US Army Corps of Engineers®
New York District

PUBLIC NOTICE

U.S. Army Corps of Engineers
New York District
ATTN: Project Mgmt. Division (Wisemiller)
26 Federal Plaza, Room 2127
New York, NY 10278-0090

In replying refer to:
Public Notice Number: **FP63-SANUC/AK4-2014**
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NEW YORK AND NEW JERSEY HARBOR DEEPENING
FEDERAL NAVIGATION PROJECT
ANCHORAGE CHANNEL UTILITY CORRIDORS &
ARTHUR KILL CHANNEL DREDGING

TO WHOM IT MAY CONCERN:

Pursuant to Section 103 of the Marine Protection, Research, and Sanctuaries Act (MPRSA) of 1972 (commonly referred to as the Ocean Dumping Act, 33 U.S.C. 1413), this Public Notice serves as the U.S. Army Corps of Engineers (New York District) notification and request for comments relating to the potential placement of Historic Area Remediation Site (HARS) suitable material to be dredged, as part of the remaining deepening of federal channels in the Port of New York and New Jersey. Specifically, the channels remaining to be deepened which have material proposed for placement at the HARS are various utility corridors and adjacent shoals in the Anchorage Channel, and the northern Arthur Kill Channel (see Figure 1).

The Anchorage Channel Utility Corridor (S-AN-UC) is authorized for construction to -50 ft. mean low water (MLW), plus 1 ft. of allowable overdepth, as part of the New York and New Jersey Harbor Deepening Project (HDP), described in Section 101(a)(2) of the Water Resources Act of 2000, Public Law 106-541. The S-AN-UC channel construction involves the dredging of sandy sediments that exist in the Anchorage Channel located in the Upper Bay of New York Harbor between Brooklyn and Staten Island, New York from depths as shallow as -46 ft. MLW to a depth of -50 ft. MLW, plus one foot for allowable overdepth.

The northern Arthur Kill Channel deepening (known as AK-4) is authorized for construction to -40 ft. MLW (plus an additional 2ft. for safety clearance given the hard substrate and 1.5 ft. for allowable overdepth) as part of the Arthur Kill Channel, Howland Hook Marine Terminal Navigation Project, New York and New Jersey, described in Section 202(b) of the Water Resources Development Act of 1986, Public Law 99-662, as amended by Section 301(b)(11) of the Water Resources Development Act of 1996, Public Law 104-303 and Section 338 of the Water Resources Development Act of 1999, Public Law 106-53. The AK-4 channel construction involves the dredging of sporadic pockets of Pleistocene glacial till and clay sediments amongst red-brown shale bedrock in the Arthur Kill Channel located between Staten Island, New York and the cities of Elizabeth and Linden, New Jersey to deepen the existing -35 ft. MLW navigable

channel to -42 ft MLW (including 2 ft. of additional safety clearance), plus 1.5 ft. of allowable overdepth.

The construction of the S-AN-UC area and the AK-4 area may be performed as separate or combined construction contracts. The two contract areas will complete remaining channel deepening for both aforementioned projects, thereby facilitating the transition of both projects from construction phase to maintenance. This proposed action will allow suitable Holocene sands from Anchorage Channel, Pleistocene glacial tills and clay, and red-brown shale bedrock materials from the Arthur Kill Channel dredged to be placed at the HARS - see below for further information.

ACTIVITY: The proposed action involves dredging, via hydraulic and/or mechanical means, approximately 70,000 cubic yards (CY) of sandy Holocene sediments from the southern Anchorage Channel and placing this material at the Historic Area Remediation Site (HARS). The utility corridor areas of the Anchorage Channel are currently as shallow as -46 ft. MLW and shall be deepened to -50 ft. MLW, plus one foot of allowable overdepth. The proposed action also involves the dredging, via mechanical means, approximately 43,000 CY of Pleistocene glacial tills and clay, and approximately 360,000 CY of red-brown shale bedrock from the northern Arthur Kill Channel and then placing these materials at the Historic Area Remediation Site (HARS). The existing Arthur Kill Channel will be deepened from the navigable depth of -35 ft. MLW to -40 ft. MLW, plus 2 ft. of additional safety clearance for hard underlying substrate and 1.5 ft. for allowable overdepth.

LOCATION: The Anchorage Channel portion of the HDP is an approximately 4 mile long channel located in the southern middle portion of the Upper Bay of New York Harbor from the Verrazano Narrows to a location adjacent to Port Jersey Channel located on the western side of the Bay. Four separate utility corridors, which require dredging, exist within the Anchorage Channel, two spanning across the channel between Brooklyn and Staten Island and two located next to the Brooklyn in the southern portion of the area.

The Arthur Kill is an approximately 13.5 mile long tidal strait located between New Jersey and Staten Island, New York. The portion of the Arthur Kill being deepened as part of the aforementioned projects is the northern approximately 3.5 miles of the channel located between the New Jersey cities of Elizabeth and Linden and Staten Island.

DESCRIPTION OF PLANNED ACTION:

Anchorage Channel Utility Corridors

The Anchorage Channel located in the Upper Bay of New York Harbor has undergone several construction contracts to deepen the southern 4 miles of the channel to -50 ft. MLW. However, construction over water, gas, petrochemical and electrical utilities located in four utility corridor areas was not performed in these past contracts. As the HDP project construction elsewhere is

concluding, the Corps now plans to dredge these utility corridor areas to provide full project functionality and reap the project's full economic benefits to the region and nation.

Two of the utility corridors span the full width of the Anchorage Channel and overlie two New York City Department of Environmental Protection (NYCDEP) water supply pipelines, which provide water (on a secondary, as needed basis) from Brooklyn to Staten Island, New York. Recent data collected by the Corps indicates that these two water siphons, which were installed in the channel in the early 20th century, are at an elevation of -53.5 ft. MLW or deeper. Efforts were underway by NYCDEP, NYC Economic Development Corporation and the Port Authority of New York & New Jersey to relocate these secondary water supply pipelines to a single supply line at a considerably deeper elevation; however that construction work was severely impacted and delayed by Superstorm Sandy. This utility relocation work has resumed and efforts are now underway to accelerate this work. Currently, the schedule for completing the relocation is mid to late 2015. The two other corridors provide various electrical, telecommunication, petrochemical and natural gas supplies to Brooklyn. These utilities are grouped into two areas and slope closer to the Anchorage Channel required elevation, as they approach the Brooklyn (eastern) side of the Anchorage Channel (see Figures 2A and 2B).

Given that dredging over utilities that are within 7 ft. of the construction work warrants additional scrutiny to ensure the safety of the underlying utilities, the Corps has developed plans for more precise dredging of the material overlying these utility corridors. Depending upon the timing of the dredging (either before the water siphon relocation or after), dredging of the Holocene sandy sediments in the Anchorage Channel may be accomplished by hydraulic and/or mechanical means. Material directly overlying active utilities may be hydraulically moved and/or dredged by non-mechanically impacting methods (e.g., sediment fluidization and/or bar dragging) to ensure the safety of the underlying active utilties. Additional construction monitoring, oversight, and contingency plans will also be employed for any work over active utilities in these areas.

As with the prior deepening construction contracts in Anchorage Channel, the contractor will be required to achieve removal of material to -50 ft. MLW, and will be compensated for any removal beyond this depth up to 1 ft. (i.e., allowable overdepth) in areas outside of the active utilities. Additional removal may be required in localized areas of inactivated utilities to ensure no hard objects lie within -52 ft. MLW, as an additional navigation safety precaution. In areas of active utilities, compensation to the contractor(s) by the Corps will be made by linear foot completed to the required depth to lessen dredging incentives. The Corps estimates that dredging of approximately 70,000 CY of sandy Holocene sediments in the Anchorage Channel will necessary to achieve full navigational clearance in the channel, including the areas of the utilities. This volume estimate is based on recent surveys with removal to -50 ft. MLW plus one foot of allowable overdepth. Any debris encountered during the dredging will be separated, with the resultant material planned to be placed at the HARS. This work, along with other ongoing HDP construction, will facilitate the transition of the project from construction to Corps maintenance and achieve the full project navigational benefits to the region and nation.

Arthur Kill Channel

The northern portion of the Arthur Kill Channel, from adjacent to the New York Container Terminal, located on Staten Island, New York, to the Phillips 66 Refinery, located in Linden, New Jersey is presently at the navigable depth of – 35 ft. MLW. The Corps, as the remaining element of planned construction of the Arthur Kill Channel, Howland Hook Marine Terminal Navigation Project, proposes to dredge this portion of the Arthur Kill Channel which has not been previously deepened to -40 ft. MLW, plus 2 ft of addition-nal depth for additional safety clearance due to the hard underlying substrate, plus 1.5 ft. of allowable overdepth, and, in the southern section which has been previously deepened, to remove accumulated shoals to -41 ft. MLW, plus 1 ft. of allowable overdepth. This channel deepening will facilitate more economical transit of petroleum products to and from the Phillips 66 Refinery.

The contract to deepen this element of the Arthur Kill Channel involves deepening a section of presently -35 ft. channel and the removal of shoals in a southern section, which has previously been dredged to -42 ft. MLW (see Figures 3A and 3B). The proposed HARS material shall only be dredged in the existing -35 ft. channel area and not from the previously deepened southern section where accumulated Holocene silt shoals will be dredged.

In the existing -35 ft. channel area, Holocene age black silts (see Figure 3C) and sands overlie hard Pleistocene age red-brown clay and Pleistocene age glacial till material and bedrock, which is largely shale, that are to be dredged to a depth of –42 feet (see Figure 3D) for the 40-foot project depth (i.e., design depth of –40 feet plus an additional –2 feet for safety). To account for the inherent imprecision and variability in a dredging operation, the contractor is also paid for removing up to an additional 1.5 feet of material, below the required depth of –42 feet mean low water. Based on analyses of survey data from previous contracts, it is expected that that the average depth that will be achieved will be –43.5 feet. Approximately 95% of the individual survey points will likely be between –42.5 feet and –44.5 feet below mean low water.

The following Table A summarizes the estimated volumes of material proposed to be dredged as part of the HDP and Arthur Kill Channel construction. The attached Figures 2A and 2B show the typical vertical and horizontal extent of the Holocene sandy material in the Anchorage Channel and Figures 3D and 3E show the vertical and horizontal extent of Pleistocene glacial till and clays in the Arthur Kill Channel dredging area. The construction under discussion in this public notice is expected to begin at the end of the year and be largely performed in 2015. While it may be dredged as one construction contract, it may be performed under separate Corps construction contracts. The District will request either new Water Quality Certificates and Federal Consistency Determinations (WQC/FC) or amendments/authorization for work to existing WQC/FC’s previously issued for dredging these areas from the State of New Jersey Department of Environmental Protection and from New York State Department of Environmental Conservation for this work.

Table A
Material Volume Estimates by Area

Location of Material / Volume Estimates	HARS Suitable Pleistocene Age Sediments	HARS Suitable Holocene Sediments	Non-HARS Suitable Holocene Sediments	Rock (shale) (CY)	Total Material Volume (CY)
	Glacial Tills & Clays* (CY)	Predominantly Sandy Material (CY)	Silts** (CY)		
Anchorage Channel Utility Corridors & Shoals		**70,000**			**70,000**
Arthur Kill Channel, Contract Area 4 – Deepening from 35 ft. to 40 ft.	**43,223**		**65,915**	**360,000**	**469,138**
Arthur Kill Channel, Contract Area 4 – Southern Area Shoal Removal			**10,600**		**10,600**

* The USEPA, Region 2 and the USACE, NY District determined in a Memorandum For Record dated July 29, 2003, that Pleistocene age glacial till from Newark Bay region is characterized for HARS placement. The USEPA, Region 2 and the USACE, NY District determined in a Memorandum for Record dated January 26, 2000 that Pleistocene age red-brown clay from the greater Newark Bay formation is characterized for HARS placement.

