



**US Army Corps
of Engineers®**
New York District

NEW YORK AND NEW JERSEY HARBOR DEEPENING CHANNEL IMPROVEMENTS

NAVIGATION STUDY

DRAFT INTEGRATED FEASIBILITY REPORT & ENVIRONMENTAL ASSESSMENT

APPENDIX A6: Hazardous, Toxic and Radioactive Waste (HTRW)

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1.0 Introduction

The United States Army Corps of Engineers (USACE) New York District (herein “District”) is preparing an integrated Feasibility Report (FR) and Environmental Assessment (EA) for the Harbor Deepening Channel Improvements (HDCI), in partnership with the Port Authority of New York and New Jersey (PANYNJ). This Hazardous, Toxic and Radioactive Waste (HTRW) report was prepared to review the Study Area to determine if the HDCI project is co-located within federal or state listed contaminated sites.

1.1. Study Area

The HDCI project Study Area is located within the NY Metropolitan Area, focused on the New York and New Jersey Harbors. The Port of New York and New Jersey (herein “Port”) is the largest port on the East Coast, serving a local population of over 27 million people (PANYNJ 2019). The Port is comprised of both public and private terminals and is capable of handling a variety of cargo including, but not limited to, containers, roll on-roll off automobiles, liquid and dry bulk, breakbulk, and specialized cargo.

The existing federal navigation channels were previously designed for the *Regina Maersk* vessel, constructed under the 50-foot Harbor Deepening Project (HDP). Presently, the Port receives cargo on vessels that are larger in width, depth, and length. The current channels are unable to support the increased vessel size, resulting in a greater risk of grounding, collision, marine casualty, and operational limitations within the harbor. The HDCI Study focuses on improving the channels to support the current and projected future vessel usage.

1.2. Regulatory Framework

This HTRW report was prepared in accordance with the USACE Engineering Regulation (ER) 1165-2-132 and the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) 42 United States Code 9601 et seq. HTRW is defined by ER 1165-2-132 as:

“Except for dredged material and sediments beneath navigable waters proposed for dredging... HTRW includes any material listed as a “hazardous substance” under [CERCLA]... Dredged material and sediments beneath navigable waters proposed for dredging qualify as HTRW only if they are within the boundaries of a site designated by the EPA or a state for a response action (either a removal action or a remedial action) under CERCLA, or if they are part of a National Priority List (NPL) site under CERCLA.”

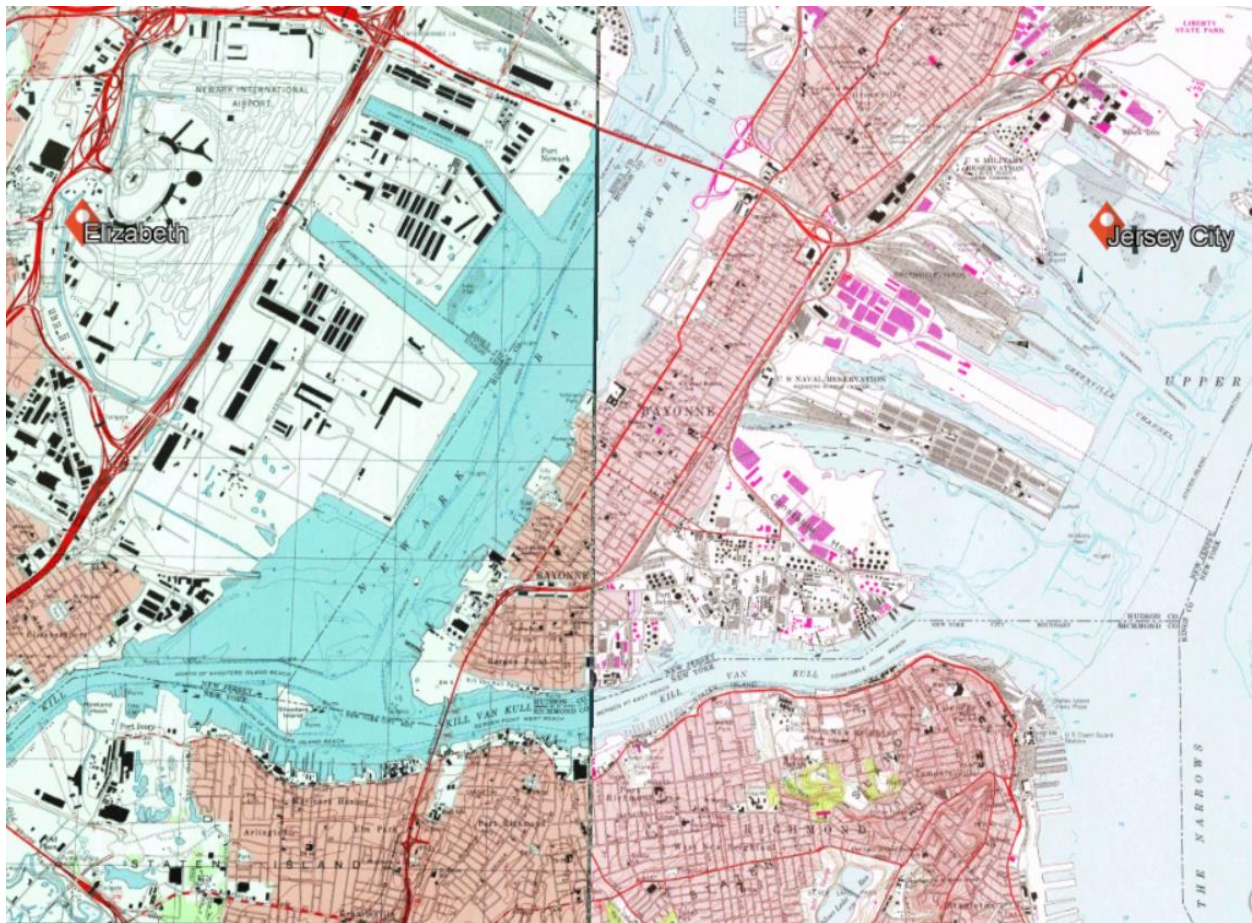
This report was prepared by performing the following:

- Review existing and readily available federal and state records of contaminated sites within the Study Area;
- Identify contaminated sites that are co-located within the navigation channels proposed to be improved; and,
- Determine if co-located contaminated sites may affect or be affected by the project.

2.0 Regional Description

2.1. Topography and Geology Summary

The topography and geology of the land surrounding the Study Area consists of mostly flat and heavily urbanized terrain, ranging from approximately five feet above mean sea level (AMSL) to approximately 200 ft AMSL in the vicinity. Topographic gradients generally slope towards, or have drainage to, surface water areas that are dominantly present throughout the area.



Source: USGS, 1995 Elizabeth Quadrangle (left) and 1967 Jersey City Quadrangle (right).

Figure 1: Topographic Maps

Many of the channels in the NY Metropolitan area are underlain by bedrock or glacial sediments with relatively recent black silt or sand waves of coarse sand and fine gravel. Outside the channels, Holocene estuarine sediments overlay Pleistocene glacial sediments. Triassic-Jurassic sandstones and shales are intruded by the Palisades diabase sill and associated basalt sills in the western Kill van Kull and Newark Bay. Pleistocene glacial sediments mostly overlie the bedrock in the surrounding area, however, bedrock is locally found exposed or overlain by Holocene sediments. The sediments consist of glacial moraine till deposits, glacial lake deposits of finely laminated to

varved clayey silts and outwash sands. Holocene sediments in Newark Bay include fossil oyster reef on diabase, finely laminated tidal deposits overlaying the Pleistocene glacial sediments and varved silty clays, peat, organic silts, and gray silts (Beda et al undated and Monteverde et al 2015). For additional details and source information regarding the topography and geology of the Study Area, refer to the FR/EA for which this document is an appendix to.

2.2. Hydrogeology and Surface Water Summary

Topographic gradients typically dictate the surficial and shallow groundwater flow, where hydrogeologic gradients usually follow, under normal circumstances, towards the nearest major water body (i.e. Atlantic Ocean). Groundwater in the vicinity of the Study Area is anticipated to flow from higher elevations in the west and north to lower elevations in the east and south, however, groundwater flow patterns can vary based on site specific topographic and geologic conditions.

The Study Area consists of several bays, rivers, and channels. Surface waters within the Study Area primarily include the Passaic and Hackensack Rivers, Newark Bay, Kill van Kull, Hudson River and Upper Bay. The Passaic and Hackensack Rivers flow south and converge in Newark Bay, where surface water continues to drain south, eventually into Raritan Bay. The Hudson River flows south, where it converges with the East River in the Upper Bay and continues to flow south. The Kill van Kull is a tidal strait that connects the Upper Bay with Newark Bay flowing from east to west. All surface water in the area ultimately drains into the Atlantic Ocean to the east.

The region has a dynamic hydrology due to the variation in tidal velocity, amount of freshwater flow, and bathymetry among the connecting bays. These waterways exist within a heavily industrialized and developed corridor and contain deepwater navigation channels that allow transport of cargo into and out of the Ports of New York and New Jersey (USACE 1999). For additional detail and source information regarding the hydrogeology and surface waters of the Study Area, refer to the FR/EA for which this document is an appendix to.

2.3. Study Area Alternatives Summary

Navigation channel improvement alternatives that were considered in this FR/EA include incremental deepening from 2 feet (ft) to 7 ft for larger vessels to achieve safer vessel access into Port Jersey-Port Authority Marine Terminal (PJPAMT) and to Elizabeth-Port Authority Marine Terminal (EPAMT). Alternatives reviewed include six incremental deepening variations to PJPAMT and six incremental deepening variations to EPAMT in addition to a No Action Alternative for each port, discussed in more detail in the FR/EA.

