DECISION DOCUMENT

1709 Surf Avenue Brownfield Cleanup Program Brooklyn, Kings County Site No. C224398 December 2024



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

DECLARATION STATEMENT - DECISION DOCUMENT

1709 Surf Avenue Brownfield Cleanup Program Brooklyn, Kings County Site No. C224398 December 2024

Statement of Purpose and Basis

This document presents the remedy for the 1709 Surf Avenue 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 (NYSDEC) for the 1709 Surf Avenue site and the public's input to the proposed remedy presented by NYSDEC.

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 shall be

constructed, at a minimum, to meet the 2020 Energy Conservation Construction Code of New York (or most recent edition) to improve energy efficiency as an element of construction.

As part of the remedial design program, to evaluate the remedy with respect to green and sustainable remediation principles, an environmental footprint analysis will be completed. The environmental footprint analysis will be completed using an accepted environmental footprint analysis calculator such as SEFA (Spreadsheets for Environmental Footprint Analysis, USEPA), SiteWiseTM (available in the Sustainable Remediation Forum [SURF] library) or similar NYSDEC accepted tool. Water consumption, greenhouse gas emissions, renewable and nonrenewable energy use, waste reduction and material use will be estimated, and goals for the project related to these green and sustainable remediation metrics, as well as for minimizing community impacts, protecting habitats and natural and cultural resources, and promoting environmental justice, will be incorporated into the remedial design program, as appropriate. The project design specifications will include detailed requirements to achieve the green and sustainable remediation goals. Further, progress with respect to green and sustainable remediation metrics will be tracked during implementation of the remedial action and reported in the Final Engineering Report (FER), including a comparison to the goals established during the remedial design program.

Additionally, the remedial design program will include a climate change vulnerability assessment, to evaluate the impact of climate change on the project site and the proposed remedy. Potential vulnerabilities associated with extreme weather events (e.g., hurricanes, lightning, heat stress and drought), flooding, and sea level rise will be identified, and the remedial design program will incorporate measures to minimize the impact of climate change on potential identified vulnerabilities.

2. Excavation

The existing on-site building will be demolished and materials which cannot be beneficially reused on site will be taken off-site for proper disposal in order to implement the remedy. Excavation and off-site disposal of contaminant source areas, including:

- soil with visual waste material or non-aqueous phase liquid;
- soil containing total SVOCs exceeding 500 ppm;
- any underground storage tanks (USTs), fuel dispensers, underground piping or other structures associated with a source of contamination; and
- soils which exceed the protection of groundwater soil cleanup objectives (PGWSCOs), as defined by 6 NYCRR Part 375-6.8 for those contaminants found in site groundwater above standards.

Excavation and off-site disposal of all on-site soils which exceed unrestricted SCOs, as defined by 6 NYCRR Part 375-6.8. If a Conditional Track 1 cleanup is achieved, a Cover System will not be a required element of the remedy. Collection and analysis of confirmation and documentation samples at the remedial excavation depths will be used to verify that SCOs for the site have been achieved. If confirmation/documentation sampling indicates that SCOs were not achieved at the stated remedial depth, the Applicant must notify NYSDEC, submit the sample results and, in consultation with NYSDEC, determine if further remedial excavation is necessary. Further excavation for development will proceed after confirmation samples demonstrate that SCOs for the site have been achieved.

Approximately 17,000 cubic yards of contaminated soil will be removed from the site.

To ensure proper handling and disposal of excavated material, waste characterization sampling will be completed for all identified contaminated site material. Waste characterization sampling will be performed exclusively for the purposes of off-site disposal in a manner suitable to receiving facilities and in conformance with applicable federal, state and local laws, rules, and regulations and facility-specific permits.

3. Backfill

Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be brought in to replace the excavated soil and establish the designed grades at the site.

