

**THIRD FIVE-YEAR REVIEW REPORT FOR  
PJP LANDFILL SUPERFUND SITE  
JERSEY CITY, HUDSON COUNTY, NEW JERSEY**



**Prepared by**

**U.S. Environmental Protection Agency  
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**September 11, 2023**

**Date**

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## LIST OF ABBREVIATIONS & ACRONYMS

ACO	Administrative Consent Order
CCS	Waste Management of New Jersey, Inc. and CWM Chemical Service, LLC
CEA	Classification Exception Area
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	Contaminant of Concern
ECS	Ecological Screening Level for New Jersey
EPA	United States Environmental Protection Agency
FS	Feasibility Study
FYR	Five-Year Review
GWQC	Groundwater Quality Criteria for New Jersey
IC	Institutional Control
IRM	Interim Remedial Measure
LSRP	NJ Licensed Site Remediation Professional
MW	Monitoring Well
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NJDOT	New Jersey Department of Transportation
NJDEP	New Jersey Department of Environmental Protection
NPL	National Priorities List
O&M	Operation and Maintenance
OU	Operable Unit
PAH	Polycyclic Aromatic Hydrocarbon
PCBs	Polychlorinated Biphenyls
PDI	Pre-Design Investigation
PFAS	Perfluoroalkyl acids and polyfluoroalkyl acids
PFOA	Perfluorooctanoic acid
PFOS	Perfluorooctanesulfonic acid
ppb	part per billion
ppm	part per million
RI	Remedial Investigation
PRP	Potentially Responsible Party
RAO	Remedial Action Objectives
ROD	Record of Decision
RPM	Remedial Project Manager
SWQS	Surface Water Quality Standards for New Jersey
SVOC	Semi-Volatile Organic Compound
UU/UE	Unlimited Use and Unrestricted Exposure
VOC	Volatile Organic Compound
WRA	Well Restriction Area
VISL	Vapor Intrusion Screening Level

## 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 third FYR for the PJP Landfill Superfund Site (Site). The triggering action for this statutory review is the completion date of the previous FYR on September 27, 2018. The FYR has been prepared due to the fact that hazardous substances, pollutants or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure (UU/UE).

The Site consists of one operable unit (OU), which addresses the entire Site including soil, sediment, surface water and groundwater. The New Jersey Department of Environmental Protection (NJDEP) is the lead agency for the PJP Landfill Superfund Site.

This FYR was led by Renee Gelblat (EPA, Remedial Project Manager (RPM)). Participants included Haiyesh Shah (NJDEP Project Manager), Liana Agrios (EPA Hydrogeologist), Abbey States (EPA Human Health Risk Assessor), Abby DeBofsky (EPA Ecological Risk Assessor), Kyle Ganow (EPA Lawyer), and Shereen Kandil (EPA Community Involvement Coordinator). The relevant entities such as the PRPs, current property owners and NJDEP were notified of the initiation of the FYR. The FYR began on 11/22/2022.

### **Site Background**

#### *Physical Characteristics*

The Site is an inactive landfill located at 400 Sip Avenue, Jersey City, Hudson County, New Jersey. The Site occupies approximately 87 acres and is bordered on the north and west by the Hackensack River and on the southeast by Truck Route 1 and 9. The Site is bisected by the Sip Avenue Ditch which runs roughly northwest-southeast. The Sip Avenue Ditch is tidal along its entire length and conveys run-off from the Site property and the Jersey City stormwater/sewer system into the Hackensack River. The Pulaski Skyway, an elevated highway with support structures on the Site, runs roughly east-west above it. (Figure 1).

From about 1970 to 1974, the PJP Sanitary Landfill Company operated a commercial landfill which accepted chemical and industrial wastes. Although the landfill was closed in 1974, allegations of illegal dumping continued until 1984. From 1970 to 1985, there were frequent subsurface fires in a 45-acre portion of the area near the Hackensack River and under the Pulaski Skyway. The fires also produced substantial amounts of smoke which resulted in periodic closure of the Pulaski Skyway.

For more details related to the Site's background, physical characteristics, geology and land use please see the documents found on the Site Profile Page at [www.epa.gov/superfund/PJP-Landfill](http://www.epa.gov/superfund/PJP-Landfill).

## **FIVE-YEAR REVIEW SUMMARY FORM**

<b>SITE IDENTIFICATION</b>		
<b>Site Name:</b> PJP Landfill		
<b>EPA ID:</b> NJD980505648		
<b>Region:</b> 2	<b>State:</b> NJ	<b>City/County:</b> Jersey City/Hudson County
<b>SITE STATUS</b>		
<b>NPL Status:</b> Final		
<b>Multiple OUs?</b> No	<b>Has the site achieved construction completion?</b> Yes	
<b>REVIEW STATUS</b>		
<b>Lead agency:</b> State (NJDEP)		
<b>Author name (Federal or State Project Manager):</b> Renee Gelblat		
<b>Author affiliation:</b> EPA		
<b>Review period:</b> 11/22/2022-6/6/2023		
<b>Date of site inspection:</b> 5/16/2023		
<b>Type of review:</b> Statutory		
<b>Review number:</b> 3		
<b>Triggering action date:</b> 9/27/2018		
<b>Due date (five years after triggering action date):</b> 9/27/2023		

## **II. RESPONSE ACTION SUMMARY**

### **Basis for Taking Action**

Samples taken during and after the RI showed the presence of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, and inorganic substances in surface soil, subsurface soil, sediment from the Sip Avenue Ditch, groundwater, and air. EPA's risk assessment concluded that Site related contaminants in soil, sediments and groundwater posed a potential risk to human health. EPA's ecological risk assessment showed that chemical contamination at the Site was not expected to have significant impacts on plants or terrestrial wildlife but may be impacting aquatic life.

### **Response Actions**

In 1977, NJDEP issued an order to the PJP Sanitary Landfill Company to properly cover and grade the landfill and to remove wastes which were in contact with the Hackensack River and the Sip Avenue Ditch. The PJP Sanitary Landfill Company did not comply with that order.

