. Actions were needed to address soil vapor intrusion and as a result a previously-installed soil vapor extraction system was converted to a vapor mitigation system in the on-site building. Contaminated soil vapor is migrating off-site (see below).

OU-2 Groundwater – TCE was encountered in shallow, intermediate and deep groundwater samples. Depth to groundwater is approximately 10 ft. bgs in the shallow aquifer, approximately 35 ft. bgs in the intermediate aquifer, and approximately 60 ft. bgs in the deep aquifer. Maximum concentrations of TCE found in; shallow off-site groundwater samples was 140,000 ppb, in intermediate off-site groundwater samples was 45,800 ppb and in deep off-site groundwater samples was 65 ppb. Approximate plume length is 500 ft. down-gradient from the site towards east.

OU-2 Soil Vapor – Off-site studies of soil vapor intrusion were conducted at several locations. Concentrations of TCE in sub-slab and indoor air samples collected at two off-site locations during the Remedial Investigation exceeded the recommended action levels as established by NYSDOH and vapor mitigation systems have been installed in these buildings.

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 site is covered with a building and pavement. Contaminated groundwater at the site is not used for drinking or other purposes and the area is served by a public water supply that obtains water from a different source not affected by this contamination. Volatile organic compounds in the groundwater may move into the soil vapor (air spaces within the soil), which in turn may move into overlying buildings and affect the indoor air quality. This process, which is similar to the movement of radon gas from the subsurface into the indoor air of buildings, is referred to as soil vapor intrusion. A soil vapor extraction system was installed beneath the on-site building, which prevents vapors beneath the slab from entering the building. Sub-slab depressurization systems (systems that ventilate/remove the air beneath the building) have been installed in off-site buildings to prevent inhalation of site contaminants in indoor air due to soil vapor intrusion.

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:

For OU 01:

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.

For OU 02:

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 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.

For OU 01: Remedial Program, the selected remedy is referred to as the Source Treatment, Vapor Mitigation, Groundwater Treatment and Site Cover remedy.

The elements of the selected remedy, as shown in Figures 3 through 6, for OU: 01 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. In-Situ Thermal Treatment with Soil Vapor Extraction

In-Situ Thermal Treatment will be implemented to volatilize volatile organic compounds (VOCs) in the source area located in the central portion of Operable Unit (OU) 1 (on-site) to achieve TCE levels of 100 ppb or less in shallow and intermediate groundwater. Electric Resistance Heating (ERH) will be utilized to perform the treatment. An electrical current will be produced in the treatment area between electrodes installed underground. Heat will be generated as movement of the current meets resistance from the soil. The volatilized VOCs produced by the thermal treatment will be collected by soil vapor extraction (SVE) wells and treated in an ex-situ treatment unit. Extracted vapors will be treated by adsorption on granular activated carbon.

Operation of the ERH system is expected to continue for approximately 6 to 8 months. The anticipated treatment area is 9,700 square feet and at a depth from 10 ft. to 40 ft. below ground surface, with a treatment volume of approximately 11,000 cubic yards.

3. Enhanced Bioremediation

Following completion of the ERH treatment, in-situ enhanced biodegradation will be employed to treat the remaining dissolved phase TCE in the groundwater. The biological breakdown of contaminants through anaerobic reductive dechlorination will be enhanced by adding KB-1®

Culture, containing a strain of reductive dechlorinating bacteria (Dehalococcoides), via injection wells. Electron Donor Solution – Extended Release (EDS-ER), a water soluble vegetable oil, and Nutrimens™, a metabolic bioremediation nutrient, will be injected concurrently into the treatment zone. Additionally, a small amount L-Cysteine base will be supplied for making anaerobic water. The exact amounts of substrate, volumes and ratios will be determined during a pilot test. The anticipated combined OU-1 and OU-2 treatment area is approximately 65,400 sq. ft. and at a depth from 10 ft. to 40 ft. below ground surface, with a treatment volume of approximately 60,300 cu. yd.

4. Cover System

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).

5. Vapor Mitigation

Any on-site buildings will be required to have a sub-slab depressurization system (SSDS), or a similar engineered system, to prevent the migration of vapors into the building from contamination in groundwater. After ERH treatment is concluded, the SVE wells used during treatment will be retrofitted into the SSDS to provide adequate coverage throughout the building. Two off-site buildings have sub-slab depressurization systems (SSDS) installed to prevent the migration of vapors into the building from contamination in groundwater. These systems have been operating since 2008, and will continue to operate until DEC and DOH approve discontinuing their use.