4. Groundwater Treatment – In-Situ Chemical Oxidation

In-situ chemical oxidation (ISCO) will be implemented to treat petroleum-related contaminants in groundwater. A chemical oxidant will be injected into the subsurface to destroy the contaminants in an approximately 1,500 square foot area located in the southern portion of the site where gasoline-related compounds were elevated in the groundwater. The method and depth of injection will be determined during the remedial design.

Prior to the full implementation of this technology, laboratory and on-site pilot scale studies will be conducted to more clearly define design parameters.

Monitoring will be required up-gradient, down-gradient, and within the treatment zone.

5. Vapor Intrusion Evaluation

As part of the Conditional 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. Local Institutional Controls

If no environmental Easement (EE) or site management plan (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 NYCDOHMH code, which prohibits potable use of groundwater without prior approval.

Conditional Track 1

The intent of the remedy is to achieve Track 1 unrestricted use; therefore, no EE or SMP is anticipated. If the soil vapor intrusion (SVI) evaluation s not completed prior to completion of the Final Engineering Report, then an SMP and EE will be required to address the SVI evaluation and implement actions, as needed. If a mitigation or monitoring action is needed, including operation of a vapor mitigation system as a result of the vapor intrusion evaluation in

Remedy Element 5, 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 a 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 2 restricted residential cleanup.

Conditional Remedial Elements

6. 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 NYSDEC 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, commercial use, or industrial use as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
- restrict the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or NYCDOHMH; and
- require compliance with the NYSDEC 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 Environmental Easement discussed in Remedy Element 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 use 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;
- maintaining site access controls and NYSDEC 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:
 - a schedule of groundwater monitoring and frequency of submittals to the NYSDEC;

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.

December 17, 2024

Date

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Scott Deyette, Director Remedial Bureau B

DECISION DOCUMENT

1709 Surf Avenue Brooklyn, Kings County Site No. C224398 December 2024

SECTION 1: SUMMARY AND PURPOSE

The New York State Department of Environmental Conservation (NYSDEC), 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, where a contaminant is present at levels exceeding the soil cleanup objectives or other health-based or environmental standards, criteria or guidance, based on the reasonably anticipated use of the property.

NYSDEC 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

NYSDEC 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 NYSDEC 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=C224398

Brooklyn Community Board 13 1201 Surf Avenue, 3rd Floor Brooklyn, NY 11224 Phone: (718) 266-3001 Brooklyn Public Library-Coney Island Branch 1901 Mermaid Avenue Brooklyn, NY 11224 Phone: (718) 265-3220

Receive Site Citizen Participation Information By Email

Please note that NYSDEC'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 public for encourage the to sign up 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 1709 Surf Avenue in the Coney Island neighborhood of Brooklyn, NY and identified as Tax Block 7061, Lots 16, 20, 21, 27 and a portion of Lot 14 on the NYC tax map. The site has an area of approximately 1.5 acres. It is bordered to the north by a paved utility corridor followed by mixed use commercial and residential buildings followed by Mermaid Avenue; to the east by West 17th Street followed by vacant land and a construction site; to the south by Surf Avenue followed by park land; and to the west by West 19th Street followed by a mixed use residential and commercial building.

Site Features: Lots 14, 20, 21, and 27 are paved with asphalt and currently used for parking and construction equipment storage. Lot 16 is improved with a one-story commercial building with an associated parking lot. The northern-most 15-feet of Lot 14 is a paved utility corridor for an active gas line and is excluded from the BCP site.

Current Zoning and Land Use: The site is within the Special Coney Island District and is zoned residential (R7X) with a commercial overlay (C2-4). Lots 14, 20, 21, and 27 are used for parking. A community health center and parking lot are on Lot 14.