The Site was put on the National Priorities List (NPL) on September 8, 1983. NJDEP was and remains the lead agency for remedial activities at the Site.

From 1985 to 1986, NJDEP took actions to mitigate the immediate threats. The landfill fires were extinguished, through the use of firefighting foam, and over one million cubic yards of material were recompact. Grossly contaminated soils were removed along with cylinders and drums containing hazardous materials. A fire break trench was installed, and 45 acres were regraded, capped, and reseeded. This 45-acre area is covered by the Interim Remedial Measures (IRM) cap. A gas venting system, consisting of 49 vents, was also installed. The IRM cap was completed in May 1986 and no fires have occurred since then.

In 1988, NJDEP contracted with ICF Technology, Inc. to perform a remedial investigation/feasibility study (RI/FS). The RI was completed in 1990. A supplemental sitewide monitoring event took place in 1993.

NJDEP, with EPA's concurrence, issued a Record of Decision (ROD) on September 28, 1995. The Remedial Action Objectives (RAOs) for the remedy are:

- Eliminate exposure to contaminated sediments in the Sip Avenue Ditch;
- Prevent additional contaminant influx into the groundwater via infiltration of rain water;
- Removal of contaminant sources that may impact groundwater; and
- Evaluate if future actions are necessary to mitigate the leaching of Site contaminants into the Hackensack River through monitoring and modeling to check the effectiveness of the remedy. If significant adverse impact is found, NJDEP and EPA will evaluate remedial alternatives and select an appropriate remedy in accordance with CERCLA and the NCP.

The major components of the ROD include:

- Removal of all known and suspected buried drum materials and associated visibly contaminated soil;
- Capping of the remaining landfill area of the site with a multi-layer modified solid waste cap in accordance with the NJDEP Bureau of Landfill Engineering Guidance with gas venting;
- Extension of the existing gravel lined ditch around the perimeter of the site to collect the surface water runoff;
- A passive or active gas venting system installed in the new portion of the cap (if an active system is deemed necessary, however, both areas will be included);
- Site fencing and institutional controls (e.g., declaration of environmental restriction and public information program);
- Quarterly inspection and maintenance, and a re-evaluation of the previously capped area;
- Replacement of the Sip Avenue ditch with an alternate form of drainage;
- Quarterly ground water monitoring to evaluate the reduction of contaminant

concentrations over time;

- Modeling to demonstrate the effectiveness of the cap by predicting the impact of ground water leachate migrating to the Hackensack River from the landfill;
- Because contamination levels in the ground water are above the Class IIA Ground Water Quality Criteria (GWQC), a Classification Exemption Area (CEA)/Well Restriction Area (WRA) will be established; and
- Implementation of a wetlands assessment and restoration plan. (The wetlands assessment will be performed prior to implementation of any of the remedial actions).

### **Status of Implementation**

In June 1997, NJDEP and two potentially responsible parties (PRPs), CWM Chemical Services, L.L.C. (CCSL) and Waste Management of New Jersey (WMNJ) collectively referred to as "CCS", entered into an administrative consent order (ACO). This ACO was amended in September 1997 and together these agreements are referred to as the original ACO for remedial design and remedial action (RD/RA).

The original ACO was amended in June 2000 (First Amendment) to implement the remedy selected in the ROD, as more specifically defined in the statement of work. The ACO was further amended in March 2008 (Second Amendment) to reflect the purchase of a portion of the Site by AMB, and again in June 2011 (Third Amendment), to reflect the purchase of another portion of the Site by Jersey City.

During the preliminary design investigation (PDI), the nature and extent of contamination at the PJP Landfill was better defined. In addition, more contaminated material, including over 10,000 full and partial drums were removed.

The Final Design Report for the cap and other elements of the remedy was approved by NJDEP and EPA on July 26, 2007. The beginning of construction of the remedy was delayed because outside parties began to show interest in purchasing and redeveloping the Site.

### ***Changes in Ownership of the Site and Implementation of the Remedy***

#### ***1) Area remediated and owned by AMB/Prologis***

On March 7, 2008, AMB bought approximately 52 acres of the Site (Figure 1). At that time, AMB assumed remedial obligations for their portion of the Site. In June 2011, AMB was purchased by Prologis, who assumed full responsibility for their portion of the Site. Prologis completed construction on their portion of the Site by July 2016.

#### ***2) Area remediated by CCS and now owned by Jersey City***

Shortly after AMB purchased a portion of the Site, the government of Jersey City expressed interest in obtaining the remaining 32 acres of the Site then owned by Edwin Siegel (Figure 1). To do so, NJDEP, Jersey City and CCS agreed that CCS would construct the landfill cap on the 32 acres, including underneath the Sip Avenue Ditch. Upon completion of the cap, Jersey City would take possession of the area and become responsible for all operation and maintenance activities.

CCS completed construction of this portion of the cap on January 5, 2012. The construction completion report (titled "Construction Quality Assurance Final Report") was approved by NJDEP

and EPA on May 18, 2012.

*3) Truck Stop Area (JC-TruckST+CheckCash+FuelST)*

Based on the findings in the RI report of October 2018, EPA and NJDEP determined that the Truck Stop Area has not contributed to contamination in the landfill. Therefore, EPA and NJDEP no longer consider the Truck Stop Area part of the Site. This area will not be included in future FYRs.

*4) New Jersey Department of Transportation (NJDOT) and the Pulaski Skyway*

The area under the Pulaski Skyway is owned by NJDOT. There were 2 small areas that did not have owners and on January 26, 2022, NJDOT took possession of these areas. Since the cap underlies the entire NJDOT property, the cap must be periodically inspected and maintained as necessary. O&M is performed for NJDOT by Prologis and Jersey City.

*5) Area now owned by Jay Dee Trucking*

Jay Dee Trucking bordered the Site and, over time, encroached on the Site by about three acres. When they were shown that they were now on the landfill cap, the owners agreed to become a PRP for the three acres. The Jay Dee Trucking owners are not responsible for historic soil and groundwater under the IRM cap. However, they would be responsible for any new contamination and are required to allow periodic inspections. There are no monitoring points on this property.

