FIFTH FIVE-YEAR REVIEW REPORT FOR MATTIACE PETROCHEMICAL CO., INC. SUPERFUND SITE NASSAU COUNTY, NEW YORK

Prepared by

U.S. Environmental Protection Agency
Region 2
New York, New York

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Date

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LIST OF ABBREVIATIONS & ACRONYMS

ARAR	Applicable or Relevant and Appropriate Requirement
AST	Above ground Storage Tanks
BCP	Brownfield Cleanup Program
BTEX	benzene, toluene, ethylbenzene, and total xylenes
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
EPA	United States Environmental Protection Agency
FFS	Focused Feasibility Study
FYR	Five-Year Review
ICs	Institutional Controls
IRIS	Integrated Risk Information System
ISTR	In-Situ Thermal Remediation
LNAPL	Light Non-aqueous Phase Liquid
MCL	Maximum Contaminant Level
MFP	Mattiace Facility Property
mg/kg	milligrams/kilogram
µg/L	micrograms/liter
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
OU	Operable Unit
O&M	Operation and Maintenance
PCE	Tetrachloroethylene
PRP	Potentially Responsible Party
RA	Remedial Action
RAO	Remedial Action Objectives
RD	Remedial Design
RI/FS	Remedial Investigation and Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager
SLERA	Screening Level Ecological Risk Assessment
SMP	Site Management Plan
SRI	Supplemental Remedial Investigation
SVE	Soil Vapor Extraction
TCE	Trichloroethylene
UST	Underground Storage Tanks
VOC	Volatile organic compound

I. INTRODUCTION

The purpose of a five-year review (FYR) is to evaluate the implementation and performance of a remedy in order to determine if the remedy is and will continue to be protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in FYR reports such as this one. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The U.S. Environmental Protection Agency (EPA) is preparing this FYR review, pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121, consistent with the National Contingency Plan (NCP) (40 CFR Section 300.430(f)(4)(ii)), and considering EPA policy.

This is the fifth FYR for the Mattiace Petrochemical Co., Inc. Superfund Site (Site). The triggering action for this policy review is May 22, 2020, the completion date of the previous FYR. The FYR has been prepared due to the fact that the remedial action (RA) will not leave hazardous substances, pollutants or contaminants on Site above levels that allow for unlimited use and unrestricted exposure, but requires five or more years to complete.

The cleanup work at the Site has been organized into six operable units (OUs) to facilitate implementation, as follows:

- OU 1 -Excavation of pesticide hot spot;
- OU 2 -Excavation and off-Site disposal of drums and contaminated soils;
- OU 3 -Extraction/treatment/reinjection of contaminated groundwater;
- OU 4 -*In-situ* vapor extraction of residually contaminated soil;
- OU 5 -Demolition and disposal of existing Site structures, including Aboveground Storage Tanks (ASTs) and Underground Storage Tanks (USTs); and
- OU 6 -Pumping/disposal of a floating product layer of light non-aqueous phase liquid (LNAPL).

Three of these OUs, OU3, OU4 and OU6, are the subject of this FYR. The remaining three OUs (OU1, OU2, and OU5) are not included in this FYR because all work has been completed.

The Site FYR was led by EPA remedial project manager (RPM) Ashley Similo. Participants included: Damian Duda (supervisor), Michael Scorca (hydrogeologist), Marian Olsen (human health risk assessor), Chuck Nace (ecological risk assessor), and Steven Petrucelli (community involvement coordinator). The potentially responsible party (PRP) was notified of the initiation of the FYR. The review began on August 6, 2024.

Site Background

The Site consists of the 1.9-acre former Mattiace Facility Property (MFP), located at 16 Garvies Point Road in Glen Cove, Nassau County, New York, and a groundwater plume that is contaminated with volatile organic compounds (VOCs) extending approximately 700 feet northwest from the former Mattiace facility property. A Site location map is provided in **Appendix A** as **Figure 1**.

Mattiace Petrochemical Company (Mattiace) began its operations in the mid-1960s with the storing, blending, repackaging and sale of organic solvents in 55-gallon drums. Operations ceased in September 1987. An underground tank farm, used for the storage of organic solvents, was located in the northeast

corner of the property. In the western part of the property, the M and M Drum Cleaning Company, owned by Mattiace, also operated at the Site until 1982. The company cleaned, pressure-tested and repainted drums in a metal Quonset hut located on the western portion of the property. Any liquid wastes were collected in a wet well and were periodically discharged to above-ground tanks or into an on-Site leaching pool.

The MFP is zoned Marine Waterfront District. The immediate area in the vicinity of the Site includes light industry, commercial businesses, a sewage treatment plant, a County public works facility, State and Federally designated hazardous waste sites and Brownfields properties. In addition, a large redevelopment project is underway in the immediate area which will include shops and residential buildings. Other land uses in the vicinity include marinas, yacht clubs, public beaches, and the Nassau County Garvie's Point Preserve (NCGP or the Preserve). There are also residences located just over 400 feet north of the former MFP.

EPA added the Site to the National Priorities List (NPL) on March 30, 1989.

FIVE-YEAR REVIEW SUMMARY FORM

SITE IDENTIFICATION		
Site Name: Mattiace Petrochemical Co., Inc. Superfund Site		
EPA ID: NYD000512459		
Region: 2	**State:** NY	**City/County:** Glen Cove/Nassau County

SITE STATUS	
NPL Status: Final	
Multiple OUs? Yes	**Has the site achieved construction completion?** Yes

REVIEW STATUS
Lead agency: EPA
Author name (Federal or State Project Manager): Ashley Similo
Author affiliation: EPA
Review period: 8/6/2024 – 1/6/2025
Date of site inspection: 10/9/2024
Type of review: Policy
Review number: 5
Triggering action date: 5/22/2020
Due date *(five years after triggering action date)*: 5/22/2025

II. RESPONSE ACTION SUMMARY

Basis for Taking Action

Soils

According to the Remedial Investigation (RI) Report, the primary contaminants of concern (COC) are tetrachloroethylene (PCE), trichloroethylene (TCE), xylenes and 1,4-alpha chlordane. See **Appendix B** for the full list of soil COCs included in the 1991 ROD**.**

EPA determined that the actual or threatened releases of hazardous substances from the Site could present a current or potential threat to human health and the environment through inhalation of particulates and/or vapors from contaminated soils, and dermal absorption of contaminated soils. The 1991 ROD calculated significant carcinogenic risks associated with prolonged exposure to contaminated soils on the MFP. Reasonable maximum exposure risks for adults were on the order of $3x10^{-3}$ for inhalation and $2x10^{-3}$ for dermal absorption, with even greater risks posed for sensitive populations, such as children. Adult non-carcinogenic risks from these types of exposures were also significant with hazard indices ranging from 6.3 for inhalation to 23 for dermal absorption. Inhalation risks were a result of airborn VOCs, and the dermal absorption risk was a result of SVOCs, namely pesticides in soils.

Groundwater

The groundwater contamination includes localized layers of LNAPLs under the Site. The COCs identified in the groundwater during the 1989 RI included PCE, TCE, chloroform, ethylbenzene, xylenes, methylene chloride, isophorone and 1,2-dichlorobenzene. A full list of groundwater COCs are shown in **Appendix C**. Concentrations observed were several orders of magnitude above federal and state drinking water standards. The area's potable water supply wells are not affected or threatened by the groundwater contamination from the Site.

EPA determined that the actual or threatened releases of hazardous substances from the Site could present a current or potential threat to human health and the environment through ingestion, inhalation or dermal absorption of contaminated groundwater (future residential land use scenario). The 1991 ROD calculated an adult carcinogenic risk from the exposure to groundwater directly beneath the site of $8x10^{-4}$ for groundwater ingestion (from a variety of VOCs), and $3x10^{-2}$ for dermal absorption. Adult non-carcinogenic effects were also significant, with hazard indices ranging from 4,730 for groundwater ingestion to 195 for dermal absorption.

Despite these risks, the area's potable water supply wells are not affected or threatened by the groundwater contamination from the Site.

Glen Cove Creek

The sediment and surface water monitoring program for Glen Cove Creek indicated that elevated levels of metals were found which exceed ecological screening values. Although the surface water and sediment data were evaluated, the Screening Level Ecological Risk Assessment (SLERA) concluded that there were no complete ecological pathways at the Site; and, therefore, the Site does not pose a risk to ecological receptors. It is very difficult to delineate and to quantify the constituents in the sediments which could be directly related to the Site given the documented releases of organic and inorganic chemicals from other facilities in the area. Radiological contamination that had been previously found in

the Creek sediments were attributed to releases from the nearby Li Tungsten Superfund Site and had been excavated as part of the Li Tungsten remedy between 2006 and 2008. The Creek is also periodically dredged for navigational purposes.

