

LONG ISLAND REGIONAL ELEMENT
NEW YORK STATE COASTAL MANAGEMENT PROGRAM

Prepared by

Long Island Regional Planning Board
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Long Island Regional Planning Board

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1.0 Introduction

Funds were made available to the New York State Dept. of State to develop a Coastal Management Program which, when approved by the United States Secretary of Commerce would make the State and its local governments eligible for federal aid to properly develop and protect the coastal zone of the State. New York State contracted the Long Island Regional Planning (LIRPB) to formulate the Nassau-Suffolk regional element of the New York State Coastal Management Program.

The New York State Dept. of State, in developing its Coastal Management Program, identified 11 coastal issues of statewide importance. They include: 1) protection of aesthetic resources; 2) increasing recreation demands; 3) need for more public access to the shore; 4) need to foster economic development; 5) impacts of OCS activities; 6) increasing demand for energy facilities; 7) protection of agricultural resources; 8) protection of property from coastal flooding and erosion; 9) protection of fish and wildlife habitat; 10) need to improve water quality; and 11) general concern for statewide air quality. The State has developed general policies addressing the 11 selected coastal issues of concern, together with management approaches, and has identified basic state authorities and techniques local government could employ in improving coastal management.

The LIRPB approach toward the development of a coastal management program for Nassau and Suffolk Counties varied from the Dept. of State format primarily because the LIRPB and its Regional Marine Resources Council had previously developed an extensive knowledge base in marine environmental planning prior to the availability of coastal management planning funds from the Federal Government. The Council developed planning guidelines for five high priority marine environmental problem areas: water supply and wastewater disposal, dredging and spoil disposal, wetlands, coastal protection and hard clam management. Additional data and coastal planning methodologies developed by the LIRPB under contract with the U.S Dept. of Housing and Urban Development added to the local knowledge base. With this information in hand, LIRPB decided to focus much of its coastal zone planning efforts on the preparation of detailed subplans dealing with the following topics: Marine Fisheries, Coastal Erosion, Land and Water Capability, Water Quality, Dredging, Recreation, and Energy. With the simultaneous preparation of the Long Island Comprehensive Waste Treatment Management Plan under Section 208 of P.L. 92-500 as amended, the LIRPB was able to address many water quality problems in detail, and incorporate recommendations, including preferred coastal zone land uses, in the final Long Island regional element.

Numerous reports prepared by the LIRPB under the Coastal Management Program have contributed to the development of the various subplans and hence, the Long Island regional element. These reports are listed in Appendix A. Summaries of the subplans, including conclusions and recommendations are contained in Section 2. In Section 3, the various elements of the subplans have been restructured to address the 11 coastal issues identified in the Statewide Program from the Long Island regional per-

spective. The reports listed in Appendix A and the Subplan Summaries found in Section 2, rather than the 11 issue discussions found in Section 3, should be consulted for the specific details of the Long Island coastal management program. References to State Coastal Management policies are made throughout this report. These policies were taken from the document entitled, New York State Coastal Management Program dated March, 1979, and are included in Appendix B.

Many of the issues and concerns of statewide importance were also identified in the regional coastal management goals and objectives developed by the LIRPB and its subcommittee, the Citizens Participation Committee. Table 1.0-1 relates these goals and objectives to the statewide coastal management program issues.

Section 4 describes the coastal management boundaries and gives brief details of the four series of maps, which have been submitted to the New York Department of State, and as included by reference as part of their regional element report.

Section 5, entitled "Compatible and Priority Uses," discusses types of land uses that are compatible with various resource characteristics, and is based on the Land Capability Classification System.

Section 6, entitled "Geographic Areas of Particular Concern", describes the GAPC site selection process, lists the GAPCs of Statewide and local significance, and describes their management objectives and priority uses.

The concluding section discusses the recommended and responsibilities framework for implementing the Long Island segment of the New York State Coastal Management Program.

Table 1.0-1 Goals & Objectives for Long Island Coastal Area Management As They Relate to New York Coastal Management Program Issues.

LIRPB CM Goals and Objectives

NY Statewide CMP Issue(s)

GOAL I MINIMIZE SHORELINE DESTRUCTION.

Aesthetic Resources; Coastal Flooding & Erosion; Recreation Res.; Aesthetic Res.; Coastal Flooding & Erosion; Fish, Wildlife & Their Habitat

Obj. A Control future development to minimize damage to such critical areas as flood plains, dunes, bluffs, and fresh and marine wetlands.

1. Use flood plain zoning, land use management concepts and other regulatory tools to control development in the Intermediate Regional Tidal Flood Plain.

Coastal Flooding and Erosion

2. Regulate construction on primary dunes and on the seaward side of secondary dunes (including intervening swales) to prevent destruction of natural vegetation.

Coastal Flooding and Erosion

3. Regulate development on shoreline bluffs through the adoption of bluff hazard zoning and other land management controls to prevent excessive erosion and property damage.

Aesthetic Resources; Coastal Flooding and Erosion

4. Control development affecting fresh and marine wetlands as inventoried pursuant to the N.Y.S. Fresh and Tidal Wetlands Acts.

Coastal Flooding and Erosion; Fish, Wildlife and Their Habitat

5. Encourage the establishment of conservation and recreation uses in any shoreline areas where development is substantially destroyed by storms.

Recreation Resources; Coastal Flooding & Erosion; Fish, Wildlife & Their Habitat.

Table 1.0-1 continued, page 2 of 12

<u>LIRPB CM Goals and Objectives</u>	<u>NY Statewide CMP Issue(s)</u>
<p><u>Obj. B</u> Establish erosion prevention policies that are compatible with coastal processes.</p>	Coastal Flooding & Erosion
<p>1. Encourage the use of non-structural methods as a primary means of stabilizing dunes, nourishing beaches and building wetlands.</p>	Coastal Flooding & Erosion
<p>2. Regulate dredging of sand for beach nourishment from the outer winter bar and from areas shoreward of the outer winter bar.</p>	Coastal Flooding & Erosion
<p>3. Encourage development of the required technology for the economical transfer of sand from deep water to the shore.</p>	Coastal Flooding & Erosion
<p>4. Prohibit the construction of groins and other shore protection devices unless it can be demonstrated that such structures will not adversely affect adjacent properties.</p>	Coastal Flooding & Erosion
<p>5. Encourage the establishment of sand bypassing systems where interruption of littoral transport is contributing to the erosion of adjacent areas.</p>	Coastal Flooding & Erosion
<p>6. Establish control methods along stream corridors to prevent excessive erosion and sedimentation.</p>	Coastal Flooding & Erosion
<p>7. Regulate off-road vehicles in the shoreline area, and eliminate their use in natural areas where it can be shown that they are responsible for environmental degradation.</p>	Coastal Flooding & Erosion

Table 1.0-1 continued, page 3 of 12

<u>LIRPB CM Goals and Objectives</u>	<u>NY Statewide CMP Issue(s)</u>
GOAL II PRESERVE AND PROTECT WATER RESOURCES.	Coastal Water Resources
Obj. A. Manage and direct growth in Nassau and Suffolk Counties.	Coastal Water Resources
Obj. B. Dispose of wastewater without appreciably diminishing the quality and quantity of groundwaters and fresh surface waters, and the quality of marine waters.	Coastal Water Resources
1. Encourage continuation of research on wastewater treatment and disposal.	Coastal Water Resources
2. Require adequate treatment for all sewage plant effluents discharged to either ocean, sound, estuarine or other confined waters, in order to maintain acceptable marine water quality.	Coastal Water Resources
3. Phase out ocean disposal of properly treated wastewater when water supplies can be successfully augmented by recharging to groundwater.	Coastal Water Resources
4. Design storm water systems to meet acceptable water quality standards so as to reduce contaminants entering fresh and saline environments.	Coastal Water Resources
5. Design storm water systems that will allow replenishment of groundwater aquifers with water of acceptable quality.	Coastal Water Resources
6. If feasible, upgrade discharge standards for all fresh and saline waters of excellent quality which are appropriate for fishing and recreation.	Coastal Water Resources

Table 1.0-1 continued, page 4 of 12

<u>LIRPB CM Goals and Objectives</u>	<u>NY Statewide CMP Issue(s)</u>
<p>7. Enforce the law with respect to holding tanks or other acceptable devices on vessels for sanitary wastes, and require adequate onshore facilities for the treatment and disposal of such wastes.</p>	Coastal Water Resources
<p>8. Phase out ocean disposal of treatment plant sludges.</p>	Coastal Water Resources
<p>GOAL III MAXIMIZE THE PUBLIC BENEFIT WHILE MINIMIZING THE ENVIRONMENTAL DAMAGE FROM THE DEVELOPMENT OF THE COASTAL AREA.</p>	Economic Development; Fish, Wildlife & Their Habitat
<p><u>Obj. A</u> Minimize alteration of natural landforms and native vegetation.</p>	Coastal Flooding & Erosion; Fish, Wildlife & Their Habitat
<p><u>Obj. B</u> Maintain living natural resources of high biologic productivity and importance through preservation, protection and establishment of suitable habitats.</p>	Fish, Wildlife & Their Habitat
<p>1. Undertake research/management programs to determine appropriate harvest quotas to maintain maximum sustained yields of shellfish and finfish.</p>	Economic Development; Fish, Wildlife & Their Habitat
<p>2. Consider the net effects on hard clam resources and other marine life when determining the acceptability of: a. up-grading the treatment process of those sewage plants which presently discharge their effluents into shellfish producing waters; b. expanding existing sewage treatment plants or constructing new sewage treatment plants which discharge effluents into shellfish producing waters; c. constructing sewage outfall pipes which traverse shellfish beds; and d. dredging of shellfish beds.</p>	Fish, Wildlife & Their Habitat; Coastal Water Resources

Table 1.0-1 continued, page 5 of 12

LIRPB CM Goals and Objectives

3. Encourage New York State, pertinent local governments and private agencies to acquire at the earliest practical date a fee simple or lesser property interest in as much of the remaining privately held wetlands as possible, with a view toward preserving them in perpetuity. Grant tax and other incentives to individual wetland owners who assure preservation and enhancement of their properties.
4. Strengthen local capability in conjunction with the United States Coast Guard for the rapid containment and clean up of oil spills.
5. Encourage the design and implementation of more efficient methods and equipment for the transport and transfer of oil and other hazardous materials.
6. Endorse national regulation and management of migrating species.
7. Encourage and develop alternatives to the use of chemical and broad-spectrum pesticides in agriculture and for vector control.
8. Fund research on the effects of mosquito control on both salt marshes and estuaries and their natural resources, including immediate and cumulative effects of insecticides and evaluation of the effects of ditch systems. Support integrated approach to mosquito control with emphasis on biological controls.

NY Statewide CMP Issue(s)

Fish, Wildlife & Their Habitat

Impacts of OCS Activities

Impacts of OCS Activities

Fish, Wildlife & Their Habitat

Fish, Wildlife & Their Habitat; Coastal Water Resources

Fish, Wildlife & Their Habitat

LIRPB CM Goals and Objectives

NY Statewide CMP Issue(s)

<u>Obj. C</u>	Encourage research to increase knowledge base necessary for understanding the environmental effects of development.	Economic Development; Fish, Wildlife & Their Habitats
<u>Obj. D</u>	Identify, preserve and protect distinct geologic and geomorphic features.	Aesthetic Resources
<u>Obj. E</u>	Identify, preserve and protect areas of scenic beauty.	Aesthetic Resources
<u>Obj. F</u>	Identify, preserve and protect important wildlife populations (fauna and flora) and their habitats, with special emphasis on rare and endangered species.	Fish, Wildlife & Their Habitat
<u>Obj. G</u>	Use available administrative and technological tools to insure the orderly economic and social development of the coastal zone.	Economic Development
GOAL IV	IDENTIFY, PRESERVE, PROTECT AND RESTORE AREAS OF HISTORIC AND CULTURAL SIGNIFICANCE.	Aesthetic Resources
<u>Obj. A</u>	Designate historical and cultural districts and historical highway and trailway corridors.	Aesthetic Resources
<u>Obj. B</u>	Solicit awards of technical and financial assistance required for classifying, categorizing, and documenting areas and structures according to the guidelines established by the State of New York Historic Resources Survey Manual.	Aesthetic Resources
<u>Obj. C</u>	Stimulate public and quasi-public acquisition of historical and cultural structures and areas, and encourage private protection of such areas.	Aesthetic Resources
<u>Obj. D</u>	Develop a procedure to compensate property owners who are adversely affected by efforts to preserve significant archeological resources.	Aesthetic Resources

Table 1.0-1 continued, page 7 of 12

LIRPB CM Goals and Objectives

NY Statewide CMP Issue(s)

GOAL V PROMOTE PUBLIC ENJOYMENT OF THE AMENITIES OF COASTAL AREAS IN A MANNER THAT INSURES PRESERVATION OF THE ENVIRONMENT

Aesth. Res; Recreation Res.; Pub. Access; Fish, Wildlife & Their Habitat

Obj. A Promote visual and physical access to the coastal area.

Aesthetic Res.; Rec. Resources; Public Access

1. Delineate areas for visual access through regulation and easement acquisition for maximum visual enjoyment of the shoreline and coastal waters.
2. Designate areas where the location of vehicle parking facilities should be encouraged or discouraged.
3. Identify underutilized recreational facilities where access can be improved through improved mass transportation.
4. Require utilities to provide public access to the water for suitable recreational purposes at shoreline power generation sites.
5. Increase access for fishermen to fishing grounds.

Aesthetic Resources

Aesthetic Resources

Public Access

Public Access

Recreation Resources; Public Access

Recreation Resources

Recreation Resources

Recreation Resources

Obj. B Encourage a diversity of public recreational opportunities in coastal areas.

1. Where feasible, increase the use of existing public properties and facilities.
2. Identify additional lands to be acquired in fee simple or lesser property interest for both active and passive recreation.

LIRPB CM Goals and Objectives

NY Statewide CMP Issue(s)

- | | | |
|----|--|----------------------|
| 3. | Establish criteria for the optimal use of recreational facilities in order to prevent the degradation of recreational areas through overutilization. | Recreation Resources |
| 4. | Encourage municipalities to open underutilized parks and beaches to all during week days in accordance with optimum recreational capacity of resources.* | Recreation Resources |

GOAL VI PROVIDE FOR COMPATIBLE, WATER DEPENDENT AND WATER ENHANCED USES IN COASTAL AREAS.

- | | | |
|---------------|---|----------------------|
| <u>Obj. A</u> | Identify those activities which are water dependent and/or water enhanced. | Economic Development |
| <u>Obj. B</u> | Amend zoning ordinances to encourage only compatible water dependent and water enhanced uses in coastal areas. | Economic Development |
| <u>Obj. C</u> | Direct non-water dependent and non-water enhanced growth inland. | Economic Development |
| <u>Obj. D</u> | Establish a coordinated plan for navigable channels which is adequate to meet the requirements of water dependent activities. | Economic Development |

GOAL VII PRESERVE, PROTECT AND DEVELOP REGIONAL INFRASTRUCTURE SITES WHICH MUST BE LOCATED IN COASTAL AREAS.

- | | | |
|---------------|--|---|
| <u>Obj. A</u> | Anticipate the future needs for regional infrastructure sites, review siting criteria for locating infrastructure, and identify sites which are appropriate for the needs. | Economic Develop.; Impacts of OCS Activities; Energy Facilities and Resources |
| <u>Obj. B</u> | Establish a land bank for the preservation of potential regional infrastructure sites. | Econom. Develop.; Impacts of OCS Activities; Energy Facilities and Resources |

Table 1.0-1 continued, page 9 of 12

<u>LIRPB CM Goals and Objectives</u>	<u>NY Statewide CMP Issue(s)</u>
<p><u>Obj. C</u> Determine which infrastructure related dredging projects are essential and in the best interests of the public. Design and implement such projects, including the selection of appropriate spoil disposal sites, in a manner which is not environmentally counter-productive.</p>	<p>Econom. Develop.; Impacts of OCS Activ.; Energy Facilities & Resources; Fish, Wildlife & Their Habitat</p>
<p><u>Obj. D</u> Satisfy demand for electric power on Long Island in environmentally acceptable ways including possible use of wind power, solar power and tidal power.</p>	<p>Energy Facilities & Resources</p>
<p><u>Obj. E</u> Consolidate port facilities for the receipt of petroleum in order to reduce vessel trips, oil spillage, dredging, highway congestion, and shorefront land consumption.</p>	<p>Impacts of OCS Activities; Energy Facilities & Resources</p>
<p>GOAL VIII. RESTORE AND ENHANCE, WHEREVER POSSIBLE, DEGRADED COASTAL AREA RESOURCES</p>	<p>Economic Development; Fish, Wildlife & Their Habitat</p>
<p><u>Obj. A</u> Improve degraded wetlands and estuarine areas, and create new wetlands.</p>	<p>Fish, Wildlife & Their Habitats</p>
<p><u>Obj. B</u> Require the planting of suitable vegetation in spoil or other disturbed areas for stabilization and restoration of marsh habitats.</p>	<p>Fish, Wildlife & Their Habitats</p>
<p><u>Obj. C</u> Rehabilitate coastal areas that have been mined for sand and gravel.</p>	<p>Fish, Wildlife & Their Habitats</p>
<p><u>Obj. D</u> Upgrade urban waterfronts.</p>	<p>Fish, Wildlife & Their Habitats; Aesthetic Resources</p>

LIRPB CM Goals and Objectives

NY Statewide CMP Issue(s)

GOAL IX DEVELOP LEGAL AND ADMINISTRATIVE MECHANISMS NECESSARY FOR IMPLEMENTATION OF COASTAL AREA PLANS

Obj. A Foster intergovernmental coordination and cooperation to eliminate regulatory duplication in coastal area management.

Applies to all NY State-wide CZM Issues

Obj. B Establish the necessary authorities for coastal area management.

Obj. C Identify areas of public interest in the coastal area and adopt legislation designating areas subject to public acquisition and/or regulatory control.

Obj. D Develop a comprehensive educational program to foster interest in the solution of coastal area management problems.

Applies to all NY State-wide CZM Issues

GOAL X ENCOURAGE RESEARCH AND EDUCATION TO INCREASE KNOWLEDGE AND UNDERSTANDING OF NATURAL PROCESSES IN COASTAL AREAS.

Coastal Flooding & Erosion;
Fish, Wildlife & Their Habitats; Coastal Water Resources

GOAL XI ANTICIPATE THE ECONOMIC, ENVIRONMENTAL, AND SOCIAL IMPACTS IN THE LONG ISLAND COASTAL ZONE WHICH ARE CAUSED BY OCS DEVELOPMENT, AND REQUIRE THAT ADVERSE IMPACTS BE MITIGATED TO AN EXTENT COMMENSURATE WITH THE WELFARE OF THE STATE CONSISTENT WITH THAT OF THE NATION.

Impacts of OCS Activities

Obj. A Identify and evaluate the coastal zone impacts associated with OCS resource extraction and utilization.

Impacts of OCS Activities

1. Develop siting criteria for onshore OCS related activities and locate sites, if any, that meet those criteria.

Impacts of OCS Activities

Table 1.0-1 continued, page 11 of 12

<u>LIRPB CM Goals and Objectives</u>	<u>NY Statewide CMP Issue(s)</u>
<p>2. Identify the offshore areas and resources in the coastal zone which could be used in OCS activities, including transportation methods, corridors, and critical habitats.</p>	<p>Impacts of OCS Activities</p>
<p>3. Collect and analyze sufficient economic, environmental, and social data to serve as a baseline reference for coastal zone areas which will be impacted. Determine stress levels and the projected consequence if those levels are exceeded.</p>	<p>Economic Development; Impacts of OCS Activities; Fish, Wildlife and Their Habitats</p>
<p>4. Establish a monitoring system to determine long-term trends in the concentration of oil on beaches and in coastal zone waters. Determine short- and long-term impacts of oil on the ecology of coastal zone waters.</p>	<p>Impacts of OCS Activities</p>
<p><u>Obj. B</u> Institute regulatory measures to control adverse impacts on the existing economic, environmental, and social conditions in the coastal zone.</p>	<p>Impacts of OCS Activities</p>
<p>1. Limit development to a few carefully selected sites to avoid uncontrolled proliferation of OCS facilities.</p>	<p>Economic Development</p>
<p>a) Establish procedures to foster the sharing of onshore OCS facilities by the private sector.</p>	<p>Economic Development</p>
<p>b) Establish procedures to ensure that OCS companies provide affected municipalities sufficient public notice of their projected onshore operations and requirements.</p>	<p>Economic Development</p>
<p>2. Establish procedures to ensure stringent regulation of OCS activities including training and licensing of personnel, design standards for equipment, and standard procedures for hazardous operations.</p>	<p>Impacts of OCS Activities</p>

Table 1.0-1 continued, 12 of 12

<u>LIRPB CM Goals and Objectives</u>	<u>NY Statewide Issue(s)</u>
3. Regulate and monitor waste discharge from OCS related facilities.	Impacts of OCS Activities; Coastal Water Resources
4. Require the rehabilitation of OCS related sites when they are no longer used for offshore work.	Economic Develop.; Impacts of OCS Activities; Fish, Wildlife & Their Habitats
<u>Obj. C</u> Encourage improved federal surveillance and enforcement to reduce the probability of oil spills related to petroleum production and transport.	Impacts of OCS Activities
<u>Obj. D</u> Seek federal assistance for relieving disproportionate economic burdens placed on local and state governments by OCS activities.	Economic Development

2.0 Long Island Coastal Management Subplan - Summaries, Conclusions, Recommendations

2.1 Marine Fisheries Subplan

The living resources in the marine portion of Long Island's coastal zone, as well as in the U.S. Fishery Conservation Zone, support two industries: the commercial fishing industry, and that segment of the Island's tourism/recreation industry pertaining to recreational or sport fishing. The health and vitality of both fishing industries in the future will depend upon management initiatives, some of which may face opposition in the short run, but may prove to be necessary over the long-term in order to sustain the existence of these industries, as well as provide for their growth.

The commercial fishing industry can be divided into two segments - shallow water and deep water. The shallow water segment currently dominates the Long Island commercial fishing industry primarily as a result of the landings of hard clams and American oysters, which command high market prices. The deep water segment relies on those species found in the deeper waters of the Atlantic Continental Shelf.

Employment in the shallow water segment has fluctuated in the past, in part due to changes in species abundance. Unpredictable changes in abundance and current management practices may not result in a sustained high level of fishery related employment in this segment in the future. Growth in this segment, under existing management arrangements, is severely limited. Indeed, overfishing of selected shallow water species may be a major problem.

The deep water segment has experienced dramatic growth during the last few years. This growth is apparent in vessel upgrading, the purchase of new vessels and the construction of onshore support facilities. Improved management of fish stocks in the U.S. Fishery Conservation Zone may lead to higher landings of those species that have been traditional targets of Long Island fishermen in the future. However, the greatest opportunity for growth in this segment rests with the development of fisheries for unutilized and underutilized species which heretofore have not been the target of domestic fishermen along the mid-Atlantic coast. Development of industries based on such species offers a unique opportunity for growth of this segment of the Island's commercial fishing industry. To accommodate this growth will require the provision of onshore facilities, e.g., docks, piers, processing/freezing capability, etc.

Long Island's recreational fishing industry is also, in a sense, reliant upon natural fluctuations in species abundance. Growth in this industry will require actions to increase angler access to shoreline areas and to offshore areas where fishing is productive. To a large extent park development policies can address these areas of concern.

Mariculture, or the growth of marine organisms under controlled conditions, can bolster both the commercial and recreational fishing industries. The Island's marine environment offers great opportunities for the controlled culture of selected species of shellfish, crustaceans,

finfish and marine plants. Such activity could lead to expansion of marine related employment. Public stocking programs could also increase resources available to public ground commercial fishermen and anglers as well. However, growth of mariculture on Long Island will require a change in attitudes on behalf of government and the public, and the implementation of baywide resource management plans that allocate specific areas to competing uses. Improved management, and in some cases restrictions, will be necessary to assure equitable access to marine resources by competing groups.

2.1.1 Commercial Fishing

2.1.1.1 Introduction and Objectives

This section contains facility and land use recommendations designed to assure that the continued existence and growth of Long Island's commercial fishing industry is not constrained by decisions affecting shore land use. It is based on the LIRPB report, A Marine Fisheries Sub-plan for Nassau and Suffolk Counties (15 Sept. 1978), which also included an evaluation of the access needs of the Island's recreational fishing industry. (The recreational segment is discussed in Section 2.1.2.)

The objectives of this report that pertain to the Long Island commercial fishing industry are to 1. recognize the importance of marine fisheries as a commercial resource to the region; 2. assess the status and future potential of Long Island commercial fishing industry operations in light of current management arrangements and extended U.S. fishery jurisdiction; and 3. develop land use and facility recommendations that take cognizance of the special needs of commercial fishermen for shoreline facilities and access.

2.1.1.2 Description of Long Island's Commercial Fishing Industry

Data and information on many aspects of commercial fishing in Nassau and Suffolk Counties are lacking. For example, no rigorous study of the economics of the commercial fishing industry in New York has ever been completed. This is due in part to the nature of commercial fishing industry operations on Long Island. The industry consists of literally thousands of individual entrepreneurs who catch, sell and in some instances process their catch on an independent basis. The picture is further complicated by the fact that some recreational anglers also sell their catch. For this reason, reliance has been placed on two major sources of information; opinions from individuals with knowledge and/or interests in commercial fishery matters, and reports based on data collected by National Marine Fisheries Service, Statistics and Market News Division. It should be noted that catch and landing statistics do not necessarily reflect abundance of a species, because catches can vary from many causes, e.g., changes in demand, fishing effort, and competition from other fisheries. Many also believe that commercial fisheries landings are larger than official records show, since cash transactions between buyers and fishermen are common at local ports. However, the statistics are valuable because they indicate general trends in fisheries and serve as gross indicators of species abundance.

Commercial fishery landings data from 1880 to the present time indicate that over 100 species of fish, shellfish and crustaceans have been landed by New York Marine commercial fishermen. The target species range from the highly migratory oceanic species, e.g., bluefin tuna, to non-migratory estuarine species, e.g., the hard clam. The wide range of species utilized as human food reflects in part the success of New York City's Fulton Fish Market - the largest wholesale fish outlet in the United States - in supplying various ethnic groups in the New York metropolitan region with a variety of fishery products. The commercial fishery landings also include species used for industrial purposes, i.e., for fish meal, oil, animal food and bait.

The relative importance of major food fish and shellfish species to New York's commercial fishery has changed over time. The American oyster dominated the landings from the late 1800's to the 1930's. Today, hard clams, whiting, scup and surf clams dominate. Flounders have always been important foodfish in New York. Industrial fish landings in New York have always been dominated by menhaden. The decline of the fish meal industry on Long Island has been partially responsible for the low New York menhaden landings in recent years. Today, most menhaden caught in New York State waters - estimated at 13,000 metric tons (30 million pounds) - are now landed at processing plants in other states by out-of-state vessels. The lack of fish processing facilities on Long Island is also a reason why vessels registered in New York State land their catches of other species at Cape May, N.J. and New Bedford, Mass.

The greater part of New York State's commercial fishing industry is based in Nassau and Suffolk Counties. Eighty-nine percent by weight of the fish and 97% by weight of the shellfish landed in New York State in 1978 were landed in Nassau-Suffolk ports. The 15,000 metric tons (33 million pounds) of fish and shellfish reported as landings in Nassau-Suffolk in 1978 had a dockside value of \$32 million. Hard clams ranked as the number one species in Nassau/Suffolk in terms of both weight and landed value. This fishery is of national importance in that Long Island's harvest of hard clams in 1978 accounted for 55% of the total national production of this species. Of the 15 species with a landed value of more than \$200,000, three (hard clam, oyster and bay scallop) are classified as estuarine, one as coastal (weakfish), five as coastal oceanic (fluke, lobster, scup, butterfish, bluefish), three as oceanic (tilefish, surf clams and whiting), one as oceanic coastal (squid), one as anadromous (striped bass), and one as estuarine oceanic (blackback flounder). In general, the estuarine species are harvested by utilizing gear and boats with shallow water capabilities; gear and vessels associated with deeper water environments are utilized to catch the non-estuarine species.

The commercial fishing industry on Long Island can be divided into deep water and shallow water segments. This arbitrary division is convenient when evaluating the land use and support facility requirements of the industry as a whole. The deep water segment consists of the offshore operations in Long Island Sound, Gardiners Bay and the Atlantic Ocean, which require the use of relatively large, deep draft vessels and related gear to catch a variety of oceanic or coastal oceanic finfish, shellfish and crustaceans. These vessels fish the entire New York Bight as well as areas to the south and east of Cape Cod, including Nantucket Shoals and Georges Bank. The deep draft vessels require port facilities with channels of sufficient draft, or naturally occurring deep water near shore, in order to ensure ready and safe access to offshore fishing grounds. Fishing activity in the shallow water segment is focused in estuaries, such as Great South Bay and the Peconics, and along the shorelines of the deeper bodies of water. The primary target species in this segment are the hard clam and oyster. Access to deep water is not a major factor in the shallow water segment, as most activity occurs in nearshore waters. Although large vessels equipped with mechanical dredges are used in harvesting clams from private or leased grounds, independent clambers using tongs, rakes, and shallow draft boats that are either

docked in marinas and along the numerous creeks tributary to the bays, or trailered to the water on a daily basis, dominate the clam industry. Large mechanical dredges working private and leased grounds are the primary means of harvesting oysters.

National Marine Fisheries Service data on New York State registered commercial fishing vessels with ratings of five tons or more indicate that 175 vessels have home ports on Long Island. Montauk, Shinnecock, Freeport/Jones Inlet, and Greenport are the major deep water fisheries centers. Greenport and Montauk are the ports frequented most by transient vessels. When considering the magnitude of offshore fishery landings made at the various ports, Montauk vies with Shinnecock as the primary fisheries center, followed by Freeport/Jones Inlet and Greenport.

The shallow water segment is not as centralized as the deep water segment. There are approximately 8,500 commercial fishing boats associated with the shallow water fisheries on the Island. These boats are primarily involved with the shellfish industry and are found mainly in the south shore bays.

2.1.1.3 Economic Aspects of the Long Island Commercial Fishing Industry

The following discussion is based upon available information on the dockside value of commercial fishery landings and commercial fishery license and permit data to illustrate, in a gross fashion, the magnitude of commercial fishing activities in Nassau and Suffolk Counties - both in terms of the number of people employed and the value of these activities and related operations, such as sea food transportation and processing, marine supplies, etc., to the economy. Public policy decisions that affect commercial fishing should be made with an awareness of the impact of this industry on Long Island. This impact is focused on those communities where the industry has traditionally been a large employer.

The only available data on the dockside value (money received by fishermen for their catch) of fish and shellfish landed in Nassau and Suffolk Counties are those published by the National Marine Fisheries Service. New York State commercial fishery landings in 1978 amounted to roughly 16,000 metric tons valued at approximately \$33.7 million. Of this statewide total, fish and shellfish valued at over \$32.2 million were landed in Nassau and Suffolk Counties. It is widely agreed that these figures underestimate the actual volume of fishery landings and associated cash transactions, but it is not known by how much. This income to fishermen is only the initial stage of the process by which economic benefits from the industry accrue to people and businesses in the region and the state. To estimate the total impact of commercial fisheries on the economy, multipliers derived in studies conducted for the State of Rhode Island and for the Town of Southold, Suffolk County were utilized.

An input-output analysis conducted by University of Rhode Island investigators to determine the economic impact of commercial fisheries in Rhode Island found that each \$100 in fish landings generated an additional \$424 of economic activity in the state. This corresponds to

a multiplier of 4.24, which measures the effect of direct fishermen income, the income received by businesses and individuals that provide goods, services and labor to commercial fishermen, and the income of those businesses using fish in their operations. It does not include retail activities. This multiplier was also found to be much higher than that associated with the "average" industry in the state, because the fishing industry depends almost entirely on a local natural resource base, while most other industries must import inputs from out of the state in order to produce outputs in a process of stages characterized by add-on value. Assuming that the same general multiplier impacts occur in the New York region, and that a conservative estimate of this multiplier for New York is 4.0, then the Nassau-Suffolk commercial fishing industry has an impact valued at about \$129 million for the state as a whole.

The results of a study conducted in the Town of Southold have been used to estimate the impact of the commercial fishing industry on the economy of Long Island. This study determined the direct community impact of commercial fisheries by using a multiplier of 2.79. When a more conservative multiplier, 2.5, is applied for the Nassau-Suffolk region, it appears that commercial fisheries have a \$80 million impact on the regional economy. Again, this does not account for retail sales.

Reference is made to permit data of the New York State Department of Environmental Conservation, in order to estimate the number of people in Nassau-Suffolk who earn their livings, either on a full time or part time basis by commercial fishing. Over 7,500 shellfish digger permits were issued to Nassau-Suffolk residents in 1978. This figure does not include those involved in lobster or crab fisheries, the number of resident finfishermen, or the employees of the large, private shellfish companies. There are roughly 500 people engaged in commercial finfishing in Nassau-Suffolk. The private mariculture firms employ about 320 people. Therefore, we can say that about 8,500 Nassau-Suffolk residents are engaged in full or part time commercial fishing activities. These people have invested significant amounts of capital in the boats, vessels and gear which support fishing operations.

Hundreds of Nassau-Suffolk residents are involved in activities that depend directly upon the commercial fishing industry, such as fish packing and transportation and fish processing. There are 12 fish and shellfish processing firms located in Suffolk County, and one in Nassau County. Greenport is the major fish (fish fillet and meal) and shellfish (oyster, scallop, surf clam) processing area in Suffolk County. Point Lookout is the shellfish processing center in Nassau County (surf clam and recently, ocean quahogs). Other processing operations are located at Islip, Montauk and other East End sites. Many of the 241 processing plants and fish wholesale plants located throughout New York State -- plants that employ over 2,400 people on a full and part time basis -- rely on the fish and shellfish landed in Nassau-Suffolk ports.

2.1.1.4 Impacts of Extended U.S. Fisheries Jurisdiction on the Long Island Commercial Fishing Industry

The United States assumed jurisdiction over the management of fishery resources within 200 miles of the Nations's shores of March 1, 1977, pursuant to P.L. 94-265. The regulatory actions of the U.S. Government in implementing P.L. 94-265, e.g., the establishment of a catch quota system and the granting of permits to foreign nations, that limit fishing operations for certain species within specific areas are based on a management program designed to foster the recovery of over-fished stocks of commercial fish, and to revive the U.S. fishing industry.

Extended jurisdiction has created an opportunity for major expansion of many segments of the U.S. fishing industry that could produce significant national economic benefits. For example, Federal studies have indicated that the development of six major new fisheries off Alaska, the West Coast, the Gulf of Mexico, New England, and Mid-Atlantic could create 38,000 new jobs and contribute \$1.0 billion to the U.S. economy by 1990.

In 1978, the U.S. had a \$2.1 billion deficit in the fisheries sector of its international balance of trade, making seafood among the top eight trade items which accounted for the overall deficit. Nearly two-thirds of the edible seafood in the United States is imported. Over the next 10 years U.S. demand for seafood will increase by at least 20 percent and, without other sources of supply, imports can be expected to keep pace with this increase.

Much of the trade deficit is attributable to imports of high-valued fishery products such as shrimp, tuna, lobster, and scallops for which domestic resources are already developed and harvested. However, imports of other species in the form of fresh and frozen fillets and frozen fish blocks and slabs which are also important, can be reduced as domestic fishermen displace foreign fishermen in harvesting these resources within the U.S. Conservation Zone. By substituting American-caught fish for imports of species such as whiting, hake, and pollock, total imports of fishery products can be cut substantially.

In addition, the trade deficit can be reduced through development of export markets for the vast U.S. fishery resources presently fished only by foreign fleets or not fished at all. For example, development of the squid, mackerel and whiting fisheries in New England and the Mid-Atlantic regions could improve the balance of trade by as much as \$211 million per year, while creating over 5,000 jobs and adding nearly \$300 million to the Gross National Product.

Recent foreign catches of selected offshore species made in the Fishery Conservation Zone off New England and the Middle Atlantic states - areas accessible to the Long Island fleet - dwarf domestic landings. Scores of foreign fishing vessels (trawlers, process and support vessels) support this fishing effort. Thus, for certain species, there appears to be a large potential for domestic fleets to increase their landings if, in fact, the capability of the industry is enhanced to the point where the level of foreign fishing is reduced. Foreign fishing is allowed in the Fishery Conservation Zone for those species where a surplus in

excess of domestic fleet capacity is available for exploitation.

The south shore of Long Island has a geographical advantage in comparison with other areas for locating shore facilities supporting those fisheries offering the most potential as a result of extended jurisdiction. Long Island fleets could intercept these species - red hake, whiting, long-finned squid, short-finned squid - during their annual migrations along the continental shelf break between Capt Hatteras and Georges Bank.

The question arises, "Why haven't Nassau-Suffolk fishermen, or U.S. commercial fishing fleets in general, developed the capacity to take advantage of these species in the past?" A partial answer to this question is that domestic fleets have concentrated their efforts on catching species which bring high per unit prices. Relatively small volumes of these species, e.g., lobster, can be handled, yet the economic returns are high. To take advantage of low cost, underutilized species (e.g., whiting and squid), large volumes must be caught and handled. Larger vessels may be necessary to do this. Another factor is the traditionally low domestic demand for these species. However, foreign demand may provide the incentive for domestic expansion. For example, if the technical problems associated with the processing of the squids can be addressed, and a high quality product can be assured, excellent market opportunities for U.S. exports exist in France, Greece and Portugal.

The commercial fishing industry on Long Island is characterized by a high degree of fragmentation, with the harvesting, processing and distribution sectors separated from one another. This tends to make the development of new industries on the Island a difficult task. Tradition remains strong within the industry, and existing marketing techniques relying heavily on the sale of fresh seafood to local and regional markets remains the primary mode of product sale. This mode will probably continue to a large measure in the future. The development of alternative product marketing schemes in the region will require the cooperation of government, fishermen and processors.

Management under extended jurisdiction may allow previously depleted stocks of yellowtail flounder, haddock and cod to recover. If this occurs over a number of years, Nassau-Suffolk fishermen could benefit as there would be more of these traditionally popular species readily available.

Another area offering potential to the Nassau-Suffolk fishing industry is the diversification of fishing effort to increase the harvest of underutilized stocks of the following species: ocean quahog, blue mussel, red crab, jonah crab, rock crab, dogfish, ocean pout, goosefish, various skates, searobins, and Americal eel. Adequate markets and processing facilities would have to be developed to meet this potential. In this regard, a Montauk firm is now developing markets for speciality products made from the jonah crab.

Fish processing/food science research currently being conducted on Long Island by the New York State Sea Grant Institute could help the

region develop the processing facilities required to take advantage of opportunities resulting from extended jurisdiction. Cooperative arrangements between fish processing interests and the Long Island duck processing industry, e.g., use of the duck processing and freezing plant in Eastport for fish processing, may also be possible. It should be pointed out that the economic benefits to Long Island derived from commercial fishing could be increased substantially in the future if fish processing facilities are expanded on the Island. Most fishery products landed in Island ports are sold as fresh fish. The value added to fish in the processed form, plus additional jobs represent the benefits to be derived from an expansion of this activity.

Many developments pertaining to the commercial fishing industry on Long Island have occurred during the last three years. Although causes and effects are difficult to identify at the local level, many of items identified below are probably related to the interest generated by P.L. 94 265 and a feeling of optimism that this law and the management programs prepared in accord with it will act to revitalize the U.S. fishing industry during the next decade. Indeed, on the national scale, U.S. fishery landings have increased, and the levels of foreign fishing within the 200 mile limit have been cut drastically. In addition to Federal Government efforts, state and local government interest as well as private industry activities have contributed to the creation of a "bullish" attitude towards the fishing industry on Long Island and other coastal areas in the northeast and the consequent entry of new capital.

During the three year period from 1975 to 1978, 38 fishing vessels (rated at five tons or more) were added to the Nassau-Suffolk fishing fleet. Activity increased primarily at the major deep water centers. During this time period 12 additional vessels utilized Montauk, seven additional vessels berthed at Shinnecock, the Freeport/Jones Inlet increased by 15 vessels, and the Greenport fleet increased by three vessels. The trend over the last few years has been for the fishing industry to invest in new, bigger and better equipped vessels capable of participating in the offshore fisheries during trips of two to three days duration. The average investment in each of these vessels is about \$150,000. Eleven additional vessels, not accounted for above, have been added to the Long Island fleet in the first six months of 1979.

There has been renewed activity in the provision of vessel docking and product transfer sites in Nassau-Suffolk during the last year and a half. The Jones Inlet Packing Company was established at Point Lookout at a site recommended for fisheries development in a draft version of the marine fisheries subplan report. This facility currently provides dock space for eight boats, and has at least temporarily solved a need for such facilities in the Freeport area. The owners have plans to expand docking capacity to 12 boats. Transient vessels from New Jersey and North Carolina frequent this facility. At the present time, no processing occurs at the site. Fish packed out at the facility are shipped out-of-state, as well as to New York markets. Because of excellent access to Jones Inlet, this area remains a high priority location for the provision of additional fisheries facilities in the future.

The conversion of a yacht marina near Shinnecock Inlet to accommodate the commercial fishing industry has helped meet the demand for shoreside facilities at Shinnecock, especially during the winter fishing season. Nick's Marina, adjacent to C & N Fisheries, has expanded its operations to include the commercial fishing industry sector (docking and product transfer). Still primarily a yacht marina during the summer months, Nick's Marina plans to maintain space for eight commercial fishing vessels year-round. The provision of this facility has helped to mitigate overcrowding at C & N Fisheries.

Montauk has been the center of most new facilities development. Existing product transfer sites have expanded and additional facilities have been built, including Gosmans Dock, Mid-Atlantic Fish Buying Co. Ltd. and Pier I. Gosmans Dock plans to buy, fillet, freeze and pack fish from its nearly completed commercial fishery facility. Gosmans will have sufficient plant capacity to hire up to 36 full-time employees for its fish filleting operation. Gosmans now has docking space to accommodate commercial fishing vessels and can accommodate vessels 100' in length with 15' drafts. Mid-Atlantic Fish Buying Co. Ltd. has icing and packing facilities and dock space for 12 vessels. Mid-Atlantic plans to export fish out-of-state and overseas. Pier I is a small fish packing facility capable of servicing several small commercial fishing vessels.

A new private commercial fisheries facility is being proposed on the east side of Lake Montauk. The site is located in the Waterfront Business District, which allows commercial fishery facilities. The proposed facility would eventually have docking space for 40 commercial fishing vessels and would have icing and packing capacity.

The Montauk Marine Basin is planning to expand its existing marina pier to accommodate 10 - 12 commercial fishing vessels. In this instance, the Town of East Hampton has to decide whether or not to allow Montauk Marine Basin to construct the pier on town-owned underwater land.

Although there have been no large scale fish processing industry commitments for locating facilities on Long Island during the past two years, major firms has shown interest in the further development of this segment of the fishing industry in the Middle Atlantic States region. Fish buyers are considering the development of facilities for the export of whiting, red hake, and squid to Japan and Spain. To encourage the larger food processing firms to locate on Long Island would require assurances that the facilities would receive a continuous large volume supply of various species for processing. If the lack of on-shore facilities affects the reliability of supplies, then it is unlikely that firms will choose to locate on Long Island.

Long Island officials and the Long Island Assoc. of Commerce and Industry have initiated studies to determine the feasibility of establishing a regional food market on Long Island. Such a regional market could benefit the fishing industry, since it could serve as an alternative for the fishermen to shipping fresh fish to the Fulton Fish Market in New York City. The development of a regional market could also create favorable conditions for the expansion of local fish processing on Long Island.

Fishery trade association representatives from the states of New York, New Jersey, Pennsylvania, Maryland, Delaware and Virginia met in Ocean City, Md. in April 1978 and formed the Mid-Atlantic Fisheries Development Foundation, Inc. (MAFDF), which is similar to those fisheries development organizations established in the Southeast, New England and West Coast areas. MAFDF, composed of fishery trade organizations, processors, and fishermen is a non-profit, educational, and fisheries research and development organization that was formed to promote the commercial development of fisheries and related facilities in the Mid-Atlantic region.

2.1.1.5 Commercial Fishing Industry Land Use and Facility Problems

The principal problems of the deep water segment of the industry are the adequacy of channel access and the availability of pier/docking facilities. In many cases, commercial fishing vessels are being forced to leave dock facilities because of incompatibility with pleasure boating interests and price considerations. The problems most frequently mentioned by the shallow water segment included the lack of sufficient number of boat ramps to insure access to coastal water and to avoid conflicts with recreational boaters and the general public, the inadequacy of catch transfer sites, the burden imposed by zoning regulations that restrict shellfish processing operations and gear storage in residential areas, and the difficulty of renewing private shellfish company leases on town-owned bay bottom. This latter issue and the topic of mariculture in general are discussed in detail in Section 2.1.3.

The major problems of the deep water segment of the industry are listed below:

1. Shinnecock Inlet - the lack of adequate docking/product transfer facilities for both resident and transient vessels at existing privately maintained fish packing operations; lack of adequate area for gear storage and repair; and dangerous navigation conditions at Shinnecock Inlet.
2. Lake Montauk Harbor - lack of dock space for resident and transient vessels; shoaling in the vicinity of the two Town of East Hampton piers reserved for commercial fishing vessel use.
3. Greenport - lack of dock space due to competition from recreation oriented boating; shoaling at entrance to Stirling Basin.
4. Mattituck Inlet - inadequate area for docking, packing and parking.
5. Fire Island Inlet/Great South Bay - ice conditions in Great South Bay during winter prevent vessels from unloading their catch at packing houses on Orowoc Creek; no formal arrangement exists between fishermen and the Long Island State Park Commission for use of the Captree Charter Boat Basin for catch unloading and safe harbor during periods of heavy ice.
6. Port Jefferson Harbor - no dock space officially designated for use by charter boats or commercial fishing vessels in the Harbor; no

special permits granted to charter boats or commercial fishing vessels that currently use Town of Brookhaven marina facilities.

7. Freeport/Jones Inlet Area - little room available at Woodcleft Canal for commercial fisheries expansion; no provision for additional dock/pier and processing facilities should the opportunity for expansion arise; need for improvements in the navigation channel system at Jones Inlet/Freeport.

These problems were evaluated and are addressed by the facility, land use and channel dredging recommendations contained in Section 2.1.1.6.

Water pollution, public health questions relating to shellfish, and the details of fishery management were not within the scope of the fisheries subplan. The effort focused on the land use and facility problems of the shallow water segment of the industry. These problems are identified below.

1. Blockage of public access through traditional rights of way to the waters of both Georgica Pond and Hog Creek in East Hampton.
2. Lack of access to waters in Town of Huntington. Restricted parking along shoreline roads in Town of Huntington.
3. Inadequate boat ramp facilities in Napeague Harbor, Suffolk County Peconic Dunes Park, and Town of Huntington.
4. Shortage of docking space for commercial shellfishermen in Greenport and Town of Huntington.
5. Difficulty encountered by self-employed shellfishermen in obtaining permits for the construction of upgraded scallop shucking facilities on residential property.
6. Town of Southold actions against individual fishermen who store commercial fishing gear on residential property.
7. Need for town recognition of the shoreline access problems faced by shellfishermen and shellfish buyers.
8. Need for evaluation of the present status and future potential of aquaculture as a marine industry in Nassau and Suffolk Counties.
9. Need for policy decisions by New York State, Suffolk County, and various towns in Nassau and Suffolk Counties regarding the leasing of underwater lands for the purpose of aquaculture. Closely related to this problem is the resolution of the status of shellfish leasing activities and underwater land rights in the Peconic and Gardiners Bays.

Problems one through seven involve matters that are basically within the purview of the local towns and villages in the Nassau-Suffolk region,

which exercise zoning and land use controls and also have authority to implement bay management programs. State or Suffolk County construction of access facilities, such as boat ramps and/or docks that are designed to address the problems of the shellfishermen might very well conflict with shellfish programs at the local level, because such facilities could not be restricted on the basis of local residency requirements. Problems eight and nine are discussed at length in Section 2.1.3.

2.1.1.6 Deep Water Segment Recommendations

2.1.1.6.1 Dock and Pier Facilities at Shinnecock Inlet/Bay

The highest priority need of the deep water segment of the industry is the provision of additional dock and pier facilities for commercial fishing vessels in the Shinnecock Inlet/Bay region. These facilities are needed to meet present demands. However, additional facilities capable of servicing vessels larger (length, beam, draft) than those characteristic of the Long Island fleet may be necessary at Shinnecock Inlet/Bay in order for Long Island to take advantage of opportunities arising from extended U.S. fisheries jurisdiction.

There are three alternative options for facility construction and operation:

1. Private construction and operation of facilities on privately owned waterfront land.
2. Suffolk County lease of County-owned waterfront land to the private sector or a fishermen's organization, which would provide capital for facility construction and would operate the facility.
3. Suffolk County capital project funding for facility construction on County owned waterfront land; Suffolk County lease of pier facilities to individual fishermen with the County responsible for operation, or Suffolk County lease of pier facilities to a fishermen's organization or the private sector, which would be responsible for operation.

It is recommended that a solution to commercial fishing vessel facility problems at Shinnecock Inlet/Bay be implemented utilizing one or a combination of the options listed above. Private and/or public projects providing needed dock/pier space at Shinnecock Inlet/Bay should be implemented as soon as possible.

Option number one is constrained by the location and use of privately owned waterfront land in the Shinnecock Inlet/Bay region. This option, however, may minimize public expenditures, while maximizing private investment opportunities. A site on Shinnecock Bay near Shinnecock Canal has been proposed for the location of new, privately financed dock and pier facilities for commercial fishing vessels. Conclusions as to the suitability of this site and of the developer's plans and intentions must await the preparation of an engineering analysis of channel dredging requirements and consequent costs to the public if public dredging projects

are involved, as well as the formal review evaluations made by local government. This private project has potential for meeting the current need for vessel dock and pier facilities; however, its location in relatively shallow waters may necessitate the future provision of additional dock and pier facilities at a second location to accommodate larger vessels seeking offshore species (e.g., whiting).

Options two and three above involve public subsidy. This subsidy is limited to the use of public land in option two, while it includes the use of public lands and public funding of facility construction in option three. These options allow flexibility in site selection for a dock and pier facility that meets current and long-term vessel facility needs. The public subsidy for the financing of construction can be recouped over time through user fees. The public options can also be structured to guarantee the existence of commercial fishing vessel docks and piers in the Shinnecock Inlet/Bay region in the long-term future. A general description of a proposed public commercial fishing facility at Shinnecock Inlet is given below.

The best location for a public commercial fishery facility in the Shinnecock Inlet/Bay region is a three acre site owned by the County of Suffolk and held for general purpose use. The land is situated on the north side of Dune Road on the barrier beach just to the west of Shinnecock Inlet. The facility would consist of a pier 165 ft. long, 12 ft. wide with a 65 ft. "T" capable of accommodating 20 fishing vessels; a 300 ft bulkhead; and a 60 car parking lot. The parking lot and bulkhead would be constructed to accommodate heavy truck access adjacent to the bulkhead. The dock facility would accommodate access to docked vessels by light truck only.

Construction of the public facility will assure that the benefits of commercial fishing at Shinnecock are not constrained in the future by land use decisions that in effect exclude the fishermen from this area. Shinnecock vies with Montauk as the Island's major deep water commercial fishing port. The impact of present Shinnecock operations on the local economy amounts to several million dollars per year. While it is not prudent to provide municipal docking facilities for all commercial fishing vessels in various Nassau and Suffolk ports, the Shinnecock Inlet facility could serve as an alternative home port for those vessels displaced from other Long Island harbors because of future market decisions involving the use of shorefront land.

Shinnecock offers many advantages as the site for such a commercial fishing facility. Shinnecock is closer to the prime fishing grounds off the south shore of Long Island in water 30 to 100 fathoms deep than New York City, other Long Island ports, and ports in Rhode Island. Vessels stationed at Shinnecock are also close to those fishing grounds offering potential under extended jurisdiction. Furthermore, they have year-round access to offshore fishing grounds since tidal currents at Shinnecock Inlet prevent severe icing conditions.

There would be other advantages to local fishermen should the public facility be constructed. Additional docking facilities will permit more

efficient unloading, fueling, etc. at the existing Shinnecock Inlet facilities. With these constraints eliminated, commercial vessel use of Shinnecock could double. Grouping the vessels at a single facility would enhance security for both vessels and gear. Provision of facilities may also provide an incentive for the creation of a fishermen's cooperative. It should be noted that the rehabilitation of piers at Point Judith, R.I. was a major factor in renewing interest in Rhode Island's offshore fishing industry and in the creation of the Point Judith Fishermen's Cooperative Association, Inc. in 1947 with a charter membership of 65 people, operating 20 vessels.

A plan view of the proposed Shinnecock facility is shown in Figure 2.1-1. This site was chosen over other alternative sites further to the west because of dredging and wetlands considerations. Review of New York State Dept. of Environmental Conservation tidal wetlands maps indicated that wetlands destruction would be minimized if the facility were to be built adjacent to existing privately owned commercial development near Shinnecock Inlet. Use of sites further to the west and near Ponquogue Bridge would involve the destruction of larger areas of intertidal marsh. Only a small amount of high marsh would be sacrificed at the proposed site. Deep water is also closer to shore at the proposed site; this minimizes the littoral zone dredging associated with creation of the access channel and boat basin. The main channel shown in Figure 2.1-1 is a modified version of the channel described in the U.S. Army Corps of Engineers Shinnecock Inlet Navigation project. Plan recommendations concerning this project and other navigation channels are described later.

The key to the public facility is the willingness of the County of Suffolk to commit the land at the site for commercial fisheries facility development. This land was acquired for general purpose use; it is not a parks acquisition, although it is under stewardship of the Suffolk County Dept. of Works, Recreation and Conservation. Commercial fishermen have expressed their willingness to pay user fees required to make the operation self-sustaining. Estimated costs for the facility are shown below:*

1. Land acquisition	-	none
2. "T" pier	-	\$115,000
3. Bulkhead	-	115,000
4. Parking lot	-	30,000
	TOTAL	<u>\$260,000</u>

Annual maintenance costs are estimated to be 2% of construction costs (\$5,200) beginning the 10th year after construction. The life expectancy of the pier facility is 40 years. The initial dredging and maintenance of the access channel from the facility to deep water has not been included in this cost analysis. It is assumed that required dredging would be per-

*These cost estimates were prepared in 1979 for planning purposes only and are not based on engineering analyses. Detailed cost estimates should be developed for project implementation.

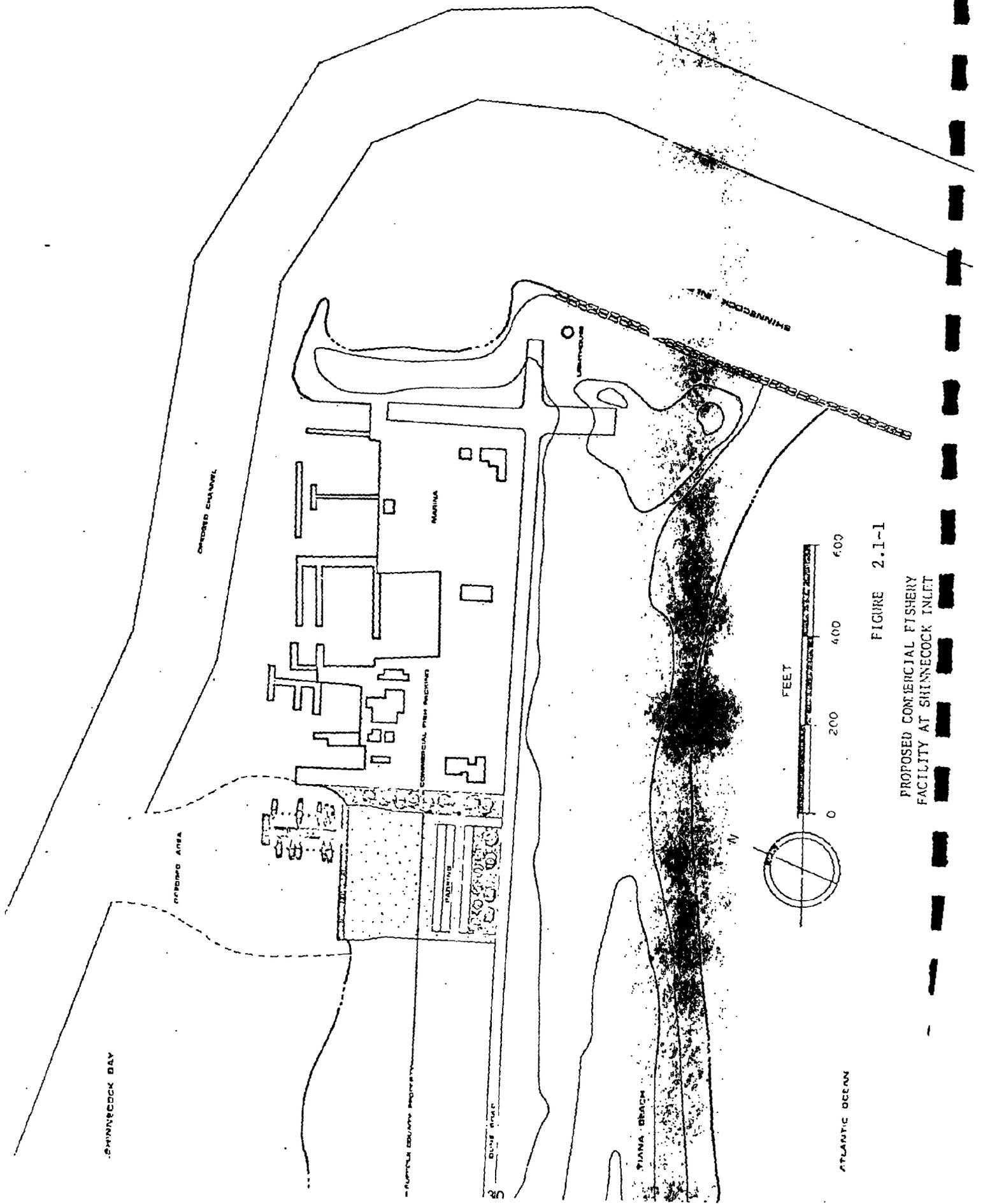


FIGURE 2.1-1

PROPOSED COMMERCIAL FISHERY
FACILITY AT SHINNED INLET

formed by the Suffolk County Dept. of Public Works as part of its waterway maintenance program.

Funding for the project could come from either a State or County public works bond issue. Using an interest rate of 7% over 40 years, the total construction cost would be \$775,200 (\$260,000 principal plus \$515,200 interest). If the pier facilities are leased to 20 individual fishermen, and maintenance charges are taken into account, the monthly fee that would have to be collected from each fishermen to amortize all costs would be \$100. Additional costs would be incurred by the provision of utilities of the facility. Total facility costs, however, could be reduced considerably if low interest loans or grants for project construction are obtained.

The U.S. Department of Commerce, Economic Development Administration does provide financial assistance for construction projects to areas designated on the basis of certain economic criteria. Suffolk County is eligible for this assistance, and piers are acceptable projects. Applications for assistance would have to be made through the appropriate New York State EDA representative; the applications are processed at the regional EDA office in Philadelphia. Another potential source of funds is the program authorized by the Commercial Fisheries Research and Development Act of 1964, P.L. 88-309, as amended. This act gives the National Marine Fisheries Service the authority to provide funds for projects designed for research and development of commercial fisheries resources of the nation. Other projects relating to fisheries can also be considered.

The option selected for operation of the facility should be based on the concept of maximizing the benefits of the facility for the largest number of people possible. Therefore, if the private sector is responsible for operation of the facility, covenants must be in place that will protect the right of the fishermen to market their catch in the manner they see fit. Dock leases should not be tied to marketing arrangements which restrict the economic independence of the fishermen.

2.1.1.6.2 Land Use Recommendations

Shoreline sites for docking and product transfer activities are required for the support of the deep water segment of the commercial fishing industry. Recommendations are made for the reservation of selected parcels of land in Nassau and Suffolk Counties for marine commercial use in anticipation of future industry needs. Sites were selected on the basis of available land, access to deep water and existing use. There are three options available for reserving the selected sites:

- a. use of local zoning powers and the recommendation that sites be placed in a marine commercial zone;
- b. public acquisition and land banking; and
- c. policy commitment for marine commercial use of those sites that are now publicly owned.

