April 12, 2024

Mr. Rafi S. Alam
New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway, 11th Floor
Albany, New York 12233-7013

Re: ExxonMobil Greenpoint Petroleum Remediation Project
Response to Comments from the NYSDEC (dated January 9, 2024) on the
Recovery Well RW-16 and RW-29 Relocation Request (dated September 18, 2023)

Dear Mr. Alam:

Roux Environmental Engineering and Geology, D.P.C. (Roux), on behalf of ExxonMobil Environmental and Property Solutions Company, on behalf of ExxonMobil Oil Corporation (collectively, ExxonMobil), has prepared this response to the January 9, 2024 comment letter provided by the New York State Department of Environmental Conservation (NYSDEC) regarding the ExxonMobil Greenpoint Petroleum Remediation Project (EMGPRP) Recovery Well RW-16 and RW-29 Relocation Request Letter, dated September 18, 2023.

The format of this response is to provide the NYSDEC comment in italic font, followed by Roux's response. The comments and responses are provided below.

Comment 1: Based on review of the data provided in the report, NYSDEC is requesting that the proposed location for relocation of RW-16 is moved north-westerly so that the recovery well is located within the borders of the regional aquifer free-product are to ensure capture the free-product beneath Kingsland Yard. Please see the attached figure for the proposed location.

As requested by the NYSDEC, the proposed location for RW-16R has been shifted north-westerly to within the current, estimated extent of free-product in the regional aquifer (Figure 1). A second recovery well (RW-30) is also proposed as a contingency to assist in maintaining hydraulic control within Kingsland Yard (i.e., the 400 Kingsland Avenue property), if needed. A groundwater modeling scenario based on the newly proposed RW-16R and RW-30 locations is detailed in the 2024 Groundwater Modeling Activities Memorandum provided as Attachment 1. Aquifer testing activities, including pumping tests, drawdown tests, and associated monitoring well fluid level measurements, will be performed during the recovery well installation process and startup operations to determine if the operation of RW-30 is necessary to maintain hydraulic control within Kingsland Yard. Results of these aquifer testing activities will be provided to the NYSDEC in a future report.

Comment 2: Figure 1 - Please provide the location of the two outfalls and update the figure accordingly.

Figure 1 from the Recovery Well RW-16 and RW-29 Relocation Request Letter has been updated to include the locations of NYSDEC-regulated Outfall 001 and Outfall 002 which are maintained under State Pollutant Discharge Elimination System (SPDES) Permit No. NY 0267724. The revised figure is attached herein as Figure 2.

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California ■ Illinois ■ Massachusetts ■ New Jersey ■ New York ■ Texas ■ Virginia

Should there be any questions or comments on this submission, please do not hesitate to contact us.

Sincerely,

ROUX ENVIRONMENTAL ENGINEERING AND GEOLOGY, D.P.C.

