DECISION DOCUMENT

27-01 Jackson Avenue
Brownfield Cleanup Program
Long Island City, Queens County
Site No. C241209
February 2021

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

DECLARATION STATEMENT - DECISION DOCUMENT

27-01 Jackson Avenue
Brownfield Cleanup Program
Long Island City, Queens County
Site No. C241209
February 2021

Statement of Purpose and Basis

This document presents the remedy for the 27-01 Jackson Avenue 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 27-01 Jackson Avenue 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:

The selected remedy is a Track 1: Unrestricted Use soil cleanup objectives remedy for on-site. For off-site contamination, the site will achieve the remedial action objectives by: (i) demonstrating a bulk reduction in groundwater concentrations to asymptotic levels; (ii) relying on the New York City municipal restriction on groundwater use for the off-site area; (iii) entering into an Off-Site Consent Order (CO) with the NYSDEC to implement a Site Management Plan (SMP) addressing the remaining off-site contamination. The CO will provide that the NYSDEC may revoke the Track 1 on-site COC if the Participant fails to comply with the SMP.

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 all on-site soils which exceed unrestricted use 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 11,500 cubic yards of contaminated soil will be removed from the site.

3. Excavation Dewatering and Treatment

Dewatering will be required to allow for excavation of petroleum-contaminated source material under dry conditions. Treatment of dewatering fluids will be required to reduce contaminant concentrations below NYCDEP/NYSDEC effluent limitations prior to discharge.

4. Backfill

Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d)(1) will be brought in to replace the excavated soil and establish the designed grades at the site. Approximately 150 cubic yards of clean fill will be imported for this purpose.

5. SVI 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.

6. Off-Site Groundwater Treatment

Activated carbon will be added to the subsurface to capture and prevent the migration of petroleum VOCs. A bio-stimulating electron acceptor solution will also be injected to enhance biodegradation. In the area of the captured contamination, conditions will be maintained that will allow aerobic degradation of the contaminants of concern to occur. Activated carbon and the amendments noted above will be added to the subsurface via injection wells screened from 12 to 30 feet below grade in an approximately 2750 square foot area located in the southwestern portion of the site where gasoline-related compounds were elevated in the groundwater.

Prior to injection, any residual LNAPL would be removed by a vacuum truck. Monitoring will be required within the treatment zone. Monitoring will be conducted for contaminants of concern, dissolved oxygen and oxidation/reduction potential.

7. Local Institutional Controls

As 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.

8. Institutional Control

The Participant will be required to enter into an Off-Site Consent Order (CO) with the NYSDEC to implement a Site Management Plan (SMP) addressing the remaining off-site contamination. The CO will provide that the NYSDEC may revoke the Track 1 on-site COC if the Participant fails to comply with the SMP. The CO will:

- require compliance with the Department approved SMP;
- require the remedial party to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3).

9. Site Management Plan

A Site Management Plan is required to monitor and maintain the off-site groundwater remedy, which includes the following:

a. 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; and
   - a schedule of monitoring and frequency of submittals to the Department.

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.

February 8, 2021

Date

Gerard Burke, Director
Remedial Bureau B

DECISION DOCUMENT

27-01 Jackson Avenue
Long Island City, Queens County
Site No. C241209
February 2021

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=C241209

Queens Library at Long Island City
37-44 21st Street
Long Island City, NY 11101
Phone: 718-752-3700
Attn: Luba Kierkosz

Queens Community Board No. 2

Attn: Denise Keehan-Smith
43-22 50th Street, Room 2B
Woodside, NY 11377
Phone: 718-533-8773

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 27-01 Jackson Avenue in the Long Island City neighborhood of Queens, NY. The approximately 9,200 square foot (0.211 acre) site is identified on the Queens Borough Tax Map as Block 432, Lot 21. The site is bounded by a multi-story hotel followed by Hunter Street to the north; a vacant lot and the Ed Koch Queensboro Bridge on-ramp and upper roadway followed by a multi-story commercial use building to the east; Jackson Avenue followed by a one-story industrial use building to the south; and 43rd Avenue followed by multi-story mixed-use buildings to the west.

Site Features:
The site is unpaved and currently vacant without buildings and is used to stage construction materials and equipment for construction on surrounding properties.

Current Zoning and Land Use:
The site is located in the Special Long Island City Mixed Use Paired District (M1-5/R9). M1-5 zoning allows for light manufacturing, commercial and community facility. R9 is a zoning that allows for high residential density through large buildable floor areas. The adjoining parcels and surrounding area in general are used for mixed-use commercial and residential purposes, as well as for industrial purposes.