Response Actions

In February 1988, EPA conducted a removal action to remove approximately 100,000 gallons of hazardous materials in drums and in above ground storage tanks (ASTs) and underground storage tanks (USTs) from the MFP. In 1990, EPA conducted a second removal action to remove a collapsed retaining wall along the western property boundary, with subsequent regrading and replacement with a lower retaining wall.

In October 1989, EPA initiated a Sitewide remedial investigation and feasibility study (RI/FS). In December 1989, EPA conducted a focused feasibility study (FFS) to evaluate remedial alternatives for removing a cache of drums buried along the western perimeter of the property.

In September 1990, EPA issued the OU 2 ROD for buried drums, requiring excavation and off-Site disposal of the drums.

The 1990 OU 2 ROD established the following remedial action objectives (RAOs):

- Eliminate the threat of fire or explosion associated with the buried hazardous drums and containers; and
- Ensure protection of public health and the environment by eliminating a concentrated and toxic source of groundwater contamination.

EPA identified the following remedies for OU 2:

- Excavation, bulking/overpacking, and off-Site disposal of buried drums.

In June 1991, EPA issued the OU 1 ROD, selecting a comprehensive remedy for the remaining contamination issues at the Site. The OU 1 remedy components were subsequently organized into 5 OUs (OUs 1 and 3-6, described above) to facilitate the implementation of the work.

EPA established the following RAOs for the comprehensive Site remedy:

- Reduce the on-Site potential health effects associated with contaminated soils and residual leakage from underground tanks to acceptable levels;
- Minimize the off-Site migration of contaminated groundwater and surface runoff to potential environmental receptors; and
- Restore the groundwater, currently being degraded as a result of the Site, to its most beneficial use.

EPA identified the following remedies for the Site in the 1991 RODs:

- *In-situ* soil vapor extraction (SVE) of VOCs from soil in the general Site area;
- Excavation of pesticide hot spots with off-Site treatment and disposal;
- Demolition, removal, and landfill disposal of Site structures, ASTs and USTs, and concrete and

asphalt debris;
- Groundwater extraction and treatment via air stripping and carbon adsorption, followed by reinjection;
- Monitoring of groundwater in the area of the Site, as well as surface water and sediments in Glen Cove Creek; and
- Excavation and off-Site disposal of buried drums and containers that were found on the Mattiace property during the OU 2 investigation (Sept 1990 ROD).

In September 2014, EPA issued a ROD Amendment which identified the following RAOs for the selected remedy:

- Reduce to acceptable levels the risk to human health associated with potential ingestion, dermal contact with, and inhalation of VOCs in groundwater;
- Prevent LNAPL from acting as a continuing source of groundwater and soil gas contamination; and
- Restore the impacted aquifer to its most beneficial use as a source of drinking water by reducing contaminant levels to the Federal and State Maximum Contaminant Levels (MCLs) on the former Mattiace Property and north of the groundwater divide.

The selected remedy in the September 2014 ROD Amendment included:

- Discontinuance of the operation of the existing groundwater pump and treat system;
- Bioventing the residual source of contamination to groundwater, which consists of both free-phase LNAPL and LNAPL in the smear zone on the former MFP and extending west northwest onto the Nassau County Garvies Point Preserve property (Preserve). This remedy component will require the installation of new horizontal bioventing wells that would be connected to the existing vapor treatment system;
- *In-situ* thermal treatment of contaminated soil and nearby groundwater in "hot spot" areas of known elevated soil and groundwater contamination on the former MFP;
- Enhanced reductive bioremediation, utilizing vertical injection wells, in areas of the former MFP where thermal treatment does not address contamination and in the Preserve areas where elevated concentrations of VOCs have been detected in groundwater;
- Installation of a partial vertical containment barrier (*e.g.*, slurry wall and/or sheet pile wall) along the former MFP line, with the exception of the area north and west, where the depth to the underlying clay layer deepens and where nonaqueous-phase liquid is present;
- Hydraulic control, via phytoremediation, to address the potential increase in water levels on the southern portion of the former MFP behind the partial vertical barrier;
- Performance monitoring of groundwater to evaluate the effects of active remedial components on natural attenuation processes, to determine if contaminant migration is controlled, to monitor changes in the VOC contaminants over time, and to ensure the RAOs are acheived;
- Implementation of institutional controls (ICs) that will include the establishment of an environmental easement/restrictive covenants to be filed in the property records of Nassau County until such time that RAOs are attained. The ICs will a) prevent inappropriate withdrawals of groundwater; b) require evaluation of the need for vapor barriers and vapor intrusion systems for any future buildings that may be constructed on the former Mattiace facility Property; and c) prevent activities or uses of the property that might interfere with any of the treatment systems (including the barrier wall) that are in place at the Site;

- Development of a Site Management Plan (SMP) to ensure the effectiveness of the engineering controls and the ICs, as well as the long-term performance and groundwater monitoring, periodic reviews and certifications; and
- Development of a restoration plan for the Preserve.

A table of groundwater cleanup criteria can be found in **Appendix C**.

The ROD also indicated there would be sufficient ICs and health and safety protections in place, *e.g.,* fencing, posting of signs, security, etc., to minimize potential exposures on the Mattiace property while the RA activities are occurring. The conceptual Site plan for the remedial components is shown in **Appendix A Figure 2**.

Status of Implementation

OU 1 - Pesticides Hot Spots

RA activities for OU 1 included the excavation and disposal of three relatively small areas contaminated with pesticides and were completed by March 1995.

OU 2 - Buried Drum Removal

RA activities for OU 2 included the excavation and disposal of approximately 400 drum carcasses and adjacent contaminated soils on the western perimeter of the Site, between the former Quonset hut and the perimeter retaining wall and were completed in 1991.

OU 3 and 4 - Integrated Soil/Groundwater Collection and Treatment Facility

In August 1998, EPA and its contractors completed construction of the OU 3 and OU 4 integrated groundwater treatment facility. On September 1, 1999; after approximately a year of shakedown, the long-term response action (LTRA) began at the treatment facility. The facility's effluent discharges to Nassau County's publicly-owned treatment works. Monthly progress reports include sampling results for both treated air and treated groundwater. Biannual monitoring and reporting for soil vapor in the vadose zone and annual groundwater and Creek monitoring are also performed.

In July 2003, as part of a Consent Decree (CD) between EPA and numerous potentially responsible parties (PRPs), the operation of the facility was taken over by TRC Environmental (TRC) acting on behalf of the PRPs. Since then, TRC implemented several major process and operational modifications, including the introduction of carbon adsorption for organic vapor treatment and pulse pumping the SVE system to optimize results.

Contaminated groundwater and associated subsurface soil vapor continue to require remediation. The OU 3 and 4 treatment facility was fully operational from September 1999 until 2011, when the systems were shut off to conduct the secondary RI. To date, the system has removed an estimated 10,000 pounds of VOCs from groundwater and soil since startup. In January 2010, as a result of some inefficiencies with the groundwater treatment facility, TRC submitted a draft FFS to evaluate the feasibility of replacing the existing remedy with a combination of phytoremediation with perimeter air sparging, which is intended to control the migration of and treat contaminants while the trees initially grow. After reviewing the FFS, EPA determined that a supplemental RI/FS was necessary in order to evaluate current Site conditions and alternative technologies for remediation. Between September 2011 and May

2013, TRC completed the supplemental RI and FS. In September 2014, as a result of the supplemental RI/FS, EPA issued a ROD Amendment which modified the selected remedy as described above.

TRC implemented the amended remedy while negotiations of the modified CD were ongoing. In September 2016, TRC began implementation of the selected remedy. A CD Amendment was executed in June 2018.

Partial Vertical Containment Barrier

Between July 17 and November 2, 2017, the following remedial activities were conducted:

- Partial vertical containment barrier was constructed
- Excavation and off-Site disposal/recycling of various debris;
- Excavation and stockpiling of contaminated soil, an underground storage tank (UST), and buried drums; sealant application;
- Driving, cutting, and surveying interlocked sheet-piles;
- Utility bedding and reconnection;
- Restoration activities; and
- Noise, vibration, and settlement monitoring.

Thermal Remediation

Between March 12 and November 5, 2018, the In-Situ Thermal Remediation (ISTR) system was constructed, including the installation of the various subsurface components (electrodes, vapor recovery wells and performance monitoring wells), off-Site disposal/recycling of construction waste and debris and off-Site disposal of approximately 28.35 tons of hazardous waste. The ISTR system was operational from November 2018 to June 2019. Results indicated a probable hot spot located in the horizontal area of Treatment Zones 3 and 4 that was located outside of the treatment zone. In order to address the contamination, a limited soil excavation was conducted in the area between January 13 and 24, 2020.