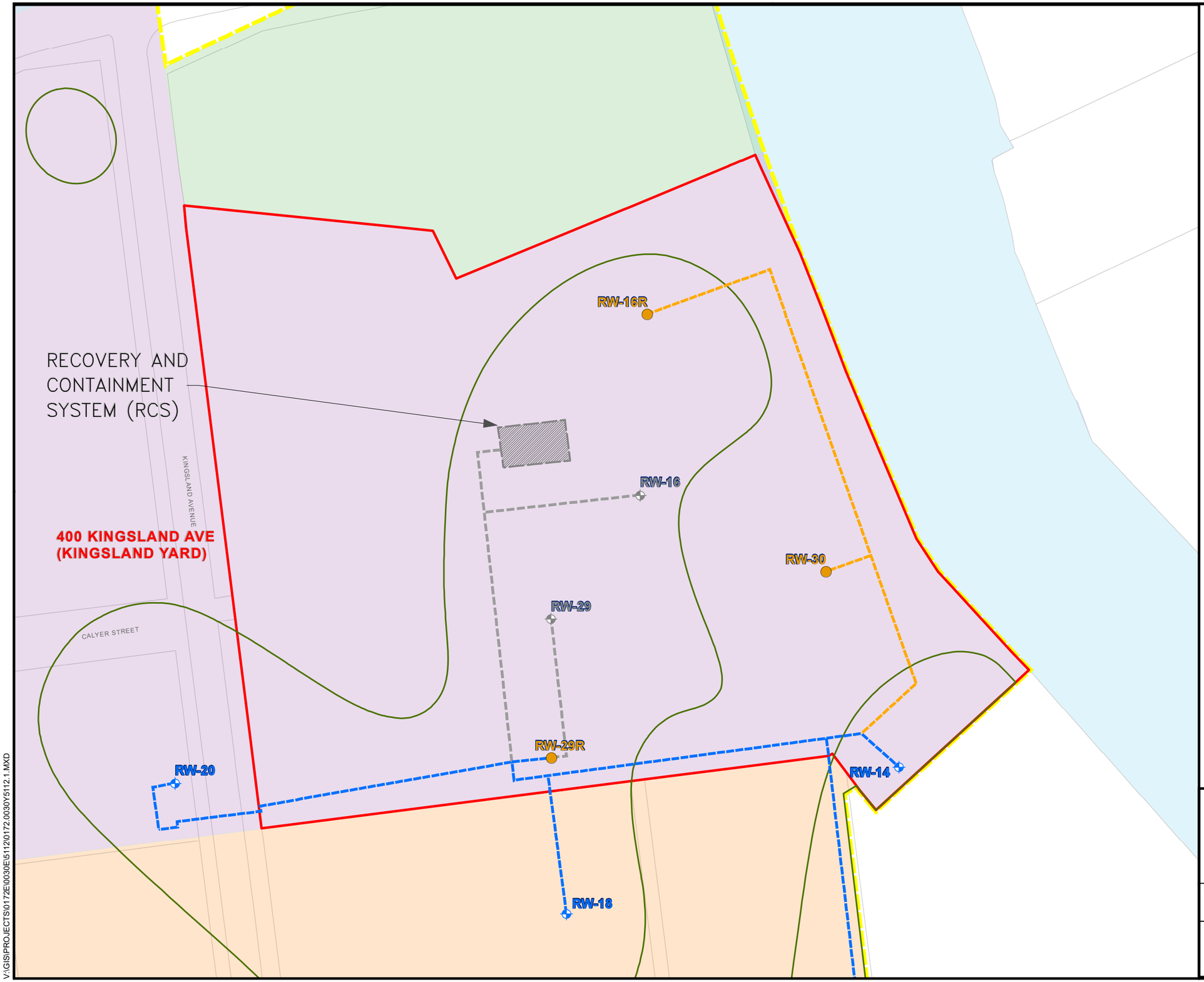
Courtney Lind
Senior Engineer

Andrew Baris, PG
Principal Hydrogeologist/
Executive Vice President

cc: Andrew G. Frank, Esq., New York State Office of the Attorney General
Deborah Gorman, NYSDEC
Michael Murphy, NYSDEC
Todd Ommen, Esq., Pace University School of Law
Richard Webster, Riverkeeper
Mike Dulong, Riverkeeper
Michael J. Burghardt, ExxonMobil
Rene Gonzalez, ExxonMobil
Christopher Proce, Roux Environmental Engineering & Geology, D.P.C.

FIGURES

1. Approximate Proposed New Locations for RW-16, RW-29 and RW-30
2. Existing Treatment System Locations and ExxonMobil-Owned Properties



LEGEND

- RW-29 — APPROXIMATE PROPOSED NEW LOCATIONS FOR RECOVERY WELLS
- RW-24 — LOCATION AND DESIGNATION OF ACTIVE DUAL-PUMP RECOVERY WELL
- RW-29 — LOCATION AND DESIGNATION OF ACTIVE DUAL-PUMP RECOVERY WELL ANTICIPATED TO BE RELOCATED
- ESTIMATED EXTENT OF REGIONAL AQUIFER FREE-PRODUCT (5/4/2023)
- GROUNDWATER REMEDIATION SYSTEM PIPING
- APPROXIMATE LOCATION OF PROPOSED NEW GROUNDWATER REMEDIATION SYSTEM PIPING
- GROUNDWATER REMEDIATION SYSTEM PIPING ANTICIPATED TO BE DECOMMISSIONED
- APPROXIMATE LOCATION OF EXISTING TREATMENT SYSTEM
- EMGPRP SITE BOUNDARY
- APPROXIMATE LOCATION OF EXXONMOBIL-OWNED PROPERTY

N

NOTES

1. THE ANTICIPATED RELOCATION/INSTALLATION OF RW-16, RW-29, RW-30 AND THE ASSOCIATED GROUNDWATER REMEDIATION SYSTEM PIPING IS SUBJECT TO APPROVAL BY THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

100 0 100'

Title:

APPROXIMATE PROPOSED NEW LOCATIONS FOR RW-16, RW-29 AND RW-30

EXXONMOBIL
GREENPOINT PETROLEUM REMEDIATION PROJECT
GREENPOINT, BROOKLYN, NEW YORK

Prepared for:
EXXONMOBIL OIL CORPORATION
BROOKLYN, NEW YORK

ROUX

Compiled by: J.C.	Date: 03/25/24	FIGURE
Prepared by: M.S.R.	Scale: AS SHOWN	1
Project Mgr: C.L.	Project: 0172.0030Y101	
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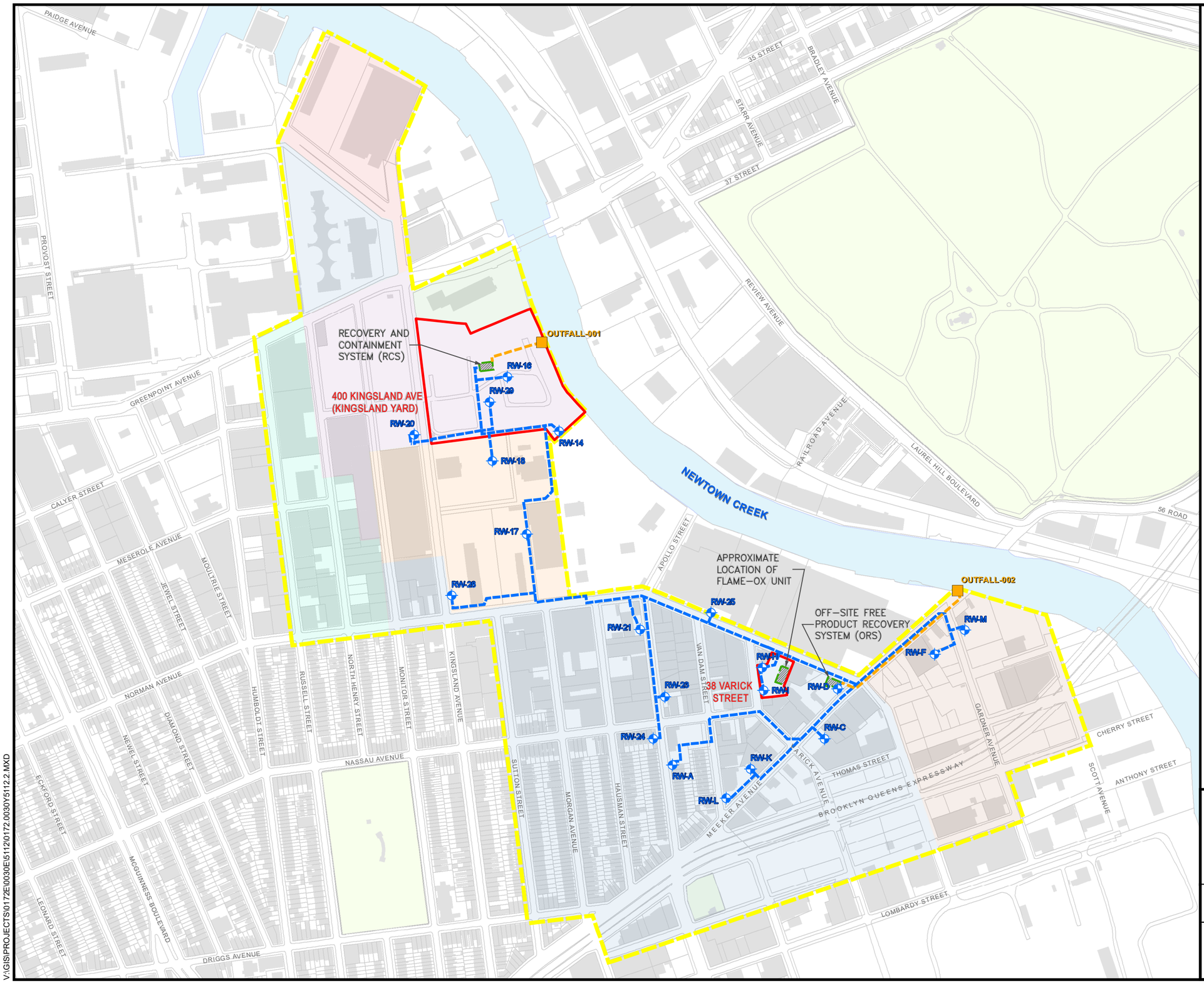

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LEGEND

- RW-24 — ACTIVE DUAL-PUMP RECOVERY WELL LOCATION AND DESIGNATION
- OUTFALL-001 — APPROXIMATE LOCATION AND DESIGNATION OF NYSDEC-REGULATED SPDES OUTFALL
- APPROXIMATE LOCATION OF TREAMENT SYSTEM EFFLUENT PIPING
- GROUNDWATER REMEDIATION SYSTEM PIPING
- APPROXIMATE LOCATION OF EXISTING TREATMENT SYSTEM
- EMGPRP SITE BOUNDARY
- APPROXIMATE LOCATION OF EXXONMOBIL-OWNED PROPERTY

NOTES

1. NYSDEC - NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
   SPDES - STATE POLLUTANT DISCHARGE ELIMINATION SYSTEM

500 0 500'

Title:

EXISTING TREATMENT SYSTEM LOCATIONS AND EXXONMOBIL-OWNED PROPERTIES

EXXONMOBIL
GREENPOINT PETROLEUM REMEDIATION PROJECT
GREENPOINT, BROOKLYN, NEW YORK

Prepared for:
EXXONMOBIL OIL CORPORATION
BROOKLYN, NEW YORK

ROUX

Compiled by: C.L.	Date: 03/25/24	FIGURE
Prepared by: M.S.R.	Scale: AS SHOWN	2
Project Mgr: C.L.	Project: 0172.0030Y090	
File: 0172.0030Y5112.2.mxd		

ATTACHMENT 1

2024 Groundwater Modeling Activities Letter Report

April 12, 2024

Mr. Rafi S. Alam
New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway, 11th Floor
Albany, New York 12233-7013

Re: 2024 Groundwater Modeling Activities
ExxonMobil Greenpoint Petroleum Remediation Project (EMGPRP)
Brooklyn, New York

Dear Mr. Alam:

Roux Environmental Engineering and Geology, D.P.C. (Roux), for ExxonMobil Environmental and Property Solutions Company, on behalf of ExxonMobil Oil Corporation (collectively, ExxonMobil), is submitting this letter to present a summary of 2024 groundwater modeling activities for the ExxonMobil Greenpoint Petroleum Remediation Project (EMGPRP). The EMGPRP includes the environmental investigation, monitoring, and remediation activities that ExxonMobil is performing within the project area (Site; Figure 1), as defined in the Consent Decree between the State of New York and ExxonMobil, filed on March 1, 2011, in the United States District Court, Eastern District of New York (Consent Decree). The EMGPRP Site and the area surrounding the EMGPRP Site, including properties where remedial actions are being conducted by third parties, were included in a groundwater flow modeling area. The EMGPRP Site and the surrounding area are collectively henceforth referred to in this letter as the "Modeled Area".

Background

At the time of this letter, ExxonMobil currently operates and maintains two free-product recovery and groundwater treatment systems at the Site. These systems include:

1. The Former Brooklyn Terminal Free-Product Recovery and Containment System (RCS); and
2. The Off-Site Free-Product Recovery System (ORS).

Each recovery system receives and treats water from various recovery wells located at the Site (Figure 2). The RCS and ORS, combined, currently consist of 20 active recovery wells (RW-14, RW-16, RW-17, RW-18, RW-20, RW-21, RW-23, RW-24, RW-25, RW-28, RW-29, RW-A, RW-C, RW-D, RW-F, RW-H, RW-I, RW-K, RW-L, and RW-M) each with a DPLE recovery system and a connection to a treatment system and outfall. The RCS and ORS began operation in 1979 and 1995, respectively, and have undergone various expansions since startup to create the current recovery well network.

The most recent significant system expansion occurred from 2008 to 2010 when ten recovery wells were added. Following the expansion in 2010, Roux constructed a three-dimensional numerical groundwater flow model (2010 GW Flow Model) based on geologic and hydrologic data collected during previous investigations within the Modeled Area. The 2010 GW Flow Model was developed with the focus of evaluating the influence of the expanded ORS on groundwater levels in the areas around the expanded recovery operations. The 2010 GW Flow Model was utilized in an effort to evaluate groundwater levels at static equilibrium (i.e., non-pumping) conditions and under pumping conditions at the time of the 2010 modeling activities associated with the on-going EMGPRP remediation activities. The results of the

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2010 modeling activities were documented in Appendix F of the Supplemental Recovery System Evaluation Report (SRSER) dated May 27, 2011.

The 2010 GW Flow Model was updated in 2019 with data collected as part of the EMGPRP since 2011 and available data from surrounding remediation projects, as detailed in the Groundwater Modeling Summary Report dated March 10, 2020 (2020 GW Modeling Report). The 2020 GW Modeling Report summarizes how the updated model (2019 GW Flow Model) was utilized to re-evaluate groundwater levels at equilibrium (non-pumping) conditions and hydrodynamic conditions (current and future) associated with the on-going remediation activities across the Site. The 2019 GW Flow Model has been used as a tool to support hydrogeological investigations, evaluations of remedial alternatives, and evaluations of on-going remediation activities, including hydraulic control evaluations.

One specific use of the 2019 GW Flow Model has been to evaluate the shutdown of various recovery wells per the Recovery Well Shutdown Procedure presented in the 5-Year Recovery System Evaluation Report (5Y-RSER) 2012-2017 dated June 13, 2018, and approved with comments by the NYSDEC on August 13, 2018. Since the 2019 GW Flow Model update, three recovery wells (RW-E, RW-22, and RW-27) from the "Reduction of Seven Recovery Wells Simulation" have been shut down in accordance with the Recovery Well Shutdown Procedure. Ongoing fluid level monitoring indicates that hydraulic control continues to be maintained as predicted by the transient models within the 2020 GW Modeling Report.

