Meeting with maritime unions.

FY94 3rd quarter

Dredging the Port: Maintaining Maritime Facilities In New York and New Jersey

Problems and Options

New York State Department of State
Division of Coastal Resources
and Waterfront Revitalization

February 1, 1995

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Contents

Section — Page

I. The Dredging Issue 1

A. Harborwide 1

B. Howland Hook Terminal 1

II. Federal Laws and Regulations 2

A. Marine Protection, Research and Sanctuaries Act of 1972 (Ocean Dumping Act component, 33 USC 1401) 2

1. EPA Permit to Transport Dredged Material (33 USC 1412)
2. Corps Dredged Material Disposal Permit (33 USC 1413)
3. Waiver of Requirements (33 USC 1413.(d))

B. Clean Water Act (Federal Water Pollution Control Act Amendments) 3

C. Coastal Zone Management Act (and 1990 Coastal Zone Act Reathorization Amendment) 4

III. Chronology of Events 4

A. Harborwide Since 1970 4

B. Howland Hook Terminal 5

IV. Dredging Options and Ramifications 6

A. Involved Interagency Organizations 6

1. Harbor Estuary Program Manaagement Conference
2. Dredging Task Force
3. Interagency Committee
4. Bi-State Committee

B. Howland Hook Terminal 8

1. Borrow Pit Disposal
2. On-Site Upland Disposal
3. Upland Disposal
4. Contained Disposal at Piers
5. Ocean Disposal

C. Harborwide 9

1. Disposal at the Mud Dump Site
2. Disposal at Alternative Ocean Sites
3. Disposal at Existing Borrow Pits
4. Disposal at Containment Islands

V. Recommended Action 11

A. Howland Hook 11

1. On-site Upland Disposal
2. Consistency Review

B. Harborwide Dredging Solutions 12

1. Near Term
2. Long Term

Addendum: Howland Hook Work Description

I. The Dredging Issue

A. Harborwide

The Port of New York and New Jersey plays a vital role in the economy of the region, handling more general and containerized cargo than any other east coast port. New York Harbor is not naturally deep, and rivers continuously transport and deposit sediment, filling in navigation channels and berthing areas. To maintain the Port for modern deep draft vessels, which draw as much as 40 feet of water, large quantities of sediments (6 to 7 million cubic yards annually) must be dredged. A majority of this material was, and continues to be, disposed at the Mud Dump Site located 6 miles east of Sandy Hook, New Jersey and 11 miles south of Rockaway, New York.

Ocean disposal has been the primary disposal option for materials dredged from New York Harbor. Other disposal options in the region have generally not been used because of the readily available and relatively low cost of ocean disposal, as well as conflicting uses and environmental concerns associated with other alternatives.

New York Harbor, including its many berthing areas and channels, contains primarily fine-grained sediments which are often contaminated with heavy metals, PAHs, PCBs, pesticides, and dioxin. Depending on their concentration, these contaminants may impact the ecosystem. Certain contaminants are bioaccumulated in marine organisms and may biomagnify up through the food chain and pose a threat to biota and public health. Dredging contributes to the resuspension of these sediments. Ocean disposal exposes additional marine organisms and habitats to these contaminants. Highly contaminated dredged material from New York Harbor may require management (i.e. capping with clean material) if it is disposed at the Mud Dump Site, or may be precluded from ocean disposal.

B. Howland Hook Terminal

Howland Hook container terminal on Staten Island is leased by the Port Authority of New York and New Jersey from the City of New York. Vacant since 1986, the Port Authority has sublet the facility to Howland Hook Container Services, Inc. Before the terminal can open, the Port Authority must dredge 150,000 cubic yards of sediments from the berthing area. The sediments are contaminated with dioxin and cannot be disposed at the Mud Dump Site. An existing borrow pit in New York Harbor, 3 miles south of Staten Island, would be used for disposal purposes.

The Port Authority claims that the requisite federal and state permit approvals must be issued by April 1, 1995, if the terminal is to be ready to accept 60,000 containers this year. A public hearing on this dredging and disposal project is tentatively scheduled for March 2, 1995, and will be co-sponsored by DOS and the

U.S. Army Corps of Engineers. The Corps of Engineers cannot issue a permit, if DOS determines that the project is inconsistent with the State's Coastal Management Program.

II. Federal Laws and Regulations

A. Marine Protection, Research and Sanctuaries Act of 1972 (Ocean Dumping Act Component, 33 USC 1401)

The Act regulates the transportation and disposal of dredged material in ocean waters within the territorial seas of the United States (outside of the State's three-mile territorial limit. Within the territorial limits of the State, the Federal Water Pollution Control Act applies - see B. below). The Act and its regulations consolidated management of the transportation and disposal of dredged material in U.S. territorial waters among four federal agencies: the Corps of Engineers and the Environmental Protection Agency, which jointly regulate ocean dumping; the Coast Guard, which enforces the Act and its regulations; and the National Oceanic and Atmospheric Administration, which jointly monitors ocean disposal with EPA, and may establish marine sanctuaries pursuant to other sections of the Act. Under the Act, EPA designates, manages and authorizes dredged material ocean disposal sites. The USA Corps of Engineers administers the permit process for the use of the sites.

