

DECISION DOCUMENT

159 Boerum Street
Brownfield Cleanup Program
Brooklyn, Kings County
Site No. C224291
April 2020



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

DECLARATION STATEMENT - DECISION DOCUMENT

159 Boerum Street
Brownfield Cleanup Program
Brooklyn, Kings County
Site No. C224291
April 2020

Statement of Purpose and Basis

This document presents the remedy for the 159 Boerum Street site, a brownfield cleanup site. The remedial program was chosen in accordance with the New York State Environmental Conservation Law and Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York (6 NYCRR) Part 375.

This decision is based on the Administrative Record of the New York State Department of Environmental Conservation (the Department) for the 159 Boerum Street site and the public's input to the proposed remedy presented by the Department.

Description of Selected Remedy

The elements of the selected remedy are as follows:

1. Remedial Design

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

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
- Reducing direct and indirect greenhouse gases and other emissions;
- Increasing energy efficiency and minimizing use of non-renewable energy;
- Conserving and efficiently managing resources and materials;
- Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;
- Maximizing habitat value and creating habitat when possible;
- Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals;
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development; and

- Additionally, to incorporate green remediation principles and techniques to the extent feasible in the future development at this site, any future on-site buildings will include, at a minimum, a 20-mil vapor barrier/waterproofing membrane on the foundation to improve energy efficiency as an element of construction.

2. Excavation

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

- Soil exceeding the 6 NYCRR Part 371 hazardous criteria for lead;
- Any underground storage tanks (USTs), fuel dispensers, underground piping or other structures associated with a source of contamination.

Excavation and off-site disposal of all on-site soils which exceed unrestricted use soil cleanup objectives (SCOs), as defined by 6 NYCRR Part 375-6.8. If a Track 1 cleanup is achieved, a cover system will not be a required element of the remedy.

Approximately 4,100 cubic yards of contaminated soil and historic fill will be removed from the site.

3. Backfill

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. Local Institutional Controls

If no EE or SMP is needed to achieve soil, groundwater, or soil vapor remedial action objectives, then the following local use restriction will be relied upon to prevent ingestion of groundwater: Article 141 of the NYCDOH code which prohibits potable use of groundwater without prior approval.

5. Vapor Intrusion Evaluation

As part of the track 1 remedy, a soil vapor intrusion evaluation will be completed. The evaluation will include a provision for implementing actions recommended to address exposures related to soil vapor intrusion.

Conditional Track 1

The intent of the remedy is to achieve a Track 1 unrestricted use; therefore, no environmental easement or site management plan is anticipated. If the soil vapor intrusion (SVI) evaluation is not completed prior to completion of the Final Engineering Report, then a Site Management Plan (SMP) and Environmental Easement (EE) will be required to address the SVI evaluation and implement actions as needed; if a mitigation or monitoring action is needed, a Track 1 cleanup can only be achieved if the mitigation system or other required action is no longer needed within 5 years of the date of the Certificate of Completion.

In the event that Track 1 unrestricted use is not achieved, including achievement of groundwater and soil vapor remedial objectives, the following contingent remedial elements will be required, and the remedy will achieve a Track 4 cleanup.

Engineering and Institutional Controls

Imposition of an institutional control in the form of an environmental easement and a Site Management Plan, as described below, will be required. The remedy will achieve a Track 4 restricted residential cleanup at a minimum and will include imposition of a site cover (as a contingency if soil greater than 2 feet but less than 15 feet deep does not meet the restricted residential SCOs), an environmental easement, and site management plan as described below.

6. Cover System

A site cover will be required to allow for restricted residential use of the site in areas where the upper two feet of exposed surface soil will exceed the applicable soil cleanup objectives (SCOs). Where a soil cover is to be used it will be a minimum of two feet of soil placed over a demarcation layer, with the upper six inches of soil of sufficient quality to maintain a vegetative layer. Soil cover material, including any fill material brought to the site, will meet the SCOs for cover material for the use of the site as set forth in 6 NYCRR Part 375-6.7(d). Substitution of other materials and components may be allowed where such components already exist or are a component of the tangible property to be placed as part of site redevelopment. Such components may include, but are not necessarily limited to pavement, concrete, paved surface parking areas, sidewalks, building foundations and building slabs.