Past Use of the Site:
Historical operations at the site included a hand laundry in 1936 and a gasoline station and auto repair shop from 1945 to 2015. The site has been fenced and vacant since 2015.

Site Geology and Hydrogeology
Historic fill predominantly consisting of brown, fine- to medium-grained sand with varying amounts of silt, gravel, clay, coal, brick, wood, glass, and concrete, is present at depths ranging from about 6.5 to 22 feet below ground surface (bgs). Native soil encountered below historic fill

predominantly consists of fine- to medium-grained sand with varying amounts of gravel, silt, and clay. Lenses of silts with varying amounts of sand and clay, ranging in thickness from 6 inches to 4 feet, were observed in three borings. The top of bedrock varies across the site from about 19 to 45 feet bgs. The bedrock surface is irregular and generally slopes from the east to west. Boring data indicates bedrock is shallowest beneath the southeastern part of the site.

Groundwater is present at depths of about 10.11 to 14.72 feet bgs at the site. Groundwater generally flows west but is likely partially influenced by dewatering activities from the southern adjoining subway tunnel, causing a low point in the groundwater table in the southwestern corner of the site. This low point is causing a secondary flow direction to the south. Underground utilities and other subsurface structures may locally influence the direction of groundwater flow.

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 under the Brownfield Cleanup Agreement is a Participant. The Applicant has an obligation to address on-site and off-site contamination. Accordingly, no enforcement actions are necessary.

SECTION 6: SITE CONTAMINATION

6.1: Summary of the Remedial Investigation

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

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

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

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

The analytical data collected on this site includes data for:

- air
- groundwater
- soil
- soil vapor

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:

1,2,4-trimethylbenzene
1,3,5-trimethylbenzene
benzene
ethylbenzene
naphthalene
toluene
xylene (mixed)
benzo(a)anthracene
benzo(a)pyrene
benzo(k)fluoranthene
benzo(b)fluoranthene
chrysene
chromium
lead
mercury
Perfluorooctane Sulfonic Acid
perfluorooctanoic acid
tetrachloroethene (PCE)
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.

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:

As part of the Remedial Investigation (RI) soil and groundwater were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, polychlorinated biphenyls (PCBs), and pesticides. Groundwater was also analyzed for emerging contaminants (ECs). Soil vapor was analyzed for VOCs. Based upon the results of investigations conducted to date, the primary contaminants of concern for the site include petroleum related volatile organic compounds (PVOCs), poly aromatic hydrocarbons (PAHs) and metals.

Soil - Several VOCs were detected in soil at concentrations above the Part 375 Unrestricted Use Soil Cleanup Objectives (UUSCOs). Petroleum-related VOCs were generally detected from 8 to 40 feet below ground surface (bgs) or refusal, whichever was shallower, in the southern and western parts of the site and the adjoining sidewalks. These VOCs include: 1,2,4-trimethylbenzene (TMB) at a maximum concentration of 1,500 parts per million (ppm) compared to the UUSCO of 3.6 ppm; 1,3,5-TMB at 670 ppm (UUSCO is 8.4 ppm); benzene at 36 ppm (UUSCO is 0.06 ppm); toluene at 770 ppm (UUSCO is 0.7 ppm); ethylbenzene at 520 ppm (UUSCO is 1 ppm); total xylenes at 3,100 ppm (UUSCO is 0.26 ppm); and naphthalene at 380 ppm (UUSCO is 12 ppm).

Several SVOCs were detected in historic fill material at concentrations above the applicable UUSCOs in the 0 to 9-foot bgs interval in samples collected across the site. The maximum concentrations of SVOCs detected include benzo(a)anthracene at 14 ppm (UUSCO is 1 ppm), benzo(a)pyrene at 12 ppm (UUSCO is 1 ppm), benzo(b)fluoranthene at 15 ppm (UUSCO is 1 ppm), benzo(k)fluoranthene at 4.2 ppm (UUSCO is 0.8 ppm), and chrysene at 13 ppm (UUSCO is 1 ppm).

The following pesticides were detected in soil at concentrations above UUSCOs in the 0 to 5-foot interval bgs in samples collected from across the site: 4,4'-DDD at 0.0381ppm (UUSCO is

0.0033 ppm), 4,4'-DDE at 0.0185 ppm (UUSCO is 0.0033 ppm), 4,4'-DDT at 0.031 ppm (UUSCO is 0.0033 ppm), and dieldrin at 0.0131 ppm (UUSCO is 0.005 ppm).

