DECISION DOCUMENT

Former Pratt Oil Works
Long Island City, Queens County, New York
Operable Units One and Two (OU-1 and OU-2)
Site No. S241115

April 2020

NEW YORK
STATE OF
OPPORTUNITY

Department of
Environmental
Conservation

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

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SECTION 1: SUMMARY AND PURPOSE OF THE SELECTED PLAN

The New York State Department of Environmental Conservation (Department or DEC), in consultation with the New York State Department of Health (NYSDOH) and the New York State Office of the Attorney General (OAG), is proposing a remedy for the above referenced site. The disposal or release of contaminants at the site has resulted in threats to the public health and the environment that will be addressed by the remedy outlined in this Decision Document.

The Petroleum Remediation element of the DEC Spill Response and Remediation Program (Program) provides for the investigation and remediation of petroleum contamination pursuant to Article 12 of the Navigation Law and/or the Petroleum Bulk Storage Program as defined by ECL, Article 17, Title 10. Petroleum contaminated sites are included in the Program when the Department determines that the nature and extent of contamination, or the magnitude of the impacts to the environment, are beyond that of a typical spill or emergency response, and the site is specifically designated for a more structured, long-term approach using appropriate regulations and Department guidance.

The Department has issued this document in accordance with the requirements of New York State Environmental Conservation Law, Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York (6 NYCRR) Party 375, and DER-10 Technical Guidance for Site Investigation and Remediation. This document is a summary of the information that can be found in the site-related reports and documents available in the document repository identified below.

DECLARATION:

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

Gerard W Burke

April 23, 2020

Gerard Burke, P. E. – Director, Remedial Bureau B **Date**

SECTION 2: CITIZEN PARTICIPATION

The public is encouraged to review the reports and documents which are available at the following project repositories:

Queens Central Library
89-11 Merrick Boulevard
Queens, New York 11432
(718) 990-0700

Queens Community Board 2
43-22 50th Street, Room 2B
Woodside, New York 11377
(718) 533-8773

A public comment period was held from July 21, 2017 through September 5, 2017. The Department received a comment letter during the comment period and responded on September 13, 2017. These letters are included in the Responsiveness Summary of this document. All comments on the remedy received during the comment period were considered by the Department in selecting a remedy for the site.

A public availability session was held on May 24, 2018 at the DEC's Region 2 office, Hunter's Point Plaza, Long Island City, NY. An update on the project was presented by ExxonMobil and Waste Management (collectively, the Remedial Parties).

After this public availability session, the Department provided project updates to local community groups and the public.

SECTION 3: SITE DESCRIPTION AND HISTORY

Location:

The Former Pratt Oil Works Site (the "site") is an irregularly shaped, 18.51-acre property located in an industrial area of Queens. The site is located adjacent to Newtown Creek to the south and a cemetery to the north and east. Trucking, asphalt recycling, and warehouse companies are located to the east and west of the site. A site location map is provided on Figure 1.

Site Features:

The entire site is developed with pavement or buildings and has very little green space. The property is divided by the Long Island Railroad (LIRR) train tracks which run parallel to Newtown Creek. A Waste Management Transfer Station for NYC and Steel Equities warehouse space occupy the property along Newtown Creek. The Steel Equities property is occupied by several tenants. Several businesses occupy the inlands portion (north of the LIRR) of the site including a cesspool service, valve manufacturer, cleaning products manufacturing/chemical storage and building and lumber supply company.

Current Zoning and Land Use:

The site and surrounding properties are zoned M3-1 which primarily allows manufacturing and industrial use. M3 districts are designated as areas with heavy industries, are generally located near the waterfront, and buffered from residential areas.

Past Use of the Site:

From the 1850's to present, the site has had various industrial uses. From 1892 until 1949, the site was used by Standard Oil Company of New York for the manufacture of wax and, at times, lubricating oils. After 1949 and Standard Oil's divestment of the site, the site has had many uses, which include, but are not limited to: The City of New York Department of Sanitation waste transfer station, warehouses, office space, vehicle storage, cesspool services, valve manufacturing, a lumber and building materials distributor, a refrigeration supply distributor, and cleaning products manufacturing.

