

DECISION DOCUMENT

CE - E. 11th St. MGP
Operable Unit Number 01: Remedial Program
New York, New York County
Site No. 231110
July 2024



**Department of
Environmental
Conservation**

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

DECLARATION STATEMENT - DECISION DOCUMENT

CE - E. 11th St. MGP
Operable Unit Number: 01
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Statement of Purpose and Basis

This document presents the remedy for Operable Unit Number: 01: Remedial Program of the CE - E. 11th St. MGP (manufactured gas plant) 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, and is consistent with the National Oil and Hazardous Substances Pollution Contingency Plan of March 8, 1990 (40CFR300), as amended.

This decision is based on the Administrative Record of the New York State Department of Environmental Conservation (NYSDEC) for the CE - E. 11th St. MGP 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), SiteWise(TM) (available in the Sustainable Remediation Forum [SURF] library) or similar Department accepted tool. Water consumption, greenhouse gas emissions, renewable and non-renewable 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. Soil Excavation

All soils in the upper two feet which exceed the restricted residential soil cleanup objectives (SCOs) will be excavated and transported off-site for disposal.

Approximately 5,000 cubic yards of contaminated soil will be removed from the site. Collection and analysis of confirmation samples at the remedial excavation depth will be used to verify that SCOs for the site have been achieved. If confirmation sampling indicates that SCOs were not achieved at the stated remedial depth, the Applicant must notify DEC, submit the sample results and, in consultation with DEC, 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.

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.

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.

3. Cover System

A site cover will be required in areas where the upper two feet of exposed surface soil will exceed the applicable soil cleanup objectives (SCOs), to allow for restricted residential use of the site. 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.

4. Coal Tar Recovery

Installation and operation of coal tar recovery wells primarily along the eastern edge of the site to remove potentially mobile coal tar from the subsurface. The number, depth, type and spacing of the recovery wells will be determined during the design phase of the remedy. Coal tar will be collected periodically from each well; however, if wells are determined by the Department to accumulate large quantities of coal tar over extended time periods, they can be converted to automated collection.

5. Engineering and Institutional Controls

Institutional Control

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 restricted residential cleanup at a minimum.

Imposition of an institutional control in the form of 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 NYCDOHMH; and
- require compliance with the Department approved Site Management Plan.

6. Site Management Plan

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

a. an Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to ensure the following institutional and/or engineering controls remain in place and effective:

Institutional Controls: The Environmental Easement discussed in Remedy Element 5 above.

Engineering Controls: The soil cover discussed in Remedy Element 3 and the coal tar recovery wells discussed in Remedy Element 4.

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 and protection of the coal tar recovery and monitoring wells and other monitoring points;
- a provision for further investigation and remediation should large scale redevelopment occur, if any of the existing structures are demolished, or if the subsurface is otherwise made accessible. The nature and extent of contamination in areas where access was previously limited or unavailable will be immediately and thoroughly investigated pursuant to a plan approved by the Department. Based on the investigation results and the Department determination of the need for a remedy, a Remedial System Optimization (RSO) will be developed for the site, including removal and/or treatment of any source areas to the extent feasible. Citizen Participation Plan (CPP) activities will continue through this process. Any necessary remediation will be completed prior to, or in association with, redevelopment;
- descriptions of the provisions of the environmental easement including any land use, and groundwater use restrictions;
- 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 3 above will be placed in any areas where the upper two feet of exposed surface soil exceed the applicable 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 and indoor air to assess the performance and effectiveness of the remedy;
- a schedule of monitoring and frequency of submittals to the Department;

c. an Operation and Maintenance (O&M) Plan to ensure continued operation, maintenance, optimization, monitoring, inspection, and reporting of any mechanical or physical components of

the remedy. The plan includes, but is not limited to:

- procedures for operating and maintaining the remedy;
- compliance monitoring of treatment systems to ensure proper O&M of the coal tar recovery system as appropriate as well as providing the data for any necessary permit or permit equivalent reporting;
- maintaining site access controls and Department notification; and
- providing the Department access to the site and O&M records.

Declaration

The remedy conforms with promulgated standards and criteria that are directly applicable, or that are relevant and appropriate and takes into consideration Department guidance, as appropriate. The remedy is protective of public health and the environment.

