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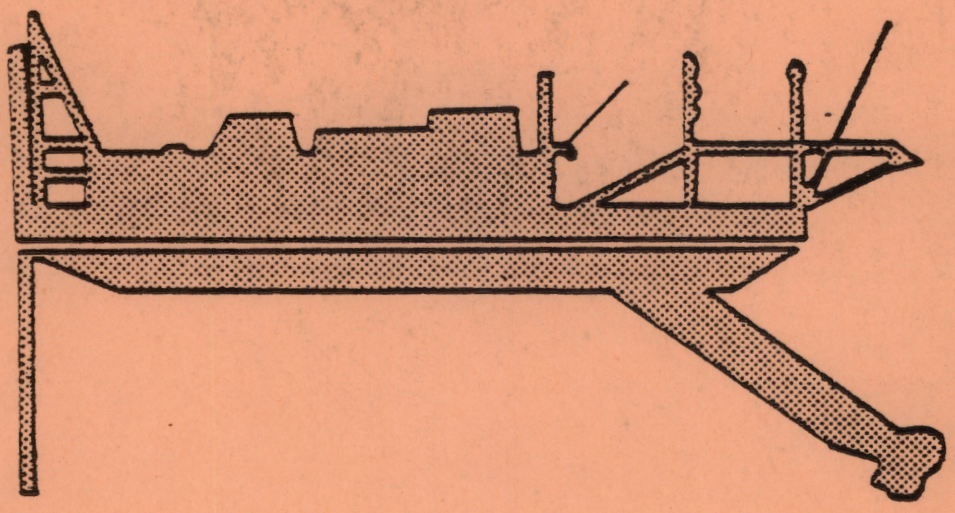

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STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF COASTAL RESOURCES

DREDGING IN NEW JERSEY

A Staff Working Paper
Michael Hochman
January 1980

Second Printing

New Jersey Department of Environmental Protection
Division of Coastal Resources
Bureau of Coastal Planning and Development
P.O. Box 1889
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I. INTRODUCTION

The purpose of this paper is to analyze dredging issues and dredging needs in the State of New Jersey. Although major dredging activity has taken place in water adjacent to New Jersey since at least 1654, the need for dredging and many associated issues are still subject to great debate.

The major problems raised by dredging are lack of money to maintain the State's navigable waters, the need to define and manage the environmental effects of dredging, and the lack of disposal sites that could accommodate the dredge spoil materials.

Later chapters of the paper outline the existing laws and regulations affecting dredging and provide a list of the required permits for dredging activities. The paper also includes summaries of current research on dredging effects on the environment, and of recent proposed dredging projects and topics for additional study.

Policy recommendations are presented as proposed amendments to the Department of Environmental Protection's Rules on Coastal Resource and Development Policies (N.J.A.C. 7:7E-1.1 et. seq.) These amendments will be proposed as part of the Proposed New Jersey Coastal Management Program (anticipated publication date is February 1980).

The conclusion of the paper includes recommended steps to address the existing lack of dredging disposal sites by developing a Spoil Disposal Siting Program, and by continuing priority analysis for State dredging projects.

The appendices which are not included in this report give the physical characteristics and locations of major dredging and dredge disposal site activities in New Jersey. They are available upon request to DEP, Division of Coastal Resources, Bureau of Planning and Coastal Development, P.O. Box 1889, Trenton, New Jersey 08625.

Three terms must be defined at the start.

New dredging is the removal of sediment from the bottom of a water body that has not been previously dredged or excavated, for the purpose of increasing water depth, or for the widening or deepening of navigable channels to a nearby authorized depth or width.

Maintenance dredging is the removal of accumulated sediment from areas where dredging has taken place in the past, such as navigation channels, marinas, or boat moorings, for the purpose of maintaining an authorized water depth and width.

Dredge spoil disposal is the discharge of sediments removed during dredging operations.

II. THE NEED FOR DREDGING

This chapter describes the need for dredging in New Jersey, and also includes a summary of major dredging activities in the state performed by Federal, State and private agencies.

1. Geographic Distribution of Dredging and Dredging Needs

Dredging needs vary in different part of the state, and are therefore, analyzed regionally below. The areas addressed are the Northern Waterfront, Bay and Ocean Shore and the Delaware River. Subsequent sections then discuss dredging in lakes and private dredging.

a. Northern Waterfront

The Northern Waterfront is marked by diversity in its 60-mile stretch from the Palisades to Raritan Bay and also along the tidal portions of the region's rivers. Segments of different rivers often show similar characteristics. The Upper New York Bay and Arthur Kill-Newark Bay regions are similar industrial port districts which have known better days, but are physically separated by the residential waterfront at Bayonne. The Upper Hackensack, Passaic and Rahway River segments, likewise, have similar urban, suburban waterfronts, while the Elizabeth and Perth Amboy Waterfronts have a similar urban residential character.

The New Jersey northern channels are used for a variety of purposes including recreational boating and passanger transportation. The major use of the channels within the harbor is as a thoroughfare for waterborne commerce. The major commodity received is oil followed by general cargo and bulk cargo. There are many petroleum terminals that are privately owned and operated within the harbor; the largest proportion is along the Arthur Kill and Kill Van Kull. Many of these larger oil tankers make their way directly into these terminals and either offload or onload. A large portion of the tankers do not make their way directly to the berthing areas, but anchor in areas of the Upper Bay and Lower Bay, and offload or lighten their cargo onto smaller barges to make their way to the various terminals around the harbor.

The second type of cargo, general cargo, is handled by terminal facilities throughout the harbor. These have been developed and operated mainly by public institutions, such as the Port Authority of New York and New Jersey. The third and final category of commodities is bulk cargo, which includes products such as scrap iron and grain.

These channels must be dredged periodically for they become too shallow to support such activities. Dredging is necessary in areas such as the Raritan, Passaic and Hackensack Rivers, which otherwise would have a depth of less than 10 feet. Approximately 1,100,000 cubic yards were removed from New Jersey channels in this area in

NORTHERN WATERFRONT



Fig. 1

1976 and deposited in Mud Dump, which is an open water disposal site in existance in the New York Harbor area since 1900 when sites were first designated under the authority of the Federal Rivers and Harbors Act of 1899. This Mud Dump, which is located 6 miles offshore from Sandy Hook, has accommodated approximately 90 percent of all material disposed within the New York Harbor. The remaining material is deposited upland or as beach nourishment in Shark River.

The Department of the Army, Corps of Engineers, New York District is responsible for dredging and maintenance of navigation channels within the drainage basins of the following: New York and New Jersey Channels, Newark Bay, Hackensack and Passaic Rivers, Elizabeth River, Rahway River, Woodbridge Creek, Raritan River, Washington Canal and South River, Raritan River to Arthur Kill Cut-off Channel. There are approximately 96.1 miles of Federally maintained waterways in New Jersey. These channels range in size from 35-38 foot depths for ocean going vessels in Newark Bay, to the smaller recreational boat channels with depths from 8-15 feet. These are not naturally deep channels. Figure 2 shows areas that have been significantly deepened below bottom depths which existed in 1857, areas that were deepened more than ten feet, and areas that had to be deepened more than 20 feet below the existing bottom in 1857. There are some naturally deep areas in the New York harbor, including a portion of the Kill Van Kull.

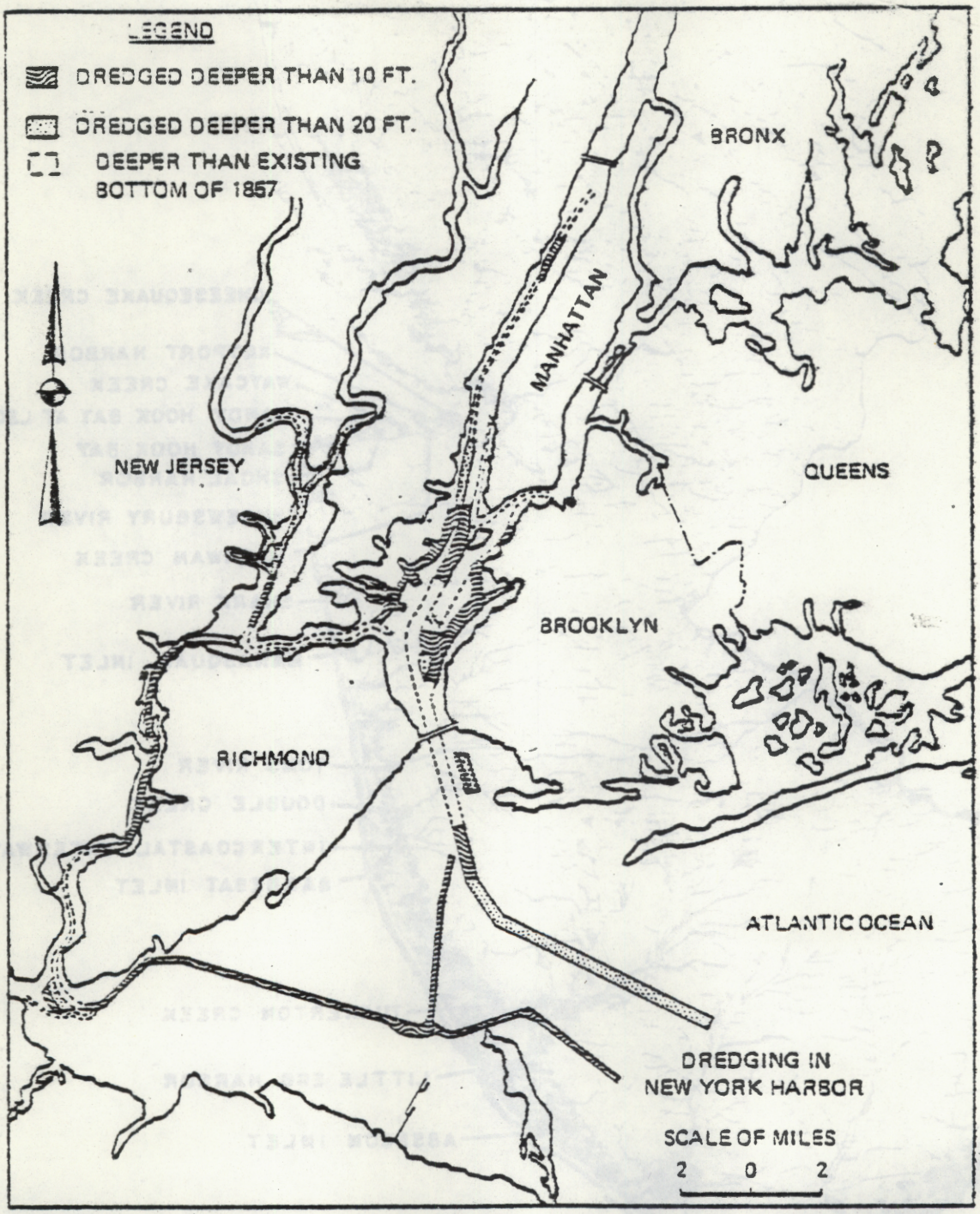
A recent Corps of Engineers study concluded that existing Federal navigation channels in Kill Van Kull and Newark Bay are inadequate in depth to permit the most economic, safe utilization by the deep draft and large ocean-going vessels that use these waterways. Consequently, these vessels either transit these channels in a lightened or underloaded condition, or anchor in New York Harbor to await a favorable tide.

2. Bay and Ocean Shore

The geographic scope of the Bay and Ocean Shore includes lands along New Jersey's Atlantic Ocean shoreline, lands along the bays behind the barrier islands, and lands along the Delaware Bay and Raritan Bay. All tidal channels that flow through this area are included in this segment.

The channels of the Bay and Ocean Shore are used for recreational boating, commercial fishing operations and access to marinas and docks.

In 1976, over 125,000 commercial and recreational motorboats were registered in New Jersey (N.J. Division of Motor Vehicles). About 75% of these boats were operated primarily in the tide water areas; Ocean County alone received over 38% of all pleasure boat activity, Atlantic County about 8%, Cape May about 10%, Monmouth



SOURCE: U.S. Army Corps of Engineers, 1977. Unpublished material.

Fig. 2

BAY AND OCEAN SHORE

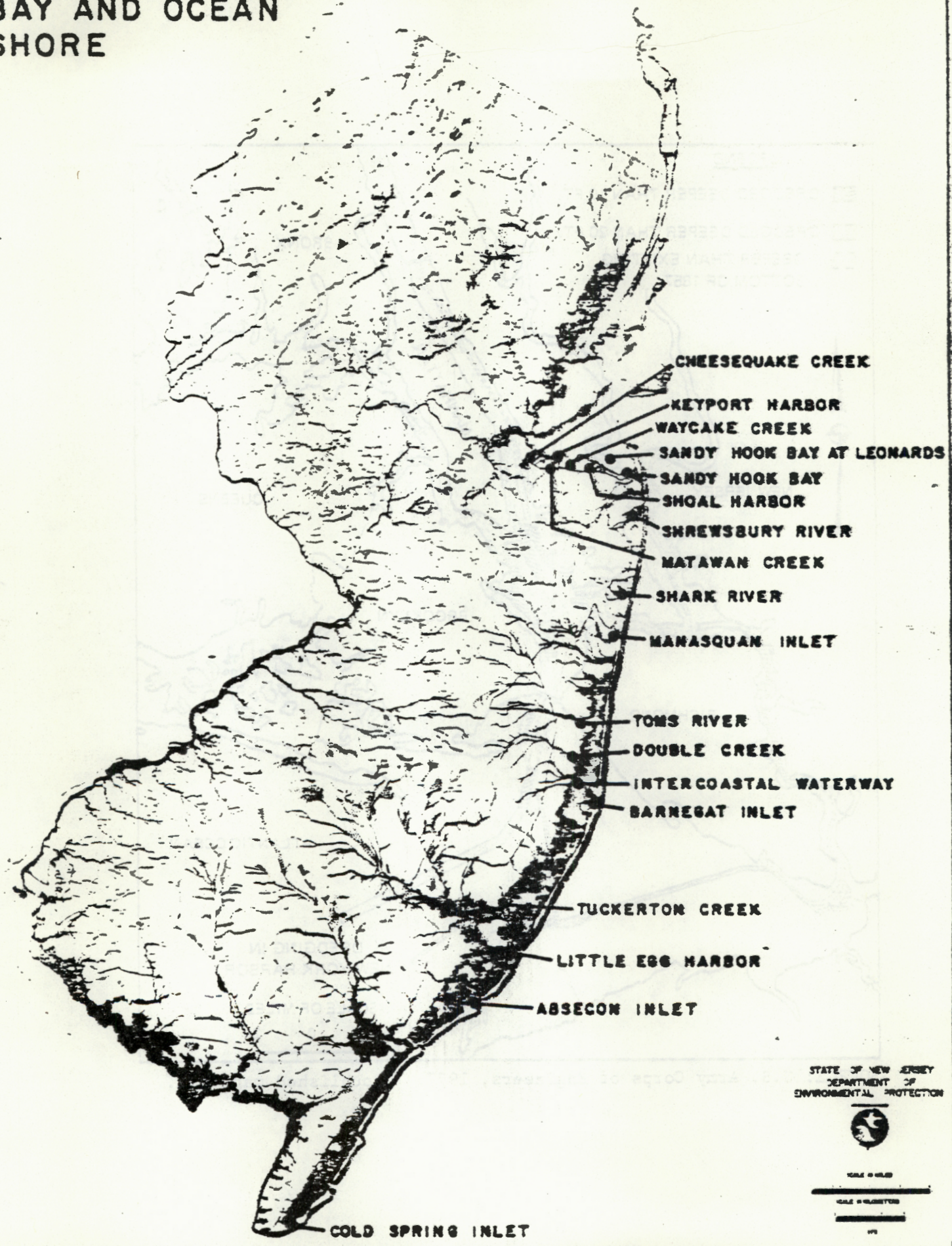


Fig. 3

about 11% and Cumberland about 3%. The remainder of the activity, approximately 5%, occurred in Bergen, Burlington, Camden, Essex, Hudson, Middlesex, Salem and Union Counties (Figley, Townsend and Boriak 1977).