During the backfilling, a total of 15 gallons of Regenesis HRC® were mixed and applied from 35 feet bgs to 20 feet bgs to enhance ongoing biological reductive dichlorination of chlorinated VOCs. A Remedial Action Completion Report for In-Situ Thermal Remediation was finalized in August 2020. Groundwater temperatures continued to be monitored post thermal treatment. To facilitate the biological degradation occuring as a result of the favorable elevated groundwater temperature, USEPA approved an Enhanced In-Situ Bioremediation (EISB) Work Plan in May 2023. Between May 22 and 26 and May 30 and 31, 2023, TRC performed sodium lactate injection activities, in accordance with the EISB Work Plan. A total of approximately 4,450 pounds of sodium lactate, mixed with 49,500 gallons of water, was injected into monitoring wells MW-11B, TRC-PM-MIP-11B, MW-21B, and TRCPM- MIP-27B to treat elevated concentrations of chlorinated VOCs in groundwater.

Bioventing

The primary objective of the bioventing system is to remediate the residual LNAPL as an ongoing source of groundwater contamination by inducing air-flow into the unsaturated zone and enhancing biological degradation. The 100% Remedial Design of the Bioventing System was finalized in September 2020, and a Remedial Action Work Plan for the Bioventing System was finalized in May 2021. Construction of the bioventing remedy commenced in 2021, and operation of the bioventing

system began on May 25, 2022. The system remains operational and monitoring indicates that contamination continues to be treated.

OU 5 -Site Demolition/Decommissioning

RA activities for OU 5 included the demolition of all existing Site structures, including ASTs and USTs, piping, and sumps, as well as above-ground structures such as the Quonset hut and loading dock.

OU 6 -Floating Product Removal

An interim RA activity for OU 6 included the removal of LNAPL with a skimmer pump located in the northeast corner of the property; upon commencement of construction activities for OUs 3 and 4, in the fall of 1997, this activity was discontinued. In June 2009, hand-bailing of LNAPL began and was found to be much more effective in removing LNAPL than the OU 6 skimmer pump. However, hand-bailing of LNAPL was discontinued after the ROD Amendment was finalized and included an alternative remedy to treat LNAPL through bioventing.

IC Summary Table

Table 1: Summary of Planned and/or Implemented ICs

Media, engineered controls, and areas that do not support UU/UE based on current conditions	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s)	IC Objective	Title of IC Instrument Implemented and Date (or planned)
Groundwater	Yes	Yes	Mattiace Property and groundwater plume area	Prevent inappropriate withdrawal of groundwater	Nassau County Public Health Ordinance Article 4, New York Environmental Conservation Law Section 15-527, and New York Sanitary Code (Title 10 of the New York Code of Rules and Regulations Section 5-2.4)
Soil Vapor	Yes	Yes	Former Mattiace facility Property	Evaluate the need for vapor barriers and vapor intrusion systems for any future buildings constructed	Environmental Easement/Restrictive Covenants (planned once the remedy is complete, estimated to be 9/30/2028)
Remedial Components	Yes	Yes	Former Mattiace facility Property, barrier wall and well locations	Prevent activities or uses of the property that might interfere with any of the treatment systems	Environmental Easement/Restrictive Covenants, Site Management Plan (planned once the remedy is complete, estimated to be 9/30/2028)

Systems Operations/Operation & Maintenance

The groundwater treatment system has remained inactive since 2014. However, groundwater monitoring continues during the design and implementation of the amended remedy. Subsequently, an updated operations and maintenance (O&M) plan will be developed.

O&M activities associated with the containment barrier include inspection of the fencing and containment barrier and monitoring of groundwater elevations in piezometer pairs.

O&M activities are ongoing while the bioventing system remains operational. The bioventing system is periodically monitored for various parameters (including vacuum pressure) to confirm the bioventing system is operating as designed. Additionally, subsurface in-situ respiration testing is performed to monitor bioventing progress. As biodegradation progresses and LNAPL reduction is realized across certain areas of the treatment zone, the manifold is used to adjust which wells serve as extraction wells in order to target areas of residual LNAPL. Various air effluent and condensate parameters (including VOC concentrations, airflow, temperature, etc.) are monitored to quantify recovered VOC mass and confirm the air emissions comply with applicable requirements. Maintenance activities may be performed on the blowers, vapor recovery system, vapor treatment system, bioventing wells, and related equipment.

Remedy resilience has been assessed, and the performance of the remedy is currently not at risk due to the expected effects of sever weather events in the region and near the Site. Please see **Appendix D** for additional details.

III. PROGRESS SINCE THE LAST REVIEW

Table 2: Protectiveness Determinations/Statements from the 2020 FYR

OU #	Protectiveness Determination	Protectiveness Statement
3	Will be Protective	The remedy for OU 3 (groundwater contamination) is expected to be protective of human health and the environment upon completion. In the interim, remedial activities completed to date have adequately addressed all exposure pathways that could result in unacceptable risks in these areas because local and State laws exist to restrict contaminated groundwater withdrawals from the underlying aquifer for potable water purposes.
4	Will be Protective	The remedy for OU 4 (soil/soil vapor contamination) is expected to be protective of human health and the environment upon completion. In the interim, remedial activities completed to date have adequately addressed all exposure pathways that could result in unacceptable risks in these areas because surface soils are not contaminated, and soil vapors have not been found inside residences.
6	Will be Protective	The remedy for OU 6 (LNAPL contamination) is expected to be protective of human health and the environment upon completion. In the interim, remedial activities completed to date have adequately addressed all exposure pathways that could result in unacceptable risks in these areas. Exposure is under control through the depth of contamination and local and State laws that exist to restrict installation of new wells and contaminated groundwater withdrawals from the underlying aquifer for potable water purposes.
Sitewide	Will be Protective	The remedy is expected to be protective of human health and the environment upon completion. In the interim, remedial activities completed to date have adequately addressed all exposure pathways that could result in unacceptable risks in these areas and no exposures to Site contaminants are expected as long as the engineering, access, and ICs discussed in this report continue to be properly operated, monitored and maintained.

There were no issues that required recommendations and follow-up actions identified during the previous FYR. However, the following suggestions were identified as “Other Findings”:

- Implement remaining components of the selected remedy.
- Perform additional investigations at the properties south of the Site.

In-situ thermal treatment was completed in 2020. The Bioventing system has been operating since May 2022. Post ISTR enhanced biological amendment injections were completed in May 2023, as described above. Additional amendment injections will be considered after completion of the bioventing remediation. The phytoremediation remedial component also remains to be implemented. While additional remediation may occur with the phytoremediation, the primary goal of this phyto remediation effort would be to maintain hydraulic control on the southern portion of the MFP.

The property south of the Site is undergoing remediation through the Brownfield Cleanup Program (BCP). 1 Garvies Point LLC is the BCP Volunteer. A RI was conducted in January/February 2020, with a Supplemental RI in July-October 2021. A Remedial Action Work Plan is anticipated to be completed in December 2025 and implemented in 2026.

IV. FIVE-YEAR REVIEW PROCESS

Community Notification, Involvement & Site Interviews

On August 7, 2024, the EPA Region 2 posted a notice on its website indicating that it would be reviewing site cleanups and remedies at Superfund sites in New York, New Jersey, and Puerto Rico, including the Mattiace Petrochemical Co., Inc. Superfund site. The announcement can be found at the following web address: https://www.epa.gov/superfund/R2-fiveyearreviews.

In addition to this notification, the EPA Community Involvement Coordinator, or CIC, for the Site posted a public notice on the EPA Site webpage https://www.epa.gov/superfund/mattiace-petrochemical and provided the notice to the City of Glen Cove by email on 12/20/24 with a request that the notice be posted in municipal offices and on the village/town webpages. Inc. Superfund Site to ensure that the cleanup at the Site continues to be protective of people's health and the environment. Once the FYR is completed, the results will be made available at the following repository: the U.S. EPA Records Center, 290 Broadway, 18th floor, New York, New York. In addition, the final report will be posted on the following website: https://www.epa.gov/superfund/mattiace-petrochemical. Efforts will be made to reach out to local public officials to inform them of the results.

No interviews were conducted during the FYR process.

Data Review

Several rounds of groundwater samples were collected from select monitoring wells during 2020, 2021, 2022, and 2023. Numerous VOCs were detected, including PCE, TCE, cis-1,2-DCE, and VC, BTEX compounds (benzene, toluene, ethylbenzene, total xylenes) and other VOCs (1,1,1- trichloroethane, 1,2-dichlorobenzene, chloroform, and 2-butanone, etc.). Total targeted VOC concentrations generally have decreased but remain elevated in some areas. Trends of a few chemicals at selected wells are discussed below.