Several metals were detected at concentrations above the UUSCOs in the historic fill layer across the site, including arsenic at 19.7 ppm (UUSCO is 13 ppm), barium at 688 ppm (UUSCO is 350 ppm), hexavalent chromium 4.27 ppm (UUSCO is 1 ppm), trivalent chromium at 43 ppm (UUSCO is 30 ppm), lead at 10,600 ppm (UUSCO is 63 ppm), and mercury at 2.22 ppm (UUSCO is 0.18 ppm). Lead concentrations did not exceed the USEPA Resource Conservation and Recovery Act (RCRA) Hazardous Waste Regulatory Level of 5 ppm using the TCLP analysis.

Data indicates the presence of off-site impacts in soil related to migration from this site.

Groundwater - Multiple petroleum VOCs were detected at concentrations above ambient water quality standards (AWQS) in the on-site monitoring wells located in the vicinity of the two former gasoline UST areas in the southern part of the site and in off-site monitoring wells located on the southern and western-adjoining sidewalks. These VOCs included 1,3,5-TMB at a maximum concentration of 620 parts per billion (ppb) compared to the AWQS of 5 ppb, benzene at 3,200 ppb (AWQS is 1 ppb), cymene at 6.9 ppb (AWQS of 5 ppb), toluene at 15,000 ppb (AWQS is 5 ppb), total xylenes at 15,000 ppb (AWQS is 5 ppb), ethylbenzene at 2,900 ppb (AWQS is 5 ppb), and naphthalene at 630 ppb (AWQS is 10 ppb).

Several SVOCs were detected above their AWQS including benzo(a)anthracene at 1.2 ppb (AWQS is 0.002 ppb), benzo(b)fluoranthene at 1.4 ppb (AWQS is 0.002 ppb), benzo(k)fluoranthene at 0.47 ppb (AWQS is 0.002 ppb), and chrysene at 1.1 ppb (AWQS is 0.002 ppb).

No pesticides or PCBs were detected at concentrations exceeding their AWQS.

The only dissolved metals detected in groundwater exceeding their respective AWQS were iron, sodium, manganese and magnesium. These are naturally-occurring metals and are not considered site-related contaminants.

PFOA was detected in groundwater samples above the screening level of 10 parts per trillion (ppt) in 12 of the 13 monitoring wells at concentrations ranging from 12.6 ppt to 245 ppt. PFOS was detected in groundwater samples above the screening level of 10 ppt in eight of the 13 monitoring wells at concentrations ranging from 11.8 ppt to 59.4 ppt. Data does not indicate that the site is a likely source of PFOS or PFOA contamination.

Data indicates that site-related contaminants have migrated off-site in groundwater.

Light, Non-Aqueous Phase Liquid (LNAPL) - During the RI, two feet of LNAPL in the form of separate phase weathered gasoline was observed in one off-site monitoring well. The well was bailed, and subsequent measurements showed reduction to about 3 inches of LNAPL. During the subsequent recovery assessment, about 25% of the initial LNAPL volume (0.72 inches) recharged into the well over a four-hour period.

Soil Vapor - Thirteen soil vapor samples and two ambient air samples were collected and analyzed in 2018/2019. Total VOC concentrations ranged from about 279.89 micrograms per cubic meter (µg/m^3) to 1,325,600 µg/m^3 in soil vapor, and up to 62.21 µg/m^3 in ambient air. Petroleum VOCs, specifically benzene, toluene, ethylbenzene and xylene (together known as BTEX), concentrations detected in soil vapor ranged from 20.6 µg/m^3 to 83.70 µg/m^3. BTEX was also detected in the ambient air sample at a concentration of 0.94 ug/m3. In addition to the petroleum VOCs, tetrachloroethylene (PCE) was detected in on-site soil vapor in the northern part of the site at 390 µg/m^3 and trichloroethene (TCE) at 476 µg/m^3. In July 2020 four previous soil vapor sample locations and two new sample locations were sampled to assess the potential for off-site vapor intrusion. Total VOC concentrations ranged from 331 µg/m^3 to 18,887 µg/m^3. Ambient air total VOC concentrations were 207.31 µg/m^3, of which 199.89 µg/m^3 were petroleum VOCs. BTEX concentrations detected in soil vapor ranged from 24.2 µg/m^3 to 873 µg/m^3 and BTEX was also detected in the ambient air sample at a concentration of 63 µg/m^3.

Data does not indicate off-site impacts in soil vapor related to this site.