The Tentatively Selected Plan (TSP) discussed herein includes the deepening of Ambrose Channel, Anchorage Channel, Kill Van Kull, Newark Bay Channel, South Elizabeth Channel, Elizabeth Channel and Port Jersey Channel up to an additional 5 feet (ft).

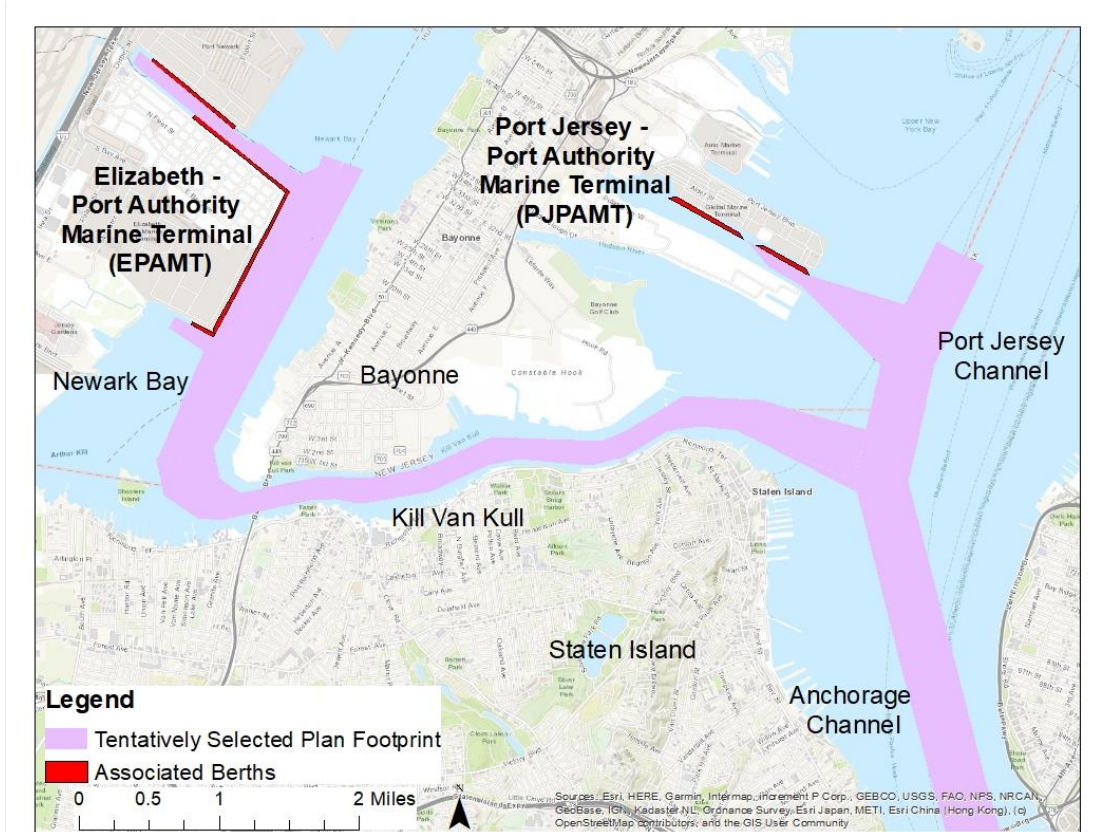


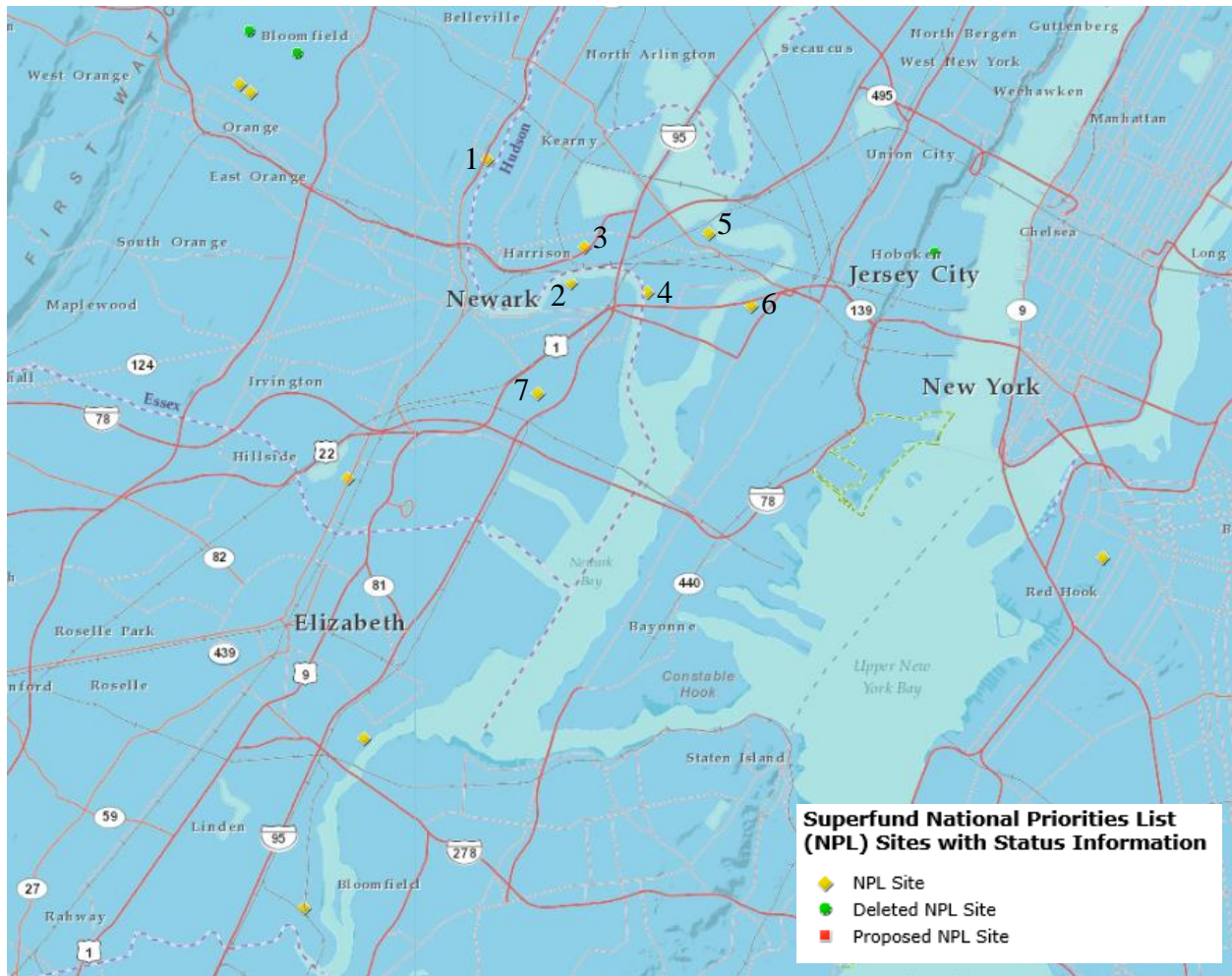
Figure 2: Tentatively Selected Plan

2.4. HTRW Sites within the Study Area

Several federal and state listed contaminated sites in the nearby vicinity of the HDCI project are on land, outside of the project boundary, with the exception of a portion of a National Priority List (NPL) Superfund Site/Listed State of New Jersey site discussed in more detail in **Section 2.4.1 and 2.4.2**. The following sections contain a summary of the federal and state listed HTRW sites located in the vicinity of the Study Area.

2.4.1. National Priority List Superfund Sites:

CERCLA was established by Congress in 1980, giving USEPA the funds and authority to remediate contaminated sites where there is no identifiable responsible party. The purpose of CERCLA, also referred to as Superfund, is to protect human health and the environment, have identified responsible parties pay for remediation, involve communities in the process, and return contaminated sites to productive uses (USEPA 2020a). There are six NPL Superfund Sites located upgradient of the HDCI project with potential, or