Well MW-07S (75.5 ft deep) is located west-northwest of the property, within the LNAPL zone. Concentrations of COCs at well MW-07S are slowly declining and are still present at highly elevated levels, likely due to the effects of residual phase LNAPL levels. For example, cis-1,2-DCE varied between 140,000 ug/L (2016) to 83,000 ug/L (2020), and rebounded to 110,000 ug/L (2023). Toluene decreased from 63,000 ug/L (2010) to 36,000 ug/L (2020) and rebounded to 54,000 ug/L (2023). Xylenes were as high as 22,700 ug/L (2012) and decreased to 9,300 ug/L in 2020 and rebounded to 10,800 ug/L (2023). These conditions are expected to improve as the bioventing remedy for LNAPL continues.

Well TRC-MW-34 (80 ft deep) is downgradient, further to the west. Chlorinated VOC (cVOC) concentrations have been highly variable but generally are higher than in 2013. During the most recent sampling in 2023, VOCs are lower than in 2022. Aside from a short-term increase in concentrations in 2021 and 2022, BTEX generally have also declined since 2016. Concentrations of xylenes decreased from 200 (2016) to 1.4 ug/L (2023); TCE rose as high as 3,200 ug/L (2022) and has fallen to 240 ug/L (2023) ; cis-1,2-DCE reached 3,200 ug/L (2022) and fell to 560 ug/L (2023); vinyl chloride ranged from 9.1 (2013) to 820 (2022) and has come down to 89 ug/L (2023); the maximum benzene concentration was 83 ug/L (2022) and it fell to 3.8 ug/L (2023).

Concentrations of VOCs at the further downgradient well TRC-MW-26D (79.8 ft deep) are significantly decreasing. Benzene decreased from 730 ug/L (2016) to 8.5 ug/L (2023); Xylenes dropped form 4,080 (2011) to 175 ug/L (2023); ethylbenzene declined from 1,100 ug/L (2011) to 23 ug/L (2023); and toluene declined from 8,700 ug/L (2018) to 180 ug/L (2023).

Wells TRC-MW-41 (70 ft deep) and TRC-MW-42 (137 ft deep) are the farthest downgradient wells to the west, near the leading edge of the groundwater contamination plume. In well TRC-MW-41, BTEX concentrations rose slightly in 2020 but have since declined. Toluene rose to 29 ug/L (2020) and has declined to 1 ug/L (2023). All the chemical concentrations at well MW-41 were below the groundwater standards in 2023. In well TRC-MW-42, following a slight spike in a few chemicals in 2019 and 2020, (toluene reached 16 ug/L (2020); maximum TCE was 12 ug/L (2019)), chemical concentrations have dropped to mostly non-detected levels in 2023.

On the property, well STMP-12 is located along the eastern boundary, near the central portion. VOC concentrations have declined significantly which indicate effective remediation in this area. Toluene declined from 130,000 ug/L (2018) to 2.6 ug/L (2023); xylenes declined from 3,050 (2018) to 1.6 ug/L (2023); vinyl chloride was 6,800 ug/L (2020) and dropped to 15 ug/L (2023); maximum cis-1,2-DCE was 19,000 ug/L (2018) and declined to 26 ug/L (2023); benzene reached 500 ug/L (2020) and dropped to 1.4 ug/L (2023).

Well MW-07R (25.2 ft deep) is in the southwest portion of the property. The concentrations of cis-1,2-DCE and vinyl chloride (VC) have been reduced significantly but remain elevated above groundwater criteria. Cis-1,2-DCE declined from 7,500 ug/L (2016) to 1,700 ug/L (2023); vinyl chloride from 5,600 ug/L (2011) to 930 ug/L (2023).

Results from the sampled wells indicate that elevated concentrations are still present in groundwater on and off the property. The ranges and trends of COC concentrations have been fairly variable over time. Bioventing continues and the potential for additional enhanced biological remediation injections will

continue to be evaluated to address remaining contamination. Monitoring of the groundwater well network will continue during and after the implementation of the various RAs.

Additionally, the installation of the vertical containment barrier should prevent future migration of any residual contamination remaining post excavation. EPA suggests that further evaluation of groundwater contamination and its potential sources south of the former Mattiace Property continue to be considered, especially as the Remedial Action at 1 Garvies Point Road progresses under the state Brownfields program.

Site Inspection

A FYR Site visit and inspection was conducted on October 9, 2024. The inspection team included: Ashley Similo, RPM and Chuck Nace, ecological risk assessor from EPA, Chris Englehart, project manager from NYSDEC, and Raymond Boyd, project manager and Joe Menniti, field operator from TRC. The purpose of the inspection was to assess the protectiveness of the remedy.

During the inspection, Mr. Boyd presented an overview of some of the remedial activities that had been conducted at the Site. The team walked around the Site property and observed the former groundwater extraction and treatment building, as well as the area where bioventing operations are being conducted. Also noted were additional well locations where optimization of the bioventing remedial activities will take place. Overall, no issues were identified during the inspection, nor were any corrective actions deemed necessary.

V. TECHNICAL ASSESSMENT

QUESTION A: Is the remedy functioning as intended by the decision documents?

Although the original remedy selected in the 1991 ROD made some progress towards meeting its objectives, it was previously determined not to be functioning as intended by the decision documents. Data suggested the time needed to achieve cleanup goals was greater than that which had been identified in the 1991 ROD. During 2013-2014, TRC completed a Supplemental RI (SRI) to delineate the groundwater and LNAPL plumes and characterize the existing Site conditions. An FS was performed, and a ROD Amendment was signed in September 2014.

The amended remedy, as described above, is in the process of being implemented. The partial vertical containment barrier was completed in 2018, which prevents the potential for contaminant migration. The in-situ thermal remediation was constructed and operational in 2019. Monitoring indicates that the effects of the thermal treatment were beneficial to the groundwater on the former MFP. Enhanced biological amendment injections were applied in 2023 for areas of elevated groundwater concentrations that remained on the former Mattiace property post-ISTR. Furthermore, design and construction of the bioventing treatment system to address the downgradient groundwater and LNAPL plume was completed, and operations of the bioventing treatment system began in May 2022 and continue to operate. Additional amendment injections will be considered after completion of the bioventing remediation. The phytoremediation remedial component remains to be implemented. While additional remediation may occur with the phytoremediation, the primary goal of the phytoremediation effort would be to maintain hydraulic control on the southern portion of the Property where there is little groundwater flow. IC’s, such as environmental easements/restrictive covenants, as well as a Site

Management Plan, also remain to be finalized. It is anticipated that the 2014 amended remedy will function, as intended, once all components have been implemented.

Currently, the Upper Glacial Aquifer (UGA) is not used as a drinking water source in this area and direct contact with on-Site groundwater is not a completed pathway, since all nearby residents are connected to a public water supply. In addition, County Ordinance Article 4 prohibits the installation of new private potable water systems in areas served by a public water supply precluding any future potable water well installations in this portion of the aquifer. The Property is currently zoned for Marine Waterfront District use, and residential development at the Site is not currently anticipated as remediation will continue for many years. The Property is not an active component of the City's revitalization plan for the Glen Cove Creek area. ICs, such as environmental easements/restrictive covenants, as well as a Site Management Plan, are anticipated to be finalized upon RA completion to protect the components of the remedy and to ensure that vapor intrusion is considered in any future development.

QUESTION B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?

The risk assessments for OU 2 and the 2013 SRI were based on residential exposure assumptions. Although the property is currently zoned Marine Waterfront District, the surrounding area is zoned to allow for residential use. The SRI was based on current residential exposure assumptions including updates to the toxicity values used in the previous HHRAs in 1990 and 1991.

Soils. The RAs at the Site to address RAOs for OUs 1, 2 and 5 have been completed including excavation of pesticide hot spot (OU 1); excavation and off-Site disposal of drums and contaminated soils (OU 2); and demolition and disposal of existing Site structures, including ASTs and USTs reducing potential direct exposures to surface soils (OU 5). Fencing, signs, and other measures have been installed at the Site to minimize potential exposures while remedial activities are ongoing.

Groundwater. Residents are not currently exposed to groundwater, since drinking water is provided through a municipal system. In addition, Nassau County Public Health Ordinance Article 4 prohibits the installation of new private potable water systems in areas that are currently served by a public water supply, which should effectively preclude any future potable water well installations in this portion of the UGA. Currently, consumption of drinking water is not a completed exposure pathway.

Vapor Intrusion. Treatment systems continue to operate to address contaminated groundwater and soil thus further reducing soil gas concentrations. Currently, there are no residential buildings on-Site where potential exposures to vapors through vapor intrusion is possible, so this pathway is not complete. In the event that future buildings may be constructed on the property, EPA will evaluate the need for vapor intrusion remediation.

Toxicity Values. Since the original ROD was signed, several chemicals have been identified for further toxicological review by the Agency through the Integrated Risk Information System (IRIS), EPA's consensus database for toxicity values. Inorganic arsenic is currently under review through the IRIS process, a Tier 1 source for toxicity information used in FYRs. Prior to the next FYR, the toxicity of inorganic arsenic will be re-evaluated to determine if there were any changes in toxicity information that would impact the protectiveness of the remedy.