6. Institutional Control

Imposition of an institutional control in the form of a declaration of covenants and restrictions for the 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 uses 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; and
- requires compliance with the Department approved Site Management Plan.

7. Site Management Plan

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

- a. an Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements

necessary to ensure the following institutional and/or engineering controls remain in place and effective:

- Institutional Controls: The declaration of covenants and restrictions discussed in bullet 6 above.
- Engineering Controls: The ERH/SVE system discussed in bullet 2 above, the Cover System discussed in bullet 4 above, and the Vapor Mitigation system discussed in bullet 5 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;
 - descriptions of the provisions of the environmental easement including any land use and groundwater use restrictions;
 - provisions for the management and inspection of the identified engineering controls;
 - maintaining site access controls and Department notification; and
 - the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.
- b. a Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:
- monitoring of groundwater to assess the performance and effectiveness of the remedy;
 - a schedule of monitoring and frequency of submittals to the Department.
- 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.

For OU 02: Off-Site Area Remedial Program, the selected remedy is referred to as the Groundwater Treatment and Vapor Mitigation remedy.

The elements of the selected remedy for OU: 02 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. Enhanced Bioremediation

Following completion of the ERH treatment on OU-1, in-situ enhanced biodegradation will be employed to treat the residual dissolved phase TCE in groundwater in OU-2 (off-site). The biological breakdown of contaminants through anaerobic reductive dechlorination will be enhanced by adding KB-1® Culture, containing a strain of reductive dechlorinating bacteria (Dehalococcoides), via injection wells. Electron Donor Solution – Extended Release (EDS-ER), a water soluble vegetable oil, and Nutrimens™, a metabolic bioremediation nutrient, will be injected concurrently into the treatment zone. Additionally, a small amount L-Cysteine base will be supplied for making anaerobic water. The exact amounts of substrate, volumes and ratios will be determined during a Pilot Test. The anticipated combined OU-1 and OU-2 treatment area is approximately 65,400 sq. ft. and at a depth from 10 ft. to 40 ft. below ground surface, with a treatment volume of approximately 60,300 cu. yd.

3. Vapor Mitigation

Two off-site buildings have sub-slab depressurization systems (SSDS) installed to prevent the migration of vapors into the building from residual contamination in groundwater. These systems have been operating since 2008, and will continue to operate as needed.