The Mud Dump Site has existed since 1914, and was formally designated as the region's dredged material ocean disposal site in 1984. Most material dredged from the New York Harbor is disposed of at this site. In 1989, EPA reported the site had a capacity for 100 million cubic yards of dredged material. The Act requires EPA and the Corps to investigate alternative sites in deeper water further offshore near the Continental Shelf (>100 miles from shore).

1. EPA Permit to Transport Dredged Material (33 USC 1412)

EPA issues permits to transport dredged material that is disposed into ocean waters. Permits may be issued when disposal will not unreasonably degrade or endanger human health, welfare, or amenities, or the marine environment, ecological systems, or economic potentialities.

EPA may not issue permits that would result in violations of federal water quality standards. To the extent that EPA may do so without relaxing the statutory requirements (see discussion of waiver, below), EPA must apply standards and criteria binding upon the United States by the International Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, including its Annexes. The Act delegates broad

discretion to EPA in adopting permit approval criteria, but does not require the EPA to balance the factors that are considered when deciding on an ocean-dumping permit application (City of NY v. USEPA, DCNY 1981, 543 F. Supp. 1084).

2. *Corps of Engineers Dredged Material Disposal Permit (33 USC 1413)*

The Corps is authorized to issue permits for disposing dredged material in ocean waters. The purpose of the Act is to regulate the disposal of material in order to protect ocean waters, marine ecosystems, and public health and safety. General standards for the issuance of permits are the same as EPA standards for permits to transport material.

EPA and the Corps developed procedures and criteria to implement these standards. The procedures and criteria establish categories of dredged material, testing protocols and standards for determining whether or not permits may be issued to transport or dispose dredged material. EPA opposes the issuance of permits by the Corps if alternatives exist which are technically feasible and environmentally acceptable with less overall environmental impacts. Where testing results based on the EPA criteria indicate acute toxicity potential, dredged material may not be disposed of at the Mud Dump.

3. *Waiver of Requirements (33 USC 1413.(d))*

The Secretary of the Army may certify that there are no economically feasible alternative methods or sites, and request EPA to waive the requirements of the Ocean Dumping Act and allow disposal at a site which would result in non-compliance with the Act. Within 30 days of a request for a waiver from the COE, EPA must grant the waiver unless the Administrator finds the dumping will result in "unacceptably adverse impacts on...shellfish beds, wildlife, fisheries, or recreational areas".

B. Clean Water Act (Federal Water Pollution Control Act Amendments)

The Act and its implementation by EPA and the Corps of Engineers regulates the discharge of all pollutants, including those resulting from dredging and the disposal of dredged material, into the navigable waters of the United States within three miles of the coastline (within New York's territorial limits). The purpose of the Act is to protect water quality by regulating the discharge of pollutants into the Nation's navigable waters, including wetlands. The dredging and disposal of dredged material requires a permit from the Corps.

The Act also requires certification from the State (in New York this is the Department of Environmental Conservation) in which the dredging and/or disposal occurs that the discharges from dredging and dumping and its effects will meet the State's water quality standards, prior to the issuance of a Corps permit.

The Act also authorizes the Corps to issue permits for the discharge of dredged material at specified disposal sites within the State's territorial limits, such as the proposed borrow pits off Staten Island and Coney Island. EPA may deny or restrict the use of the disposal sites whenever it determines that the use of the sites would result in adverse effects to water quality.

C. Coastal Zone Management Act (and 1990 Coastal Zone Act Reauthorization Amendment)

The Act requires federal direct, funding, and regulatory approval activities within a state's coastal area to be undertaken in a manner consistent with the state's federally approved Coastal Management Program. The 1990 amendments to the Act require federal activities occuring outside of the State's coastal area to be undertaken in a manner consistent with the state program.

As part of the Corps permit application, the Port Authority of New York and New Jersey is required to certify that the proposed dredging and dredged material disposal will be undertaken in a manner consistent with the New York State Coastal Management Program. The Department of State must review the application for the proposed project, determine whether the federally permitted activity would be, or would not be consistent with the policies of the CMP, and concur with, or object to, the Port Authority's consistency certification. If DOS concurs with the consistency certification, the Corps may approve the project. If DOS objects to the certification on the grounds that the project is inconsistent with the CMP, the Corps is prohibited from approving the project. If DOS objects to the Port Authority's consistency certification, the State's objection may be appealed to the U.S. Secretary of Commerce.

III. Chronology of Events

A. Harborwide Since 1970

Since 1914, dredged material from the Port of New York and New Jersey marine facilities has been deposited at an underwater site known as the Mud Dump Site.

The material deposited at the Mud Dump Site has included by-products of industrial processes. Contamination of harbor sediments peaked in the 1970s, before passage of the Clean Water Act Amendments of 1972. Since then sediment

quality has improved somewhat, but the ability to detect contamination has increased greatly. Historically, of the 6 to 7 million cubic yards of material that was dredged in the Port each year, only about 5 percent needed special treatment. It is estimated that under new testing protocols, over 60 percent – 3 to 4 million cubic yards will need treatment.

The Port Authority's attempt to obtain a dredging permit for its Port Newark/Port Elizabeth facilities provides insight into the difficulties of dredging marine facilities. On April 11, 1990, the Port Authority submitted an application to the Corps of Engineers to dredge facilities in New Jersey. Over the course of the next three years, the permits became a test case over the handling of dioxin (in this case a by-product of the defoliant Agent Orange) in dredged spoil.