There is now an unmet demand for boating and fishing needs in most of the estuarine areas of New Jersey. Private marinas are providing the bulk of the present access facilities. In many areas these private facilities are inadequate and do not provide the needed services. The demand for more marinas will create more dredging needs to provide access to the marina facilities, e.g. piers, floats.

The State and federal governments share responsibility for maintaining the navigation channels in New Jersey's Bay and Ocean Shore navigable waters.

Over the past decades, the State of New Jersey has created and maintained a system of about 500 mile of channels providing access to the Intracoastal Waterway (ICW) and other federal channels. The State does not maintain channels within lagoon developments. While no new channels have been created since 1970, DEP marks all channels each year. In addition, DEP is responsible for maintaining channels at three inlets between the Atlantic Ocean and the back bays: Great Egg Harbor Inlet, Hereford Inlet and Townsend's Inlet. DEP decided in the mid 1970's not to attempt to maintain a channel at Corson's Inlet; the inlet is now allowed to migrate and shoal naturally.

The U. S. Army Corps of Engineers is responsible for the following current projects within this area: New Jersey Intracoastal Waterway, Toms River, Manasquan Inlet, Double Creek, Barnegat Inlet, Absecon Inlet, Cold Spring Inlet, Little Egg Harbor, Shark River, Shrewsbury, Tuckerton Creek, Sandy Hook Bay, Sandy Hook Bay at Leonardo, Waycake Creek, Matawan Creek, Keyport Harbor, Shoal Harbor Comp, and Cheesequake Creek.

The total length of this project is approximately 167 miles.

The average annual dredging in New Jersey Intracoastal Waterway involves removal of 250,000 cubic yards. The overboard and upland spoil disposal sites are furnished in various locations by the State of New Jersey. Estimated FY 1979 costs for this work are $420,000. Dredging is performed at various locations in the Waterway each year.

The average annual dredging in Manasquan Inlet is 75,000 cubic yards. This project is performed every 2 years.

The Barnegat Inlet project involves 100,000 cubic yards of sand each year. No maintenance dredging of the channel was scheduled for FY 1979. Recently, a contract has been completed for restoration of eroded beaches on Long Beach Island. This work involved dredging of 1.5 million cubic yards of sand from Barnegat Inlet with placement of the material on the beaches south of the inlet. The cost of this work is $4,234,000.

The Absecon Inlet dredging program is performed annually with ocean disposal averaging 80,000 cubic yards of sand.

The Cold Spring Inlet project is performed every 2 years with removal of 50,000 cubic yards.

The remaining projects are dredged every 2-5 years depending on needs and available funds, and lead to removal of a total of approximately 1,262,000 cubic yards of dredge spoils.

In addition, the following are Small Navigation Project reconnaissance studies undertaken by the U. S. Army Corps of Engineers.

- City of Pleasantville is requesting dredging of a channel to maintain access to Pleasantville municipal yacht basin because of difficulty with navigating during low tides on Lakes Bay.

- Dover Township is requesting an access channel from the Toms River Federal Channel to the proposed marina in the "River Front Park" area of the township.

C. Delaware River

The Delaware River and Bay is tidal and navigable for approximately 135 miles from the Atlantic Ocean to Trenton Falls. With the continued growth of commerce, ports of the Delaware River rank second nationally and rank high internationally in total waterborne commerce (1979). The Delaware River is a system that tends to reestablish conditions similar to those prior to channel improvements. Dredging, therefore, requires original work followed by continuing maintenance. The present channel depth from deep water in Delaware Bay to Philadelphia is 40 feet. Average annual dredging involves removal of 4.3 million cubic yards of material by hopper dredge, funded by the federal government. Normal maintenance dredging of this area costs approximately $9 million.

In the absence of dredging, the Delaware River would revert to its natural depth of 17 feet. The 1967 estimates by the American Dredging Company show that 6.5 million cubic yards of sediment were removed from the river. However, due to more stringent erosion control practices, the river is filling up more slowly, requiring less dredging.

The Philadelphia and South Jersey port can not host the largest sea going tankers and carriers because the water depths are too shallow. Tankers come into Delaware Bay, at the month of the river, where cargo is pumped into barges for further transport up river (lightering). Though the time and energy involved in this transfer process could be cut through construction and use of an offshore loading facility for the lower Delaware Bay, funds for the undertaking have never materialized. Many proposals for such a receiving center have come and gone through the years, raising considerable controversy.

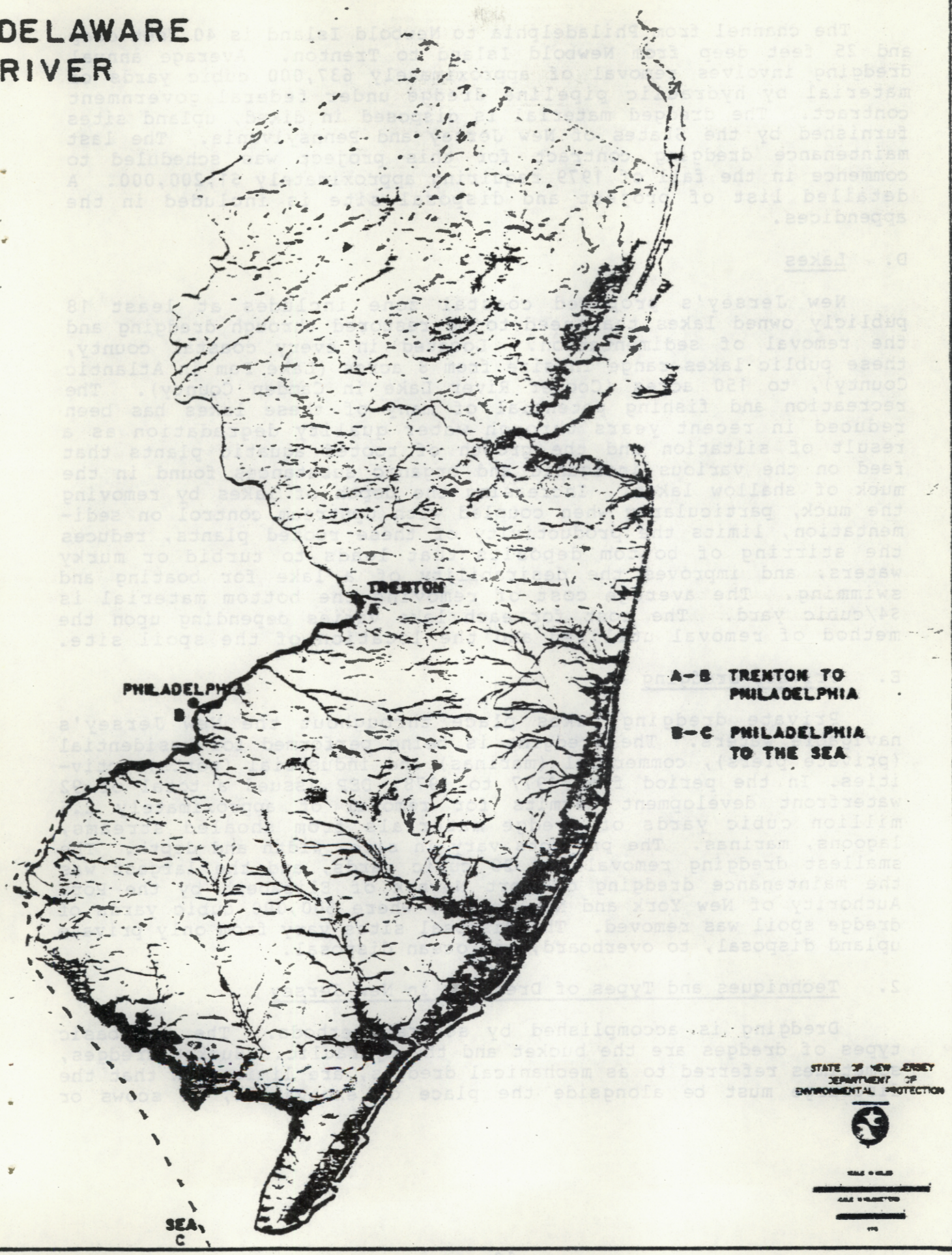

DELAWARE
RIVER
TRENTON
A
PHILADELPHIA
B
SEA
C
A-B TRENTON TO
PHILADELPHIA
B-C PHILADELPHIA
TO THE SEA
STATE OF NEW JERSEY
DEPARTMENT OF
ENVIRONMENTAL PROTECTION

Fig. 4

The channel from Philadelphia to Newbold Island is 40 feet deep and 25 feet deep from Newbold Island to Trenton. Average annual dredging involves removal of approximately 637,000 cubic yards of material by hydraulic pipeline dredge under federal government contract. The dredged material is disposed in diked, upland sites furnished by the States of New Jersey and Pennsylvania. The last maintenance dredging contract for this project was scheduled to commence in the fall of 1979 requiring approximately $1,200,000. A detailed list of project and disposal site is included in the appendices.

D. Lakes

New Jersey's proposed coastal zone includes at least 18 publicly owned lakes that need to be restored through dredging and the removal of sedimentation. Located in every coastal county, these public lakes range in size from 8 acres (Lake Pam in Atlantic County), to 150 acres (Cooper River Lake in Camden County). The recreation and fishing potential of many of these lakes has been reduced in recent years through water quality degradation as a result of siltation and the growth of rooted aquatic plants that feed on the various inorganic and organic substances found in the muck of shallow lakes. Increasing the depth of lakes by removing the muck, particularly when coupled with upstream control on sedimentation, limits the productivity of these rooted plants, reduces the stirring of bottom deposits that leads to turbid or murky waters, and improves the desirability of a lake for boating and swimming. The average cost of removing the bottom material is $4/cubic yard. The cost for each lake varies depending upon the method of removal utilized and the location of the spoil site.

E. Private Dredging

Private dredging takes place throughout the New Jersey's navigable waters. The dredging is being performed for residential (private piers), commercial (marinas) and industrial (ports) activities. In the period from 1977 to 1978, DEP issued a total of 92 waterfront development permits for removal of approximately 2.6 million cubic yards of dredge materials from shoaled streams, lagoons, marinas. The projects vary in size, width and depth. The smallest dredging removal was 20 cubic yards, and the largest was the maintenance dredging of Port Newark of Elizabeth by the Port Authority of New York and New Jersey, where 500,000 cubic yards of dredge spoil was removed. The disposal sites vary from only private upland disposal, to overboard, and ocean disposal.

2. Techniques and Types of Dredging in New Jersey

Dredging is accomplished by several methods. The two basic types of dredges are the bucket and the hydraulic. Bucket dredges, sometimes referred to as mechanical dredges, are limited in that the discharge must be alongside the place of excavation, or scows or

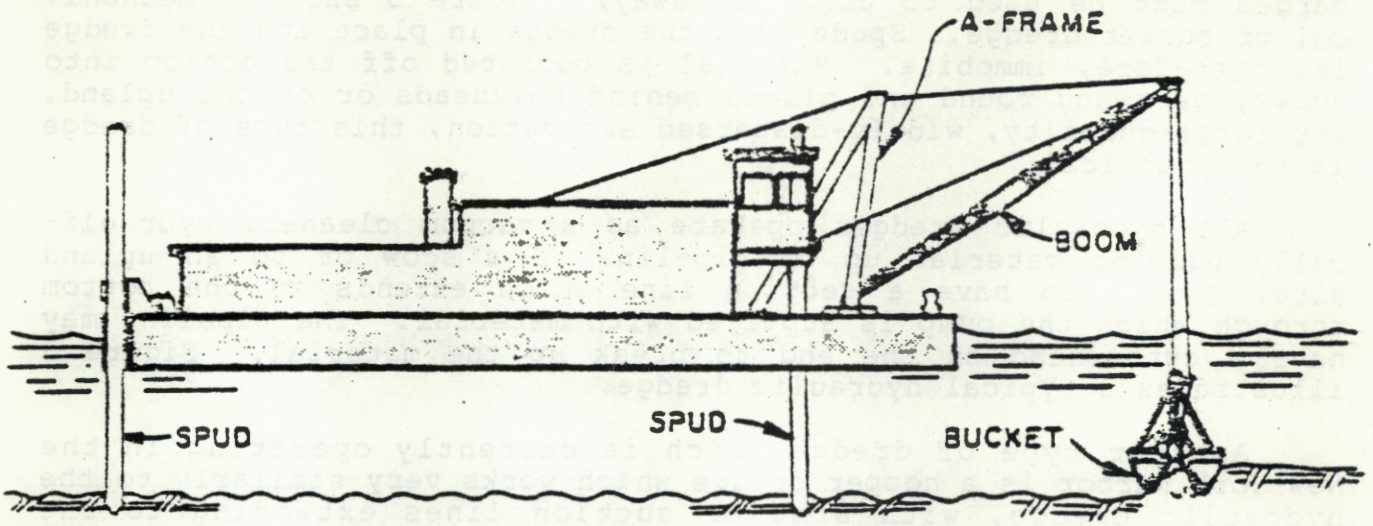
barges must be used to carry it away. Figure 5 shows a mechanical or bucket dredge. Spuds hold the dredge in place and the dredge is, therefore, immobile. Material is bucketed off the bottom into scows, or swung round and placed behind bulkheads or on the upland. For large-quantity, widely-dispersed excavation, this type of dredge is not practical.

All hydraulic dredges operate as a vacuum cleaner, hydraulically pumping material up by pipeline to a scow or to an upland site. They also have a section line which extends to the bottom through which the pump is supplied with material. The pipeline may have a cutterhead on the end to break up the material. Figure 5 illustrates a typical hydraulic dredge.

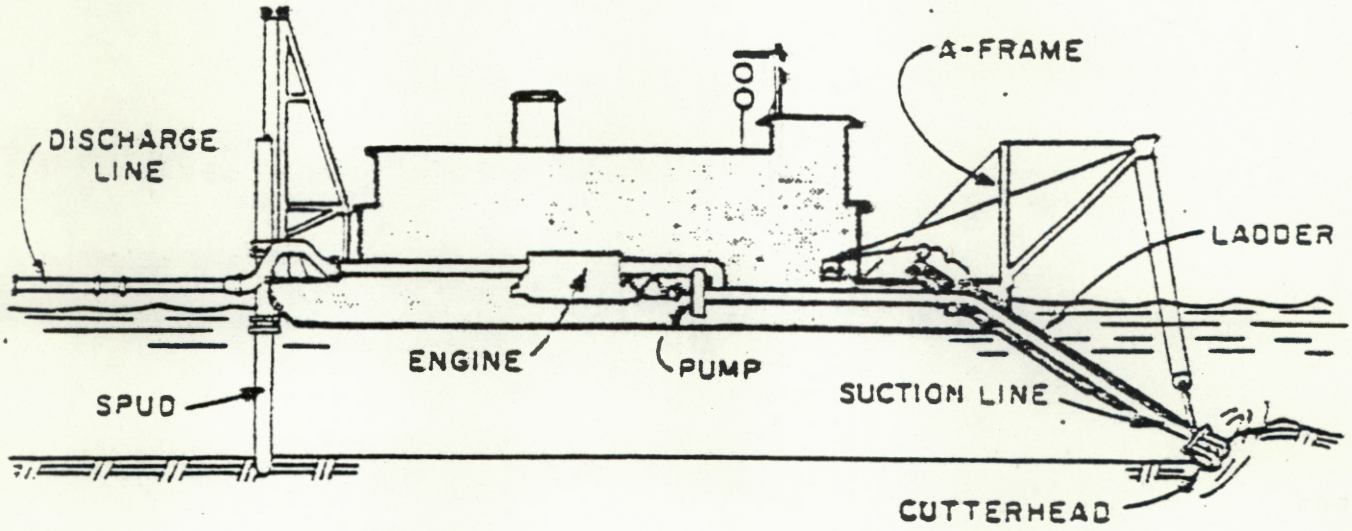
Another type of dredge which is currently operating in the New York harbor is a hopper dredge which works very similarly to the hydraulic dredge, with arms or suction lines extending to the bottom. Material is hydraulically pumped into the hoppers which are in the interior section of this dredge. The Corps of Engineers vessel Essayons, used in the New York Harbor, is over 525 feet in length and it is the longest operating hopper dredge in the country with a capacity of 8,000 cubic yards. One of the advantages of a hopper dredge as opposed to a hydraulic dredge or bucket dredge is that it is mobile, and can work in rougher seas, such as those experienced in the entrance channels.