The land use recommendations are described below:

Town of Easthampton - Additional development of commercial fishery facilities at Lake Montauk may be constrained by the availability of shoreline land zoned Waterfront Business. In the event that fishery facility expansion on Lake Montauk is limited by existing development, Fort Pond Bay provides an alternative site for private commercial fishery facility expansion. The shoreline area at Fort Pond Bay is largely undeveloped. Deep water exists close to shore and the area is adjacent to the LIRR terminal. There is also good road access from the rail terminal to Montauk State Blvd. However, Fort Pond Bay does not provide natural protection from the heavy seas generated during storms. A breakwater may be necessary to provide safe dockage/moorage.

Figure 2.1-2 shows a site on Fort Pond Bay that could accommodate private commercial fishery facilities, provided that road access from the site to the rail terminal is improved. The site is zoned for Commercial/Industrial District uses including among others, the processing, storage and packing of fishery products. It is recommended that the zoning of the site be changed to Waterfront Business District. Such a change would be in conformance with the zoning of adjacent parcels, and would also reserve the site for water dependent uses, such as the establishment of commercial fishery facilities.

Village of Greenport - Two sites in the Village of Greenport, shown in Figure 2.1-3, should be reserved for marine commercial use. One site, which is presently zoned waterfront commercial, is located near the mouth of Stirling Basin; the other site, presently zoned one and two family residential, is located adjacent to 4th Street.

Village of Port Jefferson - Figure 2.1-4 shows the one site located in the Village of Port Jefferson that is recommended for marine commercial use. This site is located on Beach Street and is the site of oil terminal operations that are being phased out. It is recommended that this site be used for the construction of a docking facility that would accommodate the existing commercial vessels utilizing the recreation facilities at the head of the Harbor. This facility could be used not only for commercial fishing vessels, but also by charter boats, open boats, and research vessels. Such use would be compatible with present zoning (Marina Waterfront District)

Town of Hempstead - The four sites shown in Figure 2.1-5 are recommended for marine commercial use in Nassau County. It is recommended that the site located adjacent and east of the Long Island Sea Clam Co. and Brown Bros. Lobster Co. at Point Lookout, which is currently zoned residential, be reserved for commercial fishery related use. This site has excellent access to deep water through Jones Inlet; it is currently used for commercial and marina uses. Part of this site has recently been converted into a new dock and fish packing facility, the Jones Inlet Packing Co., which provides services for both resident and transient vessels. Expansion of this facility may meet the needs

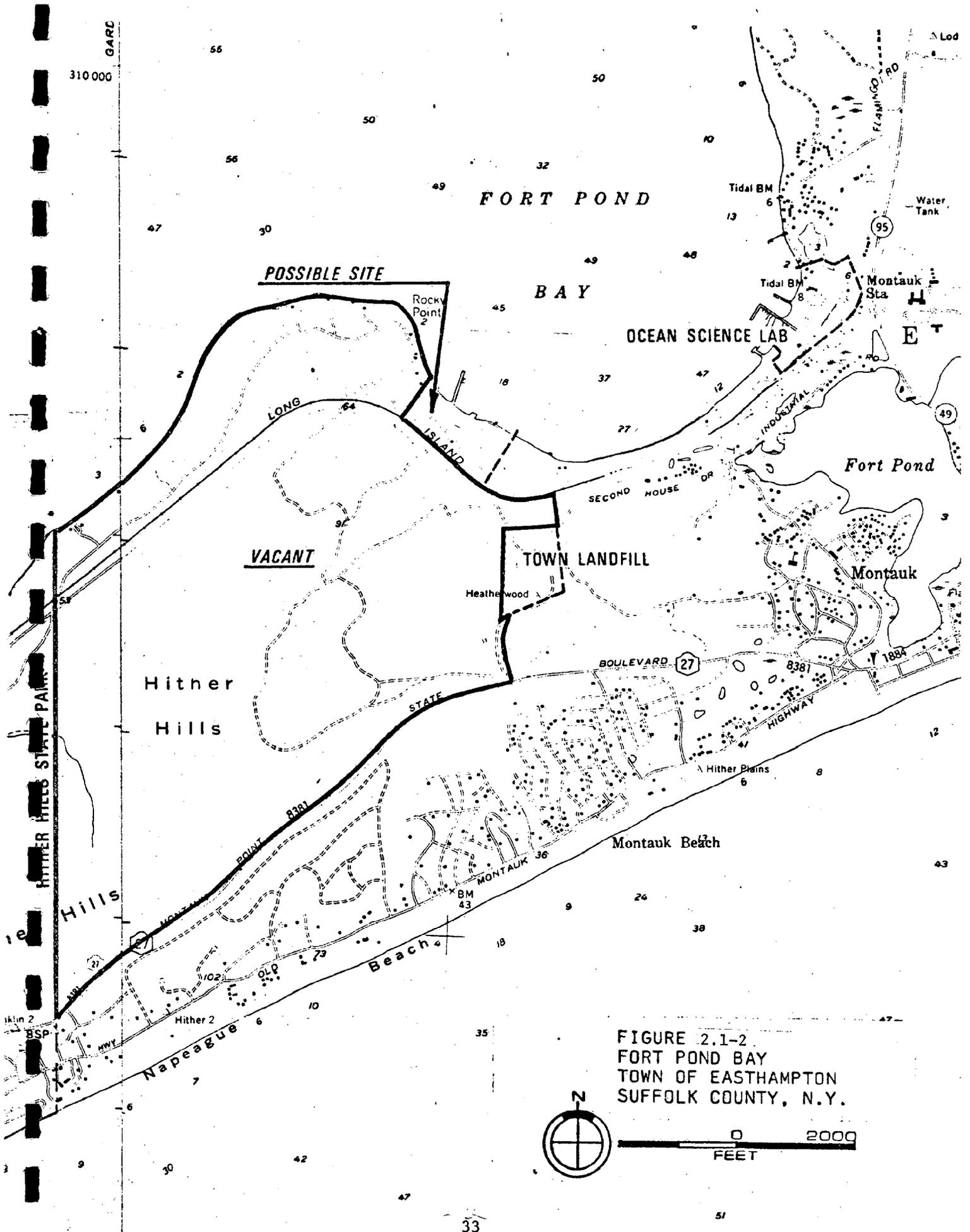


FIGURE 2.1-2
 FORT POND BAY
 TOWN OF EASTHAMPTON
 SUFFOLK COUNTY, N.Y.

NG ISLAND
SOUND

O R I E N T

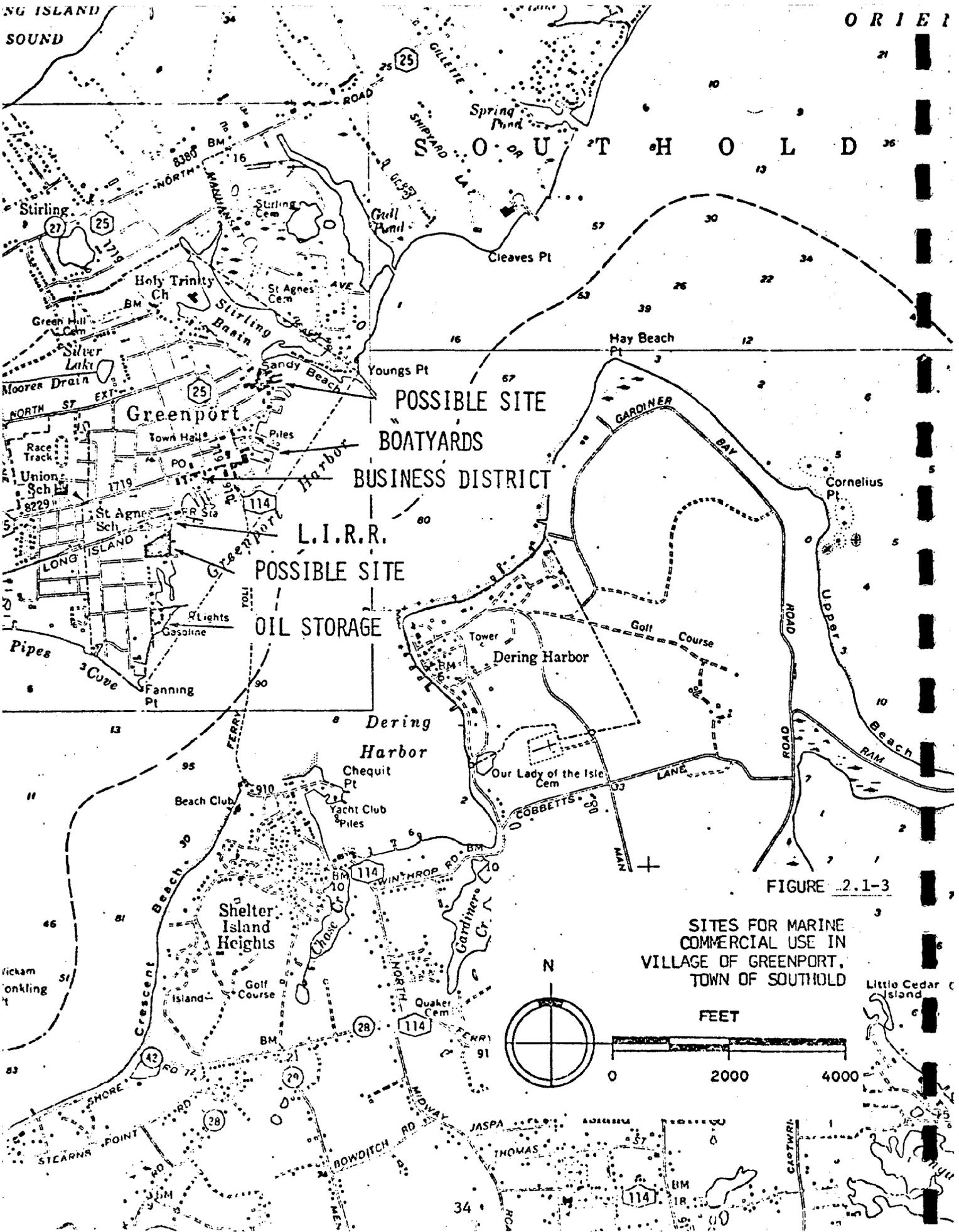


FIGURE 2.1-3

SITES FOR MARINE
COMMERCIAL USE IN
VILLAGE OF GREENPORT,
TOWN OF SOUTHOLD

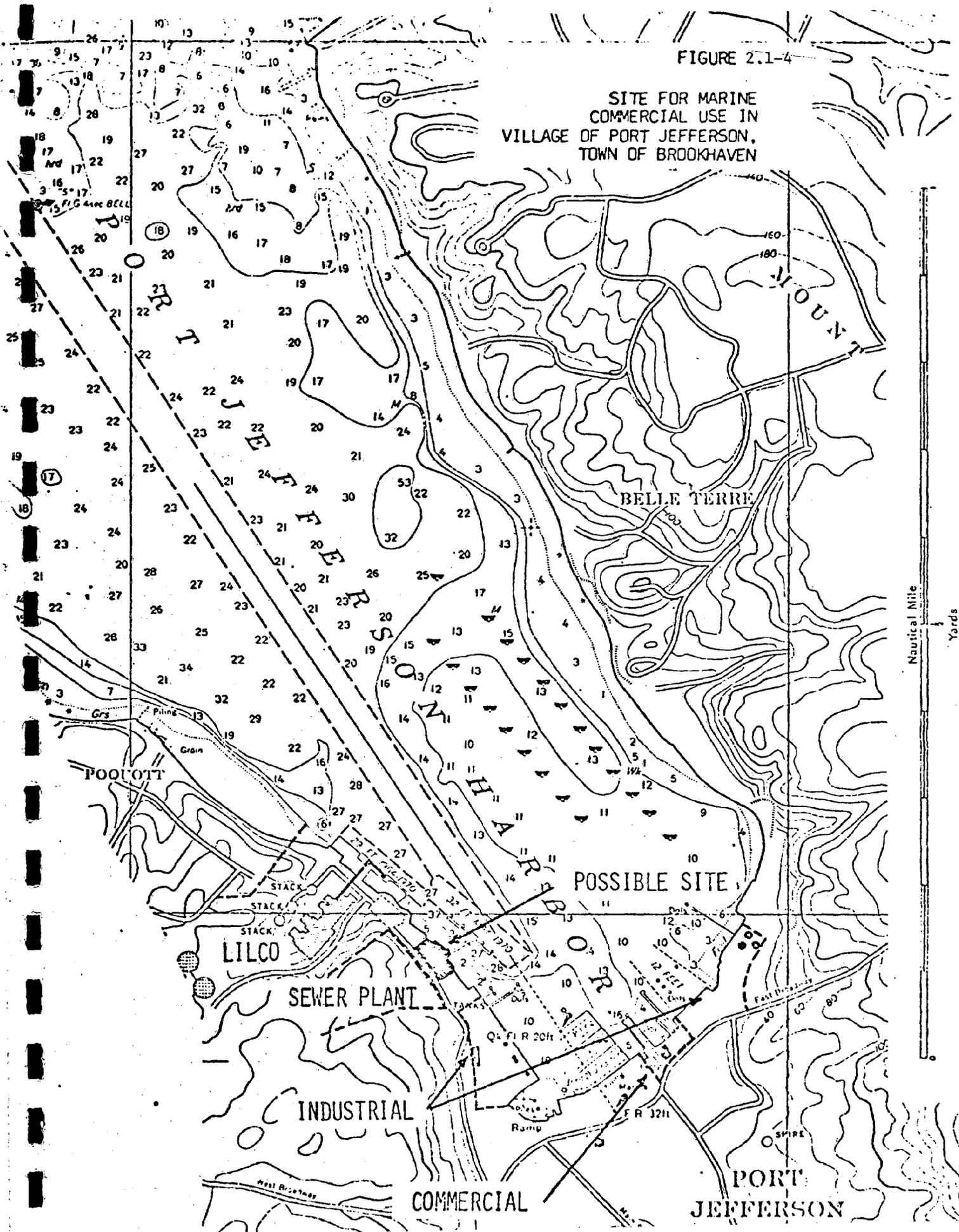
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Little Cedar Island

FIGURE 2.1-4

SITE FOR MARINE
COMMERCIAL USE IN
VILLAGE OF PORT JEFFERSON,
TOWN OF BROOKHAVEN



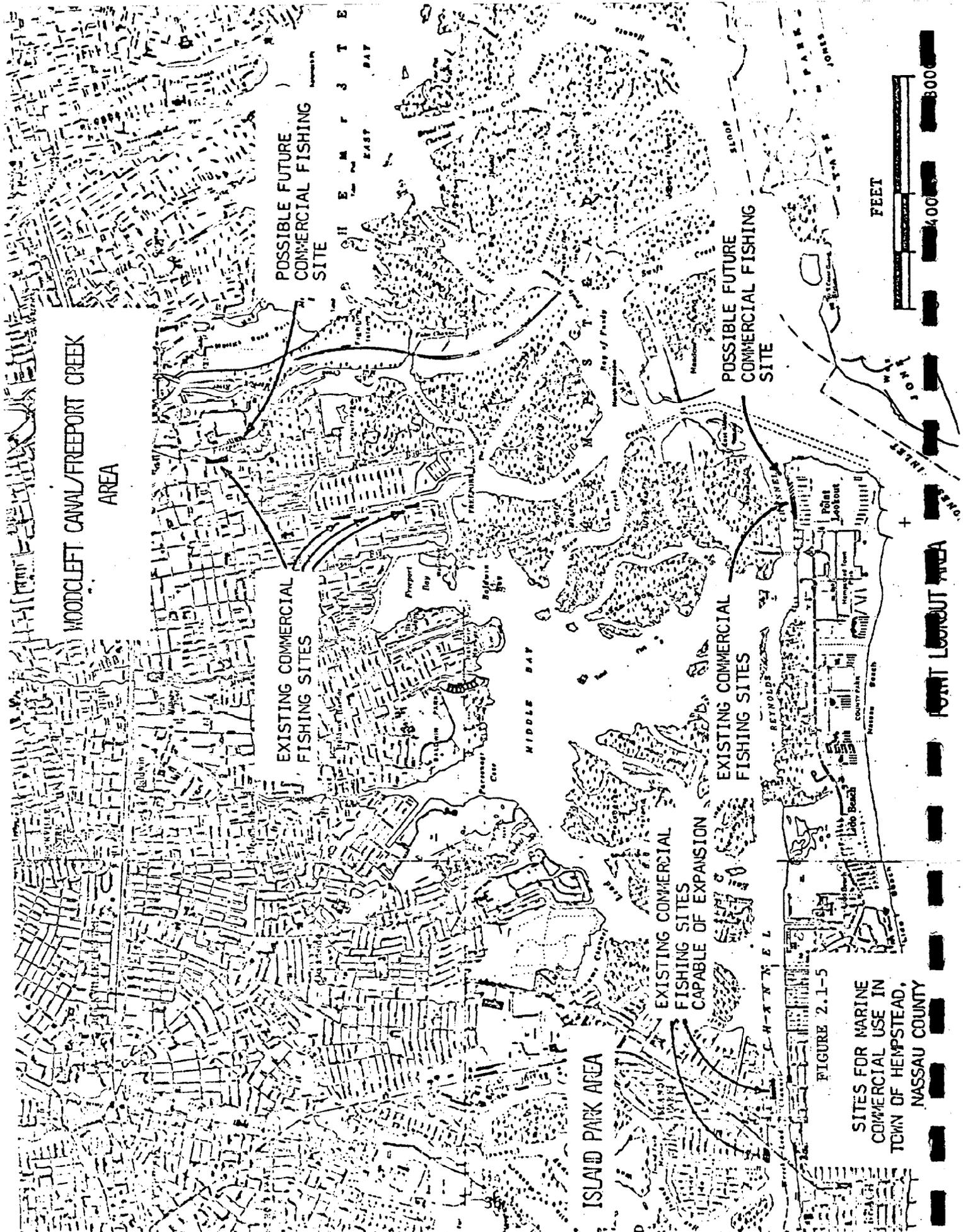


FIGURE 2.1-5
 SITES FOR MARINE
 COMMERCIAL USE IN
 TOWN OF HEMPSTEAD,
 NASSAU COUNTY

of the commercial fishing fleet in the Freeport/Jones Inlet area in the near future.

No space is available for expansion of commercial fishery uses at Woodcleft Canal. However, another site in the Village of Freeport - a parcel owned by the Town of Hempstead on the east side of Freeport Creek - offers opportunity for commercial fishery expansion. Two sites located in the Island Park area offer opportunity for the location of additional facilities. The commercially zoned site to the west of Austin Blvd. in the Village of Island Park was formerly utilized by the Pan American Dynamic Corp., a firm which converted two abandoned oil tanks into cold storage facilities. The Jordon Lobster Co. uses the industrially zoned site located east of Austin Blvd. Vacant land is available here for future commercial fishery development. Both sites have deep water access on Reynolds Channel.

This plan encourages the expansion of fish processing facilities in Nassau and Suffolk Counties that provide for maximum product utilization and recovery. Maximum utilization implies a diverse product line, such as human food, pet food, fish meal and fertilizer. Product recovery at each processing stage would minimize waste disposal problems. Although processing plants could be established or expanded at the sites described above, it is not necessary that such plants be located at the shore; they can easily be accommodated on inland industrially zoned property with good transportation access.

A fish processing facility utilizing the fish landed at Lake Montauk Harbor, Shinnecock and Greenport, could be located on industrially zoned property adjacent to Westhampton Airport. The property is bordered on the south by the Airport, on the north by the Sunrise Highway, on the east by Route 104 (Quogue Riverhead Road), and on the west by Route 31 (Old Riverhead Road). Processed fish from the facility could be shipped overland by either road (Sunrise Highway) or rail (LIRR-Montauk Branch) transportation. The proximity of the Westhampton Airport could foster the development of export markets for high value processed fish products.

A regional fish market could benefit Long Islanders by eliminating the costs and delays of routing fish landed in Long Island harbors through the Fulton Fish Market and back out to Long Island retail markets. The development of a Long Island regional food market for produce, meat and fish has been proposed for a vacant warehouse located on a 34 acre parcel of land in Brentwood. The site, located between Sagtikos State Parkway and Emjay Boulevard just north of Suffolk Avenue, already has direct rail access and acceptable road access. Studies on the feasibility of a regional food market are currently underway.

2.1.1.6.3 Channel Dredging

The continued economic viability of Long Island's deep water commercial fishing fleet, and the potential for economic expansion of the industry, depend on the access to shoreside docking and unloading facilities. Many of the navigation channel approaches to commercial fisheries facilities provide inadequate water depth for the vessels already in service, and these inadequacies are likely to become more severe as larger boats with deeper drafts are purchased to exploit fish resources

within the U.S. Fishery Conservation Zone. Commercial fishing ports along the south shore have the greatest potential for expanded economic activity, and the greatest need for improved access and dredging.

Three major north shore and three major south shore centers for deep water commercial fishing activity have been identified. The north shore sites -- Port Jefferson Harbor, Mattituck Inlet, Greenport -- are served by existing Federal channels. The channel at Port Jefferson already has adequate depth (25 feet). Mattituck Inlet channel is authorized to only 7 feet, and modification of the project to at least 8 feet at mlw is recommended. Greenport has a docking area adjacent to deep water that services large fishing vessels; the 8 foot Federal channel into Stirling Basin presently serves smaller vessels, but could be enlarged to 12 feet or more if additional fisheries facilities are developed on the western shore near the mouth of the basin.

The south shore sites -- Lake Montauk Harbor, Shinnecock Inlet, and Jones Inlet/Freeport -- are served by both Federally and locally maintained channels whose depths no longer appear to be adequate to provide safe access for deep water vessels. Channel shoaling makes navigation hazardous for existing vessels with drafts of about 8 feet, and makes access impossible for vessels with drafts of 12 feet or more. The LIRPB recommends Federal maintenance of all south shore channels serving regionally significant deep water commercial fisheries facilities at depths on the order of 15 feet, if this depth proves to be consistent with the protection of environmental values.

Specifically, the LIRPB recommends the modification of existing Federal channel project dimensions (depths) for Lake Montauk Harbor and Shinnecock Inlet (including a portion of the Intracoastal Waterway leading to existing and potential dock and pier facilities to the west of the Shinnecock Inlet on the bay side of the barrier beach). At Lake Montauk Harbor, local interest should maintain adequate depths at existing commercial pier facilities. These facilities should be expanded, pending the favorable outcome of an environmental impact assessment, to provide adequate shoreline access for the transient vessels utilizing Lake Montauk Harbor on a regular basis.

The Corps of Engineers Fire Island Inlet navigation project should be maintained at authorized dimensions (10 foot depth). Should a 12 foot draft in this inlet be required in the future, the Corps of Engineers should conduct a study to determine how changing inlet configuration would impact tidal ranges, wetlands, salinity levels, and shellfish populations in Great South Bay. If adverse impacts appear likely, the concept of deepening the channel should be abandoned. The portion of the State Boat Channel from the inlet to the Captree Boat Basin should be made part of the Federal channel system within Great South Bay. This channel system should also be expanded to include the shallower (8 foot) West Channel which runs north from the inlet to the existing Federal channel and fisheries facilities on Orowoc Creek in Bay Shore.

In southern Nassau County, existing commercial fisheries facilities and potential sites are located adjacent to Jones Inlet at Point Lookout, on the mainland within Woodcleft Canal and Freeport Creek, and in Island Park on Reynolds Channel. The LIRPB recommends that the Federal channel project for Jones Inlet be modified (deepened) to approximately 15 feet, and that the channels within Middle Bay that serve Woodcleft Canal and Freeport Creek, including Long Creek channel and the Narrows channel, also be maintained by the Army Corps of Engineers. The LIRPB also recommends that Congress authorize Federal maintenance of Reynolds Channel and Sea Dog Creek, and modify the existing project for East Rockaway Inlet Channel to 15 feet, so as to provide deep water access along the bay side of the barrier island.*

2.1.1.7 Shallow Water Segment Plan Recommendations

This section contains the recommendation addressing the land use/facility problems of the shallow water segment of Long Island's fishing industry. The recommendations are inherently different from those contained in Section 2.1.1.6 mainly because onshore facilities supporting the shallow water segment are not concentrated at a few major ports, as is the case with the deep water segment. Also, the shallow water shellfisheries do not have deep water access problems. The recommendations are as follows:**

1. The Towns of Huntington, Brookhaven, Southold, Shelter Island, East Hampton, Southampton, Islip, Babylon and Oyster Bay should prepare and implement shoreline access plans supporting the commercial shellfishing activities of their respective baymen. These access plans, prepared with the advice of baymen's associations, shellfish commissions, and State, county and town environmental organizations should provide adequate boat ramps and year round parking space for commercial shellfishermen and other means of physical access to the water. Product transfer sites at appropriate locations within each township, including the use of sites within facilities reserved for recreational use, should be identified and established. The Towns of Islip, Babylon and Brookhaven have designated or are in the process of designating such sites.
2. The towns mentioned above should investigate options for the storage of commercial fishing gear, including boats, trailers, nets, traps, etc. These options include the granting of variances in order to permit individual storage on residential property, individual storage on industrial or commercial property, cooperative storage on industrial or commercial property, and cooperative storage in town-owned facilities. In those towns where land use

*Sea Dog Creek, which is presently under the jurisdiction of the L.I. State Parks Commission, connects Long Creek Channel with Reynolds Channel while bypassing the fixed bridge (vertical clearance 20 feet) on Loop Parkway over Reynolds Channel at Point Lookout.

**The most pressing problems faced by the shallow water segment of the industry are those related to the management of shellfish resources, and the availability of these resources in light of pollution and public health considerations.

problems relating to the establishment of shellfish processing facilities are apparent, options for utilizing a centralized process facility on a cooperative basis should be investigated. Solution to the gear storage and shellfish processing problems may require zoning code amendments.

3. Detailed recommendations concerning mariculture and related activities in the Long Island coastal zone are found in Section 2.1.3.9.

2.1.2 Recreational Fishing

2.1.2.1 Introduction and Objectives

Sportfishing activities are an important segment of Long Island's tourism/recreation economy. This section concludes with recommendations that are designed to provide marine anglers with increased opportunities and various forms of access to marine waters that have recreational fishing potential. It is based on the LIRPB report, A Marine Fisheries Sub-plan for Nassau and Suffolk Counties (15 Sept. 1978). The objectives of this report that pertain to recreational fishery activities are 1. to recognize the importance of marine fisheries as a recreational resource in the Long Island region; and 2. to develop recommendations that take cognizance of the needs of anglers for facilities and access to the shoreline and marine waters.

The impact of recreational fishing activity on the Long Island recreation/tourism industry is estimated and the land use and shoreline access problems of angler concern are identified. Again, as is the case with Long Island's commercial fishing industry, published information on recreational fishing activity (finfishing, crabbing, clamming) and its impacts on Long Island is scanty, partly due to the fact that a comprehensive data base reflecting recreational use of living marine resources does not exist.

2.1.2.2 Recreational Fishing Activity by Mode and Target Species

Recreational fishing activity can be divided into surf fishing; fishing from piers, bulkheads, floats and jetties; bank fishing; and boat fishing. Boat fishing can be further subdivided into fishing from private craft that range in size from small runabouts to large sportfisherman; from charter and party boats; and from boats rented from livery operations. In 1975, roughly 90,000 motorboats were registered in Nassau and Suffolk Counties. This figure does not include sailboats and other boats without engines. Approximately 200 party and charter boats are based in the region. The angler's choice of mode depends on the degree of his commitment to sportfishing, disposable income, investment in fishing equipment, and the target species and character of the water fished.

The Long Island marine environment offers a wide variety of fish and shellfish to the recreational angler. The area is considered one of the best fishing areas in the world, not only because the quality of the fishing is high (and fishing opportunities exist at all times of the year), but also because it is accessible to many millions of people. Of particular interest to the angler are species such as the blackfish, bluefish, codfish, blackback flounder, fluke, Atlantic mackerel, pollack, porgies, black sea bass, striped bass, weakfish and white perch which frequent or inhabit relatively shallow, nearshore waters. These are the species offering recreational opportunities to the largest number of people. This interaction of fish and people also results in resource management problems in the coastal zone.

Other species of fish, such as the various types of tunas and sharks, white marlin, dolphin, and swordfish - the "big game species" - are also

prime targets of New York marine anglers fishing from private boats and charter boats in deeper offshore waters to the south and east of the Island. Tuna and shark tournaments are common summer events. Fishing for sea run trout is also a popular activity at the mouths of Long Island streams, especially the Connetquot, Carmans and Nissequogue Rivers.

Crustaceans and mollusks are also important recreational fisheries resources in nearshore waters. The south shore and eastern bays support a large blue claw crab fishery. Soft clams, mussels, bay scallops and hard clams are harvested extensively by "mess-diggers." Various forage species, e.g., American sand lance, silversides, mummichug, striped killifish, sand shrimp, grass shrimp, are also gathered for use as bait.

2.1.2.3 Recreational Fishing Catches

The National Marine Fisheries Service has estimated that 2,980,000 New York State residents participated in marine recreational finfishing and shellfishing during the period mid-June 1973 to mid-June 1974. Although available data are scanty, it is believed that the recreational catch of some species is many times the respective commercial catch, thus leading to the inevitable conclusion that for fishing management programs to succeed in the long run, the impacts of both recreational and commercial catches on fish stocks have to be considered. For example, the 1970 angler catch of striped bass in New York was estimated to be 14 times greater than New York commercial landings of striped bass; the bluefish catch was over 13 times greater than commercial landings, and catches of cods were 35 times greater. The recreational catch of hard clams in Long Island waters may approach the same order of magnitude as the commercial catch.

Although the ratios are in part, based on rough estimates of sport catches, they do show the relative sizes of sport and commercial catches landed in New York. Sport catches as a whole and for individual species are very significant. To be effective, management programs must include recreational as well as commercial fishing activity. This requires documentation of sport catches on a regular basis. Such statistics are not now available.

2.1.2.4 Economic Impacts of Recreational Fishing

Available information on the economic impacts of recreational fishing is limited. National Marine Fisheries Services data for the Atlantic Coast have been used to estimate expenditures in New York State by recreational fishermen.

In 1970 Atlantic coast marine fishermen, excluding recreational shellfishermen, spent \$636 million on food, lodging, transportation, equipment, etc. The average expenditure for each fisherman per year was \$127. An extrapolated annual marine angler expenditure in New York State of \$378 million is derived by multiplying the annual per capita expenditures by the estimated number of marine anglers in New York State (2,980,000). The monetary worth of benefits is somewhat harder to determine. It includes the value of the fish caught by anglers as food, as well as the aesthetic and psychological satisfactions of recreational fishing. The

food value is indeed high, as pointed out by the magnitude of the recreational fish catch. The psychological benefits of fishing are indeed great, but are difficult to measure in economic terms.

2.1.2.5 Recreational Fishing Land Use/Facility and Management Problems

The problems associated with recreational fishing can be grouped under two broad categories: access and management. Access problems relate to the need for facilities and sites which increase recreational fishing opportunity. Management problems include the need for user information and the development of strategies designed to assure a sustainable yield and an equitable apportionment of fishery resources among recreational and commercial fishing interests.

Recreational fishing activity in New York marine waters is expected to increase in the future; projections indicate that there will be 30% more fishermen in the Long Island region by 1990, as compared to the 1970 level. Private ownership and development of coastal land pose legal and physical barriers to angler access to the shore. This limited access, as well as the intense competition for mooring space in public and private marinas, is one of the reasons for the growth in the charter and open boat industry on Long Island during the past few decades. Available shoreline recreational facilities are used for swimming, picnicking, etc. with the result that fishermen are effectively limited as to time of day and locations when fishing will not conflict with these activities. Night fishing is often restricted because of regulations designed to reduce the threat of park vandalism. Facilities for increasing angler access are required. These include boat ramps, fishing piers, and artificial reefs. Additional shoreline areas are also needed to increase bank and surf fishing opportunities. Charter, open and livery boat operations should be encouraged by local government to meet future demands.

Boat ownership is one solution to the problem of angler access. The vast majority of boat owners are fishermen. At the present time, there are only five boat ramps with parking that are open to the general public in Nassau and Suffolk Counties. They are located at Albany Ave., Freeport; Heckscher State Park; Peconic Bay Blvd, South Jamesport; Manhasset Blvd., Greeport; and Point Lookout. Additional state financed ramps are needed. Part of the need can also be met by county boat ramp/parking facility programs.

The quality of boat angling can be increased through the construction of artificial reefs. Artificial reefs are underwater structures built from a variety of materials - scrap tire/concrete modules, concrete and building rubble, rocks, junk cars, scuttled ships and barges. These structures provide an environment conducive to colonization by fouling and encrusting organisms and the concentration of forage and gamefish. Six reefs have been constructed in the ocean off the south shore of the Island; one reef has been built in Great South Bay near Fire Island Inlet. All are frequented by both private and charter/open craft, and fishing pressures are high. Additional reef sites are warranted.

Other types of access are required to meet the needs of anglers who don't own boats. Piers and docks/bulkheads utilized by fishermen are

usually restricted to local residents, or have been constructed primarily for boat accommodation. Boating disturbances and the location of these piers hamper angler success. Only eight fishing piers open to the general public have been built on Long Island; seven of the piers are located in the Jones Beach, Captree, Robert Moses State Park complex; one bay fishing pier is located in the Town of Hempstead. More piers designed specifically for recreational fishing are needed.

Charter boats, open boats and liveries are other forms of access to fishermen who are not boat owners. Approximately 200 charter and party boats operate out of Long Island ports; nowhere else in the U.S. can one find as many boat services for hire concentrated in such a small geographic area. Over 95% of the charter businesses are found on the Island's south shore. Competition for the limited amount of mooring space along the north shore, as well as good transportation to and the availability of dock space in the south shore bays have influenced this geographic distribution. The charter boat industry on the Island is prospering now, and is expected to do so in the future. As demand increases, expansion in the industry will most likely occur at the existing charter boat centers. There may be a continuation of the trend to invest in larger, faster vessels in the future in order to provide access to better fishing grounds farther offshore.

Development of charter facilities in north shore harbors has been limited by town regulations governing use of municipal piers by commercial interests. To increase charter facilities along the north shore, it appears that new sites, rather than those currently utilized by pleasure craft, will have to be developed.

Access to shorelands is the major problem of bank and surf fishermen. This is due in part to a lack of physical facilities, such as roads, parking lots and comfort stations. Residency requirements for park use also restrict angler access and mobility. Public use of the Long Island Sound shoreline between Mt. Sinai Harbor and Wading River is extremely limited; however, this area offers great potential for expanding angling opportunities. Surf fishermen working the south shore barrier beaches and jetty/groin areas also have access problems. Some groin fields offering fishing opportunities, e.g., at Westhampton Beach, are not accessible due to the lack of access corridors, parking lots and related facilities. At the present time the only practical land access to such areas as Moriches Inlet, the Fire Island National Seashore, Democrat Point, and Shagwong Point, is by means of vehicles equipped for oversand travel. Travel on public beaches is restricted by the rules, regulations and permit systems of the Suffolk County Dept. of Parks, Recreation and Conservation, the Long Island State Park Commission, the Fire Island National Seashore and various townships that cover required equipment and prescribe the locations where and when traffic is allowed. Mobile sportfishermen organizations, such as LIBBA and GSMSF (Long Island Beach Buggy Association and Great South Beach Mobile Sportfishermen), believe that controlled beach travel by vehicles should be continued in the future to allow access to inlet areas, as well as to open stretches of beach where potential conflicts with bathers and strollers would be minimized. Continuation of the privilege of vehicular access to portions of the Fire Island National Seashore in the future is uncertain.

It is not now possible to determine whether or not current recreational

and commercial fishing pressures are at levels that jeopardize sustained yields of fishery resources in the future. To prevent overfishing and the collapse of major commercial and recreational fisheries, management programs must be devised that consider the impacts of both recreational and commercial harvesting activities. Much of the information on which management programs must be based is not available. Required information for management and management recommendations are discussed in Section 2.1.2.6.5.

2.1.2.6 Recreational Fishing Recommendations

Access to the fishing opportunities provided by shoreline and nearshore waters should be improved by 1) building more fishing piers and boat ramps; 2) developing access programs for selected shoreline areas in public ownership that are not now open to angler use; and 3) acquiring additional shoreline areas for angler usage. Boating access to a high quality fishing experience can be improved by the construction of artificial fishing reefs and by the expansion of charter, party boat, and livery facilities. Expansion of recreational fishing opportunities must be coupled with a fisheries management program designed to assure continued supplies of fish in the future. The first step of such a program is the establishment of a fishing license program covering both recreational and commercial fishermen.

2.1.2.6.1 Fishing Piers

Fishing piers should be constructed at Robert Moses State Park. The fishing potential along the bay side of Robert Moses State Park is excellent and several piers should be constructed between the U.S. Coast Guard station and the Fire Island lighthouse. A fishing pier should be constructed at Shoreham in connection with the LILCO nuclear power plant. The N.Y.S. Dept. of Environmental Conservation (NYSDEC) should construct fishing piers at New Suffolk, Orient and Napeague Bay. It is also recommended that the Suffolk County Dept. of Public Works proposal for a fishing pier at Hampton Bays in connection with the reconstruction of the Ponquogue Bridge be implemented.

2.1.2.6.2 Boat Launching Facilities

Areas of prime consideration for the construction of boat launching ramps are as follows:

1. Mattituck Creek
2. Northwest Creek Suffolk County Park
3. Shirley Marina County Property

There are no boat ramps open to the general public on Long Island Sound between Mt. Sinai and Orient Point, a stretch of approximately 40 miles. The NYSDEC should finance and construct an additional boat ramp with adequate parking at a site on Mattituck Creek in order to increase access to this underutilized stretch of Long Island Sound. Suffolk County should construct a boat ramp at the Northwest Harbor County Park in order to provide angler access to both Gardiners Bay and the Little Peconic Bay. It is recommended that the ramp be constructed on the Northwest Creek inlet sandspit by the Suffolk County Dept. of Parks, Recreation and Conservation.

The sandspit and mouth of the Creek have already been subject to dredge and fill activities. The Suffolk County property at Shirley, fronting on both the William Floyd Parkway and the Great South Bay, is also well suited and ideally located for the construction of a boat launching ramp by Suffolk County Dept. of Parks, Recreation and Conservation. Fishermen would have access to both the eastern end of the Great South Bay as well as Moriches Bay and Inlet. The County owned parcel of land is currently unused and has already been subjected to filling, bulkheading and paving.

Other locations in both Nassau and Suffolk Counties that might offer potential sites for the construction of public boat ramps are listed below:

1. Hempstead Harbor Nassau County Park
2. Harbor Arts Suffolk County Park
3. Bergen Point or Indian Island Suffolk County Pk. in Babylon Town
4. West Meadow Beach, Town of Brookhaven Park
5. Wading River
6. Napeague Bay, State of New York
7. Peconic Bay near Shinnecock Canal

The first three sites are located on either Nassau or Suffolk County owned property. The only existing boat launching ramp operated by Suffolk County is at Timber Point County Park. The car and boat trailer parking facilities at Timber Point are inadequate and need to be expanded. The N.Y.S. boat ramp facility at Freeport should also be expanded to meet future needs.

2.1.2.6.3 Shoreline Access

Shoreline access for anglers can also be improved by establishing controlled access programs governing use of shorelands already in public ownership, but which are now closed to fishermen. A model of such a limited access program for anglers that has worked very well is that operated by the Long Island State Park Commission at Caumsett State Park. Nassau County should establish a controlled access program for fishermen at two sites - the Sands Point Naval Devices/Guggenheim complex and the Welwyn estate - both of which are owned by the County and are adjacent to shore fishing areas of high potential.

The Long Island State Park Commission should repair damaged facilities at Parking Field #9 at Jones Beach State Park and reinstate fishermen access at this site. Fishermen use of this area should be limited to night fishing to avoid conflicts during the bathing season. This agency should also investigate the feasibility of establishing additional access points for anglers along the State Boat Channel east of the Wantagh State Parkway. Small fishing piers, bank fishing sites, and walkways may be acceptable in this area if designed with a knowledge of natural resource capability.

Thousands of surf and jetty fishermen rely on four-wheel drive vehicles for access to high quality fishing grounds. The programs established by the Suffolk County Department of Parks, Recreation and Conservation, the Long Island State Park Commission, the Fire Island National

Seashore and other agencies, which allow beach travel under a permit system should be maintained. Regulations governing controlled access at dune crossings, time and season of permitted travel, required equipment, and the prohibition of traffic on dunes, vegetation, or in bird nesting areas should be strictly enforced and appropriate penalties levied against violators.

The Baiting Hollow GACP area should be acquired by Suffolk County and developed in part to accommodate shore fishing. An inland parking facility located within close walking distance of the shoreline access point would considerably reduce land acquisition and would minimize potential damage to the bluffs. The Suffolk County owned property at Tiana Beach should be developed to accommodate fishermen access to the ocean shore. Should the opportunity arise, a site at Sebonac should be acquired and also developed to accommodate fishermen access.

Should funding become available under Section 12 of the Coastal Zone Management Act Amendments of 1976 - "Acquisition of Access to Public Beaches and Other Public Coastal Areas" - land for parking facilities and access corridors should be acquired in those areas where the potential for shore fishing or its expansion exists, but private ownership of property landward of mean high water currently restricts shore fishing access. An area renowned for its superb shore fishing and also subject to shoreline residential development pressures is Montauk. The area bounded by Fort Hero, Ditch Plains, State Road 27 and the Atlantic Ocean is privately owned and has no public roads leading to the ocean shoreline. The approximately three miles of boulder-strewn, indented beach stretching from Ditch Plains to Fort Hero contains such famed Montauk striped bass schooling areas as "Frisbies," "Churches," "Coconuts" and the "Tea House." These are now virtually off-limits to shore fishermen since private development of the shorefront lands in the area during the past decade has restricted the surfer's access to the shoreline.

In the area between Ditch Plains and the western boundary of Fort Hero, a parking facility and access corridor to the beach from State Road 27 is needed to once again provide opportunities for shore fishing. There are several alternative options for obtaining the parking facility and access corridor.

1. State condemnation of access easement and acquisition of oceanfront land for parking facility.
2. State acquisition of land parcels providing for a corridor from State Road 27 to the Atlantic Ocean.
3. In the event that a parcel of land in the area is subdivided in the future and it contains a public road from State Road 27 to oceanfront lots, this road could provide shore fishing access if abutting oceanfront lots are acquired by the State.

2.1.2.6.4 Artificial Fishing Reefs and Charter, Party Boat and Livery Facilities

The NYSDEC should improve fishery habitats by constructing and/or

completing artificial reefs in areas accessible to fishermen. The following sites previously recommended by NYSDEC should be investigated and construction priorities assigned.

Type	Location	Relative Size	Service Area
Offshore	Atlantic Ocean at Long Beach	Medium	Offshore Jones Inlet
Inshore	Great South Bay #2	Small	Central Great South Bay
Inshore	Jones Inlet Short Beach	Small	Freeport, Jones Inlet area
Inshore	Peconic Bay-Great	Small	Peconic Bay
Inshore	Peconic Bay-Little	Small	Peconic Bay
Inshore	Gardiners Bay	Small	Gardiners Bay

The offshore reefs at Fire Island, Moriches and Shinnecock should be completed to design specifications. Construction of the Smithtown Conservation Advisory Council artificial reef in Smithtown Bay is expected to be completed by the fall of 1979.

Small boat rental facilities with adequate parking should be established at Little Neck Bay. Charter and/or party boat facilities should be established at Port Jefferson Harbor and Mattituck Creek. Charter/open boats currently using recreational facilities at the head of Port Jefferson Harbor should be relocated to the site of the proposed commercial pier on the Harbor's west side. Facilities at Greenport, Montauk, Captree and Freeport should be expanded if warranted by sufficient demand. This expansion should be encouraged by local government.

2.1.2.6.5 Marine Fisheries Management Information Needs and License Recommendations

The goal of developing fishery management plans based on the maintenance of maximum sustained yield (the maximum harvest that can be taken annually forever) or optimum yield (the amount of fish, based on an analysis of maximum sustained yield as modified by relevant economic, social and ecological factors) is supported by the premise that such an approach to fisheries management will result in more long-term benefits to society as a whole than an approach characterized by little or no control on total harvest by species. The minimum information required to develop a management plan for a particular species includes estimates of the following:

1. standing crop (number and total weight of a species in a given area at any time);
2. growth (increase in individual biomass);

3. recruitment (number of species young that survive each year to reach harvestable size);
4. natural mortality; and
5. fishing mortality from both recreational and commercial harvests.

To be effective, the management program must include estimates of harvesting from all recreational and commercial groups taking the resource, and controls must be based on the natural mechanisms governing resource renewal. To be equitable, both commercial and recreational fishermen must be subject to control if management is to succeed.

The next step in the development of a fisheries management program for a given species is the determination of the total allowable catch on the basis of the above information. The total allowable catch quota should ensure that adequate stocks of the resource remain for reproduction. The total allowable catch would have to be subdivided into commercial and recreational quotas. The recreational quota could be assigned to individual anglers as a bag limit.

Much of the required information for developing marine fishery management plans is not available. Catch and effort statistics are of prime importance. A starting point for accumulating the required information would be the establishment of marine fishing license programs covering commercial and recreational fishermen. At the present time, New York State residents do not have to acquire licenses for either recreational or commercial marine finfishing. State license programs do cover the commercial harvesting of shellfish and crustaceans, and a state license is now required by those taking lobsters on a recreational basis. All major shellfish producing towns in Nassau-Suffolk have license programs covering the commercial harvest of shellfish and crustaceans; only a few of the towns require a license for recreational shellfishing.

It is recommended that all marine recreational and commercial fishing activities be covered by license programs. License fees should be set at an affordable level that will cover issuance and administration costs and provide a fund to pay for the development of fisheries management plans and the conduct of fisheries related research. License legislation should be flexible to accommodate means for the acquisition of fishing management data, such as questionnaires and catch logs.

There are two alternative approaches for establishing marine fishing license programs: Federal action and New York State action. Migratory species would probably best be covered by regional fishery management plans encompassing the entire range of the species. Therefore, as far as migratory species are concerned, the best approach would be the establishment of a Federal license program covering both commercial and recreational fishermen. Such a program would be analogous to that conducted by the U.S. Dept. of Interior in the regulation of migratory waterfowl hunting. Management program activities within the limits of state jurisdiction could be implemented by New York State, provided a portion of the funds received by the Federal government is earmarked for such purposes and returned to the states. Non-migratory species, such as the hard clam, that are found pri-

marily within the limits of New York State jurisdiction should be covered under state and/or local license programs.

The other alternative is action at the state level. New York State Fish and Wildlife laws could be amended to include provisions for the establishment of fishing license programs covering both commercial and recreational fishermen. A principal problem with unilateral action by New York State is the possibility of the lack of uniformity in regulation and management activities conducted by adjacent states. If adjacent states also enact license requirements, reciprocities could be arranged where licensed residents of one state would have the right to fish in adjacent state waters.

2.1.3 Mariculture

2.1.3.1 Introduction and Objectives

An analysis of existing mariculture activities on Long Island and an assessment of the potential of expanding the culture of various marine species are topics addressed in the LIRPB report, Assessment of Existing Mariculture Activities in the Long Island Coastal Zone and Potential for Future Growth (30 April 1979). In this report, a broad view of mariculture (or in freshwater, aquaculture) and its associated activities was taken. Mariculture is defined as the culture or husbandry of marine plants or animals under controlled conditions. Mariculture activities typically subject the organisms in question to at least one (but usually more than one) manipulation before their eventual harvest or capture. The activities can be grouped under two broad categories - private and public. Private mariculture activities are conducted by private industry for the commercial marketing of mariculture products. Public mariculture activities are conducted by government agencies to augment the natural stocks of marine resources or increase their availability for either commercial or recreational use.

Mariculture activities can be either extensive or intensive, depending on the degree to which environmental conditions associated with the culture technique are artificially manipulated or controlled by man. Extensive activities, such as spawner transplants and transplanting oyster seed to growout grounds in open waters, rely on use of culture sites where the degree of environmental control is minimal. The use of fish rearing pens, the raft culture of shellfish, and the operation of shellfish hatcheries are intensive, because of the higher degree of control imposed over culture conditions. In general, extensive activities are lower in cost than intensive activities, but higher yields per unit area or volume can be realized through intensive culture.

The objectives of the mariculture study were:

1. to provide a source document with information on mariculture activities occurring on Long Island that will be of use to various levels of government, the general public, and potential mariculture entrepreneurs interested in planning for the future of mariculture in the region;
2. to identify constraints on mariculture development in the region, as well as future opportunities;
3. to formulate recommendations designed to
 - a. assure multi-purpose use of Long Island's marine environment;
 - b. develop the potential of mariculture on Long Island;
 - c. foster marine-related job growth;
 - d. encourage cooperation among government agencies and the private sector in the solution of common mariculture problems; and
 - e. sustain long-term harvest of fishery products from local waters.

The study focused on the locational, jurisdictional, legal, socio-economic and intergovernmental cooperation issues that influence the actual or potential use of Long Island coastal waters for mariculture. Courses of action to eliminate the constraints that act to limit mariculture development were identified.

2.1.3.2 Control of Underwater Lands and Authorities Pertaining to Fisheries Management in the Long Island Coastal Zone

Underwater land in the Long Island bays is generally under the control of town governments, while the underwater land in Long Island Sound and the Atlantic Ocean out to the three mile limit is controlled by New York State. Five types of control are currently in effect: private title, franchises, grants, leases and public control and/or ownership. Franchises and leases have been issued by New York State for underwater land in Long Island Sound. Grants of underwater land have been made by Suffolk County in Gardiners and Peconic Bays, and Bluepoints Company has title to approximately 13,000 acres of underwater land through colonial patents.

Chapter 990 of the Laws of New York State, 1969 ceded, with some exceptions, underwater land in Gardiners and Peconic Bays to Suffolk County for shellfish management purposes. Suffolk County has not yet implemented the law and therefore cannot lease underwater land. Several firms have expressed an interest in leasing underwater land; however, due to State and County inaction, no underwater lands have been leased in Long Island Sound or Gardiners and Peconic Bays to either local firms or those from outside the region interested in establishing mariculture ventures in the Long Island coastal zone.

Changes must be made in the NYS Environmental Conservation Law to foster the development of mariculture as an industry in the State. For example, the lack of distinction between wild and artificially cultivated species in terms of market size restrictions, the pen rearing of finfish, the use of hatcheries in fish ranching operations, and restrictions in leasing underwater land should all be closely reviewed and considered in amendments to the Environmental Conservation Law.

Land use restrictions, such as zoning codes can impede the establishment of mariculture activities. This constraint can be partially overcome by efforts designed to increase public awareness of the nature of mariculture as an activity in the coastal zone.

2.1.3.3 Local Public Mariculture Activities in the L.I. Coastal Zone

In an effort to maintain, and if possible increase the natural stocks of hard clams in publicly controlled bay bottom areas, town governments have implemented shellfish programs such as seeding, transplanting and spawner relaying. Poaching of hard clams from uncertified areas that serve as nursery grounds remains a problem and has hampered town transplant and winter ground programs. Several towns are experimenting with the culture of seed clams under controlled conditions using bottom and off-bottom techniques. Vandalism, unfortunately, has severely limited the success of these experimental programs. Citing the problems of high cost and unreliability of private hard clam seed sources, three

towns have expressed interest in establishing and operating their own seed clam hatcheries. Only one of the 13 town governments - the Town of Hempstead - is interested in pursuing a hard clam depuration program.

The independent public-ground baymen generally support the public mariculture programs undertaken by the town governments, and oppose the leasing of public bay bottom to private shellfish interests. Baymen generally regard a municipal leasing program as an opportunity for private shellfish interests to encroach on and limit access to existing or potentially productive public shellfish grounds.

Three L.I. towns - Oyster Bay, Huntington and Islip - have agreements with the shellfish companies for the leasing of town-owned underwater land. The Town of North Hempstead issues exclusive one-year licenses to shellfish companies for the removal of hard clams from uncertified waters within the town's jurisdiction. The remaining L.I. towns have no established policy regarding the leasing of town-owned underwater lands to private shellfish interests.

2.1.3.4 Private Mariculture Activities in the Long Island Coastal Zone

Of the 14 private mariculture operations on the Island, all but one are engaged in the commercial production of shellfish - either hard clams or American oysters. Multi-Aquaculture Systems, the only finfish mariculture operation on L.I., is raising both striped bass and northern puffer. Shellfish companies having control over underwater land in the north shore bays, Long Island Sound, and Gardiners/Peconic Bays generally grow oysters, while companies based along the Island's south shore primarily harvest hard clams.

All but two of the 14 private mariculture operations either own or lease underwater land. Privately owned underwater lands utilized for shellfish cultivation are located in Great South Bay, Narrow Bay, Gardiners/Peconic Bays and Long Island Sound offshore of Oyster Bay and Huntington. Shellfish cultivation also occurs on underwater land leased from the Towns of Oyster Bay, Huntington and Islip.

Four active commercial shellfish hatcheries are located on L.I. F.M. Flower & Sons and Long Island Oyster Farms have oyster hatcheries located in Oyster Bay and Eatons Neck, respectively, and both Bluepoints Co. and Shellfish, Inc. have hard clam hatcheries in West Sayville. Operations at the Shelter Island Oyster Co. hatchery have been suspended since 1977. The Shinnecock Indian Tribal Oyster Project has established a pilot hatchery on the reservation for the production of oyster seed.

Nearly all of the commercially harvested L.I. shellfish is sold as fresh shell stock for the lucrative half-shell trade. L.I. shellfish are shipped throughout the U.S. by refrigerated truck. The larger shellfish companies usually ship their product directly to primary seafood distributors outside the N.Y. metropolitan area, while the smaller shellfish firms generally sell to local buyers.

The overwhelming majority of mariculture operations canvassed had plans or desires to expand current production and, in some cases, diversify their product line. Most felt their expansion plans were constrained

by either insufficient funding and/or lack of underwater land available for production.

2.1.3.5 Identification of Species with Potential for Commercial Mariculture Production in the Long Island Coastal Zone

Based on a survey of pertinent literature and interviews with experts in the field of mariculture, candidate species for mariculture development on Long Island have been identified. The species are endemic to the Long Island marine environment and can generally tolerate wide ranges in salinity, temperature and dissolved oxygen. The American oyster, hard clam, striped bass and northern puffer are presently cultured on Long Island and offer immediate opportunity for expanded production. The bay scallop, blue mussel, American lobster, American eel, winter flounder, soft-shell clam, baitworms, seaweeds and other marine plants have potential pending resolution of marketing and technical problems. This species listing should be updated periodically to account for developments in the field of mariculture.

2.1.3.6 Implications of Water Quality on Mariculture Development in the Long Island Coastal Zone

In general, Long Island marine waters are highly suitable for the culture of shellfish and other marine animals and plants. Yearly ranges of water quality constituents are favorable to the reproduction, growth and survival of species that are suitable targets for mariculture development. The existence of distinct winter/summer seasons helps to reduce shellfish predator activity. Long Island waters and shellfish are also relatively disease free when compared to Atlantic coast waters to the north and south of the Island - areas that are also subject to the frequent occurrence of toxic "red tides."

The most important water quality consideration for the conduct of mariculture in coastal waters is the presence of toxic pollutants, such as heavy metals, petroleum products, pesticides and other organics. Information on the concentration of such pollutants in Long Island coastal waters is incomplete. Surveys of ambient pollutant concentrations should be made by the prospective mariculturist before committing operations to a specific location.

Approximately four-fifths of the surface waters in the N.Y. Marine District are certified for the taking of shellfish. Those areas that do not meet the coliform standard are primarily found in the western portion of the Long Island region. While shellfish from the uncertified areas cannot be sold directly to the consumer, several types of mariculture activities, e.g., the culture of juveniles which can be relayed to cleaner water before sale, can be suitably located in such areas.

2.1.3.7 Potential Areas for the Expansion of Mariculture in the Long Island Coastal Zone

Growth of mariculture as an industry in the Long Island coastal zone will require 1. development of management plans for coastal waters that designate priority uses for specific areas; 2. assignments of se-

lected areas for mariculture use; and 3. development of formal procedures, with realistic regulations governing the allocation of underwater lands and waters to mariculture entrepreneurs. Detailed, local surveys will be required to minimize potential conflicts with traditional users of the marine environment.

Town governments, Suffolk County and the State of New York have ultimate and distinct authorities governing the use of the Long Island coastal zone for mariculture. Pending a drastic change in the attitudes of the town governments and the outcome of lease renewal negotiations, there will probably be no more than 4,500 acres of town-owned bottom leased in the Long Island coastal zone for the conduct of mariculture activities.

While Nassau County has little fishery management responsibility, Suffolk County has the authority to develop and implement a shellfish management program for Gardiners/Peconic Bays, which encompass an area of over 100,000 acres. While Suffolk County has played an historic role in the oyster industry of the past, no progress has been made in implementing a mariculture program for this area since the State ceded rights to the County in 1969.

The State of New York is also in a position to allocate a portion of the marine environment under its jurisdiction for the conduct of mariculture. Long Island Sound is a likely area for such activity; indeed, large tracts of land were franchised by the State in the Sound during the peak of the Island's oyster industry. Although the State has the explicit authority to do so, it has not leased any areas for mariculture development.

Immediate opportunities for the conduct of mariculture activities include the use of pound net fishing areas designated by the U.S. Army Corps of Engineers, and the use of privately owned/controlled areas in Great South Bay, Narrow Bay, Long Island Sound and Gardiners/Peconic Bays. Some of the private lands may be underutilized, and have potential for the conduct of intensive mariculture.

2.1.3.8 Conclusions

- Public fisheries, other marine interests and mariculture can co-exist in the Long Island marine environment in a mutually beneficial capacity. Large tracts of the marine environment are not necessary for the development of mariculture on Long Island; indeed, it has been shown that some intensive mariculture operations need only utilize a limited number of acres to achieve substantial increases in productivity.

- The constraints on the development of mariculture in the Long Island coastal zone are primarily institutional, rather than technological. Insufficient funding, marketing restrictions and the lack of leased underwater acreage available to the mariculturist were the three most often mentioned constraints limiting the expansion of private mariculture on Long Island.

- The relative status and significance of mariculture on Long Island will decrease in the future if a change in the perception of mariculture as a legitimate coastal zone activity on behalf of State, County, local

government and the public does not occur. If New York State and Suffolk County do not formulate aggressive policies fostering the development of mariculture, there will be few new large scale mariculture enterprises in the Long Island coastal zone.*

° Long Island has not taken full advantage of the potential of its marine environment for mariculture development. This environment appears to be highly suitable for various types of mariculture. The region has acquired an unfavorable reputation in the minds of those wishing to develop new mariculture endeavors in this area. As a result of this reputation, mariculture ventures will tend to locate in other regions along the Atlantic coast that encourage the development and location of marine related industries within their jurisdictions.

° With a few exceptions, government has generally shown a lack of interest in encouraging private mariculture in its Long Island coastal zone. Government inertia, funding constraints, local public opinion against private mariculture development of any sort as voiced by commercial fisherman groups, and a lack of knowledge on mariculture itself are the causes of government inaction.

° At the present time, finfish and seaweeds can be raft cultured in U.S. Army Corps of Engineers designated pound net areas.

° An immediate opportunity for mariculture growth rests with the decision of private underwater land owners to devote a portion of their acreage to more intensive use.

° State of New York and Suffolk County action is required to develop the potentials associated with the development of mariculture in Long Island Sound and Gardiners/Peconic Bays.

° Efforts to sell the Long Island region as a prime location for the establishment of new mariculture ventures must await the development of policies by the County of Suffolk and State of New York that are favorable to mariculture. Program development must coincide with this policy.

° In most Nassau-Suffolk communities, mariculture is regulated as a commercial or light industrial use that requires special permit of special exception approval by the boards of appeals. The owner/operator of a proposed facility must be prepared to educate boards of appeals members as to the nature of his venture. Public understanding of mariculture may also have to be fostered in order to forestall opposition to a particular mariculture project.

° A specific evaluation of the compatibility of various types of mariculture activities in Long Island Sound or the Gardiners/Peconic Bay areas with existing uses has not been made at this time. Such detailed studies must be accomplished during implementation of mariculture programs to determine those site specific areas suitable for mariculture where conflicts with local uses will be minimized.

*The towns and State of New York have fisheries management authority in Nassau County.

° The production of market oysters from Long Island waters is currently limited by the availability of seed oysters from hatchery facilities and natural setting grounds in Connecticut. Oyster production on Long Island relies heavily on mariculture techniques, while hard clam production is primarily dependent upon a natural fishery.