Operable Units (OUs):

The site was divided into four operable units. An operable unit represents a portion of a remedial program for a site that for technical or administrative reasons can be addressed separately to investigate, eliminate or mitigate a release, threat of release or exposure pathway resulting from the site contamination.

OU-1 includes the parcels that border the waterfront and up to the northern boundary of the LIRR. Currently OU-1 is owned by two property owners, Waste Management Corporation and Steel Equities. The Waste Management property is a 1,500 ton per day solid waste transfer station. The Steel Equities property has several connected warehouses which are leased to multiple tenants for various uses. OU-1 includes Area of Concern (AOC) 1 and 5

OU-2 includes the properties on the north side of the LIRR and makes up the inland portion of the site. OU-2 is comprised of 10 separate properties which are used for a variety of storage and industrial uses. OU-2 includes AOC-2, 3, and 4.

OU-3 and OU-4 are present within OU-1, owned solely by Waste Management, and will be addressed under a forthcoming Decision Document.

Site Geology and Hydrogeology:

The site is underlain by urban fill which contains layers of coal ash. The urban fill is underlain by sands, silt, gravel, and cobbles. Organic silt/silty clay and peat were observed occasionally in soil borings across the site. A distinct low permeability layer has been identified along the shoreline throughout a majority of OU-1 and into portions of OU-2. The areal extent of this layer is assumed to be associated with an intertidal zone that historically existed along Newtown Creek prior to industrial development.

The regional hydrogeologic unit beneath the site area is the Upper Glacial aquifer. The depth to groundwater ranges from approximately 3.5 feet below grade in the southern portion of the site to approximately 28 feet below grade in the northernmost portion of the site. Groundwater flow at the site generally flows from the site toward Newtown Creek located to the south.

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,

alternatives that restrict the use of the site to commercial use as described in Part 375-1.8(g) are being evaluated.

A comparison of the results of the investigation to the standards, criteria and guidance values (SCGs) for commercial land use, as well as the unrestricted use SCGs, for the site contaminants is available in the site investigation reports.

SECTION 5: ENFORCEMENT STATUS

The remedial work for OU-1 and OU-2 is being conducted by ExxonMobil, pursuant to the Remedial Consent Order, No. D2-1002-12-07AM-2, between the State of New York and ExxonMobil Oil Corporation, filed on April 12, 2016.

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 reports summarizing the remedial investigations are available for review in the site document repository and the results are summarized in Section 6.3, Summary of Environmental Assessment.

The analytical data collected on this site (OU-1 and OU-2) includes data for:

- soil
- groundwater

6.1.1 Environmental Issues Being Addressed Outside of ExxonMobil's Remedial Plan for OU-1 and OU-2

Newtown Creek:

Newtown Creek is not considered part of the Former Pratt Oil Works site. Newtown Creek is being investigated as a separate USEPA National Priorities List (NPL) site. These Operable Units have been defined to include only land-based areas; Newtown Creek is not considered part of this

area. Therefore, surface water and sediment data were not collected as part of the investigation of OU-1 and OU-2.

Bulkhead Repair:

On November 12, 2016, the Newtown Creek Alliance observed an oil sheen from an unknown source which appeared to be emanating from the unrepaired bulkhead at 38-20 Review Avenue and called in this spill to the DEC Oil Spill Hotline. In response, as an interim action, ExxonMobil installed a temporary boom and absorbent boom. The plastic temporary boom was replaced with approximately 300 feet of 24-inch PVC hard boom on February 6, 2017. The absorbent boom was inspected regularly (i.e., multiple times per week) and replaced as needed. Subsequently, in July 2019, ExxonMobil installed approximately 300 feet of sealed sheet piling to complete the repairs of an unrepaired bulkhead at 38-20 Review Avenue along the eastern bank of Newtown Creek, as a more permanent means to address potential sheens on Newtown Creek. The approximate locations of the new bulkhead are shown on Figure 2. ExxonMobil's bulkhead repair work addresses Spill #1607890, and is not part of the remedial work for OU-1 and OU-2.