Past Use of the Site: The site has been developed with commercial, residential, and institutional buildings since at least 1895. A railroad went through Lot 14 from 1895 to 1950. A hotel was on Lots 16, 20 and 21 in 1895. In 1906 a school was on Lot 16. Unspecified stores were on Lot 20 from 1906 to 1950 and Lot 21 from 1906 to 1989. A drycleaner was on Lot 20 from 1965 to 2007. Lot 27 has had a gasoline filling station with petroleum bulk storage and an auto service station from 1968 to 2003 and a car wash 1991 to 2003. Between 1994 and 2007, the buildings on Lots 16, 20, 21, and 27 were vacated and all structures were razed. By 2009, all lots had been paved for use as a parking lot. Lot 16 was subsequently re-developed with a one-story community health center in 2015. Lots 14, 20, 21, and 27 continued to be used for parking and construction equipment storage.

Site Geology and Hydrogeology: The stratigraphy of the site consists of a fill layer that extends between 1.5 to 10 feet below grade surface (bgs). The fill predominantly consists of brown to gray or black, fine- to medium-grained sand with varying amounts of silt, clay, gravel, concrete, asphalt, wood, glass, roots, and brick. The fill layer is underlain by native soil that predominantly consists of brown to gray, fine- to medium-grained sand with varying amounts of silt. Bedrock was not encountered in any of the soil borings and is expected to be greater than 600 feet bgs.

Groundwater depth ranged from about 4.48 to 8.41 feet bgs. Groundwater flow in the eastern part of the site generally flows to the east, and groundwater flow in the western part of the site generally flows to the northwest. The general topography of the area surrounding the site suggests that regional groundwater flow is to the south towards Coney Island Beach and Lower New York Bay.

A site location map is attached as Figure 1 and a site plan is attached as Figure 2.

SECTION 4: LAND USE AND PHYSICAL SETTING

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

A comparison of the results of the Remedial Investigation (RI) 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 Volunteer. The Applicant does not have an obligation to address off-site contamination. However, NYSDEC 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: <u>Summary of the Remedial Investigation</u>

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. NYSDEC 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: <u>http://www.dec.ny.gov/regulations/61794.html</u>

6.1.2: <u>RI Results</u>

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:

tetrachloroethene (PCE) trichloroethene (TCE) cis-1,2-dichloroethene vinyl chloride arsenic benzo(b)fluoranthene benzo(a)anthracene benzo(a)pyrene chrysene

1,2,4-trimethylbenzene 1,3,5-trimethylbenzene xylene (mixed) benzo(a)anthracene benzo(a)pyrene benzo(b)fluoranthene chrysene dichloroethene (cis-1,2-) indeno(1,2,3-cd)pyrene

| naphthalene |
|-------------|
| barium |

lead

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: <u>Summary of Environmental Assessment</u>

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 samples were analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), metals, polychlorinated biphenyls (PCBs), pesticides, perand polyfluoroalkyl substances (PFAS), and 1,4-dioxane. Soil vapor samples were analyzed for VOCs. Based upon investigations conducted to date, the primary contaminants of concern for the site include VOCs, SVOCs and metals in soil and groundwater, and VOCs in soil vapor.

Soil - Several VOCs were detected in soil above the Unrestricted Use Soil Cleanup Objectives (UUSCOs) and/or the Protection of Groundwater SCOs (PGWSCOs) including maximum concentrations of 1,2,4-trimelthylbenzene (TMB) at 1,000 parts per million (ppm) (UUSCO and PGWSCO are 3.6 ppm); 1,3,5-TMB at 270 ppm (UUSCO is 8.4 ppm); ethylbenzene at 48 ppm (UUSCO and PGWSCO are 1 ppm); tetrachloroethene (PCE) at 1.6 ppm (UUSCO and PGWSCO are 1.3 ppm); naphthalene at 130 ppm (UUSCO and PGWSCO are 3.6 ppm); n-problybenzene at 110 ppm (UUSCO and PGWSCO are 3.6 ppm); and total xylenes at 410 ppm (UUSCO is 0.26; PGWSCO are 1.6 ppm).