2024 Future Groundwater Pumping Scenario

In 2024, the 2019 GW Flow Model was used as a tool to support hydrogeologic investigations of select recovery wells located within the ExxonMobil-owned property located at 400 Kingsland Avenue in Brooklyn, New York (Kingsland Yard). The simulations completed in 2024 used the 2019 GW Flow Model to evaluate potential drawdown under hypothetical future groundwater extraction rates at the EMGPRP Site. The simulated drawdown scenarios were subsequently utilized in an effort to evaluate potential future hydraulic control based on the different simulated recovery well operation scenarios. The future model simulations provided in this letter are hypothetical for preliminary evaluation and do not represent definitive plans for future operation. The modeled results will be utilized as one line of evidence to complement empirical recovery data collected at the Site when evaluating the future plans for operating recovery wells at the Site.

The transient model was simulated for a time period between 2007 and 2047, with a removal of nine recovery wells between January 2021 and April 2027 and addition of two recovery wells (RW-16R and RW-30) in April 2025. The recovery wells selected for removal in this scenario were recovery wells RW-D, RW-E, RW-K, RW-16, RW-22, RW-23, RW-27, RW-28, and RW-29. RW-16 and RW-29 were removed to allow for the future redevelopment and beneficial reuse of Kingsland Yard. The remainder of the wells were selected for removal based on the most current evaluation of recovery operations and consideration of the Recovery Well Shutdown Procedure. The replacement well for RW-16 (i.e., RW-16R) and the new recovery well (RW-30) were both added to the simulation in order to evaluate hydraulic control within Kingsland Yard. Pumping rates were increased at other recovery wells as the nine wells were removed over time. The pumping rates for the future scenario are provided on Figure 3.

Particle tracking for the nine recovery well removal and two recovery well addition scenario (Figure 3) was conducted in an effort to evaluate future groundwater flow paths predicted by the model simulation and evaluate potential hydraulic control. Particle tracking suggests that hydraulic control within the Modeled Area would still be maintained following the hypothetical removal of the nine recovery wells and addition of two recovery wells, as described above.

Should you have any questions, please do not hesitate to contact us.

Sincerely,

ROUX ENVIRONMENTAL ENGINEERING AND GEOLOGY, D.P.C.