° With a single exception, all of the firms interviewed grow and harvest only one species of shellfish - either hard clams or American oysters. Only one Long Island mariculture firm raises finfish (striped bass and northern puffer). Reliance on the production of a single species could jeopardize the stability of private operations. The American oyster, hard clam, striped bass, northern puffer, bay scallop, blue mussel, American lobster, American eel, winter flounder, soft clam, bait worms, seaweeds and other marine plants appear to be likely candidate species for mariculture production.

° Nearly all of the shellfish grown by Long Island shellfish firms is earmarked for the lucrative half-shell trade. Generally, the larger shellfish mariculture firms have developed markets for their product outside the New York metropolitan area, while the small operations have local markets in the region. The market for high priced shellfish, finfish and crustaceans is capable of dramatic expansion if continuous supplies can be guaranteed.

° Although the use of hard clam seed for mariculture programs has become increasingly popular among municipal governments, sufficient quantities of clam seed from private shellfish hatcheries are not always available when needed by L.I. towns. In order to overcome this bottleneck, some towns are considering the construction and operation of their own hatcheries.

° The effectiveness of the various methods, e.g., spawner transplants and seed planting, employed by town governments to augment natural stocks of hard clams remains uncertain. Continued research to optimize various techniques is required.

° The Town of Hempstead is the only town government on L.I. to apply for and obtain a microbiological cleansing permit from the State of New York. All the other town governments either have no established policy towards shellfish depuration, or feel depuration is currently inappropriate within their jurisdiction.

° There appear to be discrepancies between the number of shellfish digger permits issued by NYSDEC and the number of commercial shellfishing permits issued by the towns.

° Current enforcement and surveillance programs are inadequate to control poaching of hard clams from uncertified areas and to prevent vandalism of town mariculture systems within the bays. Poaching is also a problem of varying degree in privately controlled areas.

° Commercial independent baymen are generally opposed to the leasing of public bay bottom, and favor the continuance and expansion of public mariculture programs.

° Only three of the 13 L.I. towns lease public underwater lands to private shellfish companies. The approximate percentages of town-owned underwater lands leased to private shellfish companies are as follows:

Huntington	-	25%
Oyster Bay	-	25%
Islip	-	10%

At the present time, no town-owned areas are leased to the private sector for finfish or seaweed culture. The Town of North Hempstead issues exclusive 1-year licenses to shellfish companies for the removal of hard clams from its uncertified waters. With a few exceptions, there are no explicit town policies on leasing underwater lands or the water column for mariculture purposes.

° As a result of the town posture on leasing bay bottoms, expansion of private mariculture on Long Island is limited to the use of privately owned bay bottoms, the acquisition of new leases from the State of New York or Suffolk County involving underwaterlands within their jurisdictions, or the use of pound net areas under the jurisdiction of the U.S. Army Corps of Engineers. Private bay bottom owners could act as a catalyst in the attraction and development of new mariculture activities on Long Island, if they would be willing to lease a portion of their lands to interested parties. The State of New York bottom leasing program could serve as the vehicle for mariculture developments in Long Island Sound, if in fact a positive attitude regarding leasing is demonstrated by the N.Y.S. Department of Environmental Conservation. Leasing of additional underwater lands in Gardiners and Peconic Bays rests with the implementation of a mariculture management program for this area by Suffolk County. To date, because of funding and other constraints, the County has been loath to implement Chapter 990 of the Laws of New York State, 1969.

2.1.3.9 Recommendations

2.1.3.9.1 Use of Privately Owned/Controlled Underwater Land

° The privately owned underwater lands in Great South Bay and Narrow Bay, and the privately controlled lands in Long Island Sound and Gardiners/Peconic Bays covered by franchise and grant arrangements, respectively, should continue to be used for mariculture purposes. Some of these lands are not being actively used for mariculture at the present time. These underutilized lands may have potential for other types of mariculture than are commonly practiced on Long Island today, e.g., the intensive culture of hard clams in rafts. The owners of these lands should consider the advantages of leasing a portion of their holdings to mariculture entrepreneurs for such activities.

° Privately owned salt ponds, coves, estuarine and adjacent areas offer potential for shellfish hatcheries and the intensive culture of marine organisms. Site alterations to enable control of water flow may be required in order to make such uses feasible.

2.1.3.9.2 The Role of the Towns

◦ The various towns of Long Island should consider the potential future role and significance of mariculture activities in the development of flexible bay management programs that are designed to meet the needs of changing fisheries and maintain marine-related jobs. The towns should reserve the option of leasing underwater lands for mariculture purposes. The decision to renew existing leases on underwater land should rest with a determination of the net advantages to the individual town and its bay management program that result from the lease arrangements and associated private culture operations, as well as an evaluation of the past history and performance of the lessee in improving the production of selected species over that which would occur in nature without man's intervention. Options involving private use of the water column for culture purposes should be investigated. Procedures enabling such use should be developed, as required.

◦ Where applicable, the towns should adopt zoning ordinances that equate mariculture with agriculture in order to allow the siting of mariculture facilities in upland areas.

2.1.3.9.3 The Role of Suffolk County

◦ Suffolk County should develop and implement a mariculture management program, pursuant in part to Chapter 990 of the Laws of New York State, 1969, for Gardiners and Peconic Bays. The total underwater acreage under the domain of County control is 106,700 acres, of which about 8,700 acres are under private control resulting from previous grant arrangements. Sixteen thousand two hundred acres of underwater land in the area are located between mean high water and a line 1,000 feet offshore. This land must be reserved for use by the public in accord with Chapter 990. The remaining underwater acreage - 81,000 acres - is potentially available for mariculture through lease agreements with Suffolk County. This acreage figure should be reduced, perhaps substantially, in the development of a mariculture management program as a result of considering factors such as the location of submarine cables, bay scallop beds, navigation channels, etc. The map referred to above also shows the proposed scheme developed by the Suffolk County Real Property Tax Service Agency for mapping and locating underwater lands. Implementation of this scheme, which would involve surveying, monument emplacement and mapping, would require funding on the order of \$100,000.

2.1.3.9.4 State of New York Leasing Program

◦ Thousands of acres of underwater land in Long Island Sound between Port Jefferson and Bayville were in the past used for the growing of oysters. These areas, as well as others east of Port Jefferson in Long Island Sound and in Block Island Sound, have potential for various types of culture should they be made available to the private sector under lease agreements made pursuant to section 13-0301 of the Environmental Conservation Law. Progress on this front must await assertive action by

the State.

2.1.3.9.5 New York State Environmental Conservation Law

° Some aspects of the New York State Environmental Conservation Law hinder the development of mariculture in the State. A comprehensive mariculture law is needed. At a minimum, the existing body of laws should be amended to:

- a. provide for the leasing of state-owned underwater lands and associated water column for mariculture purposes.
- b. provide for the capture and release of domestically raised anadromous fish by ranching operations.
- c. distinguish between wild fishery resources and artificially cultivated species with regard to minimum legal shellfish and finfish size limits, seasonal harvest restrictions, and bag limits.
- d. eliminate paragraph 3 of section 13-0323, which states that "Oysters in excess of one bushel shall neither be taken from public or unleased lands nor possessed or transplanted by any boat unless its propeller, if any, has been removed, except as provided for by rules and regulations of the department."

Realistic guidelines should be established for the interpretation of the following sentence contained in paragraph 1 of section 13-0301 to allow for the leasing of state-owned underwater lands:

"Lands under water shall not be leased where there is an indicated presence of shellfish in sufficient quantity and quality and so located as to support significant hand raking and/or tonging harvesting."

2.1.3.9.6 National Aquaculture Program

° The State of New York in cooperation with county and local governments on Long Island and representatives of the mariculture industry should define a course of action with priorities that would form the basis of the State's participation, first, in the formulation of the National Aquaculture Development Plan, and second, in applying for and obtaining Federal financial assistance for existing as well as new commercial mariculture enterprises in the Long Island coastal zone. With the support of a united front, the State could effectively compete with other sections of the nation for a reasonable share of the support emanating from a national aquaculture program, when such a program becomes a reality.

2.1.3.9.7 Management Recommendations

° Town shellfish programs should be coordinated to share the results of management oriented research and to avoid duplication. The Long Island Association of Town Shellfish Managers, established in 1978, provides a vehicle for this coordination. If warranted, local areas of a bay should be used to foster bay-wide fishery management objectives.

° Local bay management programs should consider the role of private intensive mariculture in the development of contingency plans that may have to be implemented should collapse of the hard clam fishery occur.

2.1.3.9.8 Facility Recommendations

° Government should encourage the location and operation of privately controlled fin and shellfish hatcheries in the Long Island coastal zone.

° If clam seed planting proves to be a useful management technique, and private sources of seed are not available, local governments bordering a common waterbody should investigate the option of establishing a regional hatchery operated on a cooperative basis that would provide all of the seed planted in the waterbody. This approach could limit the spread of disease, avoid duplication of facilities, and lead to optimal use of funds. Research conducted at a regional hatchery could result in the optimization of procedures and perhaps the development of disease resistant hybrids. Funding for a regional hatchery may be obtainable from the Federal government, if and when a national aquaculture plan is developed. If satellite hatcheries are necessary, professional staff could be shared, resulting in reduced manpower costs.

2.1.3.10 Research Requirements

° A survey of the mariculture programs in other coastal states should be made to ascertain the methods employed to promote mariculture development, and the options available for the implementation of leasing programs and the control of mariculture activities. The questions below should be addressed in the survey.

- a. What leasing mechanism is employed? First applicant or competitive bid? What are representative lease fees?
- b. What types of areas are leased?
- c. How many acres are included in each lease? What is the term of the lease? Can it be renewed? How often?
- d. Is there a limit on the number of leases (or amount of acreage) held by an individual or firm?
- e. What exclusive ownership rights are conveyed to the lessee? What restrictions are placed on other users of the marine environment?
- f. What types of mariculture activities are allowed/prohibited under lease agreements? Are special conditions incorporated in the lease? What types of information on mariculture operations must be made available to the public?
- g. What types of zoning restrictions apply to mariculture as a use?
- h. What marketing restrictions apply to mariculture products?

The results of the surveys should be used to prepare detailed recommendations for the conduct and structure of leasing programs on Long Island.

An education program should be designed to inform the public on the characteristics of mariculture ventures likely to be located in the Long Island marine environment, and benefits and disadvantages associated with their operation.

A survey of both public and private sources of financial assistance for the establishment of mariculture ventures should be conducted, perhaps utilizing the resources of the National Sea Grant Program. This survey should also identify sources of funds for the conduct of research on the technical aspects of mariculture.

2.2 Coastal Erosion Subplan

2.2.1 Introduction

In recent years beach stabilization, bluff erosion, and property development along the shorelines of Long Island have become controversial issues, generating social, economic, legal, and technical debates. The widespread expectation that the shoreline will for some reason stand still after it's been built on and the rude awakening for developers, homeowners, and commercial builders when they discover the shoreline is not static are both part of a shoreline "consciousness-raising" that has been making painful headway. In addition, the potential for storm-induced erosion damage has increased greatly in recent years because of shoreline construction activity in the late 1960's and the 70's. Perhaps this construction activity has been spurred by a false sense of security arising from the absence of major damage producing hurricanes and northeasters impacting the Long Island region during this time period. Indeed, many Long Island residents have had little or no experience with the effect of storm surge and winds resulting from a major hurricane. It is estimated that occurrence of the standard project hurricane, with tides 15 ft above sea level along the ocean shoreline, and over 11 ft in the bays at high tide, would result in over \$700 million in damages (1976 price level) along the south shore from Fire Island Inlet to Montauk Point.

In addition to the problem of structural damage, the Long Island region must also deal with long-term shoreline regression and man-induced shoreline erosion. Reviews of available literature on the stability of Long Island's shorelines indicate that: 1. the glacial bluffs of Long Island's north shore are typically eroding at rates of 1 to 3 ft/yr; 2. the relatively protected Peconic coastline along the inner side of the "flukes" of eastern Long Island is eroding on the order of 1 ft/yr; and 3. the extreme variability of the position of the south shore barrier complex - areas have historically eroded and accreted at rates greater than 10 ft/yr - is generally due to the changing form of the barrier islands over time, and the influence of tidal inlets and shoreline erosion control structures on erosion/deposition patterns.

It is unrealistic to expect Long Island's citizens to give up the many benefits gained from utilizing shoreline areas. This use, however, entails the risk of possible losses, and the inevitable requests from both private and public sources for government funds for erosion control projects to forestall damage. Tradeoffs involving shoreline use and management are required in order to maximize net benefits to the region. As mentioned earlier, shoreline recession rates on the south shore barrier islands can exceed 10 ft/yr. Such rates of recession may be acceptable along an undeveloped stretch of shoreline, e.g., the High Dune Management Unit of the Fire Island National Seashore. However, an erosion rate of 2 ft/yr may prove to be catastrophic along coastlines that have been developed to support high intensity recreational use, e.g., the Jones Beach Park. Therefore, different management approaches are warranted for urban shorelines as opposed to undeveloped areas subject to low intensity use.

The Long Island Regional Planning Board report, A Coastal Erosion Subplan for Nassau and Suffolk Counties (March, 1978) was prepared to address the

topic of shoreline erosion mitigation planning pursuant to the Coastal Zone Management Act Amendments of 1976 (P.L. 94-370). The major objectives of this report were to:

1. describe and classify Long Island marine shorelines;
2. assess and categorize the Island's coastal erosion problems;
3. develop general guidelines for coastal erosion control activities;
4. describe alternative coastal erosion management strategies; and
5. develop land use and structural recommendations governing the conduct of shoreline use and construction activities.

The scope of the subplan report was limited to consideration of problems relating to the relative stability of Long Island marine shorelines, including bluff, dune and barrier bar coasts. Erosion/sedimentation problems occurring on inland areas due to construction activities and various land uses are addressed in other segments of this regional element.

2.2.2 Guidelines for Coastal Erosion Control

The structural and non-structural recommendations adopted by the LIRPB were based on an analysis of Long Island shoreline conditions and the application of the following list of coastal erosion control guidelines based on information abstracted from many sources. The guidelines are general rather than site specific, and should be used in conjunction with the structural and non-structural recommendations described later to develop detailed site specific plans requiring public implementation in local areas. The guidelines are also meant for use in the design and review of small scale erosion control projects constructed by private interests.

1. Develop coastal erosion plans on the basis of shoreline type, use, and extent of cultural development. Design coastal erosion plans so as to allow to the maximum extent possible, the continuation of natural geomorphic processes responsible for the maintenance of coastal landforms. Maintain natural beach profile and shoreline configurations. Recognize that coastal erosion control plans for culturally manipulated shores may require adjustment in natural processes.
2. Emphasize non-structural solutions to erosion control problems; structural solutions should be advanced only as supplements to a non-structural program.
3. Discourage projects that block the transport of sand along the coast, or the exchange of sand among storage elements, i.e., dunes, berms, offshore bars.
4. Obtain sand for replenishing eroded beaches only from offshore deposits, or from areas of active accretion, such as tidal inlets and navigation channels. Prohibit the removal of sand stored in dunes, berms, offshore bars, and from productive bay bottoms outside established navigation channels. To facilitate the emergency repair of a breach in a barrier island or beach, sand for beach nourishment can be obtained from the overwash fans deposited on the bay side of the barrier at the site of the breach. In

such instances, dredging should be limited to the removal of the recently deposited overwash fans. Care should be taken to maintain bay depths at pre-breach levels.

5. Stabilize ocean inlets and implement sand by-passing programs.
6. Restore and stabilize sand dunes by utilizing such methods as the planting of beachgrass. Protect shoreline vegetation. Protective dunes should not be removed, relocated, leveled or otherwise graded because their natural location and character usually evolve as an adaptation to local natural forces and sediment supplies.
7. Prohibit development on primary dune lines and beach areas. Establish building setback lines based on topographic, geologic and meteorologic characteristics. Setbacks should be entirely landward of shifting frontal dune systems; they should also be far enough landward to allow for recession of the shore. Setback requirements should not be relaxed in those instances where new structures are proposed at sites in partially developed shoreline areas. Existing structures located seaward of the setback line should be designated as non-conforming uses and criteria and regulations should be developed to limit continued use, reconstruction, and/or expansion when the structures are damaged or destroyed. Along bluffs and headlands measurement for the setback line should begin at the top edge of the bluff as defined by an abrupt change in slope. In order to assure a useful structural life of 50 years, buildings on bluffs should be located landward a distance equal to the amount of erosion expected over a 50 year period.
8. Restrict vehicle and foot traffic over frontal dune systems. Provide boardwalks and elevated steps for pedestrian access to beaches. Prohibit vehicular traffic on frontal dune systems. Limit the number of vehicle access points to beach areas; design access points in such a manner as to preserve the natural profile of dune and beach areas. Identify and protect beach and dune wildlife breeding habitats.
9. Regulate development in flood prone areas to reduce potential damages to life and property. Elevate all new structures in coastal floodplain areas above the tide elevation associated with the design storm having a one percent chance of occurrence in any given year (the 100-year storm). Major areawide structural solutions to flooding problems, such as tidal flood gates, should not be implemented.
10. Shore hardening structures, such as bulkheads, revetments and seawalls should be an acceptable method for erosion control in areas having unstable shorelines, where non-structural methods, e.g., vegetation planting, are not practical. For example, bulkheads and other structures that reflect wave energy are acceptable at low energy shoreline locations where it is necessary to retain fill and provide docking facilities. However, such structures

should be discouraged where they would adversely impact marshes and other productive areas. Bulkheads, revetments and seawalls should be designed to minimize scouring and destruction of adjacent marine habitats.

- a. In developed shoreline areas, encourage rip-rap structures and other designs that reduce wave scouring in lieu of wood, concrete, or metal structures. Because of their irregular large surface areas, rip-rap structures provide favorable habitats for many marine species.
 - b. Discourage the construction of bulkheads that adversely affect natural longshore transport and deposition of sand.
 - c. Where possible, locate the toe of a shore hardening structure above the elevation of mean high water and shoreward of any marine vegetation.
11. The potential impacts of groins, jetties and breakwaters on adjacent shores should be adequately considered during the permit process covering such structures. Jetties, groins and breakwaters are acceptable if it is expected that they will not create adverse sand transport patterns or unduly disturb ecosystems.

2.2.3 Long Island Shoreline Protection Strategies

The general shore protection strategies for Long Island outlined below reflect three important facts.

- ° The Long Island shoreline varies in form as well as response to erosion/accretion processes.
- ° Urbanization and shorefront ownership patterns vary along the shoreline.
- ° Agency and municipal programs and controls pertaining to the shoreline differ in content as well as philosophy.

The strategies reflect an accommodation of different concerns and should be used to guide future government agency policy on coastal use and expenditures on coastal protection projects.

1. Accept the natural, long-term shoreline regression that is occurring along the north shore, Peconics shore and the headlands section of the south shore as a phenomenon that is beyond present capability for practical, effective control. Emphasize non-structural solutions to coastal erosion problems along these shoreline areas.
2. Stabilize the south shore inlets (Shinnecock, Moriches, Fire Island, Jones, East Rockaway) at approximately their present locations and implement sand by-passing programs. New, natural inlets that breach the Long Beach, Jones Beach, Fire Island and Westhampton Beach barrier islands and the Southampton barrier beach as a re-

sult of severe storms and /or shoreline regression should not be maintained. If longshore transport does not repair a natural breach steps should be taken to close it artificially.

3. Maintain the general position and configuration of the Atlantic Ocean shoreline along the entire south shore of Nassau County, and along that portion of the Jones Beach barrier island located within Suffolk County. The Atlantic Ocean shoreline along the Westhampton barrier island should also be maintained. Artificial manipulation and public investment designed to stabilize the Atlantic Ocean shoreline along Fire Island and the Southampton barrier beach should be minimized.
4. Employ sand nourishment techniques to maintain public beaches and recreation areas subject to high density use. When the need exists, use these techniques to establish new beach areas in locations where historical records indicate either an accretion or low to moderate erosion of the shore.

2.2.4 Structural Recommendations

The construction projects recommended herein are intended either to protect public and/or private shorefront development of regional significance, or to maintain shoreline processes that are conducive to man's use of the shore. The U.S. Army Corps of Engineers, the State of New York and local interests should take the appropriate actions to implement the Federal authorized projects listed below.

1. Shinnecock Inlet Channel Improvement. Inlet stabilization and sand by-passing should be initiated.
2. Moriches Inlet Channel Improvement. Inlet stabilization and sand by-passing should be initiated.
3. Fire Island Inlet to Montauk Point Beach Erosion Control and Hurricane Protection - Moriches to Shinnecock Inlet Reach. To maintain the general shoreline configuration of the Westhampton Beach barrier island, the existing 14 groin compartments should be filled as appropriate, and fill should be added to restore that section of the beach immediately to the west of the existing groin field, which is in jeopardy of inlet breaching. The combination of sand by-passing at Shinnecock Inlet and filling the existing groin field may restore the net rate of longshore transport along the Westhampton Beach barrier island to that which existed prior to the stabilization of Shinnecock Inlet and the construction of the groin field.
4. Fire Island Inlet to Jones Inlet - Beach Erosion Control and Navigation Improvement. Maintain sand by-passing operation.

The Corps of Engineers should continue by-passing sand trapped within and near Jones and East Rockaway Inlets. In conjunction with the Long Island State Park Commission, the Towns of Babylon and Hempstead, the City of Long

Beach and the Village of Atlantic Beach, the Corps should continue to take the appropriate measure for maintaining the Atlantic Ocean shoreline between Fire Island Inlet and East Rockaway Inlet.

The above projects should be implemented according to design specifications that meet relevant environmental safeguards and considerations, including the coastal erosion control guidelines mentioned earlier. Action may also be required to remove or modify existing shoreline protection structures. Federal, state and local agencies with shoreline construction permit and review powers should consider such action when structures are not performing their intended functions and are causing adverse impacts in adjacent shoreline areas.

2.2.5 Non-Structural Recommendations

The nonstructural/land use recommendations are designed to minimize public expense for construction of erosion control projects; prevent erosion related damage; minimize man-induced erosion of the shore; and prevent the victimization of shorefront property purchasers who are not aware of the potential hazards of shoreline occupancy. Responsibility for implementation of the non-structural coastal erosion control measures recommended herein rests with the many municipalities and governmental agencies that have authority to regulate development and use of coastal lands, or whose programs indirectly affect land use regulations. The non-structural recommendations are discussed below.

1. Control the location of all new development on bluff and headland areas. Such development should be set back no less than 100 ft from the top seaward edge of the bluff as determined by an abrupt increase in slope. The requirement should not be relaxed in those situations where new development is proposed along bluff and headland areas adjacent to existing structures that are located less than 100 ft from the top edge of the bluff. Inclusion of this setback requirement in municipal zoning regulations should establish a land buffer capable of providing 50 years of protection from erosion-related structural damage. This recommendation is applicable primarily to the north shore, and to a lesser extent, the Peconics shore and the headlands section of the south shore. Local ordinances should be enacted to minimize the destruction of vegetation on the tops and faces of bluffs and headlands.

Future development on dune fields not associated with barrier islands, such as those found along the south shore in the towns of Southampton and East Hampton, should also be set back a distance of at least 100 ft from the crest of the seawardmost dune line. A setback line of 100 ft should provide ample structural protection from short-term shoreline changes.

Variances from the 100 ft setback requirement along bluffs, headlands and mainland dunes should be granted only in those instances where the owner or developer could demonstrate that a setback of less than 100 ft and/or the addition of structural protection measures would still provide protection from erosion-related damage for at least 50 years.

2. Protect the primary dune line or zone on barrier islands and beaches from encroachment. No new structures, other than elevated pedestrian walkways, should be allowed within the primary dune hazard zone, defined as the area seaward from a line located 40 ft inland from the 14 ft elevation contour on the landward flank of the primary dune. New structures should only be allowed to locate landward of this zone. Along those oceanfront areas where primary dunes are absent, or where dunes are lower in elevation than 14 ft, construction of new buildings should be prohibited. Local ordinances should be enacted that prohibit alteration of coastal sand dunes and the destruction of natural, sand stabilizing vegetation. Inclusion of these requirements in municipal zoning ordinances should protect the integrity of the primary dune zone - the south shore's main defense line against severe storm attack. The difference in the setback requirement associated with primary dunes on barrier islands and beaches as compared to the setback proposed for coastal dunes is based on the geomorphic response of barriers to severe storms (the possibility of tidal inlet formation) and the physical limitations that lot size and barrier widths impose on the locations of new structures. The 14 ft elevation contour reference point for the setback line was chosen because it is a conservative estimate of the tide elevation associated with the 100-year storm.
3. Control all future development of barrier islands, spits and baymouth bars by use of floodplain zoning, the application of land use management concepts, and other regulatory tools. The establishment or expansion of uses other than those that are environmentally acceptable and, further, are water related or water dependent, should be prohibited. Developers of shoreline areas should consider the potential impacts of erosion and accretion rates in site plan design.

Municipalities should develop building codes that provide for adequate structural design capable of withstanding the wind, wave and flooding forces associated with the occurrence of the 100-year storm. The code should require elevation of the lowest floor of residential and non-residential structures to or above the level of the 100-year storm tide. Structures should be securely attached to anchored pilings or columns that are designed to withstand current and wave forces associated with the 100-year storm, including worst possible scour conditions. All structural elements (roofs, walls, floors, foundations) should be firmly tied together.

4. Develop a contingency plan for public acquisition of shorefront following a catastrophic storm. Such storms occur in the Long Island region once in every 30 to 40 years. The Long Island Regional Planning Board or the county planning departments should develop a disaster contingency plan that contains recommendations for the public condemnation and purchase of shoreline properties that are likely to be subject to erosion-related damage. These properties should be acquired for future public use and for conservation. Purchase priority should be given to properties on barrier islands, barrier beaches, and baymouth spits/bars. If

priority is given to lands that are flooded as a result of tidal inlet formation, public acquisition should occur prior to completion of publicly sponsored projects designed to fill the lands to pre-flood elevations.

5. Off-road vehicle usage in coastal areas should be monitored by the relevant authorities to determine the commercial, residential and recreational needs for such usage, the levels of off-road vehicle travel by coastal area, the existence of conflicts with other users of these areas, and existing as well as potential damage to coastal resources that can be attributed to off-road vehicles. This information should be used to develop programs for managing off-road vehicle use that are consistent with the philosophy and objectives of utilizing the coastal areas in question. The programs should include appropriate regulations and penalties that are adequately enforced.

Recommendations for minimizing the environmental impacts of off-road vehicle travel include the following:

- a. Close sensitive areas along coastal bays and lagoons (salt marshes and sand flats) to vehicle traffic. Primary dunes should be off limits to vehicle and pedestrian traffic.
- b. Establish and control necessary vehicle access points to the beach so as to maintain the primary dune elevation. Build wooden ramps at all vehicle crossings. Washovers and low points in the primary dune should be revegetated and/or snow fenced in order to build up these areas and prevent vehicle intrusion.
- c. Limit vehicle traffic in back dune areas to well-defined trails. These trails should be marked with borders of shrubbery, fences, posts, etc. in order to prevent vehicle departures into vegetated areas. The trail layout should avoid existing and potential blow-out sites and should be designed to minimize potential environmental damage while serving the needs and desires of the users of the area.
- d. Monitor trails and dune crossings. If a site exhibits continued deterioration, the trail and/or dune crossing at this site should be relocated.
- e. Limit off-road vehicle travel on the beach to the area between the seaward base of the dune and the low tide mark. New drift lines forming at the base of the dunes should be off-limits to vehicle travel.
- f. Prohibit vehicle access to the beach during periods of extreme high tide and active erosion of the beach in order to prevent vehicle intrusion on dune flanks.

- g. If warranted, close dangerous sections of the beach to traffic. In such instances adequate by-pass routes should be provided.
- h. Identify nesting areas of least terns and other colonial birds with clearly marked signs. Vehicle and pedestrian traffic within these areas during the breeding and nesting season from May 1st to September 1st should be prohibited. Signs calling attention to the colonies should be posted at least 100 ft from colony perimeters warning pedestrians and vehicles not to approach any closer.

Two other considerations, though not strictly non-structural in nature are included here. They relate to the implementation of shore protection projects and the National Flood Insurance Program.

- 6. As a general rule, discourage expenditures of public monies for the design and construction of shore protection structures and beach nourishment on private lands unless expected public benefits from such work substantially exceed public costs.
- 7. Re-evaluate the National Flood Insurance Program as it applies to coastal areas. Review the operational effect of current legislation and regulations to determine whether or not the availability of publicly subsidized flood insurance encourages the initial development of vulnerable coastal areas, and the rehabilitation of high risk sites where structural damage due to flooding and/or coastal erosion has occurred or is likely to occur in the future. It now appears, based on experience to date, that the program should be modified by the Congress and the Department of Housing and Urban Development (HUD) so as to eliminate the availability of flood insurance on new development located within high hazard coastal erosion areas defined as follows:
 - a. bluff and coastal dune hazard zone - the area seaward of a line located 100 ft landward from the top edge of a coastal bluff or headland, or the top of the seawardmost rank of coastal dunes.
 - b. barrier island and barrier beach primary dune hazard zone - the area seaward of a line located 40 ft inland from the 14 ft elevation contour on the landward flank of the primary dune; or where applicable, oceanfront areas where primary dunes are absent or are lower than 14 ft in elevation, including historic overwash areas.

HUD should also examine the policy of re-insuring structures that are substantially damaged as a result of flood-related erosion. Criteria for renewal of flood insurance should be developed. The Federal Insurance Administration should undertake detailed studies to confirm and/or modify the boundaries of the high hazard coastal erosion areas as locally defined. The construction restrictions and flood insurance limitations as described herein should be applied to properties within the officially delineated high hazard coastal erosion areas.

HUD should discourage the redevelopment of high hazard coastal erosion areas that have been subject to substantial property losses. To help accomplish this, property owners electing to re-build in a non-hazard area should receive full replacement coverage under the Program on structures suffering substantial damage. To prevent the future development of vacant coastal land in high hazard coastal erosion areas through public purchase, Congress should appropriate sufficient funds to enable the Secretary of HUD to implement section 1362 of the Flood Insurance Act of 1968. HUD should develop selection criteria prior to the purchase of flood-related coastal erosion areas for public use and/or conservation.

The Long Island approach to coastal erosion planning outlined in this paper will be difficult to implement in its entirety, because it involves aspects that will not be palatable to many segments of the public and some government agencies. Indeed, the issues of restrictions on the use of private property and the staggering costs of shoreline erosion control projects are major hurdles. However, the approach is comprehensive both from a regional point of view, and from the balance struck between the non-structural vs. the structural approach to erosion control. Implementation will not occur in quantum jump fashion, but will probably result from the decisions and actions of many individuals and government agencies over the long-term.

It should be noted that the recommendations described above will not guarantee complete protection for new development along Long Island's shores, nor will they do much to correct the abuses and mistakes resulting from past construction practices. The goal is to reduce damage to the shore and shoreline development that will occur in the future, both as a result of natural long-term processes and catastrophic storm occurrences.

2.3 Land and Water Capability Classification Systems

2.3.1 Land Capability: A System for Resource Management and Protection

2.3.1.1 Introduction

Several factors, among them the increasing concern for the environmental impacts of land use decisions affecting the coastal zone, the various Regional Marine Resources Council investigations of coastal problems, the HUD-assisted Planning Board efforts to develop a methodology for the integration of environmental science and comprehensive planning, and a growing awareness of the developmental significance of environmental hazards or constraints, have contributed to the evolution of the Land Capability Classification System described on the following pages. Although resource management considerations have often influenced land use decisions, especially on Long Island, there has been little consistent explicit recognition of the necessity for resource evaluation prior to the commitment of land to specific uses. The Land Capability Classification System is a tool for the identification of a range of environmentally acceptable uses in advance of public and private decisions as to the best use of a particular site. The analyses, upon which the classification scheme is based, contribute an essential and heretofore absent dimension to the land allocation process.

It is expected that the consideration of Land Capability limitations, as identified in the classification scheme, together with the traditional economic and social concerns will result in a significant improvement of the resource management aspects of local land use planning and control.

The Land Capability System rests upon the following assumptions:

- 1) Land management should be based upon the management of the entire ecosystem.
- 2) The coastal zone can be divided into geographic areas characterized by the presence of major environmental resources; these resources and their buffer zones require special management. These resources and buffer zones are associated with the Land Capability Units.
- 3) Land management for the protection of surface waters and groundwater must include management of the entire watershed area. Therefore the processes of the watershed and aquifer recharge are primary factors in the determination of Land Capability.
- 4) The establishment of general guidelines and the imposition of specific performance standards can effectively eliminate or minimize most undesirable environmental impacts on the immediate systems, such as vegetation, soils, wildlife habitats and upon the receiving waters and their inhabitants. The primary function of the performance standards is to limit impacts resulting from development to the least fragile portion of the development site so that impacts upon fragile resources on the site and adjacent areas will not occur. One of the major goals is to control and dispose of stormwater runoff so as to replicate insofar as possible, the natural recharge of the area in terms of quality and runoff rate. Non-point source management guidelines established as part of the Long Island Comprehensive Waste Treatment Management Plan (208 Plan) are included within the L.C.U. guidelines.

The concept of ecosystems recognizes an organization and dependency among plants and animals that is responsive to their physical environment. Optimum efficiency is required of the living portion of the ecosystem in

capturing and storing nutrients and energy within the system. If the environment is disturbed by man's activities, (such as the disturbance or alteration of soils, vegetation, solar insolation, water quality parameters or quantity) the nutrient and energy cycling is altered with a possible loss in productivity and/or diversity.

The natural resources subsection (2.3.1.2.1) describes dominant resource units that may singly or collectively constitute an ecosystem in terms of physical properties, the observed unique or particular sensitivity of the systems to human activities, and where necessary, specific recommended management guidelines and performance standards.

Human activities result in immediate and long term changes that affect the physical and biological interactions and characteristics of coastal systems. As the importance, or vulnerability of the resource increases, the Land Capability Unit to which it is assigned, becomes more restrictive in terms of the development that may occur. Fewer and fewer uses are acceptable per se. However, the ability of would-be developers to follow general guidelines and to meet increasingly stringent performance standards in order to reduce impacts to a tolerable level can effectively expand the range of permissible uses.

The guidelines and performance standards are intended to be cumulative in nature; that is, guidelines and standards established for Land Capability Unit I, also apply to Units II, III, and IV; those established for Unit II apply to Units III and IV; and those established for Unit III apply to Unit IV (see 2.3.1.9 - Site Plan Review).

Description of the Land-Capability Land Management System

The Land Capability-Land Management System categorizes land areas according to their ability to support various land uses and related activities. The assignment of land areas to capability units is based upon physical and locational characteristics. Land Capability recognizes the varying ability of the environment to tolerate development that results from the differences in physical and biological processes that characterize the various environmental resources on the Island.

Biological-physical systems such as estuaries, freshwater ponds, streams, wildlife habitats, plant communities, and hazardous areas such as bluffs, and flood prone lands, all require careful management and protection. Land use planning and site development controls can mitigate many of the existing impacts upon the environmental resources and impacts of the environment upon development (see Section 2.3.1.6).

Impacts upon resources from land use activities have been identified in the 208 Plan. The impacts upon resources from site alteration have been identified in materials submitted in the first year coastal management program. The severity of the impact depends upon the type and extent of development and the vulnerability of the environmental unit. Any development within a coastal watershed area has a potential impact upon freshwater and tidal wetlands, terrestrial vegetation and associated habitats, groundwater and aquatic and marine systems. Some of the resources cannot withstand

any development, others can withstand site activities that meet "site functioning" requirements.

Selection of the best method of management requires an understanding of the resources - including their essential characteristics, their roles in relationship to other resources, the values of the resources, and the impacts upon the resources. Selection of the proper land use and maintenance of site processes is central to the L.C.U. units.

Each capability unit includes resource types, a concept of probable impacts, and a range of permissible land uses and performance standards. The physical-locational material used to determine the Land Capability Unit for any particular site can be identified by consulting the Natural Resource and Development Constraints Maps, at the LIRPB office in Hauppauge, N.Y.

Since coastal zone management is also concerned with the impacts of natural coastal and terrestrial processes upon development, the hazards to development must also be identified.

How do environmental conditions affect development in terms of

- 1) tidal flooding - property losses, landform damage;
- 2) shoreline erosion;
- 3) slope failure resulting in structural damage;
- 4) natural terrestrial sedimentation and erosion;
- 5) high water table floodings;
- 6) long- or short-term settlement;
- 7) surface and structural damage from shrink-swell; and
- 8) surface and structural damage from frost heave?

How can these hazards be minimized through land use management and thru site design process? The answers to these questions permitted the categorization of the various resources according to their ability to tolerate development and their response to management measures.

The chapters entitled, "Development Guidelines for the Protection of Natural Resources" and "Development Constraints" found in the report entitled Land Capability Classification System, dated August 1977, apply this information to the problem of resource management. The four capability units described in the previously mentioned report are as follows:

Land Capability Unit I - the land resource can support almost any use or activity with minimal environmental effects if adequate water supplies are available and controls are imposed to assure the maintenance of groundwater and freshwater quality. This unit is categorized by disturbed soils, and vegetation and an absence of fragile resources. It has a low susceptibility to impact from most types of development. The land has water storage capacity and can be in a deep aquifer recharge area. The required performance standards are at a minimum, however, they are consistent with 208 Plan non-point source recommendations. Existing environmental laws in some towns suffice. Where intensive development is anticipated, the performance standards attempt to minimize any adverse impact on the environ-

ment, while at the same time accommodating future growth. It is preferable that growth be directed to these areas (L.C.U. I) so that sites in Land Capability Units III and IV can remain in low intensity development (L.C.U. III) and/or no development status (L.C.U. IV). Inasmuch as it is both impractical and unfair to expect existing development or small scale new development in essentially built-up areas to meet performance standards, limited exemptions are proposed.

Land Capability Unit II - the environmental resource can support most land use activities provided steps are taken to mitigate adverse environmental effects. This unit is characterized by somewhat more vulnerable resources, including areas of natural vegetation and associated wildlife habitats. The areas included are not exceptional in terms of productivity, diversity or uniqueness; however, constraints to development are greater than those in L.C.U. I. Unit II includes areas with poor soils, that are difficult to reestablish vegetation once the soils are disturbed. Land Capability Unit II also includes nondeveloped slopes of 8% or greater, flood prone land subject to 100 year floods and not otherwise classified as L.C.U. III and IV. This land has water storage capacity and flood buffering capacity during the times of heavy storms. Construction is subject to hazards that can and are being minimized by the imposition of performance standards and by federally required flood control regulations. This unit comprises areas recommended for any legally acceptable development provided that development can meet the performance standards required to minimize environmental impact.

Land Capability Unit II was divided into two categories for mapping purposes. Unit II identifies areas where the estimated depth to the water table calculated from U.S. Geological Survey Information - 1974, will usually not be a problem for basements or for the proper functioning of septic tanks. On-site tests should occur during periods of high seasonal water table to insure that water table levels will not be a problem. Pollution of the aquifers does occur from septic tanks in this unit. A large percentage of the L.C.U. II A category is located within the deep aquifer recharge areas I, II, and III discussed in the 208 Plan.

Unit II B represents areas where the depth to the water table calculated, from U.S.G.S. 1975 information, was approximately 3 to 16 feet below the land surface for undeveloped areas and from 0 - 16 feet in developed areas (If the land is developed, the general land surface elevations are more difficult to determine due to general cutting and filling associated with site development.). Unit II B can be described as areas where the high water table may interfere with the proper functioning of septic systems and with the installation and use of basements. In border line areas, the high water table may interfere with the installation of pipes. It should be noted that the water table generally in Nassau and Suffolk (except for a few areas in recent years) has been rising.

The performance standards and guidelines apply to both units A and B.

Land Capability Unit III - the environmental resource can support selected uses, provided steps are taken to limit the intensity of use and to mitigate adverse environmental effects. This unit is characterized by increasingly valuable resources including prime farmland, prime aquifer-recharge areas, prime wildlife areas, significant watershed areas, and buffer zones for areas in Land Capability Unit IV including land areas requiring set-back from bluffs and lands adjacent to freshwater and estuarine systems. In ecological terms, this unit includes areas of high species diversity, other areas of species significance (rare or endangered species) and areas of high productivity. Areas in Land Capability Unit III can tolerate limited development, provided design criteria and performance controls are used to reduce undesirable impacts such as erosion, sedimentation, loss of habitat, and loss or change in primary productivity.

Land Capability Unit IV - any development can be expected to result in moderated to extreme degradation of the resource. Areas in Land Capability Unit IV are recommended for preservation. This unit includes the resources that cannot tolerate development except in an extremely limited sense. The resource unit includes the dune system on the barrier islands, small islands, tidal marsh, freshwater marsh, and the area immediately next to the water's edge (either fresh or marine waters), the bluff face, and areas where the depth to seasonal highwater is less than 3 feet. This land must be carefully managed and protected to preserve the resource. Areas in this unit should be developed only under those circumstances where overriding economic or social values are to be served.

Land Capability Unit IV identifies environmental areas of critical concern as described in the State Environmental Quality Review Act (SEQRA). These areas are as follows:

Important aquifer recharge areas and resource units within L.C.U.'s III and IV (See Section 5.0 Chart, Relationship of Resource Units, Land Capability and Compatible Uses.).

The Land Capability System does not apply to developed land. The mapping of Land Capability, however, covers all land within the coastal zone. The land immediately adjacent to the shore is shown consistently in Land Capability Unit IV. Immediately adjacent, upland to this unit, is Land Capability III. Developed areas with a high water table are shown in Land Capability Unit II B. If redevelopment of the land were to occur then Land Capability does apply. It is also recommended that individual land owners in the management of their shoreline properties maintain the area immediately adjacent to the water in natural vegetation to minimize fertilizer nutrients carried in stormwater runoff to surface waters and to maximize trapping and some uptake of pollutants within the natural vegetation area. This land is also important for waterfowl and other wildlife whose natural habitat is the land-water interface or the land area adjacent to surface waters.

The L.C.U. IV then extends upland along stream corridors and includes significant environmental resources such as wetlands.

2.3.1.2 Mapping for the Land Capability System

2.3.1.2.1 Natural Resources

The following environmental resources were mapped:

1. Areas located at the land-water interface such as mud flats, sand flats, beaches, bluffs, dunes, prime aquatic habitats, fresh-water wetlands and tidal wetlands. Tidal wetlands were mapped as one unit (including low marsh, intertidal marsh, high marsh, coastal fresh marsh) and maritime flora and prime aquatic habitats. The interface resource units are subject to tides, flooding and/or high water tables.

2. Terrestrial resources include existing farmland, prime farm soils, old fields, upland forest associations, prime aquifer recharge areas, intermittent streams, and prime wildlife areas. Developed areas within the Coastal Zone were also mapped.

The mapping for the Natural Resource Inventory for Nassau and Suffolk contains forty-two boards. Each board comprises a planimetric base map and a natural resources inventory overlay. The scale of the base map which was derived from the U.S.G.S. Topographic 7 1/2 min. quadrangle series and the N.Y. State Department of Transportation Maps (scale 1:800; dated 1974) is 1" = 2000'.

The mapping units are as follows: Freshwater Wetland, Tidal Marsh, Forest, Maritime Flora, Dunes, Beaches, Old Fields, Farmland, Bluff and Developed Areas. Except for Freshwater Wetlands, Tidal Marsh, and Maritime Flora, the sole mapping sources for areas other than the South Fork were the April 1976 aerial photos (scale 1" = 1000') flown by the Aerographics Corp. of Bohemia, N.Y. and staff field checks. The South Fork map sources include vegetation information from the Group for America's South Fork Map Series.

For the wetland areas the following additional sources were used:

Freshwater Wetlands: N.Y. State Freshwater Wetlands, NYSDEC

Bureau of Water Pollution Control
Nassau County Health Department

Town of Hempstead Dept. of Conservation
and Waterways

Tidal Marsh: N.Y. State Tidal Wetlands Aerials - 1" =
200' U.S.G.S Topographic Maps

Town of Hempstead Dept. of Conservation
and Waterways

All land within the primary and secondary coastal zone was mapped. For complete description, see Coastal Zone Boundaries, Section 4.0.

Whenever there was an overlap between two categories, the predominant characteristic was represented; for example, the presence of bluffs took precedence over vegetation, dunes took precedence over maritime vegetation.

In transitional areas, such as formerly connected tidal marshes and drained fresh marshes, the area is represented as it appears on the aerial photo unless specific site information existed.

Freshwater streams, tidal streams, ponds, lakes, estuaries, bays, and surface waters appear on the base map. Tidal flats, mud flats, and reefs appear in an incomplete form on the U.S.G.S. quadrangles. Coastal shoals have been mapped at the 6' and 12' contour levels on the Natural Resource Maps available at the Regional Planning Board offices. The location of shellfish and other coastal wildlife habitats, feeding and nesting areas are indicated on work maps which are also available at the Regional Planning Board offices. Water bodies and natural resource types of less than one acre do not appear on maps.

The areal extent of the boundaries of the natural resources were based upon 1976 aerial photographs. The accuracy is estimated at 95% for areas larger than 1 acre. Areas of less than one acre that are different from contiguous areas are not equipped. This information has to be frequently updated and revised as it is subject to change.

2.3.1.2.2 Developmental Constraints

Any effective system of resource management must start with an inventory of sufficient detail to identify key factors such as slope, soil types, soil permeability, soil constraints, watershed boundaries, and flood hazard areas as well as critical environmental areas. The developmental constraints information was used as an input into the classification of Land Capability units.

Developmental constraints are those physical and locational characteristics of the land and water resource, which alone or in combination with on-going coastal processes, present hazards to or limit the economic feasibility and environmental acceptability of development. The maps for this section were prepared at the scale of 1" = 2000', on the U.S.G.S. 1975 N.Y.S. Department of Transportation 7.5 minute base quadrangle.

The mapping units have been divided into the following classifications: soil permeability, soils with greatest potential for frost heave, cut and fill soils, beaches, dunes, bluffs, steep slopes, and depth to water table less than or equal to 2 1/2'.

Soil permeability was mapped as either rapid, medium or low permeability for the upper soil layer. In areas where there were marked differences in permeability between the upper and lower soil layers, the differences were indicated on the maps. The boundaries for the mapping

classifications were based upon the Soil Survey of Suffolk County, New York, 1975, prepared by the Soil Conservation Service of the U.S.D.A., and from stereoscopic interpretation of the 1976 aerials (1000 scale) supplemented by the U.S.G.S. 1975 Topographic maps. The developmental constraints maps have not been published; however, sample maps have been provided to the New York State Department of State.

In addition to Developmental Constraints maps, the staff prepared Depth to Groundwater maps using published and unpublished U.S.G.S. hydrologic data. The 100 year flood plain is indicated on the U.S.G.S. Flood Plain Maps.

The developmental constraints associated with the major surficial geologic units and related current geologic coastal processes and significant soil characteristics are discussed below. The following surficial geologic units are found in the study area: glacial moraine, glacial outwash, terrestrial and marine deposits. The significant soil characteristics related to the geologic units are included within the discussion of the units. The general soil characteristics such as soil permeability, frost heave potential, depth to groundwater, slopes and slope erodibility are discussed individually. The application of soil permeability and depth to groundwater, to wastewater management, are discussed along with soil permeability.

Major Surficial Geologic Units and Related Processes

The glacial moraines, the Ronkonkoma and the Harbor Hill, are major geomorphic features of Long Island. The north shore Harbor Hill moraine and the eastern section of the Ronkonkoma moraine are still being eroded by aeolian and wave processes. The flow of stormwater as sheet runoff and in intermittent streams also contributes to the modification of the landform. Morainal areas have greater variability in terms of soil permeability and subsoil conditions. Boulders and cobblestones found in the till make excavation more difficult. Moraine areas may have perched water (discontinuous underground waterbodies) and soil conditions that may lead to bank collapse and potentially hazardous earthwork and foundation conditions.

The steeper topography of the moraine may require extensive cut and fill. Since the topography consists of hilltops, sideslopes, and lowlands, the soils are constantly varying. The side slopes tend to be sandy while the more level upland areas and the lowlands generally contain "fines".

The moraine depressions contain organic matter and silts, which are not suitable as a base for paving or for foundations, although silt loams can be used for roads that are oiled. The depth to seasonal highwater may be near the surface in the depressions, generally due to a clay lense or to the high groundwater level. There is a critical need for watershed and waste disposal management in the moraine areas.

Glacial outwash consists of stratified sands and gravels. The unit is gently sloping, usually 3% or less. The sandy and gravelly outwash materials are loose in consistency. The outwash plains are dissected by

numerous glacial meltwater channels that are gentle in profile, with slightly steeper slopes along the channel edges. Erosion is not as great a problem in the outwash plain, but "cut" soils tend to erode non-uniformly. Internal drainage, particularly near the coastal edge along rivers and streams may be poor due to the occurrence of impermeable layers or a high water table; however, in some locations, the soils may be found to be high or average in permeability. In general, the development constraints of the outwash plain tend to be minimal except for the existence of flood hazard areas and the high potential for groundwater pollution due to the high water table and the moderate to high soil permeability.

The development constraints of the terrestrial lowland deposits include a high water table and a large percentage of silts and clays eroded from uplands and possibly muck and decayed organic material, which result in low foundation bearing strength. The soils may be extremely plastic with a high shrink-swell potential or may be subject to frost heave. This condition is not dominant for the soil layer but is significant when cuts are made into the parent materials. Areas with plastic soils are generally classified as L.C.U. III and IV.

Beaches, dune land and tidal marsh are areas that are not recommended for development. The beaches and marshes are subject to wave action. These lands are classified as L.C.U. III and IV. The dunes are subject to storm waves and constant shifting due to winds. The marshes have a large percentage of organic materials which has low bearing capacity and high settlement potential.

Bluffs are landforms with facial slopes formed by the processes of wind and wave erosion, subsurface flow and by human disturbance. The soils of the bluffs vary from sandy soils to clays. The bluff face and a recommended setback area are classified as L.C.U. IV. The bluffs found along the north shore and in the Peconic and Montauk areas are subject to erosion due to wave undercutting from storms, lunar tides, groundwater seepage, and stormwater runoff. Bluff slump and collapse can also be caused by runoff, cesspool seepage, and the presence of heavy items i.e., trees, swimming pools placed near the edge of the bluff. The soils deposited at the base of the bluffs may be used in combination with planting and "army walls" to stabilize the bluff. Normally, this material is carried away by tides.

Bluffs categorized as having a high erosional rate sustain the loss of land, and damage to or loss of structures within a relatively short period of time. Recommended setbacks discussed in the Coastal Erosion Plan (Section 2.2) are based upon the erosional rate. Performance standards to minimize bluff erosion from stormwater runoff are also recommended to minimize the impact upon the bluffs.

The sequence of landforms found on barrier islands consists of primary dune, dune trough and secondary dunes and wetlands. The more protected dune trough and secondary dunes are more stable. The natural processes acting on the beach environment, the wave and wind erosions, long shore transport, and flooding, provide the greatest constraints to development. All of the barrier island units are placed in Land

Capability Units III and IV.

The 100 year flood plain is also associated with coastal processes. The location of the inland boundary of the flood plain generally occurs somewhere between the 5 and 10 foot contours on the south shore. In areas where the terminal moraine or headlands are found on the coastal edge, the inland edge of the flood plain generally occurs below the 15 foot contour; however, along the major streams and rivers the flood plain extends up the streams to higher elevations. Landfilling and channelization can lead to flood encroachment on adjacent areas. All flood plain areas not already assigned to L.C.U. III and IV have been assigned to Land Capability Unit II.

Development Related Soil Characteristics

The permeability of soils, that is, their ability or capacity to transmit fluids, is an important consideration in environmental planning to minimize future impact upon groundwater and surface waters. Differences in the porosity or interconnection of open space in the soil (i.e., high in medium sand and gravels, low with silts, clays and possibly fine sands) result in considerable variation in the rate at which water moves through the major soil horizons.

As mentioned previously, the soil permeability map identifies the varying transmission rates of soils. Areas with low soil permeability rates (i.e., between .62 and 2" per hour) are particularly suited for individual on-site waste disposal systems where the groundwater level at its highest point is sufficiently low to assure filtering of pollutants within the soil layer between effluent source and the groundwater. The depth to groundwater should be checked to determine the distance from the effluent source to groundwater, taking into account seasonal fluctuations. Since the use of tile fields and shallow leaching wells may be an acceptable means of waste disposal particularly for development at densities of less than 2 units per acre, the soil permeability information is a critical input.

Soils with permeability greater than two inches per hour may pass pollutants too quickly, thus permitting groundwater contamination. Soils with permeabilities greater than six inches per hour have the highest potential for groundwater pollution. It must be noted that the permeabilities above refer to the upper soil layers; subsoils may have different permeabilities. The permeabilities of the subsoil layer have not been mapped.

It should be noted that while highly permeable soils have a high potential for groundwater pollution, the potential for aquifer recharge is equally high. Environmental planning should maximize high quality recharge of the aquifers (Prime recharge areas are identified in the 208 Plan.).

Frost heave occurs when available high water is drawn near the surface by capillary action. The developmental constraints maps identify the areas where frost heave is most likely to occur. This is most likely to occur in the following soils: Atsion, Berryland, Canadice, Raynham, Wallington, Walpole, Wareham, and Whitman. These soils are partially

or totally associated with marsh areas and contiguous lands and should not be developed. Areas with these soils are generally classified in Land Capability Units III and IV. According to the 1975 Soil Survey, if a construction occurs on grade, the frost heave potential is minimum for soils in Suffolk County and it is assumed to be generally the same for Nassau County.

The Depth to Groundwater Maps (located at the LIRPB in Hauppauge, New York) classifications were divided into three major categories for mapping purposes: 0 to 3 feet and 3 to 16 feet and greater than 16 feet. Recent highest reported groundwater levels were recorded by indicating the location of the particular observation wells on the map. In general, wherever there is an unsaturated zone of 16 feet or less, the potential for pollution of the groundwater is relatively high. Possible sources of pollution include septic tanks, cesspools, recharge areas, and the leaching of pollutants applied to the soil surface and surface vegetation. For example, if the distance to the bottom of a cesspool is 14', the 16' depth allows only 2' of aerated soil between the bottom of the cesspool and the upper range of groundwater level. This depth may not be sufficient for the filtering of potential pollutants.

Slopes were considered individually and as a part of a watershed system. Slopes greater than 8% are a constraint to development and development on slopes is a source of significant environmental impact. Any development on a slope greater than 8% is covered by Land Capability Unit II performance standards. The management of slopes or prime watershed importance is also covered by Land Capability Unit III performance standards. For mapping purposes, the slopes were broken down into the following categories: 0-3%, 3-8%, 8-15%, 15-25%, and greater than 25%.

Muck soils are indicated on the maps and in many cases are classified as wetlands. They are shown on the development constraints maps as soils with high water table. These soils are not suitable for development due to the high compressibility and the low foundation strength.

According to Charles Barnett of the Soil Conservation Service, the Carver and Plymouth soils should not be used for top soil but are satisfactory for developing areas where natural vegetation is acceptable. If grass/sod is desired, then the soils will require the addition of top soils to minimize the cost of irrigation. Wherever possible, the Haven and Bridgehampton soils should be conserved and utilized as a soil additive to the Carver Plymouth soils. If paving or construction is to occur on these soils, the top soils should be removed and stored for future use.

The Development Constraints Chart (Table 2.3-1) identifies the developmental constraints mapping unit, the associated constraints, and recommended management.

2.3.1.2.3 Land Capability Mapping

These maps display the approximate physical boundaries of the Land

TABLE 2.3-1

DEVELOPMENTAL CONSTRAINTS MAPPING SUMMARY CHART

Color	Unit	Constraint	Recommended Management to Minimize Constraint (See Performance Standards to Minimize Environmental Impacts)
	Beach	Flooding Unstable landform subject to erosion and accretion	Recommend no development on beach Coastal Erosion Plan identifies areas that require stabilization
	Bluff	Unstable landform subject to erosion	Development setbacks to allow for new structures to remain unaffected by bluff recession for a period of 50 years Performance standards to minimize bluff erosion generated from land disturbance.
	Dunes	Unstable landform subject to erosion and/or migration	Setback controls to minimize impacts on dunes and therefore on development Performance standards and guidelines to protect dunes for a longer period of time for areas that will not be developed.
	Depth to seasonal high water less than 2'	Interferes with building, layering of pipes and paving Flooding	Areas with depth to seasonal high water are identified
	Cut and fill land	Differential settlement Potential high water table	Areas are identified
	Soils with high permeability	Difficult and costly to establish plants in disturbed areas Potential groundwater pollution	Recommend minimal disturbance of natural disturbance of natural vegetation to reduce development and maintenance costs (also to minimize impact upon groundwater, etc.) Recommend maximum recharge of nonpolluted stormwater

TABLE 2.3-1

DEVELOPMENTAL CONSTRAINTS MAPPING SUMMARY CHART:

Color	Unit	Constraint	Recommended Management to Minimize Constraint (See Performance Standards to Minimize Environmental Impacts)
	Rapid permeability in upper layer Low permeability in lower layer	Droughty soils Moderate slopes	Maintain natural vegetation May be suitable for on-site tile field waste treatment disposal for low density development
	Low permeability in upper layer Moderate permeability in middle layer Rapid permeability in lower layer	Minor constraints Possible differential frost heave in upper and middle layers	Protection of prime farm soils Conservation of top soil May be suitable for on-site tile field waste disposal system for low density development
	Moderate slopes	Extra grading and stabilization required	Minimize disturbance. Erosion control techniques prevent stormwater from traversing slope
	Steep slopes	Extra grading and stabilization required	Minimize disturbance. Erosion control techniques controlled development on steep slopes Prevent stormwater from traversing slope
	Developed (Unclassified)		
	100 Year Flood Plain	Flooding	Flood insurance development regulations No development when site contains significant environmental resources

Capability Units. Since the scale is 1" = 2000', precise boundaries of these units must be delineated in the field on the basis of the physical site criteria defined as a part of each Land Capability Unit.

The entire land portion of the land-water interface is shown on L.C.U. IV. This category does not apply to sites already developed. If redevelopment or reclamation were to occur however, the performance standards of L.C.U. II should serve as a guide to site design and the setbacks in L.C.U. IV are recommended.

2.3.1.3 Uses of the Land Capability System

The Land Capability System was used in the selection of compatible uses (see Section 5.0) and in the selection of land uses in GAPC's and the Coastal Management Plan.

The Coastal Management Plan delineation of land use areas was based in part upon the Natural Resource mappings and the suitability of land uses for the resources as described in the Land Capability System.

2.3.1.4 Use of Land Capability for Site Planning

The Land Capability Units specifically, and the maps generally, identify the required site development criteria for different areas. The L.C.U. management guidelines and performance standards explain how the site should be developed to minimize key impacts upon environmental resources (such as soils, surface water and groundwater), resources that would be influenced by site development.

2.3.1.5 Use of Land Capability for Resource Information Gathering

The natural resource maps and other in-house environmental information can be used to identify the location of environmental resources occurring on the property, adjacent properties, and within the immediate watershed area including the properties upland and "downstream" of the property. If any of the natural resources are contained within the property or adjacent to the property, or if site development would impact surface waters, the natural resource units can be consulted for information on specific impacts that might result from development and for performance standards and management guidelines to minimize impacts. The information along with the Natural Resource maps can aid in writing an EIS or an EIA.

2.3.1.6 Use of Developmental Constraints

The in-house developmental constraints maps attempt to describe hazards and constraints that the site developer-designer would encounter for a given site.

2.3.1.7 Use of Land Capability System for Environmental Impact Statements

The system can provide the following information:

- a. a description of the environmental setting of the area to be affected.

- b. the description of the general environmental impacts relating to the resources of the site.
- c. the description of adverse affects which cannot be avoided.
- d. the performance standards and site design guidelines can aid in the description of how adverse impacts can be mitigated.

2.3.1.8 Use of Performance Standards

Definition

A performance standard is an expression of acceptable achievement. It may be mathematically precise as found in construction codes, or verbal statements of criteria that allow for a range of responses, according to the particular activity.

Discussion

The basic purpose of the Land Capability performance standards is to describe how site development should occur by setting standards of site achievement, so that the environmental impacts and occasional developmental hazards that result from development can be kept to a minimum. Another basic purpose is to provide a method for the developer to meet existing environmental laws and regulations by designing the site to meet the law rather than after the fact.

Acceptable achievement is a site design solution where potential environmental impacts have been reduced to the lowest possible level. One type of performance standard is mathematically precise, such as those which describe the percent of the site to be allocated for development, the percent of site that can be disturbed, controls for degree of slopes, the amount of stormwater runoff allowed to run off the property or the amount of the rainfall to be recharged. Another type of performance standard is a verbal site design and site construction criteria to be met in any way the developer chooses. It describes the design solution and the site functioning in qualitative terms. Both types allow for the developer-site designer to solve the problem in a suitable manner as long as the criteria is met.