4. Site Management Plan

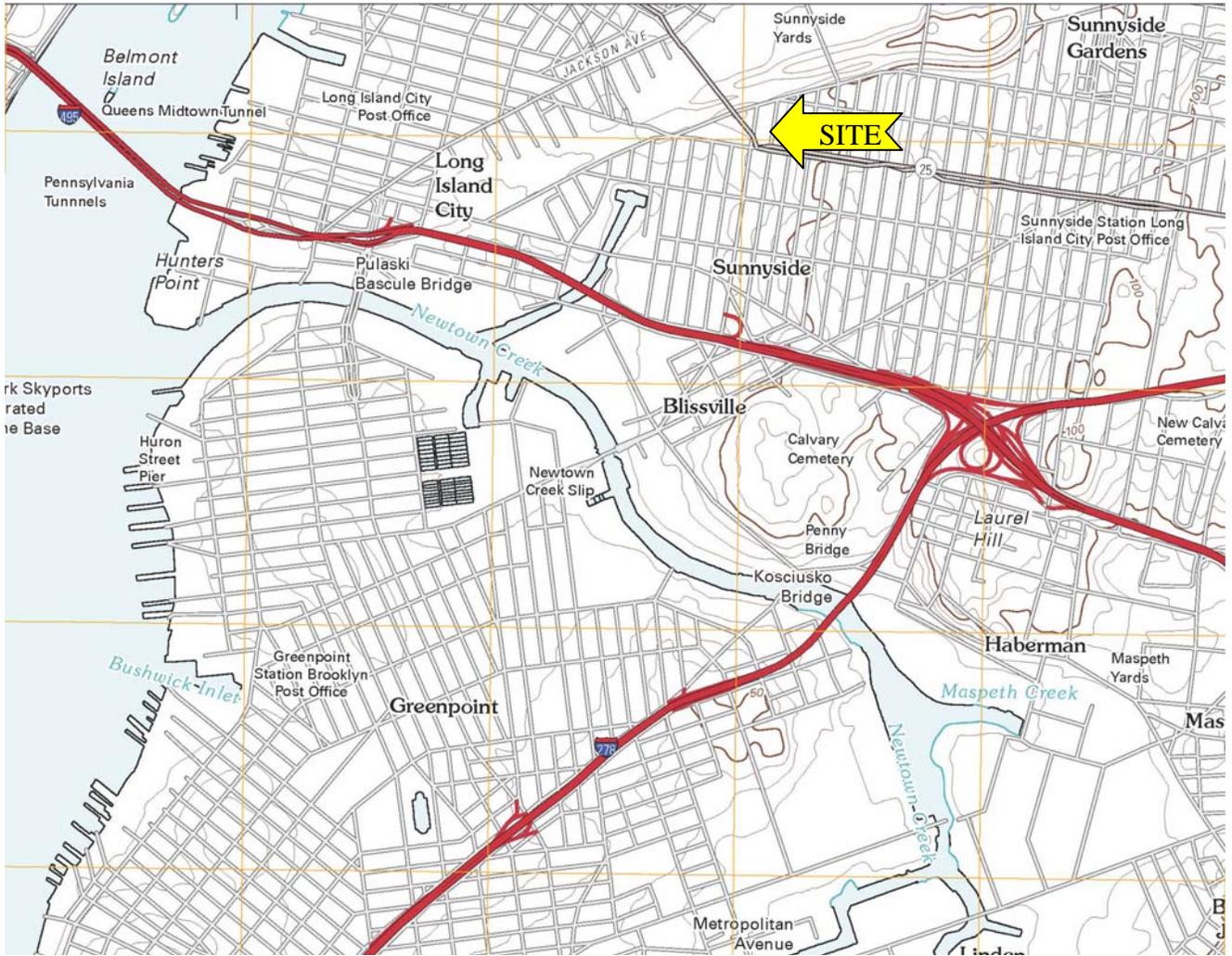
A Site Management Plan is required, which includes the following:

- 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:
 - Engineering Controls: The Vapor Mitigation systems discussed in bullet 3 above.

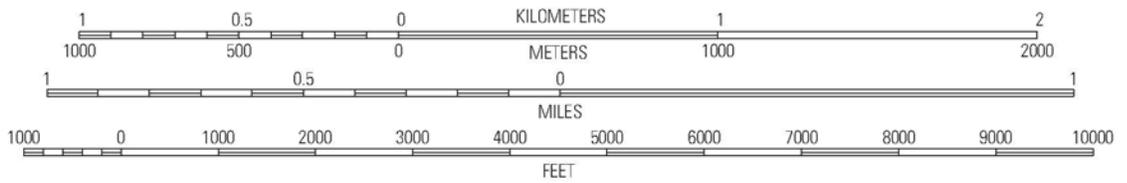
This plan includes, but may not be limited to:

- o provisions for the management and inspection of the identified engineering controls;
 - o maintaining site access controls and Department notification; and
 - o the steps necessary for the periodic reviews and certification of the engineering controls.
- b. a Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:

- monitoring of groundwater to assess the performance and effectiveness of the remedy;
 - a schedule of monitoring and frequency of submittals to the Department.
- 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.