July 26, 2024

Date



Scott Deyette, Director
Remedial Bureau B

DECISION DOCUMENT

CE - E. 11th St. MGP
New York, New York County
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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.

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=231110>

Manhattan Borough President
Attn: Gale A. Brewer
1 Centre Street
19th Floor
New York, NY 10007
Phone: 212-669-8300

New York Public Library
Attn: Tompkins Square Branch
331 E.10th Street
New York, NY 10009
Phone: 212-228-4747

Manhattan Community Board 3
59 East 4th Street
New York, NY 10003
Phone: 212-533-5300

A public meeting was also conducted on April 11, 2023. At the meeting, the findings of the remedial investigation (RI) and the feasibility study (FS) were presented along with a summary of the proposed remedy. After the presentation, a question-and-answer period was held, during which verbal or written comments were accepted on the proposed remedy.

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 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 CE - East 11th Street MGP site is on the former grounds of a manufactured gas plant (MGP) that was operated by Con Edison's predecessor companies in the lower East Side of Manhattan, New York. The site is 7 acres in size.

Operable Units: The site is divided into four operable units; they are referred to as Operable Unit 1 (OU-1), Operable Unit 2 (OU-2), Operable Unit 3 (OU-3), and Operable Unit 4 (OU-4). OU-1 is bounded by East 13th Street extension to the north, East 11th Street extension to the south, Avenue D to the west and FDR Drive to the east. OU-2 is bounded by the northern edge of the John V. Lindsay East River Park to the north, East 10th St extension to the south, the eastern edge of the Jacob Riis Houses property to the west, and the East River to the east. OU-3 is bounded by East 13th Street to the north, East 12th Street to the south, Szold Pl extension to the west, and Avenue D to the east. OU-4 is bounded by East 13th Street to the north, East 12th Street extension to the south, Avenue C to the west, and Szold Pl extension to the east.

Operable Unit (OU) Number 01 is the subject of this document.

A Decision Document for OU-03 was issued in 2017 under the old Voluntary Cleanup Program (VCP) site number (V00534). A Decision Document will be issued for OU-02 and OU-04 in the future.

Site Features: OU-1 comprises a portion of the New York City Housing Authority's (NYCHA) Jacob Riis Houses complex, encompassing five high-rise apartment buildings (commonly known

as 170 Avenue D, 178 Avenue D, 1115 FDR Drive, 1141 FDR Drive, 1223 FDR Drive), a basketball court, playground, surrounding green space, and the New York City Department of Environmental Protection Manhattan Pumping Station.

Current Zoning: The New York City Planning Commission designates the properties as R7-2: Moderate to High-Density Residential District and includes land uses designated as multilevel elevator residential buildings, transportation and utility use, and public facilities and institutions.

Past Use of the Site: The East 11th Street Works began operations sometime between 1859 and 1868 and was shut down in approximately 1933. During its operational period, the manufactured gas plant (MGP) consisted of 17 gas holders ranging in capacity from approximately 50,000 cubic feet (cu ft.) to 5,000,000 cu ft. Several of the gas holders were converted from gas storage to liquid storage of naphtha, tar, or gas oil. The original gas holders built in the late 1800s were most likely constructed with below grade bottoms. Many of these were replaced by large gas holders built on grade, with storage capacities greater than 1,000,000 cu ft. of gas. Other production and storage facilities that were present at the former MGP included retorts, fuel/gas oil tanks, tar separators, purifying houses, condensers, and scrubbers.

Site Geology and Hydrogeology: Overburden materials at the site comprise three primary stratigraphic units: fill, alluvium from glacial outwash, and bedrock. The Fill Unit is the uppermost unit encountered and is the present-day surface of the site. This unit consists of typical urban debris, including reworked gravel, sand, and clay, as well as various types of anthropogenic material, such as, but not limited to, concrete, brick, ash, cinder, and glass. The Fill Unit is underlain by alluvium in the form of the Sand-Silt Unit, which is underlain by the Silty-Clay Unit. Beneath the overburden lies gneiss bedrock, which is located at least 90 feet below ground surface (ft bgs).