Toluene/CVOCs/Acid Condition:

This Decision Document pertains to ExxonMobil's remediation of Operable Units 1 and 2 for the site. The Department plans to issue a separate future decision document to address Operable Units OU-3 and OU-4 (Figure 3) (OU-3 and OU-4). Under a separate Consent Order, Waste Management currently is performing an interim remedial measure (Soil Vapor Extraction to remediate toluene and Chlorinated Volatile Organic Compound [CVOC] contaminated soil). Waste Management has already completed an IRM to remediate acid-contaminated soil. ExxonMobil's remediation of OU-1 and OU-2 does not include remediation of toluene, CVOCs or acid-contaminated soil which are present at the site.

6.1.2: 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 the Department website at: www.dec.ny.gov/regulations/61794.html

6.1.3: RI Results

The analytical data collected for OU-1 and OU-2 includes data for:

- soil
- groundwater

Based on collected data, the Department has 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 investigation reports contain a full discussion of the data. In addition to phase separated hydrocarbons (PSH), the contaminant(s) of concern identified at this site is/are:

- Benzene
- Ethylbenzene
- Xylenes
- Chlorobenzene
- Benzo(a)anthracene
- Benzo(a)pyrene
- Benzo(b)fluoranthene
- Benzo(k)fluoranthene
- Chrysene
- Indeno(1,2,3-cd)pyrene
- Bis(2-ethylhexyl)phthalate
- Dibenz(a,h)anthracene
- Fluoranthene
- Phenanthrene
- Pyrene
- Phenol
- Arsenic
- Barium
- Cadmium
- Lead
- Mercury
- Zinc
- Polychlorinated biphenyls

It should be noted that the remediation of toluene and CVOCs within the site, in both soil and groundwater, is being addressed by Waste Management and will be addressed under a separate Decision Document, as noted above.

The contaminants of concern exceed the applicable SCGs for:

- soil
- groundwater

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 are three types of IRMs that were previously, or are currently being, conducted at the site. They are:

A) LNAPL Recovery

A total of four LNAPL Recovery wells are currently used to collect LNAPL at the site. The wells are monitored remotely and the recovered LNAPL is temporarily stored in 250-gallon above ground storage tanks (ASTs). The location of each LNAPL recovery well is shown on Figure 2.

Beginning in 2010 and prior to early 2018, LNAPL recovery was performed using passive, non-disposable bailers. At the same time, absorbent socks were installed in monitoring wells where the LNAPL thicknesses was too thin to be effectively recovered using the passive bailer.

In early 2018, the passive recovery was eliminated in favor of manual bailing and absorbent socks. Currently, there is a Department-approved weekly protocol in place for the gauging and

recovery of LNAPL from wells where LNAPL may accumulate. Observed LNAPL thickness greater than approximately one foot is removed using a hand-held, portable LNAPL skimming tool.

B) Bulkhead Sheen and Boom Areas

On April 7, 2011, a petroleum sheen was observed on Newtown Creek. In response to the sheen, approximately 85 feet of 24-inch high polyvinyl chloride (PVC) belted black boom (hard boom) and 30 feet of absorbent boom were deployed. Since completion of the new bulkhead in July 2019 (mentioned above), the absorbent boom has been removed, but the hard boom remains in place.

C) Barrier Wall

Phase I of the barrier wall IRM consisted of a vertical subsurface barrier wall that was installed parallel to and interior of the bulkhead along Newtown Creek (Figure 2/OU-1). The barrier wall was installed in an effort to reduce the hydraulic effects of tidal influence and eliminate a potential preferential pathway for LNAPL to enter Newtown Creek. The Phase I wall was installed during September and October 2014 and the Construction Completion Report was approved by the Department on March 16, 2015

Phase II of the barrier wall IRM included the installation of a series of sleeve port grout pipes offset approximately 2 feet to the north and parallel with the Phase I elements. These pipes were installed approximately 15-feet below grade and then filled with bentonite-cement permeation grout in an effort to fill the intermediate-sized open soil pore-space in the fill. Phase II of the barrier wall was completed on March 18, 2016 and the Construction Completion Report was approved by the Department on August 24, 2016.