known, impacts to surface waters. Below, **Figure 2** presents the location of nearby NPL Superfund Sites and **Table 1** provides a summary of nearby upgradient NPL Superfund Sites identified in the figure (USEPA 2020b):



Source: USEPA 2020b

Figure 3: NPL Superfund Sites in the Vicinity

FIGURE ID NO.	NPL SITE NAME	SITE ID	MEDIA IMPACTED	CONTAMINANTS OF CONCERN
1	Riverside Industrial Park	NJSFN0204232	Soil, ground water, surface water (Passaic River)	VOCs, SVOCs, PCBs, metals; Benzene, mercury, chromium, arsenic, 2,4-dimethylphenol
2	Diamond Alkali	NJD980528996	Soil, ground water, surface water (Passaic River)	2,4,5-trichlorophenol, dioxin (TCDD), metals, pesticides
3	Diamond Head Oil Refinery	NJD092226000	Soil, ground water, wetland sediment	VOCs, SVOCs, pesticides, PCBs, metals
4	Syncon Resins	NJD064263817	Soil, ground water	Benzene, PCBs, toluene.

5	Standard Chlorine	NJD002175057	Soil, ground water, surface water (Hackensack River)	VOCs, SVOCs, PCBs: dioxins, dichlorobenzenes, 1,2,4-trichlorobenzene, naphthalene, benzene, chlorobenzene
6	PJP Landfill	NJD980505648	Soil, ground water	VOCs
7	Pierson's Creek	NJD002144517	Wetland sediment, surface water (Pierson's Creek into Newark Bay)	VOCs, PAHs, PCBs, pesticides, metals: mercury, arsenic cadmium, chromium, lead, nickel

Note: **Bolded Red** text indicates NPL Site that is co-located, or partially co-located in the HDCI Project Area.