7. Institutional Control

Imposition of an institutional control in the form of an environmental easement for the controlled property which will:

- Require the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);

- Allow the use and development of the controlled property for restricted residential use as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
- Restrict the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or NYCDOH; and
- Require compliance with the Department approved Site Management Plan.

8. 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 7 above.
 - Engineering Controls: The cover system discussed in Paragraph 6 above.

This plan includes, but may not be limited to:

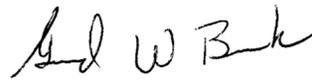
- An Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;
 - Descriptions of the provisions of the environmental easement including any land use, and groundwater uses restrictions;
 - A provision for evaluation of the potential for soil vapor intrusion for any occupied buildings on the site, including provision for implementing actions recommended to address exposures related to soil vapor intrusion;
 - A provision that should a building foundation or building slab be removed in the future, a cover system consistent with that described in Paragraph 6 above will be placed in any areas where the upper two feet of exposed surface soil exceed the applicable soil cleanup objectives (SCOs);
 - Provisions for the management and inspection of the identified engineering controls;
 - Maintaining site access controls and Department notification; and
 - The steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.
- b. A Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:
 - Monitoring of groundwater to assess the performance and effectiveness of the remedy;
 - A schedule of monitoring and frequency of submittals to the Department; and

- Monitoring for vapor intrusion for any buildings on the site, as may be required by the Institutional and Engineering Control Plan discussed above.

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.

April 9, 2020



Date

Gerard Burke, Director
Remedial Bureau B

DECISION DOCUMENT

159 Boerum Street
Brooklyn, Kings County
Site No. C224291
April 2020

SECTION 1: SUMMARY AND PURPOSE

The New York State Department of Environmental Conservation (the Department), in consultation with the New York State Department of Health (NYSDOH), has selected a remedy for the above referenced site. The disposal of contaminants at the site has resulted in threats to public health and the environment that would be addressed by the remedy. The disposal or release of contaminants at this site, as more fully described in this document, has contaminated various environmental media. Contaminants include hazardous waste and/or petroleum.

The New York State Brownfield Cleanup Program (BCP) is a voluntary program. The goal of the BCP is to enhance private-sector cleanups of brownfields and to reduce development pressure on "greenfields." A brownfield site is real property, the redevelopment or reuse of which may be complicated by the presence or potential presence of a contaminant.

The Department has issued this document in accordance with the requirements of New York State Environmental Conservation Law and 6 NYCRR Part 375. This document is a summary of the information that can be found in the site-related reports and documents.

SECTION 2: CITIZEN PARTICIPATION

The Department seeks input from the community on all remedies. A public comment period was held, during which the public was encouraged to submit comment on the proposed remedy. All comments on the remedy received during the comment period were considered by the Department in selecting a remedy for the site. Site-related reports and documents were made available for review by the public at the following document repositories:

DECInfo Locator - Web Application
<https://gisservices.dec.ny.gov/gis/dil/index.html?rs=C224291>

Brooklyn Public Library - Bushwick Branch
340 Bushwick Avenue
Brooklyn, NY 11206
Phone: (718) 602-1349

Brooklyn Community Board 1
Attn: Dealice Fuller
435 Graham Avenue
Brooklyn, NY 11211
Phone: (718) 389-0009

Receive Site Citizen Participation Information by Email

Please note that the Department's Division of Environmental Remediation (DER) is "going paperless" relative to citizen participation information. The ultimate goal is to distribute citizen participation information about contaminated sites electronically by way of county email listservs. Information will be distributed for all sites that are being investigated and cleaned up in a particular county under the State Superfund Program, Environmental Restoration Program, Brownfield Cleanup Program and Resource Conservation and Recovery Act Program. We encourage the public to sign up for one or more county listservs at <http://www.dec.ny.gov/chemical/61092.html>

SECTION 3: SITE DESCRIPTION AND HISTORY

Location - The site is located at 159 Boerum Street in Brooklyn, NY and is identified as Block 3071, Lot 40 on the Kings County Tax Map. The site is located on the city block bound by Johnson Avenue to the north, Humboldt Street to the east, Boerum Street to the south, and Graham Avenue to the west.