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.

For OU-1 areas consisting of AOC-5 to the north and AOC-1 to the south:

Soil and groundwater were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, polychlorinated biphenyls (PCBs), and pesticides. Based on investigations conducted to date, the primary contaminants of concern for OU -1 include petroleum-related VOCs associated with the presence of light non-aqueous phase liquid (LNAPL).

Soil - Analytical data for volatile organic compounds (VOCs) indicate that benzene, ethylbenzene, and total xylenes are present in soil throughout OU-1. Concentrations of acetone and chloroform were detected at 1.79 parts per million (ppm) and at 9.35 ppm, respectively. Acetone is a common known lab contaminant and industrial solvent, and along with chloroform, both compounds are not identified as petroleum-related compounds nor site-specific contaminants of concern. Benzene was detected throughout OU-1 primarily within the upper 15

feet. The highest detection of benzene was found in the northwest portion of AOC-5 at a concentration of 96.7 ppm (PGWSCO is 0.06 ppm) at 2 – 3 feet below ground surface. Ethylbenzene was also detected at various depths within the upper 15 feet with a maximum concentration of 1,900 ppm (PGWSCO is 1 ppm) at 5 to 10 feet below ground surface. Xylene had the highest frequency of detections and was found within the upper 15 feet. The most significant xylene concentrations were present in the central portion of AOC-5, detected at concentrations of 8,940 and 1,010 ppm (PGWSCO is 1.6 ppm) at 2 to 3, and 8 to 10 feet below ground surface, respectively.

Semi-volatile Organic Compounds (SVOCs) are present within the upper 25 feet of soils throughout the site at concentrations above the CUSCOs. The SVOCs detected at OU-1 consisted of poly-cyclic aromatic hydrocarbons (PAHs), and the most significant concentrations were limited to the upper 10 feet of site soils in the central-southwest portion of AOC-5. PAH detections included benzo(a)anthracene at concentrations up to 1,050 ppm (CUSCO is 5.6 ppm), benzo(a)pyrene up to 1,210 ppm (CUSCO is 1 ppm), benzo(b)fluoranthene up to 587 ppm (CUSCO is 5.6 ppm), benzo(k)fluoranthene up to 98.8 ppm (CUSCO is 56 ppm), chrysene up to 2,070 ppm (CUSCO is 56 ppm), dibenz(a,h)anthracene up to 362 ppm (CUSCO is 0.56 ppm), fluoranthene up to 750 ppm (CUSCO is 500 ppm), indeno(1,2,3-cd)pyrene up to 230 ppm (CUSCO is 5.6 ppm), phenanthrene up to 891 ppm (CUSCO is 500), and pyrene up to 547 ppm (CUSCO is 500 ppm).

Metals were detected above CUSCOs within the upper 12 feet of soils throughout the site including detections of arsenic up to 305 ppm (CUSCO is 16 ppm), barium up to 2,490 ppm (CUSCO is 400 ppm), lead up to 20,000 ppm (CUSCO is 1,000 ppm), mercury up to 21 ppm (CUSCO is 2.8 ppm), and zinc up to 11,500 ppm (CUSCO is 10,000 ppm).

No pesticides were detected above CUSCOs or the restricted residential use soil cleanup objectives (RRSCOs)

PCBs were detected above CUSCOs (1 ppm) at one location at a concentration of 1.17 ppm.

Groundwater – Light, non-aqueous phase liquid (LNAPL) is present in many of the on-site IRM extraction wells and are therefore not sampled. In areas without LNAPL, analytical data for VOCs in groundwater indicate detections above Class GA standards for acetone, benzene, chlorobenzene, chloroform, xylene, and tetrachloroethene. Acetone exceeded Class GA standards at one location, and chloroform was exceeded at two locations, however, neither chloroform nor acetone are generally identified as petroleum-related compounds or site contaminants of concern. The most significant concentrations of petroleum-related compounds, benzene and xylene, were recently detected at concentrations of 330 parts per billion (ppb) (standard is 1 ppb) and 13 ppb (standard is 5 ppb), respectively. Tetrachloroethene was most recently detected at concentrations up to 11 ppm. Chlorobenzene is also present at a maximum concentration of 74 ppb (standard is 5 ppb).