Note:

Another dredging method is the small scale <u>illegal</u> dredging activities by marine property owners and boat owners who avoid getting the dredging permit. It is done by use of a uncontrolled prop wash or water jet that blows out or disturbs the sediments from the water bottom, which then drift away in the tide. This creates shoaling conditions in the immediate vicinity.



MECHANICAL OR BUCKET DREDGE



HYDRAULIC DREDGE

Fig. 5

III. DREDGING AND DREDGE SPOIL DISPOSAL ISSUES

Dredging and the related operations of disposal of the dredged materials involve changes at the dredging site, along the disposal route, and at the disposal site.

1. Dredging Issues

Dredging activites and the physical, biological and chemical changes at the disposal site may be beneficial or detrimental depending on the specific site and the manner in which the dredging is performed. The factors discussed below relate only to the dredging activity itself. Issues related to dreged spoil disposal and transport are discussed in a following section.

a. Beneficial Effects of Dredging

The primary beneficial effect of dredging is the longer and improved availability of facilities necessary to the existence and the welfare of human communities. For example, dredging can make possible the continued use of new harbors, canals, dikes, and landfills, or the creation of new facilities. These activities can lead to social and economic benefits.

Some of the more common beneficial effects of dredging are:

- construction of new harbors and ports in marine coastal areas, on rivers, and in lakes
- excavation of approach marine channels
- intentional removal of polluted sediments from the bottom of water bodies
- intentional provision for construction materials as aggregates for concrete, material for landfills, dikes, levees and dams, and for beach nourishment
- provision of minerals and metals
- incidental removal of polluted materials from the surface, or from the bottom of the site
- incidental control of eutrophication of the water body
- transfer of nutrients from the bottom sediments to the water column, in suspension, making them available to aquatic biota with enhancement of productivity, extending through the food chain

- absorption of polluted materials present in the water column by the resuspended sediments

- increase of the oxygen content of the water in the water column, by mixing due to turbulance

- reoxygenation of sediments stirred up by the operation. This is of particular value when material is mainly organic or when organic pollution prevails without reoxygenation otherwise occurring

- creation of traps for algae and refuges for aquatic fauna with associated beneficial effects extending to adjoining areas, through the food chain

- incidental increase in the impounding capacities of lagoons, with decrease of tidal levels of waters, in some areas

- incidental reduction of resistance to tidal flows to and from land, in lagoons, to the benefit of water renovation

- establishment of new and more favorable conditions to new species of flora and fauna, eventually more useful to productive activities and to environmental conditions and equilibrium than those previously existing on the site

- excavation of approach marine channels

- excavation of new inland canals

- expansion of existing harbors and ports

- improvement of the operating capacity of existing ports and harbors, approach marine channels, canals, and rivers by deepening the existing water depths, with benefits and improved possibilities for navigation

- construction of structures resting on underwater foundations

- restoration of previously existing water depths in all the natural and artificial water bodies

- improvement of water flow conditions due to increased river bed sections and slopes, change of flow patterns and related benefits extending away from the dredging site, such as reduced height of flood peaks, reduced danger, or at least extension, of inundated areas, and enhanced renovation of water in lagoons, where desirable to maintain environmental equilibrium

6. Detrimental Effects of Dredging

The common adverse effects associated with operations at the dredge site include:

- production of turbidity at the dredging site by fine material stirred up and brought into suspension, with associated inconveniences, such as disturbance to aquatic fauna and impairment of photosynthesis, due to interception of light, for the aquatic flora

- further degradation of coastal waters by stirred up sediments which contains a variety of potentially toxic and hazardous substances, including heavy metals, petroleum hydrocarbons, and a wide range of synthetic organic compounds which come from both treated and untreated sewage discharge, maritime and industrial accidents, urban rain runoff, and discharges from the Hudson, Passaic, Hackensack and Raritan Rivers.

- production of turbidity in the receiving waters by overflow from barges or hoppers

- removal of flora and fauna, including plankton, or at least disturbance of the same, at the dredging site

- potential inconveniences associated with the reduction of oxygen demand and the increase of disolved oxygen in sediments in particular cases and possible conversion of some chemical compounds by bacterial action to others more dangerous

- alterations of the bottom surface, unfavorable to growth of the established flora and fauna, with potential decrease in the nutritive capability of the estuaries and shallow waters in general

- transfer upstream of the salinity wedge limits in estuaries

- reduction of resistance to tidal flows to and from land in lagoons, unfavorable in particular cases in relation to the enhanced speed of rise and to the levels of tidal water height

- acceleration or promotion of beach erosion

- creation of stagnant areas due to presence of mining trenches

- interference of stationary dredges with navigation and with fishing, unless avoided by advance programming and coordination

- in some cases, disturbance and danger of damage to stationary installations, such as underwater cables, pipelines, sewer outfalls

- objectionable noise, which may cause discomfort to the crew, and, especially at night, to people in nearby areas

- vista impairment by the operation of dredging or by the turbidity caused by the operation

All of the above mentioned detrimental effects of dredging should be consider and controled in any major dredging projects.

b. Financial Dredging Issues

One of the major dredging issue facing New Jersey is a lack of adequate funds to perform dredging activites for the most needed State navigable channels. Prior to FY 1975, DEP's annual State appropriations for maintenance dredging averaged $500,000, but with decreasing or non-existent annual appropriations since then, DEP has been hard pressed to maintain the State's navigation channels. The limited available funds have been used to maintain the two vital inlets to the ocean -- Hereford and Townsends -- and for other small dredging projects, using priorities based on the severity of shoaling and intensity of recreational boating, often measured by the intensity of public attention. Consequently, many State channels have not been maintained (dredged) for decades. As a result, access to marinas and docks has been reduced, recreational boating opportunities have been limited, commercial fishing operations have been hindered, and boating has become more hazardous.

The FY 80 State budget includes $400,000 for inland waterway maintenance and $700,000 for the Shark River inlet sand bypass. DEP has discussed with members of the Legislature the desirability of reprogramming the $700,000 appropriation to the inland waterway maintenance account for FY 80. The resulting $1.1 million would then be used for the top priority channel dredging needs. At the same time, the design, construction, and initial operation of the Shark River inlet sand by pass would be financed with the initial $4 million shore protection appropriation to DEP from the Beaches and Harbors Bond Issue of 1977.

To meet the accumulated dredging needs of New Jersey's navigable waterways and lakes, the a five year, $20 million dredging bond program was proposed in mid 1979. The legislature chose not to place this measure on the ballot in 1979, but could do so in future years. The program of restoring State navigation channels would be managed by the Division of Coastal Resources, at an annual administrative cost estimated at $170,000. The bond issue, as

proposed would finance 100% of the cost of dredging channels that are a State responsibility, and provide the State share of channel restoration for projects that are a shared federal-state responsibility. The initial bond funding would be expected to be sufficient to restore most channels so that a proper program of maintaining all State channels on a regular cycle can be established, to be financed through annual State appropriations.

While definitive priorities for channel dredging have not yet been established, the Division of Coastal Resources proposes initially to consider three criteria in establishing priorities:

- recreational boating intensity
- commercial fishing and boating intensity
- accessibility status (accessible, not accessible at low tide, moderate or severe shoaling).

A fourth consideration is the availability of environmentally acceptable disposal sites for dredge spoils.

Lake Restoration Projects

Lack of matching funds has been a major deterent in the State's efforts to obtain Federal Clean Lakes Program Funds under Section 314 of P.L. 95-217 for the implementation of lake restoration projects. The proposed dredging bond issue would have resulted in the long needed State aid for the utilization of federal funding for the restoraton of some public lakes. A program of restoring selected public lakes would be managed by DEP's Division of Water Resources, at an annual administrative cost estimated at $50,000. The bond issue would finance a maximum of 100% of the cost of dredging each lake, with federal funds expected to finance 50% of the cost. The full share of dredging State-owned lakes would be financed by the bond issue. DEP recommended that local governments finance 10% of the cost of dredging lakes not owned by the State in order to share the financial responsibility for proper lake management. The proposed lake dredging program would only begin the multimillion dollar effort needed to restore all of New Jersey's public lakes, based on the initial results of lake surveys by the Divison of Water Resources Lake that are expected to be completed by March 1980. Also, the watersheds of dredged lakes must be properly managed in order to achieve long-term restoration. DEP's Water Quality Management Planning efforts underway under Section 208 of the Federal Clean Water Act and the management practices instituted under the State Soil Erosion and Sediment Control Act of 1975 contribute to proper watershed management.

The Green Acres Program (N.J.A.C. 7:36-1.1 et seq.) distributes Green Acres funds for dredging and rehabilitating Lakes and ponds in public ownership for recreation purposes providing all appropriate

permits and conditions are fullfilled (N.J.A.C. 7:36-4.6). This program distributes funds to counties and municipalities on a 50-50 basis. This program could also be used to provide the matching funds for Federal Clean Lakes Program.

C. Legal Dredging Issues

Some of the legal dredging issues include the following cases:

Under N.J.S.A. 52:28-24 the State of New Jersey agreed to furnish to the U.S. Government free of cost all lands, easements, rights-of-way and disposal areas within the State required for the improvement of the Delaware River between Philadelphia and Trenton. In the past, the Philadelphia Army Corps of Engineers (COE) District Engineer interpreted this to require the State only to furnish the lands for disposal areas. However, the Chief of Engineers recommended that the State must also assume the cost of diking and related disposal area development.

The State has disagreed with this, the COE reconsidered its position and as of October 1979 this dispute has been resolved.

A similar dispute on the Intracoastal Waterway has not been resolved yet.

Another issue involves ownership disputes between the State and public and private landowners concerning the boundary of the mean high water line along the Delaware River. The State has assumed that the 1909 shoreline of the Delaware River is the demarkation line between the State and private ownership. However, the State could not successfully prove its ownership back to the apparent 1909 shoreline, and in two recent cases City of Camden vs State of New Jersey Docket No. C-686-76 and City of Beverly vs Goldsmith Docket No. F-4043-72, the Court recognized the 1935 shoreline as the line of State ownership. These cases may affect the agreement between DEP and COE on the Delaware River disposal sites. The availability of disposal sites may be diminished until the State Tidelands Delineation Project has been completed. The goal of this program is to define all lands now or formerly flowed by mean high water tide, by 1985.

2. Dredging Disposal Sites and Spoil Transportation

Dredge spoil disposal which introduce the discharge of sediments removed during dredging operations, is a major issue related to dredging. Also, the transportation of spoil can be a serious problem.

a. Issues in Water Disposal

The disposal of spoil in water may also have beneficial or detrimental effects on the environment. The beneficial effects of dredge spoil disposal associated with controlled disposal in open water, including coastal and shallow waters, can include:

- prevention of coastal erosion
- creation of artificial marsh areas
- creation of artifical lagoons
- creation of new land adjacent to the coast
- creation of islands
- creation of mounds which provide refuges for fish and wildlife
- covering of existing bottom pollution
- creation of soft bottoms favorable to some species of biota
- enhancement of bioactivity and increase in the biomass, i.e., fish food

Harmful effects, potentially associated with disposal of dredged materials in waters, include:

- temporary local turbidity created at the disposal site, but which may extend itself to rather material distances under suitable conditions
- persistent turbidity due to tides, currents, winds, transit of vessels
- general degradation of the environmental quality at the disposal site, when the disposed dredged material is polluted
- creation of water quality barrens, and consequent reduction of catch for the fishery industry
- unwanted return to the dredging site of materials deposited in coastal waters due to littoral drift or improper location of the disposal sites.
- smothering or at least disturbance of aquatic flora and fauna at the disposal site, and blanketing of the bottom
- migration of certain species of biota
- extinction of more sensitive species of biota
- introduction of the water to toxic, permanent substances which might be assimilated and accumulated by marine fauna and flora and which could proceed through the food chain down to human population

- introduction of salinity and pollution into the ground water table of land adjacent to shore disposal areas

- pollution or discoloration of recreational area facilities and beaches

b. Issues in Land Disposal

The beneficial effects associated with controlled disposal on land may include:

- reclamation of land useable for different purposes

- compensation of land subsidence

- provision of new marsh land

- improvement of vista

Harmful effects associated with disposal on land may include:

- pollution of the groundwater table by seepage

- presence of objectionable odors in the vicinity of the disposal areas

- pollution of waters receiving polluted effluent from diked or contained disposal areas

- degradation of the landscape

- air and water pollution, noise, vibrations, odors and vista impairment, some of which may result from use of inappropriate, faulty or inefficient equipment and machinery used on the site

C. Spoil Transportation

The transport of dredge spoil from the dredging site to the disposal site can also have harmful effects if it is not properly controlled. Use of inefficient equipment and methods, and in consequence the spillage of fuels, emission of toxic or noxious gases, losses of dredged materials, and noise and vibrations produced by faulty or worn out equipment and machinery may cause water pollution, air pollution and discomfort both for the crews and for the human population along the disposal route and in nearby areas. Specifically, this includes:

- pollution caused by leakage of polluted materials from transfer containers or pipelines

- presence of objectionable odors during transit of materials along the disposal route

- air and water, or even land, pollution resulting from use of inefficient equipment and machinery

In addition to the mentioned effects, the following items should also be considered in evaluating the effects of dredging and dredging disposal:

- topographic conditions of the site where the single operations, either dredging or disposal of the dredged material, take place. This includes water depth, width of the river bed, and slope of banks or shores,

- geological nature, conditions and physical stability of soils and rocks involved in any way in the operations, including for land disposal operations porosity and permeability as well as nature and conditions of the dredged material;

- hydraulic conditions, such as surface currents, depth currents, or tidal flows of the concerned water body

- meteorological conditions in the area concerned having a bearing on hydraulic conditions, such as prevailing winds, evaporation, etc.

- physical, chemical and microbial quality of water and underlying bottom sediments of the water body concerned;

- presence, types, species, behaviour and habits of existing biota in the area concerned;

- features of the adjoining land and types of development, whether residential, industrial, commercial or agricultural in the concerned and neighboring areas;

- presence and features of groundwater tables in adjoining land in the case of dredging operations in the estuaries, in connection with the increased penetration of the salinity wedge, as well as in disposal areas in connection with any type of land disposal;

- character of water bodies which will receive overflows, spills, drained water, etc.