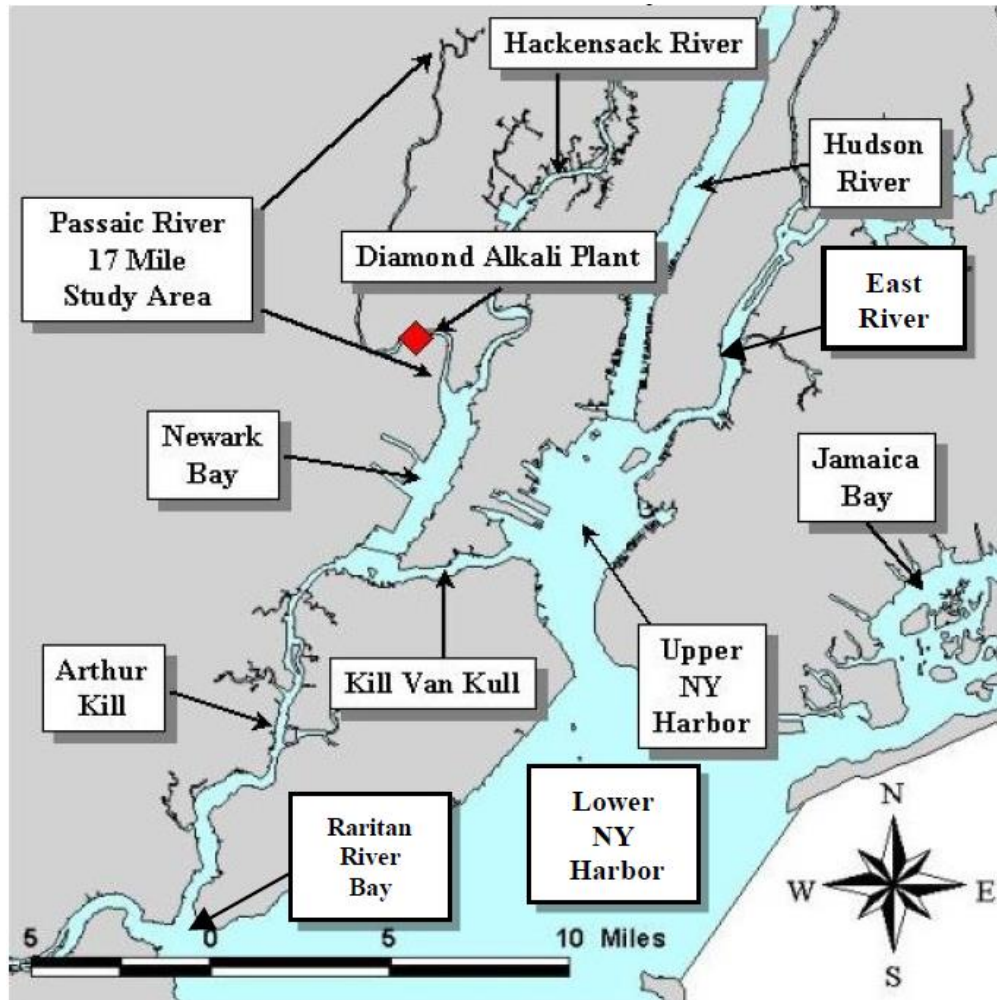
Source: USEPA 2020b

Table 1: NPL Superfund Sites in the Vicinity

Of these seven nearby NPL Superfund Sites, non are co-located within the HDCI project area with the exception of a portion of the Diamond Alkali Superfund Site (herein “Diamond Alkali”) study area that is under investigation in and around Newark Bay. No other existing, former or proposed NPL sites were identified in the vicinity of the HDCI project with the potential to affect, or be affected by, the HDCI project.