SCALE 1:24 000



QUADRANGLE LOCATION

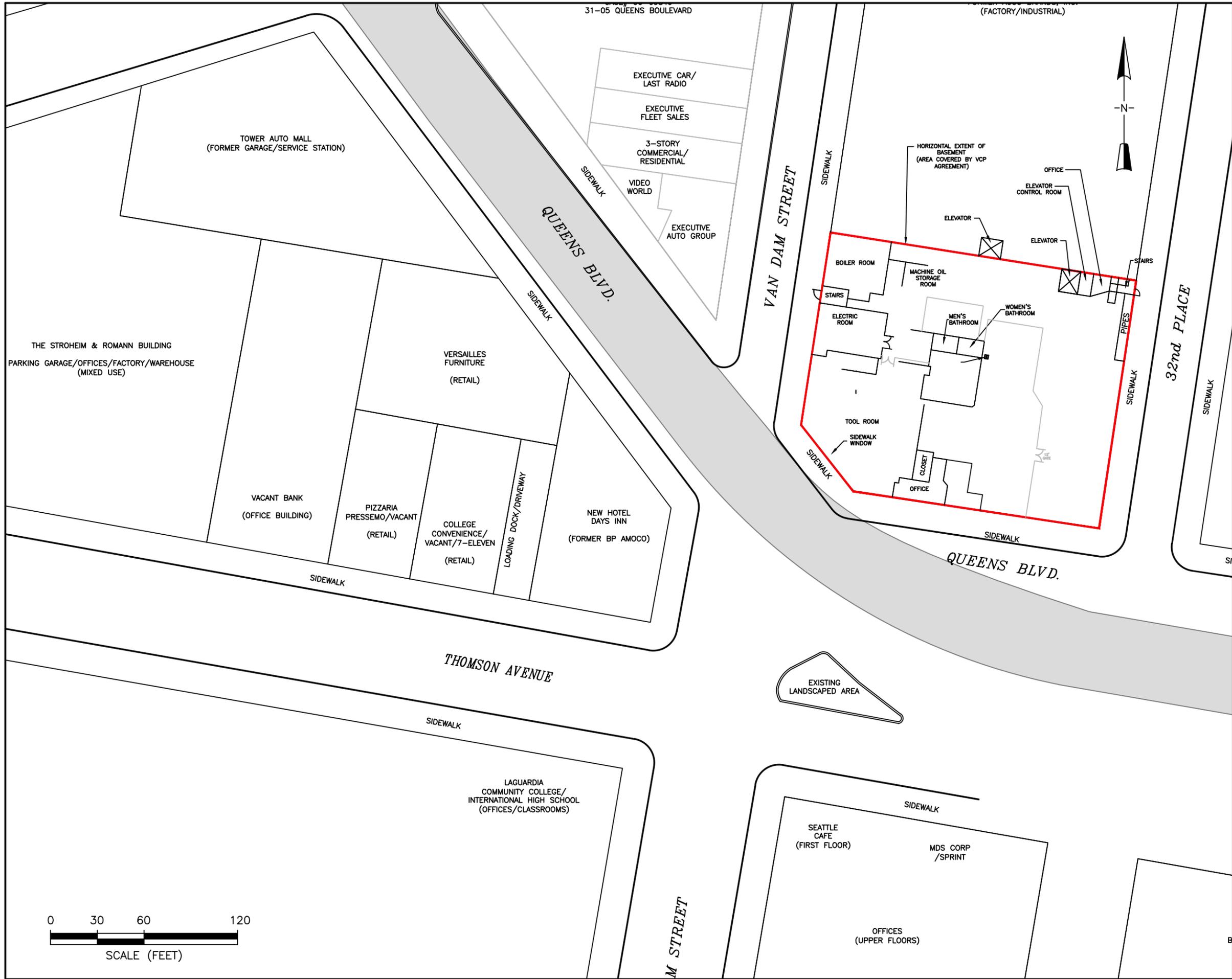
Weehawken	Central Park	Flushing
Jersey City	Brooklyn	Jamaica
The Narrows	Coney Island	Far Rockaway

ADJOINING 7.5' QUADRANGLES

Site: Brooklyn, New York 7.5 Minute series USGS Topographic Map (79287)\
 Obtained from United States Geological Survey topography compiled 2010

FIGURE 1: SITE LOCATION

SITE: FORMER ACCO BRANDS
 32-00 SKILLMAN AVENUE
 LONG ISLAND CITY, NEW YORK



32-00 Skillman Avenue
Long Island City, NY

FIGURE 2

SITE LAYOUT

Date
May 2015

Project Number
10195-001

LEGEND

- SITE BOUNDARY
- ELEVATED TRAIN (SUBWAY)