- the development of techniques for dewatering or densifying dredged material in disposal areas

- feasible techniques for reuse of disposal areas after they reach their filled capacity

- improving the design and efficiency of disposal areas

- possible treatment of contaminated dredged material

- the establishment of evaluation procedures for determining the environmental effects of fill operations in wetlands

- the development and evaluation of concepts for the artificial creation of marshlands from dredged material disposal operations

- the feasibility of using abandoned pits and mines for disposal of dredged material

- the evaluation of concepts for use of dredged material for the development or restoration of agricultural lands, the creation of recreation oriented land fill sites including beach protection, and general land reclamation works.

d. Availability of Dredge Disposal Sites

The availability of environmentally acceptable disposal sites for dredge spoils is an important issue. The concern of municipalities and land owners reluctant to enter into long term easements make it more difficult for the State to provide the new sites for Federal projects as well as for State projects. Most of the dredging projects listed in the proposed bond issue have not established the location of disposal sites. The present practice of overboard disposal is discouraged under the proposed amendments to the Rules on Coastal Resource and Development Policies. Clearly, new alternatives for dredge spoil disposal sites must be found.

Other reasons for difficulties in obtaining new dredge spoil disposal sites are:

- Much of the readily available land, especially along the Delaware River shore, has already been filled, and is now in a high state of development and industrialization, especially in the areas of recurrent shoaling between Philadelphia and Wilmington.

- Maintenance dredging spoil is often an undesirable landfill material due to its high silt content and possible toxicity.

- Increased elevation of disposal sites can make the site unsuitable for development.

- Lack of methods for sale of dredged material by the State. The State used to sale the dredge spoil from the disposal sites in order to make said sites available for further deposit of dredged spoil.

- Governmental regulations protecting or preserving wetland areas.

- Objections raised by conservation, fish and wildlife, and other environmental groups.

Another issue associated with disposal site is the "Dump Site". The offshore Dredge Spoil Dump Site which the Army Corps of Engineers has used for dumping of dredge spoils includes some of the most productive and historically important fishing grounds in the New York Bight. An attempt in 1979 to dump 265,000 cubic yards of possibly toxic East River silt by the Army Corps of Engineers was strongly criticized and successfully resisted by 26 shore communities, various federal agencies, and conservation groups and legislators.

This dredging which was part of drift collection program in the Harbor to remove old piers, piles, consequently, will not be performed. Instead, the rotten timber will be cut out.

IV. Dredging Jurisdiction

1. Existing Laws, and Regulations

This section is an analysis of Federal, Interstate, State and Local authority with respect to the regulation of dredging and the disposal of dredged and fill materials.

a) Federal Authority

The U. S. Army Corps of Engineers is actively engaged in the maintenance dredging of the navigable waters of all designated U.S. channels. Dredging and associated activities (notably spoil disposal) in navigable waters affecting riparian or regulated wetlands do require the relevant state permits. The Corps conducts maintenance activities only in waterways for which it has received specific Congressional appropriations.

The authority of the federal government to regulate dredging derives from Congress' power to regulate interstate commerce. While originally applicable to navigable waters only, recent court decision have defined this power extending to all waters of the United States, including wetlands (See 15 CFR 320-329). This authority is exercised with reference to dredging and associated activities through the River and Harbor Act, Clean Water Act, Marine Protection, Research and Sanctuaries Act, and the Fish and Wildlife Coordination Act.

Section 10 of the Rivers and Harbors Act of 1899 gives authority to the Department of the Army, acting through the Corps of Engineers, to issue permits for structures and work in or affecting the navigable waters of the United States. Section 10 permits do not preempt state permit requirements.

Section 404 of the Clean Water Act authorizes the Secretary of the Army, acting through the Chief of Engineers, to issue permits for the discharge of dredged or fill material into navigable waters at specified disposal sites selected according to criteria promulgated by the Environmental Protection Agency (See 40 CFR Part 230). EPA may veto the Corps' designation of disposal sites if it determines that the proposed discharges may adversely affect water supplies, shellfish beds, fishery, wildlife, or recreation areas. For the purposes of administering this program, Corps regulations define "all U.S. waters" to include contiguous and adjacent wetlands.

Again, this program does not preempt the State's wetlands permit program, since the Corps could not authorize disposal on regulated wetlands unless the applicant obtained a state permit.

Section 404 permits are subject to a state review for water quality certification as required under Section 401 of the Clean Water Act. The Corps will not grant such a permit until the State certifies that the proposed activity will not violate state water quality standards. In New Jersey, this review (commonly called a "401 Certification") is performed by the Division of Water Resources in DEP.

The Marine Protection, Research and Sanctuaries Act of 1972 (the Ocean Dumping Act 33 USCA 1401 et seq.) authorizes the Corps to issue permits, under criteria established by EPA, for transport and dumping of dredged material in ocean waters (40 CFR 220-2300.

A notable adjunct to each of these programs is the requirement of the Fish and Wildlife Coordination Act of 1958 that the Corps consult on every dredge permit with the U.S. Fish and Wildlife Service, whose decision concerning impact on wildlife may be overridden only by the Secretary of the Army.

Lastly, the National Pollutant Discharge Elimination System (NPDES) (see Section 402 of Clean Water Act) requires the EPA to issue a permit for point source discharges including the release of water from diking areas that were used as upland disposal sites during the dewatering process.

b). Interstate Authority

Delaware River Basin Commission (DRBC) Project Review Authority. Article 3.8 of the DRBC Compact authorizes the Commission to review projects which may have a significant impact on the water resources of the Delaware Basin. No proposed project which the DRBC determines to be within its project review jurisdiction may be undertaken until the Commission grants its approval. DRBC monitors all Corps of Engineers permit notices as well as projects summarized in the DEP Weekly Bulletin, and coordinates with DEP, under a November 1976 Administrative Agreement, and with the Corps, in project review. DRBC will review a project requiring a DEP permit only after the permit has been issued. DRBC has the authority to withhold its permit even if the state permit is issued.

c). State Authority

The extensive authority of Congress to regulate navigation under the interstate commerce clause has not excluded the State from dredging regulation. The State maintains all navigable waterways that are not maintained by the Corps, and retains its regulatory authority over dredging and disposal sites where riparian lands or wetlands are affected. In addition, the State retains regulatory authority over upland disposal sites and any alterations of stream and lake bodies.

The Riparian Statutes - Riparian lands, defined as lands now or formerly flowed by the tides, are owned by the State of New Jersey. Anyone wishing to dredge, or dispose the spoil dredge in these lands must first receive the approval of the Natural Resource Council for a riparian conveyance.

Riparian conveyances fall into three categories. A grant is an interest or estate in land, usually a simple fee. A lease allows the occupation, enjoyment and use of land for a specified term. A license allows a particular act, such as gravel mining or construction of a dock, to be performed on riparian land. The land in all cases remains in the possession of the State.

After applicants receive a lease or license from the Natural Resource Council, they must obtain a Waterfront Development Permit authorized by N.J.S.A. 12:5-3 for any planned development from DEP's Division of Coastal Resources. The State's interest in regulating the use of its riparian land is unaffected by Federal law relevant to dredging.

The Wetlands Act of 1970 (N.J.S.A. 13:9A-4) includes both the excavation and the filling of wetlands within the definition of activities regulated by the Act. Any dredging activity affecting a regulated wetlands will require a permit.

The Stream Encroachment Act (N.J.S.A. 58:1-26) requires any person desiring to put a structure or alteration within the natural and ordinary high-water mark of any stream, to obtain a permit from DEP's Division of Water Resources. This applies to dredging activities for streams and lakes that carry upland drainage.

The Solid Waste Management Act (N.J.S.A. 13:1E-1 et seq.) requires a permit from the N.J. DEP Division of Environmental Quality Solid Waste Administration (SWA) under N.J.A.C. 7:26-1 et seq. for depositing solid wastes in the sanitary landfills. Since dredge spoil is interpreted as a solid waste, a permit is required for depositing spoils in sanitary landfill. In some cases, depending on the size and volume of the fill, type and physical and chemical characteristics of fill material (contamination), the SWA may decide that a permit is not required. The Act requires that each County develop a Solid Waste Management Plan. In review of these plans for Ocean, Essex, Somerset, Passaic and Monmouth counties was found that none of the reports addresses the dredge disposal issue.

Wastewater Treatment Facilities under the State Water Pollution Control Act (N.J.S.A. 58:10A - et seq.) require a permit from the Division of Water Resources for the construction, installation, modification or operation of any wastewater treatment facility including but not limited to sewage treatment plans, sewage collection systems etc. and including dewatering from diked upland disposal areas.

The Coastal Area Facility Review Act (N.J.S.A. 13:19-1 et seq) regulates major industrial facilities and residential developments in the coastal zone, including sanitary landfills.

CAFRA permits applies only to a new sanitary landfills, not the act of placing stuff in a landfill.

Based on recent interpretations of definitions under N.J.A.C. 7:26-1 et seq, dredge spoil disposal falls within the definition of solid waste, and creation of any sanitary landfill to accommodate the dredge material is therefore subject to CAFRA. As of now, the DEP Bureau of Coastal Project Review has not been reviewing the creation of new dredging disposal sites as a sanitary landfills.

The Flood Hazards Act, N.J.S.A. 58:16A-55, authorizes DEP to adopt land use regulations for delineated floodways. The permitting function is exercised through the municipal zoning authority. The State regulations set minimum standards for delineation and land use regulation by the municipality. The administration of this Act directly results in the preservation of valuable stream corridors and flood plains, and discourages filling of dredge spoil disposal in these areas.

State Register of Historic Places (N.J.S.A. 13:1B-15,128 et seq). The State, and counties, municipalities or an agencies or instrumentalities thereof cannot undertake any project including, dredge spoil disposal, which will encroach upon, damage or destroy a registered property without application to and the prior written authorization or consent of, the Commissioner of the Department of Environmental Protection.

The Governor's Executive Order No. 53 requires all public departments and agencies of the State to prepare and submit to the Department of Environmental Protection a description and identification of the environmental impact of major construction projects. These projects include (a) any construction project with a total cost greater than $1,000,000 (b) any construction which, projects with a total cost less than $1,000,000 by reason of its nature, location in a fragile or undeveloped area, or method of construction or operation, has the potential for substantial adverse environmental impact, and (c) Construction projects undertaken by local, county or regional government or agencies for which a department or agency of the State has provided funding in excess or less than $1,000,000 which has the potential for substantial adverse environmental impact.

The Hackensack Meadowlands Development Commission, under the authority delegated at N.J.S.A. 13:17-1 et seq regulates the location, construction and operations of sanitary landfill operations within the Hackensack Meadowlands District. Under this authority, the Commission regulates all dredge spoil disposal activities within the district.

SUMMARY OF ALL EXISTING LAWS & REGULATIONS
THAT AFFECT DREDGING AND DREDGING DISPOSAL SITES

FEDERAL EXISTING CONTROLLING LEGISLATION	BRIEF SUMMARY	FEDERAL SUBSIDIARY LEGISLATION
RIVER & HARBOR ACTS 1899	Regulates dredging and construction in navigable waters (30 Stat. 1151, 33 USC 403).	FISH & WILDLIFE COORDINATION ACT OF 1958. (Requires that any control or modification of any body of water be coordinated with the U.S. Fish & Wildlife Service and the appropriate State agency). (72 Stat. 563 16 USC 661).
1902	Regulates dredging that may connect to or be in the area of a Federal project (32 Stat. 372, 33 USC 541).	
1970 (SECTION 10)	Authorizes the Chief of Engineers to construct, operate and maintain contained disposal facilities having sufficient capacity not to exceed ten years (in the Great Lakes and Connecting Waters). Also provides for comprehensive program of research study and experimentation relating to dredged spoil (84 Stat. 1823 33 USC 1165a).	
FEDERAL WATER POLLUTION CONTROL ACT ADMENDENTS (PL 925 00) 1972 (SECT. 404)	Calls for a permit to regulate discharge of dredged and fill material and a permit program to control discharges of solids and liquids that may pollute sediments. Authorizes the appropriation of money for research to identify the location of in-place pollutants with emphasis on toxic pollutants in harbors and navigable waterways and for contracting the removal and appropriate disposal of such materials from critical port and harbor areas. (86 Stat. 816, 33 USC 1251).	THE NATIONAL HISTORIC PRESERVATION ACT OF 1966. (Requires that the Advisory Council of Historic Preservation comment on activities licensed by the Federal Government which will have an effect on properties listed in the National Register of Historic Places). (80 Stat. 915).
MARINE PROTECTION RESEARCH AND SANCTUARIES ACT (PL 92532) 1972 (OCEAN DUMPING)	Requires permits from Secretary of the Army for dumping or transportation of dredged material in ocean waters. Also provides for designation of marine sanctuaries where dumping is restricted, and for a general research program. (86 Stat. 1052, 33 USC 1401).	NATIONAL ENVIRONMENT POLICY ACT 1969. (Requires agencies of the Federal Government to give appropriate consideration to unquantified environmental amenties and values in addition to technical and economic evaluations). (83 Stat. 852, 42 USC 4331).
RIVER AND HARBOR ACT 1905	Authorizes the Secretary of the Army to prescribe regulations to govern the depositing of refuse in navigable waters. (33 Stat. 1147 33 USC 419).	
STATE EXISTING CONTROLLING LEGISLATION	BRIEF SUMMARY	
RIPARIAN STATUTES	Dredging, fill, and spoil disposal have long been recognized as development activities subject to the waterfront development permits authorized by N.J. S.A. 12:5-3. The State's interest in regulating the use of its riparian land is unaffected by Federal Law relevant to dredging.	COASTAL ZONE MANAGEMENT ACT OF 1972. (Requires applicant for a federal permit for activities in lands or waters of

WETLANDS ACT (N.J.S.A. 13:9A-1 1970)	Includes both the excavation and the filling of wetlands within the definition of activities regulated by the act. Any dredging activity affecting a regulated wetlands will require a permit	a coastal State to furnish certification that the activity will comply with the State's coastal zone management program). (86 Stat. 1280 16 USC 1451).
SOLID WASTE MANAGEMENT ACT (N.J.S.A. 13:1E-1 et seq.).	Requires permit from the NJ DEP Bureau of Solid Waste Management for depositing of materials on or in the lands of the state for periods exceeding six months or which through transport, storage or other handling will cause pollution of the surface or ground waters of the state.	ENDANGERED SPECIES OF 1973 (A list of endangered species is drawn up under the act prohibiting issuance of Federal permits which may adversely affect a species on the list (87 Stat. 884).
STREAM ENCROACHMENT ACT (N.J.S.A. 58:1-26)	Authorizes the Water Policy and Supply council to regulate structures within the natural and ordinary high water mark.	
COASTAL AREA FACILITY REVIEW ACT (N.J.S.A. (13:19-1 et seq.) 1973	The CAFRA act regulated major industrial facilities and residential development in the Coastal Zone, including sanitary landfills (dredge disposal site)	The National Pollutant Discharge Elimination System (see 402 of Clean Water Act) requires the EPA to issue a permit for point source discharges including the release of water from diking areas that were used as upland sites during the dewatering process.
THE HACKENSACK MEADOWLANDS DEVELOPMENT COMMISSION (N.J.S.A. 13:17-1 et seq.)	Regulates all dredge spoil disposal activities within the Hackensack Meadowlands District, (Under N.J.A.S. 19:1.1-1.15)	INTERSTATE SIBSODARY LEGIS.
		DELAWARE RIVER BASIN COMM. COMPACT ARTICLE 38 REFERRAL AND REVIEW. Requires a DRBC Permit for any project likely to have a significant impact on the water resources of the Delaware River Basin.
		STATE SUBSIDIARY LEGISLATION The Flood Hazard Areas Act, (N.J.S.A. 58:16A-55 et seq.) authorizes DEP to adopt land use regulations for delineated floodways. It prohibits placing depositing or dumping any solid waste.