** The New York District will send this Holocene age black silt to a state-approved site(s), not to the HARS. The volume is included in this table for completeness.

The purpose of this Public Notice is to solicit comments regarding the proposed placement of these HARS suitable materials at the HARS. These comments, along with all available technical data/information, will form the basis of a determination of whether this proposed placement is in the public interest. The HARS (Figures 4 & 5), located in the Atlantic Ocean off the coasts of New York and New Jersey, is described later in this notice.

Approximately 43,223 cubic yards of the proposed dredged material from this proposed work has been demonstrated to be Pleistocene age glacial till. The joint U.S. Environmental Protection Agency – Region 2 and U.S. Army Corps of Engineers – New York District July 29, 2003 Memorandum For The Record titled Joint Federal Position on Testing of Glacial Till Dredged Materials from Selected Areas of New York – New Jersey Harbor concluded that Pleistocene age glacial till is removed from sources of contaminants and has been adequately characterized by previous testing in the vicinity. As such, further project-specific testing of glacial till, including these 43,223 cubic yards, is not required.

In accordance with geological testing and assessment procedures set forth in a joint U.S. Environmental Protection Agency – Region 2 and U.S. Army Corps of Engineers –New York District standardized operating procedures, these 43,223 cubic yards are glacial till because the material (1) lacks detectible fossils or shells, (2) has a low organic carbon content, (3) has a reddish or red-brown color, (4) is comprised of a poorly sorted layer of clay particles, silts, sands, gravels and boulders, and (5) has a stratigraphic setting consistent with other Pleistocene age deposits in the vicinity of this Newark Bay Channel dredging area. A copy of the glacial till determination for this construction contract area may be requested from Mr. Randall Hintz, Chief, Operations Support Branch, at telephone number (917) 790-8550.

Several areas of Pleistocene age glacial till in the vicinity of this proposed work were previously tested to determine suitability for use as Remediation Material at the HARS. This testing of glacial till was conducted in accordance with test protocols for ocean placement established by the U.S. Environmental Protection Agency – Region 2 and U.S. Army Corps of Engineers –New York District. Public notice of previous Pleistocene age glacial till chemical analysis, toxicity, and 28-day bioaccumulation test results for a determination of suitability for HARS remediation purposes was provided in U.S. Army Corps of Engineers – New York District Public Notice FP63-AKCA1-2003 issued on October 14, 2003 for Arthur Kill Contract Areas 1A.

The approximately 75,915 cubic yards of Holocene age black silt material in this proposed work will be removed with an environmental dredging clamshell bucket. The base solicitation for this contract plans for this material to be processed into amended dredged material and used beneficially in the ongoing remediation of suitable state approved upland remediation or construction location(s).

The approximately 360,000 cubic yards of dredged shale bedrock from this proposed action will be placed at the HARS or used beneficially at a permitted ocean artificial reef(s).

The proposed transportation and placement of this dredged material in ocean waters is being evaluated to determine that the proposed placement will not unreasonably degrade or endanger human health, welfare or amenities, or the marine environment, ecological systems or economic potentialities. On September 26, 2000, the United States Environmental Protection Agency (USEPA) and U.S. Army Corps of Engineers (Corps) signed a Memorandum of Agreement (MOA) outlining the steps to be taken to ensure that remediation of the HARS continues in a manner appropriately protective of human health and the aquatic environment. In making the determination, the criteria established by the Environmental Protection Agency (EPA) will be applied, including the interim change to one matrix value for PCBs, as described in the MOA. In addition, based upon an evaluation of the potential effect which the failure to utilize this ocean site will have on navigation, economic and industrial development, and foreign and domestic commerce of the United States, an independent determination will be made of the need to place the dredged material in ocean waters, other possible methods of disposal, and other appropriate locations.

The Corps is soliciting comments from the public; federal, state and local agencies and officials; Indian tribes; and other interested parties in order to consider and evaluate the impacts of this proposed activity. Comments are used to assess impacts on navigation, water quality, endangered species, historic resources, wetlands, scenic and recreational values, and other public interest factors.

ALL COMMENTS REGARDING THIS ACTIVITY MUST BE PREPARED IN WRITING AND MAILED TO REACH THE NEW YORK DISTRICT, USACE AT THE OFFICE ADDRESS SHOWN ON THE FRONT PAGE OF THIS NOTICE, BEFORE THE EXPIRATION DATE OF THIS NOTICE. Otherwise, it will be presumed that there are no objections to the activity.

Pursuant to Section 307 of the Coastal Zone Management Act of 1972, as amended [16 USC 1456(c)], for activities conducted or supported by a federal agency in a state which has a federally approved Coastal Zone Management (CZM) program or Federal Consistency Determination (FCD) program, the Corps must submit a determination that the proposed project is consistent with the State CZM program and/or State FCD program to the maximum extent practicable. This activity is subject to review by the New Jersey Department of Environmental Protection for CZM consistency with the enforceable policies of the State of New Jersey Coastal Management Program. The U.S. Army Corps of Engineers, New York District, has determined that the proposed activities are consistent to the maximum extent practicable and within the applicable policies of the State of New Jersey CZM program. A copy of this CZM determination has been provided to the State of New Jersey Department of Environmental Protection. Additional information regarding the Corps' consistency determination may be obtained by contacting the State of New Jersey Department of Environmental Protection, Bureau of Coastal Regulation, CN 401, 501 East State Street, Second Floor, Trenton, New Jersey 08625-0401, Attention: Consistency Review.

The proposed placement at the HARS has been reviewed based upon the "Biological Assessment for the Closure of the Mud Dump Site and Designation of the Historic Area Remediation Site (HARS) in the New York Bight and Apex" (USEPA, 2012) prepared pursuant to Section 7 of the Endangered Species Act (16 USC 1531) and the Biological Opinion (NOAA 2012). Based upon that review, and a review of the latest public listing of threatened and endangered species, it has been preliminarily determined that the proposed activity described herein is not likely to adversely affect any federally-listed threatened or endangered species (Atlantic sturgeon, humpback whales, finback whales, right whales, loggerhead turtles, leatherback turtles, green turtles, and Kemp's Ridley turtles) or their critical habitat, as designated.

The material proposed for HARS placement will not be placed within 0.27 nautical miles or more of any identified wrecks, which are indicated in the National Register of Historic Places. Other than wrecks, there are no known sites eligible for, or included in, the Register within the dredged material placement area. No known archaeological, scientific, pre-historical or historical data is expected to be lost by the anticipated placement of dredged material.

Reviews of the activity pursuant to Section 404 of the Clean Water Act will include application of the guidelines announced by the Administrator, U.S. Environmental Protection Agency, under authority of Section 404(b) of the Clean Water Act. The Corps will obtain a water quality certificate from the New Jersey Department of Environmental Protection in accordance with Section 401 of the Clean Water Act, prior to commencement of any work.

In compliance with Section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act (1996 amendments), an Essential Fish Habitat Assessment will be prepared and submitted to the National Marine Fisheries Service for review and comment.

The District continues to work closely with the following Federal and State agencies:

- U.S. Environmental Protection Agency
- U.S. Department of the Interior, Fish and Wildlife Service

- U.S. Department of Commerce, National Marine Fisheries Service
- U.S. Coast Guard, Activities New York
- New Jersey Department of Environmental Protection
- New York State Department of Environmental Conservation
- New York State Department of State

ENVIRONMENTAL DOCUMENTATION:

The environmental impacts of the New York and New Jersey Harbor Deepening Project (HDP) have been evaluated in National Environmental Policy Act (NEPA) and regulatory documents including: (1) the Final Feasibility Report and Final Environmental Impact Statement dated December 1999; (2) the Federal Record-of-Decision executed in June 2002; (3) the Final Limited Reevaluation Report and Final Environmental Assessment/Finding of No Significant Impact dated January 2004; and (4) the Final Environmental Assessment of the NY & NJ Harbor Deepening Project on the Remedial Investigation/Feasibility Study of the Newark Bay Study Area, June 2007.

The environmental impacts of the Arthur Kill Channel, Howland Hook Marine Terminal, New York and New Jersey Navigation Project have been evaluated in National Environmental Policy Act (NEPA) and other regulatory documents including: (1) the Final Feasibility Report and Final Environmental Impact Statement dated March 1986; (2) the Final Limited Reevaluation Report dated December 1997 and Final Supplemental Environmental Impact Statement dated April 1998; (3) the Final Finding of No Significant Impact/Environmental Assessment for the Selection of Potential Dredged Material Placement Sites dated November 2000; (4) the Final Addendum to the Limited Reevaluation Report and Final Finding of No Significant Impact and Final Environmental Assessment for Wetland Resources and Restoration dated May 2001; (5) the Federal Record-of-Decision executed in August 2001; (6) the Federal Consistency Determination/Water Quality Certification by New Jersey Department of Environmental Protection (No. 0000-92-0031.7) for the project dated November 23, 1998, as amended; (7) the Federal Consistency Determination/Water Quality Certification by New Jersey Department of Environmental Protection (No. 0000-02-049.1) for Arthur Kill Contract 2 dated February 6, 2004, as amended February 24, 2004; an amendment to the generic Federal Consistency Determination will be issued when permitted upland placement sites for Contract 2 have been identified; (8) the Water Quality Certification by the New York State Department of Environmental Conservation (No. 2-6499-00001/00002) for the project dated April 20, 2001, as last amended on February 26, 2004; and (9) the Federal Consistency Determination for the New York State Coastal Management Program by the New York State Department of State for the project dated May 4, 1999.

Copies of these documents can be viewed and/or obtained by contacting Mr. Bryce Wisemiller, Project Manager for this contract of the New York and New Jersey Harbor Deepening Project, at telephone number (917) 790-8307.

HISTORIC AREA REMEDIATION SITE (HARS):

In 1972, Congress enacted the Marine Protection Research and Sanctuaries Act (MPRSA) to address and control the dumping of materials into ocean waters. Title I of the Act authorized the US Environmental Protection Agency and the US Army Corps of Engineers to regulate dumping in ocean waters. USEPA and USACE share responsibility for MPRSA permitting and ocean disposal site management. USEPA regulations implementing MPRSA are found at 40 CFR Sections 220 through 229. With few exceptions, MPRSA prohibits the transportation of material from the United States for the purpose of ocean dumping except as may be authorized by a permit issued under the MPRSA. The MPRSA divides permitting responsibility between the USEPA and USACE. Under Section 102 of the MPRSA, USEPA has responsibility for issuing permits for all materials other than dredged material. Under Section 103 of MPRSA, the Secretary of the Army has the responsibility for issuing permits for dredged material, subject to USEPA concurrence.

In the fall of 1997, the USEPA de-designated and terminated the use of the New York Bight Dredged Material Disposal Site (commonly known as the Mud Dump Site or MDS). The MDS had been designated in 1984 for the disposal of up to 100 million CY of dredged material from navigation channels and other port facilities within the Port of New York and New Jersey. Simultaneous with the closure of the MDS, the site and surrounding areas that had been used historically as disposal sites for dredged materials were redesignated as the HARS (Figures 4 & 5) at 40 CFR Sections 228.15(d)(6) (See 62 Fed. Reg. 46142 (August 29, 1997); 62 Fed. Reg. 26267 (May 13, 1997)). The HARS is to be managed to reduce impacts of historical disposal activities at the site to acceptable levels in accordance with 40 CFR Sections 228.11(c). The need to remediate the HARS is supported by the presence of toxic effects, dioxin bioaccumulation exceeding Category 1 levels (a definition of which appears in an evaluation memorandum reviewing the results of the testing) in worm tissue, as well as TCDD/PCB contamination in area lobster stocks. Individual elements of those data do not establish that sediments within the Study Area are imminent hazards to the New York Bight Apex ecosystem, living resources, or human health. However, the collective evidence presents cause for concern, and justifies the need for remediation. Further information on the surveys performed and the conditions in the HARS Study Area may be found in the Supplemental Environmental Impact Statement (USEPA, 1997).