Recent analytical data show limited detections of PAHs above Class GA standards for eight compounds including benzo(a)anthracene (up to 2 ppb; standard is 0.002 ppb), benzo(a)pyrene (up to 0.9 ppb; standard is 0.002 ppb), benzo(b)fluoranthene (up to 1 ppb; standard is 0.002 ppb), benzo(k)fluoranthene (up to 0.2 ppb; standard is 0.002 ppb), bis(2-ethylhexyl)phthalate (up to 17 ppb; standard is 5 ppb), indeno(1,2,3-cd)pyrene (up to 0.2 ppb; standard is 0.002 ppb), chrysene

(up to 2 ppb; standard is 0.002 ppb), and phenol (up to 2 ppb; standard is 1 ppb).

Seven metals are present in OU-1 above Class GA standards, including arsenic at 33.7 ppb (standard is 25 ppb), and lead at 63.7 ppb (standard is 25 ppb). Other compounds including iron, sodium, manganese, and magnesium were detected above Class GA standards, but are considered to be naturally occurring and not site-related.

For OU-2 areas consisting of AOC-2 to the north, AOC-4 to the south, and AOC-3 in the center:

Soil and groundwater were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and metals. Based on investigations conducted to date, the primary contaminants of concern for OU 2 include petroleum-related VOCs associated with the presence of LNAPL.

Soil – Benzene, xylene, and ethylbenzene were the only contaminants of concern detected within OU-2. Benzene was detected at a maximum concentration of 0.319 ppm, above the PGWSCO of 0.06 ppm. Ethylbenzene was detected at a maximum concentration of 2.35 ppm (PGWSCO is 1 ppm), and total xylene was detected at a maximum concentration of 2.21 ppm (PGWSCO is 1.6 ppm). The maximum concentrations of all three contaminants were detected at 20 to 25 feet below grade in the same sample located in the southwestern-central portion of AOC-3.

PAHs were detected primarily at concentrations below CUSCOs within the upper 20 feet, including concentrations of benzo(a)pyrene up to 6.41 ppm (CUSCO is 1 ppm), benzo(a)anthracene up to 8.12 ppm (CUSCO is 6.91 ppm), and dibenz(a,h)anthracene up to 4.71 ppm (CUSCO is 0.56 ppm).

Elevated metals were detected within the upper 10 feet of site soils, including arsenic at concentrations up to 106 ppm (CUSCO is 16 ppm), lead up to 530 ppm (CUSCO is 1,000 ppm), and copper up to 370 ppm (CUSCO is 270 ppm).

No pesticides were detected at concentrations above CUSCOs.

No PCBs were detected at concentrations above CUSCOs.

Groundwater – In OU-2, there are limited detections of VOCs including acetone and chloroform present at concentrations above Class GA groundwater standards. PCE was also present at 8 ppb (standard is 5 ppb) based on the most recent data. As stated above, CVOCs present in groundwater are being managed under OU-4 by Waste Management in the southern portion of Area of Concern #5 (AOC-5). OU-3 and OU-4 will be discussed in a future Decision Document.

Analytical data for SVOCs show limited detections of PAHs in OU-2 above Class GA Groundwater standards including benzo(a)pyrene up to 0.3 ppb (standard is 0 ppb), benzo(a)anthracene up to 0.1 ppb (standard is 0.002 ppb), benzo(b)fluoranthene up to 0.1 ppb (standard is 0.002 ppb), and chrysene up to 0.1 ppb (standard is 0.002 ppb).

Analytical data for metals includes detections of cadmium at concentrations up to 35.9 ppb (standard is 5 ppb) as of November 2018, but was present at 10.7 ppb in June 2019. Other metals

were also detected above standards, including sodium, manganese, magnesium, and iron, but are considered to be naturally occurring and not related to site operations.