STATE REGISTER OF HISTORIC PLACES (N.J.S.A. 13:1B-15). 128 et seq.).

All public agencies can not undertake any project which will encroach upon, damage or destroy a registered property without application to and the prior written authorization or consent of the commissioner of the DEP.

EXECUTIVE ORDER #53

All departments and agencies of the state should prepare and submit to DEP a description and identification of the environmental impact of major public construction projects.

DISPOSAL OF WASTE MATERIALS AT SEA "CLEAN OCEAN ACT" OF 1971

This act which is not being implemented requires DEP to adopt rules and regulations concerning the loading and the handling of materials within the state which are to be disposed of at sea (N.J.S.A. 58-10-23.25)

WASTEWATER TREATMENT FACILITIES

Requires a permit from the DWR for the construction, installation modification or operation of any wastewater treatment facility including but not limited to sewage treatment plans, sewage collection systems etc. and including dewatering from diked upland disposal areas.

SUMMARY OF LAWS, AFFECTING DREDGING & DREDGE SPOIL DISPOSAL SITES

ACTIVITIES			FEDERAL										INTER STATE	STATE									
							4*	2*						1*						3*			4*
			River & Harbor Acts (Section 10)	Federal Water Pollution Coastal Act Sect. 404	Marine Prot. Research and Sanctuaries Act (Ocean Dumping Act 103)	River & Harbor Act (Refuse Act)	The National Pollutant Discharge Elimination System (Section 402)	Fish & Wildlife Coordination Act	The National Historic Preservation Act	National Environmental Policy Act	Coastal Zone Management Act	Endangered Species Act	Delaware River Basin Commission Compact Article 3.8	Riparian Statutes (Waterfront Development Permit)	Wetlands Act	Solid Waste Management	Stream Encroachment Act	The Flood Hazard Areas Act	CAFRA Act	State Register of Historic Places	Executive Order #53	Hackensack Meadowlands Development Commission	Wastewater Treatment Facilities
Dredging	A	Navigable Waters Including Streams, Bays, Ocean, Etc.	●					●	●	●	●	●	●	●			●				●		
	B	Non Tidal Streams		●													●				●		
	C	Other waters self contained lake		●																	●		
	D	Wetlands		●										●						●	●		
	E	Riparian		●										●						●	●		
Dredge Spoil Transp.	A	Upland											●	●		●					●		
	B	Open Waters			●			●	●	●	●	●		●							●		
Dredge Spoil Disposal Sites	A	Ocean (3 200 mi.)		●	●			●	●	●	●	●											
	B	Territorial Sea (to 3 mi.)		●	●	●		●	●	●	●	●		●							●		
	C	Navigable Waterways	●	●				●	●	●	●	●	●	●							●		
	D	Riparian Lands	●	●			●	●	●	●	●	●	●	●		●				●	●		●
	E	Wetlands	●	●			●	●	●	●	●	●	●	●	●	●				●	●		●
	F			●			●						●	●		●		●	●	●	●	●	●

1.* All WFD permit require prior Riparian Grant, Lease or Licence

2.* All Federal permit activities are subject to these laws

3.* Only for Public Encroachment

4* For diked areas

Disposal of Waste Materials at Sea. The "Clean Ocean Act" of 1971 (N.J.S.A. 58:10-23:25 et seq.) authorizes DEP to adopt rules and regulations concerning the loading and the handling of materials within the state which are to be disposed of at sea. This act is not being implemented due to a lack of adequate monitoring and surveillance facilities and because of the difficulties inherent developing adequate criteria fo the loading, as opposed to the disposal of materials. In addition, it would overlap with the federal and riparian jurisdiction. The disposal of material at sea is already regulated under Section 404 of the Federal Clean Water Act and Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972. It is, therefore, recommended by the Division of Coastal Resources that the Act be repealed.

d) Local Authority

There are some local ordinances governing fresh water wetlands, wildlife habitats, flood prone areas, and other natural features. These ordinances may affect the use of an area for dredge spoil disposal. In addition, the Municipal Land Use Law (N.J.S.A. 40:55D-1 et seq.), requires planning boards to prepare master plans to guide municipal land use. It requires that all municipal zoning ordinances be consistent with or designed to carry out the land use element of the master plan.

2. Existing Permit Process

a) Identify Permit Process

For all activities, such as dredging and dredge spoil disposal site, in any U.S. waters, a Federal permit is required from the U.S. Army Corps of Engineers. At the same time, a Water Quality Certification from the State is needed to process the application. Figure 7 outlines the typical Corps permit review process. The applicant should submit the appropriate State permits simultaniously. The number and type of State permits depend on the proposed type of activities and locations. Figure 8 summarizes the permit process needed for dredging and dredge disposal sites.

In addition, when it appears that a Federal activity (including permits approvals) will significantly affect the coastal zone, the agency (or applicant in the case of a permit) must submit evidence of the activity's consistency with the New Jersey Coastal Management Program. This requirement derives from Section 307 of the Federal Coastal Zone Management Act of 1972, and is waived when the activity requires a State permit.

When a state Solid Waste permit is required, the application is considered incomplete until all appropriate permits are obtained. There is no time limitation required by law to process the Solid Waste application. In some cases, due to its complexity, it may run up to two years. An average permit is issued within 3 - 4 months. Figure 9 and Figure 10 outlines the permit review process for Stream Encroachment, Wastewater Treatment Facilities, Wetlands, Waterfront Development, and CAFRA permits.

typical corps permit review process

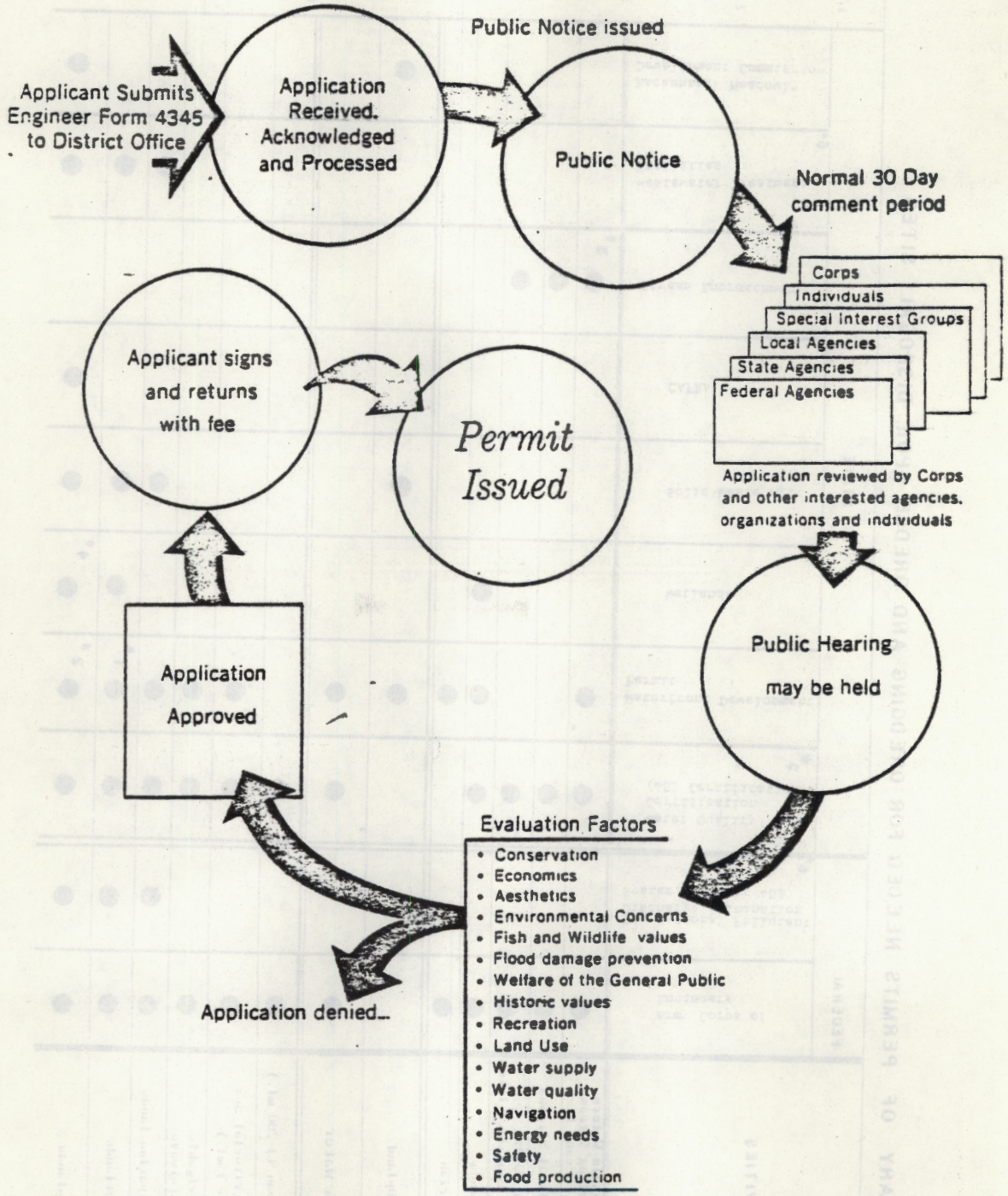


Fig. 7

SUMMARY OF PERMITS NEEDED FOR DREDGING AND DREDGE SPOIL DISPOSAL SITES

		ACTIVITIES	FEDERAL		STATE							
			Army Corps of Engineers	The National Pollutant Discharge Elimination System (Section 402) [6]	Water Quality Certification (401 Certification) [3*]	Waterfront Development Permit	Wetlands	Solid Waste Mgt.	CAFRA	Stream Encroachment	Wastewater Treatment Facilities [6]	Hackensack Meadowla... Development Commis-ion
Dredging	A	Navigable Waters Including Streams, Bays, Ocean, Etc.	●		●	●				● [3]		
	B	Non Tidal Streams	●		●					●		
	C	Other Waters Self Contained Lakes	●		●					●		
	D	Wetlands	●		●	●	●					
	E	Riparian	●			●						
Dredge Spoil Transp.	A	Upland				●		●				●
	B	Open Water	●		●	●						
Dredge Spoil Disposal Sites	A	Ocean (3-200 mi.)	●		●							
	B	Territorial Sea (to 3 mi.)	●		●	●						
	C	Navigable Waterways	●		●	●						
	D	Riparian Lands	●	●	●	●		●			●	
	E	Wetlands	●	●	●	● [1]	●	●			●	
	F	Uplands	●	●	●	● [2]	● [1]	●	●		●	●

1* Permit needed for Wetlands Tidally flown

2* Permit needed for depositing from Tidal streams

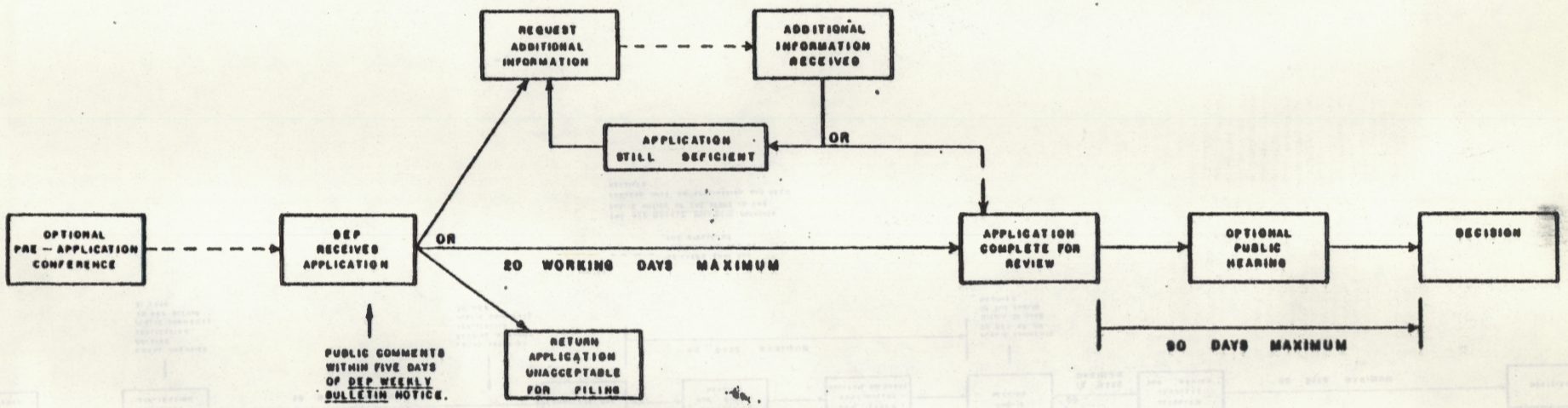
3* Only streams that carry upland drainage

4* By condition of permit if the dredging were in Wetlands.

5* As required by Federal Government.

6* For diked areas

STREAM ENCROCHMENT, WASTEWATER TREATMENT FACILITIES WETLANDS AND WATERFRONT (RIPARIAN) DEVELOPMENT PERMIT APPLICATION PROCESSES



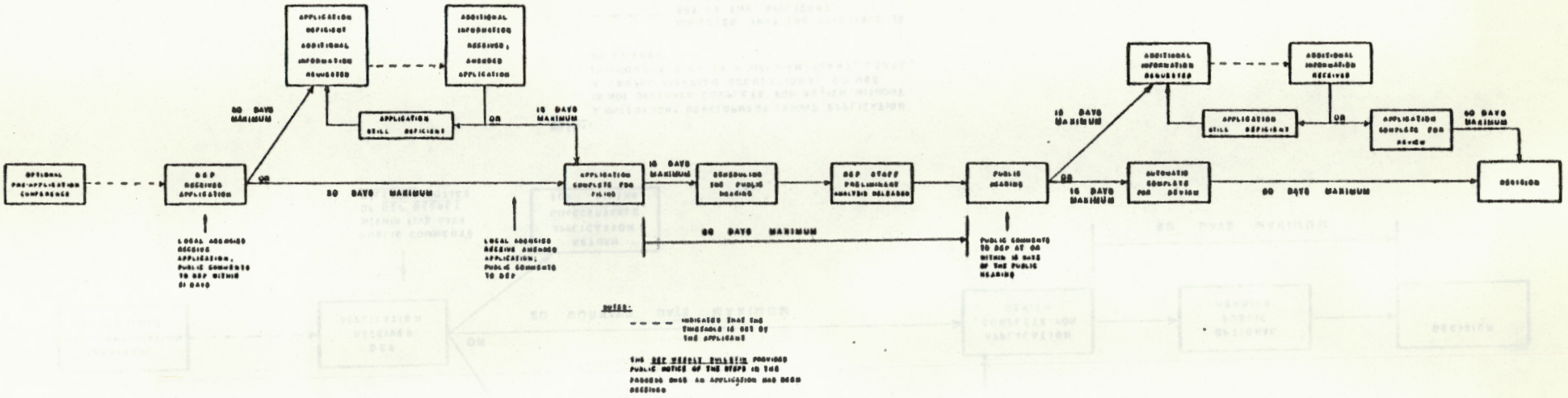
NOTE:

A WATERFRONT DEVELOPMENT PERMIT APPLICATION IS NOT DECLARED COMPLETE FOR REVIEW WITHOUT A LAWFUL RIPARIAN OCCUPATIONAL OR USE INSTRUMENT SUCH AS A RIPARIAN GRANT, LEASE, OR LICENSE.