Site Features - The site is approximately 11,180-square-foot (0.25 acres) in size and is situated on the south-central part of the tax block. The site is occupied by an open-air asphalt parking lot surrounded by landscaped areas to the north and south. There are no buildings on the site. The site grade slopes from north to south, toward Boerum Street.

Current Zoning and Land Use - The site is zoned R6 (residential). The surrounding properties are zoned R6 with C1/C2 (commercial) overlays along major thoroughfares. Land use within a half-mile radius includes residential, commercial, industrial, open space and institutional developments. The nearest ecological receptor is the English Kills (tributary to Newtown Creek), located about 0.64 miles northeast of the site.

Past Use of the Site - The site was developed as early as 1887 with four multi-story buildings used as stores (tailor shop, synagogue, candy packaging, and warehouse), parking and residential dwellings until about 1965. The previous mixed commercial/residential buildings were demolished around 1974, and the site was used as an open-air parking lot as early as 1981. Test pits excavated on-site revealed buried solid waste, including glass, organic fibers, fabric, plastic, automobile tires, coal, ceramics, metal, brick and concrete as deep as 7.5 feet bgs, suggesting that undocumented dumping occurred at some point after the buildings were demolished in 1974.

Site Geology and Hydrogeology - The topography of the region is characterized by small peaks and valleys, which causes varying changes in the direction and degree of slopes in localized areas. The surrounding area slopes downward gradually to the south-southeast. The asphalt parking lot

and vegetated areas are underlain by a fill layer extending from surface grade to depths approximately 5 to 14 feet bgs. The historic fill predominantly consists of a brown, fine to medium sand and gravel matrix and contains various amounts of glass, organic fibers, wood, coal, ash, slag, metal, brick and concrete. The historic fill material is underlain by a native tan to brown, fine- to coarse-grained sand with trace silt and fine gravel observed at approximately 5 feet to at least 25 feet bgs. Bedrock was not encountered during the remedial investigation. Groundwater was encountered at depths ranging from 21 to 23.29 feet bgs. Based on measured groundwater elevations, site groundwater flows towards the northwest.

A site location map is attached as Figure 1.

SECTION 4: LAND USE AND PHYSICAL SETTING

The Department may consider the current, intended, and reasonably anticipated future land use of the site and its surroundings when evaluating a remedy for soil remediation. For this site, an alternative which allows for unrestricted use of the site was evaluated.

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

SECTION 5: ENFORCEMENT STATUS

The Applicant(s) under the Brownfield Cleanup Agreement is a/are Volunteer(s). The Applicant(s) does/do not have an obligation to address off-site contamination. However, the Department has determined that this site does not pose a significant threat to public health or the environment; accordingly, no enforcement actions are necessary.

SECTION 6: SITE CONTAMINATION

6.1: Summary of the Remedial Investigation

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

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

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

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

The analytical data collected on this site includes data for:

- groundwater
- soil
- soil vapor

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:

lead	benzo(b)fluoranthene
mercury	naphthalene
barium	dibenz[a,h]anthracene
benzo(a)anthracene	benzo(k)fluoranthene
benzo(a)pyrene	dieldrin
fluoranthene	cadmium
chrysene	chromium
indeno(1,2,3-CD)pyrene	

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

- groundwater
- soil

6.2: Interim Remedial Measures

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

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

6.3: Summary of Environmental Assessment

This section summarizes the assessment of existing and potential future environmental impacts presented by the site. Environmental impacts may include existing and potential future exposure pathways to fish and wildlife receptors, wetlands, groundwater resources, and surface water. The RI report presents a detailed discussion of any existing and potential impacts from the site to fish and wildlife receptors.