2.4.2. Diamond Alkali Superfund Site

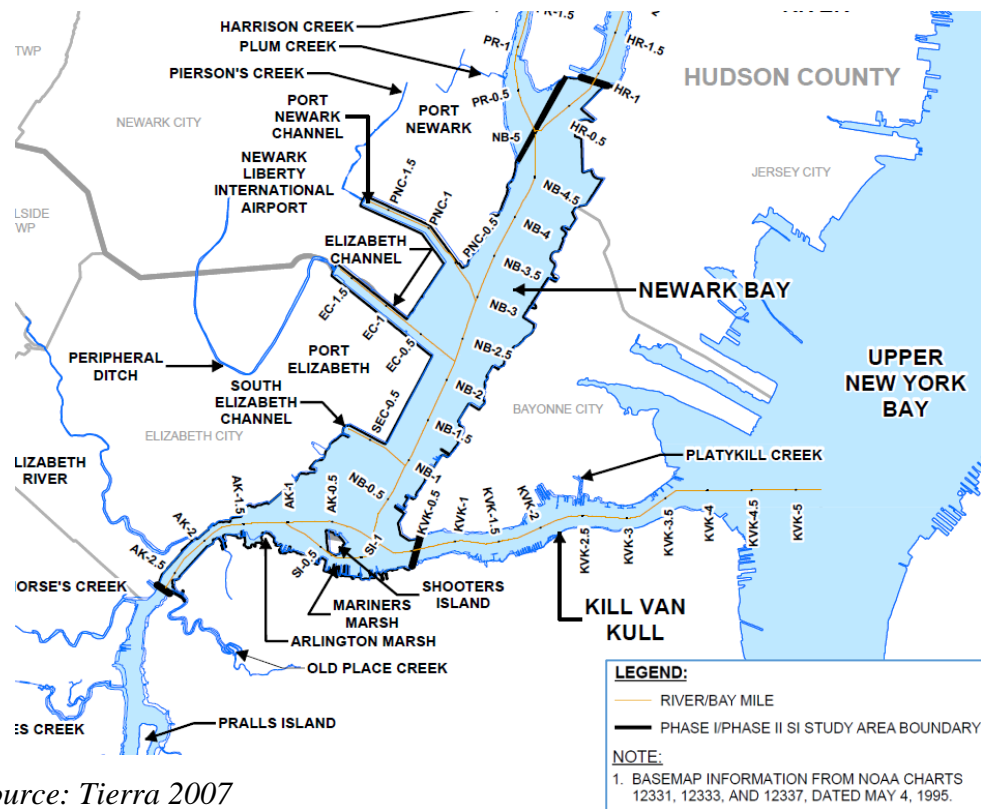
The main plant of Diamond Alkali was located at 80 Lister Avenue in Newark, New Jersey approximately five miles upgradient from Newark Bay along the western shore of the Passaic River (**Figure 2**). The Diamond Alkali plant historically is known for the manufacturing of agricultural chemicals and herbicides utilized in the production of “Agent Orange”. Agent Orange was primarily utilized in the 1950s and 1960s during the Vietnam War. A bi-product of Agent Orange manufacturing, 2,3,7,8-Tetrachlorodibenzo-p-dioxin (herein “TCDD”), polluted the surface and subsurface of the plant grounds in addition to the Passaic River which drains south into Newark Bay. Although production of Agent Orange ceased in the 1970s, adverse effects of manufacturing processes are still present to this day. Due to the known pollution concerns, the New Jersey Department of Environmental Protection (NJDEP) prohibits the consumption of fish or shellfish from the Lower Passaic River and Newark Bay (USEPA 2020c). Below, **Figure 3** presents the location of the Diamond Alkali plant in relation to the surrounding vicinity and proximity to surrounding surface water features:



Source: USFWS et al 2020

Figure 4: Diamond Alkali Superfund Site Location

In 1984 the USEPA added the Diamond Alkali plant as a NPL Superfund Site after the State of New Jersey and USEPA performed environmental sampling at the facility and in the Passaic River, revealing high levels of TCDD (USFWS et al 2020). In 1994, a six-mile stretch of the Passaic River was added to the remediation investigation requirements of the site, and in 2003 expanded the remedial investigation to a 17-mile stretch of the Passaic River. One year later, in 2004, Newark Bay, Arthur Kill and Kill van Kull channels and portions of the Hackensack River were added to the investigation efforts (referred to herein as the “Newark Bay Study Area” or “Newark Bay Operable Unit (OU)”). The Newark Bay Study Area is bound by the Lower Passaic River Restoration Project downstream boundary, the Conrail Bridge at the Hackensack River, the Bayonne Bridge, and the Goethals Bridge (Tierra 2007).



Source: Tierra 2007

Figure 5: Diamond Alkali Superfund Site, Newark Bay Operable Unit Boundaries

Currently, remedial investigation and reporting of the Newark Bay OU is still in progress. In 2007, Tierra Solutions, Inc. prepared a Phase II Remedial Investigation Work Plan for the Newark Bay Study Area, which detailed sampling goals to determine the horizontal and vertical extent and concentration levels of Diamond Alkali contaminants of concern, including, but not limited to, polychlorinated dibenzo-p-dioxins, polychlorinated dibenzofurans, polychlorinated biphenyls, polyaromatic hydrocarbons, pesticides and metals (Tierra 2007). In 2017 a Phase III Sediment Investigation Field Report was prepared to document the sediment sampling activities performed at 231 sampling locations in Newark Bay. Phase III data will be forthcoming in a Remedial Investigation Report. Additional Diamond Alkali study information and plans are located on the Newark Bay Study website: www.ournewarkbay.org (NBSW 2020).

In January 2020 the Final Natural Resource Damage Assessment (NRDA) Plan for the Diamond Alkali was released by the United States Fish and Wildlife Service (USFWS) and the National Oceanic and Atmospheric Administration (NOAA), detailing the assessment of accumulated damages caused by the Diamond Alkali on the natural resources located within the Passaic River and Newark Bay, including the Arthur Kill, Kill Van Kull, and portions of the Hackensack River. The purpose of the NRDA Plan is to document the exposure of natural resources to hazardous substance releases and identifies the anticipated procedures for evaluating the injuries caused by exposure. This report details the hazardous substance exposure to natural resources (i.e. fish, shellfish, birds) and outlines recommendations and a proposed pathway forward (USFWS et al 2020).