- - - - INDICATES THAT THE TIMETABLE IS SET BY THE APPLICANT.

Fig. 10

CAFRA PERMIT APPLICATION PROCESS



V. Dredging Studies and Projects

This chapter describes major completed, current and proposed dredging research studies or projects.

1. Completed

The following is the summary of the major completed dredging research studies:

a) The Dredged Material Research Program (DMRP) of the U.S. Army Corps of Engineers began in March, 1973, and was completed in 1978. One objective of this five year $30 million program was to provide definitive information on the environmental impact of dredging and disposal of dredged material. Secondly, the DMRP research effort was aimed at developing technically satisfactory, environmentally compatible, and economically feasible alternatives for dredging and disposal. The program was conducted by the Corps' Waterways Experiment Station at Vicksburg, Mississippi. Over 30 percent of the effort deals directly with ocean-related dredged material research.

It is important to mention several fundamental observations made as a result of the entire effort. First, and probably of greatest importance, is the fact that there is no single disposal alternative that presumptively is suitable for a region or a group of projects. This holds true for open water disposal, confined upland disposal, or any other alternative. Each project must be considered on a case-by-case basis. Irrespective of pollution status or any other characteristic it is not possible, for example, to make the general statements that ocean disposal must be phased out or that all material classified as polluted must be confined behind dikes. The DMRP results indicate that there can be situations with a greater probability of adverse environmental impacts from confined disposal than from open water disposal. Yet, in other situations when certain types of contaminants are present, confined disposal may provide the greatest amount of environmental protection.

Reviewing additional findings by COE, the deep ocean has been shown to not be a completely fragile environment and to be more acceptable than the continental shelf as a disposal area. Confined disposal has been shown not to be inherently better than open water disposal. Confined sites must be designed and constructed in such a way as to achieve maximum capacity and effuent quality.

In addition, the DMRP has shown that it is possible to dewater even some of most difficult dredged materials and consequently to provide more storage capacity for new dredge material. Dewatered dredge material reduces its volume by approximately 80%.

Disposal material reuse has been shown to be a viable concept by the study. The DMRP has shown that marsh creation is a viable alternative. Phased marsh development has been shown to accommodate maintenance dredging spoil for many years. Concerning island development or creation, the DMRP has shown islands can be reused for disposal even after habitation by wildlife established. Concerning productive uses of dredged material, the DMRP has determined that in the case of fined grained material, the best use is for recreational development.

b) The New York District Dredged Material Disposal Alternatives Workshop, sponsored by the District Corps of Engineers with the assistance of the MITRE Corporation was held in October 1977.

The purpose of the dredged material disposal alternatives evaluation was to determine whether an alternative disposal method might offer environmental, economic or regulatory advantages over the currently practiced offshore Mud Dump disposal site.

The Workshop participants proposed and discussed a number of disposal alternatives, including the following:

Continued Mud Dump Disposal, Christiansen Basin Disposal, Subaqueous Borrow Pit Disposal, Beach Nourishment, Shallow Ocean Disposal, Long Island Sound Disposal, Disposal in Abandoned Piers, River/Harbor Disposal, Diked Harbor/Protected Water Containment, Diked Offshore Island Creation, Artificial Reef Creation, Deep Ocean Disposal, Hudson Canyon Disposal, Ocean Spreading, Containerized Ocean Disposal, Disposal with Other Waste Materials--Sea, Wetlands Disposal, Disposal on Surplus Federal Lands, Disposal With Other Waste Materials--Land, Eliminate Land Disposal Disincentive, Filling Mines, Sanitary Landfill Cover, Diked Upland Containment

Each of these alternatives was evaluated using environmental, economic, social, and public health and welfare criteria. In addition, the alternatives were compared with respect to specific factors that might limit their implementation and usefulness in the New York District, including disposal cost, environmental concerns, regulatory prohibitions, and the type and amount of dredged material that could be handled by an alternative. Based on this evaluation, and on present technology, and available information the following disposal methods were conducted to be proposed alternatives:

For materials that can be ocean dumped under the Ocean Dumping Regulation without a waiver of criteria - Continued Mud Dump Disposal, followed by Disposal at Alternative Ocean Disposal Sites, and

For materials that cannot be ocean dumped without a waiver of criteria - Diked Upland Disposal.

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The workshop participants suggested that disposal alternatives can be considered in either: short-term (4-5 years) or long-term (end of the century time frames). Among the short term disposal alternatives selected for further evaluation was the concept of upland disposal, involving the transport of dredged sediments to a designated and specially prepared inland area. The New York District of the U.S. Army Corps of Engineers, therefore, has undertaken a survey of potentially suitable upland disposal sites with the land portion of a 100 mile radius from the Statue of Liberty. Included within these study areas are five New Jersey counties. The draft report of this study, which identifies vacant land areas and selects 15 representative candidate disposal sites for a preliminary assessment of suitability for use for upland disposal, was heavily criticized by various interest group and it is undergoing review. At present it is unknown when this study will be completed.

C) The Delaware River Comprehensive Navigation Study conducted by COE was authorized by the U.S. Congress in 1970 to determine the most efficient, economic, and logical means of developing onshore or offshore facilities to accommodate very large bulk cargo carriers, and to develop alternative development plans for the ports along the Delaware. By 1980, the 200,000 - 300,000 Dead, Weight Tonage (DWT) tanker and bulk carriers will become standard for world bulk trade movements and require water depths from 60 to 85 feet.

The first interim report of this study determined that deepwater port facilities to handle very large bulk carriers should be located in this region. Projections of the quantities transported along the Delaware River indicate that tremendous expansion of existing facilities will occur. The first interim report on this study on the location of deepwater port facilities was completed in 1973. The report which recommends no Federal action was submitted to Congress in November 1976, and no further action has been taken.

d) The Delaware River, Camden, New Jersey Study conducted by Army Corps of Engineers was authorized by the House Committee Resolution, dated October 10, 1974, to investigate the feasibility of providing a channel from the existing 18 foot Project at Fisher's Point, south of Petty Island, extending from an upstream end of the existing Delaware River at Camden project at the mouth of the Cooper River. The unimproved study area is currently used by all vessels travelling to and from the Cooper River, as well as vessels going to and from shipyards located along the waterway in Camden. The existing depth in the Delaware River is inadequate to meet the needs of the present and prospective vessels traffic, according to the study, and improvement is required in the interest of economy and safety of navigation and for the fuller utilization of the facilities situated along the Camden side of the channel. There is no progress reported on this project. A similar report completed by COE in 1963 indicated that improvements were justified but that local cooperation would not be forthcoming, and, a negative report was, therefore, submitted.

e) Island Beach Inlet Study conducted by Army Corps of Engineers was authorized by House Committee Resolution on April 14, 1964, to investigate a proposed access channel between the New Jersey Intracoastal Waterway in Barnegat Bay and the Atlantic Ocean and the effect of an inlet on pollution in the Bay.

The proposed new inlet would primarily benefit recreational boats based in and adjacent to Toms River and Barnegat Bay. Local interests also claim that a new inlet would improve the interchange or water between ocean and bay, with a resultant improvement of water quality in Barnegat Bay. The barrier beach is about 1,000 feet wide at a point of proposed inlet. The project, if feasible, may require a bridge across the inlet to provide access to Island Beach State Park.

A public meeting was held at that time and preliminary investigations were initiated. The work remaining is to complete a plan survey, initiate study of the interchange of water between Barnegat Bay and the ocean under present conditions and with an inlet through Island Beach; continue economic analysis, initiate environmental studies and develop alternative plans of improvement. However, there are two major environmental problems. The first concerns Island Beach State Park which comprises the lower one-third of the barrier island. The Governor of New Jersey submitted a statement at the initial public meeting indicating opposition to any inlet through the State Park as it would cause increases in park usage and subsequent degradation. The second problem involves the existing pollution and lowering of water quality in the bay. Since local interests feel that a new inlet would increase the flushing action of the bay and help relieve the situation, no regulation has been made on either of these problems. The completion date of the study is unknown.

f) The New Jersey Intracoastal Waterway Study was authorized by House Committee Resolutions in 1943 and 1947 to determine if ICW should be modified in any way, including best alignment, depth, and width of channel; clearance of bridges over waterway; extension of the present waterway from Manasquan Inlet to Sandy Hook Bay, and an alternative connection to Delaware Bay.

Some local interests in the past have shown consideable interest in such a study, and in channel realignment at various locations. Economic and realignment studies required for this study will be of further value as a guide in determining the location and minimum clearance of bridges crossing the waterway.

At present, the study is deferred while awaiting designation of areas for use as disposal sites by the State of New Jersey.

g) The Environmental Assessment of Maintenance Dredging and Open Water Disposal of Dredge Spoil in Lower Delaware Bay Study for U.S. Army Corps of Engineers prepared by Carol Collier of Betz, Converse, Murdoch, Inc. and completed in December 4, 1978, was conducted during August 1978 to assess the potential impact of maintenance dredging and open - water spoil disposal on lower Delaware Bay. The study area of approximately 33 miles of the main Delaware Shipping Channel through the Brandywine, Miah Maull and Cross Ledge has projected depth at 40 feet. In the conclusion of this study it is recommended that dredging should be limited to November through Mid-March to minimize the adverse impact of benthic invertebrate and the fish population, minimize the amount of benthic surface area disturbtion, minimize sediment suspension. If open water disposal site is required, the proposed site is suitable despite the fact that is fairly productive. Disposal site substrate should be similar to dredged material.

h) An Environmental Impact Assessment of Maintenance Dredging of the New Jersey Intracoastal Waterway study completed in July 1974 by Rutgers University addressed the principal problem, which is disposal of dredge spoil. Where spoils are dumped on the highly productive Spartina salt marsh, the result is the destruction of this marsh, which is replaced by either unproductive bare ground or recolonized by a less productive type of vegetation (generally Phragmites communis). Where spoils are dumped into the water, close to the waterway channel, the resulting problems are two fold:

- much of the dredged material moves back into the waterway channel

- the spoil shoal restricts water circulation

However, sub-aerial disposal sites, which now exist as bare ground or which are colonized by Phragmites, and sub-aqueous sites in areas where water circulation is not critical may be used for spoil dumping with a minimal loss of marsh and estuarine resources. Such areas are recommended here for disposal of spoil. It is further recommended that all sub-aerial disposal areas be diked to retain the spoil material.

In some cases, the COE should employ a booster dredge to increase the distance over which spoil may be transported from 3,000 feet to 5,000 feet. In specific areas, the use of control structures such as bulkheads and sand bypass systems have been suggested as means of reducing dredging frequency.

i) The Effects of Overboard Spoil Disposal from the Cape May Ferry Terminal on the Biota of the Delaware Bay Study, completed in March 1978 by Rutgers University as a final report to the Delaware River and Bay Authority concludes that:

- the dumping of dredged spoil offshore near Cape May, at depths of 18 feet and greater produces no measurable long-term effects on the sediment distribution. The time for recovery to a normal distribution pattern was approximately three months.

- sediments accumulates in the Cape May due to a normal annual sediment cycle and the disposal of canal spoil offshore is only a reintroduction of sediments into a system of dynamic sediment movement.

- the volume of spoil introduced by the dredging appears to be only a small fraction of fine-grained sediment that occurs inshore driving the winter and spring months, as part of a normal cycle.

- the occurence and distribution of fine-grained sediment in the area may vary in time from year to year, along with possible variances in sediment flux. This study indicates that the fine-grained sediment has moved into the area by early Spring. Dredging should be done in early spring so as to optimize the effects of dredging the canal. The dredging then would coincide with the late spring and summer movement of fine grained sediment into this area of the estuary in the winter and early spring months.

- during future dredge operations it is suggested that periodic checks be made of spoil accumulation in the disposal area. This would facilitate a more rapid removal of spoil by increasing the surface area of the spoil exposed to current activity, and prevent sediment accumulation that could possibly prove to be a temporary hazard to navigation.

j) In the recently completed Water Quality Management Plans under Section 208 of the Clean Water Act we have found no discussion on the effects of upland dredge disposal sites upon water quality.

k) Onshore Support Bases for OCS Oil and Gas Development: Implications for New Jersey completed in September 1977 by Center for Coastal and Environmental Studies, Rutgers University commissioned by the Department of Environmental Protection. This report details the physical, environmental, social, economic, and institutional impacts of siting the onshore support facilities for Outer Continental Shelf (OCS) petroleum and natural gas activities on New Jersey's coast. In relation to dredging the study states that any dredging proposal must be considered in terms of its possible adverse and beneficial effects, on water bodies. A water body must be examined to determine its physical, biological, and chemical characteristics on productivity and quality. In addition to the above factors, the degree of benthic habitat destruction by the

removal or displacement of sediments being dredged is determined by the dredging method employed. Hydraulic dredges are preferred over mechanical dredges because they are more efficient, versatile and economical to operate due to the continuous, self containing dredging and disposal method of operations. There are two problems specific to stationary hydraulic dredges. There is a high mortality for benthic organisms due to the cutter heads used, their transportation to the disposal site and smothering. The second problem is that terrestrial disposal of dredge spoils can cause decreased levels of marsh productivity if disposal on Spartina marsh. The highly productive Spartina which would be slow to recolonize, would be replaced by the less productive Phragmites communis, whose value as food and habitat for wildlife is considerably lower. Continued dredge spoil disposal on a site would remove it permanently as a part of the productive wetlands ecosystem.

Two adverse impacts are associated with the hopper method of disposal. First, if dredged materials are retained in hoppers for a long period, mortality approaches 100 percent. Secondly, disposal of the material in offshore areas can have adverse environmental impacts on bottom organisms.

The sidecasting method used where a dredge must operate in shallow depths is less efficient as compared to other methods of operation. Particular problems of turbidity, nutrient levels and smothering of benthic organisms are associated with this method.

The following is a summary of impacts that are common to all types of dredging.

- dredging conducted during the April through August period could be detrimental to fish eggs and larvae when the largest number and variety of fish eggs are present in inshore New Jersey waters. The same time period is also the spawning period for commercially important shellfish such as clams, oysters and blue crabs.

- increased nutrient levels caused by the resuspension or organic detritus and dissolved substances could compound problems that might exist by decreasing already low quantities or oxygen and causing algae blooms. Dredge discharge areas shows an increase in total phosphate and nitrogen concentration which could compound the already high level of organic nutrients whose sources are agricultural runoff, domestic sewage and industrial wastes.

1) The Estuarine Study prepared for the N.J.DEP/Division of Coastal Resources by Wapora, Inc., of Washington D.C. and completed in September 1979 examines the basic environmental resources of the coastal zone, the kinds of facilities and

activities that may be proposed in the future at various locations in the coastal zone, and the probable compatibility between each kind of facility or activity and each relevant environmental resource complex. The Estuarine Study presents the Environmental Impact Matrices. These matrices are the basics for a method of evaluating proposed coastal facilities when considering permit applications and coastal planning efforts such as development of Dredge Spoil Disposal Siting Study.

m) Coastal Development Potential Study prepared for the N.J.DEP/ Division of Coastal Resources by Rogers and Golden of Philadelphia and completed in September 1979, details a technique to assess the development potential of locations for uses and to identify sites which most or least completely satisfy the siting requirement as particular kinds of development. The Development Potential Study which is part of Coastal Location Acceptability Method (CLAM) and specifically examines development potential from the vantage point of a developer if he operated in an unregulated environment. The Division of Coastal Resources plans to use the information presented in this report for various planning endeavors including development of Dredge Spoil Disposal Siting Study.