Nature and Extent of Contamination:

A site wide investigation was conducted to delineate contamination in soil, groundwater and soil vapor. Soil and groundwater samples were analyzed for volatile organic compounds (VOCs), semi volatile organic compounds (SVOCs), metals, polychlorinated biphenyls (PCBs), pesticides, the emerging contaminants per-and polyfluoroalkyl substances (PFAS), and 1,4 dioxane. Soil vapor was analyzed for VOCs. According to the most recent analytical results, the primary contaminants of concern at the site are metals, VOCs and SVOCs. Results are summarized below:

Soil:

Based on investigations conducted to date, the primary contaminants of concern detected in soil at the site include VOCs, SVOCs and metals. One VOC, naphthalene, was detected in sub-surface soil (2 to 4 feet below grade) at a concentration exceeding its Unrestricted Use Soil Cleanup Objective (UUSCO), of 3,400 parts per million (ppm) compared to its UUSCO of 12 ppm. Several SVOCs detected in the subsurface exceeded their respective UUSCOs benzo(a)anthracene up to 230 ppm (UUSCO is 1 ppm), benzo(a)pyrene up to 210 ppm (UUSCO is 1 ppm), benzo(b)fluoranthene up to 270 ppm (UUSCO is 1 ppm), chrysene up to 210 ppm (UUSCO is 1 ppm), indeno(1,2,3-c,d)pyrene up to 110 ppm (UUSCO is 0.5 ppm), dibenz[a,h]anthracene up to 29 ppm (UUSCO is 0.33 ppm), benzo(k)fluoranthene up to 80 ppm (UUSCO is 0.8 ppm), fluoranthene up to 530 ppm (UUSCO is 100 ppm). Several metals exceeded their respective UUSCOs, including barium up to 990 ppm (UUSCO is 350 ppm), cadmium up to 5.98 ppm (UUSCO is 2.5 ppm), mercury up to 1.47 ppm (UUSCO is 0.18 ppm), lead up to 2,680 ppm (UUSCO is 63 ppm). During an additional subsurface investigation, lead was detected at a concentration above the hazardous waste regulatory threshold in three soil borings, with a maximum Toxicity Characteristic Leaching Procedure (TCLP) concentration of 11.6 ppm (Regulatory level for lead is 5 ppm), at depth of 2-3 feet bgs.

Based on the sampling results, there is no indication that these contaminants have migrated off-site.

Groundwater:

Barium was identified in on-site groundwater at a maximum concentration of 3,143 parts per billion (ppb), compared to the NYSDEC Groundwater Quality Standard (GQS) of 1,000 ppb, and chromium was found up to 317 ppb (GQS is 50 ppb). Several SVOCs were detected, including benzo(a)anthracene up to 0.07 ppb (GQS of 0.002 ppb), benzo(b)fluoranthene up to 0.07 ppb (compared to GQS of 0.002 ppb), chrysene up to 0.05 ppb (compared GQS of 0.002 ppb), and indeno(1,2,3-c,d)pyrene up to 0.12 ppb (compared to GQS of 0.002 ppb). Pesticides including dieldrin up to 0.006 ppb (GQS is 0.004 ppb). Based on the sampling results, there is no indication that these contaminants have migrated off-site.

Soil Vapor:

Total VOCs in soil vapor samples collected near the site perimeter areas ranged from 346 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) to 2,015 $\mu\text{g}/\text{m}^3$. Primarily acetone, methyl ethyl ketone (2-butanone), 2-hexanone, chloroform are driving the elevated total VOCs concentration. Tetrachloroethene (PCE) concentrations detected in soil vapor ranged from about 1.48 $\mu\text{g}/\text{m}^3$ to 5.81 $\mu\text{g}/\text{m}^3$. PCE's daughter products, trichloroethene, cis-1,2-dichloroethene and vinyl chloride, were not detected in soil vapor samples. Benzene, toluene, ethylbenzene, and xylenes (BTEX) were detected at total concentrations ranging from about 17.71 $\mu\text{g}/\text{m}^3$ to 42.5 $\mu\text{g}/\text{m}^3$. Based on the soil vapor sampling results, soil vapor intrusion does not appear to be a concern for off-site 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*.

People are not drinking the contaminated groundwater because the area is served by a public water supply that is not affected by site-related contamination. People who enter the site may come into contact with soil and groundwater contamination if they dig below the ground surface. Volatile organic compounds in soil vapor (air spaces within the soil) may move into buildings and affect the indoor air quality. This process, which is similar to the movement of radon gas from the subsurface into the indoor air of buildings is referred to as soil vapor intrusion. Because the site is vacant, the inhalation of site-related contaminants due to soil vapor intrusion does not represent a current concern. Environmental data collected from the site indicates that soil vapor intrusion is not a concern for off-site structures.