6.4: Summary of Human Exposure Pathways

The 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 majority of the site is covered with buildings and pavement. However, people could contact contaminants in the soil by walking on the site, digging or otherwise disturbing any bare soil. People are not drinking the contaminated groundwater because the area is served by a public water supply that is not affected by this contamination. Volatile organic compounds in soil vapor (air spaces within the soil) may move into overlying buildings and affect the indoor air quality. This process, which is similar to the movement of radon gas from the subsurface into the indoor air of buildings, is referred to as soil vapor intrusion. An evaluation is recommended to determine whether actions are needed to address exposures associated with soil vapor intrusion.

6.5: Summary of the Remediation Objectives

The objectives for the remedial program have been established through the remedy selection process stated in DER CP-51 and DER-10 Technical Guidance for Site Investigation and Remediation. The goal for the remedial program is to restore the site to pre-release 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 (RAOs) 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 groundwater contamination.
- Prevent discharge of contaminants to surface water.

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 contamination.

Soil Vapor

RAOs for Soil Vapor

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

SECTION 7: ELEMENTS OF THE REMEDY

The alternatives developed for the site and evaluation of the remedial criteria are presented in the Remedial Work Plan: Feasibility Study Report for the ExxonMobil Former Pratt Oil Works Petroleum Remediation Project, dated July 21, 2017. The remedy has been selected pursuant to the remedy selection criteria set forth in DER-10, Technical Guidance for Site Investigation and Remediation and 6 NYCRR Part 375 and corresponds to Alternative No. 3 for the Area of Concern 4 and Alternative No. 4 for all other Areas of the Feasibility Study Report.

The elements of the remedy for the site are as follows:

1. Remedial Design

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

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

2. Cover System

A site cover will be required to allow for commercial use of the site in areas where the upper one foot of exposed surface soil will exceed the applicable soil cleanup objectives (SCOs). Where a soil cover is to be used it will be a minimum of one foot 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.

3. Petroleum Recovery and Barrier Wall

To protect Newtown Creek and prevent migration of petroleum compounds through groundwater, a barrier wall and LNAPL recovery systems as described in Section 6.3 are components of the remedy. Operation of the existing petroleum recovery systems within AOC-1, AOC-3, and AOC-5 (see Figure 2 – AOC-2, 3, and 4 are part of OU-2; AOC-1 and 5 are part of OU-1) will continue to remove recoverable petroleum from the subsurface. Additional petroleum recovery systems within AOC-1, AOC-2, AOC-3, and AOC-5 will be determined during the design phase of the remedy. For locations where a recovery trench is feasible, the monitoring wells located within the proposed recovery trench would be removed and new recovery wells would be installed during the recovery trench installation.

Recovery trench installation would consist of excavating soil within the proposed trench footprint to a depth of approximately five feet below the depth of LNAPL observed in that area and backfilling the trench with gravel. The surface of the recovery trench would be restored to meet the cover system design specifications. Recovery wells with skimming systems would be installed within the trench. The final specifications for the recovery wells will be determined during remedial design.

For areas where it is determined that a recovery trench is not feasible, the feasibility of installing a recovery sump will be evaluated as part of the remedial design. The recovery sump would be similar to the recovery trench in that installation would consist of excavating soil within the proposed sump footprint to a depth of approximately five feet below the depth of LNAPL observed in that area, and back-filling the sump with gravel. However, the overall dimensions of the recovery sump would be less than a recovery trench. The surface of the recovery sump would be restored to meet the cover system design specifications. One recovery well with skimming systems would be installed within the sump. The final specifications for the recovery wells would be determined during remedial design.

4. Monitored Natural Attenuation

Groundwater contamination will be addressed with monitored natural attenuation (MNA) upon completion of the active Petroleum Recovery remedial activities. Groundwater will be monitored for site related contamination and for MNA indicators which will provide an understanding of the biological activity breaking down the contamination. It is anticipated that contamination will continue to decrease during continued operation/optimization of petroleum recovery methods discussed in Element 3 above. Reports of the attenuation will be provided after the first two years, and additional studies and monitoring will be conducted to evaluate and document performance of MNA in achieving further contaminant reductions, as needed. Active remediation may be proposed if it appears that the natural processes alone will not address the

contamination, as proved by the proposed remedy. The contingency remedial action will depend on the information collected, but it is currently anticipated that the injection of oxygen release compound or equivalent technology would be the expected contingency remedial action, if required.