In the winter of 1993, the Port Authority received approval to dredge from the Corps of Engineers, but the permits were blocked by the Environmental Protection Agency pending further tests. In the Spring of 1994, after the costs of the project rose from $3 million to $17 million, dredging was eventually approved at 29 of the 62 sites in the original permit. In the course of the protracted review, it is not known how much ship traffic was diverted to other ports, but the Port Authority estimates losses were substantial.

B. Howland Hook Terminal

The 187 acre Howland Hook facility was purchased by the City of New York in the 1970s as part of its effort to maintain maritime facilities in New York City. Since the container revolution – packing freight into 20 or 40 foot shipping containers – began in earnest in the 1960s, New York has steadily lost business to New Jersey facilities. Howland Hook was operated by the U.S. flag shippers, the United States Line until 1986, when the business fell into bankruptcy.

The facility remained idle until 1991, when the Port Authority, lessee of the property, submitted an application to the Corps of Engineers to dredge at this site. The Port Authority put its dredging plans on hold pending the outcome of its Port Elizabeth/Port Newark permit applications.

To allow the terminal to accomodate deep draft vessels about 150,000 cubic yards of mud must be removed. Sediments at the terminal were tested for contaminants in 1988 and 1991 and passed. The most recent tests, conducted late in 1994 under a new protocol involving marine organisms known as amphipods, determined that the sediments were actually above toxicity levels suitable for ocean dumping.

The Port Authority has investigated near-shore borrow pits off Staten Island and Coney Island as potential disposal sites, but is presently focusing on the existing

borrow pits (CAC Pit) in New York Harbor south of Staten Island. The Port Authority and Corps of Engineers argue that these pits can provide a secure depository for the sediments. While there is support for opening the terminal, the public and elected officials in Brooklyn and Staten Island have remained adamant in their opposition to placing contaminated dredge spoil in the borrow pits.

IV. Dreging Options and Ramifications

A. Involved Interagency Organizations

In addition to the agencies and their legal responsibilities described above, the following inter-agency groups are also involved in this issue:

1. *Harbor Estuary Program Manaagement Conference*

Under the general direction of the federal Environmental Protection Agency a plan for conservation and management of the New York Bight has been evolving. The plan, called the Comprehensive Conservation and Management Plan (CCMP), is in its draft stages. The Department of State as well as the Department of Environmental Conservation and the Department of Environmental Protection in New Jersey have been involved in its development. One chapter of the plan deals with dredging and dredged material disposal in New York Harbor. The material on dredging and its disposal was crafted by selected members of the Dredged Material Management Forum, a group of federal agencies - notably EPA and the U.S. Army Corps of Engineers - state agencies from New York and New Jersey, the Port Authority of New York and New Jersey and other commercial interests in the Port, environmental groups, and fishing associations brought together in June 1993 to develop solutions to the dredging and disposal problems in the Harbor. The Forum has been folded into the organizational structure of the Harbor Estuary Program (HEP) Management Conference, that is dealing with several water quality related issues in New York Harbor and Bight. The Department of State's Coastal Management Program has representatives on the Forum, and on three of its six workgroups, carrying out the tasks being addressed by the Forum, and on the HEP management committee.

2. *New Jersey Dredging Task Force*

Governor Whitman of New Jersey created a task force on dredging issues. The task force report is to be released at the beginning of February 1995. The report's principal recommendation will be construction of a fourteen

million cubic yard subaqueous disposal pit and confined disposal facility in Newark Bay next to the Port Authority's Port Newark piers. There appears to be considerable support - from City of Newark officials, the State of New Jersey, the Port Authority, as well as various environmental and fishing interests, for such a disposal option in that location. The idea of such a large disposal facility has blossomed from a suggestion in the Fall of 1993 to try such disposal in a smaller 60,000 cubic yard Newark Bay pilot subaqueous pit. The support for a disposal pit in Newark Bay seems to stem from the belief that the contaminated material would be contained close to where it would be dredged, would be at an easily identifiable site, and would be retrievable at a future date when improved technology would allow it to be decontaminated in some way.

The question arises as to whether or not material to be dredged in the future on the New York side of the Harbor would be eligible to be placed in such a pit wholly within New Jersey waters. Informal communication with the Port Authority indicates New Jersey would not be receptive to this option.

3. *Interagency Committee*

In New York State, Governor Cuomo created an Interagency Committee On Dredging to coordinate with New Jersey, and federal legislators, and with key New York State constituents and interest groups on this matter. The Committee, composed of representatives from the Governor's office and the following state agencies (DOS, DED, DOT, DEC, OGS, and Labor) met only once, on September 27, 1994. Discussion at that meeting included the recommendation that the Committee's mission should include the formulation of policy relative to the Port's future and dredging and disposal activities in the Harbor.

4. *Bi-State Committee*

Through concurrent legislation, the States of New York and New Jersey created a bi-state group known as the Clean Ocean and Shore Trust (COAST). COAST is co-chaired by state legislators from each state. The New York chair is held by Senator Marchi. Its purpose is to address issues in the waters shared by New York and New Jersey. The group, which has only met once, on December 12, 1994, designated four committees: Science & Technology; Water Quality; Fishing & Aquaculture, and; Dredging. Members of the Dredging Committee from New York are: Senator Marchi; George Stafford of DOS; Roberta Weisbrod of DEC, and; Lou Nage.