***Institutional Controls for the Site***

Since waste is left in place throughout the PJP Landfill Site, each current owner of a portion of the Site (Prologis, Jersey City, NJDOT and Jay Dee Trucking) is required to file a deed notice to inform the public of the presence of waste. They are also required to file paperwork to define a Classification Exception Area (CEA) and a Well Restriction Area (WRA) to restrict uses of the groundwater.

The status of these institutional control documents is:

*1) Institutional Controls by Jersey City*

A Deed Notice for Jersey City was recorded on May 30, 2013. On January 21, 2016, NJDEP approved the CEA/WRA for the Jersey City portion of the Site.

*2) Institutional Controls by Prologis*

A Deed Notice was recorded for Prologis on June 21, 2016, and a revised CEA/WRA was approved by NJDEP on December 4, 2021. The CEA/WRA was further revised on April 12, 2022.

*3) Institutional Controls by NJDOT*

On December 21, 2017, a Deed Notice was filed by NJDOT for a portion of their property.

NJDOT purchased another portion of the Site under the Pulaski Skyway on January 26, 2022. A new Deed Notice for the area under the Pulaski Skyway on the Jersey City portion of the Site is pending. After the deed notice is filed, a revised O&M plan will be submitted by Jersey City.

NJDOT is not required to establish CEAs for their properties. These areas are covered by exiting CEAs.

*4) Institutional Controls by Jay Dee Trucking*

The CEA/WRA for Jay Dee Trucking was approved on August 24, 2015, and the Deed Notice was filed on February 16, 2011.

## **IC Summary Table**

**Table 1:** Summary of Planned and/or Implemented ICs

<b>Media, engineered controls, and areas that do not support UU/UE based on current conditions</b>	<b>ICs Needed</b>	<b>ICs Called for in the Decision Documents</b>	<b>Impacted Parcel(s)</b>	<b>IC Objective</b>	<b>Title of IC Instrument Implemented and Date (or planned)</b>
Groundwater	Yes	Yes	Sitewide	Restrict installation of ground water wells and ground water use	CEA/WRAs established between August 18, 2010, and April 12, 2022 (see above for details)
Soil	Yes	Yes	Sitewide	Protect the integrity of the cap	Deed Notices were filed January 20, 2011 and December 21, 2017.

## **Systems Operations/Operation & Maintenance**

The Site's O&M plans include visual inspection of the landfill cap, quarterly sampling and analysis of groundwater, sediment and surface water. Groundwater is sampled for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and metals. Sediment and surface water are sampled and analyzed for metals and polycyclic aromatic hydrocarbons (PAHs). Landfill gas is monitored using a passive system on both portions of the Site. Recently, emerging contaminants of concern were added to the Site sampling list. Per- and polyfluoroalkyl substances (PFAS) were sampled the first time at the end of 2018 for groundwater and for surface water in 2020. Both media have been sampled quarterly for PFAS since 2021. Sampling for 1,4-dioxane began in July 2010. Repairs are made as necessary.

Dense non-aqueous phase liquid (DNAPL) continues to be recovered from well MW-12S. The mixture of water and free product collected from the well is stored in 55-gallon drums before being disposed of properly. Approximately five gallons of product are recovered from this well each year.

## **Evaluating Climate Change Risks**

Potential site impacts from climate change have been assessed, and the performance of the remedy is currently not at risk due to the expected effects of climate change in the region and near the site. This is specifically because:

- 1) The remedy consists of a landfill cap and some monitoring wells designed for the 100-year flood due to the Site's location along the Hackensack River. The 500-year flood was also considered for the design.
- 2) Part of the Site, the Sip Avenue Ditch, is underlain by the landfill cap and is tidal to the Hackensack. The ditch contains water most of the time and there have not been any problems with the integrity of the cap in the ditch, including after storms.
- 3) The respective O&M plans call for regular site inspections. In addition, the portion of the Site owned by Prologis is in use and has a security presence 24/7.
- 4) Superstorm Sandy (2012), which produced a historically high tidal surge, and Hurricane Irene (2011) did not impact the cap/remedy.

- 5) EPA will work with NJDEP and the PRPs to update their O&M plans to specifically include a requirement for site inspections after any major storm/flooding event.

Additional information relating to climate change is included in Appendix C.

### III. PROGRESS SINCE THE LAST REVIEW

**Table 2:** Protectiveness Determinations/Statements from the 2018 FYR

OU #	Protectiveness Determination	Protectiveness Statement
1	Protective	The remedy is protective of human health and the environment

There were no issues or recommendations in the last FYR.

### IV. FIVE-YEAR REVIEW PROCESS

#### **Community Notification, Involvement & Site Interviews**

On August 15, 2022, 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 PJP Landfill 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 (CIC) for the Site, Angely Melendez, posted a public notice on the EPA site webpage <https://www.epa.gov/superfund/pjp-landfill/> and provided the notice to the county by email on February 16, 2023 with a request that the notice be posted in municipal offices and on the village/town webpages. This notice indicated that a Five-Year Review (FYR) would be conducted at the PJP Landfill Site to ensure that the cleanup at the Site continues to be protective of human health and the environment.

Once the FYR is completed, the results will be made available at the following repository:

EPA Region 2 Records Center, 290 Broadway, 18<sup>th</sup> Floor, New York, NY. In addition, the final report will be posted on the following website: <https://www.epa.gov/superfund/pjp-landfill>. Efforts will be made to reach out to local public officials to inform them of the results.

#### **Site Inspection**

The inspection of the Site was conducted on 5/16/2023. In attendance from EPA were Renee Gelblat (RPM) and Jon Gorin; from NJDEP was Haiyesh Shah (Project Manager); from Sadat Associates, the consultant for Prologis were Lahbib Chibani and Nick Morgan; from Jersey City were Drew Banghart and Aaron Johnson along with Jersey City's consultants from Colliers Engineering including Bob Zelley, the NJ Licensed Site Remediation Professional (LSRP) for Jersey City, Nick DiVincent and Kurt Martin as well John Tregidgo from Dresdner Robins.