The HARS designation identifies an area in and around the former MDS that has exhibited the potential for adverse ecological impacts. The HARS will be remediated with dredged material that shall be selected so as to ensure it will not cause significant undesirable effects including through bioaccumulation or unacceptable toxicity, in accordance with 40 CFR 227.6. This dredged material is referred to as "Material for HARS Remediation" or "HARS Remediation Material".

As of the end of May 2014, dredged materials from ninety-nine different completed and ongoing private and federal dredging projects in the Port of New York and New Jersey have been dredged and placed as Remediation Material in the ocean at the HARS since the closure of the Mud Dump Site and designation of the HARS in 1997. This represents approximately 65,883,000 cubic yards of Remediation Material.

The HARS, which includes the 2.2 square nautical mile area of the former MDS, is an approximately 15.7 square nautical mile area located approximately 3.5 nautical miles east of Highlands, New Jersey and 7.7 nautical miles south of Rockaway, New York. The former MDS is located approximately 5.3 nautical miles east of Highlands, New Jersey and 9.6 nautical miles south of Rockaway, New York. When determined by bathymetry that capping is complete, the USEPA will undertake any necessary rulemaking to de-designate the HARS. The HARS includes the following three areas:

Priority Remediation Area (PRA): A 9.0 square nautical mile area to be remediated with at least 1 meter of Remediation Material. The PRA encompasses an area of degraded sediments as described in greater detail in the SEIS.

Buffer Zone: An approximately 5.7 square nautical mile area (0.27 nautical mile wide band around the PRA) in which no placement of the Material for Remediation will be allowed, but which may receive Material for Remediation that incidentally spreads out of the PRA.

No Discharge Zone: An approximately 1.0 square nautical mile area in which no placement or incidental spread of Material for Remediation is allowed.

To improve management and monitoring of placement activities at the HARS, electronic monitoring equipment is used on-board vessels carrying Remediation Material to the HARS. This equipment records vessel positions and scow draft throughout the duration of each trip to the HARS and during remediation operations. To improve communication reliability between tugs and scows, a prescribed formal communication procedure has been put in place (copies of this procedure are available upon request).

Over the past years, U.S. Environmental Protection Agency – Region 2 and the U.S. Army Corps of Engineers – New York District have been refining the approach to the technical review and scientific and regulatory analysis of dredging projects' dredged materials proposed for placement at the HARS. Sediment testing evaluation processes are evolving, which establish a responsible framework for assessing results of physical, chemical and bioaccumulation test results, to include tissue analysis from bioaccumulation testing of dredged materials proposed for ocean placement. The bioaccumulation framework defines a standard approach for assessing each analyte (an item to be analyzed for as part of the testing), in relation to regulatory standards and human health and environmental risk factors. The framework's purpose is to facilitate decision, and final decision making, in accordance with the Marine Protection, Research and Sanctuaries Act of 1972. The U.S. Environmental Protection Agency – Region 2 and the U.S. Army Corps of Engineers – New York District utilize these testing evaluation processes for identifying HARS-suitable dredged materials for remediation of the HARS.

Additional information concerning the HARS itself can be obtained from Mr. Buddy LoBue of U.S. Environmental Protection Agency – Region 2, Acting Team Leader of the Dredged Material Management Team, at telephone number (212) 637-3798.

HARS SUITABILITY TESTING:

In accordance with 40 CFR Part 227 of the Ocean Dumping Regulations, bioassays were performed to assess the toxicity of the solid phase, liquid phase and suspended particulate phase of the proposed dredged material from the project area. Bioassays were performed using appropriate sensitive marine organisms as discussed below, with testing conforming to procedures outlined in the 1991 Green Book. The results of bioassay tests conducted on sediments from each project area are provided in Table 2: Toxicity Test Results.

In the past years, USEPA and the Corps have been refining the approach to the technical review and scientific and regulatory analysis of dredging projects proposed for the HARS. A testing evaluation process was developed, which established a basic framework for assessing results of tissue analysis from bioaccumulation testing of dredged material proposed for ocean placement. The framework defines a standard approach for assessing each analyze (an item to be analyzed for as part of the testing), in relation to regulatory standards and human health and environmental risk factors, to facilitate decisions in accordance with the MPRSA. USEPA and the Corps utilize this testing evaluation process for identifying Category 1 dredged material in determining suitability of dredged sediments as remediation material at the HARS.

The proposed dredging areas are depicted in Figures 2A-2B and 3A-3E.

The Anchorage Channel Utility Corridor has been characterized using one (1) sediment testing reach with five (5) core samples. The samples were taken to a depth of -53 feet Mean Low Water. The core samples were combined to yield one sediment composite which was submitted to chemical and biological testing. Based upon an analysis of sediment samples from the Anchorage Channel Utility Corridor, the grain size characteristics of the proposed dredged material are:

9.6% GRAVEL, 76.8% SAND, 9.0% SILT & 4.6% CLAY

Results of the chemical and biological testing of Anchorage Channel Utility Corridor sediment samples are summarized below.

Evaluation of the Liquid Phase: Chemistry

Under the requirements of 40 CFR Sections 227.6(c)(1) and 227.27(a), chemical analyses was conducted on project area site water and elutriate. Results of this evaluation are summarized in Table 1. Please note in reading Table 1 that detection limits have been listed for only those constituents which the laboratory reported as not-detected (ND) (this reporting convention was similarly applied in reporting the results of bioaccumulation potential testing discussed below). If the constituents were detected above the detection limit, the measured value would appear.

Expected concentrations of chemical constituents in the water column following ocean placement, after allowing for initial mixing, were calculated using the Automated Dredging and Disposal Alternatives Management System (ADDAMS). ADDAMS is a mixing model developed by the Corps Waterways Experiment Station (WES) and described in the joint

USEPA/Corps implementation manual entitled "Ecological Evaluation of Proposed Discharge of Dredged Material Into Ocean Water" (commonly referred to as the National "Green Book"). The material can be considered suitable for ocean disposal only if the concentration of the Suspended Particulate Phase (SPP) of the dredged material, after allowance for initial mixing, will not exceed the Limiting Permissible Concentration (LPC) beyond the boundaries of the disposal site within the first four hours following dumping or at any point in the marine environment after the first four hours. The ADDAMS Model predicted that applicable marine water quality criteria for listed constituents were not exceeded after allowance for initial mixing (40 CFR 227.29(a)). Results of the analyses indicate that the LPC will be met for the proposed dredged material from each project area.

BIOASSAYS

In accordance with 40 CFR Part 227 of the Ocean Dumping Regulations, bioassays were performed to assess the toxicities of the solid phase, liquid phase, and suspended particulate phase of the proposed dredged material from each project area. Liquid phase bioassays, run as part of the suspended particulate phase on three appropriate sensitive marine organisms (a crustacean (shrimp, *Americamysis bahia),* finfish *(Menidia beryllina),* and larvae of a bivalve (mussel, *Mytilus edulis)),* show that after initial mixing (as determined under 40 CFR Sections 227.29(a)(2)) the liquid phase of the material would not exceed a toxicity threshold of 0.01 of a concentration shown to be acutely toxic to appropriate sensitive marine organisms. Accordingly, it is concluded that the liquid phase of the material would be in compliance with 40 CFR Sections 227.6(c)(l) and 227.27(a). The specific test results and technical analysis of the data underlying this conclusion are described and evaluated in a joint U.S. Army Corps of Engineers, New York District/US Environmental Protection Agency Region 2 memorandum (copies available upon request).

Evaluation of the Suspended Particulate Phase

The suspended particulate phase of the material was evaluated for compliance with 40 CFR Sections 227.6(c)(2) and 227.27(b). Bioassay testing of the suspended particulate phase of the material has been conducted using three appropriate sensitive marine organisms (a crustacean *(Americamysis bahia),* finfish *(Menidia beryllina),* and larvae of a bivalve *(Mytilus edulis).* Median lethal concentrations (LC_{50}), which are concentrations of suspended particulate phase resulting in 50% mortality, were determined for all three test species. In addition, the median effective concentration (EC_{50}), based on normal larval development to the D-cell stage, was determined for the bivalve larvae of *Mytilus edulis.* The Limiting Permissible Concentration (LPC) was then calculated as 0.01 of the LC_{50} or EC_{50} of the most sensitive organism. The LPC for the suspended particulate phase of the Anchorage Channel Utility Corridor composite was calculated as 1.0, based on the EC_{50} of *Mytilus edulis.*

The information shows that when placed at the HARS and after initial mixing (as determined under 40 CFR Sections 227.29(a)(2)), the suspended particulate phase of this material would not exceed a toxicity threshold of 0.01 of a concentration shown to be acutely toxic in the laboratory bioassays, and thus would not result in significant mortality. Moreover, after placement, the suspended particulate phase would only exist in the environment for a short time, which

indicates the suspended particulate phase of the project material would not cause significant undesirable effects, including the possibility of danger associated with bioaccumulation, since these impacts require long duration exposures (see USEPA, 1994). Accordingly, it is concluded that the suspended phase of the material from the Anchorage Channel Utility Corridor would be in compliance with 40 CFR Sections 227.6(c)(2) and 227.27(b). The results of bioassay tests conducted on proposed dredged sediments from the project area are presented in Table 2 of this public notice. The specific test results and technical analysis of the data underlying this conclusion are described in a joint U.S. Army Corps of Engineers, New York District/USEPA Region 2 memorandum previously mentioned.

Evaluation of the solid phase toxicity

The solid phase is the whole test sediment before it has undergone processing that might alter its chemical or toxicological properties. The reference sediment represents existing background conditions in the vicinity of the dumpsite, removed from the influence of any disposal operation. For the solid phase bioassay, 10-day toxicity was determined by exposing a filter feeding mysid shrimp *(Americamysis bahia)* and a deposit feeding, burrowing amphipod *(Ampelisca abdita)* to a composite of sediment from the project areas and comparing mortalities in those treatments to mortalities experienced after exposure to a reference sediment; these organisms are good predictors of adverse effects to benthic marine communities (see, USEPA, 1996a). Results are evaluated for biologically and statistically significant differences in mortality between treatments. The 1991 Green Book guidance considers that dredged material does not meet the whole sediment toxicity criterion when mortality in the test treatments is (a) statistically significant and greater than in the reference sediment and (b) exceeds mortality in the reference treatment by at least 10% for mysid shrimp and 20% for amphipod species. The following sections address the results of those tests and further analyze compliance with the regulatory criteria of 40 CFR Sections 227.6(c)(3), 227.27(b), and 228.15 and with USEPA Region 2/U.S. Army Corps of Engineers, New York District guidance.

The toxicity of project sediments was not statistically greater than the reference for *Ampelisca abdita* and *Americamysis bahia.* The difference between percent survivals in test and reference sediments was less than 10% for mysid shrimp and less than 20% for amphipods. These results show that the solid phase of the material would not cause significant mortality. The results of the toxicity portion of the solid phase bioassays can be seen in Table 2.