The Land Capability unit performance standards and criteria recognize the need for development, while providing controls which reduce the potential impacts upon the natural resources. They are contained within Section 2.3.1.9 - Site Design Review Process.

The performance standards increase as the sensitivity of the resource and the potential impacts increase. These standards promote the protection of environmentally sensitive areas by using existing zoning enabling power, police powers and the existing site plan review procedures. They provide a tool for managing the natural resources within the limitations of existing land use zoning constraints. The community is able to focus

on the aspects of development it needs to control.

Once the performance standards become ordinances, the implementation of these recommended changes in the site plan review process is well within the capability of town governments. The regulatory mechanisms are primarily designed to protect surface and groundwater, are consistent with the 208 Plan Non-Point Source Guidelines and also benefit terrestrial resources such as habitats, areas of natural vegetation, soils, etc. The environmental performance standard regulation can simplify the administrative process in granting permits, once the system is in operation, because the controls (once agreed upon) for all sites would be clearly identified by location and/or site description.

If the site design meets performance standards, the environmental impact statement process could be simplified. The meeting of performance standards would reduce the significance of physical impact. A proper site design displayed visually can demonstrate how impacts will be minimized. The short form EAF for a site meeting performance standards may prove to be sufficient, depending also upon the social, economic and other impacts. The presenting of adequate information on the plans and in the specifications will also prevent costly delays that usually occur when the review agency requires more information.

The meeting of performance standards may enable the site to qualify for a "determination of non-significance" pursuant to the State Environmental Quality Review Act.

The meeting of performance standards may or should reduce the following indicators of significant effects on the environment:

1. a substantial increase in potential for erosion, flooding or drainage problems;
2. the remainder or destruction of large quantities of vegetation or fauna; the substantial interference with the movement of any resident or migratory fish or wildlife species; impacts on a significant habitat area; or substantial adverse effects on a threatened or endangered species of animal or plant or the habitat of such a species; and
3. changes in two or more elements of the environment, no one of which has a significant effect on the environment, but which when taken together result in a substantial adverse impact on the environment.

Other important beneficial aspects of performance standards are listed below:

1. Performance standards assure greater protection of environmental resources because they take into account the process impacts upon the resource, indirect as well as direct.
2. Performance standards are fair because the developer/site designer meets a standard that is the same for all sites that have the same conditions.

3. Performance standards are compatible with other acts, state and federal, to control, protect or regulate environmental resources including Section 208 of the Federal Water Pollution Control Act Amendments of 1972 and the N.Y.S. Tidal and Freshwater Wetlands Acts. In fact, the proposed performance standards provide added protection to these resources while meeting the letter of the tidal and freshwater wetland regulations.
4. The performance standards have an aesthetic benefit in that the preservation of the natural characteristics of the land and vegetation provides diverse, scenic contrasts which result in greater visual interest.
5. The meeting of performance standards proposed as part of the Land Capability units may reduce site development costs. In many cases, the meeting of performance standards may reduce the amount of paving and permeable surfaces. By allowing a large percentage of the site to remain in natural vegetation, landscaping and landscaping maintenance costs can be reduced. The managed maintenance of natural vegetation, particularly upland forest vegetation, leads to an increase in the value of property.
6. Expensive erosion control and stormwater systems can be minimized in many cases by the meeting of performance standards. Since the disturbed area should be reduced, the recharge area increased and the stormwater runoff minimized, stormwater systems costs can be reduced. The reduced sedimentation can reduce upkeep on stormwater systems.
7. The property owners and developers who require assistance in meeting performance standards can receive help from the Soil Conservation Service, NYSDEC and possibly other local environmental agencies, county agencies, and from private qualified professionals.
8. Performance standards may be partially met by clustering which is a valuable tool for conserving the natural resources. Clustering also reduces the costs of utility systems and roads in new developments.
9. The compliance with performance standards fills in the inadequacies of the piecemeal methods of protecting the resources and can be a major contribution of the reduction of non-point source pollution that diminishes surface and groundwater quality, and public resources of the greatest importance.
10. Performance standards are also necessary to reduce or minimize the impact of the coastal resources on development and the impacts of the development upon contiguous lands.
11. Some of the most critical areas which respond favorable, to management by site functioning and therefore performance standards are the significant watershed areas, i.e., swales,

steep slopes, woodlands, streams, ponds, lowlands and wetlands.

12. Future governmental costs can be reduced by the protection of the water and living resources. The costs of implementing performance standards are minimal because the mechanisms for review and permit already exist.

13. The open space gained through the meeting of performance standards provides social and aesthetic benefits.

The methods of protecting the resources, while allowing development nearby, require an overlap of land use, institutional, legal and site development permit controls. It appears that the most feasible method of preserving the critical areas to be developed, would be to minimize the types of impacts that can occur. Once the construction is completed, a site inspection is required to insure that all conditions have been met before a certificate of occupancy can be granted.

2.3.1.9 Use of Land Capability Performance Standards in the Site Plan Review Process

The towns site plan review criteria, and the information required on site plans, should be compatible with the requirements listed below to insure protection and/or conservation of the environmental resources of the coastal zone. A site permit should be granted before any grading or site development work can begin. In the past, land has been cleared, roads cut, wetlands filled, streambanks cleared before the review agency has had a chance to check the plans.

It is recommended that before the site design process begins, the site designer comes to the review agency to pick up the performance standards appropriate for the site. The performance standards used as a guide for the design process, can reduce time in meeting the towns requirements.

The site plan, once completed and submitted for approval can be evaluated in terms of the performance standards. The information required to meet the standards including site coverage, stormwater runoff procedures, erosion control techniques during the construction period should appear on the site development plan.

After the construction is completed and items on the site plan are complete, the certificate of occupancy (c/o) would be based upon adequate site development as well as the usual requirements of a c/o. The c/o should not be given until all swales, berms, sediment basins, erosion control, measures are properly installed.

Site Plan Requirements

The site plan submitted to the towns for approval* and/or to the

*Would not include remodeling or additions to existing structures unless structures are located on or adjacent to bluffs, dunes, wetlands, swales, steep slopes (greater than 25% or located adjacent to surface waters). A site plan should be required for any site disturbance that requires grading for an area greater than 5,000 square feet.

county planning departments for review should include the following: general information, existing conditions and proposed plan.

General Information - Standard information now required for site plan review should be provided including name and address of the developer or owner, scale, vicinity sketch, site acreage, site boundaries and the location of existing buildings within 100 feet outside of the property boundaries.

Existing Physical and Biological Site Conditions

Site plans submitted for approval should include topography (contours at 2' or 5' intervals) natural drainage characteristics or existing drainage patterns, the quantity of stormwater coming onto the site* for a given storm - 2 year, 5 or 10 year - depth to the seasonal high water table, existing depressions, kettleholes, swales, marshes, areas of standing water, soil types, any unique geomorphic features such as dunes and bluffs, the high water line if the site is adjacent to a water body, the delineation of existing vegetation categories such as forest, grassland, old field, etc., the percent of site in natural vegetation, percent of site already disturbed and any known species that are "endangered" or "protected".

Proposed Plan

The proposed plan should include a grading plan, storm drainage plan, the percent of area to be disturbed, the plan for managing stormwater and erosion during the construction period (such as the placement of temporary berms to prevent stormwater from leaving property), the location of stockpiled soils, temporary and permanent sediment basins, recharge basins, erosion control techniques, the new edge of natural vegetation, the landscape, planting and construction plan, and the estimated site development schedule.

The site review staff can use the following Land Capability management guidelines (see also Site Planning Techniques to Meet Performance Standards 2.3.1.10).

Land Capability Unit I

Controls are needed to assure the maintenance of groundwater and freshwater quality. This unit is categorized by disturbed soils and vegetation and an absence of fragile resources. It has a low susceptibility to impact from most types of development. The required performance standards are at a minimum, however, they are consistent with the 208 Plan Non Point Source recommendations. Existing environmental laws

*Half of the townships in Suffolk County, for example, have no requirements that storm water be recharged to the groundwater aquifer and only two towns and one village specify that no stormwater runoff from a development shall be diverted so as to overload existing drainage systems or create flooding on other lands. Although most towns and villages have taken some action to regulate drainage and runoff, one Suffolk town has no specific requirements at all.

in some towns suffice. Where intensive development is anticipated, the performance standards attempt to minimize any adverse impact on the environment, while at the same time accommodating future growth.

The primary purpose of following performance standards and management guidelines proposed for land areas within L.C.U. I is to minimize non-point source impacts upon groundwater and surface waters. The performance standards and management guidelines for L.C.U. I applies to all properties to be developed.

Land Capability Unit I

Performance Standards:

1. Cesspool effluent should be discharged an adequate distance above the seasonal high water table (minimum - 4 feet) to allow sufficient filtering of pollutants.
2. The groundwater withdrawal rate for local area should not exceed safe yield.
3. High quality stormwater recharge should be maximized for all land uses. (All stormwater generating from rooftops, patios, decks, sidewalks, and driveways should be recharged on site.) All stormwater runoff resulting from onsite residential paved surfaces and from all proposed building roof areas should be recharged on site. This does not apply to areas where the groundwater table is high or in areas that are almost totally developed where storm sewers are in use.
4. Stormwater from roads in new subdivisions should be filtered and recharged on site. Filtering installations should be maintained (see comment in 3 above).
5. All stormwater runoff from major roads and large public parking areas and all other contaminated paved surfaces should be filtered before recharge. Filtration and uptake are required for polluted stormwater from highways, major roads, and other paved areas where contaminants are known to be high. Continued maintenance of filtration systems is required.
6. Direct discharge into natural fresh or salt marsh systems or into surface waters should not be allowed for any new construction. Stormwater must be desilted and pollutant-reduced, using such techniques as sufficiently low velocities, sufficient time storage and filtering action.
7. No increased sedimentation of stream corridors, tidal wetlands or freshwater wetlands resulting from constructional or operational phases of site development should be allowed. All sedimentation resulting from

- construction-induced erosion shall be trapped on the construction site.
8. Stockpiled soils shall be reasonably stabilized.
 9. All soils on property must be stabilized before an occupancy permit is given.
 10. Incoming water onto the site shall be made a part of the stormwater management plan.
 11. After the site is developed, the sum of the incoming water leaving the site and the increased stormwater due to the development shall not exceed an allowable quantity as established by local authorities. In some areas the quantity should not be increased, such as large lots of residential development, (1 acre or more) and all development on 5 acres or more.
 12. During the construction period, storm runoff flows that will be generated by construction and other site development activity, shall be disposed of on site by vertical drainage, or as follows. At sites where vertical drainage is not feasible, all storm runoff from 25-year frequency, 24-hour storm from unstabilized soil areas shall be collected, desilted, and released into adequate stable channels at not over 1% of the 25 year peak flow rate. For sites where total vertical drainage and/or on site storage of runoff from construction is not practical, that portion of site that is suitable, shall be used for vertical drainage, and areas that are not suitable, shall be provided with natural or structural stormwater drainage systems as approved by the permit agency (see comment above in item 3).

Land Capability Unit II (L.C.U. II)

This unit is characterized by somewhat more vulnerable resources (see Land Capability Unit II, under section 2.3.1.1). Construction is subject to hazards that can and are being minimized by the imposition of performance standards and by federally required flood control regulation. This unit comprises areas recommended for any legally acceptable development provided that development can meet the performance standards required to minimize environmental impact.

Land Capability Unit II

Performance Standards (Standards 1-12 apply)

13. The maintenance of natural vegetation should be encouraged.
14. Site disturbance through clearance and grading should be minimized..

15. Grading standards are required. New grades greater than 33% (3 to 1 slope) should not be allowed except in special circumstances. Existing slopes of 35% or greater should not be disturbed, including soils or vegetation. All slopes should be stabilized during the construction phase and before the certificate of occupancy is given. All disturbed soils should be stabilized before the c/o is given.
16. Tree and other natural vegetation removal for construction purposes on slopes greater than 25% should be only those areas required for grading for construction.

Land Capability Unit III

This unit is characterized by increasingly valuable resources (see Land Capability Unit III in section 2.3.1.1.). Areas in Land Capability Unit III can tolerate limited development provided design criteria and performance controls are used to reduce undesirable impacts such as erosion, sedimentation, loss of habitat, and loss or change in primary productivity.

Land Capability Unit III

Performance Standards (Items 1-17 listed under L.C.U. I & II apply)

18. The intrinsic characteristics of the resource must remain. No more than 30% coverage of natural vegetation may be removed. Trees may be thinned to provide optimal growth conditions for clearstory and understory vegetation.
19. No wetlands buffer zone vegetation shall be disturbed by either removal of vegetation or by sedimentation or by change in the amount of stormwater reaching the wetlands within 50' upland of the wetland edge or beginning of wetland vegetation.
20. No more than 10% of land may be developed.
21. No alteration of stream channel capacity, flow and stability from development of land area within should be allowed to occur.

Land Capability Unit IV

Areas in Land Capability Unit IV are recommended for preservation. This unit includes the resources that cannot tolerate development except in an extremely limited sense. The resource unit includes the dune system on the barrier islands, small islands, tidal marsh, freshwater marsh, and the area immediately next to the water's edge (either fresh or marine waters), the bluff face, and areas where the depth to seasonal highwater is less than 3 feet. This land must be carefully managed and protected to preserve the resource. Areas in this unit should be developed only under those circumstances where overriding economic or social values are to be served.

Land Capability Unit IV

Performance Standards (Items 1-21 apply)

22. Specific controls to minimize impact are required for each development, such as road or fire roads, pedestrian trails, bike paths, rangers lookout, entrance gate house, etc. All development within this category should be reviewed.
23. No more than 5% of the site should be disturbed. Disturbed soils that are not built upon should be revegetated and stabilized. Areas to be disturbed should not include rare or endangered or protected species, fresh or tidal wetlands. Disturbed areas shall not impact adjacent areas that include rare or endangered species.

Please note:

Included within L.C.U. III and IV areas, are sensitive environmental resources that may require further protection beyond the guidelines and performance standards provided.

The performance standards above are intended to be used as a guide for localities. The actual types of performance standard required will vary by town. Some of the above do not apply to certain towns. Others that are necessary may not be included.

2.3.1.10 Site Planning Techniques to Meet Performance Standards

The following list is recommended as a guide for developers to be distributed in the initial phase of the site planning process, along with performance standards, environmental regulations, and other guidelines for builders to obtain a permit and a certificate of occupancy.

- a. Minimize impermeable paving.
- b. Minimize disturbance of soils, slopes and vegetation.
- c. Recharge stormwater from roofs, patios, driveways, where possible, immediately adjacent to surface so that the traversing of soils is minimized.
- d. Recharge runoff resulting from roads, parking areas after filtration of pollutants and sediments has occurred.
- e. Use grass mixes that require minimum fertilization such as red fescue. This is especially important in areas of deep magothy recharge (Zones I and III 208 Plan), areas with high water table and in areas that are adjacent to surface waters.
- f. If the site is in a zero runoff zone or area and infiltration is restricted with a high water table, impervious soil or surficial layers (fragipan, plowpan, etc.) special techniques will be required to detain the water on site and control the

rate of runoff.

- g. Where topography limits the on-site recharge of stormwater, detain runoff from site and direct stormwater from road surfaces to sediment basins before depositing water in a sump.
- h. If clay lenses would prevent the proper functioning of leaching wells, shallow depressions and swales should be used along with minimum permeable paving.
- i. If the topography is steep and the occurrence of clay lenses is known or suspected, the extent of developed areas in impermeable surface cover should be reduced. Two story buildings will have less roof area than a one story of the same square footage. Buildings can also be clustered so that paved areas and land disturbance can be minimized. Permeable driveways, walls and patios should be required in steep slope areas.
- j. The contact of stormwater runoff with soils should be minimized. This will result in a decrease of erosion, sedimentation, impact upon downstream properties, and in the required maintenance of storm systems.
- k. Preserve existing natural waterways.
- l. All disturbed soils should be planted, retained, covered and stabilized. A plan is required to show how this will be done during the construction phase and for the permanent landscape design.
- m. Construction drawings and specification should demonstrate how dust, erosion and sedimentation would be managed during construction and operational phases of development.
- n. The natural runoff rate for the site should be calculated; construction plans and specification should indicate what provisions will be made to insure that stormwater runoff will be reduced to acceptable levels.
- o. The distance from the point effluent discharge from a private wastewater system should be increased either by raising the elevation of cesspools, in-tandem, or by using a tile field, where conditions permit, when the depth to groundwater or the soils allow for contamination of the groundwater. The location of the point discharge should be measured above the seasonal high water table rather than above groundwater level measured during a dryer month.
- p. Drawings should be inclusive enough to demonstrate to the local review agency that the plan adequately meets all guidelines, environmental laws and performance standards.

- q. If the property is located within or adjacent to critical wild-life habitats or critical environmental areas, the developer should minimize disturbance by clustering, reducing areas of paving, lawns and roofs.
- r. Plans should indicate how vegetation will be restored in undeveloped cleared areas.
- s. Trees and brush from construction sites should not be dumped in swales or along steep slopes, however, damming of small gullies, created by stormwater runoff can effectively reduce stormwater runoff and erosion. Branches should be placed perpendicular to flow and secured at the edge of the gully.
- t. Thinning of natural vegetation should be allowed where necessary to maintain health and vigor of stand and of groundcover and understory vegetation. Vegetation along the immediate stream bank edge within the area subject to flooding should be retained.
- u. Siting of roads and structures in natural drainage channels, in the flood zone of streams, along the banks of streams, along the top of bluffs or running parallel behind dunes should be avoided.
- v. Fertilizers should be supplied in small enough quantities to assure uptake by plants (Public education is required so that this particular technique to protect water quality can be used on a more general basis.).

2.3.1.11 Relationship of Land Capability and Watershed Management

Watershed management provides protection for sensitive lands, fresh and marine water quality, freshwater quantity and groundwater.

Watershed management techniques also minimize hazards relating to stormwater runoff, including landslides and flooding. The performance standards for all of the Land Capability Units, particularly Units I, II and III, deal with the management and protection of soils, stormwater, vegetation, landforms, and the recharge capacity of the watershed. L.C.U.'s III and IV occur in key watershed areas. L.C.U. IV is directly adjacent to surface waters.

The management requirements for the buffer zones of L.C.U. III and L.C.U. IV protect wetlands, surface water quality and quantity and the related recreational, economic and productive benefits of the resources.

2.3.2 Water Capability System

2.3.2.1 Introduction

Rational coastal zone planning requires a knowledge of how various human activities impact environmental resources. In addition, it requires an accurate picture or inventory of the types and distributions of environmental resources within the planning area that are likely to be impacted. Without this knowledge and information the consequences of specific planning proposals

cannot be fully determined.

Cause-effect links between human uses (activities) and marine environmental resources have been fairly well identified. However, precise quantitative expressions for these links have not yet been developed. Therefore, while the scientist or planner may be in a position to say that a given use will have a negative impact on a certain resource, he will seldom, if ever, be in a position to say how great that impact will be, or over what geographic area it will be felt, or to what extent secondary impacts will occur.

The inability to quantitatively express (i.e., to model) the interactions between human uses and marine environmental resources does not imply that scientific data on these interactions, even in their present rudimentary form, cannot be utilized in the planning process. What it does imply is that the use of these scientific data by planners must take into account the limitations described above, and must be based on determinations of what, in light of these knowledge gaps, constitutes prudent courses of action.

The Water Capability System, which integrates marine environmental science with coastal zone planning, is an outgrowth of earlier work conducted by the Long Island Regional Planning Board and others. It is based on two marine environmental parameters, bathymetry (depth) and hydrography (tidal flushing), that are capable of quantification and for which data are available for the entire Nassau-Suffolk region. Application of the Water Capability System makes possible the identification and mapping of marine waters with similar characteristics and therefore, presumably, with potentially similar responses to human use impacts.

The resolution of the Water Capability System is still rather crude, but considerable refinement should be possible in the future. However, even in its present rudimentary form, the Water Capability System gives the planner a tool with which he may sharpen his perception of the coastal zone, and may therefore be more prudent in his recommendations.

2.3.2.2 System Parameters and Categories

A classification system for marine waters could theoretically be based on an infinite number of biological, physical, chemical, hydrographical, or geological parameters. However, to be useful, such a system would require detailed data on each of these parameters for each portion of marine water to be classified. A quick review of existing environmental inventories for coastal waters reveals that bathymetry (i.e., water depth, usually, measured at Mean Low Water) is the only parameter for which accurate information is available over a large geographic area. Most inventories of other parameters either do not have adequate resolution or spatial coverage (e.g., bottom sediments or vegetation), or they involve resources whose distributions are highly variable over time (e.g., fish or other motile biota).

Fortunately, the Nassau-Suffolk region can also make use of another parameter, Steady-state Pollution Susceptibility, which provides a rough quantification of tidal flushing action and which has previously been mapped for the entire region. Thus water bathymetry (depth) measured

at Mean Low Water, and hydrography (tidal flushing) as calculated by the Steady-state Pollution Susceptibility model, serve as the basic parameters for the Water Capability System.

The possible values of water depth and Steady-state Pollution Susceptibility lie on a continuum. The definition of mappable categories requires that limits be placed on these values, and, ideally, such cutoff values would represent physical thresholds that can be shown to separate waters with different responses to external stimuli (e.g., pollution). Unfortunately, no such scientifically demonstrable thresholds exist, even for simple parameters such as depth and tidal flushing. However, limits along the continuum of values can be selected based on empirical evidence (i.e., real-world observations) so that reasonable categories can be defined. This is the approach taken in the development of the Water Capability System.

Water depth can have a significant effect on the likelihood that human uses will adversely impact marine environmental resources. For example, for a given bottom type and local biota, the effects of boating-induced turbulence or prop wash will increase as water depths decrease. In addition, the distribution of certain biological resources such as attached plants (benthic flora) is affected by water depth, due to decreasing sunlight penetration with increasing depth.

The Water Capability System utilized the 6 foot (1 fathom) and 12 foot (2 fathom) depths at Mean Low Water as limits in the definition of depth categories. The 6 foot depth is generally the lower limit at which direct damage of bottom organisms by propeller cutting will occur. Attached benthic plants will generally be found at depths less than 6 feet due to the limited penetration of sunlight in coastal waters. In addition, the 6 foot depth contour has been recommended in other planning studies as "a minimum precautionary depth for planning purposes". The 12 foot depth is approximately the lower limit of significant mixing or turbulence resulting from the operation of outboard motors. Therefore, the Water Capability System divides coastal tidal waters into three depth categories: waters equal to or greater than 12 feet deep at Mean Low Water; waters equal to or greater than 6 feet deep but less than 12 feet deep at Mean Low Water; and waters less than 6 feet deep at Mean Low Water. Depths at Mean Low Water are used since they represent average "worst case" conditions, on which to base prudent planning.

The other parameter used by the Water Capability System to categorize coastal waters is tidal flushing, which is quantified by utilizing the Steady-state Pollution Susceptibility model previously developed for the Long Island Regional Planning Board. The model is based on simple tidal prism and tidal excursion calculations. Steady-state Pollution Susceptibility values are utilized to divide tidal waters into three categories based on empirical observations about the relationship between model values and actual flushing action. The determination of cutoff values utilized by the Water Capability System takes into consideration the accuracy limitations of the Steady-state Pollution Susceptibility model, and is therefore based on order-of-magnitude differences. The three tidal flushing categories are defined as waters with Steady-state Pollution Susceptibility values less than 50; waters with Steady-state Pollution Susceptibility values equal to or greater than 50 but less than 500, and, waters with Steady-state Pollution Susceptibility values equal to or greater than 500.

2.3.2.3 System Classification Units: Application and Interpretation

The three depth and three tidal flushing categories can be combined into 9 possible classifications. However, the mapping of nine water classifications presents a considerable number of technical problems. To avoid these problems, the Water Capability System condenses the nine possible classifications into three mapping classifications "units". The exact interpretation of these units depends on the location of the water area in question. For example, along the open coastline Steady-state Pollution Susceptibility values are fairly uniform and usually less than 50. In this instance the depth parameter becomes the primary determinant for assigning Water Capability units (Figure 2.3-1). Within embayments the situation is more complex, the Steady-state Pollution Susceptibility values assume greater importance, especially at the embayment heads where they become the determining factor (figure 2.3-1). Nevertheless, depth and Steady-state Pollution Susceptibility value contours are included on maps of Water Capability even where these parameters are not crucial to the assignment of Water Capability units in order to provide ready access to all relevant information (Figure 2.3-1).

The definitions of the three Water Capability classification units can be summarized as follows: Water Capability Unit I - depths at Mean Low Water equal to or greater than 12 feet and Steady-state Pollution Susceptibility values less than 50; Water Capability Unit II - depths at Mean Low Water equal to or greater than 6 feet and Steady-state Pollution Susceptibility values less than 500; and, Water Capability Unit III - depths at Mean Low Water less than 6 feet or Steady-state Pollution Susceptibility values equal to or greater than 500. These definitions can be summarized in the following table:

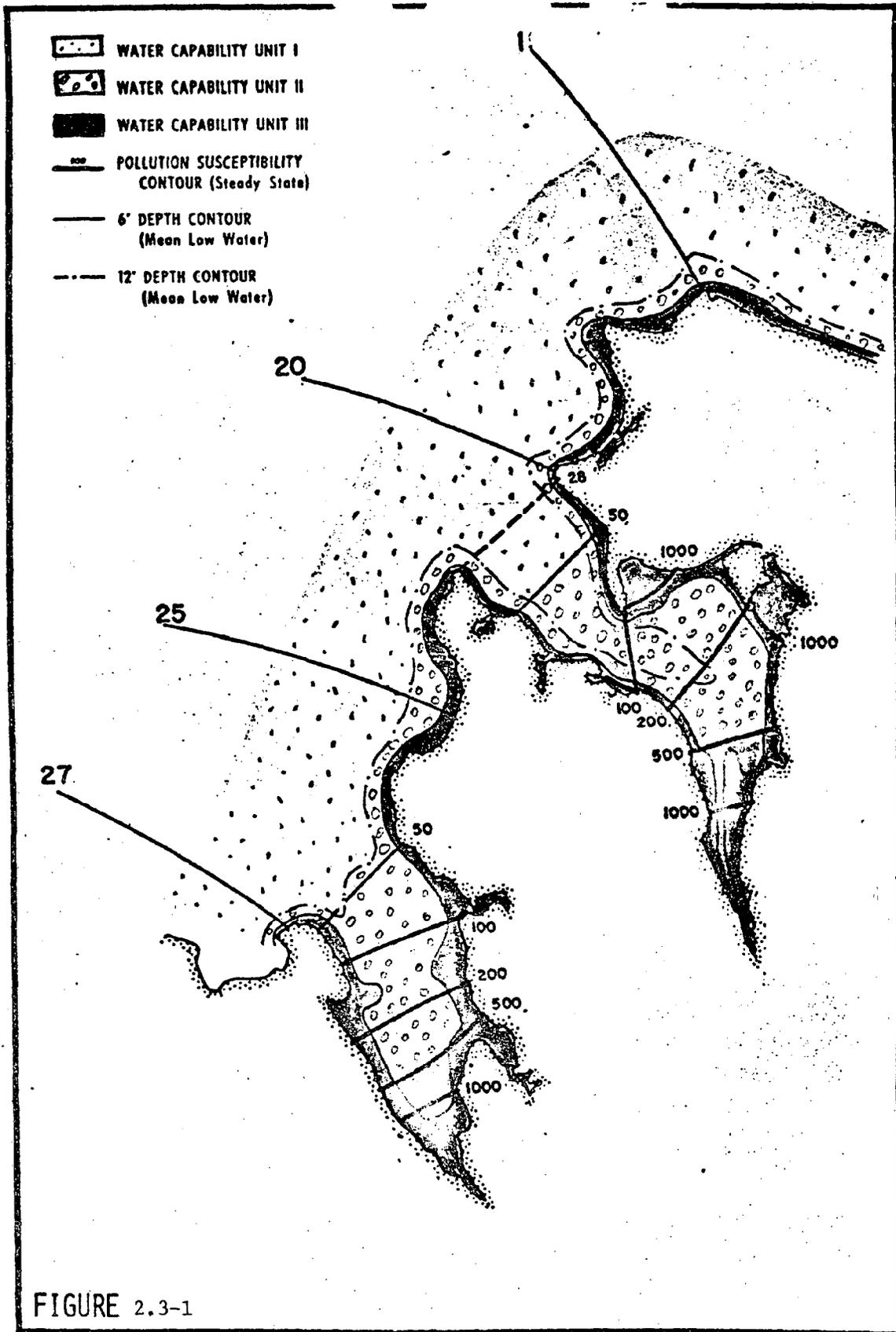
	<u>Depth at Mean Low Water (ft)</u>		<u>Steady-state Pollution Susceptibility Value</u>
Water Capability Unit I	12	and	50
Water Capability Unit II	6	and	500
Water Capability Unit III	6	or	500

Note that Unit I is a subset of Unit II (i.e., waters in Unit I also meet the definition of Unit II waters). Waters are always assigned the lower classification (Unit I when they meet the definition).

One other mapping convention involving the Water Capability System concerns the classification of fresh water ponds and lakes, and the non-tidal portions of streams. Clearly, the strict application of the Water Capability System to these waters is impossible since no Steady-state Pollution Susceptibility values can be calculated for them. However, for the purposes of mapping, the Coastal Zone Management study assigns these non-tidal waters to Water Capability Unit III. This is a reasonable convention since the kinds of management techniques that would be applied to fresh waters with no tidal flushing at all.

2.3.2.4 System Utility

The Water Capability System provides the planner with a tool with which



to develop a macroscopic picture of the relative vulnerabilities of marine waters to negative impacts from human uses. Such an overview has a number of possible applications in the coastal zone planning process.

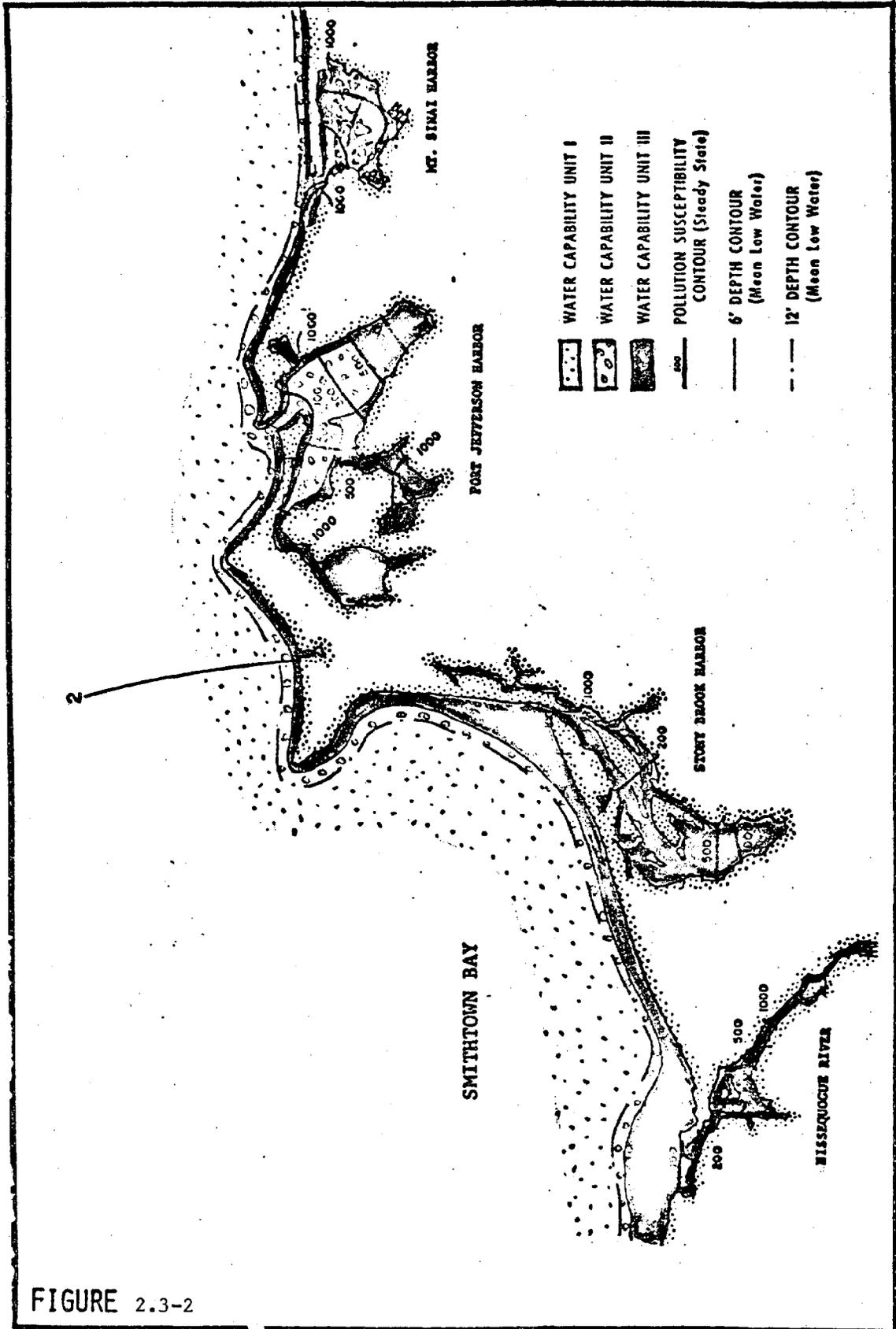
Maps of Water Capability provide a quick means of identifying potential "trouble spots" within a region's coastal marine waters. Along the open coast, Water Capability maps indicate shoal areas that may present navigational problems. For example, the map of Smithtown Bay (Figure 2.3-2) indicates extensive shoals at the entrance to Stony Brook Harbor and at the mouth of the Nissequogue River, and, indeed, these are locations where considerable navigational problems exist. In contrast, the map of Port Jefferson and Mt. Sinai Harbors (Figure 2.3-2) does not show large shoals outside the inlets and, not surprisingly, these areas have less severe navigational problems than those found in Smithtown Bay. Within embayments, the shallow poorly-flushed (i.e., Unit III) areas are most susceptible to water quality deterioration resulting from urbanization of surrounding watersheds, and it is these areas that can be expected to be degraded and closed to swimming or shellfishing first. In this regard, it can be seen from regional maps of Water Capability for Nassau and Suffolk Counties (Figure 2.3-3) that, in general, the south shore embayments are much more vulnerable to the effects of shoreline urbanization than are the north shore or east end embayments.

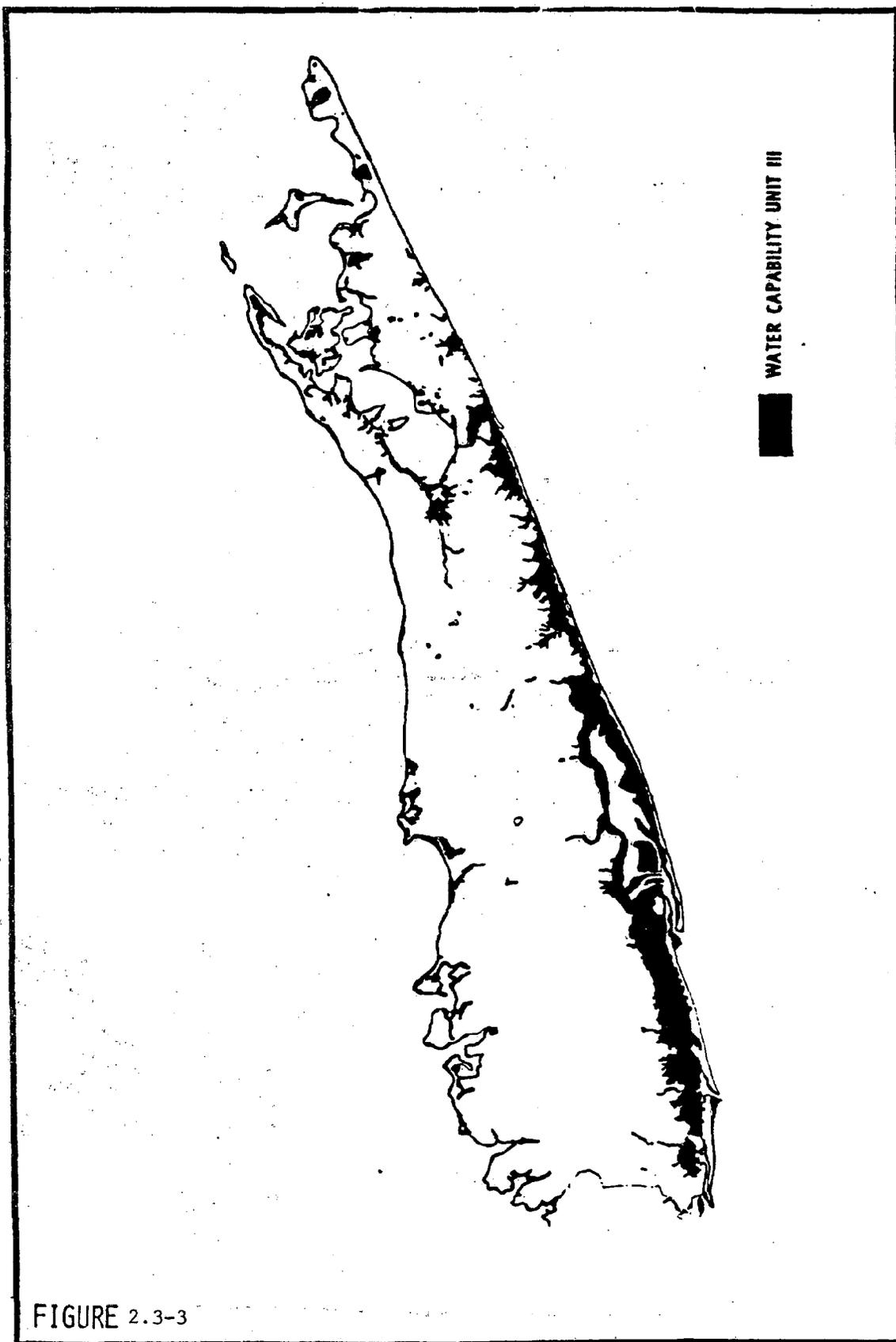
The Water Capability System also provides an objective means for delimiting water areas whose protection may require special management techniques. Such areas might include coastal shoals that are important for shellfishing and waterfowl feeding, or shallow poorly-flushed portions of embayments that tend to be biologically productive but also highly sensitive to human impacts. Special management techniques might include regulation of boat speed, horsepower or time (hours or seasons) of operation; regulation of seasons for dredging and spoil operations; or prohibitions of specified activities such as waterskiing or the discharge of marine sanitation devices.

2.3.2.5 System Transferability and Methodological Extensions

The Water Capability System, as presently constituted, can be applied to any area for which water depth and tidal flushing data (Steady-state Pollution Susceptibility values) are available. Water depth information for most tidal waters is available from the National Ocean Survey (U.S. Department of Commerce) in the form of nautical charts. The Steady-state Pollution Susceptibility model can be applied directly to any waters with semi-diurnal tides, and can also be applied, after slight modification, to areas with complex tidal regimes or significant riverflows.

As noted earlier, the complexity of the Water Capability System (i.e., the number of parameters) is presently limited by the deficiencies of existing marine environmental inventories. Clearly, it would be desirable to include in the classification scheme such parameters as bottom sediment type (e.g., sand, mud, etc.) or biological resources (e.g., attached flora, shellfish, finfish spawning areas, etc.). However, it should be recognized that an increased number of parameters would require greater scientific knowledge about their interactions in order to determine cutoff values for categories. In addition, there would be greater problems in establishing and mapping "boiled down" relative classification (ranking) units.





2.4 Water Quality Subplan

The Water Quality Subplan summarized the findings and recommendations of the Long Island Regional Planning Board's Areawide Waste Treatment Management (208) Study. The subplan described the relationship between CZM boundaries and coastal waters; the nature of point and non-point pollution sources on Long Island; coastal water quality conditions and pollution loadings; the 208 Plan technical studies; the preferred 208 Plan management alternatives and recommendations (including research needs); and, the relationship between 208 Plan recommendations and New York State Water Resource Policies.

Section 208 of the Federal Water Pollution Control Act Amendments of 1972 created a comprehensive water quality management program to deal with the treatment and prevention of water pollution. The LIRPB (formerly the NSRPB) was designated by New York Governor Malcolm Wilson in December 1974 as the regional planning entity to carry out Section 208 planning for Nassau and Suffolk Counties. The Board established a Technical Advisory Committee (TAC) to assist in the technical aspects of plan preparation; the Board also established a Citizens Advisory Committee (CAC) to provide input to the TAC from the general public, and to act as a forum for distributing the findings of the study. A number of technical consultants were retained to assist in the \$5.2 million three year study.

The close relationship between land use and coastal water quality was a major consideration in the delineation of the inland boundaries of the Nassau-Suffolk coastal zone. In particular, the location of the secondary inland boundary (See Section 4.0) was determined on the basis of information on surface drainage and subsurface underflow patterns developed by the 208 Study. The secondary boundary was delineated so as to include those areas contributing surface runoff directly to surface waters, and those areas underlain by shallow groundwater aquifers that contribute underflow to streams and marine waters.

Point sources of pollution on Long Island consist of effluent discharges from sewage treatment plants and industrial waste treatment facilities. Point discharges contain oxygen-demanding substances, bacteria, viruses, nutrients, suspended solids, heavy metals, and organic chemicals. Table 1 indicates the quantities of industrial and domestic wastes being discharged in effluents in Nassau and Suffolk Counties; although the numbers of industrial and domestic treatment plants are similar, domestic flows are greater than industrial flows by a factor of 40.

TOTAL POINT SOURCES - FLOW SUMMARY (January, 1976)

Discharge in MGD

	<u>No. of Plants</u>	<u>To Groundwater</u>	<u>To Surface Water</u>	<u>Total</u>
Nassau	Domestic 23	1.21	104.42	105.63
	Industrial 20	0.79	0.41	1.20
Suffolk	Domestic 101	7.39	6.87	14.26
	Industrial 86	1.20	0.87	2.07

Source: Section C of the Areawide Waste Treatment Management Plan

Stormwater runoff from paved surfaces and buildings was considered a non-point source of pollution during the 208 Study. The contaminants found in runoff were similar to those found in sewage. Fertilizers and pesticides applied to crops, lawns, and landscaping were found to contribute nitrogen and organic compounds to ground and surface waters via runoff. Local or temporary water quality problems were found to be caused by runoff from construction sites, oil storage depots, sand mines, and highway de-icing salt piles. The 40 major operating and abandoned landfills in the region were found to produce leachates (from percolating rainwater) that pollute ground and surface waters. Quantification of runoff volumes and loadings, however, was difficult because of the wide distribution of "sources" and the variability of storm events.

There were a number of other non-point pollution sources identified during the 208 Study; these included cesspools and septic tanks, ex-filtrated water from sewers, and leakage from petroleum pipelines and subsurface storage tanks. Direct rainfall was found to contain considerable concentrations of nitrogen and sulfur compounds. An assessment of sewage pollution from boats concluded that while it may have a significant impact in specific isolated (i.e., poorly flushed and highly used) areas, the overall impact on the region's marine waters is probably minor when compared to sources such as stormwater runoff.

Existing water quality conditions within Long Island embayments were found to be the result of pollution loading, both point and non-point, and the capabilities of each embayment to dilute and disperse pollutants. In general, the worst water quality conditions were found in the more poorly flushed tidal waters located adjacent to developed (urbanized) land, or adjacent to discharges from sewage treatment plants. This fact is reflected in the regional pattern of shellfish bed closures (Figure 2.4-1). Western Long Island Sound and the embayments in northern Nassau County, although well flushed, are significantly degraded by sewage pollution originating in New York City, as well as by treatment plant and runoff discharges from the heavily urbanized adjacent areas. The bays of southern Nassau County are also fairly well flushed but, like northern

Nassau County, are subject to large sewage and runoff pollution loads from adjacent urbanized areas. Shellfish closures in the Atlantic Ocean, central and eastern Long Island Sound, and the outer portions of the Peconic Estuary, are related to sewage treatment plant outfall discharges.

During the 208 Study, an extensive review of historical water quality data was made for Long Island marine waters that currently experience water quality problems, or are the site of existing or proposed sewage treatment plant discharges. Pollution inputs, particularly those for nitrogen and coliform bacteria, were identified for these waters, and predictive water quality models were developed to analyze the response of pollution levels to various control strategies. As a result, the 208 Program was able to characterize the water quality of each embayment, and to develop regional and local pollution control recommendations.

Pollution of coastal lakes and ponds were not studied in detail during the 208 Study, but analysis of health department data indicated that bacterial contamination of the larger lakes in Suffolk County probably results from a combination of bather and stormwater loadings (supplemented by bird wastes), and is aggravated by elevated water temperatures during the bathing season. Direct and indirect bacterial contamination by sanitary sewage was not found to be a problem for the lakes and ponds studied, even where cesspools were located close to shore.

The 208 Study divided Long Island into eight hydrogeologic zones based on groundwater flow characteristics (Figure 2.4-2). Groundwater overflow to north shore bays (Zone VIII) carries a large percentage of the total nitrogen entering these bays, except for Manhasset Bay and Hempstead Harbor, which receive most of their nitrogen inputs from point sources and Long Island Sound. Intensive agricultural activities, particularly on the North Fork, have resulted in localized nitrate-nitrogen contamination of the shallow groundwater aquifer underlying Zone IV. Shallow groundwater in Zones V and VI that moves south and emerges as underflow in bays contributes about half of the nitrogen input to the eastern bays - - Mecok, Shinnecock, Moriches, and eastern Great South Bay. Southwest Suffolk County and the south shore of Nassau County lie within Zone VII, where shallow groundwater flows south into the bays in the form of underflow and streamflow. Nitrogen levels in Zone VII are high, and the relative significance of groundwater derived nitrogen loadings increase from east to west, from western Great South Bay, South Oyster Bay, East Bay, Middle Bay, to Hempstead Bay, where nitrogen loadings are dominated by the discharge from the Bay Park Sewage Treatment Plant.

In addition to the evaluations of surface and groundwater conditions, the 208 Program conducted technical studies of the presence of viruses and organic compounds in various water media on Long Island, the sources and fate of nitrogen pollution, and the impact of animal wastes on water resources. The results of these studies were summarized in the Water Quality Subplan.

The virus study examined water samples for the presence of viruses in public water supply wells, lakes, streams, marine waters (near a stream mouth), open and closed shellfish areas, stormwater recharge basin, sewage treatment plants, landfills, and an on-site experimental septic system. Tests involving groundwater indicated good removal of viruses by the soil column. Stormwater runoff and sewage treatment plant discharges were thought to be the sources of viruses isolated from surface water samples. Current sewage treatment methods were not found to guarantee the removal of human viruses, even when effluents are chlorinated at recommended levels.

The study of organic chemicals involved the analysis of over 100 samples taken from various locations in Long Island's groundwater aquifers; a few samples were also taken from precipitation, stormwater runoff, recharge basins, surface waters, treatment plant effluents, landfill leachates, and incinerator quench waters. Both volatile and non-volatile organic contaminants were found in a significant percentage of groundwater samples, especially in those from shallow aquifers. New York State drinking water standards were found to be contravened in a number of cases. No firm conclusions could be reached concerning the origin of organic pollutants, although various household products that find their way into domestic sewage, and certain on-lot disposal system cleaners, were suspected of being major sources.

The nitrate study investigated the sources and fate of nitrogen pollution on Long Island using published data and the results of a number of field surveys and tests. Cesspools were identified as a major source of pollution to groundwater. Fertilizers applied to lawns and crops were found to contribute to both ground and surface water pollution (through the contamination of percolating rainfall and runoff). Source and fate data were used to develop regional and sub-regional nitrogen budgets. Land use and groundwater quality data were used to determine the relationship between population density, groundwater nitrate-nitrogen concentrations, and the percentage of groundwater samples that contravene the drinking water standard of 10 ppm. A preliminary guideline of 6.0 ppm was suggested as one criterion for determining when sewage collection and treatment should be provided.

The 208 Program also examined the impact of animal wastes on Long Island water resources. The bi-county dog population, which was estimated at 300,000 to 500,000, was identified as a major contributor of coliform bacteria and nitrogen to stormwater runoff. The study, therefore, called for the repeal of dog curbing laws, and the establishment of dog clean-up ordinances. Semi-wild ducks and horses were also identified as pollution sources requiring control and regulation.

A number of general recommendations were made by the 208 Study which were meant to be applied throughout the bi-county area. These recommendations, which were selected from an extensive list of possible alternatives, focus on key non-point problems:

- Control stormwater runoff.
- Ensure the proper functioning of on-lot waste disposal systems.
- Reduce the use of fertilizers.
- Minimize pollution from landfills.
- Reduce and control animal waste.
- Strengthen and enforce regulations pertaining to industrial wastes, product storage and transportation, and residuals.
- Promote water conservation.
- Provide alternatives to ocean disposal of municipal treatment plant sludge.

The NYSDEC certification document categorized the 208 Study recommendations into eight categories: municipal discharges, stormwater discharges, industrial discharges, residual and hazardous wastes, non-point sources, on-lot systems, management/financial/institutional, and other recommendations. The recommendations for municipal discharges were related to the hydrogeologic zones. For example, the plan recommends the investigation of stream augmentation needs for Zone VII (south shore of Nassau and western Suffolk) and the eastern portion of Zone I (headwaters of the Connetquot River). Advanced wastewater treatment with nitrogen removal was recommended for discharges to ground and surface waters in Zones III and VI (central and south-central Suffolk); the provision of collection and treatment systems where contaminated underflow may be expected to contribute pollutants to surface waters which result in violations of water quality standards was recommended for Zones IV and V (North and South Forks). Specific structural recommendations were also made for each of the 201 Study Areas in the region (see the Water Quality Subplan).

In regards to stormwater runoff, the 208 Plan recommended the employment of Best Management Practices to reduce the volume and velocity of runoff. It also recommended a number of research studies and field demonstration projects, including the modification of recharge basins to improve pollutant removal efficiencies; the testing of street sweeping/vacuuming practices; and, the investigation of marsh-pond treatment systems. Best Management Practices were also recommended during site clearance, building construction, and site restoration.

In regards to industrial discharges, the 208 Plan recommended that County sewer use ordinances be revised to conform to State and Federal guidelines, and that municipalities and sewer districts use the County ordinances as models for local laws. It was recommended that regulations covering specific contaminants, primarily organic chemicals and heavy metals, be expanded, and that duck farms be required to eliminate all surface water discharges and provide nitrogen removal and effluent recycling.

Plan recommendations for residual and hazardous wastes included the establishment of regional or sub-regional resource recovery systems; the upgrading of existing and completed landfills; the encouragement of

hazardous waste disposal outside the region, and, if this is not feasible, the establishment of a regional hazardous waste facility; and, the provision of land based disposal options for municipal treatment plant sludges. The prohibition of new landfills was recommended for interior Zones I, II, and III (Magothy recharge areas, see Figure 2.4-2), and in the primary coastal zone.

The non-point pollution source control recommendations contained in the 208 Plan included the establishment of public education programs to encourage reduction of the use of fertilizers; the repeal of dog curbing ordinances; the promotion of dog waste cleanup ordinances; the control of dog populations; the regulation of the stabling of horses and other large domestic animals; the prohibition of the sale of White Pekin ducks; the enactment of laws authorizing the removal of White Pekin ducks and their offspring (and hybrids) from publically controlled waterbodies; the development and enforcement of criteria to insure the integrity of all storage facilities; the design of salt storage facilities to prevent leachate contamination of groundwater; the optimization of fertilizer application to reduce nitrate contamination from agriculture; and, the regulation of storage and transportation of chemical products, with emphasis on gasoline storage facilities.

The 208 Plan also recommended a public education program to encourage routine pumping and maintenance of on-lot disposal systems, and the provision of scavenger waste treatment and disposal facilities. The enactment of County legislation banning local sale of certain organic chemical cleaners used for on-lot systems was recommended.

A number of recommendations concerning wastewater management, financial arrangements, and insitutional arrangements were contained in the 208 Plan. These included amendment of Federal law to allow funding of non-point source (particularly stormwater runoff) control; Federal assistance for operation and maintenance costs; amendment of the General Municipal Law to allow County Planning Board review of subdivision plots for non-point source impacts; funding of comprehensive and sub-regional groundwater monitoring programs; funding of regional or sub-regional hazardous waste treatment and disposal facilities; consolidation of water companies in Nassau County; and, creation of an administrative mechanism to address inter-county allocation of water supply.

Additional recommendations included measures to minimize irrigation water use; establishment of an ambient water quality monitoring program; extension of public water supplies; stabilization of Moriches, Shinnecock, and, possible, Mecox Inlets; determination of the impact of duck sludge deposits on bay waters; prohibition or restriction of further development in shoreline areas bordering Moriches, Oyster, Peconic/Flanders, Mecox, and Shinnecock Bays and the establishment of adequate buffer zones around wetlands; enforcement of existing regulations concerning waste discharges from boats, and the designation of no-discharge zones in shellfish waters and waters contiguous to bathing beaches; and, use of the 0.4 mg/l nitro-

gen guideline for marine waters established by the 208 Program to determine load allocations.

2.5 Dredging Subplan

The dredging subplan encompassed the areas of navigation channel establishment and maintenance, dredge spoil management, marina/shoreline development, inlet maintenance, beach nourishment, sand and gravel mining, pollutant removal, and pipeline/cable emplacement. Particular emphasis was placed on planning for navigation channels, since it is for navigation purposes that most of the dredging in the Nassau-Suffolk region is presently conducted.

The dredging subplan addressed the problem of navigation channel establishment and maintenance by developing an extensive set of channel dredging and spoil disposal guidelines. The guidelines were developed by the Dredging Advisory Committee of the Regional Marine Resources Council, which included representatives of the U.S. Army Corps of Engineers, NYSDEC, Suffolk County, towns, and educational institutions. The Citizen Participation Committee, and Federal CZM coordinating agencies, were given an opportunity to comment on drafts of the guidelines before they were approved by the RMRC on June 6, 1977, and the LIRPB on January 19, 1978.

The guidelines cover such considerations as the channel design, dredging operations, spoil disposal site selection, and spoil disposal operations. They were designed to minimize the amount of dredging needed, and the environmental impacts of dredging and spoil disposal that must be performed, while providing for safe navigation (see State Policy 11.7). Specifically they recommend proper working and periodic inspection of existing channels; the abandonment of underutilized channels through or adjacent to productive natural areas (see State Policy 6.1); the creation of new channels only when the facilities to be served are vital to the economic and social development of the surrounding area and only when such facilities cannot reasonably be located adjacent to existing channels or open water (see State Policies 4.2, 4.3, and 5.4); protection of groundwater resources; provision of buffer zones between new channels and sensitive areas; minimization of overdredging; minimization of slumping and shoreline erosion (see State Policy 7.2); limitation of tidal changes; minimization of interference with water and shoreline activities such as boating, bathing, and shorebird/waterfowl breeding; minimization of silting effects on fish and shellfish spawning, eutrophication, and the direct destruction or burial of shellfish stocks.

In regards to spoil disposal operations, the guidelines recommend the development of long-term spoil disposal strategies and the identification and designation of disposal sites; the constructive use of dredge spoils for beach nourishment, shoreline development or stabilization, and the creation of wetland or upland habitats, consistent with their texture and composition*; minimization of water quality impacts from spoil effluents; adequate treatment of polluted spoils; the use of unproductive depressions within bays for disposal; the use of open water disposal only after all

*The dredging subplan contains an appendix describing research on the stabilization of spoil deposits with vegetation prepared for the LIRPB under the CZM Program by the Marine Sciences Research Center at Stony Brook.

other alternatives have been found to be infeasible; strict protection of salt and freshwater marshes (see State Policy 6.1); minimization of conflicts with shoreline uses; minimization of spoil erosion and deposition back into channels and embayments.*

The guidelines were used to help develop specific channel recommendation under the CZM program (see below). They have also been used by the Suffolk County Planning Department in their review of County dredging projects under the SEQRA and capital budget review processes, and may be used to develop a County dredging plan. Similarly, the guidelines could be used in assisting Nassau County Towns in the preparation of dredging plans, and will be used by the LIRPB in the A-95 review process.

The Nassau-Suffolk Comprehensive Development Plan was reviewed under the CZM program, with particular attention given to recommendations concerning petroleum importation and transshipment, aggregate (sand, gravel, trap rock, etc.) transshipment, and commercial fisheries facilities centers. Navigation channel needs were also examined, and it was recommended that the Federal government continue to maintain channels to regionally important facilities such as oil terminals (powerplants), aggregate terminals, and fisheries centers, and that the Congress should authorize Federal maintenance of any such channels if not presently under Federal jurisdiction; conversely, it was recommended that existing Federal channels which no longer serve regionally significant facilities could be de-authorized (see Table 2.5-1).

In regards to oil importation (see State Policy 5.4), the Energy and Dredging subplans recommend the establishment of offshore marine terminals in Long Island Sound near Hempstead Harbor and Port Jefferson Harbor, which would be connected by submarine pipeline to existing onshore storage facilities; this would allow for the phasing out of existing small terminals in Manhasset Bay, Hempstead Harbor, Glen Cove Creek, Oyster Bay, Cold Spring Harbor, Huntington Harbor, and Port Jefferson Harbor (Table 2.5-1). Such a system would protect these harbors from the impacts of large-scale dredging and oil spills, and would reduce the number of oil transfers (e.g., lightering operations) in Long Island Sound. The two subplans also recommend the phasing-out of existing small terminals in Greenport, Shelter Island, Sag Harbor, and Great South Bay (Patchogue River), since these areas could be serviced from an integrated offshore terminal/land pipeline system which is already partly in place. In southern Nassau County, it was recommended that the Federal Government take responsibility for maintaining channels to petroleum terminal and powerplant facilities in Island Park and Oceanside until these areas can be served by an extension of the Buckeye Pipelines (Table 2.5-1).

There are presently five North Shore terminals for the transshipment of aggregates -- Hempstead Harbor, Glen Cove Creek, Oyster Bay Harbor, Huntington Harbor, and Port Jefferson Harbor. Since Aggregate barges do not pose the environmental threat that petroleum vessels do, nor do they require as extensive dredging, the Dredging Subplan recommended the continued Federal maintenance of channels serving these terminals (see State Policy 4.2, and Table 2.5-1). The only South Shore terminal is in southern

*Refer to footnote on preceding page.