The Fill Unit and the Sand-Silt Unit represent a shallow unconfined (or water-table) aquifer, and the Silty-Clay Unit appears to be semi-confining to groundwater. Shallow groundwater, found at approximately 10 ft bgs, appears to flow in a radial pattern from a groundwater mound centered in the southern portion of the site generally toward the East River.

Operable Unit (OU) Number 01 is the subject of this document.

A Decision Document will be issued for OU 02, 03, and 04 in the future.

A site location map is attached as Figure 1.

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) to the appropriate standards, criteria and guidance values (SCGs) for the identified land use and the unrestricted use SCGs for the site contaminants is available in the RI Report.

SECTION 5: ENFORCEMENT STATUS

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

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

Consolidated Edison Co of NY, Inc.

The Department and Consolidated Edison Co. of New York, Inc., entered into a Consent Order on July 25, 2018. The Order obligates Consolidated Edison Co. of New York, Inc., to implement a full remedial program for MGP-related contamination both on and off the site. Prior to entering into the Consent Order, Consolidated Edison Co. of New York, Inc., and the Department signed a Voluntary Cleanup Agreement in August 2002. The Voluntary Cleanup Program ended in 2018.

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. 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

- sub-slab vapor

6.1.1: Standards, Criteria, and Guidance (SCGs)

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

To determine whether the contaminants identified in various media are present at levels of concern, the data from the RI were compared to media-specific SCGs. 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: <http://www.dec.ny.gov/regulations/61794.html>

6.1.2: RI Results

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

coal tar	ethylbenzene
benzene	naphthalene
benzo(a)pyrene	toluene
chrysene	xylene (mixed)
acenaphthene	

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.

During interim site management in 2021 and 2022, a portion of the surface soils were removed and replaced with clean soil as part of the Hurricane Sandy Capital Improvement Program.

6.3: Summary of Environmental Assessment

This section summarizes the assessment of existing and potential future environmental impacts presented by the site. Environmental impacts may include existing and potential future exposure pathways to fish and wildlife receptors, wetlands, groundwater resources, and surface water.

Based upon the resources and pathways identified and the toxicity of the contaminants of ecological concern at this site, a Fish and Wildlife Resources Impact Analysis (FWRIA) was deemed not necessary for OU-01.

Nature and Extent of Contamination: Soil and groundwater were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, polychlorinated biphenyls (PCBs), per- and polyfluoroalkyl substances (PFAS), and pesticides. Soil vapor was analyzed for VOCs. Based on the investigations, the chemicals of concern at the site are the constituents of MGP coal tar from the historic manufactured gas plant operations. Coal tar is a black, oily liquid which was produced as a byproduct of the gas manufacturing process. The principal contaminants in coal tar are benzene, toluene, ethylbenzene, xylene (a group of VOCs collectively referred to as BTEX); and SVOCs. The SVOCs found most often at the site are benzo(a)pyrene, chrysene, acenaphthene, and naphthalene. BTEX and SVOCs have been found in the soil at the site at levels exceeding applicable standards, criteria, and guidance. Additionally, metals have been found in the groundwater over applicable standards.

Soil - Coal tar is found primarily in the northeast quadrant of OU-1 at depths between 10 and 40 feet below the ground surface (bgs). This tar is the source of the highest levels of soil contamination. Of the BTEX compounds, xylene had the highest maximum concentration of 1600 parts per million (ppm), which exceeded the restricted residential soil cleanup objective (RRSCO) of 100 ppm and the protection of groundwater soil cleanup objective (PGWSCO) of 1.6 ppm. Benzene, toluene, and ethylbenzene showed respective maximum concentrations of 270 ppm, 560 ppm, and 1300 ppm, all which exceed their respective RRSCOs of 4.8 ppm, 100 ppm, and 41 ppm, and their respective PGWSCOs of 0.06 ppm, 0.7 ppm, and 1 ppm. These exceedances are located adjacent to known locations of coal tar and are found at depths exceeding 15 feet bgs. Of the SVOCs found, naphthalene had the highest concentration at 13,000 ppm, which exceeds the RRSCO of 100 ppm and the PGWSCO of 12 ppm. Benzo(a)pyrene, chrysene, and acenaphthene had maximum concentrations of 740 ppm, 1,000 ppm, and 1,500 ppm, respectively. These all exceed their respective RRSCOs of 1 ppm, 3.9 ppm and 100 ppm and their respective PGWSCOs of 22 ppm, 1 ppm, and 98 ppm. These are also found at depths and locations that correspond to or are adjacent to known areas of coal tar contamination. Exposed soils at the surface of the site contained contaminants that exceeded their respective RRSCO. Among these were metals such as arsenic, lead, and mercury, with maximum concentrations of 54.4 ppm, 2,640 ppm, and 1.2 ppm respectively which exceed their respective RRSCOs of 16 ppm, 400 ppm, and 0.81 ppm respectively. SVOCs such as Benzo(a)anthracene, benzo(a)pyrene, and chrysene had maximum contamination levels of 44 ppm, 35 ppm, and 42 ppm respectively that also exceeded their RRSCOs of 1 ppm. These levels, however, are typical of urban surface soil. There were no exceedances of RRSCOs for pesticides, polychlorinated biphenyls (PCBs), or per- and polyfluoroalkyl substances (PFAS).