Evaluation of the solid phase bioaccumulation

Bioaccumulation tests for sediments from the project area were conducted on the solid phase of the project material for contaminants of concern using two appropriate sensitive benthic marine organisms, a burrowing, deposit-feeding polychaete *Nereis virens* and a filter-feeding bivalve *Macoma nasuta.* These species are considered to be good representatives of the phylogenetically diverse base of the marine food chain. Contaminants of concern, identified for the regional testing manual are listed in the NY/NJ Harbor Estuary Program Taxies Characterization report (Squibb, *et al.* 1991).

Table 3 of this notice addresses the bioaccumulation of contaminants of concern for the project area. Additional information on more rigorous evaluations conducted on individual contaminants may be found in the Testing Evaluation Memos for this project. Table 3 indicates that some contaminants bioaccumulated above reference in the clam and/or worm. The testing memos further evaluate these contaminants and conclude that any contaminant that exceeded reference did not exceed any existing regional matrix or dioxin value. Several contaminants which did not have matrix values did exceed background levels, but in no case did any contaminant accumulate to toxicologically important concentrations even when very conservative assumptions were used in the analysis. Any contaminants that exhibited bioaccumulation test results above reference were all below the acceptable human health risk range and acceptable aquatic effects range, again using conservative approaches and analyses.

Based on the requirements of 40 CFR Parts 227.6 and 227.27, bioaccumulation analyses were performed for the chemical constituents listed in Table 3 of this public notice. All constituents identified in worm and clam tissue were compared to existing Food and Drug Administration (FDA) action levels for poisonous or deleterious substances in fish and shellfish for human food, regional disposal criteria, background concentrations and risk- based criteria provided by USEPA, Region 2.

ALTERNATIVES TO HARS PLACEMENT:

The New York District has evaluated the regional practicability of potential alternatives for dredged material disposal in the August 2008 Update of the "Dredged Material Management Plan for the Port of New York and New Jersey". The Recommended Plan within the report addresses both the short and long term dredged material placement options in two specific timeframes, 2005-2014 and 2015-2065, respectively. The Plan relies heavily on the creation, remediation, and restoration of a variety of existing degraded or impacted sites in the region with material that would or would not be considered suitable for HARS remediation. The Plan anticipates that a considerable volume of HARS-suitable material will be placed at alternative beneficial use sites currently under development. Use of these sites results in habitat creation (for shellfish, oyster, and bird), habitat restoration at existing degraded pit sites, landfill and quarry remediation, provision of construction material, and beach nourishment. Many dredged material management options presented in the Plan are not presently permitted and/or are presently under construction, and are unavailable for the purposes of this notice. However, as alternative sites are developed and permitted, they may be evaluated and designated for use for the remaining dredged material from the NY & NJ Harbor Deepening Project. As specific alternative sites and their applicable testing/regulatory criteria are subject to change, future Public Notices on the remaining NY & NJ Harbor Deepening Project contracts may be issued as evaluations and testing of the material to be dredged are performed and as other alternative placement sites are developed.

Based upon several relatively recent New York District navigation dredging solicitations, the cost for dredging and then using an upland placement site for silty or sandy material was approximately $70 per cubic yard as compared to approximately $15 per cubic yard for dredging similar material and placing it at the HARS. This is a substantial increase of approximately $55 per cubic yard over the cost of dredging and placing the material at the HARS.

The shoaling area dredged material currently has no economically viable alternative site for the HARS-suitable material. The District will continue to evaluate all reasonable and beneficial alternatives, as practicable, that may become available as solicitation(s) to dredge this material are advertised and awarded.

Conclusion

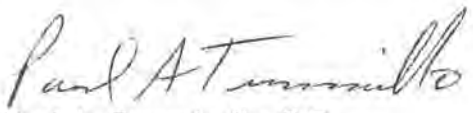
The USACE and the USEPA have determined that the material to be dredged meet the criteria for ocean placement as described in the regulator testing criteria of 40 CFR Parts 227.6 and 227.27, and in USEPA, Region 2/USACE, New York District guidance. The material is also suitable for placement at the HARS as Remediation Material as described at 40 CFR Part 228.15(d)(6). Based on the information available at the time of issuing this Public Notice, the Corps has tentatively determined that dredging of the shoals of the HDP as described within this Public Notice, with placement of the dredged material at the HARS, is not likely to have significant adverse environmental impact on water quality, marine resources, fish, wildlife, endangered species, recreation, aesthetics and flood protection of the area.

Placement of this material at the HARS would serve to reduce impacts at the HARS to acceptable levels and improve benthic conditions. Unremediated sediments in the HARS have been found to adversely impact benthic marine organisms. Placement of project material over existing unremediated HARS sediments would serve to remediate those areas. In addition, by covering the existing sediments at the HARS with this project material, surface dwelling organisms will be exposed to sediments exhibiting Category 1 qualities, which will ameliorate the existing sediment conditions.

If you have questions regarding this Public Notice or general questions on the NY & NJ Harbor or Arthur Kill Channel Deepening Projects, please contact Mr. Bryce Wisemiller at (917) 790-8307. Comments or questions may be FAXED to (212) 264-2924.

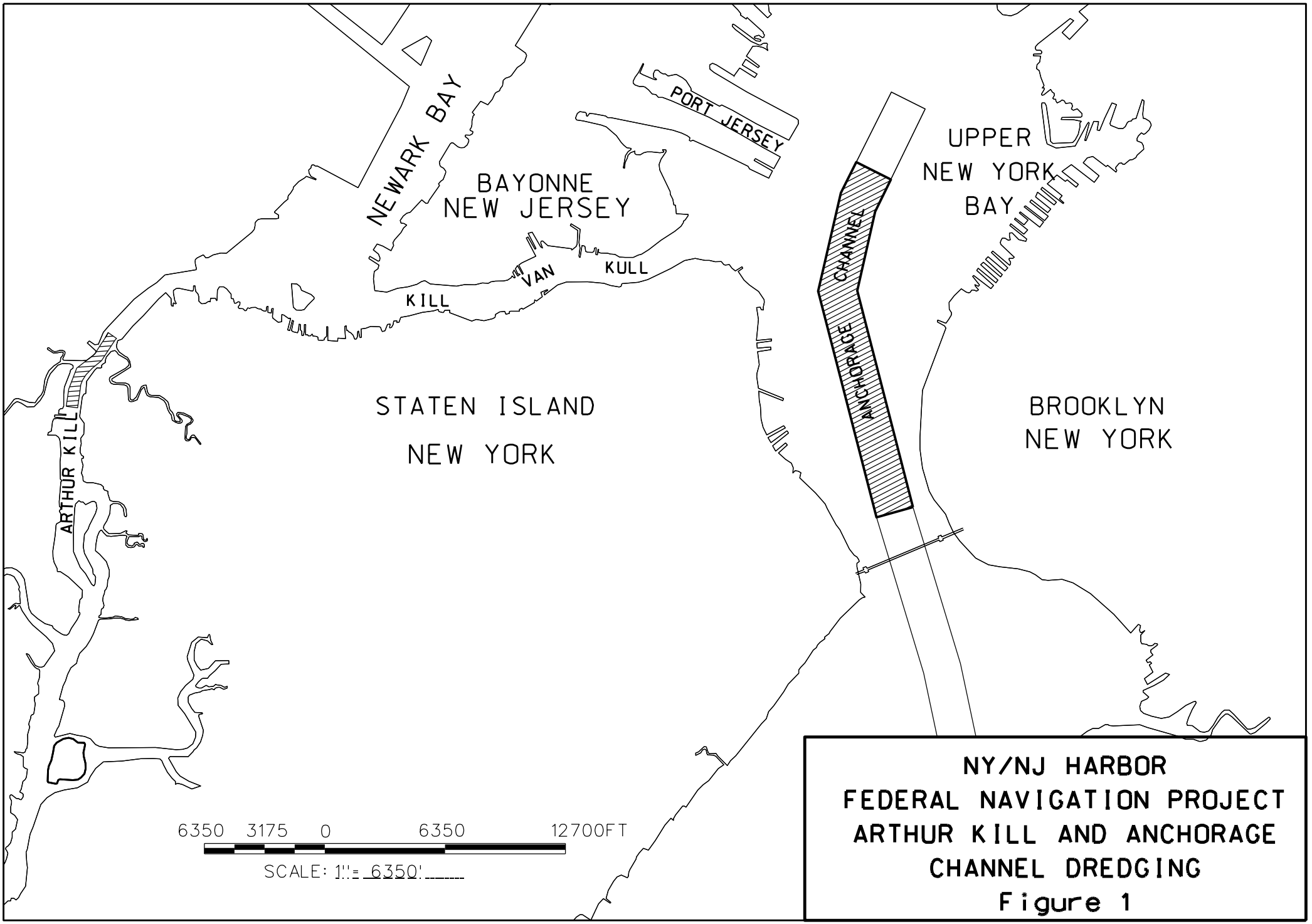
For more information on New York District programs, visit our website at http://www.nan.usace.army.mil.

We request that you communicate the foregoing information concerning the proposed work to any persons known by you to be interested and who did not receive a copy of this notice.