Table 2.5-1 RECOMMENDED FEDERAL NAVIGATION CHANNEL DREDGING PROJECTS FOR NASSAU-SUFFOLK

Channel Project	Year ¹	Can Proposed Dimensions	Type of facilities or traffic	Comments
1. Manhasset Bay	1930	6' x 100'	SR	Oil terminal phase-out; consider de-authorization of 8' x 100' project
2. Hempstead H.	1968	6' x 100'	SR	Oil terminal phase-out; consider de-authorization of 13' x 150' project
3. Glen Cove Cr.	1925	8' x 100'	AT, DR	Oil terminal phase-out; maintain existing project
4. Huntington H.	1938	8' x 100'	AT, DR	Oil terminal phase-out; consider de-authorization of cross channel
5. Northport H.	1945	6' x 100'	SR	More regional facilities; consider de-authorization of 8' x 100' project
6. Port Jeff. H.	1968	15' (min) x 250'	AT, CF, FS, PP, DR	Oil terminal phase-out; modify existing 40' x 350' project
7. Mattituck H.	1964	8' (min) x 100'	CF, DR	Harbor of refuge; modify existing 7' project
8. West Harbor ⁴	1930	14' x 100'	PT, DR	Maintain existing project
9. Greenport H.	1937	8' x 100'	CF, DR	Possible modification to 12' x 150' outside Stirling Basin
10. Peconic R.	1945	6' x 100'	SR	No regional facilities; consider de-authorization of 6' x 100' project
11. Sags Harbor	1935	8' x 100'	DR	Oil terminal phase-out; consider de-authorization of 10' x 100' project
12. L. Montauk H.	1945	15' x 150'	CF, DR	Modify existing 12' project
13. Shinnecock I.	1960	15' x 200'	CF, DR	Modify existing 10' project; extend to proposed fishery facility
14. Moriches I.	1960	10' x 200'	SR	Maintain existing project
15. L. I. Intra-coastal	1937	6' x 100'	SR, DR	Modify section Shinn. Inlet to Canal to 8' x 100'; include canal
16. Patchogue R.	1970	8' x 100'	FS, DR	Oil terminal phase-out; modify existing 10' project
17. Great South Bay	1902	8' x 150'	FS, DR	Modify existing 10' x 200' project; add Captree Spur
18. Brouns Creek	1890	8' x 100'	FS, DR	Modify existing 4'-6' project; extend south to CSB Channel
19. Oranoc Creek	1945	8' x 100'	CF, DR	Modify existing 75' project
20. Penatquit Creek	-	8' x 100'	FS, DR	Authorize from Great Cove to Creek mouth

Table 2.5-1 continued, page 2 of

Channel/Facility	Year ¹	CZM Proposed Dimensions	Type of facilities of traffic	Comments
21. GSB West Ch.	-	8' x 150'	CF, FS, DR	Authorize from Great Cove south to GSB Channel
22. GSB North Ch.	-	8' x 150'	FS, DR	Authorize from Great Cove east to GSB Channel
23. Ft. Seashore ⁵	-	6' x 75' (max)	FS, SR	Sunken Forest, Tallman, Watch Hill, Old Inlet Channels
24. Fire Island I.	1950	10' x 250'	CF, DR	Maintain existing project
25. Sumpawanus I.	1830	6' x 100'	SR	No regional facilities; consider de-authorization of 5' x 100' project
26. Jones Inlet	1945	15' x 250'	CF, DR	Modify existing 12' project
27. Long Creek Ch.	-	15' x 150'	CF, DR	Authorize Long Cr., Sea Dog Cr., Woodcleft Canal, Freeport Cr.
28. E. Reynolds Ch.	-	12' x 150'	CF, DR	Authorize from Point Lookout west to Island Park
29. N. Reynolds Ch.	-	15' x 200'	CF, PP, PT, DR	Authorize from E. Rockaway Inlet east to Island Park
30. Hog Island Ch.	-	15' x 200'	PP, PT, DR	Authorize from Reynolds Channel north to Oceanside
31. E. Rockaway I.	1930	15' x 250'	CF, PP, PT, DR	Modify existing 12' project
32. Jamaica Bay	1950	15' x 200'	AT, PT	Modify existing project - extend to Matt. Cr. mouth

^{1/} Year of project authorization or latest modification for New York District, U.S. Army Corps of Engineers.

^{2/} All depths relative to mean low water. All dimensions are approximate.

^{3/} AT (Aggregate Terminal); CF (Commercial Fisheries); DR (Deep-draft Recreational); FS (Ferry Service); PT (Petroleum Terminal); PP (Powerplant); SR (Shallow-draft Recreational).

^{4/} Responsibility of New England District - USACE.

^{5/} Responsibility of Fire Island National Seashore.

Nassau County in Inwood, and will be adequately served by the existing Federal channel through Jamaica Bay (which also serves petroleum terminals in Inwood, see Table 2.5-1).

The continued economic viability of Long Island's deep water commercial fishing fleet, and the potential for economic expansion of the industry, depend on the access to shoreside docking and unloading facilities. Many of the navigation channel approaches to commercial fisheries facilities provide inadequate water depth for the vessels already in service, and these inadequacies are likely to become more severe as larger boats with deeper drafts are purchased to exploit fish resources within the U.S. Fishery Conservation Zone. Commercial fishing ports along the south shore have the greatest potential for expanded economic activity, and the greatest need for improved access and dredging.

Long Island presently has four major and three minor centers for deep water commercial fishing vessels. On the north shore, the major center -- Greenport -- and the two minor centers -- Port Jefferson Harbor and Mattituck Inlet -- are served by existing Federal channels. Two of the major south shore centers -- Lake Montauk Harbor and Shinnecock Inlet -- are also served by existing Federal channels; the other major center -- Jones Inlet/Freeport -- and the minor center -- Orowoc Creek -- are only partially served by Federal channels. The Fisheries and Dredging Subplans recommend that the utilization of these existing fisheries centers be increased by providing good water access (see State Policies 4.2, 4.3, and 6.4), and that the Federal Government be responsible for the maintenance of channels serving these facilities.

In general, the Dredging Subplan recommends that channels utilized exclusively by recreational boats be maintained by local government. Publically owned marine recreational boating facilities were identified during the development of the subplan, and the local channels serving these facilities were mapped (see Figure 6 of the Dredging Subplan dated 31 March 1978). The only recreational channels recommended for Federal maintenance were the Long Island Intracoastal waterway (from Jones Inlet through Great South Bay and Moriches Bay to Shinnecock Inlet and Canal), which is an existing Federal project, and a number of channels within Great South Bay utilized by ferries serving Fire Island communities and the National Seashore (see Figure 6 of the Dredging Subplan and Table 2.5-1). The only channels recommended for State (Long Island State Parks and Recreation Commission) maintenance were the State Boat Channel and Sloop Channel that run north of the barrier island between Jones Inlet and Fire Island Inlet, and approach channels to the State Park (see Figure 6 of the Dredging Subplan).

General recommendations for dredge spoil management were presented for each of three coastal areas of Long Island -- North Shore, Peconic, and South Shore. Habitat (intertidal marsh, high marsh, and upland wildlife) creation, and some beach nourishment, were recommended for the North Shore and Peconic areas; ocean beach nourishment, and some upland habitat creation, were recommended for the south shore of Suffolk County; the filling in of deep, unproductive holes in bay bottom, and some upland creation, dune creation, and ocean beach nourishment were recommended for southern Nassau County. A number of tentative sites were identified (see Figure 7 of the Dredging Subplan dated 31 March 1978).

The Dredging Subplan identified 32 existing or potential deep-draft recreational boating facility centers (see Figure 6 of the Dredging Subplan). The subplan stressed the need to limit the number of deep-draft recreational boating facilities center, and to take advantage of deep water and existing deep channels, whenever possible, so as to minimize dredging requirements (see State Policies 4.2, 4.3, and 10.5).

The Dredging Subplan discussed the practice of increasing tidal flushing within embayments by dredging their inlets. The plan recommends that dredging for the sole purpose of improving flushing should only take place after field examinations indicate a reduction in the tidal range across an inlet, and that the desirability of increasing tidal flushing should be clearly established, since increased flushing action and increased tidal range can increase tidal flows and erosion within the embayment, expose new areas to dessication at low tide and flooding at high tide, and increase salinity levels with concomitant potential impacts on shellfish resources is especially important for an embayment like Great South Bay and Moriches Bay, where salinity levels are extremely sensitive to the exchange of ocean water through the inlets.

Dredging to obtain sand for beach nourishment was also covered by the Dredging Subplan. The use of offshore source areas was recommended. Such areas should have depths greater than the effective depth of wave influence so that any changes in bathymetry due to dredging will not affect the wave pattern reaching the shore and the resultant coastal erosion patterns (see State Policy 7.2). Beach nourishment dredging within embayments should be allowed only in emergency situations where offshore sources cannot be used, and should be limited to existing navigation channels so as to minimize impacts on shellfish resources.

The Dredging Subplan also recommended that sand and gravel mining operations in marine waters be limited to areas far enough offshore and at sufficient water depth so as to minimize impacts on the nearshore environment and uses, and on coastal erosion processes. The plan cited the need to identify, through field surveys, the prime source areas (i.e., gravel deposits in Long Island Sound and off the south shore.

The Dredging Subplan and Water Quality Subplan examined the problem of polluted marine sediments and found that there is little information available with which to the extent and impact of polluted marine sediments on the coastal environment of Long Island. There are few industrial outfalls. Old duck sludge deposits are not thought to be active sources of pollution, and both duck farm and industrial discharges will be required to upgrade or abate under State and Federal law. Therefore, the Dredging Subplan contained recommended procedures for minimizing the impacts of dredging (removal) operations if they are ever needed.

The recommendations for pipeline/cable emplacement dredging were similar to those for navigation channels. In addition, recommendations, covering marsh restoration were made, including the need to replant the water edges of marshes, and the considerations of habitat diversification (see State Policy 6.1).

2.6 Recreation Subplan

2.6.1 Introduction & Objectives

The purpose of this subplan was to inventory all Federal, State and County recreational holdings within the coastal zone, to inventory aesthetic resources of state and regional importance, to evaluate existing recreational uses of state and county holdings in terms of need, suitability and environmental impact, and to propose a plan that would preserve and protect coastal resources while maximizing public access and use. The recommendations were based upon visual, physical and ecological site characteristics. The plan includes acquisition recommendations.

The problems of access to the coastal zone were identified and evaluated and recommendations were made to provide additional access compatible with the natural resources and with concern for the protection of private property.

This report summarizes A Recreation and Shoreline Access Subplan for Nassau and Suffolk Counties, 1 December 1978, Task 8.1, final report, prepared by the Long Island Regional Planning Board.

2.6.2 Relationship of the Recreation and Public Access Subplan to Other CZM Elements

The Recreation Subplan was based upon an analysis of the existing recreation picture, a detailed site analysis and recommendations from the Land Capability System (Section 2.3). The plan was used as an input into the GAPCs (Section 6.0) and into the Land Use Plan. Recommendations from the Land Use Plan and the GAPCs were incorporated into the Recreation Subplan.

Among the list of resource types considered for GAPC status that are also part of the considerations of this Plan are:

- 1) areas of unique, scarce, fragile or vulnerable natural habitat, physical feature, historical significance, cultural value, and scenic importance
- 2) areas of substantial recreational value and/or opportunity
- 3) areas where developments and facilities are dependent upon the utilization of or access to coastal waters
- 4) areas of urban concentration where shoreline utilization and water uses are highly competitive

These categories were considered relative to their recreation use.

The recommendations from the recreation portion of The Marine Fisheries Subplan (Section 2.1) were incorporated into the Recreation Subplan. Recreational fishing activity was divided into fishing from piers, bulkheads, floats and jetties; bank fishing; and boat fishing. Land use and shoreline access problems were examined and potential sites identified both in The Marine Fisheries Subplan and this subplan.

Recreational channels requiring periodic maintenance dredging by local governments were identified to assure the continued existence of high quality recreational boating opportunities. (See Figure 6 in A Comprehensive Dredging Subplan for Nassau and Suffolk Counties, 31 March 1978.) A limited number of new or modified channels have been recommended in such areas as northwest Nassau County.

Another input into the recreation plan was the aesthetic resources. Concern for the aesthetic resources of the Coastal Zone has focused on opportunities to increase awareness of and visual access to Long Island's lands and waters. It is hoped that identification of scenic resources will further both governmental and private efforts to protect and, where possible, to enhance them.

Building upon work undertaken for the Long Island Sound Study, Nassau-Suffolk completed an inventory of shoreline viewing points along major roads, (state, county and substantial town roads) and from public lands and points of potential access (see Section 2.6.8 Shoreline Access). On the basis of the extensive field work, scenic sites were identified according to a list of scenic values.

The recommendations of the scenic study and the harbor design study were incorporated into this subplan. This subplan is consistent with policies stated in the New York State Coastal Management Program, Volume One, March 1979, in that it recommends: (1) recreational facilities in urban area; (2) water related and water dependent activities for new and existing coastal parks; (3) limited mass transit to increase access to coastal parks consistent with the Marine Fisheries Subplan, the GAPCs and the Land Use Plan; (4) sites where the private recreation facilities should be developed or increased; (5) sites where boat launching sites should occur; and (6) areas capable of supporting increased recreational fishing activity. The plan is consistent with goals to preserve natural and cultural resources. All park use recommendations were based upon Land and Water Capability Systems. Compatible uses adjacent to parklands were recommended in the Land Use Plan.

2.6.3 Long Island's Existing Recreation Picture General Inventory of Holdings in the Coastal Zone

Recreation holdings include federal, state, county, Nature Conservancy, town and village, school districts and private organizations. The major holdings and the activities they provide for were taken into account in this Subplan and the Land Use Plan.

Federal Lands

Although Federal lands have been omitted from consideration under the Coastal Zone Management Act regulations, it is impossible to explore the recreation lands question without including those parks in a inventory discussion.

Nassau County has 117 federally-owned acres and Suffolk County has 3,391 federally-owned acres within the coastal zone.

State Lands

Nassau County has a total of 3,776 acres while Suffolk has 16,408 acres of state lands within the coastal zone.

County Lands

The detailed description of lands owned and operated by Nassau and Suffolk Counties appears in Section 2.3.7 Plan Recommendations.

Nature Conservancy

Nature Conservancy holdings on Long Island total approximately 1,000 acres within the coastal zone.

Other Lands That Provide Recreational Uses

The towns and villages, school districts and private organizations own holdings that provide for various recreational activities; the two latter type of holdings provide limited activities. School lands are available to the general public only when not required for school functions. Private holdings are not generally available to the general public.

Undeveloped Holdings With Potential for Increased Use

Both counties have large holdings that remain essentially undeveloped. A portion of the acreage within these sites are suitable for various kinds of development. Recommendations for these holdings will be included in the Plan recommendations.

Utilization of Existing Parklands

All of the parklands in Nassau County that are open to the public appear to be fully utilized. Jones Beach might be able to withstand some increase in use along the beaches with the establishment of bus transportation links with population centers.

Some parks in Suffolk, including the beach at Robert Moses, could withstand increased use. Bus transportation should also be provided to this beach. Both Heckscher & Caumsett State Park could accommodate more people.

Southaven County Park in Suffolk suffers from overuse and corrective measures should be taken. Other locations within the Suffolk County park system suffer from overuse. This is a result of a shortage of funds for park maintenance and rehabilitation.

2.6.4 Long Island's Future Recreation Picture-Population Projections

Five year populations projections were drawn from the Long Island Regional Planning Board's 208 Areawide Wastewater Management Plan.

Table 2.6-1 indicates the projected population growth and the towns' and counties' percentage share of the regional growth.

Table 2.6-1
Amount and Distribution of Projected 20 Year Population Growth in Nassau and Suffolk by County and Town(1)

	Projected Growth 1975-1995 (No. of Persons)	Share of Regional Growth (%)
Glen Cove	2,101	0.4
Hempstead T.	9,218	1.8
Long Beach	3,175	0.6
North Hempstead	8,091	1.6
Oyster Bay T.	8,033	1.6
Nassau County	30,618	6.1
Babylon T.	26,439	5.3
Brookhaven T.	228,709	45.4
East Hampton T.	12,584	3.5
Huntington T.	31,116	6.2
Islip T.	87,885	17.5
Riverhead T.	13,568	2.7
Shelter Island T.	2,042	0.4
Smithtown T.	24,883	4.9
Southampton T.	34,279	6.8
Southold T.	11,239	2.2
Suffolk County	472,722	93.9
Nassau-Suffolk Counties	503,362	100.0

(1) Long Island Regional Planning Board, 208 WQMP 1978.

In areas with little vacant land growth is expected to be relatively slow, while areas with large vacant tracts may experience development spurts. Municipalities that have aggressive conservation or acquisition programs are expected to show a more controlled pattern of growth.

According to the projections, 93.9% of the Region's population growth will be in Suffolk County. An increase of one-half million persons is anticipated in the next 20 years. Brookhaven and Islip Towns are expected to experience the largest growth. Only 6.1% of the growth is expected in Nassau County.

Standards

Recreation needs vary with income, leisure time, mobility, age composition, shifts in technology, and a host of other factors. Certain standards have been used over the years to evaluate park development, but their validity is quite limited. Only a very general relationship exists between density of population and public recreational needs as defined in terms of acreage. Standards based on parkland acreage and population statistics did not

have a major influence upon the plan recommendations for the following reasons:

1. Parklands (particularly state and federal) are used also by visitors from out of the region. Standards are usually based on local populations. It is difficult to determine the number of users from outside the region. Parkland is required for the tourist industry.
2. One of the main objectives of this subplan was to recommend activities based upon the capability of the land to sustain uses and upon the characteristics of the site.
3. Sites vary in the type of facilities they contain. The types of activities provided are not given in acres. The number of acres required for highly developed, facility-type parks vary greatly from acres required for hiking, canoeing, and nature study.
4. Sites may be acquired for limited passive recreation use where the main intent is to preserve the ecological integrity of the resource. These acres can accommodate only a few people, while providing exceptional recreation experiences.
5. The acres of parkland are not adequate in densely populated areas. Location of the parks must factor into the acreage demand analyses. There is a scarcity of parklands in many densely developed areas.
6. There are no population statistics for the coastal zone per se. Therefore the minimum number of acres of recreation required for parks in the coastal zone cannot be computed.

In this subplan the above factors were considered in the determination of recommendations for acquisition, for an increase (or a decrease) in activities, and for the type of activities at various existing and proposed parklands.

Standards were, however, computed on a county basis and compared with the national averages. Both counties require more parklands to meet population projections and/or increased tourism. In Nassau County, there is a large shortage of parklands and the situation will be more acute by 1995. Suffolk County parklands draw tourists to Long Island's East End, which is highly dependent on tourism. Additional parklands in Suffolk are required to accommodate local residents and tourists as well. Parklands in natural areas that are used for passive uses provide open space and protect a number of environmental resources including groundwater.

2.6.5 Review of Current Planning

The New York Statewide Comprehensive Plan and the Long Island Sound Study Recreation Plan were reviewed as an input into the plan. Previous plans by Suffolk and Nassau Counties were also reviewed. The state and local plans include:

1. New York State Comprehensive Recreation Plan, 1973.
Forecast of Outdoor Recreation in New York State, 1970-1990.
2. Sea Grant Advisory Service, Cornell University, Ongoing Research of Recreational Boating on the Shoreline of Westchester County, New York City and Long Island, Ithaca, New York, 1974.
3. Nassau County Planning Commission, Parks and Recreation, 1974.
4. Nassau County Planning Commission, Parks and Recreation, 1964.
5. Interviews with Schuyler Corwin of the Suffolk County Parks Department, Francis Cosgrove of the Nassau County Parks Department, and Frank Hyland of the Long Island State Park Commission, 1977.

2.6.6 Recreation as a Function of the Natural Resources

The recommendations made in this plan can be characterized as dealing primarily with locations of great natural value.

The Natural Resource Inventory maps that were prepared as part of the Land Capability analysis were consulted in developing the Recreation Plan recommendations (see Section 2.3). The Land Capability Classification System was a primary tool used in the identification of sites suitable for acquisition and the determination of the types of activities that would be appropriate at each of the sites. The system classifies the various resources into management units and recommends compatible (recreational) uses for the resources.

Both Nassau and Suffolk Counties have long recognized the importance of natural areas preservation. Suffolk County, since 1960, has acquired thousands of acres of parkland for conservation and preservation uses.

2.6.7 Plan Recommendation

Regional parks are needed to satisfy major recreational needs. Large scale parks cannot be provided at the town or village level. There is little likelihood that additional large scale parks can be provided at the county level in Nassau County. The scarcity of land available for recreation added to the high cost of acquisition has led to Nassau's intensive effort in facilities development. Some of Nassau's recreation needs, however, must be satisfied in Suffolk County. Whenever possible, the counties should act promptly to secure sites of an appropriate scale or to facilitate acquisition by the Long Island State Park Commission. There are still substantial sites available within Nassau's boundaries and, while costs are high, they should be earmarked for future acquisition. State and Federal funds should be provided to pay for acquisition of a regional nature (serving both counties and other portions of the New York Metropolitan area). The area also requires smaller parks that provide access to the water, and active and passive recreational activities, particularly in the more densely developed areas.

The Subplan recommendations below include the following proposals: (1) acquisition; (2) increased use of some existing parks; (3) new town and village parks; (4) increased funding and new park activities for closed parks; and (5) changes in modes of transportation (see 2.3.8, Shoreline Access). There are also several recommendations for Long Island State Park Commission acquisitions (use of Federal and/or State Park funds is suggested).

The sites described are only those within the Coastal Zone. It is assumed that the entire population will be served by these facilities. Conversely, those inland sites not described here, but recorded in the total inventory, will in turn serve the total population in a different manner.

Sites are presented alphabetically for each County. Those sites for which no change is recommended do not appear. The specific proposals for each site would be subject to the performance standards and resource management guidelines described in the Land Capability System. The portions of the sites that are not in either Land Capability Units (L.C.U.) III (conservation) or IV (preservation) are in L.C.U. II. Each site proposal contains existing activities, site description and plan recommendations.

Table 2.6.-2 states whether the site is existing or proposed, states the proposed ownership, the acreage where available, and a summary of suggested activities.

Nassau County Recreation Sites: Proposed Acquisitions and Proposed Changes for Existing Parks.

The location of the site will be indicated with an asterisk.

Cold Spring Harbor (proposed acquisition) *Village of Laurel Hollow
and * Town of Huntington

Activities: Conservation, preservation and use of historic sites, recreational boating, oil receiving and storage.

Site Description: The area under consideration runs from the sand bar on the west side of the harbor around to the east and terminates at the south boundary of the Village of Lloyd Harbor. It does not include public and quasi-public parcels. There are some pockets of development, although the majority of the vacant land remains forested.

The site contains freshwater marsh, tidal marsh, tidal flats, woodlands and is a Prime Wildlife Area. Land Capability Units IV and III (L.C.U. IV & III).

Recommendation: This acquisition would permit the expansion of recreational boating opportunities on the eastern shore north of Cold Spring Beach, visual and pedestrian access, preservation of significant resources and the protection of historic sites. The southern portion could accommodate wildlife observation with controlled access. A trail should be developed through the Bethpage Parkway right-of-way.

Freeport (proposed acquisition) *Village of Freeport

Activities: solid waste disposal, landfill, boat launching ramp.

Table 2.6-2 Plan Recommendation Summary

Site	Existing	Proposed	Ownership or Proposed Ownership	Acreage	Recommended Activities
<u>Nassau</u>					
Cold Spring Harbor		x	Town and Village	n.a.	boating, visual & pedestrian access, resource & historic preservation, hiking, wildlife observation
Freeport		x	State	n.a.	boat ramp expansion, marine recreation
Glen Cove Creek		x	County	n.a.	boat ramp, marina
Hempstead Harbor	x	x	County	290 Existing	boat ramp, marine recreation
Hempstead Lake	x			800	family camping
Inwood Country Club		x	County	n.a.	golf, tennis, swimming
Jones Beach	x		State	2,413	expand existing activities
Lattintown Shore		x	County	n.a.	swimming
Lido Beach		x	County or Town	n.a.	golf, swimming
Manhasset Bay		x	County or Town	n.a.	boating, launching ramp, walkways
Massapequa Preserve	x		County	473	limited family camping
Middle Bay Country Club		x	County	n.a.	golf, tennis, swimming
Mill Neck Creek	x		County	57	conservation education
Nassau Beach	x		County	121	beach stabilization, park redevelopment
North Shore Country Club		x	County	n.a.	golf, swimming, tennis

Table 2.6-3 Plan Recommendation Summary

Site	Existing	Proposed	Ownership or Proposed Ownership	Acreage	Recommended Activities
Sands Point	x		County	175	increased access for swimming, strolling, picnicking
Sheets Creek		x	County or Town	n.a.	walkways, boating, marine commercial
Valley Stream	x		State	97	family camping
Welwyn	x		County	204	nature preserve and conference center
Whitney-Payson		x	County	401	inland uses: court and field games, riding, large group picnicking
<u>1</u> Suffolk					
<u>2</u> Baifing Hollow/Roanoke Pt.		x	State or Federal	n.a.	Golf, summer camp, swimming, sailing, fishing
Belmont Lake	x		State	459	modify uses if required
Bergen Point	x		County	194	boat ramp
Blydenburgh	x		County	588	improve access through better management and controls; restoration of historic buildings
Caril's River		x	County	29	stream augmentation
Carman's River-Southaven Fireplace Neck	x	x	County or State	1340 existing 888 proposed	reduce activity at Southaven, conservation, historic preservation, limited fishing & canoeing access
Caumsett	x		State	1476	improve access to expand activities

1 Suffolk
2

Table 2.6-2 Plan Recommendation Summary

Site	Existing	Proposed	Ownership or Proposed Ownership	Acreage	Recommended Activities
Cedar Beach	x		County	61	boat ramps
Cedar Point-Northwest Creek-Grace Estate- Barcelona Neck	x	x	County-owned, State action recommended on additions	945 existing 400+ proposed	camping, resource conservation, golf, boat ramp, youth camping
Cow Neck		x	County	n.a.	conservation education, resource conservation
Crab Meadow	x		County	160	conservation education
East Islip Meadows	x		County	87	controlled access, conservation education
East Marion-Dam Pond		x	Town		swimming, boating
Flanders-Sears Bellows	x		County	1620	limited camping, hiking, fishing; conservation education
Gardiner's Island		x	Bi-County & State or Federal	3380	swimming, boating, hiking, camping, fishing, conservation education, resource conservation
Harbor Arts Center	x	x	Town	32	boat ramp
Indian Island-Babylon	x		County	82	fishing piers
Landing Avenue	x		County	97	fishing, canoeing, conservation education
Long Pond		x	County or Town	1000+	fishing, hiking, camping, horseback riding, canoeing, motorboating, conservation education, resource conservation

Table 2.6-2 Plan Recommendation Summary

Site	Existing	Proposed	Ownership or Proposed Ownership	Acreage	Recommended Activities
Maple Swamp-Birch Creek		x	County or State	2000+	limited hiking, camping; conservation education, resource conservation
Mattituck		x	County or Town	n.a.	public and commercial marine activities; wetland conservation
McCallister	x		County	140	resource conservation
Meschutt Beach-Shimmecock Canal	x		County	10	boat ramp
Napeague			State	1300	camping, swimming, nature walks, hiking, boat ramp, fishing pier
New Suffolk		x	County	n.a.	fishing pier
Nissequogue River Complex: State & County Parks (Landing Ave., Blydenburgh), Greenbelt Acquisition	x	x	State-County	1380 existing 50 proposed	conservation and limited use: hiking, camping, fishing, picnicking
Northville		x	County	n.a.	access to Long Island Sound for fishing and swimming
Orient Beach	x	x	State and County	357+ proposed	fishing piers
Peconic Bluffs		x	State	n.a.	camping, shoreline access
Peconic Dunes	x		County	37	access to the shore for fishing
Peconic River Complex	x	x	County and Federal	1710 existing 450+ proposed	conservation education, controlled hunting and fishing
Port Jefferson		x	Town and Village	n.a.	pedestrian access, boating
Robert Moses	x		State	1000	fishing pier

Table 2.6-2 Plan Recommendation Summary

Site	Existing	Proposed	Ownership or Proposed Ownership	Acreage	Recommended Activities
Robin's Island		x	County or State	460	fishing, swimming, primitive camping
Shelter Island		x	Private dedication through clustering	n.a.	resource preservation; limited use for hunting, fishing, conservation education
Shinnecock Inlet-Tiana Beach	x		County	384	fishing, boating, swimming, shell-fishing
Shoreham		x	Town	n.a.	fishing pier at LILCO; access to L.I. Sound shoreline for boat ramps, swimming, fishing
Smith Point-Shirley Marina	x		County	1626	boating, boat ramps, and fishing piers at Shirley Marina
South Jameport Boat Landing	x	x	Town	60+ proposed	access for fishing and swimming
Timber Point	x		County	239	boat ramp
West Meadow Beach		x	Town	n.a.	boat ramp

Site Description: The site is completely developed.

Recommendation: The Woodcleft Canal area offers an outstanding opportunity for waterfront reclamation. The State boat launching ramp and related parking should be expanded.

Glen Cove Creek (proposed acquisition) *City of Glen Cove

Activities: industrial uses.

Site Description: most of the area is developed.

Recommendation: The redevelopment of this area would provide opportunities for marinas, boat launching facilities and recreation related commercial uses.

Hempstead Harbor Park and Beach (County - 290 acres) *Town of North Hempstead

Land Uses and Activities: Swimming, picnicking, miniature golf, fishing, sailing, and court games.

Site Description: the holding is divided by West Shore Road.

On the west side is the revegetated edge of the sand pit. Deeper into the site is a steep bluff unique in that it reveals a stratigraphic sequence corresponding to the geologic units underlying the area (L.C.U. VI). There are small patches of freshwater marsh (L.C.U. IV). On the east side of the road are the developed facilities.

Recommendation: The area to the west of West Shore Road provides one of the largest remaining open spaces in the coastal zone of Nassau County. This property should be developed for multiple passive and active uses and a geologic study area. The Marine Fisheries Plan calls for a boat launching ramp on the shore side of West Shore Road. Passive recreation can occur in some locations along the shore. The barges should be removed. Other recommendations are included in the GAPCs (Section 6.0). If it is feasible to phase out the industrial uses, the combined sites would be uniquely well suited for recreation related commercial uses.

Hempstead Lake Park (State - 800 acres) *Village of Rockville Centre and *Town of Hempstead

Activities: picnicking, softball, tennis, horseback riding.

Site Description: a series of freshwater lakes, freshwater marsh, woodland, old field, wildlife habitat and developed areas. All the marsh and the water's edge are in L.C.U. IV and L.C.U. III. The rest of the site is in Unit 3.

Recommendation: continuation of existing activities with the addition of some family camping at an appropriate location.

Inwood Country Club (proposed acquisition) *Town of Hempstead

Activities: private golf club with tennis and pool facilities. At another location there is an oceanfront beach club.

Site Description: extensive shoreline along Jamaica Bay. The water's edge is in L.C.U. IV with a buffer zone of L.C.U. III.
Recommendation: the County should obtain and exercise the right of first refusal if and when the club comes up for sale.

Jones Beach (State - 2,413 acres) *Town of Hempstead and *Town of Oyster Bay

Activities: ocean swimming, pool swimming, softball, fishing, picnicking, golf, theatrical performances, court games.
Site Description: beach, wildlife habitat, maritime vegetation, dunes and salt marsh. A large part of the site is used for parking. All areas that are not developed are in L.C.U. IV; all developed areas are in L.C.U. III.
Recommendation: continuation and expansion of existing activities. Shuttle transportation service to improve accessibility.

Lattingtown Shore (proposed acquisition) *Village of Lattingtown

Activities: water related recreation.
Site Description: the area west of Stehli's Beach. Beach, dune, maritime shrubland, saltwater marsh, forest, a Prime Wildlife Area and development. The marsh and shoreline are in L.C.U. IV and the remainder is in L.C.U. III.
Recommendation: expand the recreation facilities. The County should obtain and exercise the right of first refusal whenever the private beaches are offered for sale and investigate the possibility of beach nourishment to offset shoreline erosion.

Lido Beach Club (proposed acquisition) *Town of Hempstead

Activities: golf and bathing.
Site Description: a private club with extensive shoreline.
Recommendation: the County should obtain and exercise the right of first refusal when the club comes up for sale.

Manhasset Bay (proposed acquisition) *Town of North Hempstead, Village of Thomaston, Village of Kensington and Village of Great Neck

Activities: oil storage and utilities, an existing park, some boating.
Site Description: peripheral salt marsh, some maritime shrubland, small patches of freshwater marsh, and isolated forest pockets. The water's edge is in L.C.U. IV. A 300' buffer strip around the water and the steeper slopes are in L.C.U. III.
Recommendation: this area offers considerable redevelopment opportunities (see GAPCs). The proposal excludes land already

in public ownership. If the utilities were to be phased out, an existing park could be expanded to include waterfront walkways. An expansion of shallow-draft boating activities could be accommodated with minimal dredging. Boat launching facilities could be accommodated on the reclaimed sites.

Massapequa Preserve (County - 473 acres) *Town of Oyster Bay

Activities: nature preserve.

Site Description: woodland and freshwater marshes along the stream corridors and park support facilities. The water bodies and their edges are in L.C.U. IV with a buffer zone in L.C.U. III.

Recommendation: continuation of existing activities with the addition of some family camping at an appropriate location.

Middle Bay Country Club (proposed acquisition) *Town of Hempstead

Activities: golf and related activities.

Site Description: extensive shorefront along Middle Bay (L.C.U. IV and III). Water's edge is in a buffer zone in L.C.U. 3.

Recommendation: the County should obtain and exercise the right of first refusal if and when this private club comes up for sale.

Mill Neck Creek (County - 57 acres) *Village of Bayville, Village of Mill Neck, Village of Lattintown and Town of Oyster Bay

Activities: conservation

Site Description: salt marsh, grasslands, Prime Wildlife Area. The entire site is in L.C.U. III and L.C.U. IV.

Recommendation: guided nature walks and nature study programs should be introduced into this prime ecological area.

Nassau Beach (County - 121 acres) *Town of Hempstead

Activities: ocean and pool swimming, court games, fishing.

Site Description: beach and dunes and developed facilities.

Recommendation: continuation of the beach and dune stabilization program. Nassau County is planning a redevelopment program for this park which will probably include the demolition of the cabanas, a long standing source of controversy.

Sands Point Park & Preserve (County - 175 acres) *Village of Sands Point

Activities: museum, guided tours.

Site Description: bluff, shoreline, woods, some old fields; two large mansions and outbuildings. The park is mostly in L.C.U. III with the bluff and water's edge in L.C.U. IV.

Recommendation: the use of the park is extremely limited at

the present time. It should be expanded to include unescorted users: swimmers, picnickers, strollers, etc. It is an excellent location for summer concerts.

Sheets Creek (proposed acquisition) *Village of Port Washington
North, Village of Manorhaven,
Village of Baxter Estates and
Town of North Hempstead

Activities: industrial, commercial, extractive, recreational, residential uses.

Site Description: South and east of Manhasset Isle, the GAPC recommendation area runs along Shore Road to the town dock. It is almost completely developed but there are tiny pockets of vegetation and salt marsh. The water's edge is in L.C.U. IV with a bufferzone in L.C.U. III.

Recommendation: the oil receiving and storage operations should be phased out. The local beaches, no longer swimmable, could be the location of shoreline walkways. Boating and commercial activities should be expanded. A locally funded plan for this area was developed, but not implemented.

Valley Stream Park (State - 97 acres) *Village of Valley Stream and
Town of Hempstead

Activities: picnicking, softball, hiking, bike paths.

Site Description: freshwater marsh, woodland and wildlife area. The pond, marsh and forested area are L.C.U. IV with a buffer strip of L.C.U. III.

Recommendation: continuation of existing activities with the addition of some family camping on an appropriate portion of the site.

Welwyn County Park (204 acres) *City of Glen Cove

Activities: none at present.

Site Description: woods, saltwater marsh, and a Prime Wildlife Area. The greater part of the site is in L.C.U. III; the freshwater stream is in L.C.U. IV.

Recommendation: The County plans to use Welwyn as a Nature Preserve and Conference Center, utilizing the main house for meetings. There is a possibility for limited camping.

Whitney-Payson (proposed acquisition - 401 acres) *Town of Hempstead
and Village of
North Hills

Activities: large estate, some farming.

Site Description: one of the two largest undeveloped tracts on the North Shore; it runs from Community Drive to Shelter Rock Road. It is forested and in farm fields. The site has large areas in both L.C.U. III and L.C.U. II (suitable to more active development).

Recommendation: This site could accommodate court and field games, horseback riding, horse show events, and large group picnicking, etc.

Suffolk County Recreation Sites: Proposed Acquisitions and Proposed Changes for Existing Parks

Baiting Hollow/Roanoke Point (proposed acquisition) *Town of Riverhead

Activities: golf, private camping with developed shorefront facilities, and a substantial amount of seasonal housing.

Site Description: tidal wetland, beach and bluff, and Prime Wildlife Area. The Baiting Hollow area, as identified in the GAPC recommendation, falls into L.C.U. IV and III. There is an additional parcel at Roanoke Point, a Long Island Sound Study recommendation.

Recommendation: The club and the camps should be purchased as soon as they become available. As a general policy, the County should have the right of first refusal on existing golf courses and camps as they are considerably less costly to purchase than to build. Acquisition of the golf courses would give the County the opportunity to offer golf on the north shore as well as access to Long Island Sound. At the present time, three County golfing facilities are located on the south shore and one at Riverhead. Acquisition of the summer camps would permit expansion of summer programs teaching swimming, sailing, fishing, etc. If the existing seasonal housing is destroyed as a result of storms, these sites could be converted to a resort facility. This is a potential regional acquisition.

Barcelona Neck (See Cedar Point)

Belmont Lake (State - 459 acres) *Town of Babylon

Activities: picnicking, hiking, ice skating, rowing.

Site Description: Prime Wildlife Area, wetlands, woodlands, and a unique system of clear freshwater streams. Predominately L.C.U. IV with a small portion in L.C.U. III.

Recommendation: Continuation of existing activities, with modification if required by over-use.

Bergen Point (County - 194 acres) *Town of Babylon

Activities: golf 18 hole course, driving range, putting green.

Site Description: The golf course has been undergoing alteration, as has the southern portion of the site accommodating the sewage treatment plant. Most of the site is in L.C.U. II, permitting active recreation. There are narrow bands of L.C.U. IV and L.C.U. III encompassing a small strip of saltwater marsh along the western border.

Recommendation: A boat launching ramp should be constructed at the south end of the property.

Blydenburgh (County - 588 acres) *Town of Smithtown

Activities: picnicking, fishing, rowboating, ice skating, horse riding, camping, and hiking.

Site Description: A large inland pond, part of the headwaters of the Nissequogue River system, with freshwater wetlands, forests, old fields, and a deteriorating historic area. Preservation areas have been designated along the water's edge (L.C.U. IV), but the majority of the site is in L.C.U. III with some areas suited to more active uses (L.C.U. II).

Recommendation: A plan for Blydenburgh Park (prepared by the Suffolk County Planning Commission, August 1977) has been developed recently which indicates a continuation or modification of the present uses but with much more stringent maintenance and operations control. The restoration of the historic buildings is recommended.

Carlls River (proposed acquisition - 29 acres) *Town of Babylon

Activities: none at present.

Site Description: A drainage way affording freshwater refuge to wintering waterfowl. It is part of the Belmont Lake watershed and is a classified bass and trout stream. The entire site falls into L.C.U. III and IV.

Recommendation: A major drainage area which should be acquired for conservation purposes and used in the stream augmentation recharge progress of the Southwest Sewer District.

Carmans River - Southaven Park - Fireplace Neck (County) *Town of Brookhaven

Carmans River (Suffolk County proposal), 800 acres; Southaven County Park, 1340 acres; and Fireplace Neck (Suffolk County proposal), 88 acres.

Activities: Southaven County Park: camping, fishing, boating, hunting, picnicking, horseback riding. With the exception of duck farming, Carmans River and Fireplace Neck are undeveloped.

Site Description:

Carmans River: Most of the site is in L.C.U. IV and contains a variety of ecosystems and a prime waterfowl watering area.

Southaven: Most of the site is in L.C.U. III with some land in L.C.U. II serving the more active park uses. The section of the river within the park is stocked with trout and is very popular with fishermen. The park generally suffers from over-use.

Fireplace Neck: All of the site is in L.C.U. IV. Almost totally saltmarsh with freshwater marsh areas and a Prime Wildlife Area.

Recommendation: The activity at Southaven should be reduced as camping and fishing sites are developed elsewhere. The acquisition along the Carmans River and at Fireplace Neck (GAPC proposals as well as Suffolk County proposals) would preserve some historic sites and complete the Carmans River greenbelt. This

site is a passive recreation site with the possibility of access at Sunrise Highway for fishing and limited canoeing.

Caumsett (State - 1476 acres) *Village of Lloyd Harbor

Activities: fishing by permit, guided tours, hiking and horse-back riding.

Site Description: Prime Wildlife Area, forest, old field, beach, bluff, and maritime shrubland. Most of the property is in L.C.U. III with some in L.C.U. II and IV.

Recommendation: Activities should be expanded to include additional picnicking, hiking, camping and biking. Unfortunately, access to Caumsett is via a narrow causeway and through a low-density residential area. This park should remain in low intensity use. The possibility of water-borne access should be explored, as was suggested in the Long Island Sound Study. (See Table 2.6-3 "Access Through Changes in Modes of Transportation".)

Cedar Beach (County - 61 acres) *Town of Southold

Activities: swimming.

Site Description: The park is in L.C.U. II. It is a prime breeding, feeding, and nesting area for waterfowl.

Recommendation: A boat launching ramp to Hog Neck Bay should be constructed in order to increase boating and fishing opportunities.

Cedar Point - Northwest Creek - Grace Estate - Barcelona Neck (County)
*Town of East Hampton

Cedar Point County Park - 608 acres; Northwest Creek County Park - 337 acres; Grace Estate (Suffolk County proposal); and Barcelona Neck (Suffolk County proposal) - 355 acres.

Activities:

Cedar Point County Park: picnicking, biking, camping, fishing, hunting, riding, swimming, conservation activities; Northwest Creek: conservation; Grace Estate: camping conservation; and Barcelona Neck: golf - a nine hole course.

Site Description: large forests and salt marsh areas, freshwater marsh, Prime Wildlife Area, maritime shrubland, and dunes at the Barcelona Neck and Cedar Point beaches. An historic stone lighthouse stands at the end of a long sand spit at Cedar Point. All of the ponds and marshes are in L.C.U. IV and significant areas bordering the marshes are in L.C.U. III. There is a large groundwater recharge area in the forested portion of the site (L.C.U. II).

Recommendation: The uses at Cedar Point can be expanded. The Marine Fisheries Plan recommends a boat launching ramp on the northernmost section of Northwest Creek. Portions of the Grace Estate and Barcelona Neck acquisitions are both recommendations of this report and the GAPC report. The remaining part of the Grace Estate would link two County holdings: Cedar Point to the north and Northwest Creek to the south. The existing camp would facilitate an

expansion of the Suffolk County Park Department's youth camping program; the extensive shoreline and other sites suitable for recreation activities would provide opportunities for combined recreation-conservation uses on a regional basis. The portion of Barcelona Neck proposed for acquisition has a 9-hole golf course and large areas suitable for conservation education activities. The State is planning to acquire the remaining wetlands on Barcelona Neck.

Cow Neck (proposed acquisition) *Town of South Hampton

Activities: fishing.

Site Description: The confluence of Sebonac Creek and Great Peconic Bay with extensive saltwater marshes, some freshwater wetlands, active farms, old fields, maritime shrubland, and dunes. An ideal area in which to observe migrating shore birds; mostly wild and wooded, with vegetation of good quality, but quite disturbed by trails and clearings (L.C.U. IV, III and II).

Recommendation: a potential site for increased scientific and educational activities and limited boating and fishing. The waters are excellent and there is enough land for back-up facilities. This is also a GAPC.

Crab Meadow (County - 160 acres) *Town of Huntington

Activities: conservation.

Site Description: Woodland and saltwater marsh. The entire site is L.C.U. III and IV.

Recommendation: Crab Meadow is ideally suited to serve as a nature study center for western Suffolk schools and other groups. Development would involve large wooden observation platforms looking out over the marsh, several small bunks for overnight classes in outdoor education, and a study-dining center. The operation would be similar to the one at New Paltz where classes spend four or five days working at the study center conducting experiments in pond and field ecology and recording their observations.

Cranberry Bog County Park (see "Peconic River")

East Islip Meadows (County - 87 acres) *Town of Islip

Activities: conservation, nature walks.

Site Description: managed as part of the Town of Islip's South Shore Nature Center, there is a small dune area, saltwater and freshwater marsh and a Prime Wildlife Area. The entire site is in L.C.U. IV.

Recommendation: controlled access for passive recreation and conservation education.

East Marion-Dam Pond (proposed acquisition) *Town of Southold

Activities: none at present; undeveloped land, abandoned sand mining operation.

Site Description: extensive freshwater marshes and brackish ponds, and a Prime Wildlife Area; views to both Orient Harbor and Long Island Sound; rolling terrain with woods and fields. L.C.U. IV and III.

Recommendation: To the west of Dam Pond is an abandoned sand mining area that would provide an excellent location for back-up facilities to beach and boating uses on the Sound. This is a GAPC.

Fireplace Neck (See Carmans River) *Town of Southampton

Flanders and Sears Bellows (County - 2266 acres) *Town of Southampton

Flanders, 1,620 acres and Sears Bellows, 646 acres plus small proposed addition.

Flanders: undeveloped, some informal hunting and fishing.

Sears Bellows: camping, hiking, nature walks, picnicking, fishing, rowboats, ice skating, duck hunting, swimming.

Site Description: saltwater marsh, freshwater marsh, fresh ponds, extensive forest areas, some beach, and a Prime Wildlife Area. Primarily L.C.U. IV and III with some areas in L.C.U. II.

Recommendation: The GAPC recommendation identifies it as an excellent wildlife habitat which, with proper management, could accommodate limited recreation use and conservation education.

Gardiners Island: (proposed acquisition - 3380 acres) *Town of Hampton

Site Description: freshwater and saltwater marshes, extensive maritime shrubland, farm fields, "virgin" woods, dunes, and a Prime Wildlife Area. Also, many rare plants, the largest known breeding colony of Osprey on Long Island, and historical and archeological sites. Most of the Island is in L.C.U. III with a large area in L.C.U. IV and II.

Recommendation: Acquisition would provide opportunities for swimming, boating, hiking, camping and fishing. It could be developed into one of the best and most spectacular nature preserves in the United States. It is ideally suited to serve as an outdoor education and recreation facility for the region (see discussion under "Crab Meadow"). This also is a GAPC.

Grace Estate (See Cedar Point)

Harbor Arts Center County Park (32 acres) *Village of Lloyd Harbor and Town of Huntington

Activities: Indoor gymnasium, programs utilizing the meeting hall, kitchen, conference and classroom, hiking, picnicking.

Site Description: a former school with an outstanding view of Huntington Harbor and Bay, a dock and an old boathouse.

Recommendation: The existing pier needs repair and a guard rail. A portion of this site would be suitable for a boat launching ramp and backup facilities. The County should sell

the upper ten acres. The boat house needs repairing. A study should be made to determine costs of repair and potential uses of this building.

Indian Island (County Park - 82 acres) *Town of Babylon

Activities: none at present

Site Description: a former spoil dumping area, accessible only by boat.

Recommendation: Although it is in L.C.U. IV it presents an excellent opportunity for recreation activities. If the bridge were to be reconstructed, it would be a fine site for fishing piers. The site should be revegetated with appropriate plants conducive to both wildlife habitats and recreation uses.

Landing Avenue County Park (97 acres) *Town of Smithtown

Activities: none at present

Site Description: A large forested parcel and wildlife area recently acquired by the County (L.C.U. IV, III and II).

Recommendation: The site is well suited to the establishment of a nature study center. There is excellent shoreline fishing and a fine opportunity for a canoe launching facility. Controlled access and use for nature study, canoeing and fishing is suggested.

Long Pond (proposed County acquisition - 1,010 acres - 26 acres already acquired) *Town of Southampton

Activities: some farming, mostly undeveloped.

Site Description: This complex of ponds is one of the finest wildlife habitat areas remaining on Long Island. There are large areas of freshwater marsh, some forest, old fields and active farms, and small pockets of development. It is a Prime Wildlife Area. A large portion of the site is in L.C.U. IV buffered by L.C.U. III with the outer edges in L.C.U. II.

Recommendation: The acquisition of this site, previously recommended in the Capital Program, would provide opportunities for fishing, hiking, camping, horseback riding, canoeing and row-boating. Crooked Pond should be used for conservation education.

Maple Swamp-Birch Creek (proposed acquisition - 2,000+ acres)
*Town of Southampton

Activities: none at present

Site Description: a diversified area with freshwater marsh, ponds, pine barrens, Pine/Oak woods, rare plants, a Prime Wildlife Area and expansive views to Shinnecock Bay and the ocean from the high points. The site is in L.C.U. IV and III.

Recommendation: This area serves as a significant watershed and groundwater recharge area; this acreage is contiguous to the Sears Bellows-Flanders complex. It could serve as a

major nature study center for the region and could accommodate limited passive park uses.

Mattituck (proposed acquisition) *Town of Southold

Activities: Mixed residential and commercial uses

Site Description: On the west bank of the inlet are developed areas, forest, active farms and old field; on the east bank are salt marshes, freshwater marsh, forest, and a Prime Wildlife Area. The south end is developed. The marsh and buffer area is in L.C.U. IV.

Recommendation: The Marine Fisheries Subplan suggests a boat launching ramp at the inlet. Mattituck is the only protected harbor between Port Jefferson and Greenport and is heavily used for recreation. There are potential sites for both public and commercial recreation that should be developed as abandoned or obsolete industrial uses are phased out. Both the marshes and the areas suitable for active recreation should be acquired.

McCallister (County - 140 acres) *Town of Brookhaven

Activities: none at present

Site Description: beach, dune, salt marsh (L.C.U. IV). An extremely sensitive site with poor access.

Recommendation: conservation, preservation uses.

Meschutt Beach-Shinnecock Canal (County - 10 acres) *Town of Southaven

Activities: swimming, picnicking, boating, fishing.

Site Description: with the exception of the beach front in L.C.U. IV, all of the site is in L.C.U. II.

Recommendation: Continue present uses and activities, and construct a boat launching ramp on Peconic Bay near the canal.

Napeague (State - 1,300 acres) *Town of East Hampton

Activities: none at present.

Site Description: All of the site is in L.C.U. IV and is composed of dune, beach and freshwater marsh, and a Prime Wildlife Area. It is extremely sensitive and contains some of the best unspoiled dunes on Long Island. The site includes the old fish meal plant.

Recommendation: The Long Island State Park Commission is beginning to develop a plan for the site. Activities they hope to include are camping, swimming, nature walks, hiking and boat launching ramps. The Marine Fisheries Plan recommends a boat ramp and fishing pier at Napeague Bay. A limited railroad station is recommended.

New Suffolk (proposed acquisition) *Town of Southold

Activities: fishing

Site Description and Recommendation: A specific site has not yet been determined, but a fishing pier is recommended as part of the Marine Fisheries segment of the Plan. Care should be taken to assure that this is located in the developed area and not in the salt marsh.

Nissequogue River Complex *Town of Smithtown and Village of the Branch

Nissequogue River State Park, 543 acres; Nissequogue River County Park, 34 acres; Nissequogue River (proposed County acquisition, 50 acres; Landing Avenue County Park, 97 acres; Smithtown Greenbelt, 118 acres; and Blydenburgh County Park, 588 acres.

Activities: Nissequogue River State Park - open by permit, guided walking tours, trout fishing; Nissequogue River (proposed acquisition) - conservation and limited use; Smithtown Greenbelt - conservation; Landing Avenue County Park (see Landing Avenue); and Blydenburgh County Park (see entry for Blydenburgh).

Site Description: The complex shows variation among the parcels, but it is predominately freshwater wetland and forest, and a Prime Wildlife Area. Most of the complex is in L.C.U. IV and III with some areas in L.C.U. II.

Recommendation: Nissequogue River State Park - continuation of existing activities; Nissequogue River County Park - conservation; Nissequogue River - proposed County acquisition of 100 acres - conservation and limited use; Smithtown Greenbelt - conservation and limited use; and Blydenburgh County Park - see discussion under "Blydenburgh".

Northville (proposed acquisition) *Town of Riverhead

Activities: none at present.

Site Description: woodland, farmland, freshwater marshland, ponds, and bluffs. A GAPC recommendation calls for additional acquisition in the Northville area along the Sound between the LILCO property and Mattituck Inlet. The ribbon of land along the Sound is in L.C.U. IV; the remainder is in L.C.U. III with small pockets in L.C.U. II.

Recommendation: Increase public access to recreational opportunities on the Sound by establishing a potential access point for fishing and swimming.

Northwest Creek County Park (see Cedar Point)

Orient Beach (State - 357 acres and proposed acquisition) *Town of Southold

Activities: swimming, picnicking.

Site Description: beach, maritime shrubland and extensive salt marsh. Recommended additions include an area contiguous to the State Park and supplemental farmlands and old fields. (The ferry site is excluded.) Surrounding waters are excellent fishing grounds. The entire area is in L.C.U. III and IV.

Recommendation: The State Park should continue existing activities. The contiguous sites are also GAPCs. They provide excellent opportunities for fishing piers. In addition, the Marine Fisheries Plan recommends construction of a fishing pier on Long Island Sound at Orient.

Peconic Bluffs (proposed acquisition) *Town of Southold

Activities: none at present.

Site Description: beach, bluff, forest, freshwater marsh, active farmland, and a Prime Wildlife area. The site is in L.C.U. IV and III.

Recommendation: Provide campsites to accommodate limited numbers on the south side of the bluff. Access to the shore via a pedestrian walkway and steps over the bluffs would provide opportunities for both swimming and fishing and would minimize bluff erosion. See also GAPC recommendations.

Peconic Dunes County Youth (37 acres) *Town of Southold

Activities: overnight summer camping for boys and girls between the ages of 7 and 12.

Site Description: freshwater marsh, forested areas, dune and beach front; a way station for migratory birds. The site is in L.C.U. IV and III.

Recommendation: Increase fishing access to the shore during the non-camping season and improve existing facilities.

Peconic River Complex (1690 acres) *Town of Riverhead, Town of Brookhaven and Town of Southampton

Cranberry Bog County Park - 165 acres; Peconic River County Park - 1319 acres; Peconic River Wetlands, 166 acres; and Peconic River Watershed, proposed 750 acre acquisition.

Activities: Cranberry Bog County Park - nature trails, hiking; Peconic River County Park - conservation, some areas under a Fish and Wildlife management program conducted by New York State Department of Environmental Conservation and involving fishing, hunting, bird dog trials, hiking; and Peconic River Wetlands - hunting, fishing.

Site Description: forested, freshwater marshes, and a Prime Wildlife Area. Acquisition of this property would extend the preservation of the Peconic River Watershed eastward from Peconic River Park. The entire complex is in L.C.U. IV and III.

Recommendation: The existing holdings are recommended for preservation. Selected portions of the proposed acquisition that can sustain limited use should be open for nature study, controlled hunting and fishing. The White Cedar Swamp area should be dedicated as part of the Suffolk County Nature Preserve.

Port Jefferson (proposed acquisition) *Village of Port Jefferson
*Town of Brookhaven

Site Description and Activities: A deep water protected harbor on Long Island Sound; the inner harbor is a jumble of mixed industrial and commercial uses.

Recommendation: A large-scale harbor redevelopment would provide opportunities for increased pedestrian access to the shore and expanded recreational boating activities. If there is increased commercial recreation, outright acquisition of land would not appear to be necessary. See also GAPCs.

Robert Moses (State - 1,000 acres) *Town of Babylon and *Town of Islip

Activities: 18 hole pitch and putt golf, boating, playground, picnicking.

Site Description: beach, dune, maritime shrubland, small salt march, limited freshwater marshland, and a Prime Wildlife Area. The entire site is in L.C.U. IV and III.

Recommendation: Construct a fishing pier on the bay side. Determine extent of damage to dunes by motor vehicles. If vehicles are to be allowed in the dunes, the areas should be clearly identified and road blocks should be installed to prevent access to other areas.

Robins Island (proposed acquisition - 460 acres) *Town of Southold

Activities: none at present.

Site Description: mature oak forest, Prime Wildlife Area, small bluffs, freshwater and saltwater marsh, maritime shrubland and beach. Three-fourths of the site is L.C.U. III and the remainder is in L.C.U. IV.

Recommendation: Should be developed to provide opportunities for fishing, swimming and primitive camping. Ferry access to the Island could come from either the North of South Fork, preferably from New Suffolk. See GAPC recommendation.

Shelter Island (Mashomack Forest - proposed acquisition) *Town of Shelter Island

Activities: hunting.

Site Description: an extensively forest area, some old field, fresh and saltwater marsh, maritime shrubland, beach, and a unique Prime Wildlife Area. The majority of the site is in L.C.U. IV and III.

Recommendation: The GAPC recommendation identifies this private hunting preserve as a Prime Wildlife Area worthy of preservation. It should serve as a limited use or use-by-permit area for hunting, fishing, and nature study.

Shinnecock Canal (see "Meschutt Beach")

Shinnecock Inlet - *Tiana Beach (County) *Town of Southampton

Shinnecock Inlet - 88 acres, and Tiana Beach - 296 acres.

Activities: some commercial use, fishing, occasional swimming.

Site Description: Extensive shorefront, maritime shrubland, beach, rock jetties, salt marshes, and some freshwater marsh (L.C.U. IV and III).

Recommendation: The shorefront should be developed to take advantage of the excellent opportunities for fishing, boating, swimming and shellfishing. The Marine Fisheries Plan recommends construction of a fishing pier at Hampton Bays in connection with the reconstruction of the Ponquogue Bridge.

Shirley Marina (See Smith Point)

Shoreham (LILCO and Wading River) *Town of Brookhaven

Activities: none at present.

Site Description: The proposed site is contiguous to the power plant, Prime Wildlife Area, wetlands, and beach.

Recommendations: Recommendations include a fishing pier at the LILCO site and the utilization of the Long Island Sound shorefront for boat ramps, swimming, and fishing. These are recommendations of this plan, the GAPC memo, and the Marine Fisheries Plan.

Smith Point - Shirley Marina (County) *Town of Brookhaven

Smith Point - 1,468 acres, and Shirley Marina - 160 acres.

Activities: Smith Point: ocean bathing, shuffleboard, surfing, fishing, camping, hunting. Shirley Marina: closed.

Site Description: beach, dunes, saltwater wetlands and maritime shrubland.

Recommendation: Shirley Marina is officially closed, however, it is used for fishing and boat launching. This holding should be developed as soon as possible to provide expanded opportunities for boating and fishing from both boats and piers. (See also The Marine Fisheries Plan.)

Southaven County Park (See Carmans River)

South Jamesport Boat Landing (60 acres plus additional acquisition)
*Town of Riverhead

Activities: boating and fishing, utilizing an existing boat launching ramp and backup facilities owned and operated by the Town of Southold, but open to all State residents, since it was built with State assistance.

Recommendation: Increase public access to recreational opportunities at Peconic Bay by establishing several potential access points for fishing, boating, and swimming.

Tiana Beach (See Shinnecock Inlet)

Timber Point (County - 239 acres)

Activities: golf, tennis, boat berths, launching ramp.

Site Description: developed as a 27-hole golf course, with saltwater marsh and a Prime Wildlife Area (L.C.U. III and IV).

Recommendation: Expansion of the boat launching facility. The launching ramp is narrow with no parking and is only used for seasonal launching by the people who keep their boats at the slips. The Parks Department hopes to move the marina to the opposite side of the property.

West Meadow Beach *Town of Brookhaven

Activities: fishing, swimming.

Site Description: a developed stretch of beach with a large amount of seasonal housing on shorefront lots leased from the Town of Brookhaven.

Recommendation: The Marine Fisheries Plan identifies this as a possible site on Smithtown Bay for a boat ramp. Potential recreation sites would occur with the removal of seasonal housing.

2.6.8 Shoreline Access

This section deals with physical access through acquisition, improved utilization, and changes in modes of transportation; and visual access through the provision of highway turnouts or viewpoints and the protection of viewsheds.

At the present time there is insufficient access on a regional level due to existing road patterns, size of parking areas, and availability of parking areas to out-of-town visitors. There is a need for additional acquisitions as well as improved access to existing facilities. Sites recommended for improved access are described in the GAPCs (Section 6.0), harbor design sites listed under Aesthetic Resources (Section 3.1), and in this Subplan where improved access and increased uses are recommended for various areas (Section 2.6.7). Some parks have inadequate approach roads or insufficient parking. In certain cases there are residence restrictions or high entry or activity fees. Most town beaches are open to nonresidents, but the size of the beach and the availability or parking space act as limitations to use.

There are essentially two types of access: physical access for either active or passive recreation, and visual access which may be of a transitory nature; i.e., a view glimpsed from a passing car. Physical access for active recreation presents the greatest problem as it invariably requires acquisition of large areas. Access for passive uses may be accomplished in other ways: redevelopment of harbor areas, access to private or quasi-private preserves, pedestrian access in new developments, and easements for trails and bikeways.

The series of proposed harbor designs include opportunities for increased access to the shore as part of an overall redevelopment plan (see Section 3.1). Three sample plans are described below.

The Kings Park Harbor Plan was designed to eliminate erosion problems along the bluff to west of Kings Park-San Remo GAPC. The park, at the mouth of the Nissequogue River in the Town of Smithtown, is an active boating area. On weekends and holidays during the summer the parking lot is filled with boat trailers. More than 100 boats are moored offshore. However, the bluffs are being destroyed by pedestrian traffic to and from the water's edge. The design solution was to provide a promenade which serves as a retaining wall protecting the bluffs from further erosion and channels pedestrian traffic through two staircases.

The Shinnecock Canal Plan also offers opportunities for increased access.

The canal, located in the Town of Southampton on the South Fork of Long Island, connects Peconic Bay to the Atlantic Ocean via Shinnecock Bay. It is an active area for large and small craft. The swift current, depending on the tides, draws fish to Great Peconic Bay and Shinnecock Bay through the canal, making this a prime fishing area. Most fishermen park their cars at the water's edge and fish adjacent to their cars. Unfortunately, this limits the number of fishermen able to utilize the area.