The cap, fences and the material overlying the cap on the Jay Dee Trucking Property, Prologis Property, and the areas owned by NJDOT are in good condition. Fences surrounding the Site, the

landfill cap and vegetation along the Sip Avenue Ditch were found to be in good condition. Monitoring wells also appeared to be in good condition.

However, on the Jersey City portion of the Site, EPA and NJDEP observed the following deficiencies:

1. Carbon at the passive vents had not been changed according to the O&M plan and needs to be changed immediately. Future carbon change must follow the frequency identified in the O&M plan and the NJDEP Air pollution Control Permit.
2. The vegetation cover had not been maintained. Jersey City is required to immediately perform mowing of the vegetative cover and removal of any debris, large weeds, and woody plant species from the cover.
3. On the JC Skypark Property North of Sip-Avenue ditch and West of Hartz Mountain Property, all representatives noticed unauthorized use of this area. Specifically:
  - o NJDOT's contractor, Skanska, and/or their subcontractors were found to be staging material, equipment, steel drums and trash on the capped landfill owned by the City of Jersey City and next to one of the groundwater monitoring wells. In addition, on top of the triangle-shaped area along the banks of the Hackensack River, EPA and NJDEP observed a flatbed tractor trailer and a tree of lights that are commonly used to illuminate highways during nighttime construction. Representatives from Jersey City immediately contacted police to remove the truck and lights.

NJDEP and Jersey City are working with NJDOT to remove the equipment and materials from the landfill cap, educate NJDOT employees and their contractor about the landfill cap and better define the property boundaries so that the integrity of the cap is maintained. Jersey City is also working to reseed the "road" from the NJDOT property to the top of the hill used by the flatbed trailer.

## **Data Review**

### *Groundwater:*

In general, the contaminants found in the groundwater, surface water, and sediments have been found throughout the Site. The contaminants of concern (COCs) in groundwater include benzene, chlorobenzene, PCE, iron, manganese, and 1,4-dioxane. The COCs found in surface water and sediments include PAHs and inorganics, principally benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluorine, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, arsenic, manganese, and copper. The details of recent sampling on each portion of the Site are described below. Sampling for PFAS began during this FYR period.

Synoptic water level data collected during this FYR period show that the average groundwater flow has radial components that flow towards the Hackensack River to the west, the Sip Avenue Ditch to the north, and Route 1 and 9 to the east. The groundwater at the Site nearest the Hackensack River is tidally influenced, which appears to affect the magnitude, not the direction, of flow on the majority of the Site.

During this review period, benzene has primarily been detected above the GWQS in the shallow aquifer, with a maximum concentration of 54.7 parts per billion (ppb) detected in MW-5SR2 in 2020. Benzene was also detected above the standard in monitoring wells MW-4SR, MW-1SR, and MW-9SR, but at concentrations considerably lower than MW-5SR2 (Figure 2). Note that monitoring wells MW-5SR and MW-4S were replaced with MW-5SR2 and MW-4SR in August 2018 due to blocked and damaged casings. In the deep aquifer, benzene concentrations are below the standard (1 ppb), ranging from non-detect to 0.65 ppb.

Chlorobenzene concentrations exceeding the GWQS of 50 ppb were reported at monitoring wells MW-8SR2 and MW-5SR2 with maximum concentrations of 73.7 ppb and 70.2 ppb, respectively. Concentrations of

chlorobenzene continue to fluctuate in the shallow aquifer, but no detections were reported in monitoring wells screened in the deep aquifer.

1,4-Dioxane concentrations remain above the GWQS (0.4 ppb) in the majority of wells. However, there is a strong decreasing trend since sampling for this contaminant began in 2013. Although 1,4-dioxane is present in both the shallow and deep aquifers, the highest concentrations have been detected in shallow monitoring wells MW-4SR and MW-5SR2 with maximum concentrations reported at 1,780 ppb and 1,930 ppb, respectively.

Monitoring well MW-8SR2 continues to exhibit elevated concentrations of benzene, toluene, ethylbenzene, xylene (collectively referred to as BTEX), and lead which may indicate a gasoline source. Though concentrations here remain above GWQS with a maximum benzene concentration of 63.4 ppb (2020), the overall concentrations have decreased since monitoring began in 2013 and the BTEX remains localized. The extremely low concentrations of BTEX compounds from the three deep monitoring wells on the Prologis Property indicates that BTEX from the shallow groundwater source area near MW-8SR2 is having a minimal impact on the deep aquifer.

Beginning in 2018, PFAS compounds were sampled in groundwater at 10 wells: MW-6S, MW-7S, MW-10S, MW-11S, MW-18S, MW-19S, MW-20S, MW-21S, MW-4SR and MW-5SR2.

The GWQS for PFOA and PFOS/PFNA are 14 parts per trillion (ppt) and 13 ppt, respectively. Exceedances of GWQS for PFAS were reported in all sampled wells, typically several orders of magnitude above their respective standards. In MW-4SR, the maximum PFOA and PFOS concentrations detected were 4,330 ppt and 28,000 ppt, respectively. The highest PFAS concentrations were reported in MW-5SR2 with a maximum PFOA concentration of 10,800 ppt and a maximum PFOS concentration of 144,000 ppt. PFNA levels were detected at concentrations in the low tens of ppt or less.

Overall, PFOA and PFOS occur at much higher concentrations in the area where firefighting foam was used. The wells located in that area are MW-4SR, MW-5SR2, MW-6S, and MW-7S.

#### *Surface Water:*

Surface water and sediment samples are collected quarterly from five locations, three of which are along the remediated Sip Avenue Ditch and two of which are in the Hackensack River adjacent to the Site (Figure 2). The principal contaminants detected in surface water include PFAS, 1,4 dioxane and inorganics.