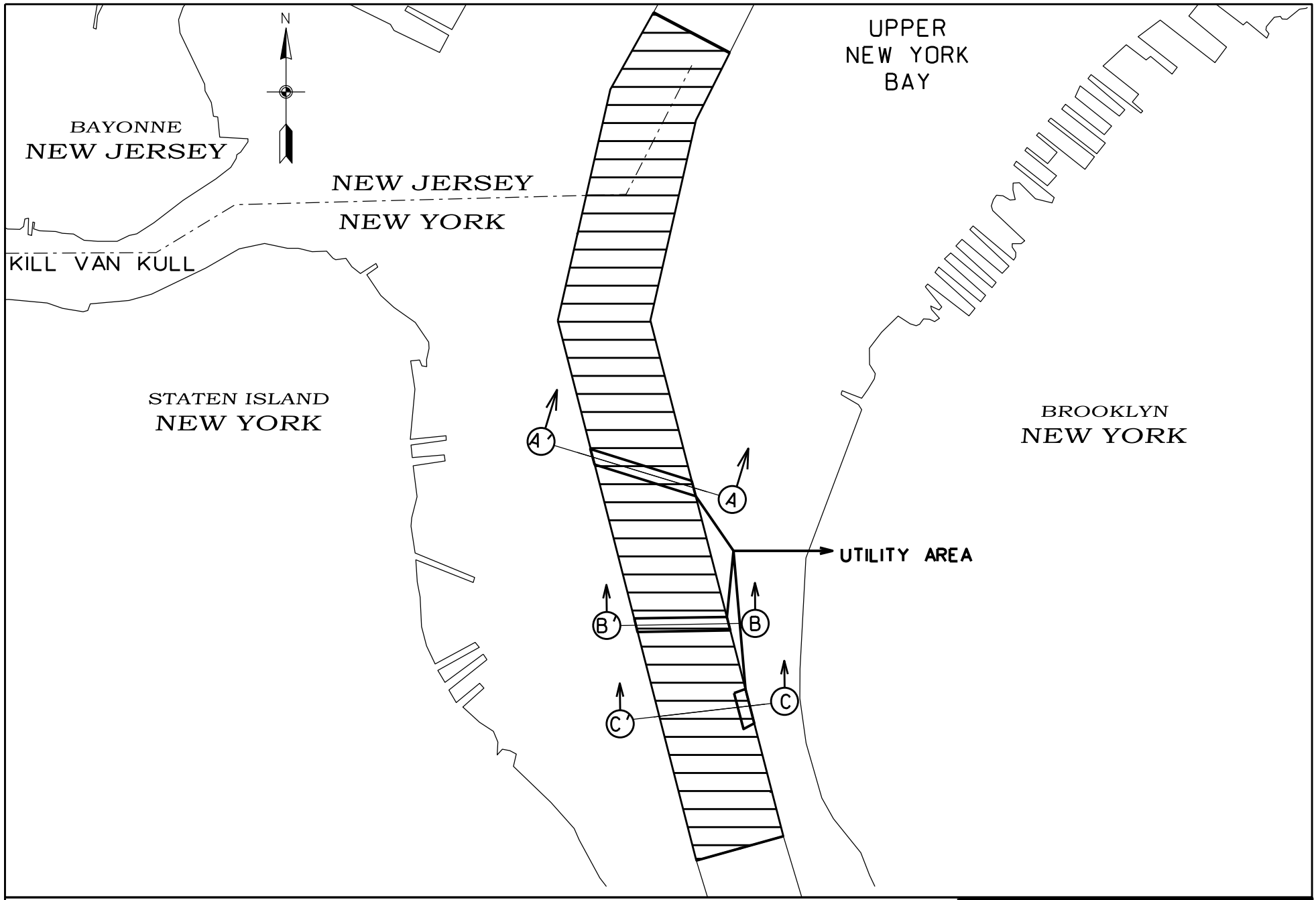


Paul A. Tumminello, P.E.
Chief, Civil Works Branch

Enclosures

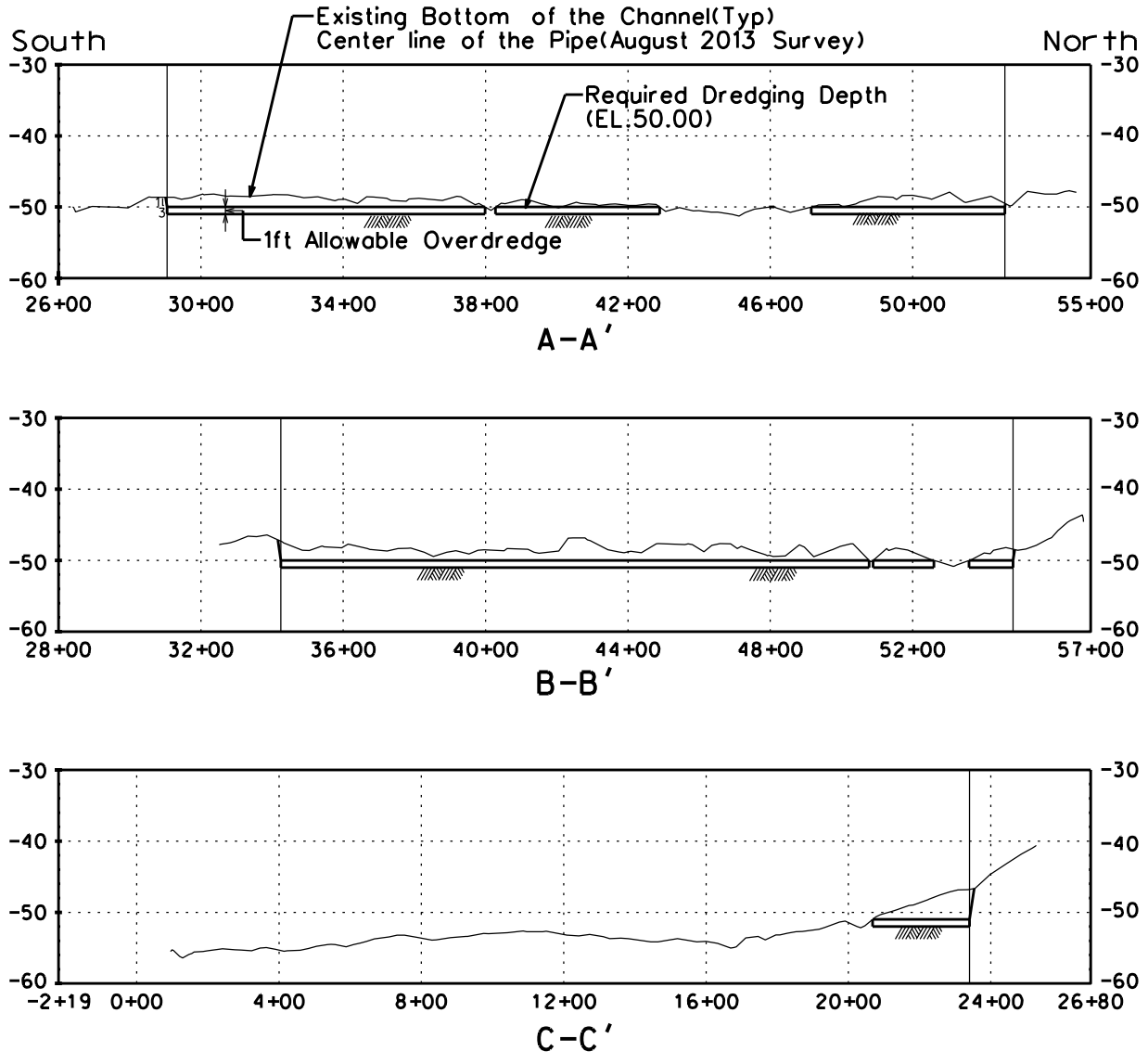


NY/NJ HARBOR
FEDERAL NAVIGATION PROJECT
ARTHUR KILL AND ANCHORAGE
CHANNEL DREDGING
Figure 1

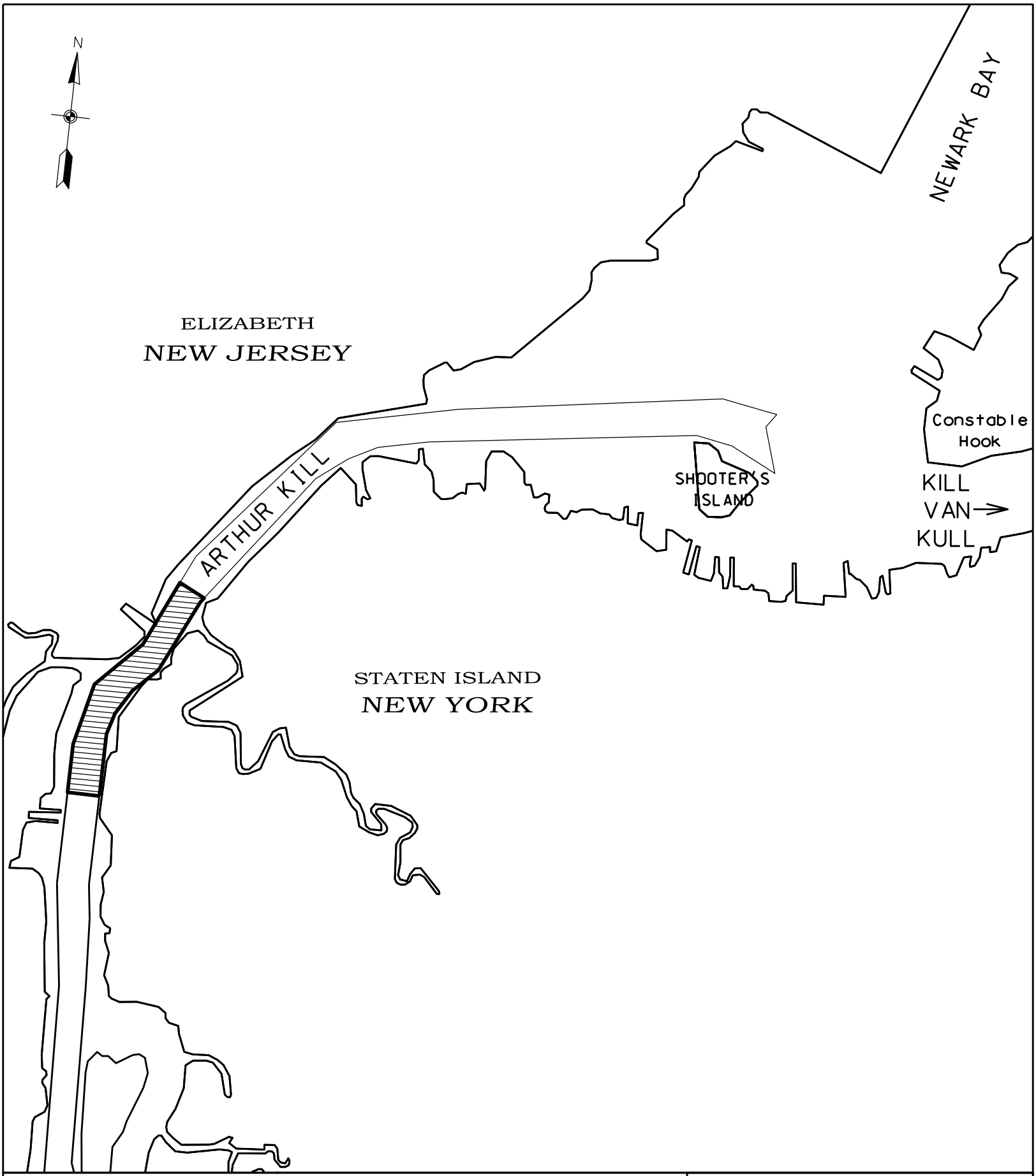


NY/NJ HARBOR DEEPENING
FEDERAL NAVIGATION PROJECT
ANCHORAGE CHANNEL DREDGING
Figure 2A

PROFILES OF DREDGING AREA



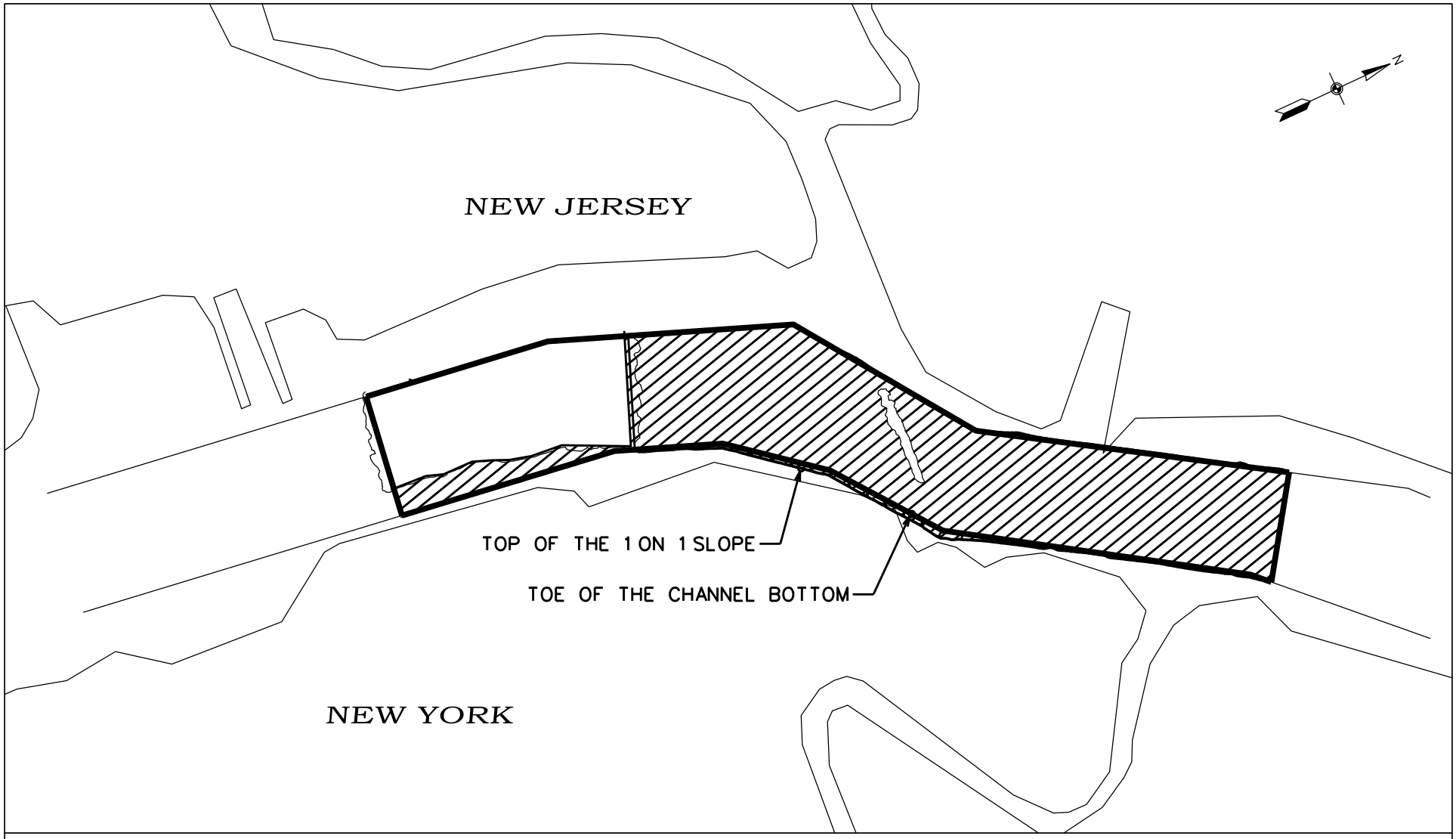
NY/NJ HARBOR DEEPENING
FEDERAL NAVIGATION PROJECT
ANCHORAGE CHANNEL DREDGING
CROSS SECTIONS
Figure 2B