Once the decision was made to consolidate parking, space became available for a restaurant, walkways and seating areas, thereby opening the experience to people other than fishermen. The provision of outdoor lighting makes it a night as well as a day facility, and the walkway to the northernmost overpass serves as a link to the County property on the northeast side of the canal.

The Patchogue River design area is located at the northern end of the river at Division Street and West Avenue, just south of Patchogue's central business district. The use of this area as a ferry terminal linking Patchogue to the National Seashore on Fire Island would serve as a catalyst for future development. The site is located close to the Patchogue railroad station with its substantial parking lot. The plan could serve to spur renewal southward in a deteriorated area along the river by extending commercial development in this direction. The ferry terminal will have a boardwalk to link the terminal to restaurants with water views, facilities for docking, slips, showers and restrooms. The design redirects the focus of the central business district of Patchogue back to its original orientation - the harbor (see also GAPCS).

Increasing Access Through Acquisition

The following sites proposed for acquisition would provide shoreline access.

Acquisition recommendations in Nassau include Cold Spring Harbor (a regional proposal), Freeport, Glen Cove Creek, Lattingtown Shore, Manhasset Bay, and Sheets Creek.

Acquisition recommendations in Suffolk include Baiting Hollow (a regional proposal), Carll's River, Carman's River, Fireplace Neck and Grace Estate (a regional proposal), Barcelona Neck, Cow Neck, East Marion-Dam Pond, Gardiner's Island (a regional proposal), Long Pond, Maple Swamp-Birch Creek (a regional proposal), Mattituck, New Suffolk, Nissequogue River, Peconic Bluffs, Peconic River Watershed, Port Jefferson, Robins's Island (a regional proposal), and Shelter Island.

Increasing Access Through Improved Utilization

It was found that Jones Beach, Robert Moses and Hecksher State Parks could possibly accommodate additional visitors with increased bus service.

The undeveloped parks with portions suitable for active recreation were found to be Hempstead Harbor, Sands Point and Welwyn in Nassau. In Suffolk, the development of Caumsett and Napeague State Parks could provide for additional access and activities, primarily passive and boating. Sears-Bellows, Cedar Point, Indian Island-Babylon, Shirley Marina and Tiana Beach County Parks should be developed as per plan recommendations (see Section 2.6).

Increasing Access Through Changes in Modes of Transportation

It was mentioned previously that bus service to certain parks should be provided. One proposed solution would be to encourage the parking of individual cars in satellite parking areas that are underutilized at specific times and to provide bus service from the parking areas to the parks.* Some of the potential areas for these bus stops (depending on Sunday closings) might include such regional areas as Roosevelt Field, Roosevelt Raceway, Walt Whitman Mall, Smithhaven Mall, Greenacres Shopping Center, various high schools, Stony Brook University, Suffolk Community College, Nassau Community College, Farmingdale University, Hofstra, and various village or town Central Business Districts.

There is an increasing realization that regional residents without private transportation are virtually denied access to public recreation facilities in Nassau and Suffolk Counties. Most parks are accessible only by auto or charter bus. The Long Island State Park Commission has examined improved transit access and made the recommendations displayed in Table 2.6-3. They fall into two categories; capital and non-capital intensive. The capital intensive recommendations require structural improvements to existing facilities; the non-capital intensive recommendations involve changing of schedules and service coordination.

*Interview with Francis Cosgrove, Nassau County Department of Parks and Recreation.

Table 2.6-3
Mass Transit Access Improvements*

<u>Capital Intensive</u>	<u>Non-Capital Intensive</u>
1. Expand day use activities at Bethpage State Park (provide picnic facilities, build pool and support facilities).	1. Modify charter bus quotas..
2. Make selected structural improvements to State Parkways to allow limited bus service.	2. Improve bus route service to State Parks.
3. Delineate or construct exclusive bus lane along State Parkways to Jones Beach.	3. Coordinate rail/bus schedules, maximize ease of access.
4. Construct a new train station facilities closer to selected State Parks to ease access and reduce need for long bus rides.	4. Employ shuttle bus/park-and-ride system to Jones Beach on trial basis.
5. Extend Seaford-Oyster Bay Expressway south to Merrick Road to connect with Wantagh State Parkway.	5. Add local service along Robert Moses State Park at minimal cost.
	6. Create Suffolk County Transit Authority to better coordinate bus service in the county and with LIRR.
	7. Devise new fare structure to benefit weekend recreation-found ridership.

*Long Island State Park Commission Mass Transit Access Improvement Study, Long Island State Parks and Recreation Commission (1975, revised 1977).

Scenic Access

In addition to direct access for swimming and boating, there are many scenic vistas, and many public roads that could be improved by the provision of small turnoffs accommodating three or four cars at a time. The scenic points listed below were determined by field survey and include many scenic areas already listed in the Long Island Sound Study. The list describes road locations where outstanding scenic views occur. Some sites were suggested as potential candidates for some kind of turnoff with limited time parking, based upon site suitability and road safety conditions. Although highway turnoffs are hardly of a regional scale, a series of them would provide an appreciable increase in viewing opportunities. Most access points would utilize road rights-of-way and would provide a location from which to observe early settlement patterns, historic buildings, farms, and glimpses of the shoreline and the water beyond. Improvements would include designing and constructing turnoffs, and mapping viewsheds where scenic easements should be considered. Views from publicly owned recreation lands, although important, have been discussed elsewhere and are excluded from the list below.

Hempstead

1. Meadowbrook Parkway to the south shore: excellent views, possibility of turnoff.
2. Jones Beach Causeway: excellent views.

North Hempstead

3. West Shore Road, Port Washington: the crest of the hill overlooking the Sand Pits and the harbor; possibility of turnoff.
4. Middle Neck Road and Lighthouse Road, Sands Point: open view of the Sound, long narrow beach; possibility of turnoff.
5. Bryant Avenue, Roslyn Harbor: scenic road with historic house, glimpses of the harbor.

Oyster Bay

6. Cove Neck Road, Cove Neck: scenic roads with opportunities for turnoff.
7. Laurelton Road, Laurel Hollow: road ending at the bay.
8. Shore Road, Mill Neck, Long Harbor Road: opportunities for turnoff.
9. Cleft Road at Beaver Lake.
10. Southland Drive, Glen Avenue: view from bridge out toward the Sound and in toward a pond.
11. Cliff Way and Shore Drive, Sea Cliff: village drive with splendid Victorian buildings, open view toward the Sound; parking available.

Babylon

12. Ocean Parkway: the barrier beach.

Islip

13. Main Street and Brighwaters Canal: a pastoral enclave in the

heart of Town looking out toward Great South Bay; parking available.

14. Lotus Lake at Montauk Highway: a view directed primarily inland.

Brookhaven

15. Bellport Village: typical village, historic buildings, rural character, shingle houses; parking available.

16. South Country Road from Swan Lake to Beaver Dam Creek: scenic road.

17. Montauk Highway at Forge River

18. Peconic River: entire length of river - not always accessible by foot or by canoe.

19. Crystal Brook Hollow Road, south of Mt. Sinai Harbor: scenic road around harbor; possibility of turnoff.

20. Shore Road, Mt. Sinai: scenic road; possibility of turnoff.

21. Cliff Road, Belle Terre: north end with view of the Sound.

22. Port Jefferson Harbor: many opportunities for seeing a busy multi-use harbor; parking available.

23. Flax Pond, Old Field: pond view

24. Conscience Bay, Old Field: bay view

25. Old Field Point, Old Field: view toward Sound..

Smithtown

26. Stony Brook Harbor, Stony Brook: peaceful harbor, no commercial or industrial intrusion, historic buildings; parking available.

27. Cordwood Path and Harbor Road, Head of the Harbor.

Huntington

28. Makamah Road, Fort Salonga: end of the road, view to water, adjacent to Crab Meadow County Park; possibility of a turnoff.

29. Ocean Avenue, Northport: view from high point out to Eaton's Neck.

30. Northport Harbor: busy harbor with small park; parking available.

31. Lloyd Harbor Road, Lloyd Harbor: the approach to Caumsett, a causeway with views into the harbor and out to the Sound.

Riverhead

32. South Jamesport: view to the bay; parking opportunities

Shelter Island (Scenic roads throughout)

33. Reel Point at Ram Island.

34. South Ferry: view across to North Haven; parking available.

35. Shelter Island Heights: Victorian enclave.

East Hampton

36. Scenic Road; south of 27A, north of the shore, the Georgica and Hook Pond area.

- 37. Lazy Point, Napeague: open view; turnoff opportunities.
- 38. Napeague at Montauk Highway and Fort Pond: open and enclosed views; turnoff opportunities.
- 39. Montauk: around Lake Montauk, Montauk Highway to Montauk Point: diversified views.
- 40. Montauk: end of East Lake Road - open views; parking available.
- 41. Acabonack Harbor: open and enclosed views.

Southampton

- 42. Main Street, Quogue: village patterns; parking available.
- 43. Dune Road, Quogue, to Shinnecock Inlet: dunes, beach, summer home; opportunities for turnoff.
- 44. Dune Beach, Meadow Road: beach, rural estates.
- 45. Halsey Neck Road: beach, rural estates
- 46. Scenic roads: Sagaponack, Mecox, Route 27 (Shinnecock Canal)
- 47. Sag Harbor: historic village, harbor, early settlement patterns; parking available.
- 48. Long Beach and Noyack Bay: open view, opportunity for turnoff.

Southold

- 49. Scenic roads: Sound Avenue, Middle Road: farms, rural landscape.
- 50. Cutchogue Village Green: small historic village scene, rural in character, parking available.
- 51. Marratooka Point: small enclosed view inward, more expansive view to the bay.

Plan Implementation Tools

Existing authorities sufficiently exist to utilize the following techniques for plan implementation.

Acquisition

The most direct method for securing coastal areas for public recreation use is to obtain them through negotiated purchase or condemnation. Large recreation sites may occasionally be obtained through gift or through transfer from the federal government or from non-recreational agencies of state government, through scenic easements or through partial acquisition by clustering.

It is recommended that the Long Island State Park Commission, after review of the proposals for new or expanded regional facilities, indicate which of the suggested acquisitions is or can be included in the State program. The counties, utilizing such state and federal funds as are available, should move to acquire the remaining "regional" sites. The counties should continue to acquire land for the somewhat smaller or sub-regional facilities through the expenditure of county funds. Where extremely high acquisition costs or the specialized nature of the facility make outside funding necessary, appropriate federal, state or other assistance should be sought.

The counties should investigate and pursue all reasonable measures to assure the continued recreational use of Long Island's private golf courses and beach clubs. The right of first refusal should be received by the counties at such time as the private owners decide to sell the golf course or beach club. Where such an arrangement is not feasible, immediate purchase and lease-back for a term of years may provide a way to preserve an existing facility and to guarantee ultimate public access at moderate cost.

Nassau and Suffolk should encourage donations of land or of development rights whenever governmental acceptance of the fee simple or a lesser interest will further the provision of recreation opportunities or the conservation of significant environmental resources.

Expansion of Existing Uses

The State of New York, Nassau and Suffolk Counties and the towns should develop and implement capital programs for the further improvement of existing facilities in order to expand recreation opportunities to the extent compatible with the natural resource base. They should also develop programs to increase access to underutilized facilities through changes in, or additions to, existing transportation arrangements. Development programs and transportation improvements should focus on increasing access to four popular types of recreation activity: swimming, camping, boating (through provision of launching ramps), and fishing.

More Efficient Use Through Increased Funding

The State and the Counties should restore or increase park budgets to permit efficient use of existing facilities through adequate staffing, maintenance, and security. Better levels of staffing would obviate the need to reduce hours of use or the length of the season or to close whole sections of existing facilities.

Contingency Planning

Nassau and Suffolk should establish County policy and make advance preparations to acquire and convert to recreation use shoreline areas that may have structures heavily damaged, or removed, as a result of hurricanes or severe storms.

2.7 An Energy Facilities Subplan for Nassau and Suffolk Counties

2.7.1 Introduction

2.7.1.1 Objectives

The Coastal Zone Management Act of 1972 (P.L. 92-583), as amended by the Amendments of 1976 (P.L. 94-370), requires (Section 305 (b)(8) that the management program for each coastal state shall include, among other requirements, a planning process for energy facilities likely to be located in, or which may significantly affect, the coastal zone. Such a planning process must include, but not be limited to, a process for anticipating and managing the impacts from such facilities. The LIRPB has, herein, undertaken this planning process for the Long Island segment of the coastal zone.

The federal regulations, which provide guidance to States for implementing these requirements (Federal Register, Vol. 42, No. 83-Friday, April 29, 1977. 15 CFR 920.19) discuss a number of approaches that could be used. Among these is the following:

"...the State could develop performance standards or other regulations that particular types of energy facilities would have to meet irrespective of their coastal zone location. Under this approach, no sites would be specifically reserved, but neither would any be specifically excluded."

In view of the high level of development in the Bi-County area, a variety of alternative sites may not be available for any given facility type. Consequently, this plan may call for the reservation of specific sites, simply to ensure that sites will be available when needed.

The federal regulations continue:

"(Another) option, a variant of the (previous), would combine a performance standard approach with specific exclusions of all or particular types of facilities in selected coastal zone locations."

The regulations then proceed to spell out the kinds of environmental safety, and policy factors on which such exclusions/restrictions could be based. This generally, is the overall approach followed in the Nassau-Suffolk energy facilities subplan.

2.7.1.2 Scope

This subplan establishes energy demand projections for the years 1985 and 2000, and covers electric power, all kinds of liquid and gaseous fuels, and coal. From these projections, an estimate is made of the capacity of the facilities required in those years. These estimates are compared to the existing inventory of installations, taking into account current plans for their expansion, retirement and replacement. From this review comes a list of additional required facilities. Although not included in this summary, the list of required facilities, together with

all the possible types of onshore facilities associated with Outer Continental Shelf (OCS) oil and gas exploration, development and production, is reviewed in An Energy Facilities Subplan for Nassau and Suffolk Counties, dated 15 August 1977, as to land use requirements, need for waterfront locations, and environmental impacts. The review includes an examination of the types of exclusion/restriction factors discussed in the federal regulations, where relevant.

The final list resulting from this review will then be checked against the inventory of feasible locations within the coastal zone, and "matches" will be established wherever possible.

2.7.2 Summary of Total Demands -- Electricity

Electricity, unlike ordinary fuels, cannot be stored. It must be used as it is generated, and, as demand varies during the day, there must be generating equipment of sufficient capacity available to satisfy the demand at all times. Demand has been computed in kilowatt hours per year, whereas plant capacity is measured in kilowatts. If demand did not vary through the day, then the required plant capacity would simply be the annual kilowatt hour demand divided by 8760, the number of hours in the year. However, since demand does indeed vary during the day, a larger installed capacity is required than would be computed in this way. Actual capacity could be determined from the annual demand by dividing by some hypothetical number of hours less than 8760. This is a purely empirical concept, but is, indeed in use. The ration of this hypothetical number of operational hours to 8760 is called the "Peak Load Factor". There are seasonal variations in the mode of power consumption, and the summer peak required is usually different from the winter peak. (In Long Island, the summer peak is greater.) Consequently, there are both Summer and Winter Peak Load Factors. In the New York State Power Pool's report to the Public Service Commission, values are given for the Power Pool as a whole, namely Summer Peak Load Factor 63.4% and Winter Peak Load Factor 66.1%. LILCO, in the same report, uses other methods to derive required capacity from demand figures, but one can compute the peak load factors, and one finds that their summer one is considerably lower.

Summer Peak Load Factor	49.9%	-	49.1%
Winter Peak Load Factor	62.8%	-	62.5%

(LILCO finds that the values vary slightly with time. The ranges given are from 1982 to 1997.) The lower the load factor, the sharper the peak. Under pressure from the government, utilities will, in the future, have to reform their rate structures in order to "shave" the peak, and thus reduce the amount of installed capacity required to handle it. LILCO has instituted "Time of Use Metering" for certain of their larger customers as of February, 1977, and expect to extend its application in the future. Table 2.7-1 lists those demands which contribute to the peak load. Thus, we exclude the consumption by electric automobiles, since their batteries can be recharged during off-peak hours.

Since the Summer Peak Load in Long Island is greater than the Winter

Table 2.7-1

Electrical Demands Contributing to the Peak Load
(10^6 kwh/year)

	<u>1985</u>	<u>2000</u>
Residential	7,379	8,522 (1)
Commercial/Industrial	8,453	11,414
Other Public Authorities	252	252
Street and Highway Lighting	200	200
LILCO Internal	1,942	3,180
	<hr/>	<hr/>
	18,226	23,558

(1) A limited increase in the number of gas customers reduces this by approximately 300×10^6 kwh/yr.

Peak, we will compute only that:

1985 The effective load factor used by LILCO for 1985 is 49.7%.

Annual demand = $18,226 \times 10^6$ kwh.

Summer Peak Load = 4,186 megawatts.

"Time of Use Metering" adjustment pro-rated from the value projected by LILCO = 125 MW.

1985 Summer Peak Forecast = 4061 MW

2000 The effective load factor, extrapolated to 2000 from LILCO's tabulation, is 49.0%.

Annual demand = $23,558 \times 10^6$ kwh.

Summer Peak Load = 5,488 MW

"Time of Use Metering" adjustment pro-rated from values extrapolated to 2000 from LILCO's tabulation = 307 MW

2000 Summer Peak Forecast = 5,181 MW

To the peak forecasts, LILCO adds 18% as a safety margin, to determine the required capacity. Thus:

Required capacity in 1985 = 4,792 MW

Required capacity in 2000 = 6,114 MW

2.7.3 Distillate and Residual Oils

Table 2.7-2 summarizes all the projected demands for distillate and residual fuel oils. Various degrees of housing retrofit, and, in 2000, some increase in the permitted number of gas customers result in a possible reduction in the overall distillate demand of the order of 4%. For planning purposes, this difference is not significant, and we will use the maximum values, which are those tabulated.

LILCO is under notice by the Federal Government to reconvert the Port Jefferson units 3 and 4 to coal firing. If that should actually be carried out, there would, of course be a reduction in the residual oil demand, and a coal demand instead. It is unwise to simply replace a certain amount of oil demand by its heating value equivalent of coal. Firing coal may change the economics of operation of the Port Jefferson plant enough to make it preferred for base load operation. This would mean it would stay on the line longer each day than at present, and some other, less economic plant would be loaded less than at present. If the two units were to operate 24 hours a day, they would consume 13,600 barrels of oil per day, or 3,360 tons of coal a day. In practice, in the present oil-firing situation, Port Jefferson 3 and 4 operate at full load approximately 45% of the time. If the units are converted

Table 2.7-2

Summary of Demand Projections for Distillate and Residual Fuel Oils
(10⁶ gal./year)

	1985		2000	
	<u>Dist.</u>	<u>Resid.</u>	<u>Dist.</u>	<u>Resid.</u>
Residential	790 ⁽¹⁾		789 ⁽²⁾	
Commercial/Industrial	800	51	1,033	59
Transportation		9.4		9.4
LILCO Internal	29.4	924	24	749
	<hr/>	<hr/>	<hr/>	<hr/>
	1,619.4	874.4	1,844	817.4

(1) Based on 30% of existing homes retrofitted.
If 60% retrofitted, the distillate demand is 730×10^6 gal./yr.

(2) Based on 60% of existing homes retrofitted, and no new gas users.
If 100% retrofitted, and a limited number of new gas users is permitted, the distillate demand is 717×10^6 gal/yr.

back to coal, and if the economics justify it, they might operate as much as 72% of the time. Thus the exchange could be 2,420 tons of coal per day for 6,120 barrels (257,040 gal.) per day consumed at Port Jefferson plus an undetermined amount of oil saved in some other plant that would operate less than before.

2.7.4 Gasoline and Diesel Fuel

Table 2.7-3 summarizes the projected demands for gasoline and diesel fuel.

2.7.5 Natural Gas and Coal

Table 2.7-4 summarizes the projected demands for natural gas. In 1985, increasing the percentage of retrofitted houses from 30 to 60 lowers the residential gas demand by 5.5%. In 2000, increasing the percentage from 60 to 100 reduces the residential gas demand by 7.8% and increasing the number of gas customers by 15% increases it by 9.1%.

Coal usage in Nassau and Suffolk Counties at this date is not significant. What the future holds for its use in homes, commerce, and industry is uncertain. As discussed in Section 2.7.3, LILCO may have to fire coal in its Port Jefferson units 3 and 4. In addition, any future power stations authorized in the bi-county region will almost certainly be nuclear or coal-fired. Power station coal handling will be discussed later, in Section 2.7.13.

2.7.6 Inventory of Existing and Additional Required Power Plants

Table 2.7-5 lists the present inventory of LILCO operating plants, and Table 2.7-6 lists the plants they have under construction. In addition, the Village of Freeport has a total generating capacity of 50 MW, of which 18 MW is by combustion turbine and 32 MW by diesel engine, and the Village of Greenport has a small internal combustion plant.

Figure 2.7-1 presents curves of existing generation capacity and future electrical demand, spanning the period from 1977 to the year 2000. Line (A) traces LILCO's total installed capacity, including that which is under construction. No account is taken of any new plants not yet authorized, and capacity is diminished by the retirement of plants, according to the dates listed in Table 2.7-5. Steam turbine plants are usually financed over an assumed life of 35 years, and gas turbine and other plants for 25 years.

However, retirement is usually delayed, and 5 years have been added to each of these terms. The increases in capacity indicated through 1984 are, in sequence, Northport 4, Mitchel Gardens, Shoreham 1 (nuclear), and Nine Mile Point No. 2 (LILCO's share). During this period, Glenwood 2 and 3 are retired.

Line (B) represents an additional potential availability of power by virtue of a possible arrangement with the Power Authority of the State of New York. The arrangement is not firm, as of the date of this report,

Table 2.7-3

Summary of Demand Projections For Gasoline and Diesel Fuel
 (10⁶ gal./year)

	<u>1985</u>	<u>2000</u>
Gasoline	1,004	1,046
Diesel Fuel	85.5	110.5
	<hr/>	<hr/>
	1,089.5	1,156.5

Table 2.7-4

Summary of Demand Projections for Natural Gas
(10^6 ft³/year)

	<u>1985</u>	<u>2000</u>
Residential	23,868 ⁽¹⁾	22,549 ⁽²⁾
Commercial-Industrial	16,105	16,105
	<hr/>	<hr/>
	39,973	38,654

(1) Based on 30% of existing homes retrofitted.

If 60% retrofitted, the gas demand is $22,550 \times 10^6$ ft³/yr.

(2) Based on 60% of existing homes retrofitted, and no new gas users.

If 100% retrofitted, and no new gas users, the gas demand is $20,790 \times 10^6$ ft³/yr. If additionally, a limited number of gas users is permitted, gas demand is $23,963 \times 10^6$ ft³/yr.

TABLE 2.7-5
INVENTORY OF LILCO POWER PLANTS IN OPERATION
1977

Station	Unit	Type	Method Of Fuel Handling(1)	Max. Storage Capacity 10 ⁶ Gal.	Capability - MW		Type of Cooling System	Start-up Year	Retire-ment Year(4)
					Summer	Winter			
Northport	1	Steam Turbine	Water	83.5	386	386	Once-through	1967	2007
"	2	"	"		386	386	"	1968	2008
"	3	"	"		386	386	"	1972	2012
Port Jefferson	GT	Combustion Turbine	Truck	0.1	16	20	Air	1967	1997
"	1	Steam Turbine	Water	27.1	49	49	Once-through	1948	1988
"	2	"	"		49	49	"	1950	1990
"	3	"	"		196	196	"	1958	1998
"	4	"	"		196	196	"	1960	2000
"	GT	Combustion Turbine	Truck	0.1	16	20	Air	1966	1996
Glenwood	2	Steam Turbine	Water	6.2(2)	77	77	Once-through	1930	1980
"	3	"	"	(2)	77	77	"	1938	1980
"	4	"	"	(2)	114	114	"	1952	1992
"	5	"	"	(2)	113	113	"	1954	1994
"	1	Combustion Turbine	Truck	0.5	16	20	Air	1967	1997
"	2 & 3	"	Water	1.5	114	124	"	1972	2002
Barrett	1	Steam Turbine	"	20.2(2)	189	189	Once-through	1956	1996
"	2	"	"	(2)	191	191	"	1963	2003
"	APG	Combustion Turbine	Truck	0.1	18	22	Air	1966	1996
"	1 - 8	"	"	3.0(2)	126	151	"	1970	2000
"	9 - 12	"	"	(2)	162	190	"	1971	2001
Far Rockaway	4	Steam Turbine	Water	2.1(2)	114	115	Once-through	1953	1993
Shoreham	1	Combustion Turbine	Truck	1.0	51	64	Air	1971	2001
West Babylon	1 - 3	"	"	0.5	52	63	"	1966	1996
"	4	"	"	0.5	48	62	"	1971	2001
Southold	1	"	"	0.126	14	17	"	1964	1994
Southampton	1	"	"	0.126	11	14	"	1963	1993
Nontauk	2 - 4	Internal Combustion	"	0.042	6	6	"	1961	1991
East Hampton	1	Combustion Turbine	"	0.134	20	24	"	1970	2000
"	2 - 4	Internal Combustion	"	0.055	6	6	"	1962	1992
Holbrook	1 - 10	Combustion Turbine	Water(3)	5.0	528	664	"	1974/5	2004/5

(1) All plants use heavy oil

(2) Alternative gas firing-fuel in by pipeline

(3) Alternative handling by pipeline

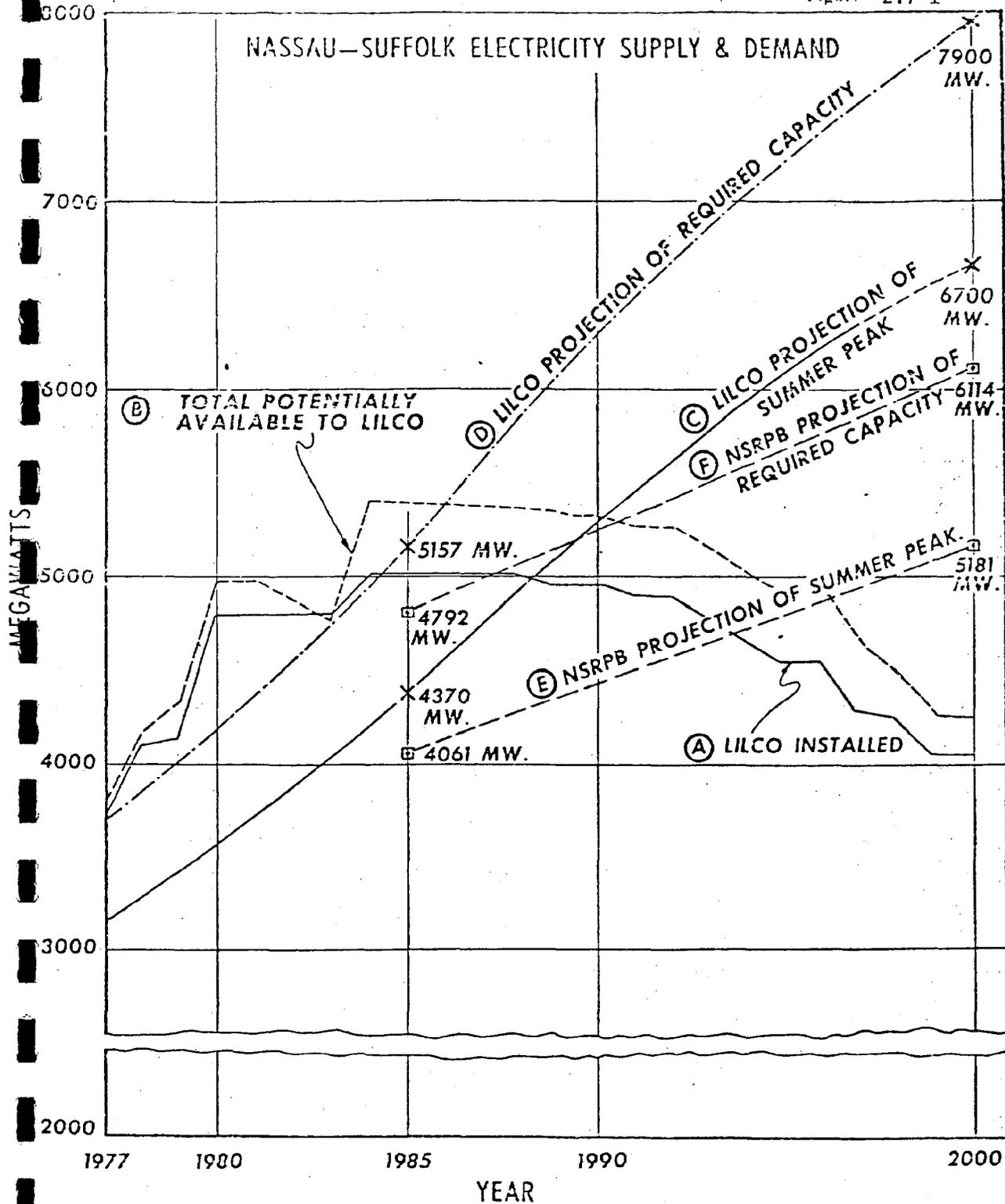
(4) Either the date has been announced (Glenwood 2 & 3), or it is assumed that steam turbine units are retired 40 years after start-up, and other units 30 years.

TABLE 2.7-6
LILCO POWER PLANTS UNDER CONSTRUCTION

<u>Station</u>	<u>Unit</u>	<u>Type</u>	<u>Fuel</u>	<u>Method of Fuel Handling</u>	<u>Capability MW</u>	<u>Type of Cooling System</u>	<u>Start-up Year</u>
Northport	4	Steam Turbine	Oil	Water	386	Once-through	1977
Mitchel Gardens	1 & 2	"	Solid Waste	Truck	32		1978
Shoreham	1	"	Nuclear		820	Once-through	1980
Nine Mile Point	2	"	"		194(1)	"	1983

(1) LILCO's 18% share of a plant on Lake Ontario

Figure 2.7-1



but is included for planning purposes.

Line (C) is a plot of LILCO's estimate of summer peak demand. Their projections run only through 1997, but the curve has been extrapolated to the year 2000. Line (D) is then LILCO's projections of required capacity, being line (C) increased by 18%, their standard margin. The intersection of line (D) with line (B) indicates that LILCO requires additional capacity by 1986, and the supply deficit by the year 2000 is, according to their numbers, approximately 3600 megawatts.

LIRPB has made estimates for 1985 and 2000, and line (E) joins the two points in the figure. There is little reason to suppose that line (E) would not represent a steady increase from 1985 to 2000, although, admittedly, the profile of this increase has not actually been determined. Line (F) is then LIRPB's projection of required capacity, being line (E) with the standard 18% margin.

The intersection of line (F) with line (B) (the total available line) now occurs in 1992, approximately, and the apparent deficit in the year 2000 is now about 1800 megawatts, about 1800 megawatts less than LILCO's projection.

2.7.7 Handling and Storage Facilities for Petroleum Products

Petroleum products are currently delivered by tanker and barge to shoreside terminals in six locations in Nassau north shore bays, seven locations in Hempstead Bay, three locations on the north shore of Suffolk, and one location each in Greenport, Sag Harbor and Patchogue. In addition, LILCO has an offshore oil terminal at their Northport power station, and Northville Industries operates an offshore terminal at Northville, with a storage facility onshore. Finally, the onshore terminal in Port Jefferson Harbor is linked by pipeline to three inland storage facilities, one of them as far away as Plainview, just over the Nassau border.

For a number of pressing reasons of environmental importance, including not only the dangers of oil spills, but also problems of channel dredging and dredge spoil disposal, the LIRPB is proposing a radical revision of the entire oil unloading and storage system in the two counties, including the installation of two more offshore terminals on the north shore, one in Nassau and one in Suffolk. This is in accord with State policy 5.4 found in Appendix A. This proposal is spelled out in the Dredging Subplan, which is another part, companion to the Energy Facilities Subplan, of the bi-county Coastal Management Plan. The revised oil handling and storage scheme is reviewed below in more detail, after an inventory of the existing facilities. Future needs for the years 1985 and 2000 will then be discussed.

It should be noted that, when breakdowns are given by product, these numbers are current ones and temporary. It is quite customary for the same tank to hold one product one month, and another product the next.

2.7.8 Existing Nassau County Petroleum Products Handling and Storage Facilities

The following information was obtained from the County Fire Com-

missioner's Office. Facilities with a capacity of more than 0.1 million gallons are listed.

- a. Port Washington
Total storage 6.3 million gal.
No. 2 and gasoline
- b. Great Neck
Total storage 5.2 million gal.
No. 2, gasoline, kerosene
- c. Glen Cove
Total storage 2.3 million gal.
No. 2, kerosene
- d. Glenwood
Total storage 18.9 million gal.
No. 2, No. 6, No.4, gasoline,
propane, solvent
- e. Roslyn
Total storage 1.8 million gal.
not in use
- f. Oyster Bay
Total storage 5.7 million gal.
No. 2, gasoline, No. 4
- g. Mineola
Total storage 0.5 million gal.
No. 2
- h. New Hyde Park
Total storage 0.5 million gal.
No. 2
- i. Westbury
Total storage 1.6 million gal.
No. 2
- j. Hicksville
Total storage 2.7 million gal
No. 2
- k. Plainview
Total storage 1.0 million gal.
No. 2
- l. Bethpage
Total storage 0.5 million gal
No. 2
- m. Uniondale
Total storage 0.3 million gal.
chemicals and solvents
- n. Hempstead
Total storage 0.3 million gal.
No. 2
- o. Valley Stream
Total storage 0.2 million gal
No. 2
- p. Wantagh
Total storage 1.3 million gal.
No. 2
- q. Massapequa
Total storage 0.9 million gal.
No. 2
- r. Meadowmere Park
Total storage 5.8 million gal.
No. 6, No. 2, diesel, No. 1,
gasoline
- s. Inwood
Total storage 25.0 million gal.
gasoline, No. 2, No.4, kerosene,
diesel
- t. Oceanside
Total storage 34.2 million gal.
gasoline, No. 2, No. 6, kerosene,
diesel
- u. Island Park
Total storage 15.3 million gal.
gasoline, No. 2, No. 4, kerosene
- v. Floral Park
Total storage 0.3 million gallon
No. 2

2.7.9 Existing Suffolk County Petroleum Products Handling and Storage Facilities

The following information is not always up to date, but is the best available.

- a. Cold Spring Harbor.
Total storage 2.7 million gallons.
- b. Huntington Harbor.
Total storage 2.9 million gallons.
- c. Port Jefferson Harbor.
Total storage 3.8 million gallons.
- d. East Setauket (inland storage facility).
Total storage approximately 100 million gallons, of which 42 million is gasoline, and the rest No. 2 fuel oil.
- e. Holtsville (inland storage facility).
Total storage 13.0 million gallons, of which 8.2 million is gasoline, and the rest No. 2 fuel oil.
Plans have been laid for a 12.8 million gallon expansion.
- f. An overland pipeline starts at the Port Jefferson shoreside terminal, and runs south to the Holtsville facility, connecting up with the East Setauket facility enroute. The pipeline then turns westerly, and ends at the Plainview facility in Nassau County.
- g. Northville.
Total storage 145.9 million gallons, comprising 86.8 million gallons of residual fuel oil, 28.4 million gallons of gasoline, and 30.7 million gallons of No. 2 fuel oil. Another 44.1 million gallons of storage is under construction.
The storage facility is served by an offshore terminal, with a water depth of 60 feet at mean low water.
- h. Village of Greenport.
Total storage 1.3 million gallons.
- i. Village of Sag Harbor.
Total storage 1.5 million gallons.
- j. Village of Patchogue.
Total storage 10.5 million gallons.
- k. Northport, LILCO.
LILCO has an offshore terminal, with 45 feet of water at mean low water, for supplying the Northport power station. Total storage 81.0 million gallons.

2.7.10 Proposed Petroleum Products Handling and Storage System

The LIRPB recommends (Section 2.5) that offshore terminals be con-

structed at Hempstead Harbor and Port Jefferson Harbor in water at least 45 feet deep at mean low water, to handle tankers in the 80,000 dead-weight ton class. The Hempstead Harbor terminal should be located off Matinecock Point and should be connected by submarine and land pipeline to existing petroleum storage facilities located off the east shore at Hempstead Harbor in Glenwood Landing. The volume of storage to be provided in this facility should approximate the total of all existing terminals in the north shore bays from Manhasset Bay to Huntington Harbor. (This would comprise items a,b,c,d,e and f in Section 2.7.8 and items a and b in Section 2.7.9). This total storage volume comes to approximately 38 million gallons. The Port Jefferson Harbor terminal should be located off Mount Misery Point and should be connected by submarine pipeline to the existing land pipeline that runs from the harborfront to East Setauket and Holtsville.

The construction of offshore terminals at Hempstead Harbor and Port Jefferson would eliminate the need to undertake Federal channel dredging projects for Manhasset Bay, Hempstead Harbor, Glen Cove Creek, Huntington Harbor, and Port Jefferson Harbor, for the purpose of supporting petroleum traffic, and would allow for the phasing out of all existing terminals within embayments on the north shore of Nassau County and western Suffolk County (see State policy 5.4 in Appendix B).

The present rates of petroleum importation at Northville and the existing storage capacity at that facility are sufficient to supply the North and South Forks and allow for the phasing out of existing terminals in Greenport Harbor and Sag Harbor. Storage facilities for future increased shipments to the Northville terminal should be constructed on properties of the Suffolk County Airport and connected by pipeline to the existing tank farm in Northville. This would allow for easier truck delivery within Southampton Town and to the South Fork via Sunrise Highway.

The Northville - Suffolk County Airport pipeline could also be connected to the existing pipeline and tank farm at Holtsville by a pipeline running along State Route 24 and the Long Island Expressway. Such a pipeline would provide flexibility for the petroleum transportation network, and could serve an additional tank farm in the Yaphank-Upton area of Brookhaven Town (which can be expected to experience rapid growth in the next few years). The existing tank farm facility at Holtsville already allows for the phasing out of the terminal in Patchogue.

An additional storage facility is recommended, located on property of the Pilgrim State Hospital. This facility would be supplied from the existing Holtsville-Plainview pipeline, and would serve the southwest part of Suffolk County, and the southeast part of Nassau.

There is an existing development plan that recommends the extension of the existing pipeline, connecting New Jersey refineries with Kennedy International Airport, to serve existing tank farms in Inwood - Lawrence and Island Park - Oceanside. However, little action has been taken on this proposal since the adoption of the plan, and there remain a number of technical questions regarding the feasibility of transmitting heavy oils by pipeline (e.g., Number 6 residual fuel oil for the LILCO power-plant at Island Park). It is therefore recommended that the channels

to existing petroleum and powerplant facilities in Hempstead Bay be maintained at a depth of 15 ft. and a width of 200 ft. while the feasibility of the pipeline extension alternative is explored further.

Another possible alternative system would dispense with all offshore terminals except one. This would be located in water deeper than 100 feet, roughly in the middle of Long Island Sound, between Wading River, Suffolk County, and New Haven, Connecticut. The type of terminal envisaged here is the OBATS design of Parson, Brinckerhof, Quade and Douglas. In this design, a vertical cylindrical shaft is supported off the sea floor, and carries a platform arrangement, that can ride up and down with the tide, rotate in response to the current direction, and roll with wave motion. Two 100,000 deadweight ton tankers can be unloaded simultaneously, by means of jointed pipes that can accommodate to the motion of the vessels. The unloading pipes are connected to lines which pass down the vertical shaft to its base. The shaft base is part of a tunnel, which, in this case, would communicate with both the Connecticut and Long Island shores. The pipelines can then be run to land inside the tunnel. The same configuration of overland pipelines would be required as before, with the addition of what would now be the main supply line, running south on the William Floyd Parkway right-of-way, to connect into the east-west pipeline at Yaphank. The existing pipeline, which now ends at Plainview, would have to be extended further into Nassau, in order to supply that county. It would end with a terminal that would replace the one recommended for Glenwood Landing under the scheme calling for an offshore terminal off Matinecock Point. The tunnel would, of course, accommodate vehicular traffic, as well.

2.7.11 Additional Required Facilities

LILCO's requirements for oil can be expected to reach a maximum in the eighties. Any new power plants thereafter will probably be either nuclear or coal-fired, whereas oil-burning older plants will be successively retired. Present facilities should suffice for the future.

If LILCO's needs are deleted from Tables 2.7-2 and 2.7-3 the requirements by commerce, industry, transportation and homes total $2,729 \times 10^6$ gal./year for 1985, and $3,058 \times 10^6$ gal./year for 2000.

The demand for 1985 is little different from current consumption, and represents a "trade-off" between a higher number of users and improved efficiencies. Hence, no additional facilities are envisioned for 1985.

For the year 2000, the demand is 9.2% higher than current consumption, and it is recommended that provision be made for increasing the total storage capacity in the bi-county region by this percentage.

Growth in Nassau County is not expected to be significant after 1985, and this additional storage should be installed in Suffolk County, in the three additional facilities mentioned in Section 2.7.10.

Total storage now in place, plus the expansion being constructed at Holtsville, is approximately 330 million gallons. (Patchogue's capacity

is excluded from the total, since Holtsville's expansion is expected to cover it). Thus, the additional capacity recommended for 2000 is 9.2% of 330 million, i.e., about 30.5 million gallons. This capacity should be distributed between the three recommended new locations, with more going to the easternmost facility (Suffolk County Airport) than to the westernmost one (Pilgrim State), since that would be the trend of new development.

2.7.12 Gas Handling and Storage Facilities

Natural gas enters the bi-county region by three pipelines. One is a submarine pipeline from New Jersey, with a landfall at Long Beach. The other two are overland pipelines entering Nassau County from Queens, one at Valley Stream, the other at Lake Success. The gas is distributed by a system of pipelines of various sizes. The southern two-thirds of the island as far as Bellport appear to be reasonably well covered, as is North Hempstead. Small lines extend out from Holbrook to Riverhead and extend southeast through Hampton Bays to Southampton Village. There are gas storage spheres in Riverhead and holders in Inwood but holders in Glenwood and Rockaway Park (Queens) have been retired.

When the demand exceeds the pipelined supply during the daily peaks, additional gas is provided by three Liquid Propane-Air (LPA) plants. In these plants, propane is vaporized from liquid storage, and mixed with a proportion of air, such that the resulting mixture has approximately the density and heating value of methane (natural gas) and requires roughly as much additional air to burn efficiently as methane does. Thus, it is an excellent substitute and supplement for natural gas. These three plants are located in Inwood, Riverhead and Glenwood, the last being larger than the other two.

During those parts of the day when the pipelined supply exceeds the consumption rate, excess gas is liquefied and stored in a liquefied Natural Gas (LNG) plant at Holbrook. Storage capacity is the liquid equivalent of 600 million cubic feet of gas, whereas the plants liquefaction capacity is 2 million cubic feet per day. This system currently delivers 42 billion cubic feet annually to LILCO's "firm" customers; i.e. those whose supply it is obligated not to interrupt. Interruptible customers account for 5 - 6 billion cubic feet more. The highest daily demand in winter is 375 million cubic feet/day. The highest daily demand in summer is 70 million cubic feet/day.

LILCO does not, at this time, contemplate any changes in the system. An oil-gas plant in Bayshore has been retired, and no replacement is planned.

A new source of supply is possible from offshore oil development in the area. As described in Section 2.7.19 a gas pipeline landfall might be accommodated at Shirley, on the south shore, leading to a gas purification plant possibly located in Yaphank. It appears that the purified output of such a plant would most economically be piped back offshore in a pipeline to be run parallel to the shore and connected into the New Jersey pipeline. The smallest economical gas purification plant would probably have a capacity far in excess of the peak summer demand in

Nassau-Suffolk, and the offshore pipeline would serve to conduct this excess capacity elsewhere.

If such an additional source did become available, provision would have to be made to bring the supply into areas not at present supplied. This would entail extending supply mains along the entire north shore of Suffolk County, and further into Southampton and East Hampton on the South Fork.

2.7.13 Coal Handling and Storage Facilities

There are no such facilities of any magnitude currently in operation in the bi-county region. The only thing that can be said, with some degree of certainty, is that any future power stations in the area will not be oil-fired. If they are not nuclear, then they will be coal-fired.

LILCO is now under notice to re-convert Port Jefferson units 3 and 4 to coal. However, the coal handling equipment will require work to make it operative, and the original coal storage area is now occupied by oil tanks. Thought is being given to retaining coal barges at dockside, and using them for storage, but this would incur additional demurrage charges.

Power generation facilities to meet the additional capacity requirements projected for the year 2000 will probably be located toward the east end of Long Island. This makes supply by water more likely than by rail and docking facilities will be required, with sufficient water depth. Furthermore, 30 - 45 days supply of coal is considered necessary, and land must be made available for this purpose.

2.7.14 Location of Power Plants in the Coastal Zone

As stated in Section 2.7.6, approximately 1800 MW of additional generation capacity will be required in the bi-county region by the year 2000. Furthermore, the capacity deficit will manifest itself in about 1992, i.e., some portion of the 1800 MW must be made available by that date. This section will suggest sites for electric generating facilities in accord with State policy 5.3 found in Appendix A.

This generation capacity is roughly equivalent to two additional plants of the same size as the Shoreham nuclear unit. It is also equivalent to the coal-fired alternative submitted by LILCO in their Jamesport application.

In the New York Power Pool's 1977 report to the Public Service Commission, LILCO discusses seven possible sites for plant expansion, namely:

Northport
Shoreham
Shoreham West
E. F. Barrett
Holbrook
Glenwood

Northport must be eliminated, because of LILCO's agreement with the Town of Huntington to build no more steam generating facilities on this site. Barrett, Holbrook and Glenwood can be eliminated for lacking sufficient land area. They have 118, 94 and 41 acres respectively, and the same report states that 2400 MW of generating capacity (with cooling towers) requires 250 acres. The remaining three sites, Shoreham, Shoreham West and Jamesport, can all provide this amount of space, ample for the needs of 1800 MW. Shoreham and Shoreham West are contiguous, and can be considered as one.

It has already been established that reconverting Port Jefferson 3 and 4 to coal-firing will require additional precipitation, but no scrubbers, in order to meet all air quality standards. This is in contrast to the Barrett plant, where reconversion would require scrubbers, owing to the nearness of the metropolitan area. It goes without saying, therefore, that Shoreham and Jamesport, since both are further east than Port Jefferson, would also have less stringent air emission limits. It is probable that cooling towers will be the preferred cooling method in future, and these can cause salt drift, fogging and icing. From this point of view, Jamesport has an advantage over Shoreham, since it is located in an area of sparser population, and fewer homes would be affected.

In the event that the new capacity is coal-fired, a coal storage area of approximately 50 acres would be required. Daily coal consumption would be about 11,000 tons, shipped in by the largest barges. These would require up to 30 feet of water unloading depth, with a dockside length of 500 ft. This depth of water is available about one mile offshore at Shoreham and somewhat less at Jamesport. An offshore unloading terminal would require a pier carrying a conveyor to the shoreside stockpile. Alternatively, a channel of 30 ft. depth would have to be dredged to provide access to a shoreside unloading terminal.

As a power plant site, Shoreham has a number of advantages over Jamesport. First, there is an existing gas turbine installation there, and a nuclear plant is under construction. Additional capacity in this location would therefore probably find readier public acceptance. Second, the site is wooded, and thus has an excellent buffer against noise and visual impacts. Third, the Jamesport site is located in a prime agricultural area. It is recommended that the Shoreham site be used for all additional generating capacity needed through the year 2000.

2.7.15 Location of Handling and Storage Facilities for Petroleum Products in the Coastal Zone

Two possible arrangements are described in Section 2.7.7. Both call for an extension of the existing oil pipeline down the center of the island to link up, by two branches, to the existing bulk storage facility in Northville, and to a new facility at Suffolk County Airport. In addition, two new bulk storage facilities are recommended in the Yaphank-Upton area and at Pilgrim State Hospital.

The two schemes differ, as follows:

- a. The first calls for phasing out the onshore unloading terminal

in Port Jefferson, and installing an offshore terminal instead off Mount Misery Point. Another offshore terminal would be located off Sands Point, and connect to storage facilities in Hempstead Harbor at Glenwood Landing, to replace all existing shoreside terminals from Manhasset Bay to Huntington Harbor.

- b. The second calls for a tunnel from Wading River to New Haven, Connecticut, combined with a mid-Sound unloading terminal with a capacity to supply all the needs of the bi-county area. A pipeline from this tunnel would be run alongside the William Floyd Parkway, and would feed into the pipeline extension referred to previously. The western end of the existing pipeline would then be extended further west to industrial zoned land in the Westbury area, and end in a bulk storage facility that would substitute for the centralized Hempstead Bay installation that the first scheme called for.

None of the pipeline extensions, additional facilities, and alternatives mentioned would have a significant adverse impact on the coastal zone. There would be temporary disruptions during pipeline construction, but good management practices should overcome them.

2.7.16 Gas Handling and Storage Facilities

The supply of gas to the bi-county region is not expected to change radically, unless a significant quantity of gas is found offshore.

An increase in gas supply from this, or any source, would require the installation of additional distribution mains, many of them inside the coastal zone. This is not expected to constitute a significant problem.

2.7.17 Coal Handling and Storage Facilities

It is expected that any such future facilities will be associated with power generating stations (See Section 2.7.14.).

2.7.18 List of OCS Facility Types

The following types of onshore facilities associated with OCS exploration, development, and production can be identified:

1. Temporary Base for Exploratory Drilling
2. Temporary Base for Platform Installation
3. Temporary Base for Pipeline Laying
4. Permanent Service Base
5. Pipeline Landfall
6. Marine Terminal
7. Partial Processing Plant
8. Gas Treatment Plant
9. Oil Refinery
10. Petrochemical Plant
11. Platform Fabrication Yard
12. Pipecoating Yard
13. Boat Repair and Maintenance Yard
14. District Office

Each of these types has certain requirements for acreage, waterfront, personnel, etc., etc., and has certain environmental impacts which were analyzed in An Energy Facilities Subplan for Nassau and Suffolk Counties dated 15 August 1977.

2.7.19 Onshore Facilities for OCS Development

There are six sites in the Nassau-Suffolk area that could accommodate some type of onshore facilities that would be needed for outer continental shelf development. Some could accommodate only one or two types of activities while others could accommodate more. The availability of land, depth of water and surrounding land uses are major limitations. This site selection process is in accord with State policy 8.4 found in Appendix B.

A site at Fort Pond Bay in the Montauk area of Suffolk County could accommodate five major activities. They are temporary bases supporting exploratory drilling, platform installations and pipeline installation, a permanent base which requires 50 acres, and a pipe coating yard which would need somewhat more. Commercial fisheries related facilities, however, are higher priority uses for this site.

At the present time, the land around Fort Pond Bay is partially zoned for industrial purposes and is being used for sand mining, an ocean science laboratory and miscellaneous industrial uses. The sand mining area occupies at least 50 acres and lies between the Long Island Railroad and the shore. The three temporary bases could easily be located here, and it is possible to assemble additional land to accommodate the permanent uses. There is over 1,000 acres of land to the west of the site that is not used. Adequate buffering could be built into the site if and when residential development were to occur on the land. Direct access to Montauk Point State Boulevard could be acquired to avoid any additional traffic near the business section of Montauk.

Fort Pond Bay faces roughly north into Block Island Sound, much of which has depths greater than 60 feet. Depths greater than 40 feet are found within 20 yards of the east shore of the bay and within 500 yards of the west and south shores. Ample water depth for service boats and supply barges could be had at dockside for relatively little dredging.

The Village of Greenport in the Town of Southold, Suffolk County, has two waterfront areas that could accommodate the three temporary uses although commercial fisheries related facilities are higher priority uses. The three temporary uses include the following: (1) a temporary base supporting exploratory drilling, (2) a temporary base supporting platform installations, and (3) a temporary base supporting pipeline laying. Railroad access is a possibility at the southwestern parcel. The drawback of this site is that it is not presently zoned for industrial or commercial use. Unused marine commercial and industrial buildings at the northeastern end of the harbor could be removed or converted to accommodate the uses. Greenport also has boat repair facilities that might accommodate the large boats that would be required for O.C.S. exploration.

The main shipping lane running between Greenport and Shelter Island has a minimum depth of 33 feet, and most of it is deeper than 50 feet. The 20 foot depth contour runs within 220 yards of the southwest site, and within 450 yards of the northeast one. In the boat repair area of the harbor, 20 feet of water is available even closer in. So that, dredging of access channels does not appear to be a problem in this location.

A site on the west side of the harbor in the Village of Port Jefferson in the Town of Brookhaven, Suffolk County, is usable as a temporary base supporting exploratory drilling although again, as in Greenport, commercial fisheries related facilities are higher priority uses at this site. There is an oil terminal site that is being phased out and approximately 5 acres could be obtained in this deep water harbor that has protection from storms and has adequate turning room for large boats. The major drawbacks of Port Jefferson are its distance from the proposed drilling sites and the possible conflict with recreational boating activities in the harbor. However, 35 feet of water depth is already available at the existing dock, and a channel 25 feet deep and 300 feet wide extends the full length of the harbor and out into Long Island Sound.

The industrial area in the Village of Freeport (Figure 2.7-2) in the Town of Hempstead, Nassau County, could provide a temporary base supporting exploratory drilling. The area could also be used for boat repair since facilities of the type already exist in an area that might have enough depth for large boats. A few of the uses in the industrial area could be phased out in the future so there is an outside possibility of assembling enough land for a permanent base. The Village sewer plant, incinerator and public works storage area are the uses that could be replaced by the use of county facilities or could be at a non-waterfront location. The only municipal use that cannot be relocated is the new village power plant.

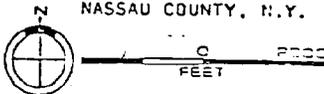
Sea access is by Jones Inlet, either side of Meadow Island, the Bay of Fundy, the west side of Pettit North, and Freeport Creek, a distance of about 11 miles. Depths along this route are mostly between 10 and 17 feet, with some spots of less than 10 feet. Considerable dredging would be necessary to provide 15 feet minimum throughout. However, the area is highly industrial, and the access that the channel would provide to boat repair yards might make it economical.

A site adjacent to the oil terminals in Oceanside (Figure 2.7-3) in the Town of Hempstead, Nassau County, can be used as a temporary base supporting exploratory drilling. A 5 acre site could be assembled by combining the vacant land and abandoned buildings along the channel that leads into East Rockaway. There are two large tracts of industrially zoned land in the Oceanside area that have good highway access and are surrounded almost entirely by non-residential uses. However, they do not have direct access to major channels since they are blocked by low bridges on the Long Island Railroad and Long Beach Road.

Sea access is by East Rockaway Inlet, Reynolds Channel, and Hog Island Channel, a total distance of about 16 miles. Most of the route is deeper than 20 feet, in places considerably deeper. However, there



FIGURE 2.7-2
 VILLAGE OF FREEPORT
 TOWN OF HEMPSTEAD
 NASSAU COUNTY, N.Y.



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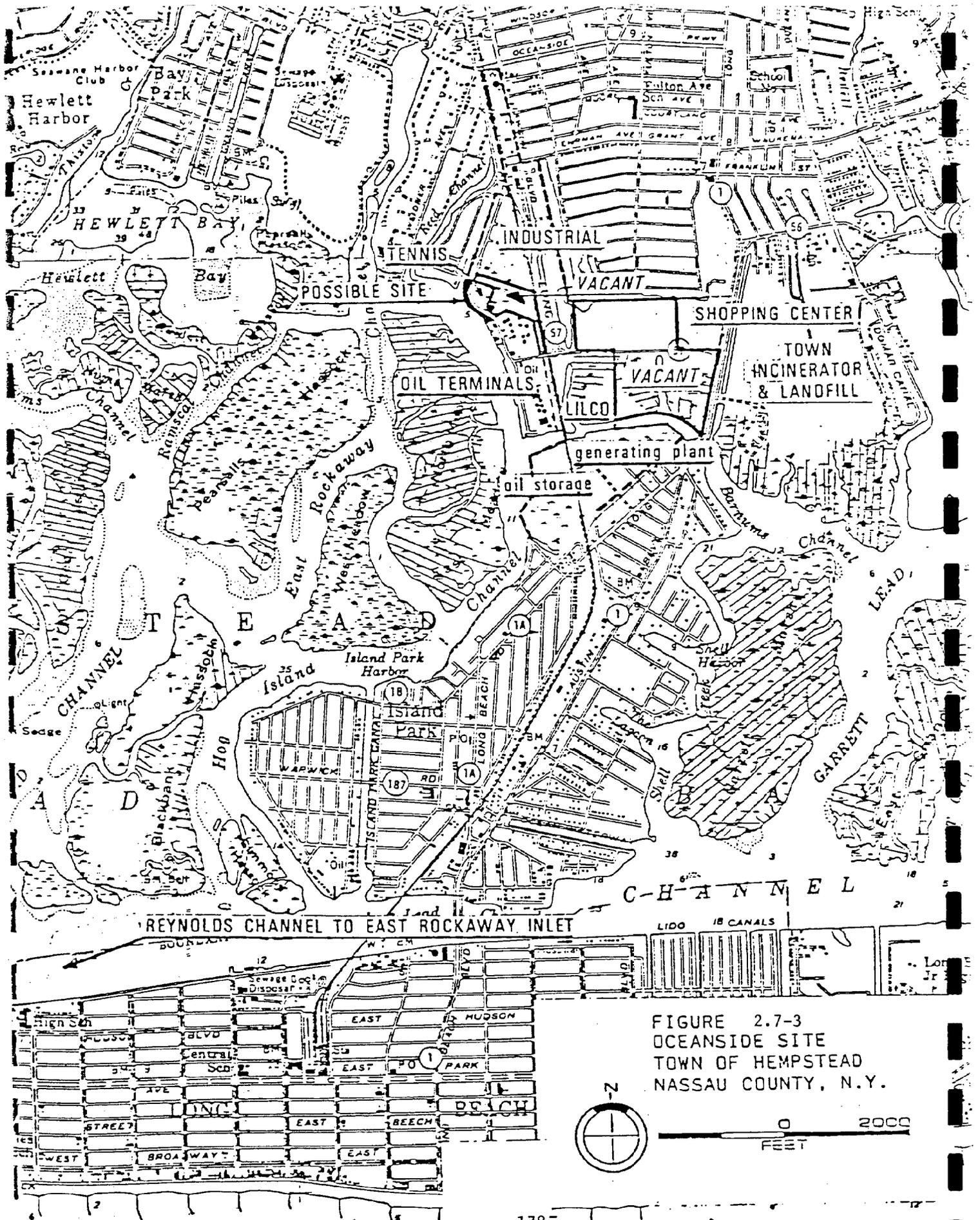
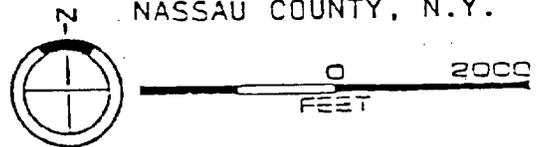


FIGURE 2.7-3
 OCEANSIDE SITE
 TOWN OF HEMPSTEAD
 NASSAU COUNTY, N.Y.



are some stretches shallower than 20 feet, and a few places as shallow as 11 or 12 feet. Dredging would probably not be a serious problem if the site itself was considered advantageous, and the distance to the ocean was not a drawback.

A site in the Yaphank-Shirley area (Figure 2.7-4) in the Town of Brookhaven, Suffolk County, appears to be the best possibility for locating a gas treatment plant. At the present time, there are two large sites east and west of William Floyd Parkway that are between the Long Island Railroad main line and the Long Island Expressway. The westerly site has 118 acres and the easterly site 215 acres. There is an office building on William Floyd Parkway and model homes which are temporarily occupying part of the land, along with an access road for a proposed industrial park on the 215 acre site. The interior of this parcel could accommodate a gas treatment plant on approximately 100 acres. Non-residential uses such as the Brookhaven Laboratory, a race track, and a proposed shopping center, are on the other side of the expressway. Vehicular access to this site is as good as any location on Long Island. In addition, a connection could be made to the gas pipeline system that could serve all parts of Long Island.

In order to connect a pipeline from this site to a site on the continental shelf, a direct line to the south would be necessary. This is possible if the median strip of county-owned William Floyd Parkway is used. The road extends past this site almost to the Atlantic Ocean (Figure 2.7-5). At the ocean is a parking area that is part of the Smith Point County Park and it would be possible to place a line underneath the parking lot. There are bridges over the Long Island Railroad main line, Sunrise Highway, and Narrow Bay (between the Park and Fire Island). In addition, there is a proposed additional railroad bridge over the Montauk branch. The pipeline could be carried on the bridges or tunneled underneath the roadways and railroad crossings.