B. Howland Hook Terminal

1. Borrow Pit Disposal

The Port Authority has submitted a permit application to the Corps of Engineers, NYS DEC, and NYS DOS to dredge 150,000 cubic yards of material at the Howland Hook Terminal on Staten Island with disposal to take place at an existing borrow pit, (the CAC pit) about three miles southeast of Staten Island. The proposal is to deposit 75,000 cubic yards of contaminated material in the southern part of the pit. The remaining 75,000 cubic yards of contaminated material to be dredged would be placed in geotextile bags and deposited at the same site. All of the dredged material would be capped with cleaner material. The theory is that the borrow pit sides would in conjunction with the capping material contain the contaminated material indefinitely. A court decision in the 1980s enjoined the Port Authority from using the CAC pit for depositing dredged material. The DEC water quality certificate which had been granted was rescinded. There is considerable opposition to the use of the CAC pit from environmentalists, who see the plan as having serious negative impacts on the fish resource, and by political leaders in NYC, particularly in Staten Island, who feel that the CAC pit is much too close to the Staten Island shoreline.

2. On-Site Upland Disposal

The 187 acre Howland Hook Terminal site is large enough to accomodate the placement of 150,000 cubic yards of dredged material on its upland side. If properly dewatered and contained upland,the material proposed to be dredged could be safely stored. However, there is some question as to whether or not the material would be considered a hazardous material or solid waste and if placing it upland would necessitate permits from the federal government under provisions of Resource Conservation and Recovery Act of 1976, Comprehensive Environmental Response, Compensation and Liability Act of 1980, and/or Superfund Amendments and Reauthorization Act of 1986, as well as permits from DEC.

3. Off-Site Upland Disposal

The contaminated dredge material could be exported overland or by sea to another state. A plan had been set forth in the past to send dredged materials to Pennsylvania, but the governor of that state vetoed the proposal. No out of state disposal sites have been identified. Transportation of such contaminated or hazardous material over long distances, particularly overland, would be expensive.

4. *Contained Disposal at Piers*

Disposing dredged material behind barriers, for instance sheet piling, around and between abandoned piers was set forth in a December 1989 publication of the U.S. Army Corps of Engineers/New York District entitled Managing Dredged Material. This means contaminated dredge material disposal would have the advantage of providing additional land, perhaps even buildable land, and might avoid the necessity of having to procure numerous federal and state permits. It might also offer the advantage of a short-term solution for relatively modest amounts of dredge material. The disadvantage would be that such inter-pier space would be lost for the purposes for which the pier complexes were constructed, maritime commerce.

5. *Ocean Disposal*

The Mud Dump Site in the Atlantic Ocean, may only be used for the disposal of relatively clean material (Category I and II). The approximately two (2) square mile area site and a surrounding area of approximately twenty (20) square miles, referred to as the historical dumping area has been the most commonly used area for disposal of Category I and Category II dredged material. Category III (the most contaminated material which is found at Howland Hook) cannot be dumped at the Mud Dump Site. The standards and criteria for designating the three categories will be revised by the Dredged Material Management Forum and EPA. The new standards and criteria will be more stringent. Higher proportions of the materials to be dredged in New York Harbor will be designated as Category II and Category III.

C. **Harborwide**

1. *Disposal at the Mud Dump Site*

In the long run disposal of dredged material (Category I and II) at the Mud Dump Site or at the expanded Mud Dump Site (the existing site plus the approximately twenty (20) square mile contiguous area) may prove to be a partial solution to the problem. EPA is embarking on the development of a Supplemental Draft Environmental Impact Statement on future use of the Mud Dump Site which it plans on completing in mid-1996. The approximately twenty-two (22) square mile area has a finite and not overly large capacity to take additional dredge material, given all the material that has been placed there over the years and the need to maintain a reasonable depth over the material to allow the safe passage of ever larger ocean-going ships. Commercial and recreational fishing interests are

opposed to future dumping at the site and are in favor of remediation or even restoration of the site. Environmental groups are opposed to further dumping in the ocean. Governor Whitman also appears opposed to continued ocean dumping.

2. *Disposal at Alternative Ocean Sites*

Another alternative for the disposal of dredged materials is dumping the material twenty (20) or more miles at sea. This would be approximately fourteen (14) miles farther from shore than the Mud Dump Site and, given the large width of the continental shelf off the east coast of the U.S., would be in relatively shallow water. This site, if designated by the EPA - no such designation has taken place - would be far from New York's and New Jersey's heavily populated coast. However, many environmental groups, committed to cleaning up the oceans, would likely be opposed. Fishing associations might or might not be opposed. Deeper water with greater wave energy would present the transporting scows with additional operating problems. Also, there would be greater likelihood of the dispersion of the dumped material, and, therefore, the probability of more widespread environmental damage. In addition, the costs of transporting the dredged material over greater distances would increase the costs.