6.4: Summary of Human Exposure Pathways

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

Direct contact with contaminants in the soil is unlikely because the site is fenced but persons who enter the site could contact contaminants in the soil by walking on the soil, digging or otherwise disturbing the soil. Contaminated groundwater at the site is not used for drinking or other purposes and the site is served by a public water supply that obtains water from a different source not affected by this contamination. Volatile organic compounds in the subsurface may move into soil vapor (air spaces within the soil), which in turn 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 currently vacant, soil vapor intrusion does not represent a current concern. Environmental sampling indicates that the potential exists for the inhalation of site contaminants due to soil vapor intrusion for future onsite buildings, however soil vapor intrusion in offsite structures is not a concern.

6.5: Summary of the Remediation Objectives

The objectives for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375. The goal for the remedial program is to restore the site to pre-disposal conditions to the extent feasible. At a minimum, the remedy shall eliminate or mitigate all significant threats to public health and the environment presented by the contamination identified at the site through the proper application of scientific and engineering principles.

The remedial action objectives for this site are:

Groundwater

RAOs for Public Health Protection

- Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards.
- Prevent contact with, or inhalation of volatiles, from contaminated groundwater.

RAOs for Environmental Protection

- Restore ground water aquifer to pre-disposal/pre-release conditions, to the extent practicable.
- Remove the source of ground or surface water contamination.

Soil

RAOs for Public Health Protection

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

RAOs for Environmental Protection

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

Soil Vapor

RAOs for Public Health Protection

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

SECTION 7: ELEMENTS OF THE SELECTED REMEDY

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

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

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

The selected remedy is a Track 1: Unrestricted Use soil cleanup objectives remedy for on-site. For off-site contamination, the site will achieve the remedial action objectives by: (i) demonstrating a bulk reduction in groundwater concentrations to asymptotic levels; (ii) relying on the New York City municipal restriction on groundwater use for the off-site area; (iii) entering into an Off-Site Consent Order (CO) with the NYSDEC to implement a Site Management Plan (SMP) addressing the remaining off-site contamination. The CO will provide that the NYSDEC may revoke the Track 1 on-site COC if the Participant fails to comply with the SMP.

1. Remedial Design

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- 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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Activated carbon will be added to the subsurface to capture and prevent the migration of petroleum VOCs. A bio-stimulating electron acceptor solution will also be injected to enhance

biodegradation. In the area of the captured contamination, conditions will be maintained that will allow aerobic degradation of the contaminants of concern to occur. Activated carbon and the amendments noted above will be added to the subsurface via injection wells screened from 12 to 30 feet below grade in an approximately 2750 square foot area located in the southwestern portion of the site where gasoline-related compounds were elevated in the groundwater.
Prior to injection, any residual LNAPL would be removed by a vacuum truck. Monitoring will be required within the treatment zone. Monitoring will be conducted for contaminants of concern, dissolved oxygen and oxidation/reduction potential.

7. Local Institutional Controls

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- require compliance with the Department approved SMP;
- require the remedial party to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3).