2. Current

The following is a summary of the major known current dredging research studies.

a) The New Jersey Department of Environmental Protection has dredged the Absecon Creek in Atlantic County as part of a four year study to determine the effects of dredging and overboard disposal on fish, shellfish, and other marine organisms. The results of the study will help DEP to determine the best ways to dispose of dredging material and the best times to perform dredging operations. This study will be completed in 1981.

Four kinds of areas are studied: undisturbed control areas, dredged area, and to a lesser degree undredged, unspoil areas that are worked by clammers.

The study is divided into four phases:

- a baseline study. This study completed in 1978 provides a sampling base of the site before dredging operations began. The baseline information was obtained with reference to water quality and circulation, bathymetry, and sediments, benthic organisms, and experimental clam plantings.

- dredging and disposal by the American Dredging Company for the total of $106,925.20 completed in 1978.

- a post-dredging study just completed with the Second Annual Report, July 1979. In this report field emphasis was placed on continued sampling of benthic invertebrates, follow up measurements of clam growth and continued measures of nutrient regeneration and sediment analysis of the control site, dredged channel and dredged spoil disposal site, dredged channeld and dredge spoil disposal sites. No attempt has been made in this report to judge effects of channel dredging and overboard disposal. Observation during benthic sampling strongly suggest changes in benthic communities associated with both dredging and spoil disposal. This study cost was $27,894.00.

- a follow-up study in which benthic recolonization of dredged areas and spoil areas will be studied through 1981.

b) The New Jersey Department of Environmental Protection and Stockton State College, with possible funding by New Jersey Sea Grant, has been developing a time series and process study for the Barnegat Inlet area, including the southernmost portion of Island Beach and the northern half of Long Beach Island. During the initial phase, the study will monitor the effect of the U.S. Army Corps of Engineer's (COE) beach nourishment project on this area. The COE's project was instituted in response to critical erosion caused by the winter of 1977-1978 northeast storms.

To date, the dredge spoil, averaging 100,000 cubic yard/year, has only been deposited within the beach nourishment of northern Long Beach Island. Initially, profiles and sediment samples will be taken approximately every 2 weeks for a year to document changes. Aerial photos will be taken once every 2 months. Dredging began on December 1, 1978. This study will report on the initial results of the program.

These data will provide a base for a longer term study to monitor the proposed reconstruction of Barnegat Inlet and its effect on the dynamics of the inlet and bay.

c) The Delaware River Dredging Disposal Study adopted by the U.S. Senate Committee on Public Works in 1974 and 1978 authorizes the Army Corps of Engineers to expedite its continuing navigation studies and to direct its initial efforts toward:

- the development of a Regional Dredging Disposal Plan for the Delaware River including its tidal tributaries and Delaware Bay, and for the Indian River Inlet and Bay.

- the designation of specific sites for the disposal of dredging spoil which may be used with minimum degradation of the natural environment by both the public and private sector during the next ten years, and the identification of potential sites which may be used for those purposes thereafter.

- the determination of land uses in the estuary.

- the development of recreation where appropriate.

- the protection of existing fish and wildlife resources.

- the identification and examination of alternatives available for use of dredged material.

- the development of procedures for assuring an appropriate level of public participation.

The study was initiated in February 1978. Work has included preliminary planning, data collection, identification of the magnitude of the problem, and public involvement and coordination. Work during FY 1979 will include continuation of data collection and problem identification, coordination with Delaware River Basin Commission (DRBC) and with the Coastal Zone Management Programs for New Jersey, Delaware and Pennsylvania, and identification of Federal problems an Federal permits. A contract with U.S. Geological Survey (USGS) will result in chemical analysis of estuary sediments from Trenton to Reedy Point. The completion date of this study is August 1985.

d) The Shore State Protection Master Plan by the NJDEP and Department of Treasury, Division of Building and Construction will incorporate locations where dredged material can be used as beach fill. This study undertaken by Dames and Moore of Cranford, New Jersey, in January 1979 will be completed by Summer of 1980.

e) Study on Hazardous Solid Wastes undertaken by Rutgers University under contract to Cancer Research Toxic Substances Council is being conducted to develop a method and test the method in Middlesex County for the location of hazardous solid waste. This study will develop set of criteria for screening large geographic areas. Upon completion of this study on September 17, 1980 it is anticipated that a new contract will be awarded to continue in depth site screening for location of hazardous solid wastes.

The finding of these studies could complement the proposed Dredge Spoil Disposal Siting Study.

3. Proposed

. The following is a summary of the major known proposed dredging research studies and projects:

a) Additional studies are needed to complement the above mentioned projects. The most needed study work is to the development of a Dredge Spoil Disposal Siting Study. This study would be build on the work of DEP-Division of Coastal Resources, Bureau

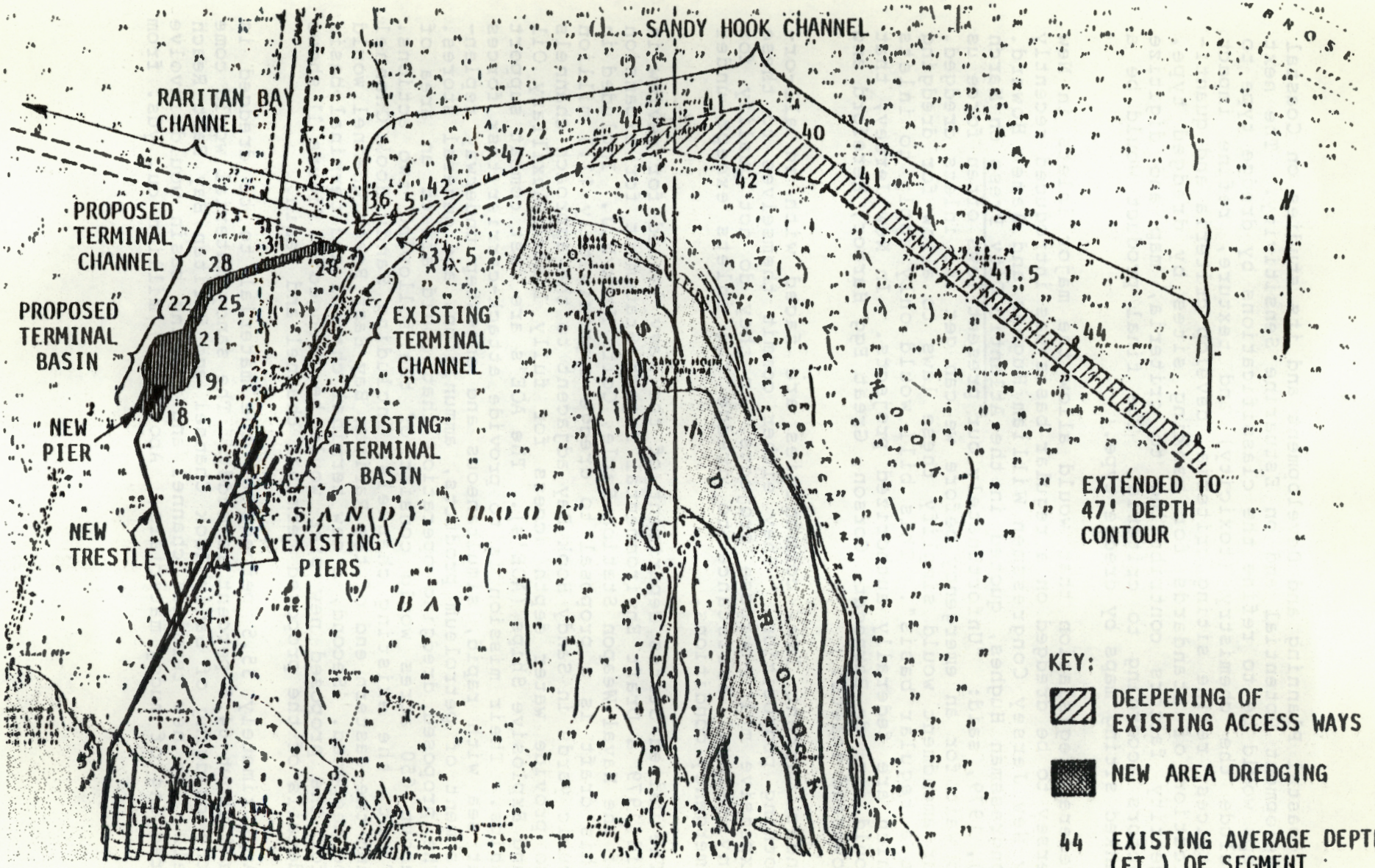
of Coastal Planning and Development and its studies on Coastal Development Potential and on Estuarine Sensitivity. The next steps would be to refine the classifications by dredge type to include the chemistry (toxicity) and texture, refine impact matrices, refine siting criteria, develop criteria and quantification of standards for ranking sites by dredged type, identity factors contributing to criteria, map and digitize factors according to criteria... The final product would be a ranked siting maps by dredge type.

b) Federal legislation that would allow the major inlets in New Jersey to be dredged on a regular basis was introduced recently by New Jersey Congressmen William Hughes and James Howard. Congressman Hughes, quoted in the Atlantic City Press on March 10, 1979, said: "Unfortunately our present laws often force us to wait for an emergency before we can get the inlets dredged. Our amendment would simplify these laws to allow for dredging at a regular basis". This bill would only apply to inlets which are federally authorized projects. In New Jersey, that would include Barnegat, Corson, Great Egg Harbor, Hereford and Townsend inlets.

Under current law, communities are faced with an all-or-nothing proposition. They either commit themselves to these expensive multi-purpose projects, or they do not qualify for any federal assistance to dredge the inlets except under emergency conditions.

c) The United States Department of the Navy issued for review in mid 1979 a Draft Environmental Impact Statement for expansion of the Naval Weapon Station Earle, Colts Neck N.J. Included in this draft is a proposal to dredge approximately 11.3 million cubic yards in Sandy Hook Bay adjacent to the approach channels to provide water depth access for fully loaded Auxiliary Oil and Explosive Ships (AOE's). The AOE's are fast combat support ships. Their mission is to provide attack-carrier task forces at sea with rapid, simultaneous and one-step underway replenishment of petroleum products, ammunition, and general stores. The proposed dredging operation that could affect an area of about 650 acres would consist of the following two actions. First, the existing channels, including Sandy Hook Channel and the eastern end of the Raritan Bay East Reach Channel would be deepened. Second, a new terminal channel and terminal basin for the proposed new pier would be dredged. Figure 11 shows details of the proposed terminal channel and basin.

Approximately 35.5 percent of the material to be dredged is sand and about 64.5 percent is muddy. The sandy material would come from the dredging of Sandy Hook Channel and Raritan Bay East Reach Channel. The new terminal channel and turning basin would involve the dredging of muddy materials. About 1.01 million cu. yds. from



PROJECT DREDGING LOCATION MAP

the upper three feet of the muddy areas is considered to be contaminated. About 6.28 million cu. yds. of uncontaminated muddy materials would be dredged from the low (below three feet) portions of the new terminal channel and turning basin.

Considering the nature of sediments, operating conditions and disposal methods, tenative dredging techniques would include but are not limited to, hopper dredging along the Sandy Hook Channel and mechanical or hydraulic techniques in the proposed terminal channel and terminal basin. Dredging operations are expected to occur for a period of 6 months to a year, depending on the number and size of dredges employed and weather conditions.

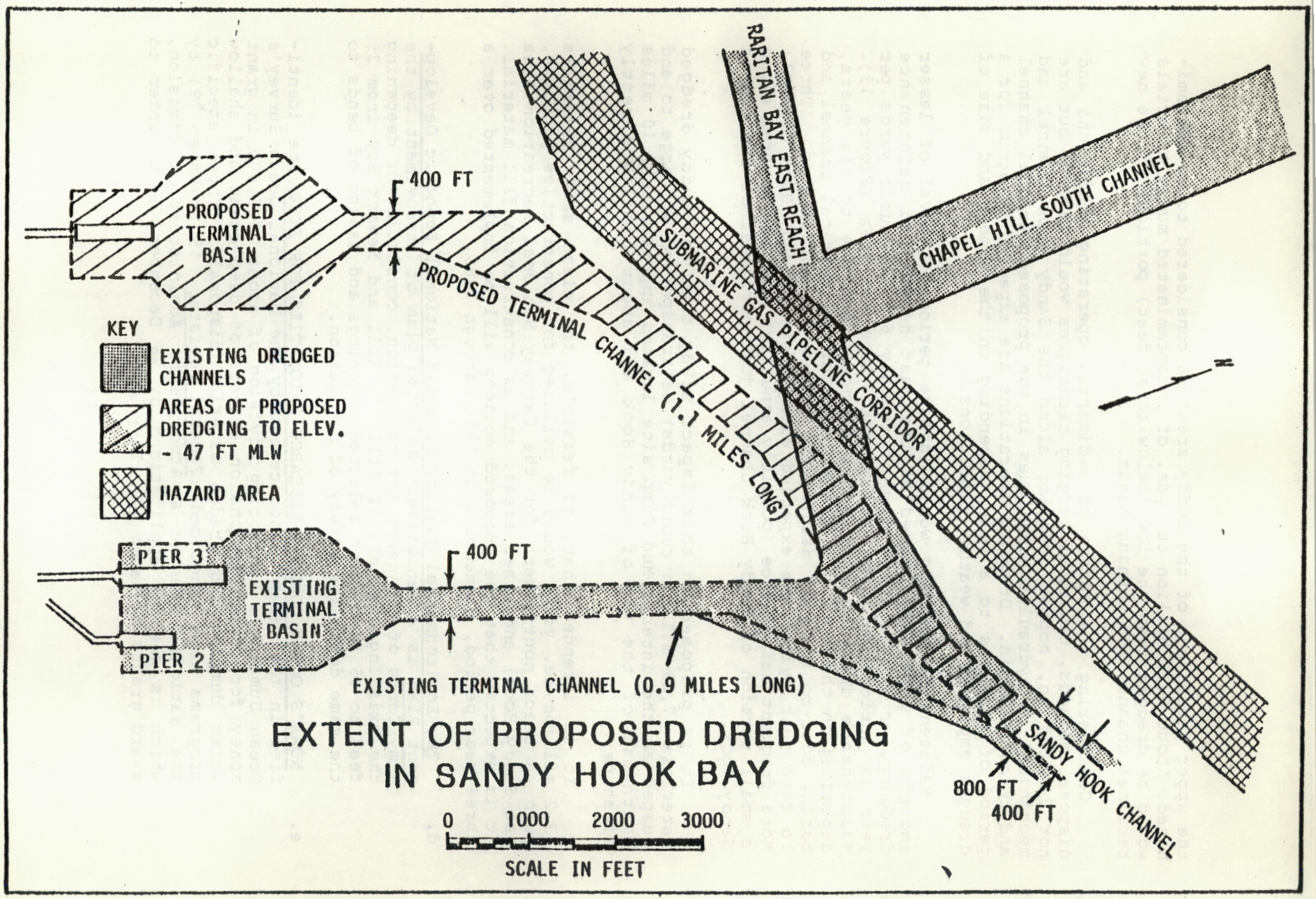
Maintenance dredging would involve periodic removal of lesser amounts of material. Based on the past history of maintenance dredging, an accumulation rate of roughly 600,000 cubic yards per year is anticipated over the proposed project area (Figure 13). Maintenance dredging cycles have ranged from one to six years, depending on the area. In the vicinity of the terminal channel and basin, four-to six-year maintenance cycles are anticipated. Three to five year cylces are expected along most of Sandy Hook Channel. More frequent maintenance (possibly annually) will be required along a small portion of Sandy Hook Channel just northeast of the tip of Sandy Hook.