3. *Disposal at Existing Borrow Pits*

The Corps of Engineers New York District is seeking New York State's approval for use of one of the many existing borrow pits (pits scooped out of the bed of the Harbor for sandmining) for disposing of contaminated dredged material, including the most contaminated Category III material. The Corps applied to DEC for a water quality certificate for the use of borrow pit #6, located less than two miles off Coney Island. The Corps claims that disposing of contaminated harbor sediments in borrow pits within the Harbor would have the following advantages: reduction of transport costs; lessen the dispersion of contained material while being dropped through the water column; lower wave energy resulting in more secure containment in the pits, and; use natural depressions which in conjunction with capping could contain the material. The disadvantages of this proposal by the COE revolve around the proximity of most of the pits to the heavily populated shores of the metropolitan area. The use of borrow pit #6 off Coney Island and the CAC pit off Staten Island has been opposed by local and state officials, civic organizations, and private citizens in the New York metropolitan area. Fishing interests as well as environmental interests are opposed on the grounds that the pits harbor rich marine life.

4. *Disposal at Containment Islands*

Placement of dredged materials in specifically constructed containment areas attached to the shoreline (similar to but much larger than the disposal between piers) or in containment islands built offshore has been advanced as a long-range option. Such a facility, particularly if built some distance offshore, would be removed from the heavily populated coastal area. Once filled, the facility could serve other uses (e.g. cargo transfer or power generation). Dispersion of contaminated material through the water column would not take place, because the material would be placed behind constructed walls or dikes. Similarly, transport of contaminated material across the floor of the Harbor or the ocean would not take place because the walls or dikes would prevent such migration. Support from local officials and the various environmental and fishing interests could be expected. However, the costs of constructing such containment islands would be significant as would be the time of construction, especially if the islands were to be of large size.

V. Recommended Action

A. Howland Hook

1. *On-site Upland Disposal*

Given the opposition to the use of borrow pits by local and state elected officials, New York State could press for the most expeditious solution to dispose of 150,000 cubic yards of dredged material, on-site upland disposal. This must be considered as a one-time solution to the terminal's dredging needs. New York State needs to determine if this alternative is feasible. To accomplish this quickly, the following steps need to be taken:

a. DOS legal and coastal program staff will review the federal and state technical and procedural requirements that govern the placement of contaminated dredged material at the site. Staff will determine if these requirements would seriously delay the proposed dredging activity.

b. DOS staff could meet with elected officials from Staten Island to explore the issues of on-site containment of dredged material. Staff will determine if there are any issues that would seriously delay the proposed dredging activity.

2. *Consistency Review*

In the event that on-site upland disposal cannot be achieved, DOS would coordinate its consistency review of borrow pit disposal with DEC (for water quality purposes), so that a consistency decision could be reached as early as possible in the project review period.

B. Harborwide Dredging Solutions

1. *Near Term*

DOS could request Governor Pataki to establish a New York Harbor dredging task force and charge it with the responsibility for recommending short term and intermediate term (up to 10 years) options for disposal of contaminated dredged material.

a. Composition: DOS, DEC, OGS, DOT, DED

b. Study Duration: 6 months.

c. Study design: include cost estimates and funding sources; siting considerations; regulatory bottlenecks and identify an entity responsible for site management.

2. *Long Term*

New York's marine facilities at Howland Hook in Staten Island and Red Hook in Brooklyn represent alternatives to the present port configuration. New York State could conduct a needs analysis for New York Harbor to explore how dredging can be avoided or minimized through reconfiguring marine facilities. Specifically, the proposed study will target the maritime industry in New York Harbor and examine dredging and containment strategy, rail (intermodal) connections and warehouse development.