Wells will be installed to monitor groundwater and the hydraulic effects of the newly constructed bulkhead discussed in Section 6.1.1 to determine whether additional action is needed to address Spill #1607890.

5. Engineering and Institutional Controls

Imposition of an institutional control (e.g., an environmental easement or notice), to be agreed upon by the Department, the property owners and ExxonMobil, and a Site Management Plan, as described below, will be required. The remedy will allow for commercial use and will include imposition of a site cover that meets the commercial SCOs, an institutional control, and site management plan as described below.

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 institutional control discussed in Paragraph 5 above.

Engineering Controls:
- The cover system discussed in Paragraph 2 above;
- The petroleum recovery systems discussed in Paragraph 3 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 institutional control, including any land use, and/or 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;
- A provision that should a building foundation or building slab be removed in the future, a cover system consistent with that described in Paragraph 2 above will be placed in any areas where the upper one foot of exposed surface soil exceed the applicable soil cleanup objectives (SCOs)

- Provisions for the management and inspection of the identified engineering controls;
- Maintaining site access controls and Department notification; and
- The steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.

b. A Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:

- Monitoring of groundwater to assess the performance and effectiveness of the remedy;
- A schedule of monitoring and frequency of submittals to the Department; and
- Monitoring for vapor intrusion for any buildings on the site, as may be required by the Institutional and Engineering Control Plan discussed above.

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 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.

ATTACHMENTS

Figure 1 - Site Location Map
Figure 2 - Site Plan/IRM well locations/AOC Map
Figure 3 - Operable Units

Appendix A – Responsiveness Summary


FIGURE 1
SITE LOCATION
SITE
Basemap Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community
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FIGURE 2
SITE PLAN

LEGEND

- MONITORING WELLS WITHOUT LNAPL
- MONITORING WELLS WITH LNAPL
- MONITORING WELLS WITH SPILL BUSTER LNAPL RECOVERY
- NEWLY INSTALLED 300' BULKHEAD
- APPROXIMATE GROUT WALL LOCATION
- AOC-1 AREAS OF CONCERN
- APPROXIMATE PARCEL BOUNDARY
- PROPOSED LNAPL RECOVERY TRENCH
- PROPOSED LNAPL RECOVERY SYSTEM
- SITE BOUNDARY

CORRECTED LNAPL THICKNESS (FEET)

- 0 - <0.5
- 0.5 - 1
- 1 - 2
- >2

GRAY SHADED AREAS REPRESENT NON-ACCESSIBLE BUILDING STRUCTURES, BUT ADDITIONAL AREAS WITHIN THE SITE ARE INACCESSIBLE FOR INTRUSIVE REMEDIAL ACTION

MW-20
MW-59
REVIEW AVE
AOC-2
MW-54 0.01
MW-55 4.52
MW-57 0.15
MW-58 0.20
MW-22 0.50
MW-1
MW-37 0.01
MW-6S
MW-56
MW-60S
MW-60D
MW-63
MW-2 0.29
MW-5S
AOC-5
MW-5 1.47
MW-61 4.00
MW-24 0.96
MW-14 2.38
MW-16 0.01
PROPOSED LNAPL RECOVERY SYSTEM
MW-42 11.66
MW-66 1.80
MW-15
MW-15R
MW-44 0.01
MW-17 5.78
AOC-3
MW-19 0.50
MW-67 0.09
MW-23 0.25
MW-64 0.44
MW-62
MW-68 0.57
MW-4S
MW-4D
MW-65 11.74
MW-46
MW-28
MW-28D
MW-18
NEWLY INSTALLED 300' BULKHEAD
MW-29
MW-7 0.74
MW-30 1.00
MW-33 0.44
MW-9 3.59
AOC-4
MW-69
MW-48S
MW-48D 0.15
MW-49M 0.52
MW-8
MW-31
MW-49S 1.43
MW-49D
MW-50 1.92
RAILROAD
MW-27 0.01
MW-51
GROUT WALL
BW-1
MW-12R 0.01
MW-21
BW-2
BW-3
AOC-1
MW-10
BW-4
MW-52
BW-5
BW-6
MW-11R
BW-7
BW-8
BW-9
MW-13
BW-10
BW-11
BW-12
NEWTOWN CREEK