As of September 2020, the USEPA's cleanup schedule for the Diamond Alkali, Newark Bay OU estimates that the combined remedial investigation/feasibility study for the Newark Bay OU will be completed in approximately September – November 2022, with a Record of Decision completed also in 2022 (USEPA 2020c).

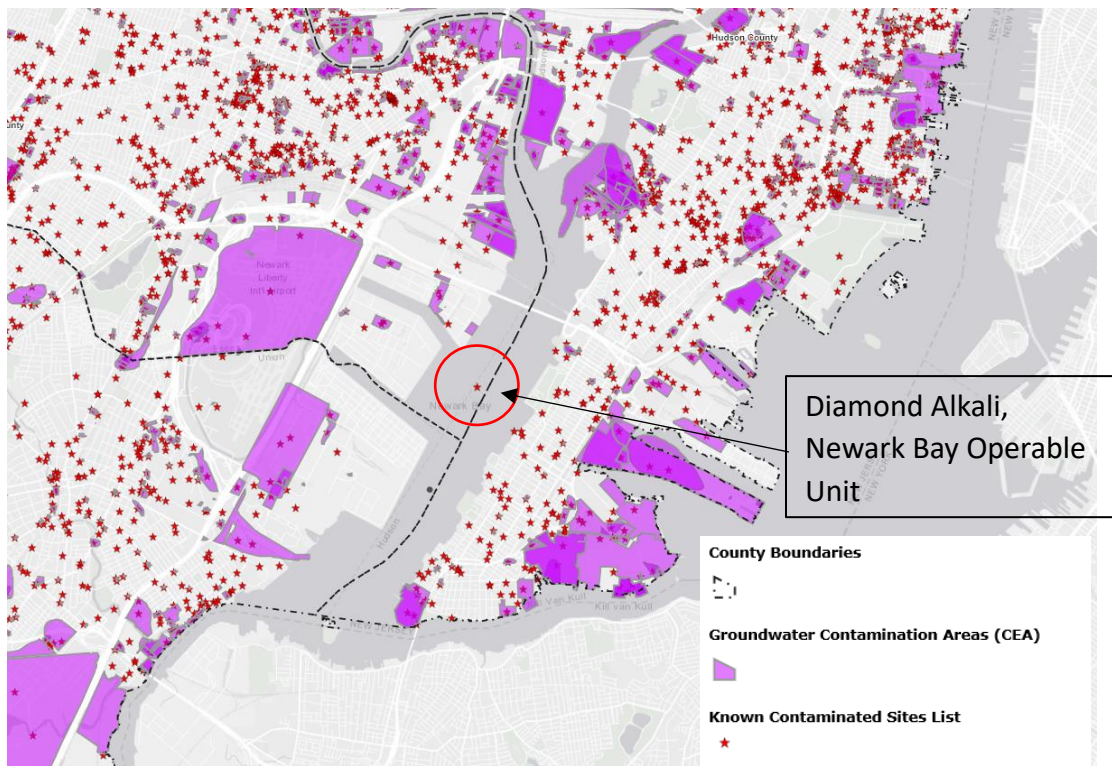
Milestone	Start Date	Completion Date
OU 03 - NEWARK BAY		
Administrative Order of Consent <i>(EPA Performed)</i>		02/13/2004
Combined Remedial Investigation/Feasibility Study <i>(PRP Performed, EPA Oversight)</i>	02/13/2004	Estimated Sep - Nov 2022
Record of Decision		Estimated Sep - Nov 2022

Source: USEPA 2020c

Table 2: Schedule for the Diamond Alkali Superfund Site, Newark Bay Operable Unit

2.4.3. State Listed Contaminated Sites (NJDEP)

There are several known contaminated sites listed by the NJDEP located within the vicinity of the Study Area, presented on **Figure 4** below. Known contaminated sites are defined by the NJDEP as sites where contamination of soil or groundwater has been confirmed (NJDEP 2020).



Source: NJDEP 2020

Figure 6: NJDEP Known Contaminated Sites in the Vicinity

The contaminated site identified in Newark Bay, within the HDCI project area is the Diamond Alkali, Newark Bay OU, discussed in more detail in the previous section. The remainder of these sites are located on land and are not co-located within the project area.

2.4.4. State Listed Contaminated Sites (NYSDEC)

There are several New York State listed contaminated sites, including Superfund, voluntary cleanup program, brownfield, resource conservation and recovery act (RCRA), and environmental restoration program sites, located in the vicinity of the project area in Staten Island and Brooklyn, as shown on **Figure 7** (NYSDEC 2020). These sites are located on land and are not co-located within the project area.