Addendum
Howland Hook Work Program

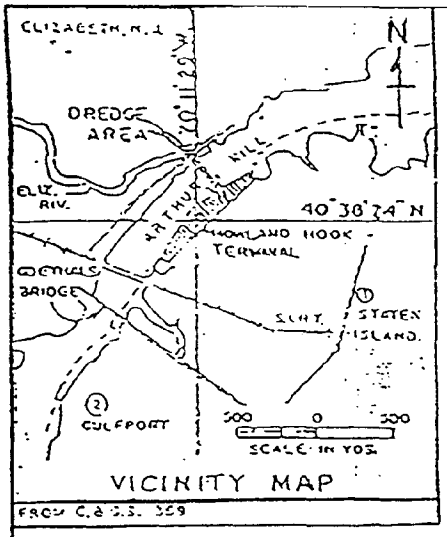
WORK DESCRIPTION
HOWLAND HOOK MARINE TERMINAL

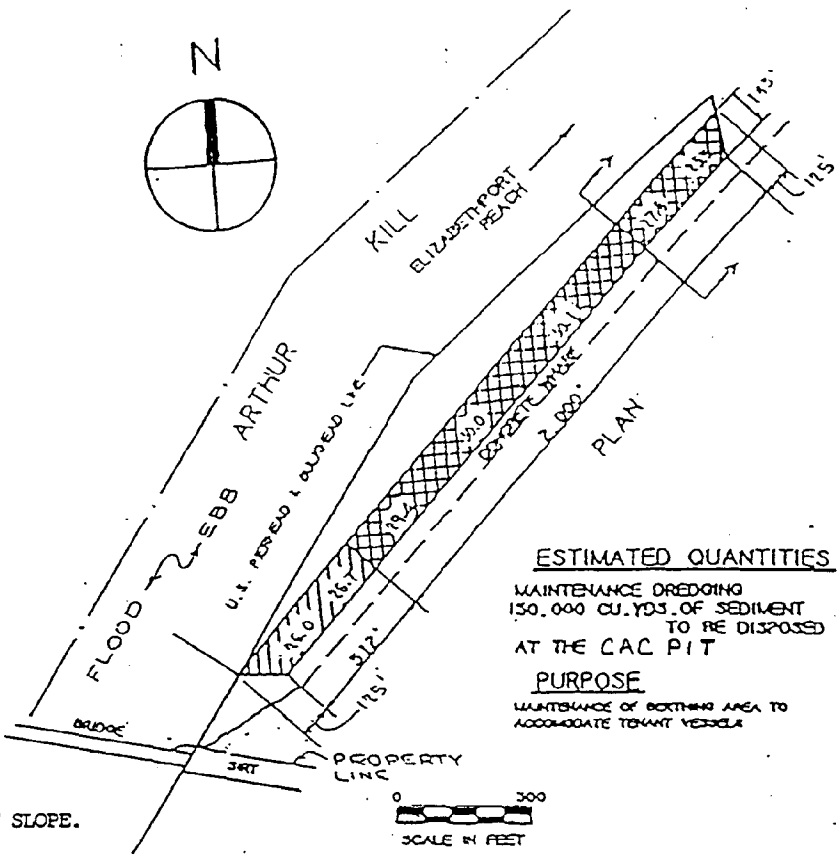
The applicant, The Port Authority of New York and New Jersey, proposes to maintenance dredge the Howland Hook Marine Terminal by clamshell bucket with barge overflow. Approximately 150,000 cubic yards of material would be dredged from the facility on the Arthur Kill in the Borough of Staten Island, Richmond County, New York, to maximum depths of 35 and 40 feet below the plane of mean low water (MLW), with two feet of allowable over-depth, as shown on the attached drawings. The two contiguous dredge areas have a total length of approximately 2,500 feet and a width of approximately 145 feet. The stated purpose of the proposed project is to re-establish prior water depths to allow for the revitalization of the Howland Hook Marine Terminal as a major container terminal in New York State with an annual capacity of 300,000 containers, providing approximately 250 direct jobs, indirectly supporting another 1,450 jobs while generating $230 million in total economic activity.

The applicant proposes to dispose of the dredged material in a subaqueous borrow pit in lower New York Bay, Richmond County, New York, in a location on the west side of Chapel Hill Channel, approximately 6,000 feet south of the West Bank Light and 3.5 nautical miles seaward of the nearest shore point on Staten Island, New York (see attached Drawing No. 2 of 3). This pit is commonly known as the CAC Pit. Subaqueous borrow pits are irregularly shaped, sea floor depressions caused by sand and gravel mining, typically for construction material and beach nourishment. The use of subaqueous borrow pits for dredged material disposal has been the subject of extensive study by the New York District Corps of Engineers, culminating in a Final Supplemental Environmental Impact Statement and a Record of Decision wherein the Corps of Engineers, with a U.S. Department of the Interior (U.S. Fish and Wildlife Service), The National Oceanic and Atmospheric Administration (National Marine Fisheries Service), and the U.S. Environmental Protection Agency concluded that use of subaqueous borrow pits for disposal of dredged material is the environmentally preferred alternative.

As part of this project, the applicant proposes to demonstrate the operational utility of geotextile bags as a method for minimizing sea floor spread of dredged material which would thereby reduce the amount of clean material needed to cap the dredged material because of its reduced lateral movement. An additional benefit to be demonstrated by the use of geotextile bags is the diminution of water column loss of dredged material as it moves from the bottom of the barge to the bottom of the pit. The final aspect of this demonstration project is to provide the opportunity for an evaluation of the precision with which geotextile bags can be placed on the bottom so that consideration can be given to the future use of geotextile bags for the construction of subaqueous berms, as a cover material, and as structural elements in large fill projects.

The applicant proposes to bottom dump the initial 75,000 cubic yards into the southernmost portion of the pit using conventional bottom dumping without geotextile bags followed by disposal of the balance of the material in geotextile bags in an array which optimizes consolidation and immobilization of the underlying material. The material will be placed in a portion of the pit which is delineated by the southern wall of the CAC pit and a 500-feet wide berm which creates a small pocket at the end of the pit rising from the 40 feet below MLW contour (see Drawing No. 3 of 3).





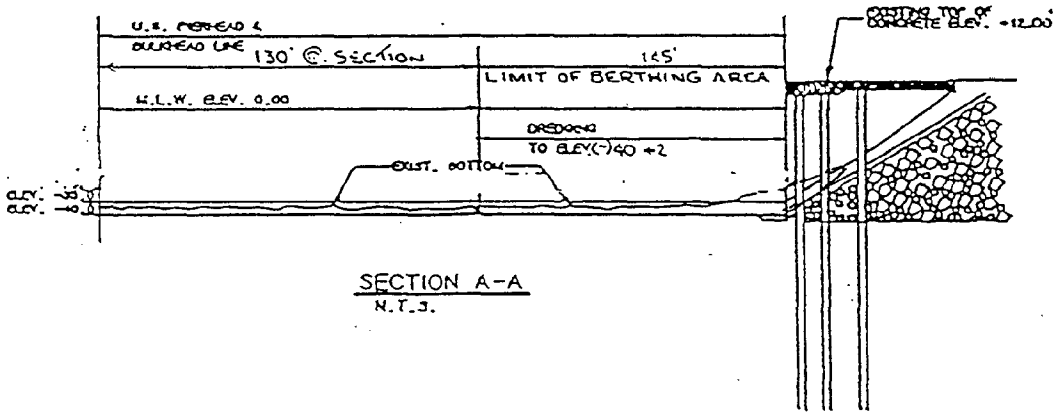
ESTIMATED QUANTITIES

MAINTENANCE DREDGING
150,000 CU.YDS. OF SEDIMENT
TO BE DISPOSED
AT THE CAC PIT

PURPOSE

MAINTENANCE OF BERTHING AREA TO ACCOMMODATE TENANT VESSELS

NOTE:
REMOVE MUD TO PROVIDE A STABLE SIDE SLOPE.