In addition, the ROD Amendment identifies the MCLs among the RAOs. Updated toxicity values were

identified in the previous FYR for TCE and PCE. Based on these updates to the toxicity values, the MCLs remain protective.

Ecological. The previous FYR concluded that the remedy was protective of ecological receptors, primarily due to exposure pathways for soil and groundwater being incomplete for ecological receptors. This conclusion was also supported by the screening level ecological risk assessment (SLERA) that was completed as part of the evaluation for the ROD amendment. Based upon the current monitoring data and the Site visit that was conducted, the conclusion that the remedy is protective of ecological receptors remains valid.

QUESTION C: Has any other information come to light that could call into question the protectiveness of the remedy?

There is no other information that calls into question the protectiveness of EPA's remedies selected for this Site.

VI. ISSUES/RECOMMENDATIONS

Issues/Recommendations
OU(s) without Issues/Recommendations Identified in the Five-Year Review:
OU 3

OU(s): 4 and 6	**Issue Category:** Institutional Controls			
	Issue: Institutional controls have not been implemented.			
	Recommendation: Implement final institutional controls in the form of Environmental Easements/Restrictive Covenants once the site remedy is complete.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	PRP	EPA/State	9/30/2028

OTHER FINDINGS

In addition, the following are suggestions that were identified during the FYR which may improve performance of the remedy and accelerate closeout but do not affect current and/or future protectiveness:

- Implement remaining components of the selected remedy. As described above, post ISTR enhanced biological amendment injections were completed in May 2023, however, additional amendment injections will be considered after completion of the bioventing remediation. The phytoremediation remedial component also remains to be implemented. While additional remediation may occur with the phytoremediation, the primary goal of the phytoremediation effort would be to maintain hydraulic control on the southern portion of the Property where there is little groundwater flow.

- Further evaluation of groundwater contamination and its potential sources south of the former Mattiace Property continue to be considered, especially as the remedial action at 1 Garvies Point Road progresses under the state Brownfields program.

VII. PROTECTIVENESS STATEMENT

Protectiveness Statement(s)	
Operable Unit: 3	*Protectiveness Determination:* Will be Protective
Protectiveness Statement: The remedy for OU 3 (groundwater contamination) is expected to be protective of human health and the environment upon completion. Additional remedial components to be implemented include phytoremediation, possible additional amendment injections, as well as finalizing ICs. In the interim, remedial activities completed to date have adequately addressed all exposure pathways that could result in unacceptable risks in these areas because local and State laws exist to restrict contaminated groundwater withdrawals from the underlying aquifer for potable water purposes.	

Protectiveness Statement(s)	
Operable Unit: 4	*Protectiveness Determination:* Short-term Protective
Protectiveness Statement: The remedy for OU 4 (soil/soil vapor contamination) is protective of human health and the environment in the short-term. Remedial activities completed to date have adequately addressed all exposure pathways that could result in unacceptable risks in these areas because surface soils are not contaminated, and soil vapors have not been found inside residences. In order for the remedy to be protective in the long-term, IC's need to be finalized and implemented.	

Protectiveness Statement(s)	
Operable Unit: 6	*Protectiveness Determination:* Short-term Protective
Protectiveness Statement: The remedy for OU 6 (LNAPL contamination) is protective of human health and the environment in the short-term. Remedial activities completed to date have adequately addressed all exposure pathways that could result in unacceptable risks in these areas. Exposure is under control through the depth of contamination and local and State laws exist to restrict installation of new wells and contaminated groundwater withdrawals from the underlying aquifer for potable water purposes. In order for the remedy to be protective in the long-term, IC's need to be finalized and implemented.	

Sitewide Protectiveness Statement
Protectiveness Determination: Will be Protective
Protectiveness Statement: The remedy is expected to be protective of human health and the environment upon completion. Additional remedial components to be implemented include phytoremediation, possible additional amendment injections, as well as finalizing ICs. In the interim, remedial activities completed to date have adequately addressed all exposure pathways that could result in unacceptable risks in these areas and no exposures to Site contaminants are expected.

VIII. NEXT REVIEW

The next FYR report for the Mattiace Petrochemical Co., Inc. Superfund Site is required five years from the completion date of this review.