Several SVOCs were detected in soil including maximum concentrations of benzo(a)anthracene at 91 ppm (UUSCO and PGWSCO is 1 ppm); benzo(a)pyrene at 92 ppm (UUSCO is 1 ppm;); benzo(b)fluoranthene at 96 ppm (UUSCO is 1 ppm; PGWSCO is 1.7 ppm); benzo(k)fluoranthene at 25 ppm (UUSCO is 0.8 ppm; PGWSCO is 1.7 ppm); chrysene at 87 ppm (UUSCO and PGWSCO is 1 ppm); dibenzo(a,h)anthracene at 10 ppm (UUSCO is 0.33);

fluoranthene at 160 ppm (UUSCO is 100 ppm); indeno(1,2,3-cd)pyrene at 58 ppm (UUSCO is 0.5 ppm); and naphthalene at 16 ppm (UUSCO is 12 ppm).

Metals detected include maximum concentrations of barium at 606 ppm (UUSCO is 350 ppm); hexavalent chromium at 1.54 ppm (UUSCO is 1 ppm); trivalent chromium at 35.1 (UUSCO is 30 ppm); lead at 707 ppm (UUSCO is 63 ppm); and mercury at 0.378 ppm (UUSCO is 0.18 ppm).

For PFAS compounds, perfluorooctanesulfonic acid (PFOS) was detected in soil at a concentration of 4.25 parts per billion (ppb), exceeding both the unrestricted use guidance value of 0.88 ppb and protection of groundwater guidance value of 1 ppb. Perfluorooctanoic acid (PFOA) was detected in soil at a concentration of 1.65 ppb, exceeding both the unrestricted use guidance value of 0.6 ppb and protection of groundwater guidance value of 0.8 ppb.

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

Groundwater - Several VOCs were detected in groundwater in exceedance of the Ambient Water Quality Standards and Guidance Values (AWQSGVs) including maximum concentrations of 1,2,4,5-tetramethylbenze at 95 ppb (AWQSGV is 5 ppb); 1,2,4-TMB at a max of 1,800 ppb (AWQSGV is 5 ppb); 1,3,5-TMB at 400 ppb (AWQSGV is 5 ppb); benzene at 52 ppb (AWQSGV is 1 ppb); ethylbenzene at 420 ppb (AWQSGV is 5 ppb); isopropylbenzene at 58 ppb (AWQSGV is 5 ppb); m,p-xylene at 1,900 ppb (AWQSGV is 5 ppb); naphthalene at 350 ppb (AWQSGV is 10 ppb); n-butylbenzene at 23 ppb (AWQSGV is 5 ppb); n-propylbenzene at 170 ppb (AWQSGV is 5 ppb); o-xylene at 900 ppb (AWQSGV is 5 ppb); sec-butylbenzene at 11 ppb (AWQSGV is 5 ppb); tetrachloroethylene (PCE) at 85.6 ppb (AWQSGV is 5 ppb); toluene at 710 ppb (AWQSGV is 5 ppb); and total xylenes at 3,730 ppb (AWQSGV is 5 ppb).

Several SVOCs were also detected in groundwater including maximum concentrations of 2,4dimethylphenol at 3.9 ppb (AWQSGV is 1 ppb); benzo(a)anthracene at 3.8 ppb (AWQSGV is 0.002 ppb); benzo(a)pyrene at 3.4 ppb (AWQSGV is non-detect); benzo(b)fluoranthene at 3.5 ppb (AWQSGV is 0.002 ppb); chrysene at 3.7 ppb (AWQSGV is 0.002 ppb); indeno(1,2,3cd)pyrene at 2 ppb (AWQSGV is 0.002 ppb); naphthalene at 110 ppb (AWQSGV is 10 ppb); and phenol at 13 ppb (AWQSGV is 1 ppb).