SECTION A-A
N.T.S.

DATUM: M.L.W.

37.5 TYPICAL SOUNDING

MAINTENANCE DREDGE AREA SHOWN AS (-)40'+2

MAINTENANCE DREDGE TO (-) 35'+ 2 AS SHOWN

ADJ: PROPERTY OWNERS

NORTH: PROCTER & GAMBLE, INC.

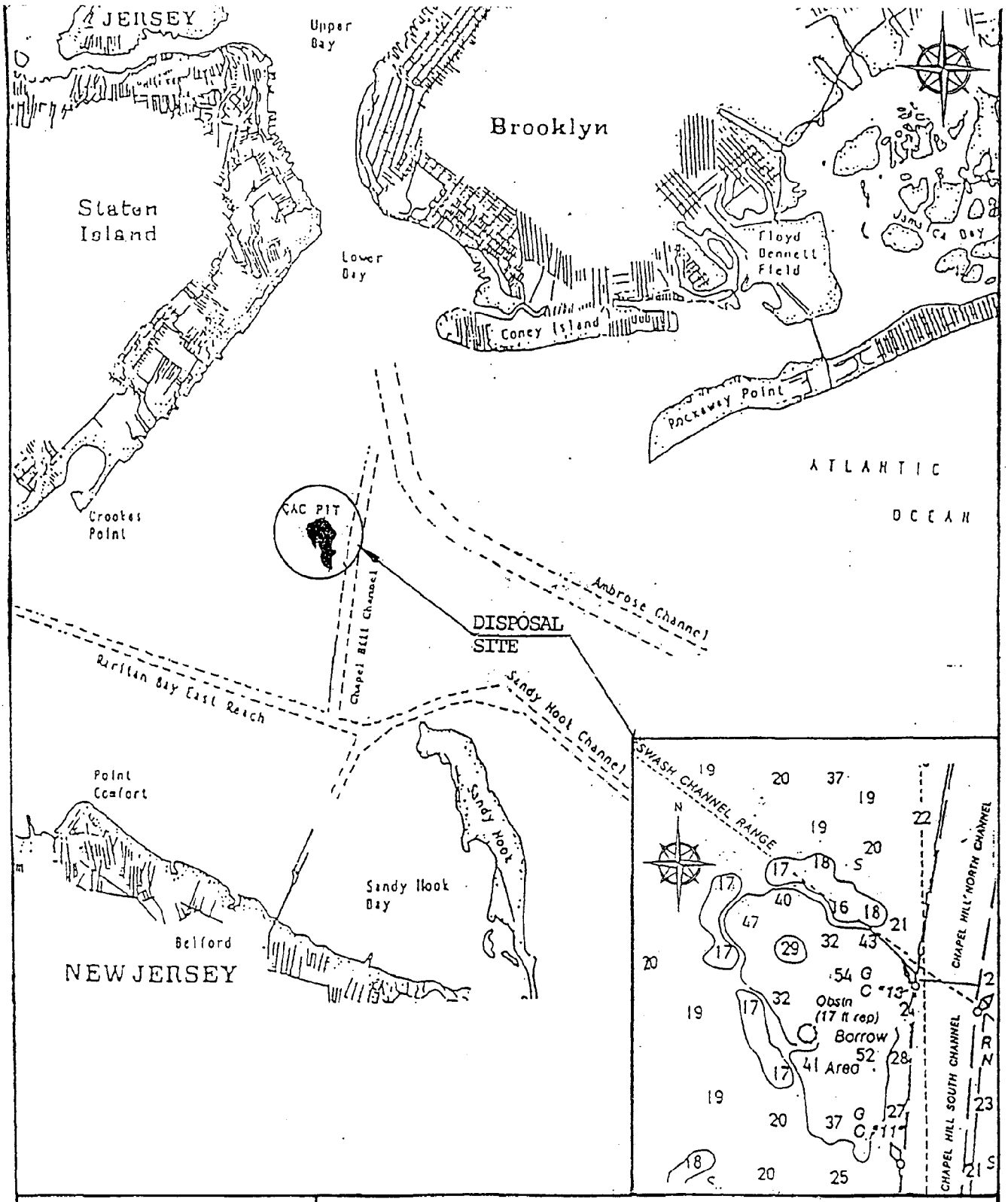
SOUTH: STATEN ISLAND RAPID TRANSIT

THE PORT AUTHORITY OF NEW YORK & NEW JERSEY

HOWLAND HOOK-MARINE TERMINAL MAINTENANCE DREDGING

IN: ARTHUR KILL
AT: 300 WESTERN AVE. STATEN ISLAND N.Y.
COUNTY: RICHMOND STATE: NEW YORK

SHEET 1 OF 3. DATE: 1-10-95.