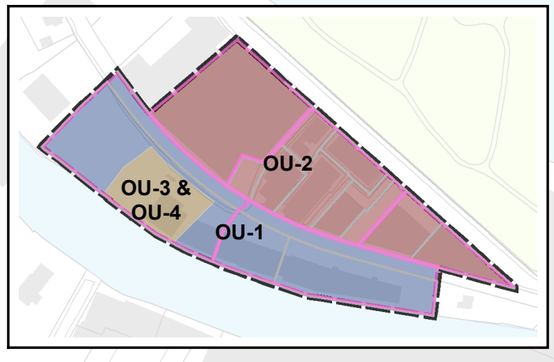

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FIGURE 3
OPERABLE UNITS

LEGEND

- OPERABLE UNIT 1 BOUNDARY
- OPERABLE UNIT 2 BOUNDARY
- APPROXIMATE OPERABLE UNITS 3 & 4 BOUNDARY
- NEWLY INSTALLED 300' BULKHEAD
- APPROXIMATE PARCEL BOUNDARY
- SITE BOUNDARY

NYSDEC - NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

THE NYSDEC EXPECTS A DECISION DOCUMENT COVERING WASTE MANAGEMENT'S REMEDIAL ACTIVITIES CONCERNING OPERABLE UNITS 3 AND 4 IN 2020.

REVIEW AVE

OU-2

OU-3 & OU-4

OU-1

NEWLY INSTALLED
300' BULKHEAD

NYSDEC SPILL
NUMBER 1607890

RAILROAD

NEWTOWN CREEK

N

0 115'

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APPENDIX A

RESPONSIVENESS SUMMARY

ExxonMobil
Former Pratt Oil Works
Long Island City, Queens, New York
Operable Units 1 & 2
Site No. S241115

NYSDEC Public Meeting
Thursday, May 24, 2018 4:30 PM to 7:30 PM
NYSDEC Region 2 Office
47-40 21st Street, Long Island City, Queens, NY

An availability session was conducted beginning at 4:30 PM followed by a presentation and question & answer session at 5:30 PM. The public meeting was held to discuss the proposed decision document for two operable units (OUs 1 and 2) at the Former Pratt Oil Works Petroleum Remediation site. Approximately 6 members of the public attended the meeting and availability session.

The following is a summary of the questions asked at the meeting and the New York State Department of Environmental Conservation (DEC) responses. Please note questions and answers were NOT recorded verbatim.

Question 1: Will this Decision Document cover Waste Management's (WM) portion of the site?

Response 1: No, this Decision Document pertains to ExxonMobil's remediation of Operable Units 1 and 2 for the site. WM is currently performing an interim remedial measure (IRM) which includes soil vapor extraction to remediate toluene and chlorinated volatile organic compounds found in soil. The Department will draft a Decision Document covering WM's remedial activities when the soil vapor extraction IRM is complete. WM has already completed an IRM which remediated acid-contaminated soil.

Question 2: What remedial activities are ongoing at the site now?

Response 2: Interim remedial measures are currently operating at the site. Light non-aqueous phase liquid (LNAPL) recovery wells have been operating since 2010; soft and hard booms, including a recently constructed bulkhead, have been installed to contain sheens; and a barrier wall was constructed in two phases to prevent lateral migration of LNAPL. See Section 6.2 for detailed descriptions of completed IRMs.

Question 3: Foul odors migrate from this site to the Greenpoint neighborhood in Brooklyn. Are these odors emanating from the petroleum remediation efforts?

Response 3: No, the petroleum contamination is below ground and floating above the groundwater. The contamination is extracted from below ground and sent off-site for proper disposal. The collected LNAPL is contained in drums, and does not emit vapors due to its low volatility.

Question 4: The attendees asked for a copy of the power point presentation.

Response 4: DEC provided the presentation via email to the attendees on May 25, 2018.