Concentrations of arsenic, copper, lead, manganese, and zinc exceeded SWQS in all sampling locations and varied widely among quarterly sampling events. Sporadic detections of elemental mercury exceeding the SWQS were measured at both locations within the Hackensack River and at the mouth of the Sip Avenue Ditch, indicating an upgradient source in the Hackensack. BTEX concentrations in surface water are generally not detected or are orders of magnitude below SWQS.

Currently, NJ does not have a SWQS for 1,4-dioxane. Therefore, the New York State surface water standard for 1,4-dioxane (i.e., 0.35 ppb) was used as a screening level. Concentrations of 1,4-dioxane were detected above 0.35 ppb at all surface water sampling locations. SW-2, which is located at the confluence of the Sip Avenue Ditch and the Hackensack River, had a maximum concentration of 370 ppb in 2019. In general, 1,4-dioxane levels in surface water are not increasing.

PFOS and PFOA concentrations were detected at all five surface water stations but were generally highest in SW-1 and SW-2. Maximum PFOA and PFOS concentrations of 491 ppt and 3,680 ppt, respectively, were detected in SW-1 while maximum concentrations of 472 ppt and 3,730 ppt, respectively, were detected in

SW-2. Consistent with the groundwater sampling results, PFOS levels were the highest followed by PFOA levels. PFNA was detected at all five surface water stations at levels below 13 ppt.

#### *Sediment:*

Sediment samples are compared to the NJDEP ecological screening criteria (ESC) for saline water. During this FYR period, exceedances of up to 20 PAHs were measured at all five sediment sampling locations. In addition, 13 metals were measured above their ESCs. These include six metals (arsenic, copper, lead, manganese, mercury, and zinc) which were also measured above their SWQS. There was also temporal and spatial variability in the sediment exceedances, which is similar to what was found in surface water sampling results. The sediment contaminant levels do not show clear trends, and metals in the sediments appear to be primarily sorbed to sediment making them largely immobile.

1,4-Dioxane was detected in only one sediment sample (SED-3) during the 1<sup>st</sup> quarterly sampling event in 2021 and was not detected in other samples.

PFOS was measured in sediment and usually at the highest concentrations at SED-1/SW-1, SED-2/SW-2, and SED-3/SW-3. PFNA was measured in sediments at the lowest concentrations of the PFAS compounds. This pattern is similar to the one found in surface water and groundwater. Higher levels of PFAS were found in locations SED-1/SW-1, SED-2/SW-2, and SED-3/SW-3, which are nearest to elevated levels of PFAS under the cap. The latest sediment levels were 34 ppt and 3,330 ppt for PFOA and PFOS, respectively, at location SED-1/SW-1, 180 ppt and 2,390 ppt at SED-2/SW-2 and 130 ppt and 4,330 ppt at SED-3/SW-3.

#### *Passive Air Monitoring*

On the Prologis property, landfill gas is monitored as methane concentrations using samples from under the building slab, in the building and from roof top vents. Inspection and sampling of the system takes place twice a year. In 2021, most instantaneous methane readings collected from the under slab, air intake risers, and exhaust risers were 0% of the lower explosion limit (LEL). Overall, the methane levels have decreased since the commencement of system operation and are expected to continue decreasing as the waste degrades over time.

According to the NJDEP Air Pollution Control Preconstruction Permit and Certificate to Operate Compliance Plan Change, effective December 4, 2020, sampling of methane from the four rooftop blowers as well as the external blower located outside of the building area is no longer required. Blower flow measurements are performed on a monthly basis. On December 14, 2021, SAI (a Prologis contractor) conducted surface gas monitoring for methane on the Prologis property. No methane was detected.

On the Jersey City property, a passive gas venting system was constructed within the capped area to prevent the accumulation of landfill gases beneath the geomembrane cap. The landfill gases are collected from 8 gas vents and are treated through granular activated carbon before being released to the atmosphere.

Based upon calculations using laboratory analytical results, instrument readings, and landfill gas flows observed at each vent, there were no exceedances of the emission thresholds set forth in the Facility Air Permit Compliance Requirements.

## V. TECHNICAL ASSESSMENT

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

Recent data (notably the PFAS data) seem to indicate Site related compounds might be impacting the Hackensack River's surface water and sediments. The remedy for the PJP landfill is a low permeability RCRA cap across the entire Site including under the Sip Avenue Ditch. The goal of the cap is to prevent rainwater from infiltrating the material under the cap and to prevent material under the cap from causing significant adverse impacts to the Hackensack River. The groundwater data trends are mostly stable or decreasing, showing that the cap is effective at preventing infiltration of precipitation. However, surface water and sediment samples collected during this FYR period indicate elevated levels of PFAS in both media, especially in areas adjacent to areas under the cap which contain elevated PFAS in groundwater. This suggests that the cap may not be preventing significant adverse impacts to the Hackensack River.

Groundwater at the Site continues to exceed ROD cleanup levels, however, there are no impacted private water supply wells within or near the groundwater plume. The CEA/WRA prevents the installation of new wells in the contaminated plume and the deed notices prevent activities that would damage the cap and potentially expose contaminated materials.

Passive air monitoring on both the Prologis and Jersey City properties did not have exceedances demonstrating that there is no unacceptable risk from landfill gasses.

### **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 exposure assumptions and toxicity values that were used to estimate potential cancer risks and noncancer hazards for the pathways evaluated in the 1995 ROD followed the Superfund risk assessment process at the time. Although specific parameters may have changed since the time the risk assessment was completed, the process that was used remains valid and is not expected to affect the remedy. The cleanup levels, remedial action objectives, and land use assumptions used at the time of the remedial action also remain valid.

Since the previous FYR period, PFAS have been added to the regular sampling list due to known firefighting foam use at the Site in the 1980s. Elevated levels of PFOA and PFOS were detected in groundwater up to several orders of magnitude above GWQS. PFOA and PFOS were also found at elevated levels in surface water and sediment. These contaminants will continue to be evaluated during the next FYR period, incorporating any new standards or toxicity information.