32-00 Skillman Avenue
Long Island City, NY

FIGURE 3

PROPOSED ELECTRICAL RESISTANCE HEATING AND SSDS LAYOUT

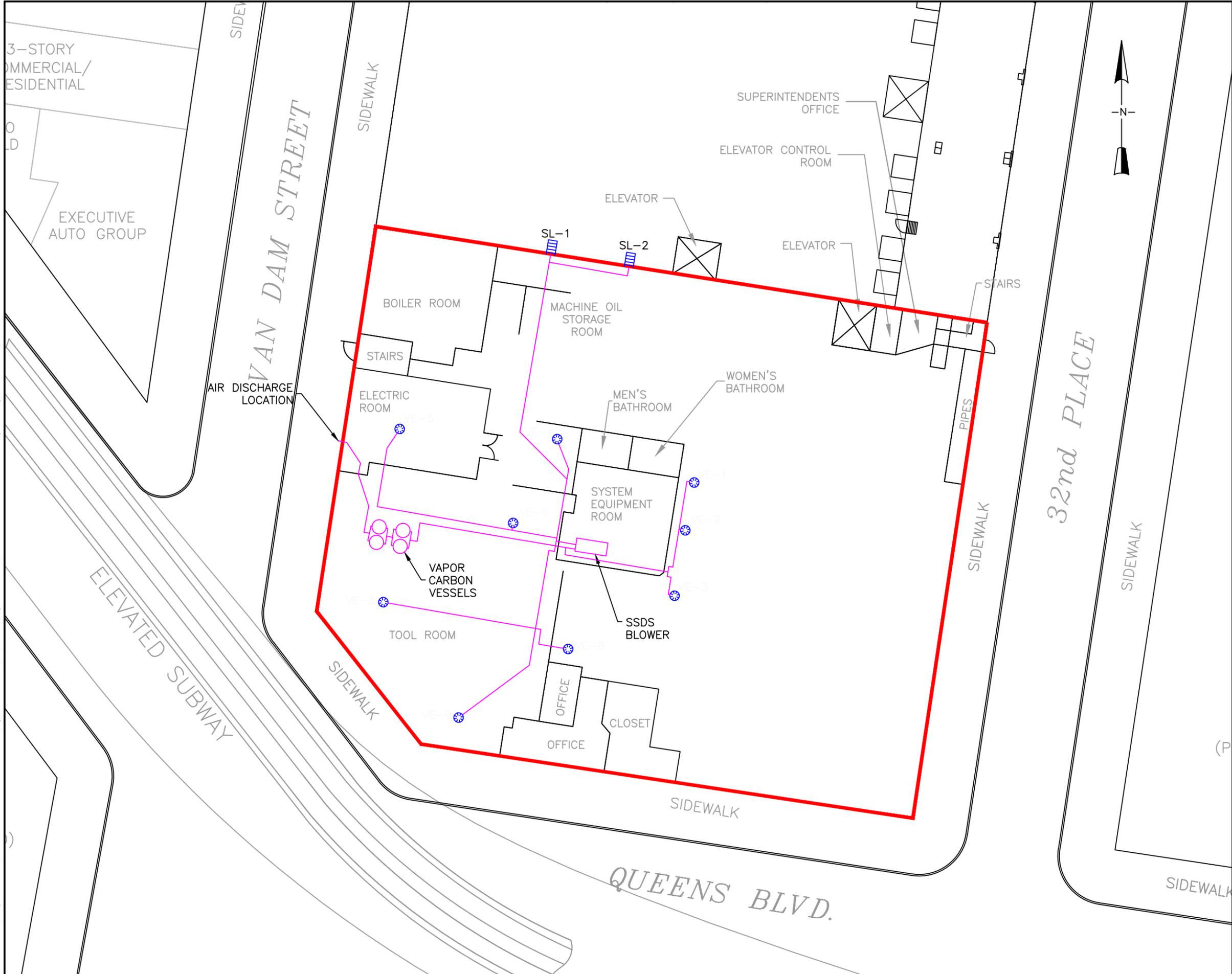
Date
March 2015

Project Number
10195

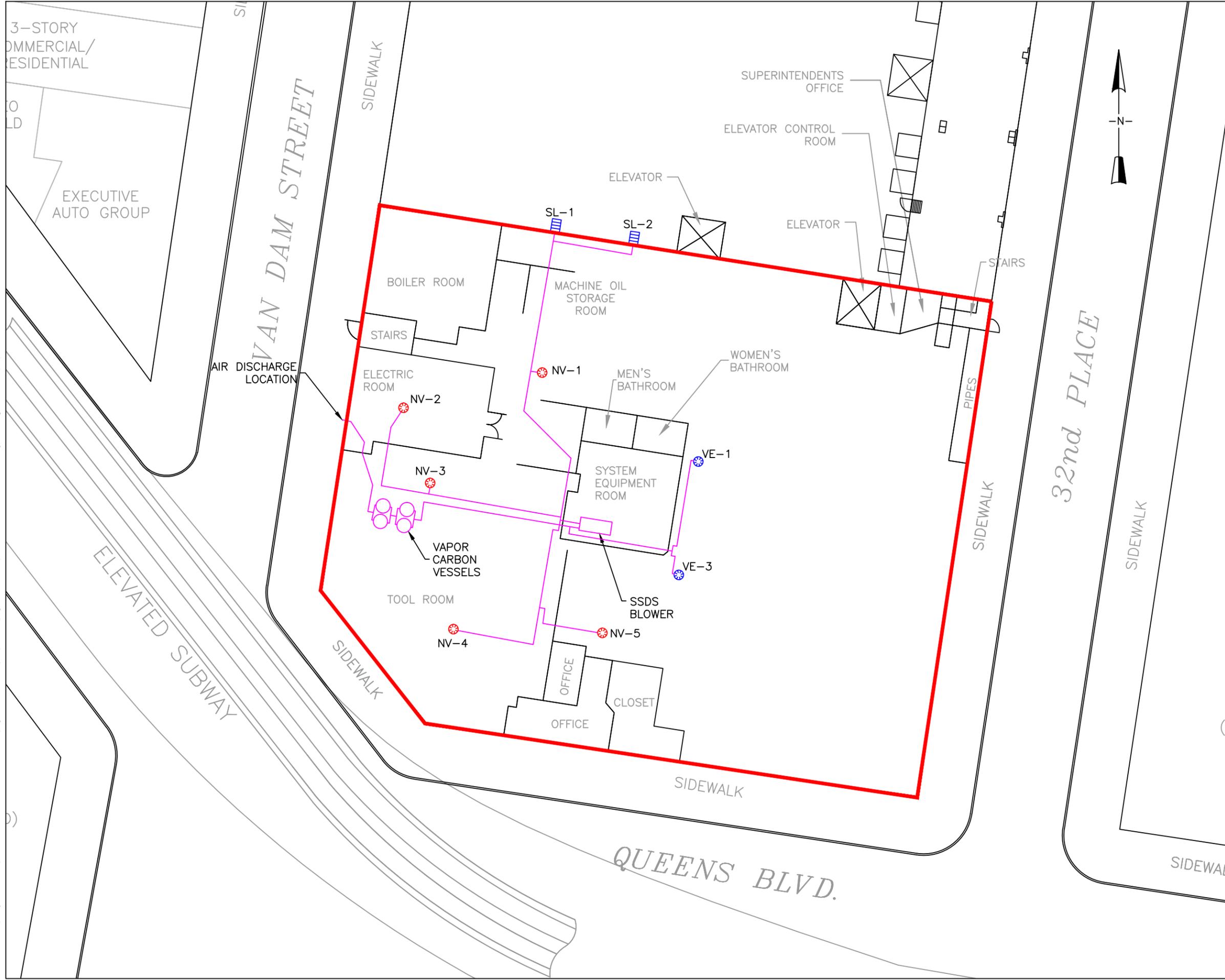
LEGEND

- COLLOCATED ELECTRODE & VAPOR EXTRACTION POINT (QTY. 52)
- ▭ ANGLED COLLOCATED ELECTRODE & VAPOR EXTRACTION POINT (QTY. 8)
- ⊕ REPLACEMENT SHALLOW MONITORING WELL (QTY. 4)
- ⊕ REPLACEMENT INTERMEDIATE MONITORING WELL (QTY. 4)
- ⊕ REPLACEMENT DEEP MONITORING WELL (QTY. 4)
- VE-1 ⊗ SOIL VAPOR EXTRACTION POINT
- SL-1 ▭ SSDS LATERAL
- SECURITY FENCE
- TEMPORARY FENCE/BARRIER
- SITE BOUNDARY

FILE: P:\Project Files\10195 - ACCO - Jim Beam\Figures and Maps\RAM\Figure set 2\FIG 10A - Current SSDS Layout.dwg DATE: 5/7/2015



FILE: P:\Project Files\10195 - ACCO - Jim Beam\Figures and Maps\RAM\Figure set 2\FIG 10B - Final SSDS Layout.dwg DATE: 5/7/2015