The ocean bottom at this point slopes 30 feet in about 1000 yards, the beach itself is gently sloping and the dunes are minimal.

2.7.20 Offshore Sanctuary Zone for OCS Development

Studies have shown that the Nassau-Suffolk coastal zone, particularly the south shore, is susceptible to adverse impacts from oil spills occurring at certain times of the year, and in fairly well defined regions.

Stewart and Devanney utilized an MIT oil spill trajectory model to describe oil spill movement based in part on the probabilistic nature of changes in wind speed and direction. Surface circulation in the New York Bight was determined by Hardy et al. in an empirical fashion through the analysis of interface drift card release/return data. The interface drift cards were designed to simulate oil spill movement.

The results of these studies will be discussed under two headings-

- a) Spills occurring in the course of drilling and production operations at the offshore platforms, and
- b) Spills occurring in the course of tanker operations.

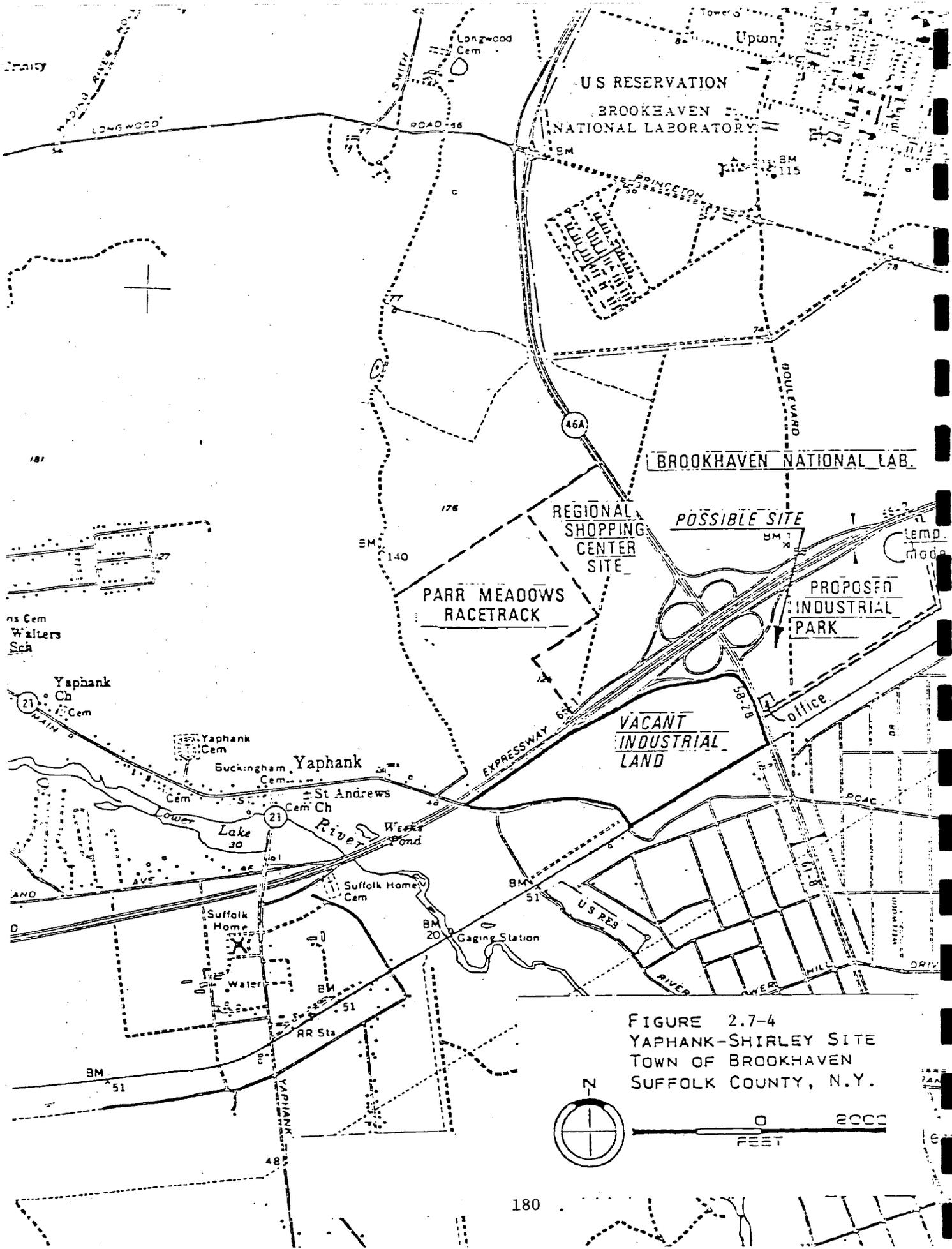
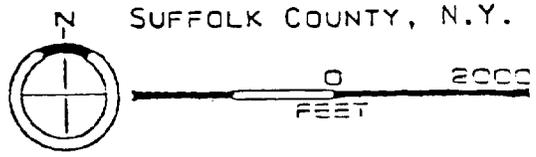


FIGURE 2.7-4
 YAPHANK-SHIRLEY SITE
 TOWN OF BROOKHAVEN
 SUFFOLK COUNTY, N.Y.



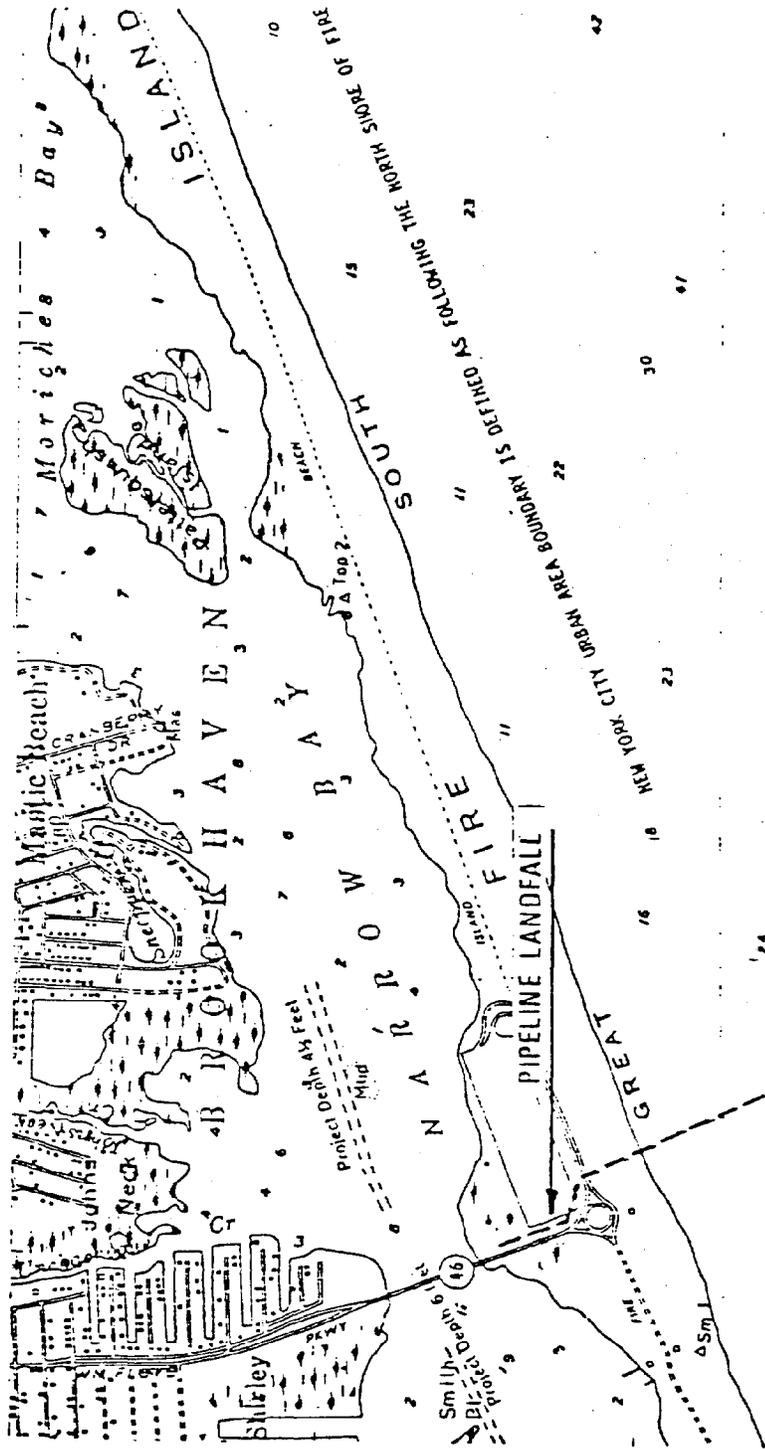


FIGURE 2.7-5
SHIRLEY SITE
TOWN OF BROOKHAVEN
SUFFOLK COUNTY, N.Y.



2.7.21 Platform Spills

Results of the study by Stewart and Devanney indicate that, during the winter, it is extremely unlikely (probability less than 1%) that spills originating at tracts in the Baltimore Canyon or Georges Bank Troughs will strand on Nassau-Suffolk beaches. In the summer the Baltimore Canyon tracts still pose little threat to Long Island. However, spills occurring at the westernmost tracts of Georges Bank in summer have a probability of about 5% of stranding on Long Island. Such spills could reach Long Island in a minimum time of 20 days, with an average of about 35 days. Thus, Georges Bank platform spills would be classified as "weathered", on arrival at south shore beaches.

Studies by Hardy et al. confirm that platform spills at either the Baltimore Canyon or Georges Bank Troughs would not pose a threat to Nassau-Suffolk beaches in the winter. Such spills would strand within 10 days of release, or not at all. The studies also confirm that Baltimore Canyon sites pose little threat in the summer. However, a platform spill at a Georges Bank tract west of Great South Channel would, in the summer, have a greater than 20% probability of stranding on Long Island within 60 days after release. Thus, both studies agree that the western tracts of the Georges Bank leasing area pose a threat to Long Island beaches in the summer, but that the transit lines would be long, and the stranded material would be weathered.

2.7.22 Tanker Spills

There are three pairs of official shipping lanes converging on the Port of New York. (In each pair of lanes, incoming traffic is confined to one lane and outgoing traffic to the other.) The Ambrose-Nantucket lanes run approximately east-west, and lie 15 to 30 miles south of Long Island. The Barnegat-Ambrose lanes run roughly north-south, and lie fairly close to the New Jersey shore. Between the Barnegat and Nantucket lanes lie the Hudson Canyon-Ambrose lanes.

Stewart and Devanney found that tanker spills occurring in the Nantucket lanes in the summer had a higher than 60% probability of stranding in the Nassau-Suffolk coastal zone. Such spills could hit Long Island beaches in less than 10 days. Hardy et al. found that the probability, was about the same, i.e., 40 to 80%. Some drift cards released within the Nantucket lanes took no more than two days to reach Long Island. This indicates that oil spilled by tankers could strand on south shore beaches in an unweathered, and therefore highly toxic state. It should be pointed out that the probability values mentioned above are based on seasonal averages that, in effect, mask worst-case results obtained during individual months in winter and summer. All of the figures indicate that Long Island is highly susceptible to oil spills occurring within the Ambrose-Nantucket shipping lanes. The LIRPB is now involved in developing a workable oil spill contingency plan for Fire Island Inlet in accord with State policy 8.5 found in Appendix B.

2.7.23 Sanctuary Zone

Based on the information discussed in the preceding sections, and

other material prepared as part of general studies on offshore oil development the LIRPB proposes a "Sanctuary Zone" in which no oil-associated activities should be permitted. This zone is displayed in Figure 2.7-6. Its boundary was drawn to identify an area beyond which an oil spill would have a less than 1% chance of reaching Long Island, and is based on the Stewart and Devanney work.

It is strongly recommended that any tract falling within the sanctuary zone be withdrawn from the leasing program. It is further strongly recommended that absolutely no tanker traffic be permitted within the zone. This would deny the use of the Ambrose-Nantucket lanes to tankers, and they would have to be routed south and west to the Hudson Canyon-Ambrose lanes.

The sanctuary zone displayed in Figure 2.7-6 has an area of approximately 24,000 square miles.

2.7.24 Conclusions

1. The apparent Nassau-Suffolk electrical generating capacity deficit will manifest itself in 1992; by the year 2000 the deficit will be approximately 1800 megawatts, about 1800 megawatts less than LILCO's projection.
2. Any new power plants constructed after the mid-1980's will probably be either nuclear or coal-fired and be located toward the east end of Long Island.
3. No changes are anticipated in the natural gas processing and distribution system.
4. The industrial area in the Village of Freeport in the Town of Hempstead, Nassau County, could provide a temporary base supporting exploratory drilling.
5. A site adjacent to the oil terminals in Oceanside in the Town of Hempstead, Nassau County, could accommodate a temporary base supporting exploratory drilling.

2.7.25 Recommendations

1. The entire oil unloading and storage systems in Nassau and Suffolk Counties should be revised. This includes the installation of two more offshore terminals on the north shore, one at Hempstead Harbor and one at Port Jefferson Harbor.
2. Petroleum terminals in Greenport Harbor and Sag Harbor should be phased out.
3. Storage facilities for future increased shipments to the Northville terminal should be constructed on properties of the Suffolk County Airport and connected by pipeline to the existing tank farm in Northville.
4. The Northville - Suffolk County Airport pipeline could also be connected to the existing pipeline and tank farm at Holtsville by

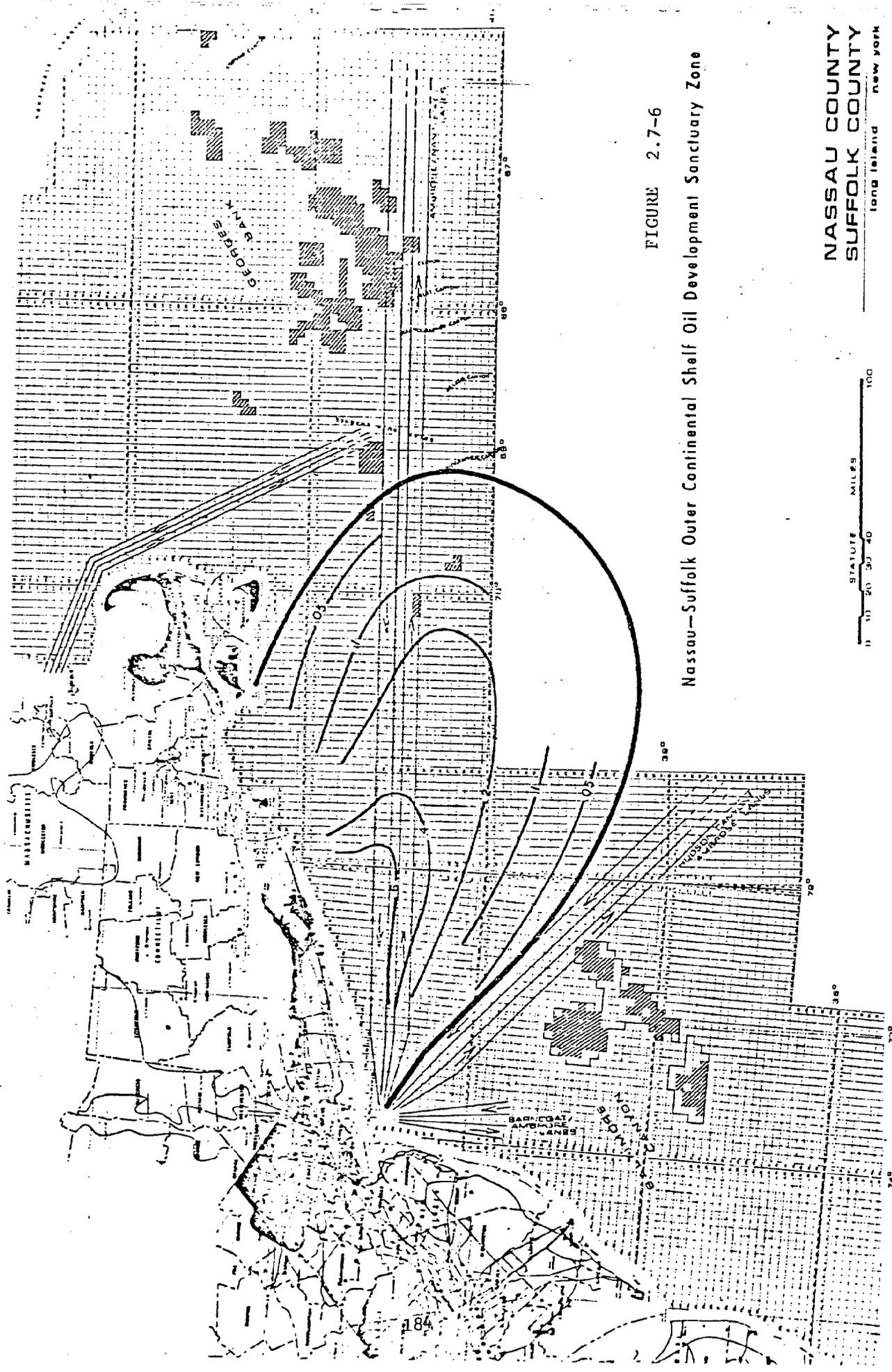


FIGURE 2.7-6

Nassau-Suffolk Outer Continental Shelf Oil Development Sanctuary Zone

NASSAU COUNTY
SUFFOLK COUNTY
Long Island new york

STATUTE MILES
0 10 20 30 40 100

a pipeline running along State Route 24 and the Long Island Expressway.

5. Two new bulk oil storage facilities are recommended in the Yaphank-Upton area and at Pilgrim State Hospital.
6. The Shoreham site should be used for all additional electrical generating capacity needed through the year 2000.
7. The LIRPB proposes a "Sanctuary Zone" in the Atlantic Ocean, southeast of Long Island, encompassing an area of approximately 24,000 square miles, in which any tract falling within the zone be withdrawn from the OCS leasing program. It is further strongly recommended that absolutely no tanker traffic be permitted within the zone.

3.0 Regional Element Summary Reports on Statewide Coastal Issues

3.1 Aesthetic Resources

Concern for the aesthetic resources of the Coastal Zone has focused on opportunities to increase awareness of and visual access to Long Island's lands and waters. It is hoped that identification of scenic resources will further both governmental and private efforts to protect and, where possible, to enhance them.

Building upon work undertaken for the Long Island Sound Study, Nassau-Suffolk completed an inventory of shoreline viewing points along major roads, (state, county and substantial town roads) and from public lands and points of potential access. Work sheets were prepared documenting scenic categories, (such as natural areas, farmland, man-made intensive, historic, rural, and special categories), topography, type of development; qualitative scenic descriptions, historic significance, local or regional importance, and alteration recommendations. On the basis of the extensive field work, scenic sites were identified according to a list of scenic values. Sites were listed if they possessed scenic values (above average visual design category characteristics) such as (1) interesting form (topographic complexities and pleasing arrangement of natural and man-made shapes), (2) contrast in texture and color, (3) harmony, (4) unity, (5) diversity, and (6) views (near, far or panoramic). The list appears in Section 2.3.8. The sites selected had a minimal number of eyesores and intrusions. These above characteristics are admittedly subjective as are all aesthetic inventories. A quantitative ranking system was not applied to the subjective categories.

The recommendations of the scenic study are incorporated in the Recreation Plan. These are recommendations to improve scenic views along roads by providing turnoffs. The other proposals include:

1. the improvement of existing views through the removal of certain uses, e.g. non-water dependent uses as recommended in the GAPCs;
2. controls over bluff development (see Erosion Subplan);
3. controls over beach development;
4. limiting development immediately adjacent to surface waters (Land Capability Unit 4 - Section 2.3); and,
5. providing recommendations for clustered housing, open space, preservation of coastal resources - - all of which maintain scenic qualities.

The selected sites were reflected in GAPC designations and in the land use plan.

The character and location of historic sites, structures, and districts were also documented and their presence is likewise reflected in the GAPC designations and in the land use plan. The list below indicates all National Register Historic sites and buildings that are in the primary and secondary coastal zone that were not included on the list of generic GAPCs of statewide importance.

HISTORIC SITES

Nassau County

Great Neck Plaza. Grace and Thomaston Buildings, 11 Middle Neck Rd. and 8 Bond St., (12-14-78).

Manhasset vicinity. Valley Road Historic District, S of Manhasset on Community Drive, (4-8-77).

North Hempstead. Saddle Rock Grist Mill, (Long Island Wind and Tide Mills Thematic Resource) at Grist Mill Lane and Little Neck Bay, (12-27-78).

Oyster Bay, Long Island. Sagamore Hill National Historic Site, End of Cove Neck Rd., (10-15-66) PH0203513 HABS.

Oyster Bay hamlet. Adam-Derby House, 5.4 acres off Lexington Ave., (5-17-79).

Glen Cove. Woolworth Estate, 18 acres north of Glen Cove CBD, (5-17-79).

Cove Neck. James Alfred Roosevelt Estate, 360 Cove Neck Road, (5-17-79).

Suffolk County

East Hampton. Gardiners Island Windmill, (Long Island Wind and Tide Mills Thematic Resources) on Gardiners Island, (12-27-78).

East Hampton. Hayground Windmill, (Long Island Wind and Tide Mills Thematic Resources) at Windmill Lane, (12-27-78).

East Hampton. Hook Windmill, (Long Island Wind and Tide Mills Thematic Resources), (12-27-78).

East Hampton. Wainscott Windmill, (Long Island Wind and Tide Mills Thematic Resources) on Georgica Association grounds, (12-27-78).

Huntington. Eaton's Neck Light, Eatons Neck Point at Huntington Bay and Long Island Sound off NY 25A, (4-3-73) PH0031828.

Huntington. Van Wyck-Leffert Tide Mill, (Long Island Wind and Tide Mills Thematic Resources) 2 mi. NE of Mill and Southdown Rds., (12-27-78).

- Mastic. Floyd, William, House, 20 Washington Ave., (4-21-71).
- Shelter Island. Shelter Island Windmill, (Long Island Wind and Tide Mills Thematic Resources) N of Manwaring Rd., (12-27-78).
- Smithtown. First Presbyterian Church, 175 E. Main St., (12-23-77).
- Southampton. Beebe Windmill, (Long Island Wind and Tide Mills Thematic Resources) SE corner of Ocean Rd. and Hildreth Ave., (12-27-78).
- Southampton. Windmill at Water Mill, (Long Island Wind and Tide Mills Thematic Resources) NY 27 and Halsey Lane, (12-27-78).
- Westhampton. Jagger House, Old Montauk Hwy., (12-12-78).

Prototype harbor design studies were undertaken to provide guidance for waterfront rehabilitation and enhancement efforts and to improve public access and tourism. The intent of the harbor design study was to encourage local development of smaller harbor areas in order to improve public access to the water, to provide a better more orderly use of the harbor for the private sector as well as for commercial fishermen, and to encourage more water dependent uses of water adjacent areas. With the development of boardwalks, outdoor sitting areas, new marinas, and sometimes restaurants, the harbors can become a focal point for residents and tourists. The implementation of harbor designs can be expected to enhance the economic and social benefits of an important resource. Site plans covering portions of the Nassau and Suffolk shoreline suggest various ways to increase public access and enjoyment through the revitalization of waterfront areas. Harbor designs were prepared for the following sites:

- 1) In the Town of Riverhead, Riverhead Central Business District, east of Peconic Avenue, north of Flanders Road, south of East Main Street, and bordering the Peconic River.
- 2) In the Village of Patchogue, the proposed Fire Island National Seashore Headquarters and Terminal located on the eastern side of the Patchogue River, west of West Avenue and south of Division Street.
- 3) In the Town of Oyster Bay, at the northern side of the mouth of Glen Cove Creek at Hempstead Harbor.
- 4) In the Town of Islip, at Bayshore-Orowoc Creek, south of Montauk Highway and centered off of the southern end of Long Wharf Road.
- 5) In the Village of Roslyn, Town of North Hempstead, north of Old Northern Boulevard (Main Street), south of the 25A viaduct and along the headwaters of Hempstead Harbor Creek.

6. In the Town of Southampton, adjacent and west of the Shinnecock Inlet on the barrier island as described in the Fisheries Subplan (Section 2.1).

7. In the Town of Smithtown, Kings Park, adjacent to the Nissequogue River and west of Old Dock Road.

8. In Bay Shore, Town of Islip, at Watchogue Creek.

9. In Port Jefferson, Town of Brookhaven, between Port Jefferson Harbor and East Broadway.

10. In the Town of Babylon in Amityville Village, surrounding Oakland Lake, north of Montauk Highway and west of Lake Drive.

11. In the Town of Southampton, the western and eastern sides of Shinnecock Canal, south of Montauk Highway.

The harbor plans will be published by the Long Island Regional Planning Board in the forthcoming Coastal Zone Plan. Xerox copies of the harbor plans are available at this time.

The removal of non-water related uses - - many of them eyesores - - and the opening up of shore areas for recreation and water-related commercial uses is a consistent theme throughout the studies. Waterfront development was proposed as part of the harbor designs, in the GAPCs and in the Coastal Zone Plan. The focus is on man's ability to enhance an area using man-made structures. Enhancing the area could take the form of introducing diversity of use, refurbishing existing structures, increasing the number of viewpoints or introducing a change in scale to a more pedestrian level. Some examples of this approach include the provision of the pedestrian walkways, shoreline restaurants, parks, boat slips, marinas, and dredging as in the case of Roslyn Harbor.

The general policies are almost identical with those documented by New York State; namely, to "Preserve and enhance aesthetic resources," and to "incorporate aesthetic considerations into the planning and development of the coastline as a whole."

It is expected that implementation, at least that portion dealing with increased citizen awareness of aesthetic resources, will be accomplished largely through a public education program. An effective education program, together with the provision of technical assistance, should stimulate local government and civic action to protect aesthetic resources threatened by incompatible development. The redevelopment of harbor areas along the lines proposed in the design studies will probably require the establishment of special study groups to develop plans, identify sources of funding, and suggest a package of incentives and regulations that will encourage private renewal efforts in accordance with an overall plan.

Section 3.2 Recreation Resources

Shoreline recreation has long been considered a "public good". In many countries public use of the shoreline is taken for granted, but in America private development and competing uses have significantly reduced the amount of available shoreline open to recreation.

The objectives of the recreation studies were to 1) determine Long Island's future recreational needs; 2) evaluate all existing publicly-owned recreation lands; 3) make site specific recommendations for new acquisitions, more efficient use of existing holdings, and improved shoreline access; and 4) make recommendations for the implementation of shoreline recreation proposals. The recommendations can be characterized as dealing primarily with locations of great natural value. Coastal recreation, by definition, is resource-based. Beach swimming requires a beach, fishing requires the presence of a potentially good catch, boating requires large water bodies. Camping is a fuller experience when there is the opportunity to swim. Picnicking becomes a part of all these other experiences. These activities are not recommended for environmentally sensitive sites where continued use would result in a significant environmental impact.

The determination of future needs of the region was based upon the following philosophy:

1) That the number of acres required for recreation lands in Nassau-Suffolk cannot be determined by national recreation standards for the following reasons:

a) Many of the recreation users are from out of the region. Tourism is a major input into the economy of Long Island. A variety of recreational lands, that are open to visitors from out of the region, provide various experiences for visitors as well as local users. The lands include beaches, forests, dunes, bluffs, wildlife habitats, nature preserves, marinas, and golf courses. These all promote tourism. Therefore, the number of non-local recreational users must be used to determine total acreage. Acres cannot be based only on the local residents.

b) Due to the great variety of sites within the open space system, from intensely developed active recreation facilities to wetlands and habitats for rare or endangered species, the recreation acres vary in the number of people they can support. A portion of the recreation lands in the bi-county areas is dedicated to preservation. One of the goals is to preserve those unique areas and areas of ecological importance for the future. Some acres dedicated for preservation or conservation are buffer zones and are not in themselves ecologically significant except they are necessary to protect more sensitive areas.

c) The location of the recreational space plays an important role in determining whether more recreation space is needed. In densely built-up areas there are not enough recreational acres avail-

able for the local residents in Nassau and Suffolk. The shortage is expected to increase with the projected population totals.

2) These standards, however, can be used as a general guideline to determine minimum future needs. Based upon the 20-year population projections prepared by the Long Island Regional Planning Board for the 208 Areawide Waste Water Management Plan, 93.1% of the region's population growth will be in Suffolk County. One half million persons are anticipated in the next 20 years. Brookhaven and Islip are expected to experience the largest growth, while little change is expected in Nassau County.

3) Suffolk County, while meeting an arbitrary population acreage ratio, requires more land because of items a through c above. Nassau County at this time, and in the future, will not be able to meet the number of acres required by local residents, according to the standards. Nassau's future recreation expansion will be primarily in the area of active facility development and dual uses of public holdings, although some land is available for acquisition.

Recreation holdings, within the coastal zone, were identified for the region, and were analyzed relative to the expected growth patterns. Nassau County has 117 federally-owned acres, while Suffolk County shows 3,391 federally-owned acres. Although Federal lands have been omitted from consideration under the Coastal Zone Management Act regulations, and are excluded in the discussion of needed management, it is impossible to explore the recreation lands question without including these parks in a discussion of inventory. Nassau has a total of 3,786 state-owned acres; while Suffolk has 16,408 acres within the Coastal Zone.

The Land Capability Classification System was the primary tool used in the identification of sites suitable for acquisition and the determination of the types of activities that would be appropriate at each of the sites. This System categorizes areas on the basis of physical and locational characteristics and reflects the ability of the resource to support various uses. In general, undeveloped areas immediately adjacent to the surface waters, and sensitive ecological areas were placed in the preservation category, Land Capability Unit IV (L.C.U. IV). L.C.U. IV allows 1% disturbance of the land area for development. Areas such as prime watershed areas and prime wildlife areas were placed in the conservation category; L.C.U. III allows for only 20% development of the land area. Disturbed, partially developed areas were placed in Land Capability Unit II or I, unless they were recommended for reclamation; therefore they were placed in L.C.U. III or IV. Performance Standards are recommended for each unit to minimize environmental impact and to recommend how development, however, minimal, should occur. (See also Section 5.0 - Permissible Uses.) These units were mapped and used for each park recommendation.

The marine fisheries investigations were concerned with those living marine resources that support Long Island's commercial and recreation fishery activities. Recreational fishing activity on Long Island includes fishing from piers, bulkheads, floats and jetties; bank fishing; and boat

fishing. The recommendations pertaining to fishing piers, boat launching facilities, shoreline access sites, artificial reefs and expansion of charter, party and livery boat facilities are described in Section 2.1.2.6.

Recreational channels requiring periodic maintenance dredging by local governments were identified to assure the continued existence of high quality recreational boating opportunities. (See Figure 6 in A Comprehensive Dredging Subplan for Nassau and Suffolk Counties, 31 March 1978.) A limited number of new or modified channels have been recommended in such areas as northwest Nassau County. Dredging requirements can be minimized by concentrating deep-draft channels that must be maintained for industrial/commercial purposes. Such minimization of dredging requirements will help conserve marine resources and reduce spoil disposal needs. The use of dredge spoil to construct wetlands, bird nesting islands, and other wildlife habitats will improve passive recreational and educational opportunities.

The general policies embodied in the recreation recommendations, although more detailed, are entirely consistent with New York State's policy to improve the quantity and quality of recreation opportunities to the extent that it can be accomplished without damage to the resource base. Sites recommended for acquisition by various governments are listed in the chart below. Other recommendations are in the Recreation Subplan, Section 2.6.

SITES PROPOSED FOR ACQUISITION

<u>Nassau County</u>	<u>Proposed Ownership</u>
Freeport	State
Glen Cove Creek	County
Inwood Country Club	County
Lattington Shore	County
Lido Beach	Town or County
Manhasset Bay	Town or County
Middle Bay Country Club	County
North Shore Country Club	County
Sheets Creek	Town or County
Valley Stream	State
Whitney-Payson	County
<u>Suffolk County</u>	<u>Proposed Ownership</u>
Baiting Hollow/Roanoke Point	State or Federal
Carlls River	County
Carmans River-Southaven-Fireplace Neck	County or State
Cedar Point-Northwest Creek-Grace Estate- Barcelona Neck	State for Additions
Cow Neck	County
East Marion-Dam Pond	Town

SITES PROPOSED FOR ACQUISITION
(continued)

<u>Suffolk County</u>	<u>Proposed Ownership</u>
Gardiners Island	County and State or Federal
Long Pond	Town or County
Maple Swamp-Birch Creek	County or State
Mattituck	Town or County
New Suffolk	County
Nissequogue River Complex, additional lands	State and County
Northville	County
Orient Beach - additional land	County
Peconic Bluffs	State
Peconic River Complex	County and Federal
Port Jefferson	Village or Town
Shoreham	Town
South Jamesport Boat Landing	Town
West Meadow Beach	Town

Six existing facilities are discussed as underutilized and two existing facilities as inefficiently utilized. There are 11 undeveloped parks encompassing 6,028 acres that could sustain active rather than passive uses on a large portion of the acreage (see Section 2.6).

It is recommended that the Long Island State Park Commission, after review of the proposals for new or expanded regional facilities, indicate which of the suggested acquisitions is or can be included in the State program. The counties, utilizing such state and federal funds as are available, should move to acquire the remaining regional sites. The counties should continue to acquire land for the somewhat smaller or sub-regional facilities through the expenditure of county funds. Where extremely high acquisition costs or the specialized nature of the facility make outside funding necessary, appropriate federal, state or other assistance should be sought.

The counties should investigate and pursue all reasonable measures to assure the continued recreational use of Long Island's private golf courses and beach clubs. At such time as the private owners decide to sell a golf course or beach club, the right of first refusal can be secured by the counties. They should explore this method which has not been used on Long Island. Where such an arrangement is not feasible, immediate purchase and lease-back for a term of years may provide a way to preserve an existing facility and to guarantee ultimate public access at moderate cost.

Nassau and Suffolk should encourage donations of land, or of development rights, whenever governmental acceptance of the fee simple or a lesser interest will further the provision of recreation opportunities or the conservation of significant environmental resources.

Section 3.3 Public Access

There are essentially two types of access to the shoreline: physical access for either active or passive recreation; and visual access, which may be of a transitory nature, i.e., a view glimpsed from a passing car. The provision of physical access for active recreation presents the greatest problem since it usually requires the acquisition of large areas. Access for passive uses may be accomplished in other ways: redevelopment of harbor areas, access to private or quasi-private preserves, pedestrian access in new developments, and easements for trails and bikeways.

At the present time there is insufficient access on a regional level based upon existing roads, road patterns, parking areas, availability of parking areas to out-of-town visitors. There is a need for additional acquisitions as well as improved access to existing facilities. Sites recommended for improved access are described in GAPCs (Section 6.0), harbor design sites listed under Aesthetic Resources (Section 3.1), and in the Recreation Subplan where improved access and increased uses are recommended for various parks (Section 2.6). Some parks have inadequate approach roads or insufficient parking. In certain cases there are residence restrictions or high entry or activity fees. Most town beaches are open to non-residents, but the size of the beach and the availability of parking space act as limitations to use.

The following recommendations are consistent with the general policies of the State of New York, which call for the protection and enhancement of existing access opportunities through recreational resources and the improvement of the quantity and quality of public access opportunities to the coastline at large.

Increased opportunities for public access require the improvement of access through acquisition, more efficient utilization, and changes in modes of transportation; and the improvement of visual access through the provision of highway turnout or viewpoints and the protection of viewsheds.

Acquisition proposals have been described in the Recreation Resources section. Implementation of the proposed acquisition of recreation sites in Nassau and in Suffolk should help to meet public access needs. Harbor redevelopment plans when implemented will also help to meet access needs by providing new or increased pedestrian and visual contact with the shoreline as part of commercial development for marinas and restaurants. The creation of opportunities for access via boat launching ramp sites and fishing piers at numerous new locations and the provision of increased shoreline access for anglers at various locations are recommended in the Marine Fisheries Subplan. A primary means for implementing the acquisition and facility recommendations is the incorporation of these proposals into state, county and local park and land use plans. Funding is required at various levels of government so that plans can be implemented. Private development in harmony with the above plans that allows water access should be encouraged at the town level. Part of the developing properties could be dedicated as small pocket parks with limited parking in return for reduced taxes or increased yield for the rest of the property. Additional opportunities may be obtained through local subdivision control, clustering, and other devices. Contingency plans should be made for the acquisition of sites that may become available as a result of hurricanes or severe storms.

Changes in current modes of transportation are also recommended as a means of increasing public access. There is a growing realization that regional residents without private transportation are virtually denied access to public recreation facilities. Further limitations occur because the state-owned beach capacity is determined by parking lot capability. The provision of satellite parking areas in underutilized locations with bus service from the parking areas to the parks can increase park and especially beach capacity. Recreational ferry service, as suggested in the Long Island Sound Study, is recommended for improving access to Caumsett State Park. The establishment of a rail station at Hither Hills/Napeague is recommended for improving access. Other mass transit improvements that should be considered are structural improvements on state parkways to allow limited bus service, additional rail and bus service, modification of charter bus quotas, co-ordination of rail/bus schedules, and new fare structures to benefit weekend recreation bound ridership.

The State of New York and Nassau and Suffolk Counties and Towns should develop and implement capital programs for the further improvement of existing facilities in order to expand recreation opportunities and increase access to the extent compatible with the natural resource base. Development programs and transportation improvements should focus on increasing access to four popular types of recreation activity: swimming, camping, boating (through provision of launching ramps), and fishing.

In addition to direct access for swimming, fishing and boating, there are opportunities for indirect access. Many scenic vistas, roads and individual views could be improved by the provisions of small turnoffs accommodating three or four cars at a time. Although highway turnoffs are hardly of regional scale, a series of them would provide an appreciable increase in viewing opportunities. Most of the 51 recommended points would utilize road rights-of-way and would provide a location from which to observe early settlement patterns, historic buildings, farms, and glimpses of the shoreline and the water beyond. Improvements would include the design and construction of turn-offs, the delineation of viewsheds where scenic easements should be sought, and the establishment of design controls for scenic areas.

See Section 2.6.8 for site specific recommendations.

Section 3.4 Economic Development

Activities that are of major economic importance to Long Island's coastal area and/or require waterfront locations are: commercial shell and finfishing, recreation and tourism, waterborne commerce and generation of electricity. Shore based OCS facilities and operations could have a significant impact on the Long Island economy if commercial quantities of fossil fuels are found offshore. Channels of sufficient depth leading to L.I. ports and docking facilities play an essential role in the importation of sand and gravel and petroleum products, the landing of fish, and the movement of recreational boats.

The locations of existing oil terminals create a number of serious environmental, economic and land and water use problems. The multiplicity of facilities exposes almost all of Long Island's major embayments, and the shellfish, finfish, and wetland resources they contain, to the threat of damage from oil spills. Shallow bay and channel depths necessitate the use of small and partially loaded barges, which in turn often necessitates lightering operations and an increased number of barge trips. Even small barges often have to wait for high tide before they can navigate the shallow channels, and they are often left high and dry at the dock, unable to offload, when the tide retreats. These factors increase the likelihood of accidents and spills, and the potential for damage to sensitive and valuable embayment ecosystems.

The oil importation and distribution system used on L.I. is economically inefficient due to both the location and small size of the existing oil storage terminals. Only two of the nearly two dozen shorefront oil terminals on L.I. are connected to an oil pipeline distribution network. Lack of a coordinated oil pipeline distribution network causes both increased oil truck traffic and increased distances trucks must travel to make deliveries.

The location of oil terminals, which are generally in downtown waterfront areas, has caused a number of land use problems. Oil storage facilities occupy valuable waterfront locations that, in many cases, could be better used for water dependent and water enhanced uses that would revitalize deteriorating, downtown waterfront areas. The oil truck traffic generated by oil terminal operations contributes significantly to the traffic congestion within downtown areas adjacent to oil terminals.

There are presently six locations for the transshipment of aggregates (sand, gravel, and crushed rock) within the Nassau-Suffolk region. Crushed rock (trap rock), from eastern Connecticut and the lower Hudson River Valley is received primarily at north shore terminals on Long Island, and sand is shipped from north shore terminals on L.I. to ports in western Connecticut and the Port of New York.

The potential for increased catches of fish among domestic fishermen as a result of extended U.S. fisheries jurisdiction has stimulated local investment in the building of new, larger, more efficient fishing vessels. If adequate channel access and pier/docking facilities are not made available to commercial fishermen, growth in this segment of the regional economy will be stymied. Land based processing facilities may also be required for some species.

The culture of oysters on L.I. bay bottoms controlled by private interests has been very successful, and this activity supports an important local industry. The artificial or controlled propagation of other marine species in L.I. marine, fresh and brackish waters may offer a potential for expanding the regional marine based economy in the future.

Marine surface waters, including bays and estuaries, are used for both commercial and recreational purposes. Shellfishing and finfishing are major commercial enterprises in bays and estuaries. Recreational use includes shellfishing, sportfishing, swimming and boating.

The continued deterioration of marine surface water quality is of great concern to the commercial fishing industry, in particular the shellfish industry. The tourism and recreation industry of eastern L.I. thrives not only on overall environmental integrity, but also on the rural setting of the East End. The maintenance of both the environmental quality and rural character of L.I. is crucial for the continued viability of these two major industries.

The location of power plants and shore based OCS support activities can have a significant impact on L.I. coastal waters and coastal area land use patterns. Based on land use requirements, the need for waterfront locations and associated environmental impacts, six Nassau-Suffolk locations were found able to accommodate some type of onshore facility associated with OCS gas and oil production.

Recommendations that address the economic development problems discussed above have been developed by the Board in the CZM program. The recommendations set forth constitute a balanced approach to both the economic development needs and the environmental considerations of L.I.'s coastal area.

The Board has identified those channels that serve existing or proposed petroleum, sand and gravel, marine fisheries, or major recreational boating facilities and has recommended continued federal maintenance of, or new Congressional authorization for, channels in harbors for which industrial or fisheries facilities are recommended by the CZM program (see Table 1 and Figure 6 of A Comprehensive Dredging Subplan for Nassau and Suffolk Counties dated 31 March 1978). In addition, continued maintenance of the federal channel system within the south shore bays, including the L.I. Intracoastal Waterway and all major ocean inlets, is recommended. Federal, State and county channel dredging program consistency with the channel recommendations, and the application of the Navigation Channel and Spoil Disposal Guidelines developed by The Regional Marine Resources Council under the Coastal Management Program should help preserve the economic viability of Long Island's marine based industries (see Appendix A of A Comprehensive Dredging Subplan for Nassau and Suffolk Counties dated 31 March 1978).

The elimination of all petroleum terminals from within Nassau-Suffolk embayments; the construction of offshore terminals in deep, well flushed waters; and the relocation of petroleum storage facilities from shoreline to inland areas would substantially reduce the risk of oil spills in fragile shallow water ecosystems used extensively by baymen and recre-

ational users; provide more economical product delivery; reduce the truck transportation of petroleum through densely populated port communities on local residential streets; and permit redevelopment of those obsolete, waterfront oil terminal areas for water dependent and water enhanced uses. The construction of offshore petroleum unloading facilities would allow the use of larger, more economical tankers, and would eliminate the need for dangerous lightering transfers. Although funding schemes for construction were not developed under the CZM program, the cost of construction would have to be weighed against the existing and potential monetary and environmental costs of dredging, spoil disposal, lightering, delays due to icing of embayments, shoreline damage due to explosions, etc. The consolidation of existing storage facilities into larger centralized facilities, and the expansion of the inland petroleum transportation system will allow for waterfront redevelopment opportunities in designated GAPC areas.

Total receipts and shipments of sand, gravel and crushed rock at L.I. terminals decreased during the last decade reflecting a slowdown in construction, especially in Suffolk County. The Board recommends that the consolidation of aggregate operations on L.I.'s north shore should be considered in the future.

Shoreline sites are required for the support of the deep water segment of the L.I. commercial fishing industry. The highest priority need of the deepwater segment of the fishing industry is the provision of additional dock and pier facilities for commercial fishing vessels in the Shinnecock Inlet/Bay region. These facilities are needed to meet present demands. However, additional facilities capable of servicing vessels larger (length, beam, draft) than those characteristic of the Nassau-Suffolk fleet may be necessary at Shinnecock Inlet/Bay in order for Long Island to take advantage of opportunities arising from extended U.S. fisheries jurisdiction. This recommendation is consistent with New York State Coastal Management Program policy (No. 6.4) pertaining to the upgrading of commercial fishing support facilities.

Recommendations have been made for the reservation of selected parcels of land in Nassau and Suffolk Counties for accommodating growth in the commercial fishing industry. Sites have been identified in the Town of East Hampton at Fort Pond Bay, in the Town of Hempstead for the Freeport/Jones Inlet fleet and in the Villages of Greenport and Port Jefferson. Details on the sites and the means available for reserving them for marine commercial use are found in Section 2.1.1.6.2. All of the parcels are located on the waterfront and therefore are ideally suited for docking and product transfer activities. Sites were selected on the basis of available land, access to deep water and existing use.

The most pressing problems faced by the shallow water segment of the fishing industry are those related to the management of shellfish resources, and the availability of these resources in light of pollution and public health considerations. The policies adopted by the Board in the Long Island Comprehensive Waste Treatment Management Plan regarding pollution abatement of marine surface waters are discussed in the Water Quality Subplan.

Development of the potential of mariculture as a marine based industry on Long Island will probably proceed at a slow pace in the near future given the absence of a change in the attitudes on the part of the State of New York, the County of Suffolk and the towns on the relative priority of mariculture as a competing use in the coastal zone. The long-term outlook for the success of mariculture ventures on Long Island, however, is favorable because of the increasing costs of finfish and shellfish used for food, rising demand, and limited supplies from traditional sources. The marine environment of Long Island is highly suitable for the controlled culture of several marine species. This, coupled with existing markets, local research capability, the "hands-on" experience on the part of the 14 firms and their employees now involved with mariculture activities, and town fishing management programs initiatives are the advantages which are the seeds for broader mariculture development in the future. Not only can mariculture add to the commercial production of fishery production in the future but it can also result in benefits to public ground commercial fishermen and the angler as well through publicly sponsored stocking programs. The specific actions and policies that should be pursued to initiate growth in mariculture are detailed in Section 2.1.3.9. They pertain in general to the New York State Coastal Management Program policy (No. 6.3) on expansion of mariculture activities.

Section 3.5 Impacts of Outer Continental Shelf Activities

The Nassau-Suffolk Regional Planning Board's efforts pertaining to the impacts of oil and gas development in both the North and Mid-Atlantic Outer Continental Shelf (OCS) on the region were focused on three areas of concern: the feasibility of locating Atlantic OCS related support facilities within the Nassau-Suffolk coastal zone; the potential threat to the Nassau-Suffolk coastal zone posed by oil spills originating at Atlantic OCS production sites and from tankers travelling the shipping lanes south of Long Island; and estimates of the probable physical, chemical and biological impacts of oil spills on Nassau-Suffolk coastal zone habitats.

The results of the analyses indicated that several Nassau-Suffolk sites can accommodate selected OCS support facilities (see Section 2.7.19). The onshore facilities associated with OCS exploration, development and production were reviewed as to land use requirements, the need for waterfront locations and associated environmental impacts. An inventory of feasible Nassau-Suffolk locations was established and matched to the various facility types. Six Nassau-Suffolk areas - Fort Pond Bay, Village of Greenport, Village of Port Jefferson, Village of Freeport, Oceanside, Yaphank, Shirley - were found able to accommodate some type of on-shore facility associated with OCS gas and oil production. Whether or not these sites are eventually used for the facilities depends upon oil company plans and other private sector interests as well as upon local government decisions. At present, the oil industry has chosen Atlantic City, N. J. and Davisville, R. I. as the onshore sites supporting exploration activities involving tracts in the Baltimore Canyon region in OCS Lease Sale #40. The bi-county region has not, like New York City, undertaken a unified public relations effort to promote the location of OCS oil related development in Nassau and Suffolk Counties. With the exception of land based facilities of minor significance that may be located on Long Island (excluding a possible gas pipeline and treatment facility), the major impacts of Atlantic OCS development on the Nassau-Suffolk coastal zone are associated with oil spills.

Oil spill trajectory studies conducted for the Board indicated that the Nassau-Suffolk south shore is susceptible to tanker related oil discharges that could occur in the established navigation lanes servicing the Port of New York/New Jersey. For tanker related discharges occurring in the Ambrose/Nantucket lanes south of western Suffolk County and Nassau County during summer, the percent probability of oil spill stranding on Long Island varies between 40 and 80%. However, to avoid increased exposure of Long Island's coastline and productive shellfish habitats to oil spills likely to result from Atlantic OCS oil and gas operations, action must be taken by the Federal Government to insure the safe and efficient movement of tanker traffic in the New York Bight, and to prohibit drilling activity and the tanker shipment of oil in those marine areas where, if a spill should occur, there is a probability that oil would foul Long Island's beaches and bays.

Review of the distribution and the physical/biological characteristics of the habitats along the south shore has indicated that the extremely productive protected bay habitats have longer oil residence and recovery

times than the habitats associated with the open coast. Given the event of a worst case oil spill, complete recovery of bay habitats could take a decade. Spilled oil entering Fire Island Inlet, therefore could have a devastating effect on the world's most productive hard clam (Mercenaria mercenaria) "factory" - the Great South Bay, and could also cause a severe dislocation of the south shore's marine industry economy based on tourism, recreation, boating and recreation fishing.

To protect the region from OCS related oil spills, the Board has proposed the creation of a Nassau-Suffolk OCS Oil Development Sanctuary Zone, within which no OCS oil related activities, including both production and tanker transport would be permitted. Oil spilled outside of the Zone would have a less than five percent chance of stranding on Long Island's south shore. To implement this concept, the U.S. Dept. of Interior, Bureau of Land Management would have to eliminate the lease of OCS tracts within the Zone, and in concert with other agencies, require tankers transporting OCS oil to refineries in the Port of New York/New Jersey to use the Hudson Canyon/Ambrose shipping lanes. To date, the Bureau of Land Management has not leased any tracts within the proposed Sanctuary Zone as a result of OCS Sale #40, and has also deleted tracts occurring within the Zone prior to the scheduled opening of bids for OCS Sale #42, which has been delayed pending court action. (The tracts deleted from OCS Sale #42 were those located to the south and east of Nantucket.) However, preliminary planning for the Mid-Atlantic OCS Sale #49 has identified tracts that may be leased within the area of the proposed Sanctuary Zone at a future date. It also appears that the Federal Government will not implement re-routing of tanker traffic from the Ambrose/Nantucket lanes to the Hudson Canyon/Ambrose lanes.

Experience has shown that should a major oil spill occur off the south coast of Long Island tomorrow, it would be impossible to clean up the largest portion of the spill. This oil would threaten the south shore beaches and bays. While little could be done to prevent the fouling of the beaches, it might be feasible to contain/collect oil in the shallow tidal inlets before it fouls the productive bay habitats. To accomplish this requires detailed, site specific, engineering feasibility studies of oil spill control within the inlet areas to determine how and where oil spill containment/cleanup equipment can be most effectively deployed. Equipment deficiencies must also be identified. These studies must be completed before spills occur in order to improve oil spill contingency plans and response effectiveness. The Board will be conducting such a study for the Fire Island Inlet area with funding from the Coastal Energy Impact Program in 1978-1979.

Generally, State and Regional policies on OCS development are in agreement. The main difference appears to be that State policies encourage OCS related development, whereas the Regional policies do not solicit or otherwise encourage OCS related development. Regional policies were formulated to accommodate OCS related development.

3.6 Energy Facilities and Resources

Planning for the accommodation of energy facilities and resources is an essential, if controversial component of coastal management planning. The Long Island Regional Planning Board has completed a planning process for energy facilities likely to be located in or which may significantly affect the coastal zone by undertaking an investigation of present and future energy needs, of existing and programmed power generation facilities, of petroleum products receiving and distribution facilities, and of suitable sites for new power plants and for onshore support facilities for outer continental shelf exploration and development. On the bases of its findings, the Board has made recommendations, which, if implemented, will permit Long Island to meet present and forecast energy needs in an environmentally acceptable manner.

The population projections developed for the Long Island Comprehensive Waste Treatment Management Plan, together with projections of household and industrial energy usage were utilized to forecast energy demand for the years 1985 and 2000. The demand forecasts covered electric power, all types of liquid and gaseous fuels, and coal. Estimates of required capacity, by type of fuel, were compared with present installed capacity adjusted to reflect current plans for facility expansion, retirement, and replacement. Shortfalls were identified, and a list of necessary additional facilities was prepared. Land use and locational requirements of the additional facilities as well as potential environmental impacts were examined in order to match site requirements and available land wherever possible. Suitable sites were either included within a designated GAPC, as in the case of Hempstead Harbor, or were separately identified as a GAPC, as in the case of Fort Pond Bay.

The general policies embodied in the Nassau-Suffolk recommendations differ from but are not incompatible with those of the State. The policies differ only in that some State policies deal with issues which can only be addressed by State law. Statewide concerns, particularly with regard to petroleum-based industry, LNG and the Great Lakes are not particularly relevant to coastal zone planning on Long Island, where the major energy issues are the maintenance of self sufficiency in power generation, the achievement of economic efficiency and environmental effects of outer continental shelf activities.

The bi-county region will require approximately 1800 MW of additional generating capacity by the year 2000. It is expected that even with conservation effort and increased reliance on alternative energy sources, a capacity deficit will be realized by about the year 1992. It appears that existing sites can provide the required space for the new generating capacity regardless of the type of plant (coal or nuclear) constructed. The LIRPB in its Coastal Energy Facilities Subplan summary in Section 2.7 recommends the use of the Shoreham site for all new capacity needed through the year 2000 and the reservation of one or more other sites for any additional capacity that may be required subsequent to that date.

Long Island is dependent on waterborne deliveries of petroleum products. At present, numerous small petroleum terminals are scattered through-

out the region, an arrangement that leads to the inefficiencies and exposes many fragile embayments to the threat of oil spills. The construction of offshore terminals is recommended for the north shore (see Section 2.7.15 and 2.5) (with a network of interconnecting pipelines and storage facilities); southern Nassau County should be served by an extension of the Buckeye Pipeline. Those channels requiring continued maintenance in order to serve existing petroleum terminals and powerplants pending completion of the proposed system are identified; continued federal maintenance of, or Congressional authorization for new channels is recommended. Deauthorization or modification of federal channels is recommended for channels that serve harbors where petroleum facilities have already been phased out or can be phased out without seriously affecting the region's petroleum deliveries (see Table 2.5-1). Federal consistency with the energy and dredging recommendations which are in agreement with the State Coastal Management Plan policies, should assure that an efficient and environmentally sound petroleum delivery system will gradually free Long Island harbors of unnecessary tanker and barge traffic, reduce the risk of oil spills, open up waterfront areas for water-dependent uses, and reduce truck traffic in the coastal zone.

The availability of natural gas in the bi-county region is not expected to change radically unless a significant quantity of gas is found offshore. In the event that a sufficient quantity of gas is found offshore it may be feasible to locate a gas treatment plant in the region. A gas pipeline landfall might be accommodated at Shirley, on the south shore. The pipeline could be linked to a treatment plant, located in the Yaphank-Shirley area in the Town of Brookhaven. A connection could be made from the treatment plant to the gas pipeline system that could serve all parts of Long Island.

If an additional source of gas did become available, provision would have to be made to extend gas service into areas not presently supplied. This would entail extending supply mains along the entire north shore of Suffolk County, and further into Southampton and East Hampton.

Section 3.7 Agricultural Resources

Farming has been an important part of the Long Island economy for more than 300 years. Until the late 19th century, agriculture was the chief way that a majority of Long Islanders in Nassau and Suffolk Counties earned a living. Agriculture is still a major industry on Long Island even though most of the farmland in Nassau and western Suffolk has been converted to housing and other related facilities. The 1974 census of agriculture indicated that Suffolk County was the number one county in New York State in terms of the value of agricultural products sold per acre. Suffolk products were valued at \$1,231 per acre, a 33% increase over the value indicated in the 1969 census of agriculture. On a per acre basis, Suffolk County's product value is 15 times greater than the national value. In New York State, the county with the next highest county product value per acre was Sullivan County with \$502 per acre.

The 1974 agriculture census listed 737 Suffolk farms, occupying a total of 55,397 acres; and 104 Nassau County farms occupying 1,112 acres. The farm acreage in this region amounts to only 0.5% of all such acreage in the State of New York and the number of farms account for just under 2% of the 43,000 farms that exist in the entire state. The high product value increases the importance of this land in relationship to the entire state. In 1974 9.3% of Suffolk County's land was still used for farming. The statewide figure is 30%.

The general policy is to preserve, insofar as possible, the prime agricultural soils that exist on eastern Long Island. The coastal zone boundary encompasses a large part of the existing farmland. All of the farmland within Southold Town and East Hampton Town are within the boundary and that portion of Southampton Town that has prime agricultural soils is included in its entirety. Part of the Town of Riverhead where there is a large concentration of prime soils is also within the coastal boundary.

There are many environmental and economic reasons for preserving farmland and making it an important part of the Coastal Management Program. The maintenance of low intensity uses in an area that has poor transportation access and a limited underground water supply are important. However, one of the most significant elements of the Coastal Management program is the maintenance of tourism on eastern Long Island. It is here that there is a direct relationship between the location of second homes and the nearby farmland. The presence of the farmland contributes to the maintenance of a rural atmosphere where seasonal or second homes look out over vast expanses of open space, rather than typical suburban development.

The land use element of the Coastal Management Program calls for a continuous agricultural belt extending from Wading River to just west of the Mattituck Creek area and another large belt of farmland on the North Fork extending from east of Mattituck Creek to the Hashamomuck Pond area. In addition, the retention of a cluster of farms near Orient Point is proposed. Recommendations for the South Fork include all land

north of the shorefront wetlands and south of the wooded belt that extends laterly adjacent to Peconic Bay. The overall land use pattern, therefore, would consist of large blocks of interior farmland with residential and tourism oriented commercial uses on Long Island Sound, the Peconic Bay and the Atlantic Ocean.

The implementation of farmland preservation efforts involves State, County and local government participation. Suffolk County government has made a commitment to the future of agriculture with its Farmland Preservation Program. The purchase of development rights from owners of prime agricultural land under this program has already resulted in the setting aside of more than 3,000 acres of farmland. More than half of the properties are in the secondary coastal area. Further efforts are to be made in this direction in later phases of the program.

The State policies for the preservation of agriculture recommend low density zoning in prime agricultural areas and the use of clustering or the transfer of development rights to preserve valuable farmland. The formation of State agricultural districts is also recommended as a means of preserving the land. The Regional Planning Board recommendations are not in conflict with the Statewide policies and also recommend the additional acquisition of development rights to supplement the formation of State agricultural districts. The Suffolk County program of acquiring development rights is viewed as one way to implement the agricultural preservation recommendations in the plan where owners are unwilling to enter into a State agricultural district but are totally surrounded by lands that are being used for agricultural purposes. In this type of situation, the acquisition of development rights can avoid having incompatible development occur in the midst of a large agricultural district.

The Town of Southampton recently is holding hearings on a local law designed to preserve some of the prime farmland in that town. A reduction in density and a mandatory limited clustering arrangement are the major elements of the law. The successful application of this law would probably lead to its use by other municipalities that have significant amounts of farmland within their borders. The use of clustering and the possible transfer of development rights are other proposed ways in which to preserve prime farmland and thus implement the recommendations of the Coastal Management Program.

Section 3.8 Coastal Flooding and Erosion

The LIRPB recommendations pertaining to coastal erosion control that are described in Section 2.2 are based on strategies which emphasize both non-structural and structural solutions depending upon the nature of the erosion processes occurring along a given shoreline segment, the extent and type of development, and the practicality and effectiveness of available techniques for maintaining the shoreline and preventing structural damage. The strategies listed below are in accord with the New York State Coastal Management Program policies (Nos. 7.1, 7.2 and 7.3) that pertain to the minimization of damage to property and coastal resources through application of land use and performance standards, and the implementation of dredging and structural control projects in an environmentally and economically acceptable manner.