APPENDIX A – FIGURES

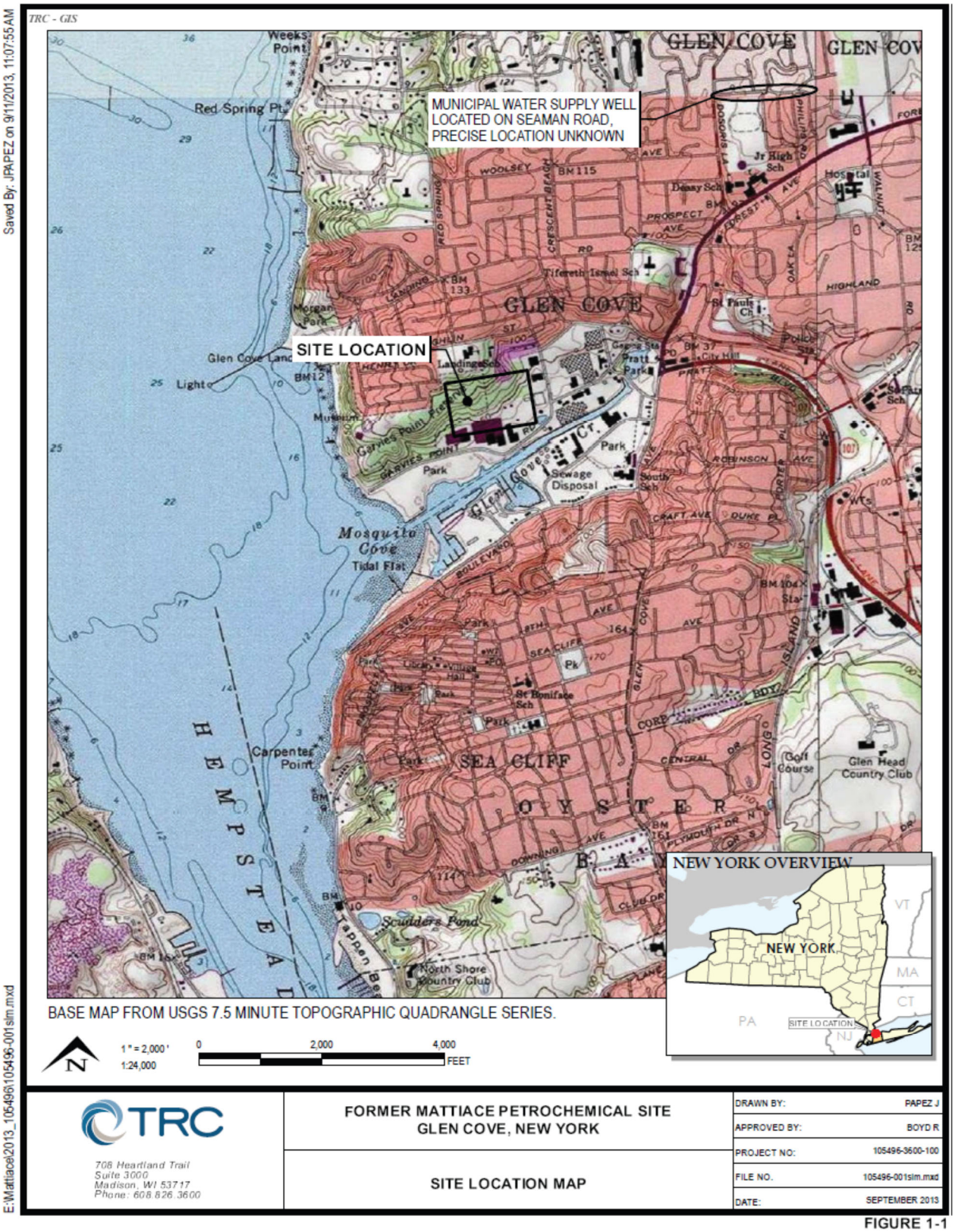

FIGURE 1-1

Figure 1

Figure 2

NASSAU COUNTY
GARVIES POINT PRESERVE
GLEN COVE COMMUNITY
DEVELOPMENT AGENCY
Existing Metal
Treatment Bldg
1 Garvies
Point Road
20-30 Garvies
Point Road
CONCEPTUAL VERTICAL
BARRIER LOCATION
LEGEND
LIF PROBE
GROUNDWATER MONITORING WELL
PIEZOMETER
GROUNDWATER EXTRACTION WELL
TEMPORARY WELL
VAPOR EXTRACTION WELL
AIR SPARGE WELL
PROPOSED BIOVENTING LOCATIONS
VERTICAL BIOVENTING / INJECTION WELL
VERTICAL BIOVENTING / EXTRACTION / INJECTION WELL
HORIZONTAL BIOVENTING WELL SCREEN
HORIZONTAL BIOVENTING WELL CASING
CONCEPTUAL VERTICAL BARRIER LOCATION
MIN. EXTENT OF FREE PHASE LNAPL
MAX. EXTENT OF FREE PHASE LNAPL
EXPECTED EXTENT OF RESIDUAL LNAPL
MAX. EXTENT OF RESIDUAL LNAPL
FORMER LEACHING POOL
FORMER UST
THERMAL TREATMENT AREA
PROPOSED ERH PROBE/SVE WELL
NOTES
1. BASE MAP IMAGERY PROVIDED BY NYS GIS CLEARINGHOUSE, PHOTOGRAPHY DATE: APRIL 2010.
2. MAP PROJECTION AND GRID COORDINATES ARE NAD83 STATE PLANE NY, LONG ISLAND, US SURVEY FEET.
3. GROUNDWATER ELEVATIONS FROM 10/22012.
4. UPON COMPLETION OF THERMAL TREATMENT A PHYTOREMEDIATION SYSTEM, AS DESCRIBED ON FIGURE 4-11, WOULD BE IMPLEMENTED.
0 50 100 Feet
1" = 100'
N
PROJECT: FORMER MATTIACE PETROCHEMICAL SITE
GLEN COVE, NEW YORK
SHEET TITLE: CONCEPTUAL SITE PLAN FOR
BIOVENTING, ENHANCED BIOREMEDIATION, THERMAL TREATMENT,
PARTIAL CONTAINMENT, AND PHYTOREMEDIATION
DRAWN BY: PAPEZ J
CHECKED BY: WARREN D
APPROVED BY: BOYD P
DATE: JANUARY 2014
SCALE: 1:1,200
DATE PRINTED:
PROJ. NO.: 105496-3600-100
FILE NO.: 105496-055FS.mxd
FIGURE 4-14
TRC
708 Heartland Trail, Suite 3000
Madison, WI 53717
Phone: 608.826.3600
www.trcsolutions.com
Coordinate System: NAD 1983 StatePlane New York Long Island FIPS 3104 Feet (Feet US)
Map Rotation: 0
Saved By: JPAPEZ on 1/30/2014, 1:45:59 PM
Path: E:\Mattiace\2013_105496\105496-055FS.mxd

APPENDIX B

1991 ROD Selected Constituents of Concern for Soils

Metals	**Volatiles**	**Semi-Volatiles**
Antimony	1,1,1-Trichloroethane	1,2-Dichlorobenzene
Arsenic	2-Butanone	1,4-Dichlorobenzene
Barium	1-1, 2-Dichloroethene	2-Methylnaphthalene
Beryllium	Chloroform	Aldrin
Cadmium	Ethylbenzene	Alpha Chlordane
Chromium	Tetrachloroethene	Heptachlor Epoxide
Lead	Toluene	Naphthalene
Manganese	Trichloroethene	
	Xylenes	

APPENDIX C

Summary of Potential Chemical-Specific Groundwater ARARS and TBCs and Selected Criteria

Chemicals	**Federal ARAR[1]**	**NY ARAR and (Groundwater Quality Standards)[3] and TBCs [4]**	**EPA Calculated Risk-Based Concentration[5]**	**Selected Criteria**
	ppb	**ppb**	**ppb**	**ppb**
Volatile Organic Compounds				
2-Butanone (MEK)	-	50	-	50
Chloroform	-	7	-	7
Cis-1,2-dichloroethene	70	5*	-	5*
1,2-dichlorobenzene	600	3	-	3
1,2-dichloroethane	5	0.6	-	0.6
Dichloromethane	5	-	-	5
Ethylbenzene	700	5*	-	5*
Tetrachloroethylene (PCE)	5	5*	-	5*
1,1,1-Trichloorethane	200	5*	-	5*
Trichloroethene (TCE)	5	5*	-	5*
Vinyl chloride	2	2	-	2
1,1-Dichloroethane	-	5	-	5
1,4-Dichlorobenzene	-	3	-	3
Benzene	5	1	-	1
Toluene	1,000	5	-	5
Xylene	10,000	5*	-	5*
Semi-volatile Organic Compounds				
Naphthalene	-	10	-	10
Bis(2-ethylhexylphthalate)	-	5	-	5
Pesticides				
4,4'-DDD	-	0.3	-	0.3
Metals				
		NY MCL[2]		
Manganese	-	300	430[6]	430
Arsenic	10	25	-	10
Cadmium	5	5	-	5
Cobalt	-	5	-	5
Iron	-	300	14,000	14,000
Nickel	-	100	-	100

*Principal Organic Contaminant standard
- No criterion established
[1] 40 CFR Part 141.
[2] 10 NYCRR 5-1.
[3] Groundwater Quality Standard - 6 NYCRR 703.
[4] NYC – TBC – from Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1 June 1998 last revised in 2004: Class GA Groundwater.

[5] EPA calculated concentrations based on the risk to human health for iron and manganese. The NY MCL is a secondary standard which is based on aesthetics.

[6] The IRIS RfD (0.14 mg/kg-day) used in the calculation of hazards includes manganese from all sources, including diet. The author of the IRIS assessment for manganese recommended that the dietary contribution from the normal U.S. diet (an upper limit of 5 mg/day) be subtracted when evaluating non-food (e.g., drinking water or soil) exposures to manganese, leading to a RfD of 0.071 mg/kg-day for non-food items. The explanatory text in IRIS further recommends using a modifying factor of 3 when calculating risks associated with non-food sources due to a number of uncertainties that are discussed in the IRIS file for manganese, leading to a RfD of 0.024 mg/kg-day. The non-cancer hazards calculated in this BHHRA were calculated using the IRIS RfD of 0.14 mg/kg-day which may underestimate the hazards by a factor of 5.8.

APPENDIX D
Remedy Resilience Assessment

In accordance with Region 2 practice, three tools were utilized to assess the Mattiace Site. Screenshots from each of the tools assessed are shown below.

The first tool used to assess the site was the *Climate Mapping for Resilience and Adaptation* (CMRA) Assessment Tool. The tool examined five for the county the Site falls within. According to this tool, the National Risk Index Rating for extreme heat is "Relatively Moderate." There is a slight projected increase of days per year with maximum temperatures >100°F, as shown in Figure E-1. However, increases in heat are not anticipated to impact the Site remedial activities in the near future. Two other hazards evaluated by this tool, drought and wildfire, have a National Risk Index Rating of "Relatively Low." Figures E-2 and E-3 show a slight increase in average annual total precipitation and a decrease in days per year with precipitation. Figure E-4 shows a "Relatively High" National Risk Index rating for flooding potential with an increase in annual days with precipitation over one inch. Flooding has not historically impacted the site or components of the remedy. As shown in Figure E-5, the percent of the county impacted by global sea level rise is 3% through the late century.

The second tool utilized is called Sea Level Rise. Glen Cove, New York is at a slight risk of flooding due to sea level rise or high tide flooding and is considered medium vulnerablility (Figure E-6). However, the location of the Site does not appear to be at risk.

The final tool utilized is called the USGS U.S. Landslide Inventory. As shown by Figure E-7, the area of the site is slightly vulnerable to landslides. However, there are no known incidents of landslides to date. Site conditions will continue to be monitored.

Based on this information, remedy resilience has been assessed, and the performance of the remedy is currently not at risk due to the expected effects of severe weather events in the region and near the Site.