For dissolved metals, arsenic was detected at a maximum concentration of 28.75 ppb (AWQSGV is 25 ppb). PFOS was detected at a maximum concentration of 110 parts per trillion (ppt) (AWQSGV is 2.7 ppt) and PFOA at 61.7 ppt (AWQSGV is 6.7 ppt).

Data does not indicate any off-site impacts in groundwater related to this site.

Soil Vapor - Several chlorinated VOCs were detected in exterior soil vapor samples across the site, including maximum concentrations of PCE at 341 micrograms per cubic meter ($\mu g/m^3$); trichloroethylene at 53.2 $\mu g/m^3$; cis-1,2-dichloroethene at11.1 $\mu g/m^3$; and vinyl chloride at 57.8 $\mu g/m^3$. Several petroleum related VOCs were detected in exterior soil vapor samples in the area of the former gas tanks, including maximum concentrations of isooctane (2,2,4 trimethylpentane) at 142,000 $\mu g/m^3$; heptane at 17,500 $\mu g/m^3$; hexane at 7,820 $\mu g/m^3$; ethylbenzene at 3,670

 μ g/m³; cyclohexane at 3,580 μ g/m³; m,p-xylene at 3,240 μ g/m³; o-xylene at 1,410 μ g/m³; 1,2,4-TMB at 619 μ g/m³; 1,3,5-TMB at 521 μ g/m³; toluene at of 72.4 μ g/m³; and benzene at 20.3 μ g/m³. Sub-slab and indoor air samples were collocated in the crawl space beneath the health center. The maximum indoor air for PCE and TCE were detected at IA23 and SSV23. The maximum indoor air for PCE was 0.427 μ g/m³ and sub-slab at that location was 30 μ g/m³. The maximum indoor air for TCE was <0.107 μ g/m³ and sub-slab was 5.27 μ g/m³.

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

6.4: <u>Summary of Human Exposure Pathways</u>

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*.

The site is occupied. The entire site is covered with pavement and a building. People will not come into contact with contaminated soil and groundwater unless they dig below the ground surface. 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 soil vapor (air spaces within the soil) may move into buildings and affect the indoor air quality. The inhalation of site-related contaminants due to soil vapor intrusion does not represent a current concern, however may be a potential concern for future on-site buildings. Environmental sampling indicates that soil vapor intrusion from site contamination is not a concern for off-site buildings.

6.5: <u>Summary of the Remediation Objectives</u>

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:

<u>Groundwater</u>

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.

<u>Soil</u>

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.

<u>Soil Vapor</u>

RAOs for Public Health Protection

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

SECTION 7: ELEMENTS OF THE SELECTED REMEDY

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

The selected remedy is a Track 1 remedy.

The selected remedy is referred to as the Excavation, Groundwater Treatment, and Soil Vapor Intrusion Evaluation remedy.

The elements of the selected remedy, as shown in Figure 3, 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;
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- 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 shall be constructed, at a minimum, to meet the 2020 Energy Conservation Construction Code of New York (or most recent edition) to improve energy efficiency as an element of construction.

As part of the remedial design program, to evaluate the remedy with respect to green and sustainable remediation principles, an environmental footprint analysis will be completed. The environmental footprint analysis will be completed using an accepted environmental footprint analysis calculator such as SEFA (Spreadsheets for Environmental Footprint Analysis, USEPA), SiteWiseTM (available in the Sustainable Remediation Forum [SURF] library) or similar NYSDEC accepted tool. Water consumption, greenhouse gas emissions, renewable and nonrenewable energy use, waste reduction and material use will be estimated, and goals for the project related to these green and sustainable remediation metrics, as well as for minimizing community impacts, protecting habitats and natural and cultural resources, and promoting environmental justice, will be incorporated into the remedial design program, as appropriate. The project design specifications will include detailed requirements to achieve the green and Further, progress with respect to green and sustainable sustainable remediation goals. remediation metrics will be tracked during implementation of the remedial action and reported in the Final Engineering Report (FER), including a comparison to the goals established during the remedial design program.