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.

Soil

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil.
- Prevent inhalation of or exposure from contaminants volatilizing from contaminants in soil.

RAOs for Environmental Protection

- Prevent migration of contaminants that would result in groundwater or surface water contamination.

Soil Vapor

RAOs for Public Health Protection

- Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion into buildings at a site.

SECTION 7: ELEMENTS OF THE SELECTED REMEDY

The alternatives developed for the site and the evaluation of the remedial criteria are presented in the Alternative Analysis. The remedy is selected pursuant to the remedy selection criteria set forth in DER-10, Technical Guidance for Site Investigation and Remediation and 6 NYCRR Part 375.

The selected remedy is a Conditional Track 1 remedy.

The selected remedy is referred to as the Soil Excavation and Backfill remedy.

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

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;
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- Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;
- Maximizing habitat value and creating habitat when possible;
- Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals;
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development; and
- Additionally, to incorporate green remediation principles and techniques to the extent feasible in the future development at this site, any future on-site buildings will include, at a minimum, a 20-mil vapor barrier/waterproofing membrane on the foundation to improve energy efficiency as an element of construction.

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Approximately 4,100 cubic yards of contaminated soil and historic fill will be removed from the site.

3. Backfill

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. Local Institutional Controls

If no EE or SMP is needed to achieve soil, groundwater, or soil vapor remedial action objectives, then the following local use restriction will be relied upon to prevent ingestion of groundwater: Article 141 of the NYCDOH code which prohibits potable use of groundwater without prior approval.

5. Vapor Intrusion Evaluation

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Conditional Track 1

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In the event that Track 1 unrestricted use is not achieved, including achievement of groundwater and soil vapor remedial objectives, the following contingent remedial elements will be required, and the remedy will achieve a Track 4 cleanup.

Engineering and Institutional Controls

Imposition of an institutional control in the form of an environmental easement and a Site Management Plan, as described below, will be required. The remedy will achieve a Track 4 restricted residential cleanup at a minimum and will include imposition of a site cover (as a contingency if soil greater than 2 feet but less than 15 feet deep does not meet the restricted residential SCOs), an environmental easement, and site management plan as described below.

6. Cover System

A site cover will be required to allow for restricted residential use of the site in areas where the upper two feet of exposed surface soil will exceed the applicable soil cleanup objectives (SCOs). Where a soil cover is to be used it will be a minimum of two feet of soil placed over a demarcation layer, with the upper six inches of soil of sufficient quality to maintain a vegetative layer. Soil cover material, including any fill material brought to the site, will meet the SCOs for cover material for the use of the site as set forth in 6 NYCRR Part 375-6.7(d). Substitution of other materials and components may be allowed where such components already exist or are a component of the tangible property to be placed as part of site redevelopment. Such components may include, but are not necessarily limited to pavement, concrete, paved surface parking areas, sidewalks, building foundations and building slabs.

7. Institutional Control

Imposition of an institutional control in the form of an environmental easement for the controlled property which will:

- Require the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);
- Allow the use and development of the controlled property for restricted residential use as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
- Restrict the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or NYCDOH; and
- Require compliance with the Department approved Site Management Plan.