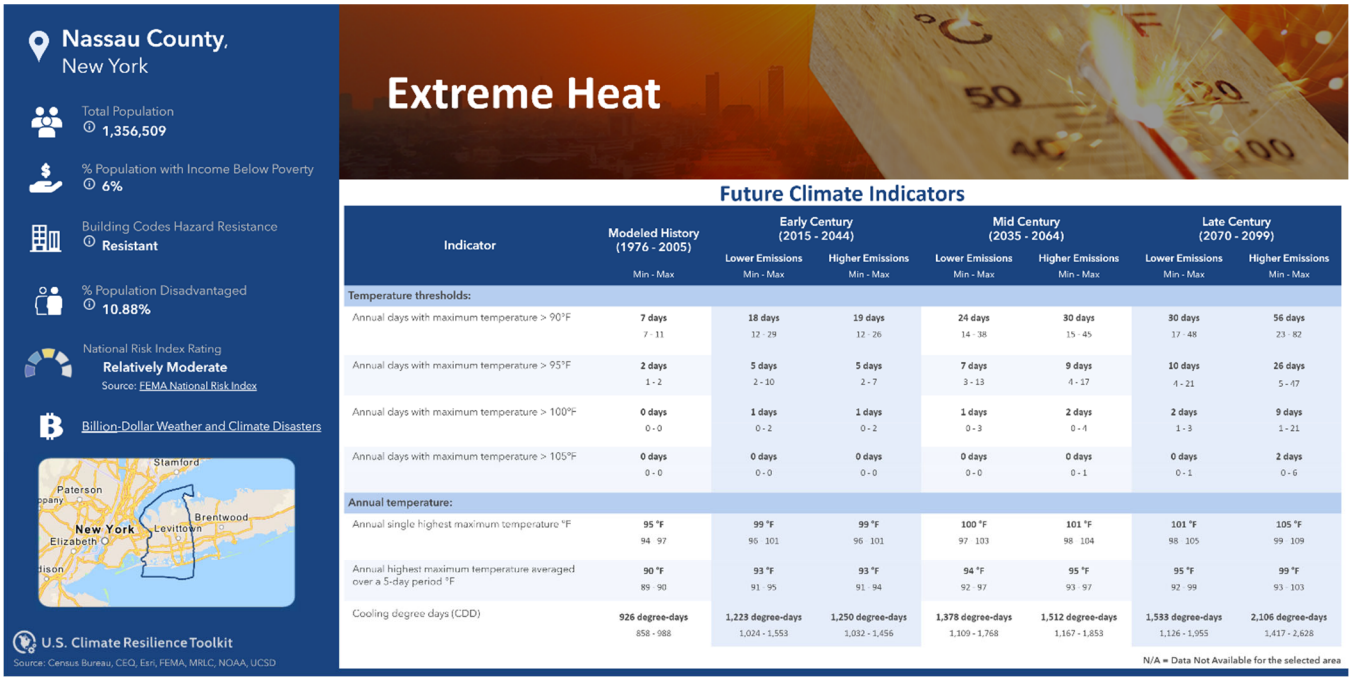

Figure E-1

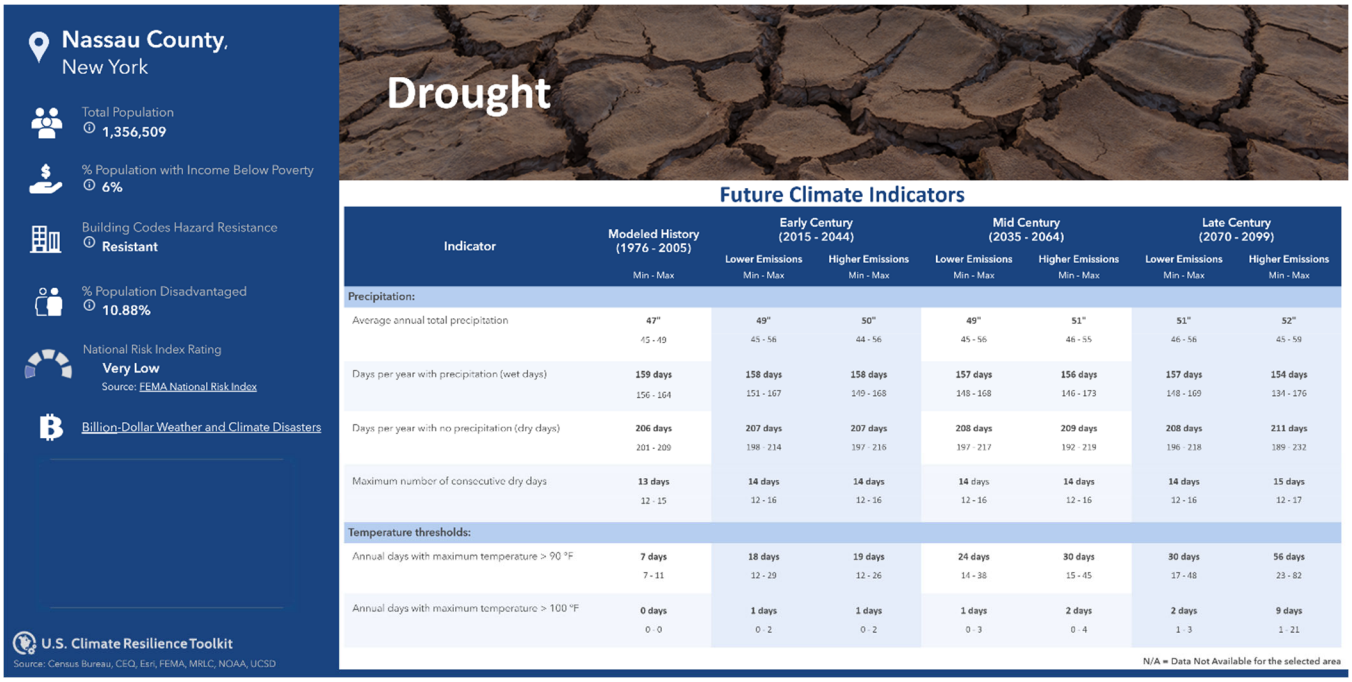

Figure E-2

Figure E-3

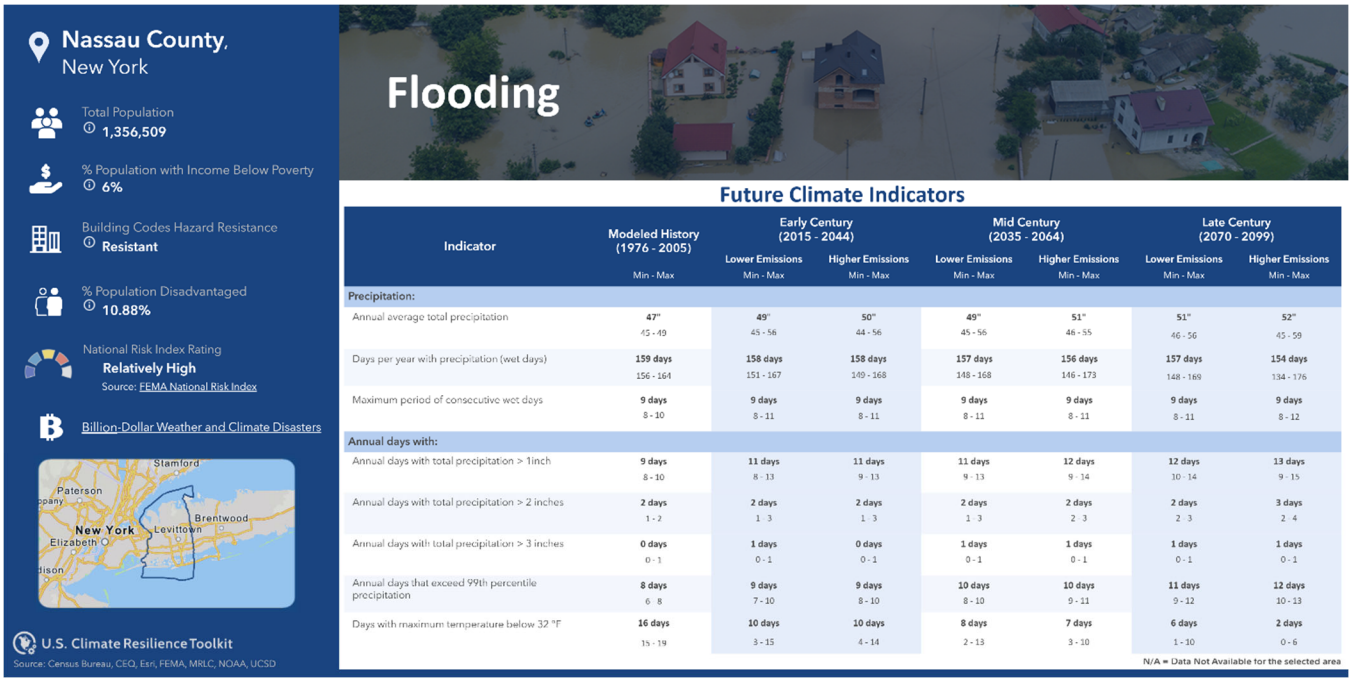

Figure E-4

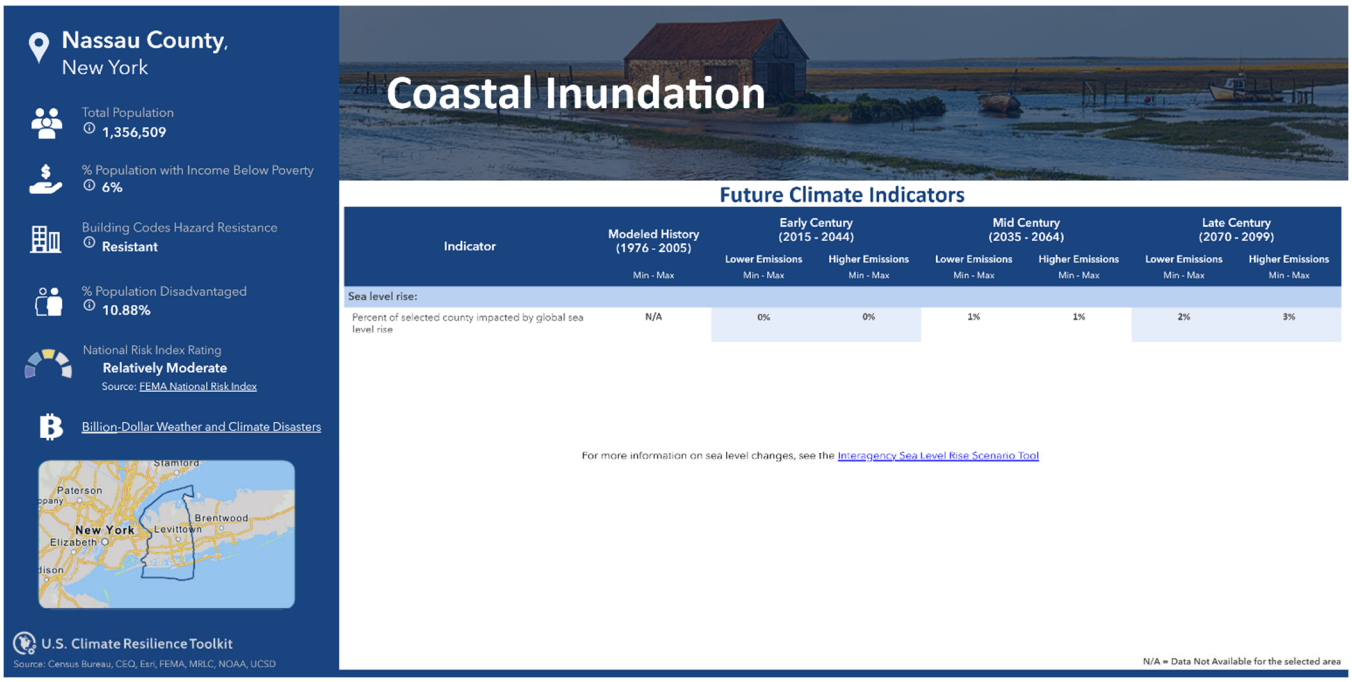

Figure E-5

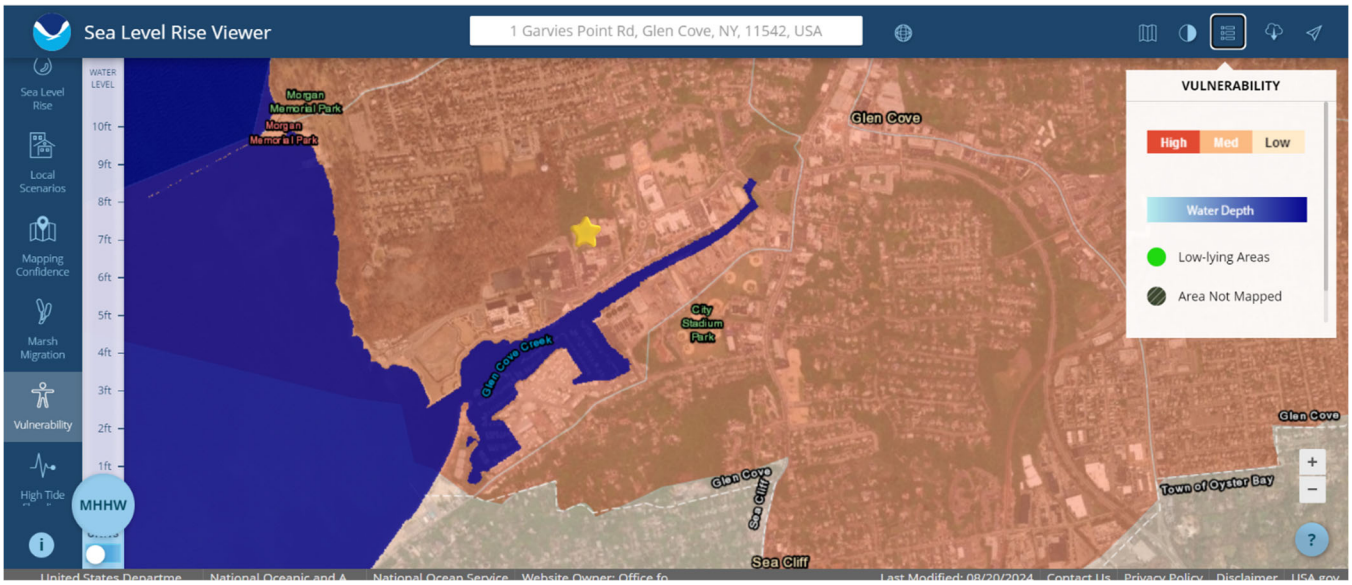

Figure E-6

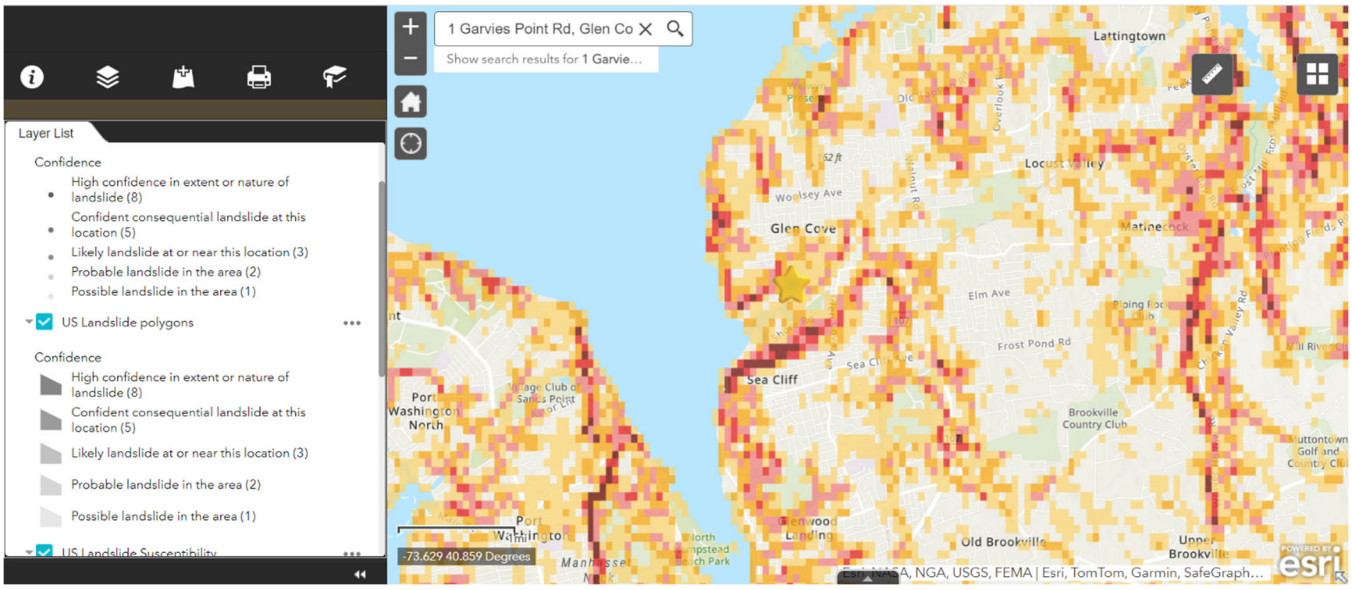

Figure E-7

APPENDIX E – REFERENCE LIST

Document	Date
Record of Decision for the Mattiace Superfund Site, Operable Unit 2 Drum Removal	September 27, 1990
Record of Decision for the Mattiace Superfund Site, Operable Unit 1 Comprehensive Sitewide Remedy	June 27, 1991
OU 1 Remedial Action Report	July 11, 1995
OU 5 Remedial Action Report	March 27, 1997
OU 3 and 4 Remedial Action Report	September 29, 2000
OU 2 final POLREP	March 31, 1992
Monthly Progress Reports for OUs 3 and 4	1999 to present
Semiannual and Annual Environmental Monitoring Reports for OUs 3 and 4	1999 to present
Draft Focused Feasibility Study TRC	January 2010
Second FYR Report	August 2010
Supplemental RI/FS	May 2013
ROD Amendment OU 2	September 2014
Third FYR Report	September 2015
Final Mattiace Barrier Wall Remedial Action Construction Completion Report	March 2018
Mattiace ISTR Remedial Action Construction Completion Report	August 2020
Fourth FYR Report	May 2020
Remedial Action Work Plan Bioventing System	May 2021
Bioventing Monthly Reports	May 2022-Present
Enhanced In-Situ Bioremediation (EISB) Work Plan	March 2023