1. Accept the natural long-term shoreline regression that is occurring along the north shore, Peconics shore and the headlands section of the south shore as a phenomenon that is beyond present capability for practical, effective control. Emphasize non-structural solutions to coastal erosion problems along these shoreline areas.
2. Stabilize the south shore inlets (Shinnecock, Moriches, Fire Island, Jones, East Rockaway) at approximately their present locations and implement sand by-passing programs. New, natural inlets that breach the Long Beach, Jones Beach, Fire Island and Westhampton Beach barrier islands and the Southampton barrier beach as a result of severe storms and/or shoreline regression should not be maintained. If longshore transport does not repair a natural breach, steps should be taken to close it artificially.
3. Maintain the general position and configuration of the Atlantic Ocean shoreline along the entire south shore of Nassau County, and along that portion of the Jones Beach barrier island located within Suffolk County. The Atlantic Ocean shoreline along the Westhampton barrier island should also be maintained. Artificial manipulation and public investment designed to stabilize the Atlantic Ocean shoreline along Fire Island and the Southampton barrier beach should be minimized.
4. Employ sand nourishment techniques to maintain public beaches and recreation areas subject to high density use. When the need exists, use these techniques to establish new beach areas in locations where historical records indicate either accretion or low to moderate erosion of the shore.

The U.S. Army Corps of Engineers, the State of New York and local interests should take the appropriate actions to implement the authorized navigation and beach erosion control projects consistent with these

strategies.

Responsibility for implementation of the non-structural coastal erosion control measures recommended by the LIRPB rests with the many municipalities and governmental agencies that have authority to regulate development and use of coastal lands, or whose programs indirectly affect land use regulations. Building setback lines and hazard zones form the basis of the non-structural recommendations. A few Long Island municipalities have building setback ordinances already in force. It should be recognized that public purchase of selected shore-front parcels may be a viable option in certain situations.

Use of erosion/accretion rates to determine appropriate non-structural approaches for controlling erosion is fraught with many problems, including the availability of data on a local basis and the nature of the response of various shoreline types to erosion/accretion processes that occur in varying time scales. As a minimum, such information, if available, can be used to describe the magnitude of the shoreline erosion problem in an area. This information alone, however, is not sufficient for justifying use of erosion rates in establishing construction setback lines or delineating hazard zones. Additional inputs include how and to what extent shoreline change occurs along a particular shoreline and the goals the development restrictions are designed to address. With this in mind, the LIRPB examined available erosion/accretion data for L.I.'s north shore and found that the glacial bluffs are typically eroding at rates of 1 - 3 ft/yr. To simplify use, interpretation and implementation of the building setback approach, the LIRPB recommended a 100 ft setback line for coastal bluffs and headlands. These features either erode or remain stable over the long-term; they do not accrete, and generally display an easily defineable feature - the bluff or headland lip - from which the 100 ft setback distance can be measured. Inclusion of this setback requirement in municipal zoning regulations should establish a land buffer providing 50 years of protection from erosion-related structural damage. Variances from this requirement should be granted in those instances where it can be shown that a lesser setback (based on site specific erosion/accretion data) or the provision of structural measures (e.g., bulkheads) and vegetative techniques with slope control will provide the desired 50 year level of protection.

Along coastal dune fields, the recommended building setback distance of 100 ft is measured from the crest of the seawardmost dune line, and is designed to protect development from radical changes in the position of the shoreline. The variable nature of this type of landform (coastal dunes can erode, accrete or remain stable) and their fragile character justify the use of the setback approach along coastal dunes.

The setback approach is not as useful a technique along barrier islands and primary dunes, because of their extreme variability and response to severe storm attack. For example, dune fields can be leveled and new inlets cut through the barriers as a result of severe storm attack. In such areas, the LIRPB elected to protect the dune line and to minimize structural damage by means of establishing a

hazard zone within which development would be prohibited or extremely curtailed. The primary dune hazard zone is defined as the area seaward of a line located 40 ft inland from the 14 ft elevation contour on the landward flank of the primary dune. Oceanfront areas where there are no primary dunes, or where the land is less than 14 ft in elevation, including areas that have been historically subject to overwash by stormwaves are also included in this hazard zone.

The primary dune hazard zone is designed to protect the dune line or area from encroachment and damage associated with development. It is not solely designed to protect development situated behind the primary dunes, although this is a benefit. Barrier island development cannot be considered safe from the impacts of severe storms and flooding no matter how far structures are set back from either the dune line or the edge of the sea.

Section 3.9 Fish, Wildlife and Their Habitats

The Board has long recognized the need to protect the biological resources of the coastal zone. Public and private efforts to encourage the dedication and management of wetlands, to preserve stream corridors, and to purchase or otherwise establish nature preserves and wildlife sanctuaries have been in progress for many years. The results, particularly in portions of Nassau and Suffolk, are most impressive. State laws, among them the Tidal Wetlands Act and Freshwater Wetlands Act have facilitated habitat preservation, but to date many important areas are still inadequately protected.

The Board used various sources for the identification of prime wildlife areas, including interviews with New York State Department of Environmental Conservation personnel, other local authorities on fish and wildlife and the report prepared by the NYSDEC Division of Fish and Wildlife entitled, Significant Coastal Related Fish and Wildlife Habitats of New York State, 1977. The board's maps are generally consistent with the above report. The information was used in the Land Capability System, in the designation of GAPCs and an input into the Land Use Plan.

In those areas of Long Island that are still relatively undisturbed, wildlife communities are quite rich and varied. In Nassau County, the remaining wildlife habitats (some are prime wildlife habitats) are generally found along stream and parkway corridors, in wildlife preserves, in coastline areas, and in low density residential areas, such as the Mill Creek area.

In Suffolk County the prime wildlife areas are generally found within the stream corridors and in natural areas that are adjacent to estuaries, wetlands, and surface waters. The Connetquot, Nissequogue, Peconic and Carmans Rivers and Flanders Bay areas are particularly important locations for wildlife. Prime wildlife areas also include the Conscience Bay-Little Bay-Setauket Harbor area; Long Beach Bay, southeastern Shelter Island, Gardiners Island, Plum Island, Shinnecock area adjacent to the barrier island, on the terminal moraine around glacial ponds, Northwest Creek, Napeague Bay and Harbor, and at Montauk.

The Long Island marine environment contains a wide variety of fish and shellfish and is considered to be one of the best fishing areas in the world. The water quality, which is generally good, tends to improve from west to east, from inner harbor areas with little tidal exchange to highly flushed areas, and from areas surrounded with development to areas where adjacent lands are undeveloped. Even polluted Long Island waters support various species and populations.

Changes in water quality, due to either man-made or natural causes can result in the growth or decline in the population of a particular species. Such changes in population levels are difficult to predict/quantify in that information on causes and effects is inadequate. For example, it has been suggested that striped bass landings have increased in New York State during the 1960s and '70s as compared to earlier years,

because this species has been able to take advantage of nutrient enrichment of its estuarine spawning grounds, and undergo a positive change in abundance. However, too much enrichment may prove less advantageous. In another instance, the recent rise in the abundance of blue claw crabs in the New York Bight may be related to regulations on the sale and use of various organophosphate pesticides. In the case of the hard clam, Long Island's most important commercial fishery pollution loadings have resulted in the closure of over 200,000 acres of underwater lands in the New York Marine District to shellfishing. Even though the clams seem able to survive - and survive well - in the closed areas, the standing crop of clams in these areas is off limits to both commercial and recreational diggers because of potential health problems. The existence of closed areas not only results in the loss of valuable fishery products, but also poses public health and law enforcement problems due to illegal harvesting activity.

Tidal wetland areas in the quieter portions of the bays and in protected waters of harbors and tidal streams are critical spawning and nursery areas for finfish. The Connetquot and the Nissequogue are prime freshwater streams for fishing. They are stocked by the State with brown, brook, and rainbow trout. The Carlls, Peconic, and Carmans Rivers also harbor numerous species. Although many freshwater streams and ponds in Nassau County and in western Suffolk have been designated by New York State as Class C and D waters, others in northeastern Nassau and southcentral Suffolk are still relatively unpolluted and support numerous aquatic species. On the South Fork and in the Peconic watershed, there are some streams and pond systems with excellent water quality.

The Nassau-Suffolk Coastal Management Plan assigns high priority to the protection of fish and wildlife habitats and of the natural functioning of coastal ecosystems. The undeveloped land areas immediately adjacent to surface water, required to protect the integrity of fish and wildlife areas, were classified as Land Capability Unit IV. The remaining prime wildlife areas were classified as Land Capability Unit III (see Land Capability - Section 2.3). These areas were then recommended for land uses in accordance with the acceptable uses identified for each Land Capability Unit (see Compatible, Permissible and Priority Uses - Section 5.0). The permissible uses identified for these areas were then incorporated into the Coastal Management Plan, and also into the Comprehensive Waste Treatment Management Plan (208).

Prime wildlife areas, such as Maple Swamp, privately-owned land parcels within the four major river corridors, and numerous other areas are designated as open space. Where possible, the contiguous areas are designated as low-density residential. Tidal and freshwater wetlands including stream corridors have been mapped as open space or low-density residential areas. Wherever possible, undeveloped lands adjacent to surface waters were also designated as open space or low-density residential, or as somewhat higher residential density with clustering.

Many of the natural areas that remain in the counties are within

existing or proposed parklands or other public lands. Some are preserves others are used or recommended for use for passive recreation, but can also serve as wildlife habitats, breeding sites, gene pools, and way stations on the routes of migratory birds. The more fragile portions of the prime wildlife areas are recommended for preservation while the remainder can serve as buffer zones and for passive recreation.

The protection of habitat areas from waterborne pollution has been addressed in both the performance standards that are part of the Land Capability Classification System and in the Comprehensive Waste Treatment Management Plan recommendations (see Performance Standards included in Section 2.3). The control and disposal of surface water so as to replicate, insofar as possible, the natural recharge of an area in terms of water quality and runoff rate is a primary goal of the performance standards. Minimization of disturbance of the natural vegetation, which protects the watersheds, and indirectly, surface water quality and natural habitats is another goal.

The Comprehensive Waste Treatment Management Plan identified several major types of pollution impacting surface waters on Long Island, including coliform bacteria, nutrients (particularly nitrates), and sediments carried in stormwater runoff. It proposed a series of point and non-point control measures, which, if implemented, should markedly reduce the pollutant loads affecting aquatic and marine ecosystems.

The GAPC plans are more detailed and allow the recommendation of specific sites that protect fish and wildlife areas for public acquisition, clustering and dedication and low density residential uses.

A number of GAPCs have been selected entirely or in part to protect areas with high natural productivity and essential habitats for rare, threatened, endangered or diminished species (see discussion in GAPCs, Section 6). Acabonack Harbor and the Maple Swamp are two of the more important examples. Acabonack Harbor includes large areas of tidal wetlands, a limited area of freshwater wetlands, a stream and a prime wildlife habitat. The estuary contains soft and hard clams. Preservation of existing resources by selecting land uses that would assure the maintenance of the environmental integrity of the entire harbor area is one of the major purposes of GAPC designation. Purchase of several parcels for preservation and the retention of others as open space in low-density clustered residential development is recommended.

The Maple Swamp is a prime wildlife area and a significant watershed for Flanders Bay. This site was recommended for open space-preservation.

Other site specific GAPCs that were selected in part to protect wildlife and/or water quality are the Peconic River, Carmans River, Kings Park-San Remo, Cow Neck, Robins Island, the Mashomack Forest at Shelter Island, Gardiners Island and Shinnecock Inlet.

The dredging recommendations, which are designed to provide needed channel access while minimizing adverse marine impacts, also reflect a concern for habitat preservation and, where possible, habitat creation. Recommendations for improvements in the management of major fisheries resources, particularly hard clams, focus on both populations and their environments. Long Island Regional Planning Board recommendations pertaining to fish and wildlife are in accord with statewide policies which call for sound resource management, habitat restoration, habitat maintenance, and habitat protection.

3.10 Coastal Water Resources

The Nassau-Suffolk 208 Study recommendations generally agree with the coastal water resource policies developed by the New York State Department of State as part of its state-wide CZM program. There appears to be no conflict between Long Island and the State policies; however, because of the diverse nature of the water quality problems found throughout the State, a few of the State policies do not apply to Long Island. In addition, some of the policies outlined by the State are directed toward State regulatory agencies, while others involve issues or levels of detail that do not fall within the scope of the 208 Program.

The relationship between 208 plan recommendations and the New York State water resource policies can be summarized as follows:

- In regards to effluent discharges into coastal waters (Policies 11.1 and 6.2), the thrust of the 208 recommendations for both point and non-point discharges has been the achievement of surface and groundwater quality that meets or exceeds NYS standards and protects fish, wildlife, and their habitats. The setting of effluent limitations and discharge permit conditions for specific firms and treatment plants, however, are the responsibility of NYSDEC.
- The classification of coastal waters and the establishment or modification of water quality standards (Policy 11.2) is generally the responsibility of the State. It is expected that NYSDEC will utilize the land and water use information generated during the 208 Program.
- The potential applicability of alternative or innovative sanitary waste systems (Policy 11.3), such as marsh-pond systems, dry toilets and denitrifying cesspools was examined during the 208 Program, and the development of marsh-pond systems was specifically endorsed. Recommendations concerning area-specific applications of such techniques, however, must be made in 201 level studies.
- The LIRPB performed an extensive analysis of stormwater runoff (Policy 11.4) as part of its initial 208 Program and is presently addressing the runoff problem in its day-to-day technical assistance functions and in its continuing planning effort under 208. It will be working with USGS and with county agencies in the testing of selected non-point source controls to reduce the contaminant loadings to ground and surface waters. It will also be disseminating information about Best Management Practices through a "BMP Handbook for Local Officials." The development of a bi-county stormwater runoff management program will be a part of that effort and will include priorities for the installation of control measures. The protection of significant coastal resources will be a major consideration in the determination of priorities.

- The 208 Program addressed and made recommendations for irrigation water and fertilizer use (Policy 11.5) in eastern Suffolk. Agriculture-related water quality problems in Suffolk were found to be insignificant when compared with those found elsewhere in the State.
- The LIRPB recommended that the discharge of waste material from vessels (Policy 11.6) be prohibited in poorly flushed embayments where they are likely to adversely impact shellfishing, bathing, and mariculture activities.
- The LIRPB developed a comprehensive set of dredging and spoil disposal guidelines (Policy 11.7) that are contained in the CZM report entitled "A Comprehensive Dredging Subplan for Nassau and Suffolk Counties", dated 31 March 1978 which was prepared by the Board for the State.
- The Dredging Subplan proposed the reduction of the number of marine petroleum terminals, and the use of pipelines instead of tanker trucks, in order to reduce the likelihood of spills.
- Existing laws concerning oil spill clean-up were examined by the Board and are summarized in the CZM report entitled "Identification and Analysis of Federal, State and Local Legislation, Ordinances, and Regulations Related to the Impact of Onshore OCS Support Facilities Meeting Siting Criteria as Applied to the Nassau-Suffolk Coastal Zone." Specific recommendations on clean-up liability were not made, however, since the subject is already covered by State and Federal legislation.
- The discharge of excess nutrients (Policy 11.9) was a central concern of the 208 surface water modeling effort, which utilized a nitrogen criteria developed for the program to determine alternative levels of treatment and outfall locations required to ensure compliance with State surface water D.O. standards. Recommendations on animal waste and stormwater runoff control were based in part on the need to limit nutrient discharges.
- Long Island's groundwaters have been declared a "sole source aquifer" (Policy 11.10). A special review process has been established to ensure that no federally funded project results in significant degradation of Long Island's groundwater. A preliminary screening of all applications for funding has been combined with the A-95 process. Further review, where indicated, is performed by E.P.A. The LIRPB is also encouraging the incorporation of sole-source aquifer considerations in SEQRA and legally mandated other project review.
- The LIRPB recommended that resource recovery systems be applied to solid wastes (Policy 11.11), and that landfills be used only for inert residuals and non-recoverable, non-putrescible wastes, except in rural areas where quantities of solid waste are small and the location is too far from resource recovery facilities.

Where landfills are allowed, they are expected to conform to 6 NYCRR in Part 360; however, where leachates could impact uncontaminated groundwaters, the 208 Study recommends special precautions. The 208 Study also recommends that no new landfills be established in groundwater recharge areas, immediately adjacent to surface waters (i.e., in the primary coastal zone), or in areas with high groundwater.

- The problem of thermal pollution (Policy 11.12) was not examined during the Nassau-Suffolk 208 Study, since past evidence has not indicated any problem for Long Island marine waters.

Section 3.11 Coastal Air Resources

Present and proposed coastal zone activities do not appear to be significantly affected by or to significantly affect regional air quality. Frequent shifts in wind direction and velocity tend to disperse atmospheric pollution from both local and extra-regional sources. Major stationary sources of air pollution in the coastal zone are, few in number, and are subject to regulation under existing law. Should national energy needs require a shift from oil to coal for power generation, as proposed for the LILCO Port Jefferson facility, localized air quality problems necessitating strict monitoring of operations and the installation of costly pollution controls might result.

Mobile sources constitute a somewhat greater problem on Long Island; however, it is expected that improvements in pollution control technology and reductions in non-essential driving should ease the situation.

4.0 Coastal Zone Boundaries and Mapping Series

On the basis of almost any criteria, all of Long Island could be considered part of the New York State and the United States Coastal Zone. However, since Section 304(a) of P.L. 92-583 defines the coastal zone as the coastal waters and adjacent shorelands strongly influenced by each other and in proximity to the shorelines of the State, and Section 304(b) requires the identification of the coastal zone subject to the State's management program, a more limited area has been delineated.

The seaward boundary of the Long Island coastal zone is identical with the seaward boundary of the State; that is, three miles offshore in the Atlantic Ocean on the south, the New York - Connecticut border in Long Island Sound on the north and northeast, and the New York - Rhode Island border in Block Island Sound on the east.

The landward boundary is more difficult to establish since, according to Section 304(a), the coastal zone "extends inland from the shorelines only to the extent necessary to control shorelands, the uses of which have a direct and significant impact on the coastal waters."

Inasmuch as the immediacy and magnitude of environmental impacts and the appropriate areas extent of governmental control vary with the character of the land uses and activities, Nassau-Suffolk has delineated both a primary and a secondary coastal zone. The proposed zone boundaries are based upon data acquired during more than a decade of Regional Planning Board coastal research and inventory efforts, and upon input provided by an active and knowledgeable Citizens Participation Committee.

The primary zone, which will require a somewhat greater degree of governmental protection and control than will the secondary zone, comprises both marine and terrestrial areas. It extends from the seaward limit of the State's jurisdiction inland to the ten foot elevation contour line of for a distance of 1000 feet from the mean high water line, whichever encompasses the greater land area; to a line located 1000 feet from the banks of any stream, ditch, or drainage way discharging to coastal waters; and to the landward periphery of any contiguous freshwater wetland (as identified pursuant to the NYS Freshwater Wetland Act of 1975); and, of any contiguous Geographic Area of Particular Concern. The primary zone as delineated for coastal management planning covers nearshore waters and those shorelands, the development of which is most likely to have direct and significant impacts upon coastal waters: the wetlands, protective upland vegetation, the barrier beach and other coastal landforms, the 100 year floodplain, areas characterized by a high groundwater table, bluffs and steep slopes, freshwater wetlands, stream corridors, and major drainageways or swales carrying surface runoff into coastal waters.

The secondary zone extends from the landward edge of the primary zone south to the Long Island Expressway and Route 25A, the Long Island Railroad (Oyster Bay and Port Jefferson Lines), and Sound Avenue in northern Nassau and Suffolk; west to a line generally following Church Land and Riverhead-Quogue Road; and north to the Southern State Parkway

and Sunrise Highway in southern Nassau and Suffolk. It includes lands that are visible from the water or that are located within scenic viewsheds where inappropriate alteration or use might seriously impact coastal aesthetics. It also includes areas beyond the primary zone but from which surface runoff and underflow from shallow aquifers may transport nutrients, metals, organic chemicals and coliform bacteria to streams and nearshore waters.

Federal holdings located within the boundaries of the primary and secondary zones are, of course, exempt from State or local coastal management planning. These holdings have been identified and mapped. Although the federal presence, particularly in the case of the Fire Island National Seashore, influences and is influenced by coastal management planning, all federally owned, leased, or occupied properties are excluded from the coastal zones. However, through cooperation and communication with those Federal agencies with management responsibility for the excluded land, conflicts between local CZM planning efforts and Federal action can be minimized.

Because of the difficulty in delineating a coastal zone boundary that is derived from contour lines or the fixed distance from the shoreline, the Long Island Regional Planning Board agreed to the use of an interim boundary that delineates the primary zone on the basis of the nearest cultural feature. The cultural features include roadways, railroads and other items that can be used in a description of the coastal zone boundary. It is expected that this boundary will be utilized during the initial phase of the state-wide Coastal Management Program, but will be subsequently replaced by the 1,000 foot or 10 foot contour line definition. The Long Island Regional Planning Board will prepare a detailed set of maps showing the boundary so that individual parcels or dwellings can be identified by all individuals using the coastal zone maps. This way there can be no discrepancies concerning the boundary of the coastal zone. In addition, a boundary based on a standard throughout the Nassau-Suffolk region is easily defended if controversies arise related to the definition of the coastal zone boundary.

4.1 Coastal Management Program Mapping

Four sets of maps series were produced as part of the Nassau-Suffolk segment of the coastal management program. Each set contains forty-two maps at a scale of one inch equaling two thousand feet. The four sets include maps of the following: (1) Existing Land Use 1977 (2) Natural Resources Inventory (3) Land and Water Capability and (4) Land Use Plan 1995.

The series depicting existing (1977) land use shows the following uses: (1) residential (at various densities), (2) commercial, (3) Industrial, (4) Institutional, (5) Open Space and Recreational, (6) Agricultural, (7) Transportation and Utilities, and (7) Vacant.

The two maps series depicting natural resources and land and water capability are described in sections 2.3.1.2.1, 2.3.1.2.2 and 2.3.2.

The maps series entitled, Land Use Plan, 1995 depicts all uses

shown on the existing land use maps, with the exception of the "vacant" category, that are keyed to the planning horizon, 1995.

Reproducibles of each map series are available at the offices of the New York State Department of State in Albany, New York.

Section 5.0 Compatible and Priority Uses

Determination of the appropriate use of coastal lands and water is central to successful coastal zone planning and management. Inasmuch as the impacts of various uses and related activities can be supportive, neutral, or destructive of the resources base, proposed or potential development must be evaluated with regard to the capability of the site to accommodate the use or activity without significant impairment of physical or biological resources.

Compatible Uses - In most parts of the coastal zone, there are numerous uses or activities that may be considered compatible and therefore acceptable. Acceptability of a given use will depend upon the character of the site, the location of the site in relation to nearby coastal resources and human activities, and the state of the art in respect to impact mitigation or control.

Long Island Regional Planning Board has developed a Land Capability Classification System that permits the categorization of resource units according to their ability to support different uses and activities by Land Capability classes or units (See Section 2.3).

Table 5.0-1 provides a brief description of the major environmental aspects of the four capability classes and indicates the kinds of development considered acceptable for each. Existing development, particularly in urban areas, is generally regarded as a "given." Inasmuch as the application of limitations on development in essentially built-up areas would be not only unfair, but of little environmental value, most of the intensively developed portions of the coastal zone have been assigned to Land Capability Unit I, locational and resource considerations notwithstanding. As indicated in Table 5.0-1, Land Capability Unit I, which includes the areas least likely to suffer damage from or provide hazards to man's activities, has the greatest range of acceptable uses. All forms of residential, commercial, industrial, institutional and other uses that meet state and local health and land use regulations are considered acceptable. Land Capability Unit II, which is somewhat more likely to suffer damage from or present hazards to development, has a narrower range of uses that are acceptable per se, but allows any land use that can meet performance standards. Land Capability Unit III, which includes highly permeable and productive soils, as well as prime watershed areas, steep slopes, and fragile landforms, is more limited in the range of acceptable uses, allowing low density uses and agriculture. Land Capability Unit IV, comprising the areas most likely to sustain degradation or even irreversible damage from man's activities, further limits the acceptable uses, allowing only extremely low density scattered residential uses (for the most part already in place) and passive recreational or educational uses associated with preserves or other controlled or limited access areas.

Table 5.0-1

RELATIONSHIP OF RESOURCE UNITS, LAND CAPABILITY AND COMPATIBLE USES

The following land uses are recommended for the land capability identified with the capability units.

<u>LAND CAPABILITY</u>	<u>REQUIRING SPECIAL TREATMENT RESOURCE UNIT</u>	<u>COMPATIBLE LAND USE</u>
I	Groundwater - Aquifer	All land uses
	Surface waters	All new development meet performance standards
II	Areas of natural vegetation	Any land use that can meet performance standards
	Important aquifer recharge areas	
	Slopes greater than 8%	
III	Prime Farmland-	Low density residential agriculture
	Buffer zones for prime ecological sites	Public and private recreation
	Prime watershed area	Low density institutional
	Prime wildlife areas	Low density resort
	Land areas immediately adjacent to dunes, bluffs, swales	
	Land on steep slopes	
	Areas of high water table Undeveloped areas within the 100 year flood plain	
IV	Prime ecological sites	Nature study
	Freshwater wetland	Preservation Easements
	Tidal wetlands	Controlled access - Open Space
	Endangered species habitats, "Protected Plants", Unique or rare vegetation	Area is recommended for no development
		Water dependent uses when over-riding public need can be demonstrated

Table 5.0-1 (continued)

<u>LAND CAPABILITY</u>	<u>RESOURCE UNIT (R.C.)</u>	<u>COMPATIBLE LAND USE</u>
IV (continued)	Undeveloped areas of the barrier island	Passive recreation categories such as education
	Foredune, primary dune	Swimming, hunting, boating, fishing, by permit only
	Seaward face of secondary dune	Scientific uses
	Faced bluff & setback (recommended in Coastal Erosion Plan)	Nature preserves
	Landward edge of streams, freshwater wetlands, tidal marsh, ponds, lakes and all surface waters	Conservation areas Extremely low density residential (1 unit/5 acres)
	Slopes greater than 25% within 300' of water's edge	
	All coastal landforms inundated by daily tides	

Permissible Uses

6.0 Geographic Areas of Particular Concern

Section 305(b) (3) of the Coastal Zone Management Act, Sections 920.13 and 290.16 of the Regulations, (15CFR920, 38CFR33044, November 29, 1973; amended by 40CFR16823, April 15, 1975 and 15CFR920.13, March 1, 1978) -- all address the important topic of "geographic areas of particular concern."

The legislation and regulations indicate that there are certain land and water uses and activities that should be regulated or, on occasion, prohibited because of their direct and significant impact on coastal waters. However, in addition to these uses and activities that are to be subject to some degree of management throughout the coastal zone, there are a number of specific geographic areas where natural features, environmental processes, man's works, or existing and potential economic and recreational opportunities merit further protection, preservation or enhancement.

The list of resource types to be constrained eligible for GAPC status covers a broad range of related and often overlapping categories. The legislation and guidance identify seven general resource classifications, which can be interpreted to include almost every kind of area within the coastal zone.

The most recent regulations suggest that GAPCs should comprise not only those land and water areas of significant natural value or importance, but also rapidly changing or intensely developed areas where "reclamations, restoration, public access and other actions are especially needed", or areas particularly "suited for intensive use or development." The regulations also state that "immediacy of need should be a major consideration in determining particular concern."

Preliminary analysis of the criteria clearly indicated that literal application to the Long Island coastal zone would yield an unmanageably large inventory of candidate areas for further evaluation. It was, therefore, determined to limit the initial inventory of potential GAPCs to those areas not already subject or likely to be subject to presumably adequate management pursuant to existing state law or to the proposed land capability classification listings of permissible uses and guidelines for the establishment of priorities among permissible uses.

In order to facilitate the rapid identification of candidate GAPCs, the staff undertook the elaboration and restatement of the federal criteria and the development of additional criteria to be used in making initial selections in each of the major categories or subcategories. The staff then proceeded to review environmental resource maps, land use maps, aerial photography and special studies.

Staff application of the refined and expanded criteria to the previously assembled data sources yielded more than 100 potential nominations for GAPC status. Reference materials used in the identification of candidate areas included the Nassau-Suffolk Comprehensive Plan studies and Marine Resources Council publications; aerial photographs, U.S. Geological Survey Quadrangle Maps and U.S. Coast and Geodetic Survey Charts; New York State Tidal Wetlands Maps and wetlands reports; the New England River Basin's Long Island Sound Study Plan, and subject reports dealing with scenic and

cultural resources, fish and wildlife, outdoor recreation, erosion and sedimentation, and marine transport; and miscellaneous federal, state, county, town and historic preservation society publications.

Initial suggestions for GAPCs were mapped on U.S.G.S. Quad Sheets and presented to the Citizen's Participation Committee for discussion. Some additional sites were proposed and others deleted in response to C.P.C. information and comments. Existing parks and preserves were also noted on the Quad Sheets in order to clarify the relationships between potential GAPCs and public or quasi-public properties.

The staff then undertook a further and final screening of the candidate areas, using five general criteria; the presence of multiple rather than single attributes or values warranting level 3 management; the presence of redevelopment opportunities sufficient to justify A.P.R. (Area for Preservation and Restoration) designation; national or state-wide need or significance; location adjacent to or between existing public or quasi-public holdings, and consequent ability to serve as a buffer area or connector; and the potential for successful development and implementation of management measures.

Re-evaluation of the initial nominations resulted in the selection of 37 areas that were proposed for designation as GAPCs and submitted to the Department of State's Coastal Management Unit. The State then selected 20 areas it considered of statewide importance. Three of the areas are generic GAPCs since they have power plants, wetlands or historic sites, however, there are several other concerns that require their designation as specific GAPCs. The following is a list of the areas: Hempstead Harbor, Cold Spring Harbor, Kings Park - San Remo, Port Jefferson, Robin's Island, Cow Neck, Shelter Island, Gardiners Island, Napeague, Shinnecock Inlet, Huntington Harbor, Shoreham - Wading River, Mattituck Creek - Northville, Peconic Bluffs, Greenport, Shinnecock Canal, Fort Pond Bay, Patchogue River, Freeport Waterfront Area, Oceanside - Island Park. The 17 sites regarded by the State as not being of statewide significance -- Acabonack Harbor, Peconic River, Carmans River, Maple Swamp, South Jamesport, Sheets Creek, Barnum Island, Orient Point, Glen Cove Creek, Manhasset Bay, Oyster Bay, Riverhead, East Marion (Dam Pond Area), Sag Harbor, Orowoc Creek, Watchogue Creek, Baiting Hollow -- were considered by the LIRPB as local GAPC's and are delineated in a manner similar to that used for the statewide GAPC's Management plans will be developed as funds become available.

Descriptions of all 37 GAPCs were prepared and submitted to the State in a two-volume report entitled, "Nassau-Suffolk Planning Board Management Plans for GAPC's in the Nassau-Suffolk Coastal Zone" (March 1978). These descriptions included the rationale used in GAPC designation (as they relate to State coastal issues); locations and boundaries; ownership; physical and natural features; present uses; zoning; existing plans; and adjoining areas. Also included were the management objectives and priority uses; existing management and regulatory authority; required additional management and regulatory authority; and, the proposed implementing agencies. In addition, an addendum to the report, submitted to the State in 1978, provided greater detail for each of the 21 State priority GAPCs in terms of the State coastal issues involved in the designation rationale; management objectives and priority uses; and, the State's management role.

The following sections summarize the management objectives and priority uses of the GAPC's of statewide and local significance.

6.1 GAPCs of Statewide Importance - Management Objectives and Priority Uses

Hempstead Harbor - The primary objective is to convert this harbor from predominantly industrial uses to one that increases recreational opportunities and public access to the coastal waters. In addition to the recreational and public access priorities, power generation, petroleum products importation and trap rock importation would have highest priorities. Marine-related commercial uses would follow in priority order. The lowest priority would be for oil storage on the shore, landfill at the shore edge and housing units immediately adjacent to the waterfront. These uses can be accommodated within the GAPC but they do not have to be on the very valuable waterfront.

Cold Spring Harbor - The primary objectives are to maintain the wildlife habitat, and assure that the scenic qualities of the harbor that already exist are retained and those uses in conflict are gradually phased out. Highest priority uses would be to increase public access and the opportunities for passive recreation. Active recreational uses and marine commercial development are assigned a lower priority.

Huntington Harbor - The management objective is to increase public access and expand water dependent uses adjacent to the harbor. Oil storage should be phased out, thus freeing additional land for recreation or necessary industrial use, such as the importation of stone. Boating activities and passive recreation should be priority uses. Marine commercial should have a lower priority, and any other industrial uses other than the importation of stone, should be given a low priority.

Kings Park - San Remo - The management objectives are to preserve the wetlands in the area and enhance the scenic qualities that already exist. Another management objective is to convert the State Psychiatric Hospital property, which will be designated as surplus in the near future, to a combination of residential and recreational uses. The highest priority should go to open space on the Nissequogue River. There should also be an increase in certain limited recreational facilities. Marine commercial uses and new residences on the waterfront or in the low-lying area should be low priority uses.

Port Jefferson Harbor - The primary objective is to consolidate the water-dependent industry and commerce in the northwest portion of harbor, and thus increase the recreational and public access opportunities in the remainder. The highest priority for new uses would be marine commercial on the waterfront that is related to the adjacent business district. A low priority is continued oil storage and non-water dependent commercial uses.

Shoreham-Wading River - The management objective is to retain a portion of this site for future energy facilities and a transportation access point for Long Island Sound crossing. The wetlands in the eastern part of the

GAPC should be preserved because of their value both as wetlands and as a buffer between the LIRPB power plant and the residential community of Wading River. The highest priority uses are power generation and wetlands preservation. Lower priority is assigned to transportation use and recreation along the shore. Additional residential development at the eastern edge of the GAPC is also a low priority.

Mattituck Creek-Northville - Management objectives within this GAPC are to increase the public access and convert the creek area from obsolete industrial uses to tourist related facilities. Tourist facilities and recreational boating activities should have a high priority. The protection of the agricultural resources and wetlands preservation should also be a high priority. A lower priority is additional residential development along the shore.

Peconic Bluffs - The primary objective is to utilize the site for recreational purposes to serve local and regional needs without causing erosion to the bluff area. Increased bluff and beach erosion rates would threaten adjacent residential development. The priority uses would be swimming, fishing and camping.

Robins Island - The primary management objectives are to maintain the open space on the island and allow public access for active and passive recreation uses. The highest priority is for preservation of natural resources and use for limited hunting and fishing activities. A lower priority should be given to active recreation uses.

Greenport - The primary management objective is to increase the public use of the waterfront by locating water-dependent facilities along the shore in order to improve the relationship between the business district and the waterfront. This will benefit the downtown and at the same time improve facilities for transients. Continued maintenance dredging should encourage investment opportunities on the harbor. Priority is given to water-dependent commercial uses that would create a closer relationship between the harbor and the central business area. These new uses should provide jobs and increased tourism activities for this economically depressed location. A low priority should be given to new ferry access to Connecticut, which is presently under consideration, since this activity would increase traffic in the downtown area and utilize more of the valuable waterfront for vehicle storage, rather than increased pedestrian access.

Shelter Island (Mashomack) - The objective is to preserve a major portion of this GAPC, which possesses unique natural resources, while allowing year-round or seasonal housing development on the remainder of the property. The highest priority would be for the retention of the wetlands. Clustered residential development that would guarantee the preservation of open space in the GAPC would also be a high priority. Lower priorities would go to marine commercial uses and active recreational use.

Fort Pond Bay - This GAPC should be reserved for water dependent industrial, commercial and research facilities. No further mining of the bluff areas should be allowed and the remaining bluffs should become a

buffer between the non-residential uses in this area and potential new housing areas to the west. The highest priority should be for water dependent commercial facilities, such as docking, fish landing and processing. Increased tourism activities can be accommodated but should have a lower priority.

Napeague - Development of the State park for recreation uses, which would be related to resort activities on eastern Long Island, is the management objective. Acquisition of the parcels now surrounded by the State land is also an objective for proper management control. Active and passive recreational use, marine fishery activities, and marine-related commercial uses are high priority uses. The lowest priority should be for additional residential development due to the continued erosion and flooding of the area due to storms.

Gardiners Island - The management objective is the preservation of the unique natural and historic characteristics of the island, while allowing limited access for the enjoyment of the public. The highest priority uses would be those which have a limited impact on the island, such as outdoor education, fishing and hiking. A low priority should be given to camping and other active recreational uses.

Cow Neck - The primary management objectives are the maintenance of agricultural land, and the preservation of freshwater supplies and tidal wetlands. The highest priority is to preserve existing uses in the GAPC and to allow some passive recreational use. A low priority is given to residential development and marine commercial uses.

Shinnecock Canal - The management objectives are to maintain navigation through the canal and increase public access in the area, while developing new tourism facilities. The priority uses should be a concentration of tourist related activities that, when clustered in this location, would encourage more pedestrian activity and enjoyment of the scenic resources. Any new seasonal and year-round housing should have a low priority.

Shinnecock Inlet - The major objective is to provide commercial fishermen with needed dock/pier space. Another objective is to develop the unused portion of the beach for oceanfront bathing. Commercial fisheries operations and active recreation are the highest priority uses. Inlet improvement and construction of a sand by-pass system should also be a high priority. Additional marine commercial uses should have a lower priority.

Patchogue River - A major objective is to convert the uses along the river from predominantly industrial to a combination of marine commercial and recreational that will increase public access to the river and make it better able to relate to the needs of the Fire Island National Seashore. The priority uses should be in the areas of recreation and tourism, with a heavy emphasis on boating activities. Residential uses can be accommodated, but should have a lower priority than those which increase public access.

Freeport Waterfront Area - The primary objective is to retain the residential-industrial-commercial balance along the waterfront, while increas-

ing public access and expanding and improving the tourist related facilities that already exist. Uses, such as the incinerator and the sewage treatment plant, that are obsolete should be replaced by water dependent uses. Marine commercial uses, and especially commercial and recreation boating, should have a high priority. Industrial use should have a high priority only in the northeast section of the GAPC; any residential development is assigned lower priority.

Oceanside-Island Park - The remaining vacant land within this GAPC should be maintained for energy generation, oil storage and solid waste disposal. Adequate controls and buffers should be created to avoid conflict with the built-up residential areas that surround the area. Industrial facilities which are water dependent should be the priority use. A lower priority should be given to the commercial activities. Recreational uses can be included on a portion of the land that is presently used for landfill purposes.

6.2 GAPCs of Local Significance - Management Objectives and Priority Uses

Acabonack Harbor - The preservation of the wetlands, which will maintain water quality in the harbor and minimize the effects of flooding and erosion, is a top management priority. It is possible to cluster most of the housing units allowed under existing zoning in a manner that retains most of the wetlands. It would be necessary to acquire a series of parcels less than 50 acres in size, for which clustering is not feasible, in order to preserve virtually all the wetlands in the area. Dredging for recreational boating should be limited to the inlet and the area immediately to the south. Another management objective is to increase the public access and at the same time allow additional seasonal housing units to be constructed where they would not have an adverse effect on the natural environment.

Peconic River - The priority is to acquire as much of the land along the river as possible through purchase, gift, or cluster arrangements. Uses that will bring in the fewest number of residents to the area should have priority in this GAPC. Therefore, a golf course or small industrial area can be accommodated easier than a large residential subdivision. The recommended plan calls for the industry to be located on land partly owned by Suffolk County adjacent to the southern entrance of the airport. An ownership exchange could be used to add properties to the County preserve area immediately to the south of the above parcel. Only the upland sections of the GAPC that are outside of the primary noise zones of the airport should have any new housing. The maximum use of clustering throughout the GAPC to preserve land along the river is feasible, since there are a number of large parcels that contain both river edge and adjacent upland.

Carmans River - The primary management objective for this GAPC is to preserve the watershed in its natural state. In addition, some public access and limited recreational uses can also be provided. The control of development adjacent to the shore is necessary to avoid pollution from cesspools and to prohibit structures from being built in areas subject to flooding. The enhancement of the scenic value of the river by removing commercial uses, such as oil storage and duck farms, is also a management objective.

Maple Swamp - The preservation of the entire swamp and its management as a wildlife preserve are the primary objectives.

South Jamesport - The major objectives are to provide public access to the bay, improve physical appearance of the area, and avoid development that would have an adverse effect on bay water quality. A combination of public and commercial recreational uses can enhance this area to attract a seasonal and year-round population.

Sheets Creek - A continuous waterfront pedestrian area should be the management objective. Marine-commercial and public uses should have a high priority with multi-family housing a somewhat lower priority. Any additional industry should be confined to interior parcels in the immediate vicinity. Channel maintenance for deep draft recreational boating is another objective.

Barnum Island - A fishery with direct access to Reynolds Channel should be a priority use, since the site has good waterfront and highway access and is not immediately adjacent to residential uses.

Orient Point - The objectives should be to protect the aesthetics of the area, increase the public access and add commercial facilities to enhance the resort-recreational environment of the North Fork. Open space should be a priority use for the eastern portion of the GAPC. Additional recreational fishing facilities should be provided at Orient Point.

Glen Cove Creek - The primary management objective is to reserve vacant land or land that might be redeveloped for uses that are water dependent, while phasing out those uses which are not water dependent. In addition, an effort should be taken to preserve the remaining wetlands and expand the recreation opportunities on the waterfront. Residential development can be accommodated within the GAPC in conjunction with recreational use. New industrial development outside the area already used for industry should have a low priority.

Manhasset Bay - The conversion of the west side of the harbor to recreational uses, marine commercial and multi-family uses, and phasing out of industrial uses are the major objectives. Room for expansion of the sewage treatment plant, if necessary, is also a consideration within this GAPC. The east side of the harbor should become a developed passive recreation area.

Oyster Bay - The maintenance of water quality, room for future expansion of the sewage treatment plant and the conversion of the industrial uses to residential and marine commercial should be the priorities. Improved public access and upgrading of the area between the harbor and the business district, removing obsolete structures and converting other commercial industrial uses to multi-family residential are other major objectives.

Riverhead - The primary management objective of this GAPC is to re-orient the Central Business District to the Peconic River. The pedestrian areas produced would be linked to the County Center area further to the west. Flood control measures are a high priority. Redevelopment of the obsolete

uses on the south side of the river is also a high priority.

Orowoc Creek - The primary management objective is to stimulate and upgrade water dependent uses, such as fish landing and marketing at waterfront areas. Modification of the federal project to widen the channel from 75 ft to 100 ft is a priority. Another management objective should take the form of eliminating uses which are not consistent with waterfront use, such as the mobile home park.

Watchogue Creek - The primary management objective is to provide an improved relationship between the center of Bay Shore and its nearby waterfront. Boating, restaurants and pedestrian areas are approaches of creating this type of relationship. Priority uses in the immediate area should be those which are boat oriented and will increase pedestrian traffic.

Baiting Hollow - The phasing out of obsolete structures, the maintenance of water quality, the preservation of farmlands and wetlands and increasing recreational opportunities, such as swimming and shore fishing, are the priority uses or management objectives for this GAPC.

Sag Harbor - The primary management objective for the GAPC is to stimulate the establishment of water oriented uses, which will make Sag Harbor a vital commercial area for 12 months of the year, while maintaining its historic seaport atmosphere.

East Marion - Dam Pond Area - The major objectives are to preserve the wetlands and wildlife habitat, and to allow additional residential construction that would not have an adverse effect on the key preservation areas or the exceptionally high quality scenic vista available throughout the GAPC.

Section 7.0 Implementation

The Coastal Zone Management Act of 1972 specifies the following general techniques for control of land and water uses within the coastal zone: direct regulation by the state, local regulation in accordance with state-established standards, and local regulation subject to state review. The approach recommended by the Long Island Regional Planning Board is discussed below and represents a composite of the two latter alternatives. It is based on the assumption that coastal management programs will be prepared for the entire coastal zone as defined by New York State.

The recommended implementation framework is based on the premise that the LIRPB will serve as the regional agent for the designated "306" agency. It is recommended that the LIRPB be responsible for the implementation of the Coastal Management Program in the Nassau-Suffolk region. The general interagency coordination links are shown in Figure 7.0-1. In the figure, a direct link indicates that the initial contact and subsequent interactions between the LIRPB and another agency would be handled directly, whereas, an indirect link indicates that initial contact and subsequent interactions between the LIRPB and another agency would be handled by an intermediary agency (i.e., the State designated 306 agency), with the LIRPB participating in an advisory role. In many cases, however, the LIRPB could be delegated primary responsibility for dealing directly with specific Federal or State agencies, particularly those involved primarily in Long Island matters (e.g., the Fire Island National Seashore or the L.I. State Parks and Recreation Commission).

It is strongly recommended that the regional goals and objectives, management guidelines, criteria, and planning recommendations, as developed by the LIRPB in its Coastal Management Plan serve as the basis for State and local coastal planning and regulation. It is intended, however, that planning and management for the coastal zone should continue to be, primarily, the responsibility of local government. Zoning and subdivision powers will remain intact at the municipal level. Municipalities will be urged to prepare or expand local coastal management programs. The LIRPB should provide technical assistance as required. As the agent for New York State, it is proposed that the LIRPB existing and proposed plans for compatibility with the regional coastal management program element and the State Coastal Management Plan, and would facilitate the resolution of any conflicts that may arise.

The State, through the LIRPB, would monitor local administration of the approved local coastal management programs to insure compliance. It is recommended that State financial aid be made available to local governments through the LIRPB on a contractual basis for the development and administration of coastal management programs.

It is recommended that the LIRPB coordinate Coastal Management activities of the two counties by assisting the county planning boards in updating and amending plans and procedures so as to assure compatibility with regional goals, objectives, guidelines, criteria and recommendations. It is proposed that the LIRPB monitor county actions that affect the coastal zone, and comment where appropriate. This will require the establishment of notification pro-

cedures involving various county agencies to assure that the LIRPB will be informed of all potentially significant actions affecting the coastal zone.

To facilitate the monitoring of coastal management program implementation, it is recommended that all permit issuing agencies of government be required to notify the LIRPB of all permit applications involving areas located within the legally defined coastal zone. The LIRPB will review and comment on these applications as required. This function supplements the existing A-95 review procedures conducted by the LIRPB for programs and projects involving federal funding. It should be noted that the LIRPB will utilize the A-95 review process in implementing the Coastal Management Plan on Long Island.

APPENDIX A

Long Island Regional Planning Board Reports Prepared for
the N.Y.S. Dept. of State under the CZM/OCS Study Programs

OCS Year I - Contract D93781

- . CZM Goals & Objectives Relating to OCS Activities - 1 January 1977
- . Annotated Bibliography of Existing Regional Technical Information and Data Related to OCS Activities - 22 December 1976
- . Outer Continental Shelf Study Program Public Participation - 15 June 1977
- . Catalogue of Plans, Regulations, and Programs That Are Relevant to OCS Development Activities - 1 February 1977
- . Analysis of Potential Oil Spill Impacts in the Nassau-Suffolk Coastal Zone - 1 December 1976
- . Siting Criteria for Onshore Facilities for OCS Oil Development Support and Their Potential Application in Nassau and Suffolk Counties - 28 February 1977
- . Identification and Analysis of Federal, State and Local Legislation, Ordinances and Regulations Related to the Impact of Onshore OCS Support Facilities Meeting Siting Criteria As Applied to the Nassau-Suffolk Coastal Zone - 20 July 1977

CZM Year I - Contract D88681

- . Coastal Zone Planning Elements: Goals & Boundaries - 31 January 1976

CZM Year II - Contract D93967

- . Nassau-Suffolk Coastal Zone Boundaries - 15 August 1977
- . Criteria Used for the Delineation of GAPC's - 15 August 1977
- . Inventory and Description of GAPC's - 15 August 1977
- . Land Capability Classification System - 15 June 1977
- . Permissible Uses & Priorities - 15 June 1977
- . Evaluation of Local Land Use Plans - 15 August 1977
- . Water Capability Classification System - 15 August 1977
- . Evaluation of Local Water Use Plans - 15 August 1977

- . Documentation of the National Interest in Facility Siting - 15 August 1977
- . Local, Regional & State Land & Water Use Regulations in the Nassau-Suffolk Coastal Zone - 15 August 1977
- . Method to Assure that Regional Land & Water Uses are not Arbitrarily or Unreasonably Restricted or Excluded by Local Land & Water Use Regulations - 15 August 1977
- . Coastal Zone Management Program Public Participation - 15 August 1977
- . A Marine Fisheries Subplan for Nassau & Suffolk Counties - 15 August 1977
- . An Energy Facilities Subplan for Nassau & Suffolk Counties - 15 August 1977
- . A Recreation Shoreline Access Subplan for Nassau & Suffolk Counties - 31 August 1977

CZM Year III - Contract D125991

- . A Comprehensive Dredging Subplan for Nassau & Suffolk Counties - 31 March 1978
- . A Coastal Erosion Subplan for Nassau & Suffolk Counties - 1 March 1978
- . Long Island Regional Planning Board Management Plans for GAPC's in the Nassau-Suffolk Coastal Zone, Parts I & II - March 1978 with Addendum (31 May 1978)
- . Coastal Zone Management Program Public Participation - 31 March 1978
- . Documentation of Interagency Coordination and Consistency of the Nassau-Suffolk Coastal Zone Management Program with Other Agency Plans and Programs - 26 May 1978
- . Preliminary Coastal Zone Management Plan Recommendations - 14 June 1978
- . Preliminary maps of Nassau & Suffolk Counties at a scale of 1:24,000 showing coastal zone boundaries and excluded Federal lands, existing land use, natural resources, land and water capability classifications, and plan land uses.

CZM Year IV - Contract D142372

- . A Comprehensive Water Quality Subplan for Nassau & Suffolk Counties -
30 April 1979
- . Long Island Regional Planning Board Final Map Series
 - Existing Land Use 1977
 - Land Use Plan 1995
 - Natural Resources Inventory
 - Land & Water Capability
 - Twenty Statewide GAPC Maps
- . Long Island Coastal Management Program Priorities
- . Administrative Procedures for Implementing The Coastal Management Program on Long Island
- . Assessment of Existing Mariculture Activities in the Long Island Coastal Zone and Potential for Future Growth - 30 April 1979

APPENDIX B

POLICIES OF THE NEW YORK STATE
COASTAL MANAGEMENT PROGRAM*

- 1.0 Aesthetics
- 1.1 Inventory Aesthetic Resources of Statewide Significance Within the Coastal Area
- 1.2 Preserve and Protect Aesthetic Resources of Statewide Significance Within the Coastal Area
- 1.3 Incorporate Aesthetic Considerations in Public and Private Planning and Development in the Coastal Area
- 1.4 Increase Visual Access To and Along the Shore and Protect Existing Points of Visual Access
- 2.0 Agriculture
- 2.1 Conserve All Important Agricultural Lands in the State's Coastal Area
- 3.0 Air Quality
- 3.1 Land Use or Development in the Coastal Area Shall Not Cause National or State Air Quality Standards to be Violated
- 3.2 Coastal Management Policies will be Considered in Classifying Land Areas Pursuant to the Significant Deterioration Regulations of the Federal Clean Air Act
- 4.0 Economic Development
- 4.1 Give Locational and Funding Priority to Water-Dependent and Water-Enhanced Economic Activities
- 4.2 Channel Growth Within the Coastal Area to Already-Developed Areas.
- 4.3 Encourage Development Where Geological, Topographical and Other Environmental Considerations are Favorable
- 4.4 Expedite Permitting Procedures to Facilitate the Siting of Economic Activities at Locations Identified by the Coastal Management Program as Desirable for Development
- 4.5 Promote New York State's Major Ports as Centers of Commerce and Industry

*As contained in New York State Coastal Management Program, Volume One, March, 1979.

4.6 Encourage the Development of Harbor Areas to Maximize the Economic and Social Benefits to be Gained by Surrounding Localities

4.7 Encourage Urban Localities to Undertake Waterfront Development Projects

5.0 Energy Development

5.1 Develop an Integrated and Comprehensive Statewide Long-Range Energy Master Plan so as to Provide a Framework For Energy-Related Decisions in New York State

5.2 In a Single Proceeding, Provide for the Expeditious Siting of Major Electric Generating Facilities, Balancing the Public Need for Electricity, the Compatibility of Such Facilities with the Environment, and the Necessity of a Shorefront Location for Such Facilities

5.3 Provide for the Siting of Major Gas and Electric Transmission and Associated Facilities and Ensure that Such Facilities Will Serve the Public Interest, Convenience, and Necessity, Be Compatible with the Environment and, if Necessary, are Sited at the Most Appropriate Shorefront Location

5.4 Provide for the Siting of Petroleum Facilities, Taking Under Consideration: State and National Energy Needs; the Need to Minimize Adverse Impacts on Water and Air Quality; and if Such Facilities Require a Shorefront Location, Provide This Location Within or Adjacent to Existing Ports

5.5 Provide for the Siting of Liquefied and Substitute Natural Gas Facilities Through a Review Process which Balances State and National Energy Needs, Public Safety Concern, and the Necessity for a Shorefront Location

5.6 Encourage the Development of Lake Erie Natural Gas in order to Further the National Effort of Energy Self-Sufficiency, and Ensure that its Development and Operation Take Place in an Environmentally Compatible Manner

6.0 Fish and Wildlife

6.1 Significant Coastal Fish and Wildlife Habitats will be Preserved, Managed and, where possible, Restored so as to Maintain or Re-Establish Their Viability as Habitats

6.2 Fish, Wildlife and Their Habitats Shall be Protected From Contamination Due to the Introduction of Toxic Substances and other Pollutants

6.3 In a Manner Consistent with Sound Resource Management Considerations, Public Use of Fish and Wildlife Resources for Recreational Purposes Shall be Expanded by Increasing Access to Existing Resources, Supplementing Existing Stocks and Developing New Resources*

6.4 In a Manner Consistent with Sound Resource Management Considerations; Encourage Increased Utilization of Commercial Finfish and Shellfish Resources by Expediting the Construction of New or the Improvement of Existing Commercial Fishing Support Facilities, Increasing Access to Fishing areas, Maintaining Adequate Stocks and Expanding Aquaculture Activities

7.0 Flooding and Erosion

7.1 Minimize the Damage to Property and to Natural Resources of Great Public Benefit Caused by the Erosion of the Coastline

7.2 Dredging or Excavation in Coastal Waters Should Not Interfere with the Natural Processes which Supply Sand to Shorelands Nor Cause Erosion of those Shorelands.

7.3 Minimize Damage to Property Caused by the Flooding of Coastal Lands Preferably Through the Application of Appropriate Land Use and Performance Standards and Criteria, or where Necessary, by Constructing Structural Flood Controls Provided they are Determined to be Technically Feasible and Environmentally and Economically Acceptable.

7.4 Reduce the Quantity of Debris in New York Harbor and the Hudson River

7.5 Property Owners Along the Shorelands of Lake Ontario Should Have Direct Representation on the International St. Lawrence River Board of Control

7.6 A Study Board Should Be Appointed by The International Joint Commission or by a United States Federal Entity, to Investigate and Report expeditiously on Ways to Improve the Regulation of Lake Ontario's Water Levels

8.0 IMPACTS OF OUTER CONTINENTAL SHELF ACTIVITY

8.1 Undertake a Long-Term Involvement with the Federal Offshore Leasing Process, Maintaining a State Capability for Technical Input and Policy Review of All Related Federal Actions Affecting the Coastal Resources of the State, While Working to Anticipate and Ameliorate any Adverse Environmental Impacts to those Resources.

8.2 Work to Ensure Maximim Environmental Protection of the Outer Continental Shelf Resources

*Sound resource management consideration include: biology of the species; managing stocks to attain optimum sustained yield; availability of suitable habitats; public demand; costs; available technology; and political constraints.

- 8.3 Work with the Oil and Gas Industry and Federal Agencies to Ensure the State's "Fair Share" of OCS Energy Resources
- 8.4 In Order to Maximize Economic Benefits to State Residents, Encourage the Siting of Outer Continental Shelf Related Support Facilities in:
1) Environmentally Compatible Areas of the Coast: 2) Developed Areas of the Coast Where Labor, Housing, Commercial Establishments and Associated Industries are Available, Thereby Ensuring the Least Disruption to the Social and Economic Infrastructure
- 8.5 Develop Workable Oil Spill Contingency Plans for Coastal Areas of the State, with Particular Emphasis Given to Localities Along the Marine Coast
- 8.6 Study the Feasibility of Establishing the Tanker Traffic Lanes From Nantucket to Ambrose Farther Offshore
- 9.0 Public Access
- 9.1 Consistent with Natural Resource Protection and Public Demand, Provide For Maximum Public Access to Public Water Related Recreation Resources and Facilities
- 9.2 Increase Opportunities for Physical Access to the Coastline-at-large Consistent with Natural Resource Protection and Protection of Private Property Rights
- 9.3 Increase Visual Access to and Along the Shore and Protect Existing Points of Visual Access
- 9.4 Maintain a Procedure for the Identification of Coastal Areas Requiring Improved Public Access
- 10.0 Recreation
- 10.1 Give Priority to Water-Related Recreation over Non-Water-Related Recreation in the Development of State Park Facilities and in the Allocation of State and Federal Funds for the Development of Recreation Facilities
- 10.2 Increase the Amount of Coastal Recreational Facilities In and Near Urban Areas
- 10.3 Give Priority to Acquisition of Land Shoreward of Major Transportation Facilities Where These Have Significantly Reduced the Amount of Accessible Shorefront Land
- 10.4 Promote the Role of the Private Sector in the Provision of Recreation Facilities
- 10.5 Develop Recreational Marinas, Public Boat Launching Sites, and Harbors of Refuge Where Demand is Greatest

10.6 In a Manner Consistent With Sound Resource Management Principles, Provide for Increased Public Use of Fish and Wildlife Resources for Recreation Purposes by Increasing Access to Existing Resources, Supplementing existing stocks, and by Developing New Resources

10.7 Preserve Historic, Cultural, and Archeological Resources

10.8 Ensure the Consideration of Recreation as a Multiple Use in the Development and Management of Public Facilities in Coastal Areas and in the Development of Waterfront Property

10.9 Prevent Incompatible Development on Lands Immediately Adjacent on Recreational Resources

11.0 Water Quality

11.1 Municipal, Industrial and Commercial Discharge of Pollutants, Including, but Not Limited to, Toxic Substances and Hazardous Substances, Into Coastal Waters Shall Conform to State Water Quality Standards

11.2 State Coastal Management Policies and Information Pertaining to Specific Land and Water Uses Shall Be Considered While Reviewing Coastal Water Classifications and While Modifying Water Quality Standards; However, Those Waters Already Over-Burdened with Contaminants Shall be Recognized as Being a Development Constraint

11.3 Encourage the Use of Alternative or Innovative Sanitary Waste Systems in Those Areas Where the Cost of Conventional Facilities are Unreasonably High, Given the Degree of Protection They Would Afford Priority in Encouraging the Use of Such Systems Shall Be Accorded to Those Areas Where Significant Coastal Resources Will Be Protected

11.4 All Practicable Efforts Shall Be Undertaken to Control Storm Runoff and Combined Sewer Overflows; Priority in Coastal Waters for Such Efforts Shall Be Accorded to Those Areas Where Protection of Significant Coastal Resources Will Be Protected.

11.5 In Providing Funds to Apply Best Management Practices to Mitigate Rural Non-Point Pollution Problems, Priority Shall Be Given to Those Critical Agricultural-Related Water Quality Problems Which Can Best Be Eliminated or Reduced Through Such Practices. The Threat of Impact On Significant Coastal Resources Will Also Be Considered

11.6 Discharge of Waste Material From Vessels Into Coastal Waters Shall Be Limited so as to Protect Fish and Shellfish Habitats, Recreational Areas and Water Supply Areas

11.7 Dredging and Other Excavation in Coastal Waters Shall Be Undertaken In Such a Manner so as to Minimize Adverse Effects On Water Quality and On Other Significant Coastal Resources

- 11.8 Spills Associated With The Shipment and Storage of Petroleum and Other Hazardous Substances Into Coastal Waters Will Be Minimized; All Practicable Efforts Shall Be Undertaken To Expedite the Cleanup of Such Discharges; and Restitution for Damages Will Be Required When These Spills Occur
- 11.9 All Practicable Efforts Shall Be Undertaken To Minimize the Discharge of Excess Nutrients Into Coastal Waters From Both Point and Non-Point Discharge Sources
- 11.10 All Practicable Efforts Shall Be Undertaken To Insure The Protection of the Quantity and Quality of Groundwaters, Particularly Where Such Waters Constitute the Primary or Sole Source of Water Supply
- 11.11 The Disposal of Solid Wastes and the Construction and Operation of Solid Waste Management Facilities Within Coastal Areas Shall Be Conducted In Such a Manner As Not To Release Contaminants Into Ground and Surface Waters.
- 11.12 Effluent Discharged From Major Steam Electric Generating and Industrial Facilities Into Coastal Waters Shall Not Be Unduly Injurious to Fish and Wildlife and Shall Conform to State Water Quality Standards