8. Site Management Plan

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

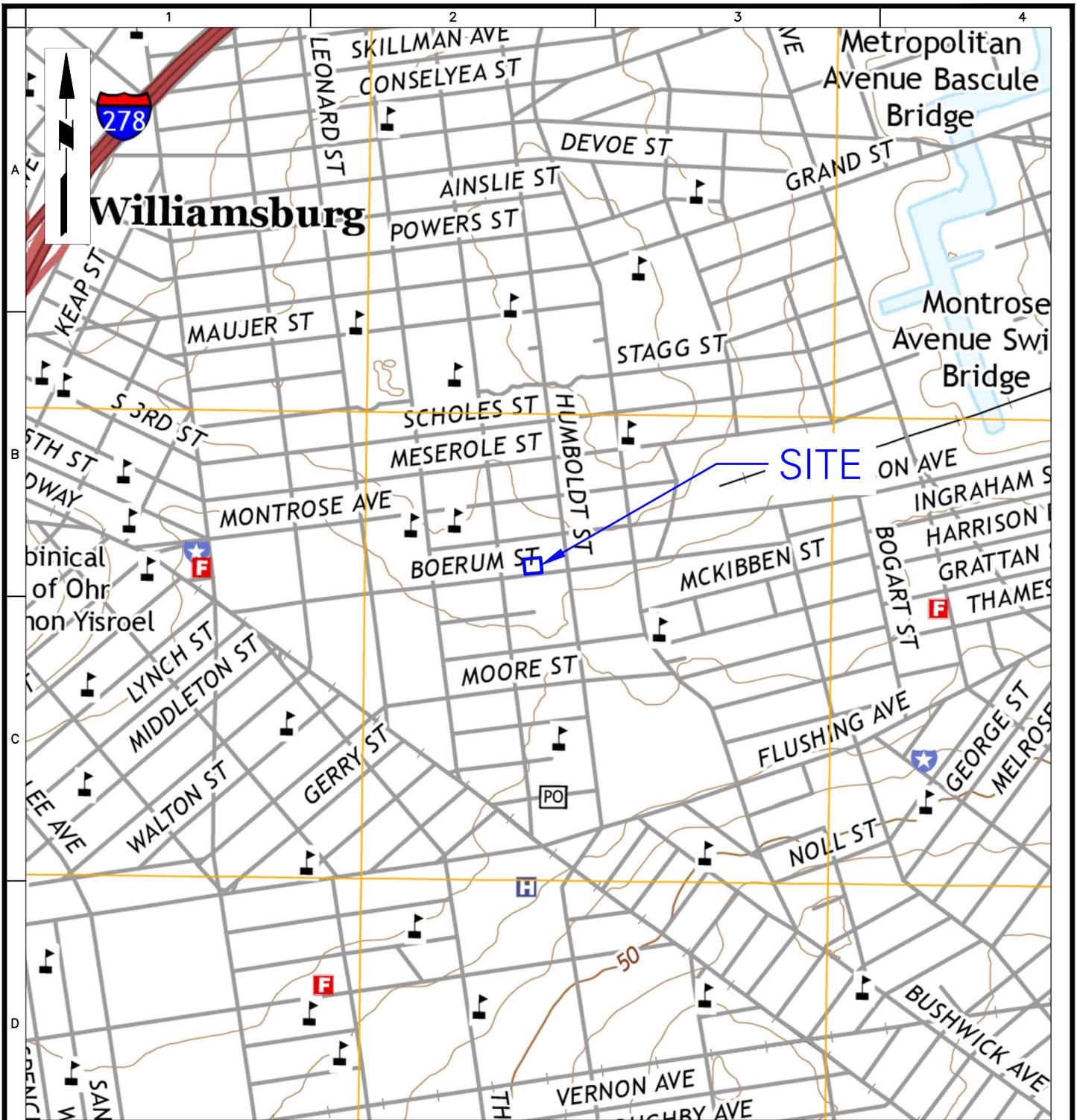
- a. An Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to ensure the following institutional and/or engineering controls remain in place and effective:
 - Institutional Controls: The Environmental Easement discussed in Paragraph 7 above.
 - Engineering Controls: The cover system discussed in Paragraph 6 above.

This plan includes, but may not be limited to:

- An Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;
- Descriptions of the provisions of the environmental easement including any land use, and groundwater uses restrictions;
- A provision for evaluation of the potential for soil vapor intrusion for any occupied buildings on the site, including provision for implementing actions recommended to address exposures related to soil vapor intrusion;
- A provision that should a building foundation or building slab be removed in the future, a cover system consistent with that described in Paragraph 6 above will be placed in any areas where the upper two feet of exposed surface soil exceed the applicable soil cleanup objectives (SCOs);
- Provisions for the management and inspection of the identified engineering controls;
- Maintaining site access controls and Department notification; and
- The steps necessary for the periodic reviews and certification of the institutional and/or

engineering controls.

- b. A Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:
- Monitoring of groundwater to assess the performance and effectiveness of the remedy;
 - A schedule of monitoring and frequency of submittals to the Department; and
 - Monitoring for vapor intrusion for any buildings on the site, as may be required by the Institutional and Engineering Control Plan discussed above.