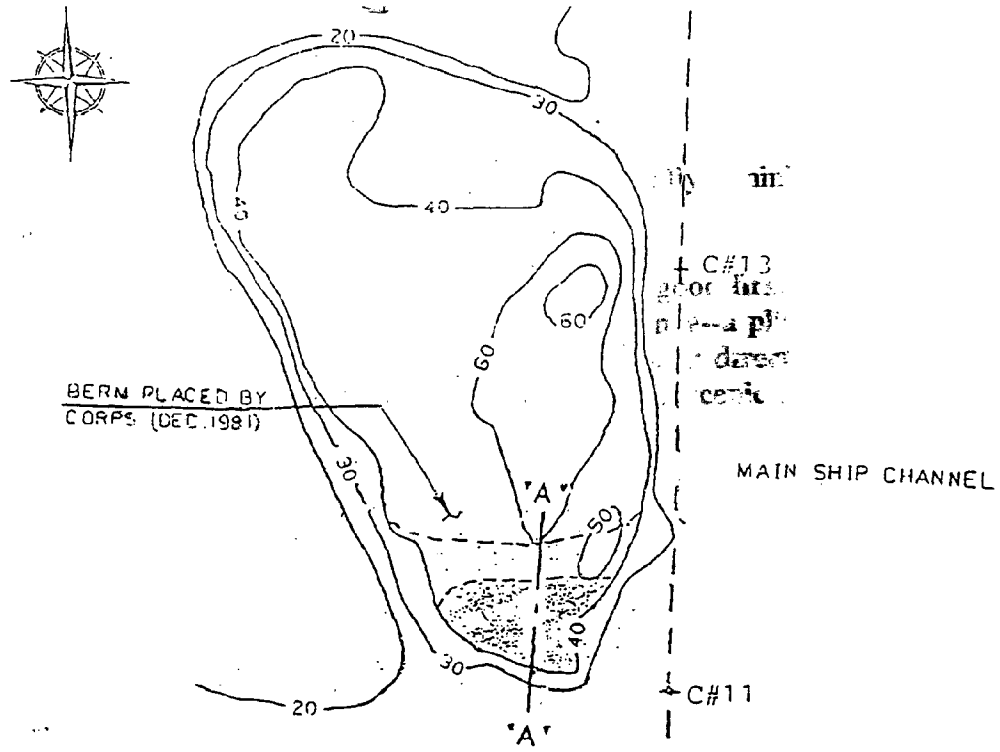
IN: ARTHUR KILL
AT: 300 WESTERN AVE., STATEN ISLAND N.Y.
COUNTY: RICHMOND STATE: NEW YORK

LOCATION PLAN

THE PORT AUTHORITY
OF
NEW YORK & NEW JERSEY

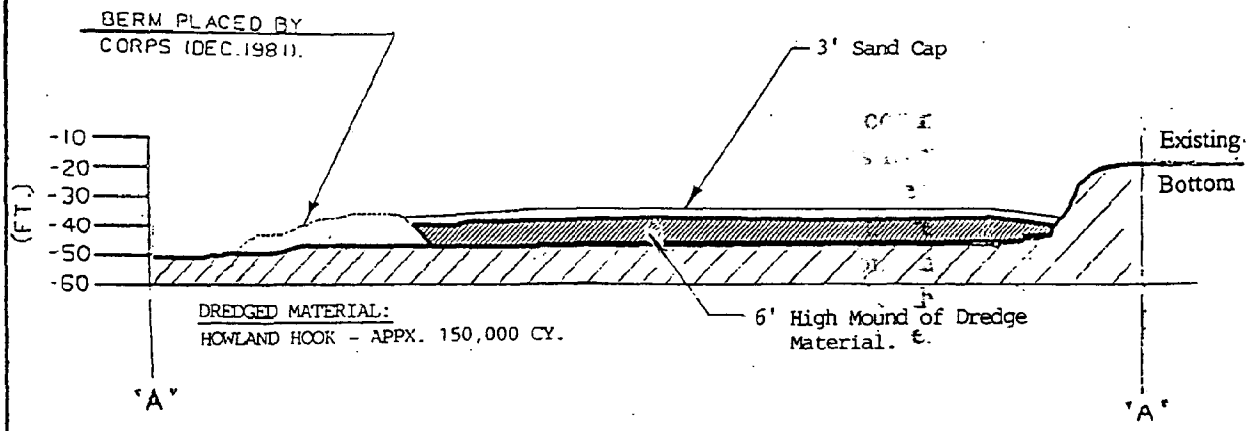
HOWLAND HOOK-MARINE TERMINAL
MAINTENANCE DREDGING

SHEET 2 OF 3. DATE: 1-10-95.



PLAN VIEW OF BORROW PIT

SCALE: 1"=1500'



CROSS SECTION "A" - "A"

SCALE: 1"=200'

PLAN AND SECTION	THE PORT AUTHORITY OF NEW YORK & NEW JERSEY HOWLAND HOOK-MARINE TERMINAL MAINTENANCE DREDGING
DATUM: M.L.W.	SHEET 3 OF 3. DATE: 1-10-95.

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