Data indicates that there are off-site impacts in soil related to the site.

Groundwater - The same contaminants in the soil are found in the groundwater, all at concentrations that exceed their respective NYSDEC (1998) Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations (AWQSGVs). As the groundwater flow is generally to the east, the highest contaminant concentrations are found at the same locations as the coal tar with steadily decreasing levels to the east (downgradient). Toluene has the highest concentration in the groundwater at 9,300 parts per billion (ppb), exceeding its AWQSGV of 5 ppb. Benzene, xylene, and ethylbenzene had maximum concentrations of 7,900 ppb, 3,900 ppb, and 2,900 ppb, respectively. These all exceeded their AWQSGVs of 1 ppb for benzene, and 5 ppb for both xylene and ethylbenzene. SVOCs were all also found in exceedance of AWQSGVs in locations adjacent to coal tar. Naphthalene was found at the highest concentration, at 4,700 ppb, which exceeds the AWQSGV of 10 ppb. Acenaphthene, benzo(a)pyrene, and chrysene were found at maximum concentrations of 150 ppb, 3.2 ppb, and 4.5 ppb, respectively. These exceeded their respective AWQSGVs of 20 ppb for acenaphthene and 0.002 ppb for chrysene. Benzo(a)pyrene has an AWQSGV of 'non-detect.'

Data indicates that there are off-site impacts in groundwater related to the site.

Soil vapor - Indoor air samples were collected as part of the SC and RI to determine if there is a complete transport pathway of MGP-related VOCs from soil gas and/or subslab vapor to indoor air. MGP constituents of interest were below the range of typical background for indoor air indicating that indoor air quality was not likely to have been adversely impacted by sub-surface intrusion of MGP-related vapors.

As found in the RI Report (April 2008), benzene and ethylbenzene were found in indoor air at maximum concentrations of 4.2 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) and 3.3 $\mu\text{g}/\text{m}^3$, respectively. Subslab vapor concentrations for benzene and ethylbenzene were 90 $\mu\text{g}/\text{m}^3$ and 19 $\mu\text{g}/\text{m}^3$, respectively. Toluene and xylene (mixed) were found in indoor air at maximum concentrations of 24 $\mu\text{g}/\text{m}^3$ and 4.2 $\mu\text{g}/\text{m}^3$, respectively, and in soil vapor at concentrations of 51 $\mu\text{g}/\text{m}^3$ and 25 $\mu\text{g}/\text{m}^3$, respectively. Naphthalene had a maximum indoor air concentration of 0.39 $\mu\text{g}/\text{m}^3$ and a soil vapor concentration of 1.5 $\mu\text{g}/\text{m}^3$.