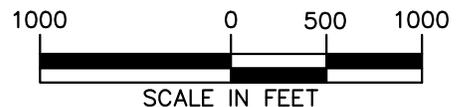


LEGEND:

 APPROXIMATE SITE BOUNDARY

NOTE:

BASE MAPS ADAPTED FROM UNITED STATES GEOLOGICAL SURVEY (USGS) 7.5-MINUTE BROOKLYN TOPOGRAPHIC QUADRANGLE, DATED 2016.



LANGAN

Langan Engineering, Environmental, Surveying,
Landscape Architecture and Geology, D.P.C.
21 Penn Plaza, 360 West 31st Street, 8th Floor
New York, NY 10001

T: 212.479.5400 F: 212.479.5444 www.langan.com

Project

159 BOERUM STREET

BLOCK No. 3071, LOT No. 40

BROOKLYN

NEW YORK

Figure Title

**SITE LOCATION
MAP**

Project No.

170552901

Date

10/03/2018

Drawn By

NEK

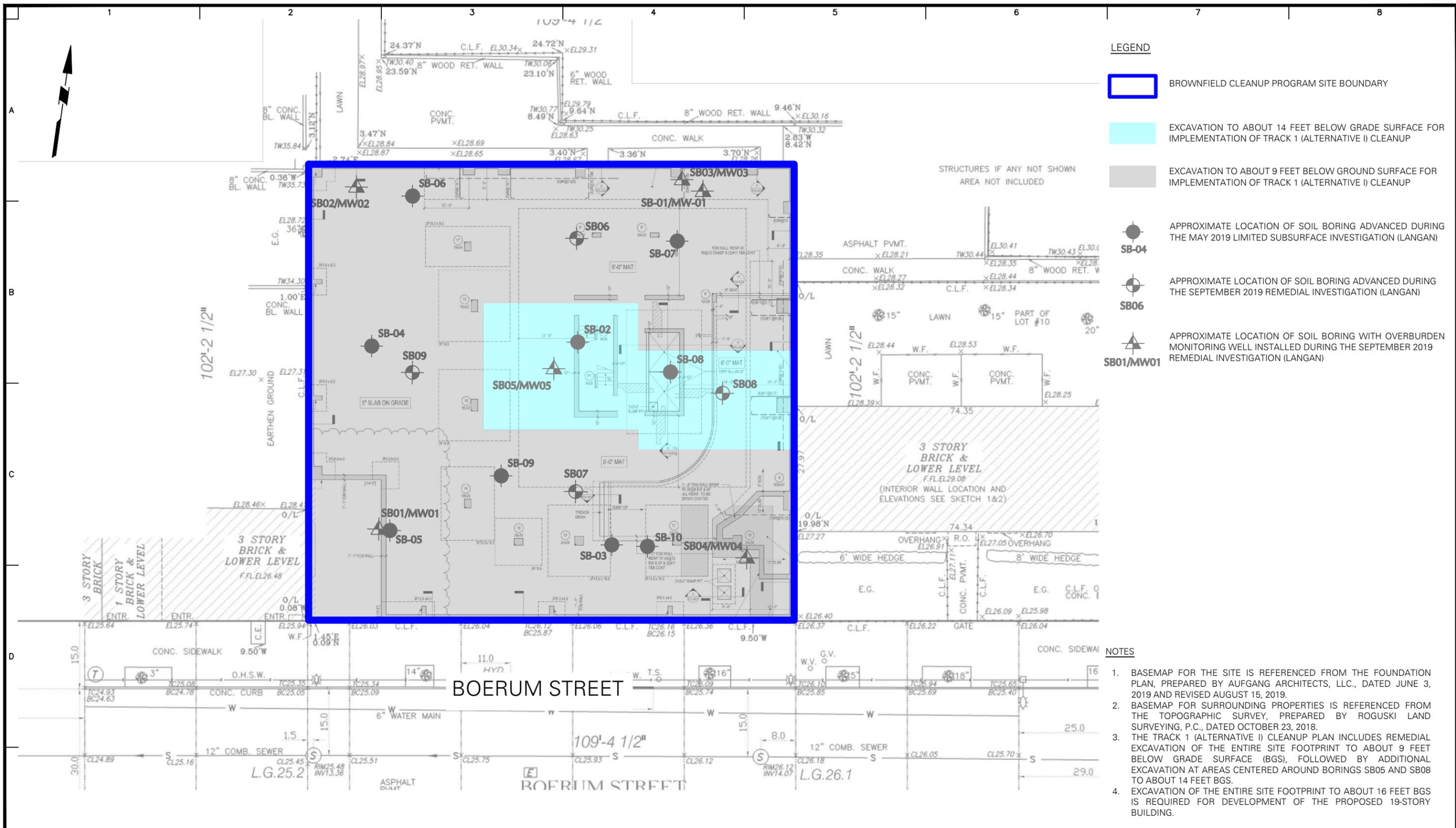
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Figure No.