Shallow groundwater concentrations of VOCs during the FYR period were compared to EPA's vapor intrusion screening levels for commercial exposure. Maximum concentrations of benzene and ethylbenzene on the Prologis property were within the acceptable cancer risk range ( $10^{-6}$  to  $10^{-4}$  at a hazard quotient of 1) and concentrations on the JC property were below screening levels. Since the Prologis property incorporates vapor barriers and a sub-surface gas venting system, vapor intrusion is unlikely. Vapor intrusion evaluations should continue to be included in annual sampling reports, and any future development of the Site should consider incorporating vapor intrusion protections into the building plans.

An ecological risk assessment was conducted to support the 1995 ROD. Although the ecological risk assessment process has since changed, it is not expected to affect the remedy and its assumptions remain valid. The assessment concluded that there was a potential for food chain effects to occur due to predation

on aquatic species since several of the contaminants, such as cadmium and mercury, bioconcentrate. During this FYR period, several contaminants in surface water and in sediments in the Sip Avenue Ditch and Hackensack River exceeded their respective SWQC or ESC. However, the results in surface water and sediment were temporally and spatially variable, similar to previous FYR reporting periods. The most significant concern currently related to ecological risk is the presence of PFAS in surface water and sediment that appear to be associated with the landfill. Additional sediment and surface water characterization is warranted to further evaluate risks to ecological receptors.

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

Yes, the levels of PFAS found in the sediments and surface water suggest that the remedy may not be preventing the movement of Site contaminants into the Hackensack River.

## VI. ISSUES/RECOMMENDATIONS

Issues/Recommendations	
<b>OU(s) without Issues/Recommendations Identified in the Five-Year Review:</b>	
None	

Issues and Recommendations Identified in the Five-Year Review:				
OU(s): 1	<b>Issue Category: Other</b>			
	<b>Identification of Emerging Contaminants</b>			
	<p><b>Issue:</b> High levels of PFAS compounds were detected in groundwater samples collected on Site and in surface water and sediment samples collected in the Hackensack River at points adjacent to the Site. This seems to indicate that the remedy (cap) may not be preventing the migration of PFAS. Therefore, the landfill could be a source of PFAS contamination in the Hackensack River.</p> <p><b>Recommendation:</b> Perform additional PFAS investigations in groundwater, sediments, and surface water in order to evaluate ecological risks.</p>			
<b>Affect Current Protectiveness</b>	<b>Affect Future Protectiveness</b>	<b>Party Responsible</b>	<b>Oversight Party</b>	<b>Milestone Date</b>
Yes	Yes	PRP	EPA/State	11/15/2025

## OTHER FINDINGS

None.

## VII. PROTECTIVENESS STATEMENT

Protectiveness Statement(s)		
<i>Operable Unit:</i> 1	<i>Protectiveness Determination:</i> Protectiveness Deferred	<i>Planned Addendum Completion Date:</i> 11/15/25
<i>Protectiveness Statement:</i> A protectiveness determination for the remedy at the PJP Landfill Site cannot be made until further information is obtained. Further information includes the collection of additional PFAS data for groundwater, sediments and surface water in order to determine if and to what extent the landfill is impacting the Hackensack River surface water and sediments. EPA expects it will take two and a half years to complete these investigations, at which time EPA will make a protectiveness determination.		

## VIII. NEXT REVIEW

The next FYR report for the PJP Landfill Superfund Site is required five years from the completion date of this review.

## **APPENDIX A – REFERENCE LIST**

### **1995 ROD**

Five Year Review Report, Prepared by EPA, September 30, 2013

Five Year Review Report Prepared by EPA, September 27, 2018

Preliminary Close Out Report Prepared by EPA September 25, 2020

Revised Vapor Intrusion Assessment Report for the PJP Landfill Site (Jersey City Marion Greenway Park), 400 Sip Avenue, Route 1&9, Jersey City, Hudson County, New Jersey, Prepared by Dresden Robin for Jersey City, August 14, 2014.

Preliminary Assessment Report for the PJP Landfill Site- JCTruckST+CheckCash+FuelST 325-353 Route 1 and 9, Jersey City, Hudson County. Prepared by Arcadis February 18, 2015.

RI for Truck Stop submitted on October 19, 2018, and approved on February 25, 2020.

Remedial Action and As-Built Closure Certification Report for Prologis Ports Jersey City Distribution Center, Part of the Former PJP Landfill Site, Jersey City, Hudson County, NJ, Prepared by Sadat Associates, October 30, 2015.

Annual Groundwater Monitoring Report (2014, 2015, 2016) for Groundwater Classification Exception Area/Well Restriction Area, Prologis Ports Jersey City, Distribution Center, Part of the Former PJP Landfill Site, Jersey City, Hudson County, New Jersey, Prepared by Sadat Associates, Inc. (submitted 2015, 2016, 2017)

Annual Groundwater Monitoring Report (2017, 2018, 2019, 2020, 2021, 2022) for Groundwater Classification Exception Area/Well Restriction Area, Prologis Ports Jersey City, Distribution Center, Part of the Former PJP Landfill Site, Jersey City, Hudson County, New Jersey, Prepared by Sadat Associates, Inc. (submitted 2018, 2019, 2020, 2021, 2022, 2023)

Annual Monitoring Report for the Jersey City Portion of the PJP Landfill (AKA Jersey City Skyway Park) for 2014, 2015, 2016, 400 Sip Avenue, The City of Jersey City, Hudson County, New Jersey, Prepared by Boswell Engineering, (submitted 2105, 2106, 2017)

Annual Monitoring Report for the Jersey City Portion of the PJP Landfill (AKA Jersey City Skyway Park) for 2017, 2018, 2019, 2020, 2021, 400 Sip Avenue, The City of Jersey City, Hudson County, New Jersey, Prepared by Boswell Engineering, (submitted 2108, 2109, 2020, 2021, 2022)