9. Site Management Plan

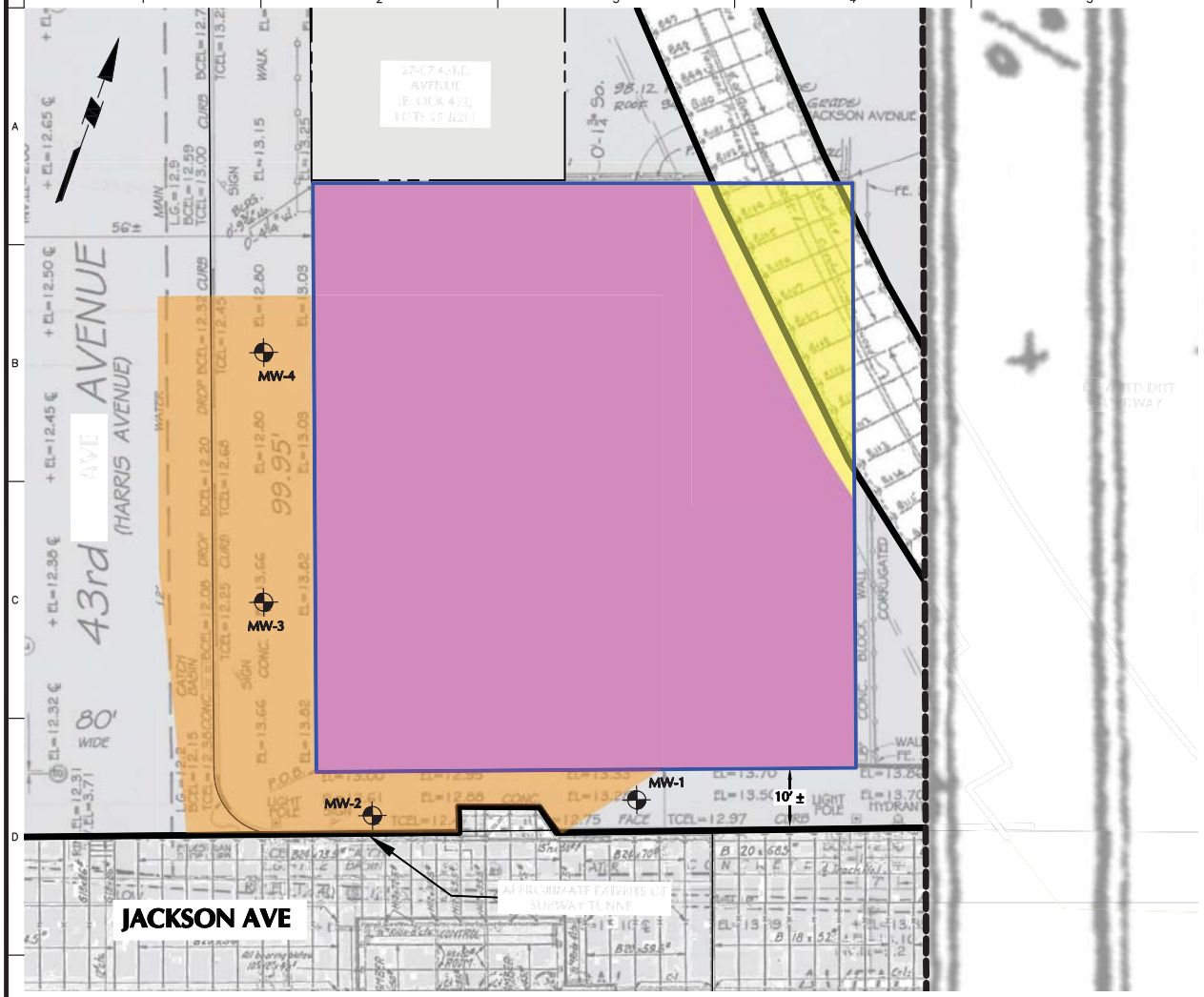
A Site Management Plan is required to monitor and maintain the off-site groundwater remedy, which includes the following:

a. 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; and
    - a schedule of monitoring and frequency of submittals to the Department.

BASEMAP SOURCE: CENTRAL PARK AND BROADWAY, 7.5-MINUTE SERIES, TOPOGRAPHIC QUADRANGLE MAPS, DATED 2013.

——— - APPROXIMATE SITE BOUNDARY

	Project	Figure Title		Figure No.
	27-01 JACKSON AVENUE BLOCK 432, LOT 21 LONG ISLAND CITY NEW YORK	SITE LOCATION MAP		1



LEGEND:

- APPROXIMATE SITE BOUNDARY
- PROPOSED EXTENT OF EXCAVATION TO ABOUT 13 FEET BELOW GRADE SURFACE
- PROPOSED EXTENT OF EXCAVATION TO ABOUT 38.5 TO 40 FEET BELOW GRADE SURFACE
- PROPOSED EXTENT OF OFF-SITE IN-SITU TREATMENT AREA
- MW-1 OFF-SITE MONITORING WELL LOCATION

NOTES:

1. BASEMAP TAKEN FROM HAYNES LAND SURVEYORS, DATED ON NOVEMBER 12, 2014.
2. DEPTH AND DIMENSION OF ON-SITE REMEDIAL EXCAVATION AREAS ARE ESTIMATED BASED ON ANALYTICAL RESULTS EXCEEDING TRACK 1 SOIL CLEANUP OBJECTIVES (SCO).
3. DEPTH AND DIMENSION OF OFF-SITE TREATMENT AREA IS ESTIMATED BASED ON ANALYTICAL RESULTS EXCEEDING TRACK 4 SITE-SPECIFIC SCOS.

20 0 5 10 20
SCALE IN FEET

	Project: 27-01 JACKSON AVENUE BLOCK No. 432 LOT No. 21 LONG ISLAND CITY NEW YORK	Figure Title: ALTERNATIVE II - REMEDIAL EXTENT MAP		Figure No.: 2