2500 1250 0 2500 5000FT

1" = 2500'

NY/NJ HARBOR
FEDERAL NAVIGATION PROJECT
AK-4
CONTRACT AREA MAP
Figure 3A



LEGEND

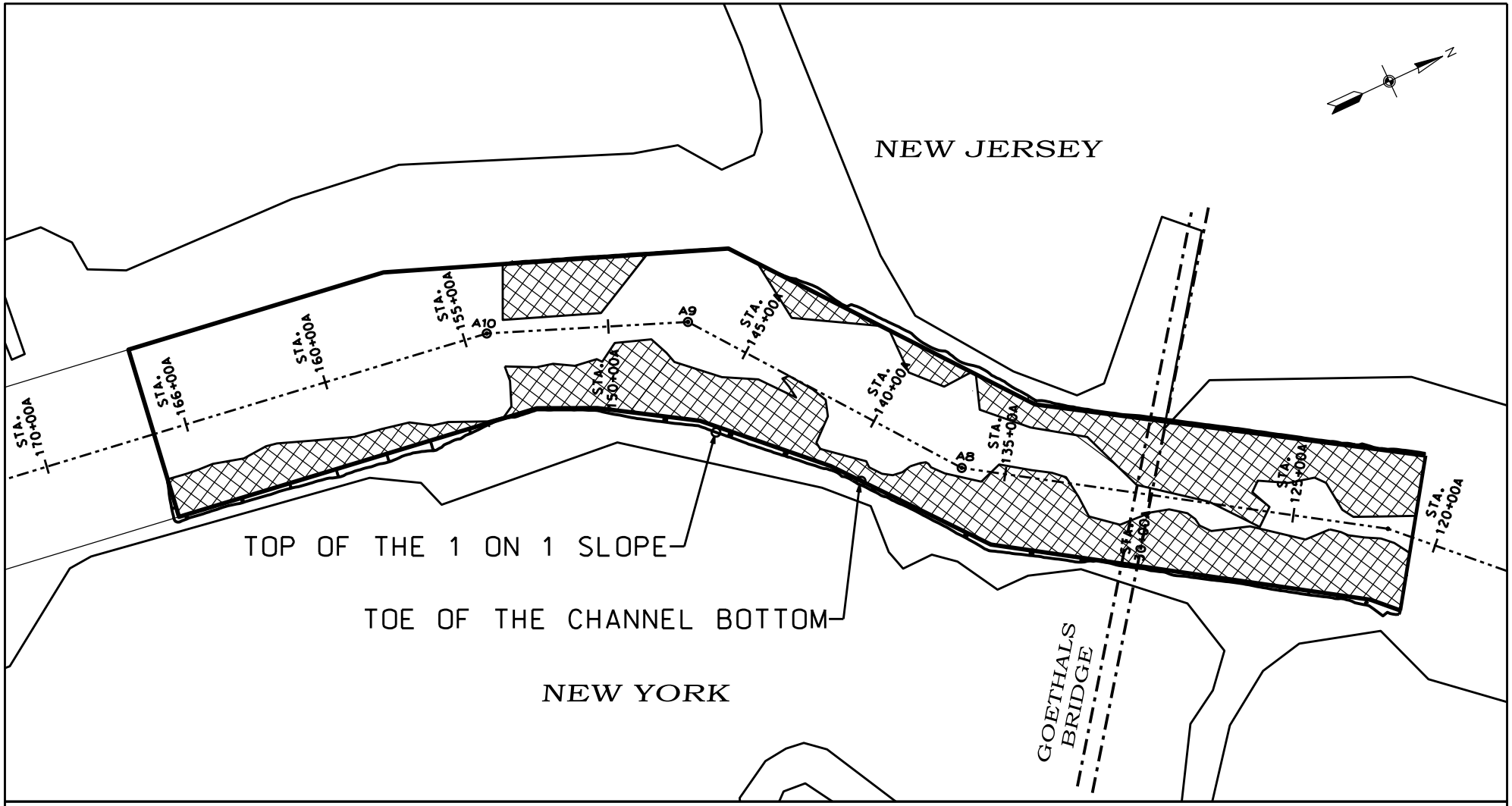
PROJECT AREA

DEEPER THAN DREDGING DEPTH

700 350 0 700 1400FT

SCALE: 1"=700'

NY/NJ HARBOR
FEDERAL NAVIGATION PROJECT
AK-4
ARTHUR KILL CHANNEL DREDGING
Figure 3B



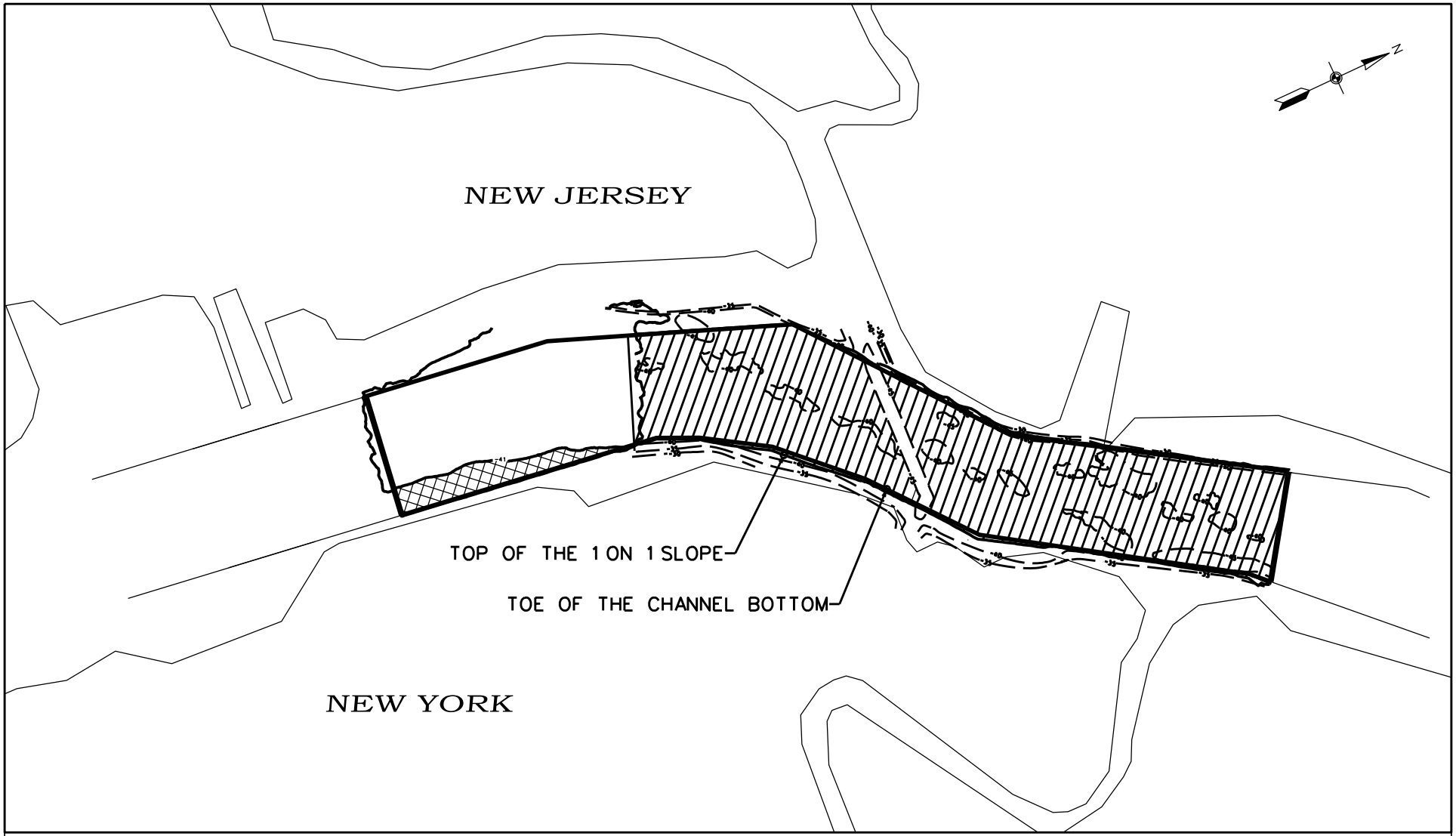
LEGEND

HOLOCENE, NON-HARS
SILTY MATERIAL

500 250 0 500 1000FT

SCALE: 1"=500'

NY /NJ HARBOR
FEDERAL NAVIGATION PROJECT
AK-4
ARTHUR KILL CHANNEL DREDGING
FIGURE 3C



LEGEND

PROJECT DEPTH EL.-41
(NOT INCLUDING 1 FT ALLOWABLE OVERDEPTH)

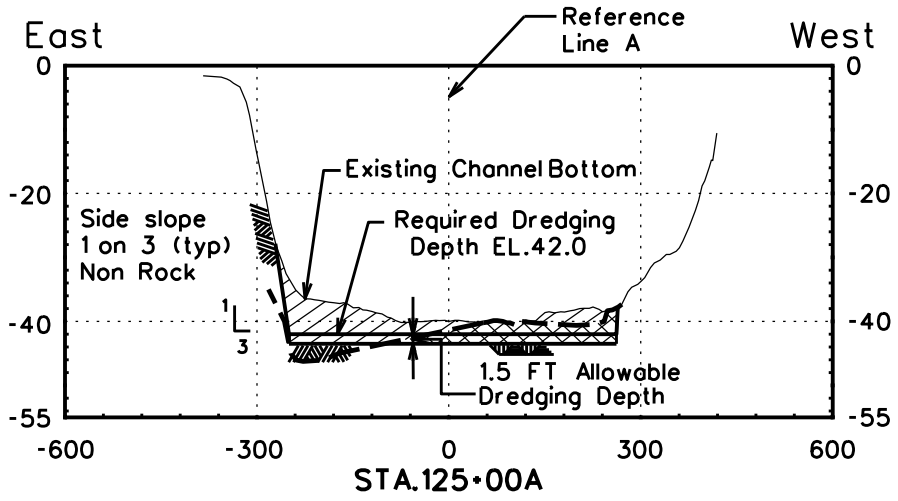
PROJECT DEPTH EL.-42
(NOT INCLUDING 1.5FT ALLOWABLE OVERDEPTH)

NOTE:
SIDE SLOPE 1 ON 1 IN ROCK AREA ONLY AND
1 ON 3 IN NON-ROCK AREA.