Jacqueline Carames
Project Geologist

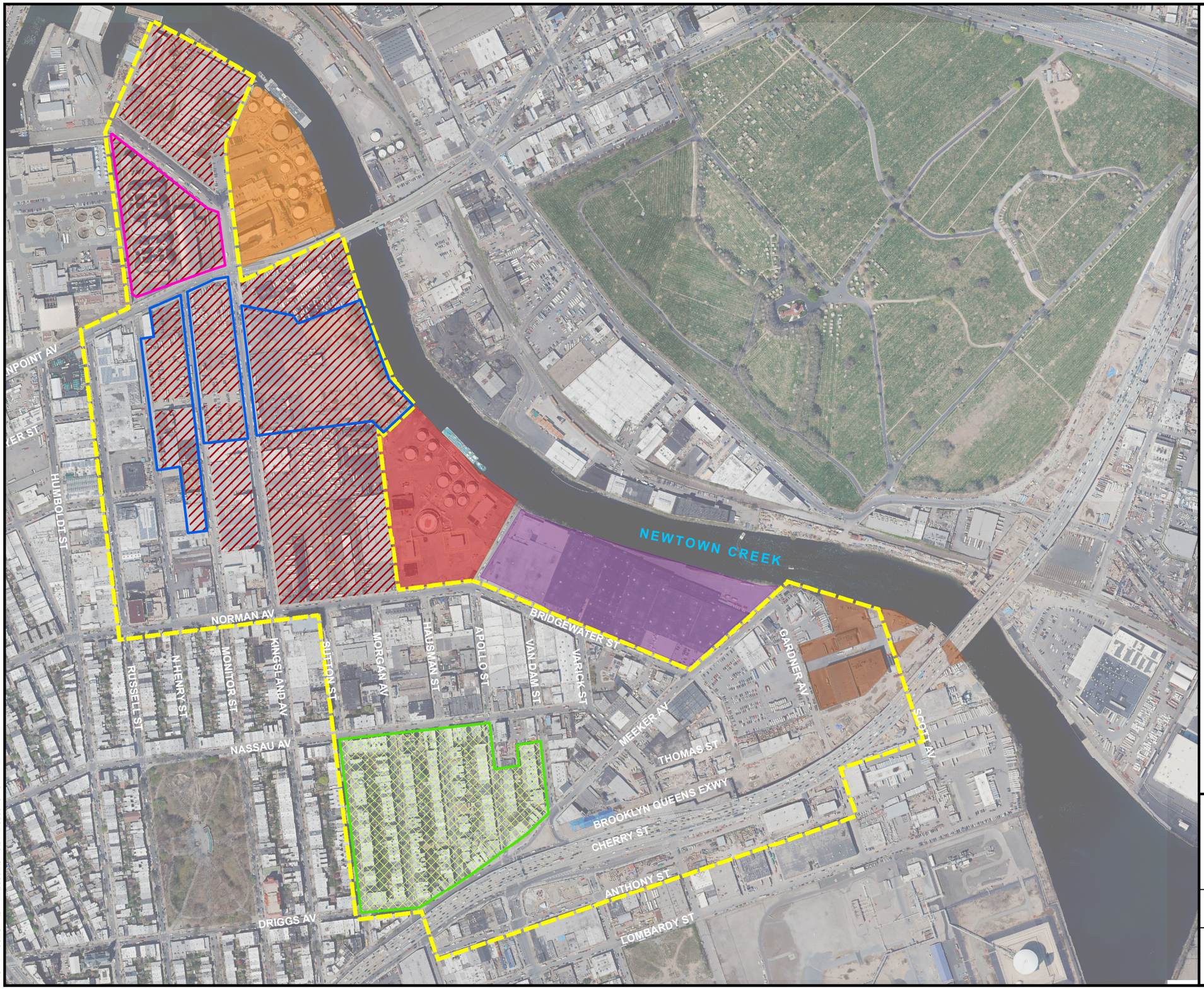
Courtney Lind
Senior Engineer

Andrew Baris, P.G.
Principal Hydrogeologist/
Executive Vice President

Attachments:

Figure 1 – Site Map
Figure 2 – Pumping Well Locations
Figure 3 – Particle Traces Under Future Hypothetical Pumping Rates

cc: Andrew G. Frank, Esq., New York State Office of the Attorney General
Deborah Gorman, NYSDEC
Michael Murphy, NYSDEC
Todd Ommen, Esq., Pace University School of Law
Richard Webster, Riverkeeper
Mike Dulong, Riverkeeper
Michael J. Burghardt, ExxonMobil
Dan Grapski, ExxonMobil
Rene Gonzalez, ExxonMobil
Christopher Proce, Roux Environmental Engineering & Geology, D.P.C.



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LEGEND

- FORMER BROOKLYN TERMINAL
- EMPIRE MERCHANTS (REMEDIATION UNDER CHEVRON MANAGEMENT)
- METRO TERMINAL (UNDER METRO MANAGEMENT)
- FORMER BP TERMINAL (UNDER KINDER MORGAN MANAGEMENT)
- HISTORICAL FOOTPRINT
- NEWTOWN CREEK WPCP (UNDER NYCDEP MANAGEMENT)
- RESIDENTIAL AREA
- WASTE MANAGEMENT
- EMGPRP SITE BOUNDARY

NOTES

NYCDEP - NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
EMGPRP - EXXONMOBIL GREENPOINT PETROLEUM REMEDIATION PROJECT
WPCP - WATER POLLUTION CONTROL PLANT

500 0 500'

Title:

SITE MAP

EXXONMOBIL
GREENPOINT PETROLEUM REMEDIATION PROJECT
GREENPOINT, BROOKLYN, NEW YORK

Prepared for:
EXXONMOBIL OIL CORPORATION
BROOKLYN, NEW YORK

ROUX

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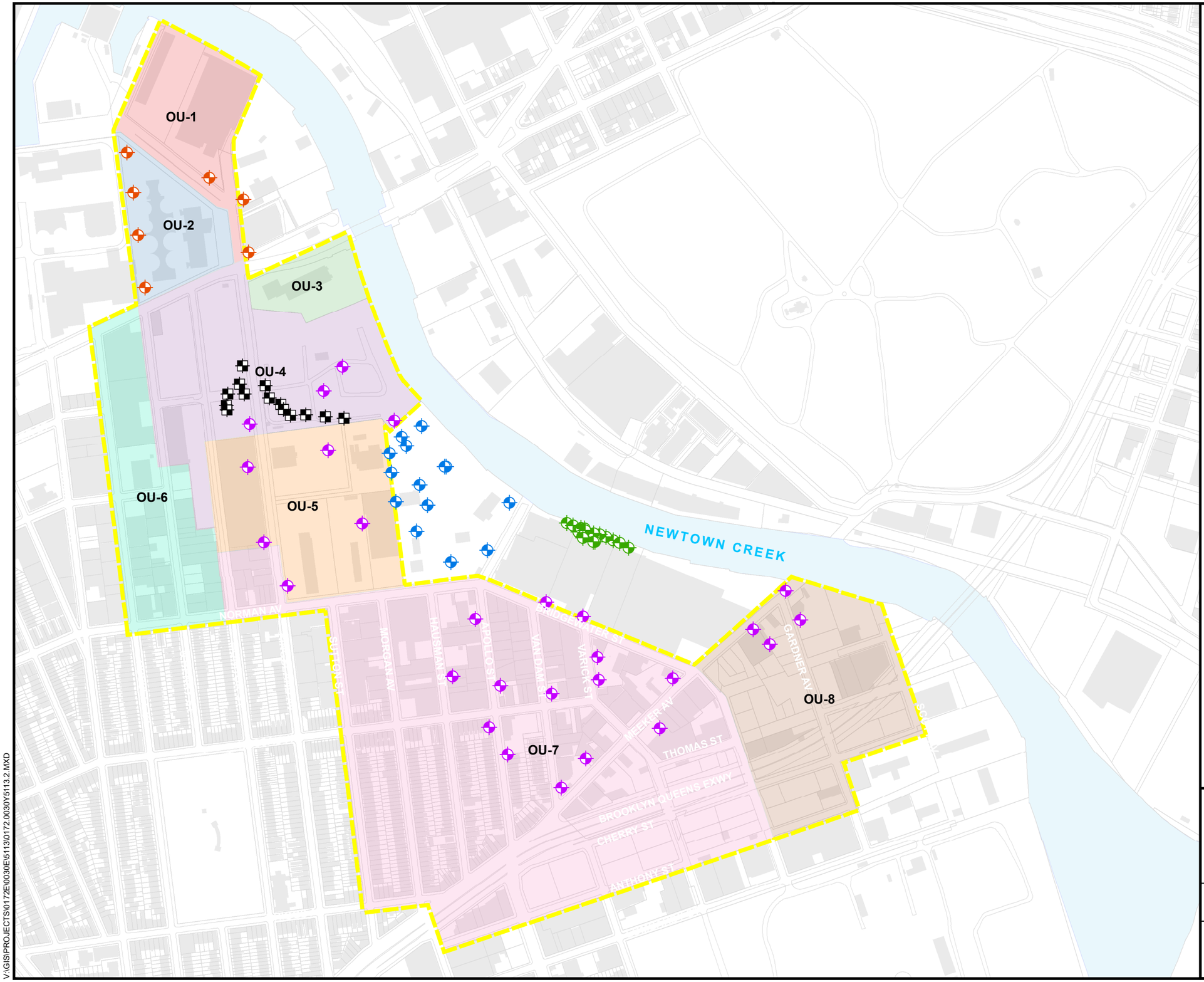

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LEGEND

- LOCATION OF PUMPING WELL OWNED AND OPERATED BY EXXONMOBIL
- LOCATION OF PUMPING WELL OWNED AND OPERATED BY CHEVRON
- LOCATION OF PUMPING WELL OWNED AND OPERATED BY KINDER MORGAN
- LOCATION OF PUMPING WELL OWNED AND OPERATED BY NYCDEP
- LOCATION OF WATERFLOODING INJECTION WELL OWNED AND OPERATED BY EXXONMOBIL
- EMGPRP SITE BOUNDARY

500 0 500'

Title:

PUMPING WELL LOCATIONS

EXXONMOBIL
GREENPOINT PETROLEUM REMEDIATION PROJECT
GREENPOINT, BROOKLYN, NEW YORK

Prepared for:
EXXONMOBIL OIL CORPORATION
BROOKLYN, NEW YORK

ROUX

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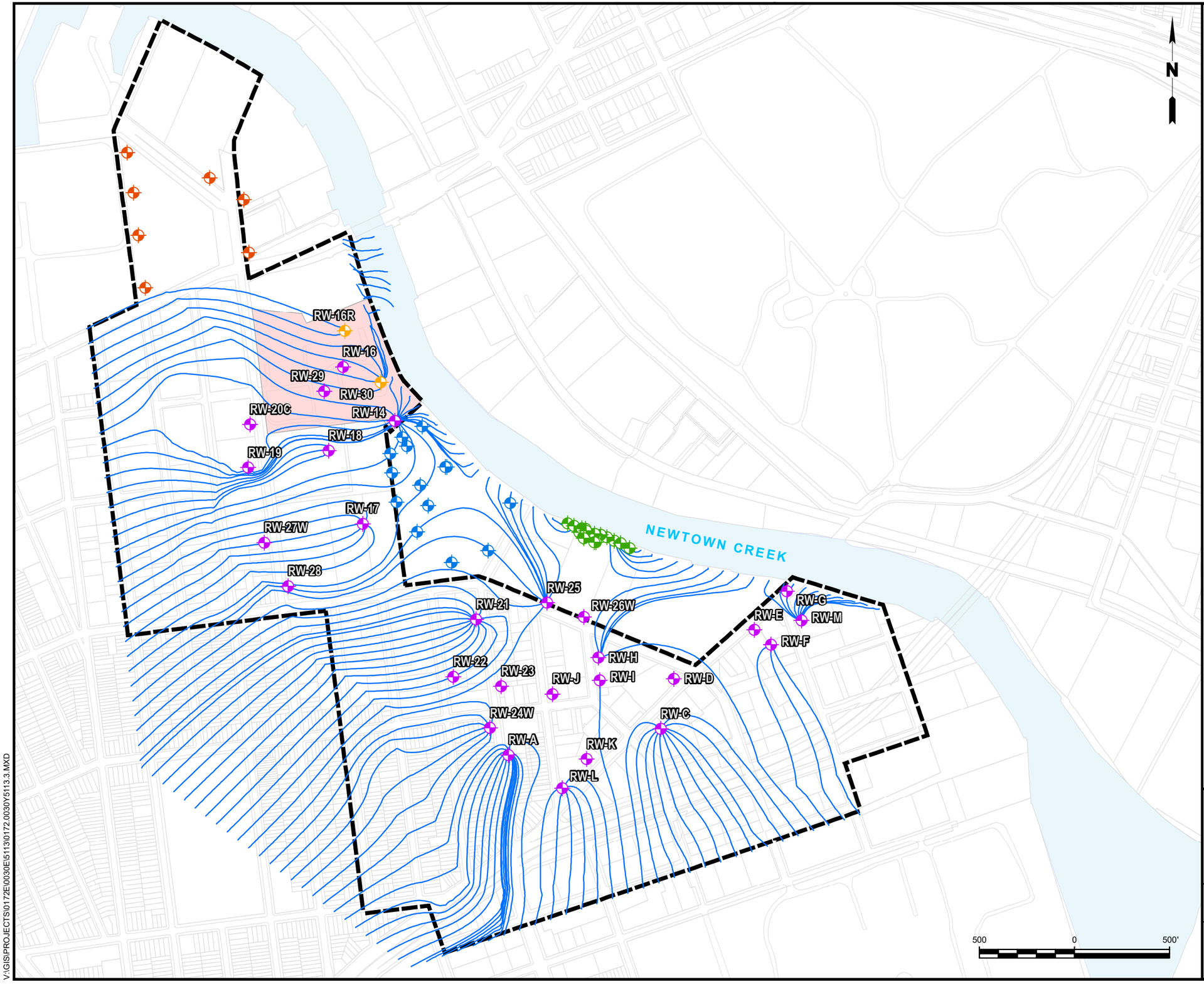

LEGEND

- LOCATION OF PUMPING WELL OWNED AND OPERATED BY EXXONMOBIL
- LOCATION OF POTENTIAL NEW RECOVERY WELL OWNED AND OPERATED BY EXXONMOBIL
- LOCATION OF PUMPING WELL OWNED AND OPERATED BY CHEVRON
- LOCATION OF PUMPING WELL OWNED AND OPERATED BY KINDER MORGAN
- LOCATION OF PUMPING WELL OWNED AND OPERATED BY NYCDEP
- MODELED GROUNDWATER PARTICLE TRACES
- APPROXIMATE EXTENT OF KINGSLAND YARD
- EMGPRP SITE BOUNDARY

Recovery Well	GPM
RW-14	50
RW-16	0
RW-16R	15
RW-17	65
RW-18	15
RW-19	0
RW-20	5
RW-21	70
RW-22	0
RW-23	0
RW-24	30
RW-25	50
RW-26	0
RW-27	0
RW-28	0
RW-29	0
RW-30	15
RW-A	30
RW-C	60
RW-D	0
RW-E	0
RW-F	50
RW-G	0
RW-H	50
RW-I	40
RW-J	0
RW-K	0
RW-L	45
RW-M	10

TOTAL COMBINED FLOW	600

NOTES

Potential reduction of nine recovery wells and one new recovery well simulated between 2007 and 2047

January 2021:	RW-E Off
February 2022:	RW-22 Off
April 2023:	RW-27 Off
April 2024:	RW-23 Off
April 2025:	RW-D, RW-16 AND RW-29 Off; RW-16R AND RW-30 On
April 2026:	RW-28 Off
April 2027:	RW-K Off

Title:

PARTICLE TRACES UNDER FUTURE HYPOTHETICAL PUMPING RATES

GREENPOINT PETROLEUM REMEDIATION PROJECT
GREENPOINT, BROOKLYN, NEW YORK

Prepared for:

EXXONMOBIL OIL CORPORATION
BROOKLYN, NEW YORK

ROUX

Compiled by: J.C.	Date: 03/28/24	FIGURE
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