Additionally, the remedial design program will include a climate change vulnerability assessment, to evaluate the impact of climate change on the project site and the proposed remedy. Potential vulnerabilities associated with extreme weather events (e.g., hurricanes, lightning, heat stress and drought), flooding, and sea level rise will be identified, and the remedial design program will incorporate measures to minimize the impact of climate change on potential identified vulnerabilities.

2. Excavation

The existing on-site building will be demolished and materials which cannot be beneficially reused on site will be taken off-site for proper disposal in order to implement the remedy. Excavation and off-site disposal of contaminant source areas, including:

- soil with visual waste material or non-aqueous phase liquid;
- soil containing total SVOCs exceeding 500 ppm;
- any underground storage tanks (USTs), fuel dispensers, underground piping or other structures associated with a source of contamination; and
- soils which exceed the protection of groundwater soil cleanup objectives (PGWSCOs), as defined by 6 NYCRR Part 375-6.8 for those contaminants found in site groundwater above standards.

Excavation and off-site disposal of all on-site soils which exceed unrestricted SCOs, as defined by 6 NYCRR Part 375-6.8. If a Conditional Track 1 cleanup is achieved, a Cover System will not be a required element of the remedy. Collection and analysis of confirmation and documentation samples at the remedial excavation depths will be used to verify that SCOs for the site have been achieved. If confirmation/documentation sampling indicates that SCOs were not achieved at the stated remedial depth, the Applicant must notify NYSDEC, submit the sample results and, in consultation with NYSDEC, determine if further remedial excavation is necessary. Further excavation for development will proceed after confirmation samples demonstrate that SCOs for the site have been achieved.

Approximately 17,000 cubic yards of contaminated soil will be removed from the site.

To ensure proper handling and disposal of excavated material, waste characterization sampling will be completed for all identified contaminated site material. Waste characterization sampling will be performed exclusively for the purposes of off-site disposal in a manner suitable to receiving facilities and in conformance with applicable federal, state and local laws, rules, and regulations and facility-specific permits.

3. Backfill

Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be brought in to replace the excavated soil and establish the designed grades at the site.

4. Groundwater Treatment – In-Situ Chemical Oxidation

In-situ chemical oxidation (ISCO) will be implemented to treat petroleum-related contaminants in groundwater. A chemical oxidant will be injected into the subsurface to destroy the contaminants in an approximately 1,500 square foot area located in the southern portion of the site where gasoline-related compounds were elevated in the groundwater. The method and depth of injection will be determined during the remedial design.

Prior to the full implementation of this technology, laboratory and on-site pilot scale studies will be conducted to more clearly define design parameters.

Monitoring will be required up-gradient, down-gradient, and within the treatment zone.

5. Vapor Intrusion Evaluation

As part of the Conditional 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. Local Institutional Controls

If no environmental Easement (EE) or site management plan (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 NYCDOHMH code, which prohibits potable use of groundwater without prior approval.

Conditional Track 1

The intent of the remedy is to achieve Track 1 unrestricted use; therefore, no EE or SMP is anticipated. If the soil vapor intrusion (SVI) evaluation s not completed prior to completion of

the Final Engineering Report, then an SMP and EE will be required to address the SVI evaluation and implement actions, as needed. If a mitigation or monitoring action is needed, including operation of a vapor mitigation system as a result of the vapor intrusion evaluation in Remedy Element 5, 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 a 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 2 restricted residential cleanup.

Conditional Remedial Elements

6. 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 NYSDEC 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, commercial use, or industrial use as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
- restrict the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or NYCDOHMH; and
- require compliance with the NYSDEC approved Site Management Plan.

7. Site Management Plan

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

- c. 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 Remedy Element 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 use 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;
- maintaining site access controls and NYSDEC notification; and
- the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.

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



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| Parcel data provided by the New York City Department of City Planning. |
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