Source: NYSDEC 2020

Figure 7: NYSDEC Known Contaminated Sites in the Vicinity

2.4.5. Previous Harbor Deepening Project (HDP) Summary

In 1986, Congress authorized USACE to perform several studies to deepen navigation channels within the New York and New Jersey Harbor. In 1999, the District completed an Environmental

Impact Statement (EIS) to analyze the impacts of deepening several navigation channels. Three years later, in 2002, the EIS was updated by consolidating several individual harbor deepening projects into one main project, known as the 50-foot Harbor Deepening Project (HDP). Following consolidation, the District prepared a limited reevaluation report, Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) of which was completed in 2004.

After completion of NEPA, the District entered into litigation in 2005 with Natural Resource Defense Council (NRDC), et al as Plaintiffs due to the appearance of a conflict between the EPA's Remedial Investigations Feasibility Study (RI/FS) and the initiation of construction of the 50-foot HDP within the Newark Bay Study Area (USDC 2005). In June 2007, the District agreed to assess the effects of the HDP on the Newark Bay Study Area RI/FS which resulted in a FONSI (USACE 2007). In October 2007, the litigation was resolved with a Stipulation and Order (S&O) that obligated the District to collaborate with USEPA and NJDEP, as necessary, on the advancement of 50-foot HDP regarding ongoing remediation efforts at the Diamond Alkali site within the Newark Bay Study Area. As this is part of standard agency coordination, the District intends to honor the 2007 S&O with the advancement of the HDCI project, by coordinating the proposed project work with USEPA, as well as implement best management practices, where applicable, in order to not interfere with ongoing investigation and remediation efforts occurring in the Newark Bay (USDC 2007).

3.0 Findings and Conclusion

The Study Area is heavily urban and, as discussed in **Section 2.4**, has many contaminated sites located in the vicinity, both in New Jersey and New York. These sites are primarily located on land and outside of the HDCI project boundary except for a portion of one Federal and State (New Jersey) listed Superfund site identified as the Diamond Alkali, Newark Bay OU located in New Jersey. The District will continue to coordinate with the USEPA and NJDEP in order to not interfere with ongoing investigation and remediation efforts occurring in the Newark Bay Study Area. It is not anticipated that any other federal or state listed contaminated site will affect or be affected by the project.

The current schedule for the HDCI project estimates completion of the Final FR/EA by January 2022 with a signed Chief's Report by May 2022, following State and Agency review. The Planning, Engineering and Design (PED) phase is not anticipated to begin until after the signing of the Chief's Report with construction estimated to begin in approximately 2025. The remedial investigation activities for the Diamond Alkali, Newark Bay OU listed on the USEPA website are currently estimated to be completed, with a record of decision, by November 2022. Schedules are subject to change based on a variety of field and project advancement conditions and therefore, information regarding any future remedial action plans for the responsible parties to remediate the Diamond Alkali Newark Bay OU will be coordinated with the USEPA and NJDEP as well as further future coordination with the USEPA and NJDEP to ensure complimentary actions commence with the improvement of the Port navigation channels without interfering with remedial action activities.

A Confined Disposal Facility (CDF) is located in Newark Bay between Port Elizabeth channel and

Port Newark channel. Now closed and capped, the CDF was designed to store contaminated dredge materials and to prevent pollution of the estuary. The CDF is located outside the proposed dredging areas of the existing navigation channels and will be avoided to ensure no impact to the CDF.

In accordance with ER 1165-2-132, dredged materials will be tested under dredged material placement criteria for their suitability for beneficial use in accordance with the appropriate guidelines and criteria including, but not limited to, Section 404 of the Clean Water Act and/or Section 103 of the Marine Protection Research and Sanctuaries Act and supplemented by the Corps of Engineers Management Strategy for Disposal of Dredge Material: Containment Testing and Controls.

4.0 Acronyms

AMSL	Above Mean Sea Level
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CDF	Confined Disposal Facility
EA	Environmental Assessment
EIS	Environmental Impact Statement
ER	Engineering Regulation
FONSI	Finding of No Significant Impact
FR	Feasibility Report
FS	Feasibility Study
HDCI	Harbor Deepening Channel Improvements
HDP	Harbor Deepening Project
HTRW	Hazardous, Toxic and Radioactive Waste
NEPA	National Environmental Policy Act
NJDEP	New Jersey Department of Environmental Protection
NOAA	National Oceanic and Atmospheric Administration
NPL	National Priority List
NRDA	Natural Resource Damage Assessment
NRDC	National Resource Defense Council
NYSDEC	New York State Department of Environmental Conservation
OU	Operable Unit
PANYNJ	Port Authority of New York and New Jersey
PED	Planning, Engineering and Design

RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
S&O	Stipulation and Order
TCDD	2,3,7,8-Tetrachlorodibenzo-p-dioxin
USACE	United States Army Corps of Engineers
USC	United States Code
USDC	United States District Court
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

5.0 Resources and Sources

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) United States Code (USC) 9601 et seq.

Engineering Regulation (ER) 1165-2-132. United States Army Corps of Engineers, *Hazardous, Toxic and Radioactive Waste (HTRW) Guidance for Civil Works Projects*. June 1992.

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