It is proposed in this impact study that the muddy dredged materials (7.29 million cubic yards) be transported by barge to and dumped at the interim Mud Dump site located approximately 10 miles southeast of the tip of Sandy Hook and about 6 miles directly offshore.

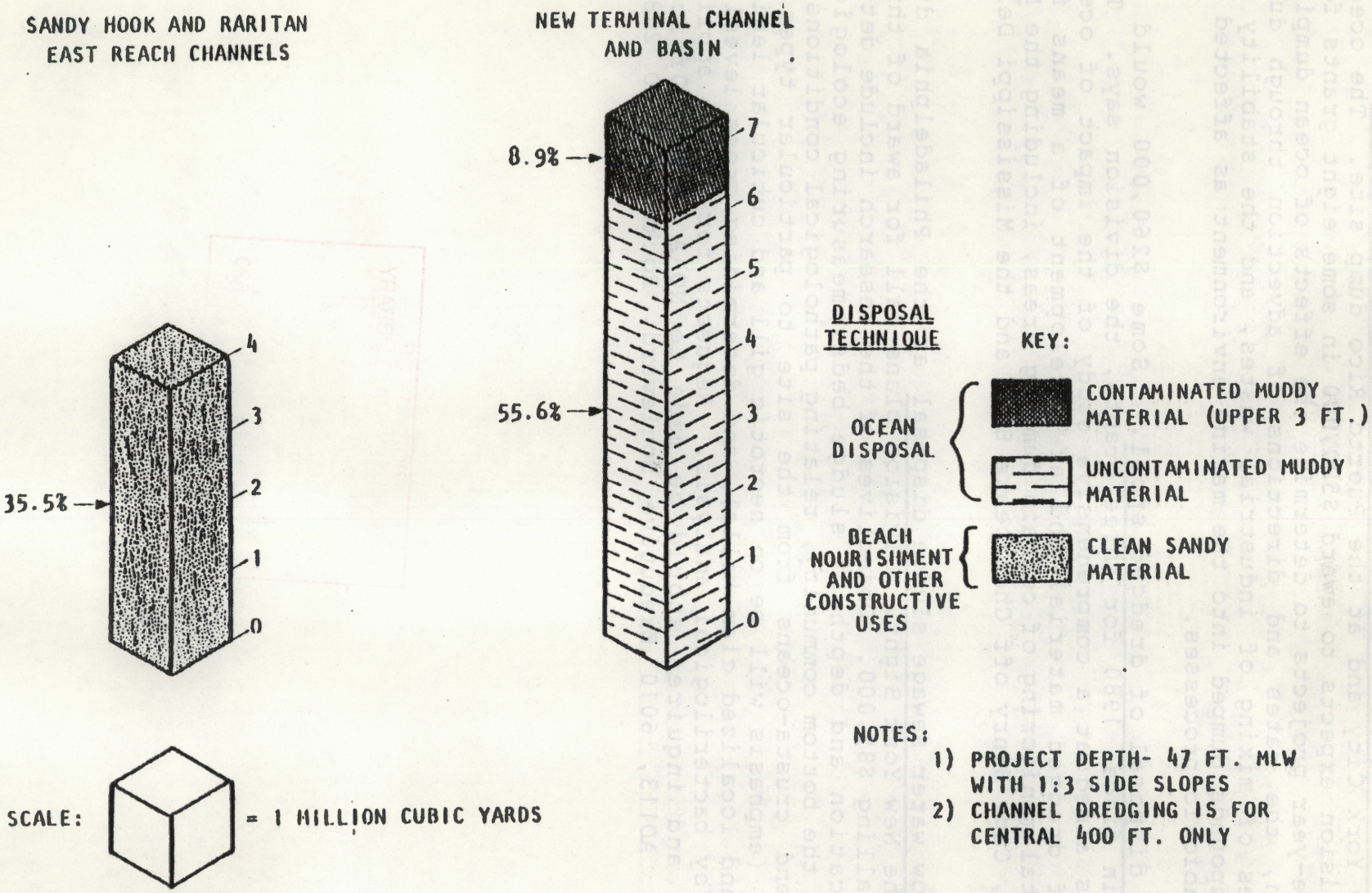
It is intended that, if feasible, the clean sandy materials (3.2 million cu. yds.) would be utilized for constructive purposes, such as beach nourishment for the Gateway National Recreation Area (at Sandy Hook) and other areas, and as construction fill material. It is expected that the proposed actions will be implemented over a three year period, commencing in 1981 through 1983.

d. The Environmental Quality Oriented National Economic Development Plan is a tentatively selected plan of improvement by the Army Corps of Engineers for navigation, consisting of deepening the existing channels of Kill Van Kull and Newark Bay from 35 feet to 45 feet, with selected widenings and easing of bends to the same depth for safety of navigation.

e. NOAA'S OCEAN DUMPING RESEARCH PRIORITIES FOR FY80 are identified in the recent announcement by the National Ocean Survey's Ocean Dumping & Monitoring Division of about $845,000 in grant money for investigations on effects of deep ocean and shallow water dumping and dredge material disposal. Three specific programs were announced (Federal Register, 15 November 79) by the National Oceanic & Atmospheric Administration division, which is seeking applications by 26 December 79 in order to award grants by March 80. They are:



EXTENT OF PROPOSED DREDGING IN SANDY HOOK BAY



PROJECT DREDGE MATERIALS AND VOLUMES

Deep ocean dumping of industrial wastes at the 106 site southeast of New York City and at the Puerto Rico dump site. The ocean dumping division expects to award $500,000 in some eight grants for one to three-year projects to determine the effects of ocean dumping on plankton, the rates and directions of advection through dump sites, rates of mixing of industrial wastes, and the stability of organic compounds dumped into the marine environment as affected by biotic or abiotic processes.

Ocean disposal of dredged spoil. Some $260,000 would be available in fiscal 1980 for three grants, the division says. The research is aimed at a comprehensive study of the impact of ocean dumping of dredged material and at development of a means for environmental monitoring of certain dumping areas, including the New York Bight, Cape Henry off Chesapeake Bay, and the Mississippi Delta region.

Shallow water sewage sludge disposal at the Philadelphia dump site, in the New York Bight. Division plans call for award of three grants totalling $85,000. Objectives of the research include determining location and depth of sludge beds, measuring ecological changes in the bottom community, relating pathological conditions in mollusks and crusta-oceans from the site to particular types of pollutants (emphasis will be on necrotic gill and cuticular lesions in crabs and localized clam kills), and determining gross levesl of pollution by bacterilogical analysis. Requests for grants application kits and inquires should be made to NOAA Grants Officer, Attenion: AD113, 6010 Executive Boulevard, Rockville, MD 20852.

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VI. Recommendations and Conclusions

1. The State's policies on dredging and dredge spoil disposal sites should be those found in Rules on Coastal Resources and Development Policies (N.J.A.C. 7:7E-1.1 et seq.). These are as follows:

Dredging-Maintenance

Definition

Maintenance dredging is the removal of accumulated sediment from areas where dredging has taken place in the past, such as navigation channels, marinas, or boat moorings, for the purpose of maintaining an authorized and width.

Policy

Maintenance dredging is acceptable to the authorized depth and which in all existing navigation channels, access channels, anchorages and boat moorings to ensure that adequate water depth is available for safe navigation; provided that an acceptable spoil disposal site exists.

Maintenance dredging is necessary to provide access to marinas, docks boats and other appropriate water-dependent facilities.

Rationale

Maintenance dredging is necessary to provide access to marinas, docks, ports, and other appropriate water-dependent facilities.

Dredging - New

Definition

New dredging is the removal of sediment from the bottom of a water body that has not been previously dredged or excavated, for the purpose of increasing water depth, or the widening or deepening of navigable channels to a nearby authorized depth or width.

Policy

New dredging is conditionally acceptable for boat moorings, navigation channels or anchorages (docks), lakes, ponds providing that: (a) there is a demonstrated need that cannot be satisfied by existing facilities, (b) the facilities served by the new dredging satisfy the location requirements for water's edge areas, (c) the adjacent water areas are currently used for recreational boating, commercial fishing or shipping (d) the dredge area causes no significant disturbance

to intertidal flats or widgeon grass or eelgrass (e) the adverse environmental impacts are minimized to the maximum extent feasible, (f) dredging will not have any adverse impacts upon ground water resources (g) an acceptable dredge spoil disposal site exists, and (h) the dredged area is reduced to the minimum practical. New dredging or excavation to create new lagoons for residential development is prohibited.

Dredged Spoil Disposal

Definition

Dredged spoil disposal is the discharge of sediments (spoils) removed during dredging operations.

Policy

Disposal of dredge spoils in the ocean, bays and ports is acceptable on the condition that it is in conformance with EPA guidelines (40 CFR 230, 40 FR 41291, September 5, 1975) established under Section 404(b) of the Clean Water Act, and that it occur where water depths are at least 18 feet, and where sediments will not be carried landward of the 18 feet contour line. It is discouraged in all other water bodies.

EPA guidelines require that consideration be given to the need for the proposed activity, the availability of alternate sites and methods of disposal that are less damaging to the environment, and applicable water quality standards. They also require that the choice of site minimize harm to municipal water supply intakes, shellfish, fisheries, wildlife, recreation, threatened and endangered species, benthic life wetlands and submerged vegetation, and that is be confined to the smallest practicable area.

Clean dredge sediments of suitable particle size are acceptable for beach nourishment on ocean or open bay shores. The use of clean dredge spoil to create news wetlands is conditionally acceptable depending upon the biological value of the wetlands gained versus the water area lost.

Dredge spoil disposal on land is conditionally acceptable, under the following conditions: (a) sediments disposed on land, are covered with appropriate clean material that is similar in texture to surrounding soils, (b) the sediments will not pollute the groundwater table by seepage, degrade the surface water quality, present an objectionable odors in the vicinity of the disposal area, or degrade the landscape. Dredge spoil disposal is prohibited on natural undisturbed wetlands, and on formerly spoiled wetlands that have revegetated with wetland species.

The use of uncontaminated dredge material of appropriate quality and particle size for beach nourishment is encouraged. Creation of some useful recyclable materials such as bricks and light weight aggregate out of the dredge materials is encouraged. The use of uncontaminated dredge material for purposes such as restoring landscape, enhancing farming areas, creating recreation oriented land-fill sites including beach protection and general land reclamation works, building islands, creating marshes, capping contaminated spoil areas, and making new wildlife habitats is encouraged.

Effects associated with the transfer of the dredged materials from the dredging site to the disposal site shall be minimized to the maximum extent feasible.

Rationale

Dredge spoil disposal is an essential coastal land and water use that is linked inextricably to the coastal economy and has serious impacts on the coastal environment. Evolving state and federal policies on protection of the marine and estuarine coastal environment have sharply limited the creation of new dredge spoil disposal areas in the past decade. Yet selective dredging must continue if inlets and navigation channels are to be maintained. The coastal policy recognizes the importance of this use of coastal resources.

Use of inefficient equipment and methods, and resulting spillage of fuels, emission of toxic or noxious gases, loss of dredge materials, and noise and vibrations produced by faulty or worn out equipment and machinery may cause water pollution, air pollution and discomfort both for the crews and for the human population along the disposal route and in nearby areas.

2. Based on the issues discussed in the Needs for Dredging and Dredging Jurisdiction Chapters, this report makes the following management recommendations:

(a) DEP, Division of Coastal Resources should develop a Spoil Disposal Siting Program for the Bay and Ocean Shore dredging activities, in coordination with Delaware River Dredging Disposal Study, the MITRE Corporation Study on Preliminary Evaluation of Upland Disposal, and the Rutgers University Study on Hazardous Solid Wastes under contract to Cancer Research Toxic Substances Council.

Such a study would compliment the existing efforts by COE and would help the State in designating upland areas for dredge spoil disposal.

(b) DEP, Division of Coastal Resources should complete the analysis of New Jersey navigable dredging projects in the course of establishing a priority list based on shoaling conditions, recreational and commercial boating intensities and availability of dredge spoil disposal sites.

These analysis will help DEP in properly distribute funds to the most needed State dredging projects.

(c) New Jersey should establish additional sources of fundings for dredging activities. One means would be to increase DEP's FY 81 budget request for coastal dredging from the present level of $400,000 in regular funds and $700,000 in state aid funds.

(d) DEP, Division of Coastal Resources should determine the best way of handling and evaluating the quality of spoil material and reinstitute a program of selling settled dredge disposal material.

Such a program would help the Natural Resource Council to determine the price conditions and restrictions for the use of dredge materials. In addition, the sale of dredge material would extend the life of the existing state disposal sites, especially along the Delaware River.

(e) DEP should initiate a review and permitting of dredging disposal activites within the Bay and Ocean Shore Segment by DEP Bureau of Coastal Project Review, based on the recent Solid Waste Administrative classification of dredge spoil as a solid waste. Since a CAFRA permit is needed to open a new sanitary landfill and any solid waste should be deposited in sanitary landfills, consequently, creation of new dredging disposal sites as a sanitary landfill also falls under CAFRA jurisdiction.

(f) Resolve the dispute between the U.S. Army Corps of Engineers and State of New Jersey on the disposal area diking costs in the Intracoastal Waterways.

A similar dispute on Delaware River ended with COE agreeing to pay for the diking costs. The Intracoastal Waterway project should not exempt the COE from paying the billing costs which are COE responsibility.

(g) Research should be performed by the Division of Coastal Resources to resolve the legal questions concerning mineral resources ownership, where tideland conveyences on the State owned land were issued to private individuals.

(h) Implement vigorously the existing land policies as developed in the N.J. Coastal Management Program - Bay and Ocean Shore Segment (August 1978) i.e. soil erosion and sedimentation control, and runoff, to reduce maintenance dredging requirements.

(i) Perform dredging activities from November to Mid-March to minimize the adverse impact to benthic environment.

(j) NJDEP, Division of Water Resources and U.S. Army Corps of Engineers should establish a mechanism to demonstrate that the COE has obtained all the necessary State and federal permits for their dredging activities.

One of the mechanisms could be establishment of quarterly meetings between DEP/DWR and COE Philadelphia District to coordinate programs, projects and related permits. Such meetings are already taking place between DEP/DWR and COE New York District.

(k) The U.S. Army Corps of Engineers should establish a mechanism to enforce the conditions outlined in the State's Water Quality Certifications for COE permits to dredge.

(l) The State should involve DEP, the Office of Environmental Analysis tidelands delineation team in ownership dispute affecting lands now or formerly flowed by mean high water tide on Delaware River. The State has lost two cases because of an inability to prove its claimed ownership. Since the Delaware River is the last stage of the tidal delineation program, which is scheduled to be completed in 1985, the State may have more disputes with private owners. Consequently, the availability of dredge disposal sites may be reduced.

(m) The State should repeal the Clean Ocean Act of 1971 (N.J.S.A. 58:10-23.25 et seq.) because it overlaps with section 404 of the Federal Clean Water Act and Section 103 of the Marine Protection, Research Sanctuaries Act of 1972.

In conclusion, the main dredging and dredge spoil disposal problems can be summarized as a lack of money to maintain State channels for navigation use and lack of adequate dredge disposal sites. More funds would help to finance the most needed channel maintenance projects, while a dredge disposal siting study from Sandy Hook to Cape May would complement other ongoing dredge disposal studies and outline the most suitable sites for disposal by spoil type.

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