Ongoing indoor air monitoring was performed to ensure acceptable VOC levels. Sampling was completed in 2010, 2011, 2013, and 2019 to confirm earlier findings. Benzene and ethylbenzene were found in indoor air at maximum concentrations of 8.6 $\mu\text{g}/\text{m}^3$ and 7.4 $\mu\text{g}/\text{m}^3$, respectively. Toluene and xylene (mixed) were found in indoor air at maximum concentrations of 41 $\mu\text{g}/\text{m}^3$ and 15 $\mu\text{g}/\text{m}^3$, respectively. Naphthalene had a maximum indoor air concentration of 8.1 $\mu\text{g}/\text{m}^3$. Based on the types of analytes detected, as well as the solvents, cleaning supplies, petroleum, oils, and maintenance-related chemical products stored within the ground-level areas/basements, and coupled with the absence of MGP indicator compounds, the data suggests that MGP-related impacts do not exist in the building areas monitored within the site.

Data does not indicate potential 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*.

People could contact contaminants in the soil by walking on non-vegetated areas, digging in the soil or otherwise disturbing soils. People are not expected to come into direct contact with contaminated groundwater unless they dig below the ground surface. People are not drinking contaminated groundwater because the area is served by a public water supply that is not affected by site contamination. 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. On Operable Unit 1 (OU-1 - Jacob Riis portion of the site); environmental sampling indicated soil vapor intrusion was not a concern. OU-2, East River Park has no buildings so soil vapor intrusion is not a current concern. On OU-3, there is potential for soil vapor intrusion to impact the indoor air quality in one building (church) and monitoring is recommended for the school, but because these two buildings are vacant this does not represent a current exposure concern. On OU-4, Haven Plaza Co-Op Apartments indoor air continues to be monitored for soil vapor intrusion. Additionally, the potential exists for the inhalation of site contaminants due to soil vapor intrusion for any future on-site development, however, environmental sampling indicates soil vapor intrusion from site contamination is not a concern for off-site buildings.

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

- 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.

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.

The selected remedy is referred to as the Cover System and Coal Tar Recovery remedy and is shown on Figure 2.

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), SiteWise(TM) (available in the Sustainable Remediation Forum [SURF] library) or similar NYSDEC accepted tool. Water consumption, greenhouse gas emissions, renewable and non-renewable 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. Soil Excavation

All soils in the upper two feet which exceed the restricted residential soil cleanup objectives (SCOs) will be excavated and transported off-site for disposal.

Approximately 5,000 cubic yards of contaminated soil will be removed from the site. Collection and analysis of confirmation samples at the remedial excavation depth will be used to verify that SCOs for the site have been achieved. If confirmation sampling indicates that SCOs were not achieved at the stated remedial depth, the Applicant must notify DEC, submit the sample results and, in consultation with DEC, 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.

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.

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.

3. Cover System

A site cover will be required in areas where the upper two feet of exposed surface soil will exceed the applicable soil cleanup objectives (SCOs), to allow for restricted residential use of the site. 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.

4. Coal Tar Recovery

Installation and operation of coal tar recovery wells primarily along the eastern edge of the site to remove potentially mobile coal tar from the subsurface. The number, depth, type and spacing of the recovery wells will be determined during the design phase of the remedy. Coal tar will be collected periodically from each well; however, if wells are determined by the Department to accumulate large quantities of coal tar over extended time periods, they can be converted to automated collection.

5. Engineering and Institutional Controls

Institutional Control

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 restricted residential cleanup at a minimum.

Imposition of an institutional control in the form of 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 NYCDOHMH; and
- require compliance with the Department approved Site Management Plan.

6. Site Management Plan

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

- a. an Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to ensure the following institutional and/or engineering controls remain in place and effective:

Institutional Controls: The Environmental Easement discussed in Remedy Element 5 above.

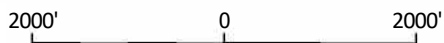
Engineering Controls: The soil cover discussed in Remedy Element 3 and the coal tar recovery wells discussed in Remedy Element 4.

This plan includes, but may not be limited to:

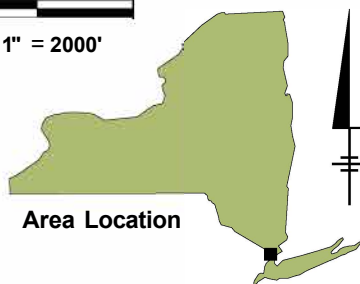
- an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination and protection of the coal tar recovery and monitoring wells and other monitoring points;
 - a provision for further investigation and remediation should large scale redevelopment occur, if any of the existing structures are demolished, or if the subsurface is otherwise made accessible. The nature and extent of contamination in areas where access was previously limited or unavailable will be immediately and thoroughly investigated pursuant to a plan approved by the Department. Based on the investigation results and the Department determination of the need for a remedy, a Remedial System Optimization (RSO) will be developed for the site, including removal and/or treatment of any source areas to the extent feasible. Citizen Participation Plan (CPP) activities will continue through this process. Any necessary remediation will be completed prior to, or in association with, redevelopment;
 - descriptions of the provisions of the environmental easement including any land use, and groundwater use restrictions;
 - 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 3 above will be placed in any areas where the upper two feet of exposed surface soil exceed the applicable 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 and indoor air to assess the performance and effectiveness of the remedy;
 - a schedule of monitoring and frequency of submittals to the Department;
- c. an Operation and Maintenance (O&M) Plan to ensure continued operation, maintenance, optimization, monitoring, inspection, and reporting of any mechanical or physical components of the remedy. The plan includes, but is not limited to:
- procedures for operating and maintaining the remedy;
 - compliance monitoring of treatment systems to ensure proper O&M of the coal tar recovery system as appropriate as well as providing the data for any necessary permit or permit equivalent reporting;
 - maintaining site access controls and Department notification; and
 - providing the Department access to the site and O&M records.



REFERENCE: BASE MAP USGS 7.5 MIN. QUAD., BROOKLYN, NEW YORK, 1967, PHOTOREVISED 1979.



Approximate Scale: 1" = 2000'



Area Location

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
 EAST 11TH STREET WORKS SITE
 MANHATTAN, NEW YORK
 ALTERNATIVES ANALYSES REPORT FOR OU-1