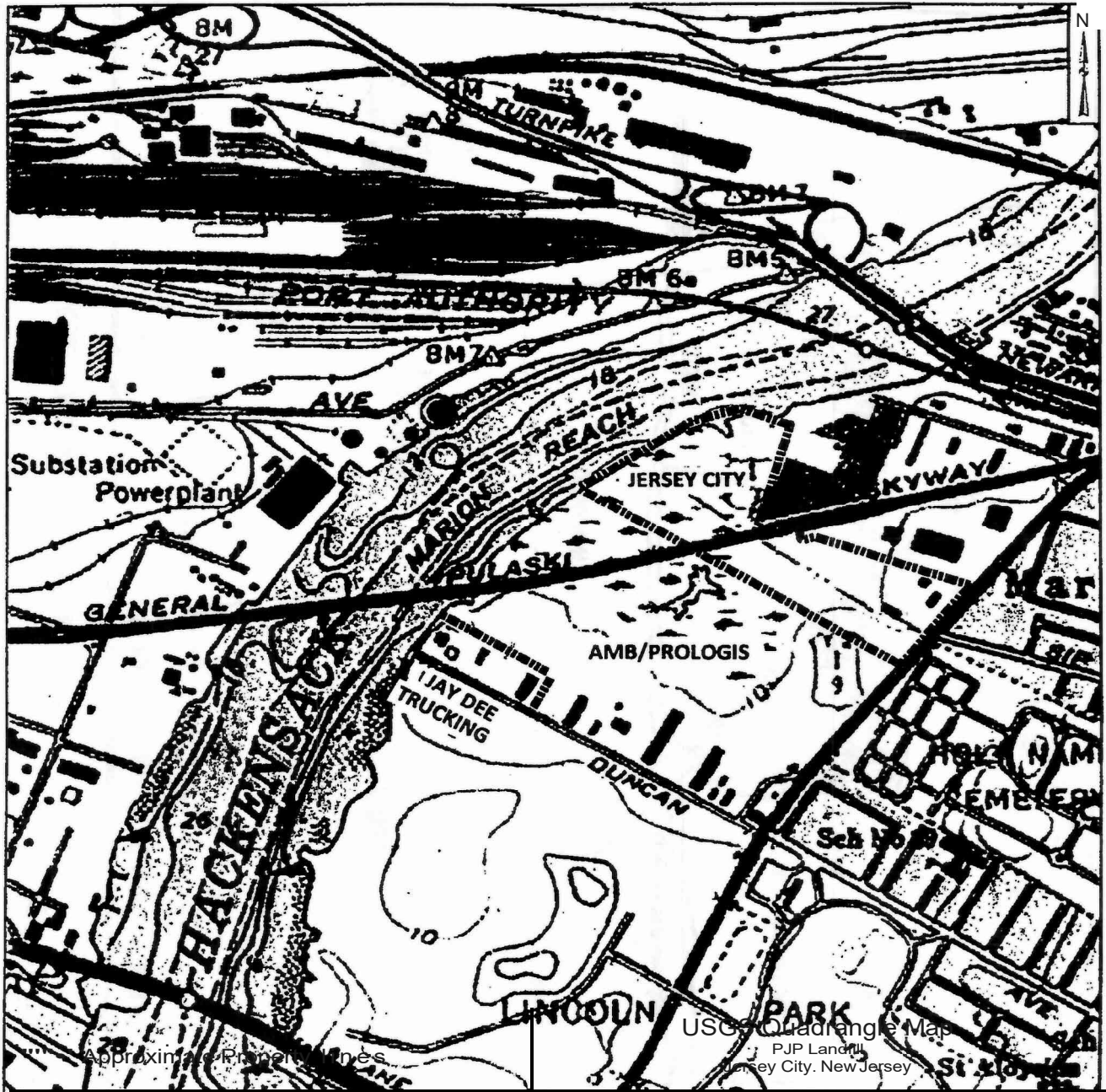
PJP Landfill Cap Penetration Repair, Liquid Boot Application, 301 Broadway Way, City of Jersey City, Hudson County, New Jersey, Prepared by Boswell Engineering for Jersey City, November 30, 2017.

Documentation of NJDOT purchase of the area under the Pulaski Skyway on January 26, 2022.

Monthly progress reports by Jersey City

## **APPENDIX B**

### **Figures**



<p>USGS Quadrangle Jersey City published 1992          Copyright © 2011 National Geographic Society.</p>	<p>1,000 500 0 1,000 Feet  <b>Geosynfec</b>          consultants</p>	<p><b>Figure 1</b></p>
<p><b>Legend</b></p>	<p>Columbia, Maryland April 2012</p>	

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- LEGEND**
- MW-4S EXISTING MONITORING WELLS
  - SW-1A SURFACE WATER MONITORING LOCATION
  - BOUNDARY
  - CEA BOUNDARY (AOC - PORTION OF FORMER PJP LANDFILL SITEWIDE)
  - GROUNDWATER FLOW DIRECTION SHALLOW FILL FORMATION (LOCALIZED RADIAL FLOW LEACHATE MOUND)
  - MEAN DAILY GROUNDWATER FLOW DIRECTION SEMI-CONFINED FORMATION

NOTES:  
GREATEST WIDTH OF GROUNDWATER CONTAMINATION IS 40 FEET

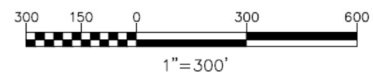


Figure 2

<b>NOT FOR CONSTRUCTION</b>			<b>SADAT ASSOCIATES INC.</b> ENGINEERING & ENVIRONMENTAL SCIENCE 1545 LAMBERTON ROAD, TRENTON NJ 08611. (609) 826-9600 FAX (609) 826-9601		DESIGN BY DZ	CHECKED BY	CERTIFICATE OF AUTHORIZATION NO. 24GA28015200	
REV. NO.	DATE	REMARKS			PROJ MGR LC	STATUS <input type="radio"/> DRAFT <input checked="" type="radio"/> PRELIM <input type="radio"/> FINAL <input type="radio"/> CONSTRUCTION	<b>PROLOGIS PORTS JERSEY CITY DISTRIBUTION CENTER CEA BOUNDARY MAP</b>	
OWNER <b>PROLOGIS LP. (PROLOGIS PORTS JERSEY CITY DISTRIBUTION CENTER)</b> EAST RUTHERFORD, NJ			DRAWN BY JG	DATE 09/25/2015	DRAWING NO.	SHEET		
			AUTOCAD PATH G:\PJP Landfill\2021\fig			JOB NO 06053-000	<b>1</b>	<b>1</b> OF <b>1</b>

Figure 2 – Sample Location Map

## APPENDIX C – CLIMATE CHANGE EVALUATION

In accordance with the Region 2 Guidance for Incorporating Climate Change Considerations in the Five-Year Review process, two climate change tools were considered appropriate to assess the PJP Landfill Superfund Site. Screenshots from each of the tools assessed are included here.