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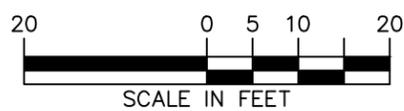
Sheet 1 of 9



- LEGEND**
- BROWNFIELD CLEANUP PROGRAM SITE BOUNDARY
 - EXCAVATION TO ABOUT 14 FEET BELOW GRADE SURFACE FOR IMPLEMENTATION OF TRACK 1 (ALTERNATIVE I) CLEANUP
 - EXCAVATION TO ABOUT 9 FEET BELOW GROUND SURFACE FOR IMPLEMENTATION OF TRACK 1 (ALTERNATIVE I) CLEANUP
 - APPROXIMATE LOCATION OF SOIL BORING ADVANCED DURING THE MAY 2019 LIMITED SUBSURFACE INVESTIGATION (LANGAN) **SB-04**
 - APPROXIMATE LOCATION OF SOIL BORING ADVANCED DURING THE SEPTEMBER 2019 REMEDIAL INVESTIGATION (LANGAN) **SB06**
 - APPROXIMATE LOCATION OF SOIL BORING WITH OVERBURDEN MONITORING WELL INSTALLED DURING THE SEPTEMBER 2019 REMEDIAL INVESTIGATION (LANGAN) **SB01/MW01**

- NOTES**
1. BASEMAP FOR THE SITE IS REFERENCED FROM THE FOUNDATION PLAN, PREPARED BY AUFANG ARCHITECTS, LLC., DATED JUNE 3, 2019 AND REVISED AUGUST 15, 2019.
 2. BASEMAP FOR SURROUNDING PROPERTIES IS REFERENCED FROM THE TOPOGRAPHIC SURVEY, PREPARED BY ROGUSKI LAND SURVEYING, P.C., DATED OCTOBER 23, 2018.
 3. THE TRACK 1 (ALTERNATIVE I) CLEANUP PLAN INCLUDES REMEDIAL EXCAVATION OF THE ENTIRE SITE FOOTPRINT TO ABOUT 9 FEET BELOW GRADE SURFACE (BGS), FOLLOWED BY ADDITIONAL EXCAVATION AT AREAS CENTERED AROUND BORINGS SB05 AND SB08 TO ABOUT 14 FEET BGS.
 4. EXCAVATION OF THE ENTIRE SITE FOOTPRINT TO ABOUT 16 FEET BGS IS REQUIRED FOR DEVELOPMENT OF THE PROPOSED 19-STORY BUILDING.

WARNING: IT IS A VIOLATION OF THE NYS EDUCATION LAW ARTICLE 145 FOR ANY PERSON, UNLESS HE IS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS ITEM IN ANY WAY.



 Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C. 21 Penn Plaza, 360 West 31st Street, 8th Floor New York, NY 10001 T: 212.479.5400 F: 212.479.5444 www.langan.com	Project 159 BOERUM STREET BLOCK No. 3071, LOT No. 40 BROOKLYN NEW YORK	Figure Title TRACK 1 CLEANUP PLAN	Project No. 170552901 Date 01/23/2020 Drawn By ABK Checked By ELS	Figure No. 6 Sheet 6 of 9
	File name: \\langan.com\data\NY\data9\170552901\Project Data\CAD\01\SheetFiles\RAWP\Figure 6 - Track 1 Cleanup Plan.dwg Date: 1/29/2020 Time: 10:26 User: nkung Style Table: Langan.stb Layout: TRACK 1			