32-00 Skillman Avenue
Long Island City, NY

FIGURE 5

FINAL CONCEPTUAL SUB-SLAB DEPRESSURIZATION SYSTEM LAYOUT

Date
May 2015

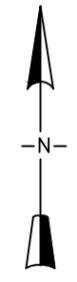
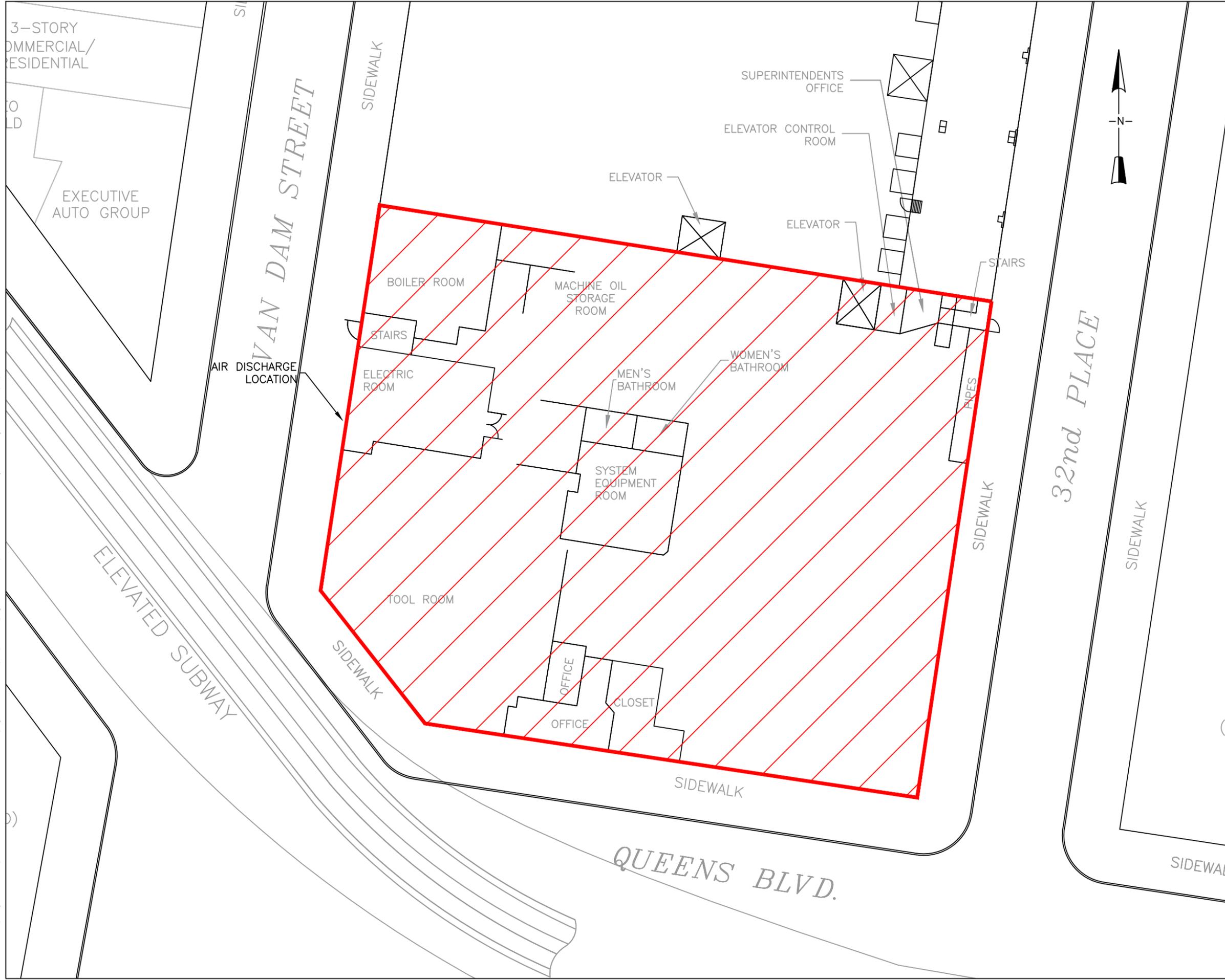
Project Number
10195-001

LEGEND

- SITE BOUNDARY
- ⊗ RETROFITTED SOIL VAPOR EXTRACTION POINT
- ⊗ NEW SSDS PIT
- ▤ SSDS LATERAL



FILE: P:\Project Files\10195 - ACCO - Jim Beam\Figures and Mops\RAM\Figure set 2\FIG 10C - Cover System.dwg DATE: 5/8/2015



32-00 Skillman Avenue
Long Island City, NY

FIGURE 6

COVER SYSTEM

Date
May 2015

Project Number
10195-001

LEGEND

-  SITE BOUNDARY
-  COMPOSITE COVER