The first tool used was Risk Factor in Hudson County. This tool states that flooding is a moderate risk over the next 30 years (Figure C-1). According to the tool, there are 15,977 properties in Hudson County that have greater than a 26% chance of being severely affected by flooding over the next 30 years. This represents 18% of all properties in Hudson County. This is based on the level of risk the properties face rather than the proportion of properties with risk. As seen in Figure C-2 (note, this is the NOAA Sea Level Rise Viewer), the PJP Landfill is on the banks of the Hackensack River and is known to be situated in a flood zone. In fact, the Sip Avenue Ditch, which is underlain by the landfill cap, is tidal to the Hackensack River and “floods” twice a day. Based on the site’s location, the remedy was designed for a 100-year flood. A 500-year flood was also taken into consideration. Although the Sip Avenue Ditch is tidal, no issues related to cap integrity have been observed. Furthermore, Superstorm Sandy (2012), which produced a historically high tidal surge, and Hurricane Irene (2011), did not impact the cap at the site.

The second tool is called the *NOAA Sea Level Rise Viewer*. The PJP Landfill is vulnerable to sea level rise. As shown in Figure C-3, however, the Site itself is at a high enough elevation that it would not be heavily affected by a sea level rise of 10 feet. However, the area around it would be flooded and the Sip Avenue Ditch would come out of its banks.

Based on the information above, potential Site impacts from climate change have been assessed, and the performance of the remedy is not currently at risk due to the expected effects of climate change in the region and near the Site. Although flooding and sea level rise are considered risk factors at the Site, significant storm events have not caused damage to the cap and the O&M plans call for regular site inspections. In addition, the portion of the Site owned by Prologis is constantly in use and there is a security presence 24/7. EPA will work with NJDEP and the PRPs to update their O&M plans to specifically include a requirement for site inspections after any major storm/flooding event.

Figure C-1 – Risk Factor Flood Risks for Hudson County, NJ

FLOOD RISK OVERVIEW

## Does Hudson County have risk?

### Moderate



There are 15,977 properties in Hudson County that have greater than a 26% chance of being severely affected by flooding over the next 30 years. This represents 18% of all properties in Hudson County.

In addition to damage on properties, flooding can also cut off access to utilities, emergency services, transportation, and may impact the overall economic well-being of an area. Overall, **Hudson County** has a **moderate risk of flooding** over the next 30 years, which means flooding is likely to impact day-to-day life within the community. This is based on the level of risk the properties face rather than the proportion of properties with risk.

Figure C-2 – NOAA Sea Level Rise Viewer

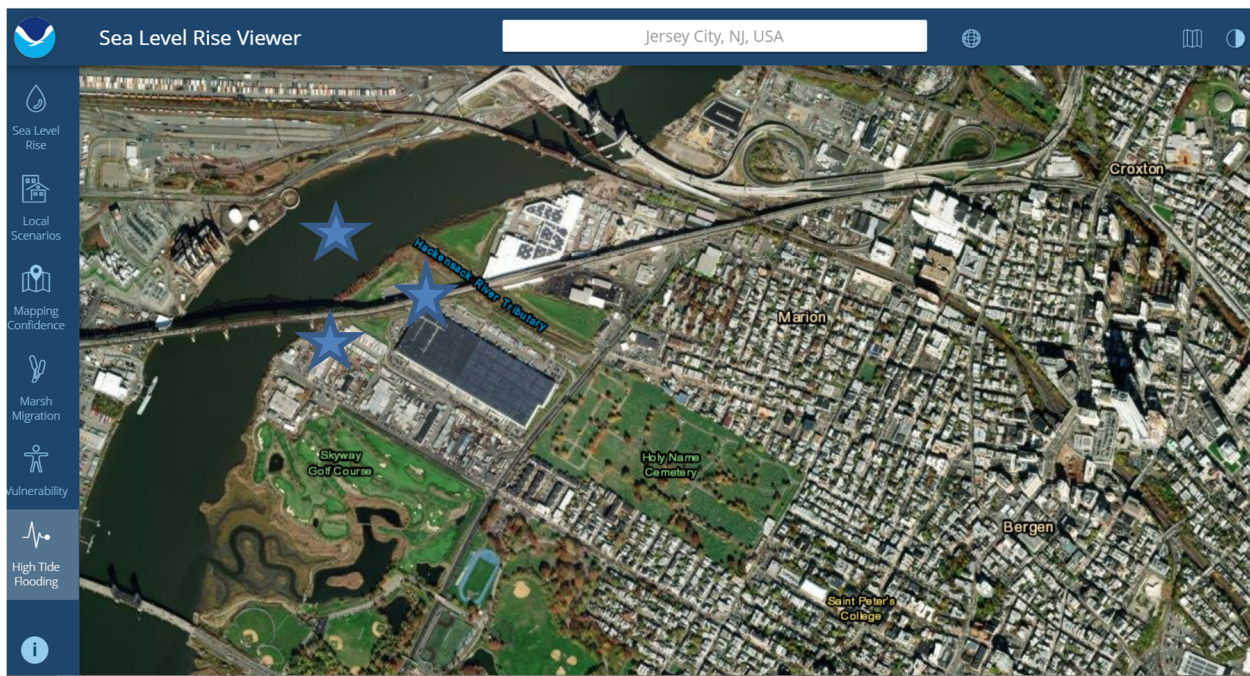


Figure C-3 – NOAA Sea Level Rise Viewer (10 feet)