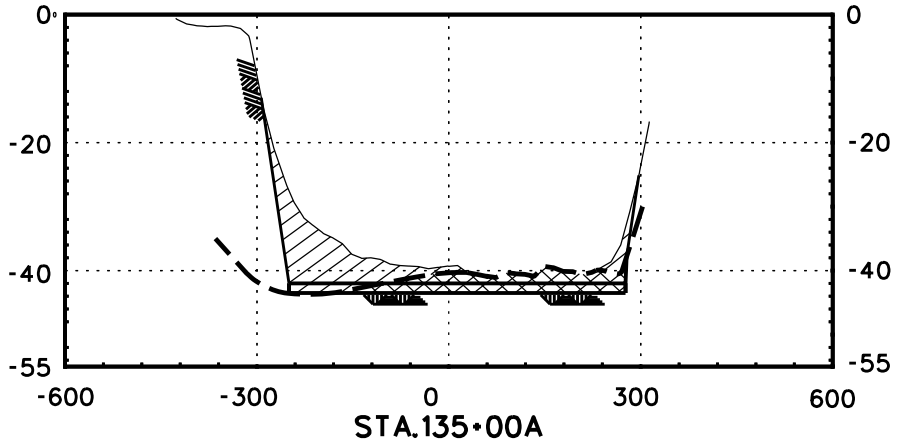
700 350 0 700 1400FT

SCALE: 1"=700'

NY/NJ HARBOR
FEDERAL NAVIGATION PROJECT
AK-4
ARTHUR KILL CHANNEL DREDGING
Figure 3D



STA.125+00A



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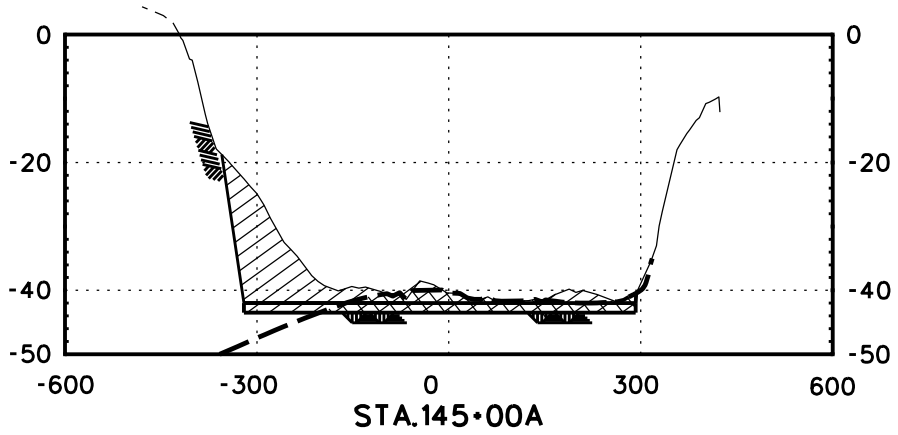


STA.145+00A

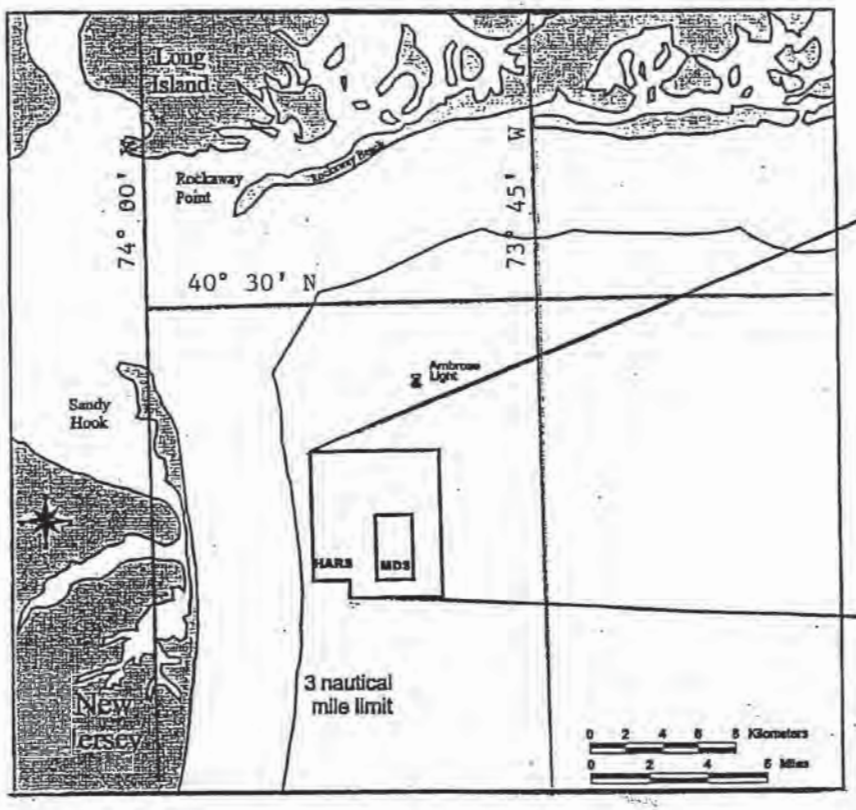
LEGEND

RED-BROWN SHALE ROCK

NON-ROCK

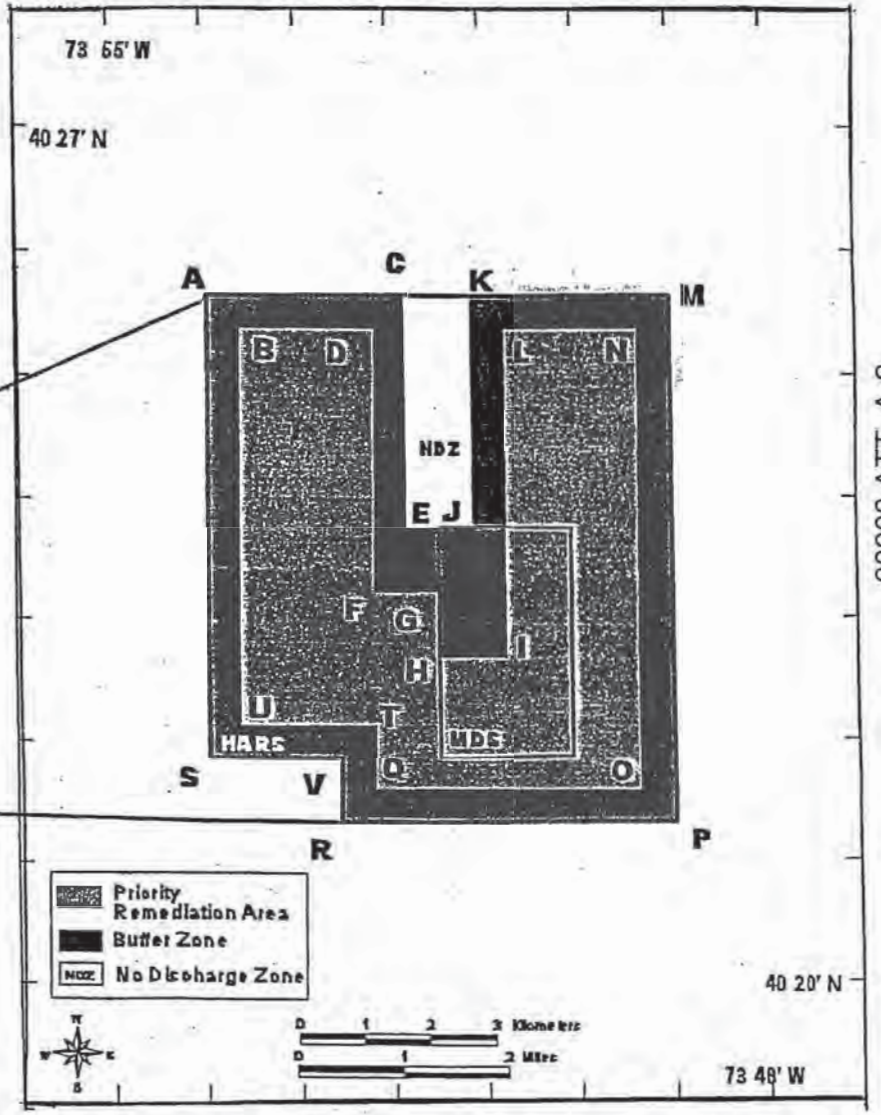
NY/NJ HARBOR
FEDERAL NAVIGATION PROJECT
AK-4
ARTHUR KILL CHANNEL
CROSS SECTIONS
Figure 3E

HISTORIC AREA REMEDIATION SITE LOCATION MAP



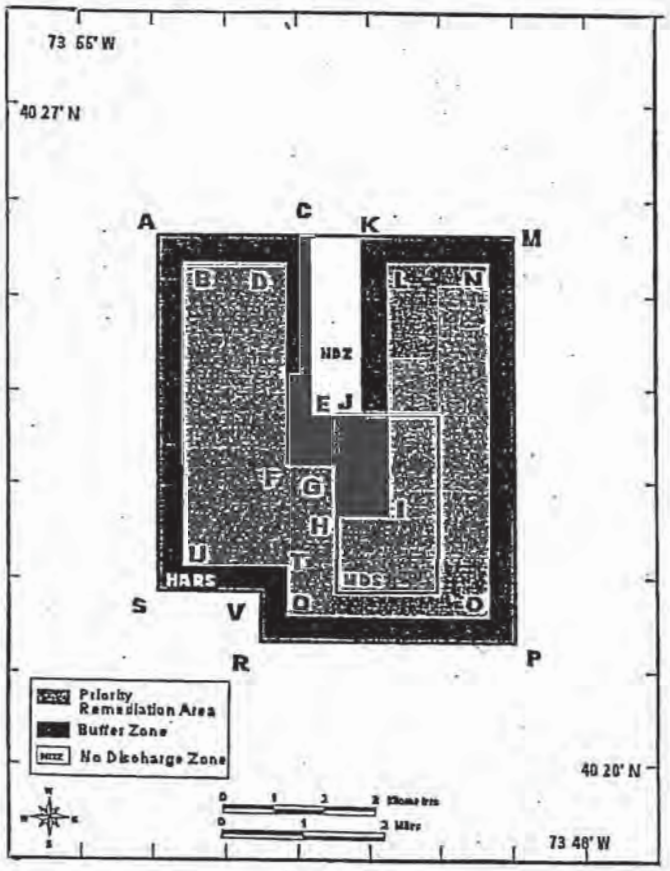
A

LOCATITON OF PRIMARY REMEDIATION AREA WITHIN THE HISTORIC AREA REMEDIATION SITE



B

Figure 4



Priority Remediation Area (PRA): 9.0 square nautical mile area to be remediated with at least one meter of Remediation Material, bounded by the following coordinates:

Point	Latitude DMS *	Longitude DMS	Latitude DDM **	Longitude DDM
B	40° 25' 23" N	73° 53' 34" W	40° 25.38' N	73° 53.57' W
D	40° 25' 22" N	73° 52' 08" W	40° 25.37' N	73° 52.13' W
F	40° 23' 13" N	73° 52' 09" W	40° 23.22' N	73° 52.15' W
G	40° 23' 13" N	73° 51' 28" W	40° 23.22' N	73° 51.47' W
H	40° 22' 41" N	73° 51' 28" W	40° 22.68' N	73° 51.47' W
I	40° 22' 41" N	73° 50' 43" W	40° 22.68' N	73° 50.72' W
L	40° 25' 22" N	73° 50' 44" W	40° 25.37' N	73° 50.73' W
N	40° 25' 22" N	73° 49' 19" W	40° 25.37' N	73° 49.32' W