SITE LOCATION MAP



FIGURE

1

E. 11th St. MGP Site
(No. 231110)
Operable Units



Operable Unit 4

Operable Unit 3

Operable Unit 1

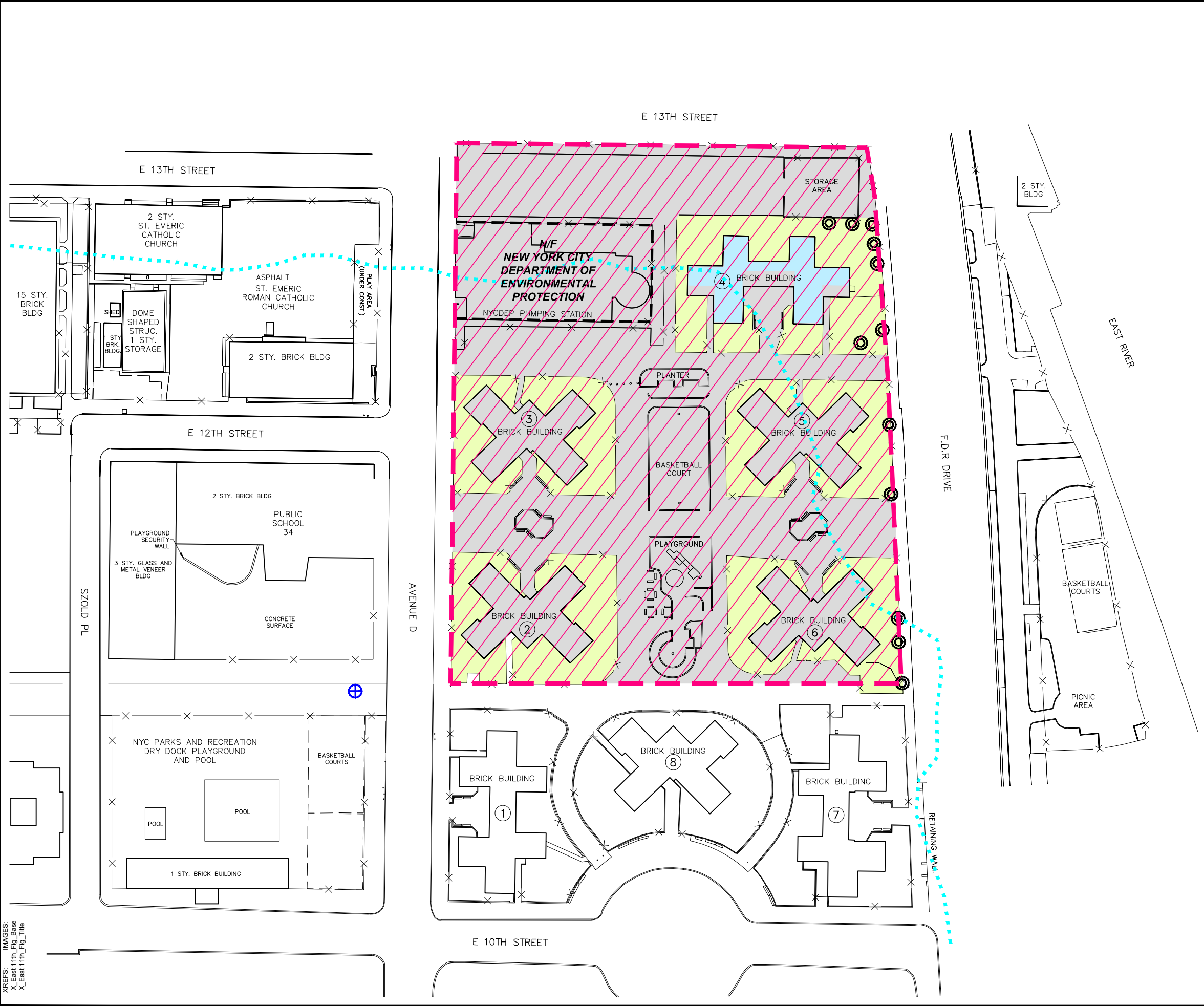
Operable Unit 2

Figure 2



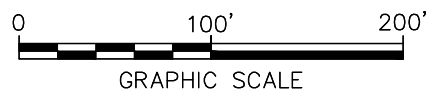
700 ft

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 XREFS: IMAGES: X_East 11th_Fig_Base X_East 11th_Fig_Title
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- LEGEND:**
- ⊙ PROPOSED NAPL RECOVERY WELL
 - ⊕ PROPOSED NEW GROUNDWATER MONITORING WELL
 - APPROXIMATE HISTORICAL SHORELINE
 - FENCE
 - BUILDING
 - ④ JACOB RIIS BUILDING NUMBER
 - AREA OF SHALLOW SOIL REMOVAL TO A DEPTH OF 2 FEET
 - PROPOSED CONCRETE CAP INSTALLATION (SEE NOTE 5)
 - LIMITS OF COVER SYSTEM
 - OU-1 BOUNDARY
 - LOT BOUNDARY
 - LIMITS OF EXISTING BUILDINGS/PAVEMENT

- NOTES:**
1. BASE MAP AND SURVEY CONTROL WAS TAKEN FROM ORIGINAL SURVEY DATED 9/3/2004; SUBMITTED BY B.B.L. ON 8/25/2006 AND SATELLITE IMAGERY OBTAINED FROM GOOGLE EARTH ON SEPTEMBER 16, 2009.
 2. ALL PLANIMETRIC FEATURES SHOWN ARE IN NAD 83 NY STATE PLANE COORDINATE SYSTEM.
 3. THE OLD SURVEY WAS CONVERTED INTO NEW COORDINATE AND VERTICAL SYSTEM BASED ON 7 TRAVERSE POINTS, RECOVERED IN THE FIELD (#2,3,4,6,7,12, AND 18).
 4. PROPOSED NAPL RECOVERY WELL LOCATIONS ARE CONCEPTUAL. ACTUAL LOCATION AND CONFIGURATION WOULD BE DETERMINED DURING DESIGN.
 5. ESTIMATED EXTENT OF CONCRETE FLOOR TO BE INSTALLED AS SURFACE CONTROL OVER EARTHEN FLOOR STORAGE AREAS IN JACOB RIIS BUILDING No. 4.
 6. PROVISIONAL INVESTIGATION/REMEDATION TO OCCUR IF ANY STRUCTURES ARE DEMOLISHED OR IF SUBSURFACE IS OTHERWISE MADE ACCESSIBLE.



CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
 FORMER EAST 11TH STREET WORKS SITE
 MANHATTAN, NEW YORK

SELECTED ALTERNATIVE

ARCADIS

FIGURE
3