* -- DMS = Degrees, Minutes, Seconds

** -- DDS = Degrees, Decimal Minutes

Figure 5

TABLE 1. RESULTS OF CHEMICAL ANALYSIS OF SITE WATER AND ELUTRIATE
Anchorage Channel Utility Corridor

	SITE WATER		ELUTRIATE	
CONSTITUENTS	**DETECTION LIMITS**	**CONCENTRATION**	**DETECTION LIMITS**	**CONCENTRATION**
Metals	**ppb**	**ppb**	**ppb**	**ppb**
Ag		0.014	0.01000	ND
Cd		0.065		0.051
Cr		0.521		1.263
Cu		2.46		3.350
Hg		0.004		0.020
Ni		1.09		1.96
Pb		0.58		2.67
Zn		4.02		18.53
Pesticides	**pptr (ng/L)**	**pptr (ng/L)**	**pptr (ng/L)**	**pptr (ng/L)**
Aldrin	0.32	ND	0.31	ND
a-Chlordane	0.34	ND	0.32	ND
trans Nonachlor	0.58	ND	0.55	ND
Dieldrin	0.59	ND	0.57	ND
4,4'-DDT	0.27	ND	0.26	ND
2,4'-DDT	0.46	ND	0.44	ND
4,4'-DDD	0.54	ND	0.52	ND
2,4'-DDD	0.68	ND	0.65	ND
4,4'-DDE	0.34	ND		0.35
2,4'-DDE	0.64	ND	0.62	ND
Total DDT		**1.5**		**1.6**
Endosulfan I	0.52	ND	0.50	ND
Endosulfan II	0.41	ND	0.40	ND
Endosulfan sulfate	0.45	ND	0.43	ND
Heptachlor	0.49	ND	0.47	ND
Heptachlor epoxide	0.58	ND	0.55	ND
Industrial Chemicals	**pptr (ng/L)**	**pptr (ng/L)**	**pptr (ng/L)**	**pptr (ng/L)**
PCB 8	0.31	ND	0.29	ND
PCB 18	0.44	ND	0.43	ND
PCB 28	0.31	ND	0.30	ND
PCB 44	0.23	ND	0.22	ND
PCB 49	0.28	ND	0.27	ND
PCB 52	0.43	ND	0.42	ND
PCB 66	0.45	ND	0.43	ND
PCB 87	0.35	ND	0.34	ND
PCB 101	0.32	ND	0.31	ND
PCB 105	0.30	ND	0.29	ND
PCB 118	0.37	ND	0.35	ND
PCB 128	0.47	ND	0.46	ND
PCB 138	0.73	ND	0.70	ND
PCB 153	0.32	ND	0.31	ND
PCB 170	0.66	ND	0.63	ND
PCB 180	0.52	ND	0.50	ND
PCB 183	0.31	ND	0.29	ND
PCB 184	0.42	ND	0.40	ND
PCB 187	0.26	ND	0.25	ND
PCB 195	0.20	ND	0.20	ND
PCB 206	0.26	ND	0.25	ND
PCB 209	0.34	ND	0.33	ND
Total PCB		**10.19**		**9.3**

ND = Not detected
Total DDT = sum of 2,4'- and 4,4'-DDD, DDE, and DDT
Total PCB = sum of congeners reported x 2
Concentrations shown are the mean of three replicate analyses.
Means were determined using conservative estimates of concentrations of constituents that were at concentrations below the detection limit.

TABLE 2. **TOXICITY TEST RESULTS**
Anchorage Channel Utility Corridor

Suspended Particulate Phase

Test Species	Test Duration	LC_{50}/EC_{50}	LPC (a)
Menidia beryllina	96 hours	**(b)** >100%	1.00
Americamysis bahia	96 hours	**(b)** >100%	1.00
Mytilus edulis **(larval survival)**	48 hours	**(b)** >100%	1.00
Mytilus edulis **(larval normal develop.)**	48 hours	**(c)** >100%	1.00

(a) Limiting Permissible Concentration (LPC) is the LC_{50} or EC_{50} multiplied by 0.01

(b) Median Lethal Concentration (LC_{50}) resulting in 50% mortatlity at test termination

(c) Median Effective Concentration (EC_{50}) based on normal development to the D-cell, prodissoconch 1 stage

Whole Sediment (10 days)

Test Species	% Survival Reference	% Survival Test	% Difference Reference - Test	Is difference statistically significant? (a=0.05)
Ampelisca abdita	93%	96%	-3%	No
Americamysis bahia	94%	94%	0%	No

TABLE 3. 28 DAY BIOACCUMULATION TEST RESULTS: CHEMICAL ANALYSIS OF TISSUE
Wet weight concentrations
Anchorage Channel Utility Corridor

CONSTITUENTS	*Macoma nasuta*				*Nereis virens*			
	REFERENCE		TEST		REFERENCE		TEST	
	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION
Metals	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)
Ag		0.02		0.03		0.03		0.01
As		2.77		* 3.37		4.01		4.00
Cd		0.03		0.03		0.04		0.04
Cr		0.25		* 0.44		0.18		0.19
Cu		1.04		* 1.71		1.55		1.55
Hg		0.010		* 0.017		0.035		0.035
Ni		0.36		* 0.55		0.68		0.73
Pb		0.17		* 1.10		0.12		* 0.30
Zn		11.56		12.06		22.52		21.74
Pesticides	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)
Aldrin	0.10	ND	0.08	ND	0.08	ND	0.08	ND
a-Chlordane		0.07		0.05		0.12		0.11
trans Nonachlor		0.03		0.04		0.23		0.23
Dieldrin		0.08		* 0.12		0.26		* 0.33
4,4'-DDT		0.09	0.17	ND		0.08	0.17	ND
2,4'-DDT	0.11	ND	0.09	ND		0.08	0.09	ND
4,4'-DDD		0.14		* 0.25		0.23		* 0.37
2,4'-DDD		0.05		* 0.23		0.14		* 0.20
4,4'-DDE		0.14		* 0.42		0.06		* 0.14
2,4'-DDE	0.04	ND		0.03	0.03	ND	0.03	ND
Total DDT		**0.49**		* **1.06**		**0.60**		* **0.86**
Endosulfan I	0.15	ND	0.12	ND		0.07	0.12	ND
Endosulfan II	0.09	ND	0.07	ND		0.04	0.07	ND
Endosulfan sulfate	0.20	ND	0.17	ND		0.10	0.17	ND
Heptachlor	0.10	ND	0.08	ND		0.05	0.08	ND
Heptachlor epoxide	0.10	ND	0.08	ND		0.05	0.08	ND
Industrial Chemicals	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)
PCB 8		0.02	0.04	ND	0.04	ND	0.04	ND
PCB 18		0.02	0.04	ND		0.02		* 0.07
PCB 28		0.05		0.03		0.06		0.07
PCB 44		0.03		* 0.09		0.08		* 0.13
PCB 49		0.08		0.11		0.07		* 0.09
PCB 52		0.09		* 0.15		0.17		* 0.22
PCB 66		0.07		* 0.11		0.09		0.11
PCB 87		0.04		* 0.06	0.07	ND		ND
PCB 101		0.13		0.15		0.39		0.45
PCB 105		0.03		0.06		0.15		0.17
PCB 118		0.09		* 0.12		0.22		0.27
PCB 128		0.02		0.03		0.17		0.18
PCB 138		0.13		0.12		0.94		0.95
PCB 153		0.18		0.16		1.89		1.91
PCB 170		0.05		0.05		0.30		0.30
PCB 180		0.06		0.07		0.77		0.79
PCB 183	0.05	ND		* 0.04		0.31		0.31
PCB 184	0.06	ND	0.05	ND	0.05	ND	0.05	ND
PCB 187		0.05		0.06		0.79		0.81
PCB 195	0.06	ND	0.05	ND		0.10		0.11
PCB 206	0.06	ND	0.05	ND		0.33		0.33
PCB 209	0.08	ND	0.07	ND		0.26		0.28
Total PCB		**2.57**		**3.11**		**14.37**		**15.25**
1,4-Dichlorobenzene		0.07		0.07		0.21		0.08

TABLE 3. (Continued)

Anchorage Channel Utility Corridor

CONSTITUENTS	*Macoma nasuta*				*Nereis virens*			
	REFERENCE		TEST		REFERENCE		TEST	
	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION
PAH's	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)
Naphthalene		0.62		* 1.44		1.35		1.52
Acenaphthylene		0.07		* 2.06		0.22		* 0.77
Acenaphthene		0.19		* 0.43		0.45		0.65
Fluorene		0.32		* 0.69		0.34		0.39
Phenanthrene		1.86		* 4.45		1.01		1.24
Anthracene		0.28		* 2.90		0.13		* 0.33
Fluoranthene		5.24		* 23.74		1.84		* 4.29
Pyrene		3.59		* 209.85		1.20		* 31.05
Benzo(a)anthracene		0.64		* 22.17		0.06		* 0.52
Chrysene		1.25		* 19.41		0.50		* 3.04
Benzo(b)fluoranthene		0.67		* 19.04		0.06		* 0.84
Benzo(k)fluoranthene		0.69		* 24.79		0.08		* 1.34
Benzo(a)pyrene		0.43		* 26.25		0.06		* 1.14
Indeno(1,2,3-cd)pyrene		0.18		* 4.08		0.07		* 0.14
Dibenzo(a,h)antracene		0.07		* 1.43	0.23	ND		* 0.08
Benzo(g,h,i)perylene		0.25		* 5.56		0.07		0.38
Total PAH's		**16.35**		* **368.27**		**7.55**		* **47.70**
Dioxins	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)
2378 TCDD		0.08	0.08	ND	0.01	ND	0.02	ND
12378 PeCDD	0.22	ND	0.10	ND	0.02	ND	0.03	* ND
123478 HxCDD	0.19	ND	0.11	ND	0.02	ND	0.02	ND
123678 HxCDD		0.14	0.12	ND	0.02	ND	0.02	ND
123789 HxCDD	0.19	ND	0.18	ND	0.02	ND	0.03	ND
1234678 HpCDD	0.23	ND		0.35		1.37		0.11
1234789 OCDD		2.18		5.10		9.29		5.69
2378 TCDF	0.11	ND		0.10		1.24		1.15
12378 PeCDF	0.15	ND	0.08	ND	0.02	ND	0.02	ND
23478 PeCDF		0.14	0.11	ND	0.02	ND	0.02	ND
123478 HxCDF	0.12	ND	0.08	ND	0.01	ND	0.01	ND
123678 HxCDF	0.12	ND	0.07	ND	0.01	ND	0.01	ND
234678 HxCDF		0.33	0.09	ND	0.01	ND	0.01	ND
123789 HxCDF		0.39	0.10	ND	0.01	ND	0.02	ND
1234678 HpCDF	0.14	ND		0.12		0.41		0.38
1234789 HpCDF		0.51	0.08	ND	0.01	ND	0.02	ND
12346789 OCDF		1.44		0.16		0.36		0.20

ND = Not detected
Total PAH = Sum of all PAH's.
Total DDT = sum of 2,4'- and 4,4'-DDD, DDE, and DDT
Total PCB = 2(x), where x = sum of PCB congeners
Concentrations shown are the mean of 5 replicate analyses in wet weight.
Means were determined using conservative estimates of concentrations of constituents that were at concentrations below the detection limit.
* = Statistically significant at the 95% confidence level.