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74-005.011

REGIONAL LAKES RESTORATION STUDY PROGRAM: FINANCIAL ASSISTANCE FUNDING PROPOSAL "LAKE LOUISE", "LAKE OF THE LILIES" AND "TWILIGHT LAKE" BOROUGH OF POINT PLEASANT BEACH AND BOROUGH OF BAY HEAD OCEAN COUNTY, NEW JERSEY

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APRIL, 2000

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I. Introduction

The subject of this proposed Regional Lakes Study Report is inventory, assess and recommend restoration strategies the rehabilitation of three (3) existing lakes, which are tidally influenced. Two (2) of the lakes are located within the Borough of Point Pleasant Beach known as "Lake Louise" and "Lake of the Lilies". The third lake is located within the Borough of Bay Head and is known as "Twilight Lake". This report shall present goals and objectives in order to evaluate and assess a much needed comprehensive Regional Lake Restoration Program to assist the Boroughs of Point Pleasant Beach and Bay Head in the rehabilitation of the three (3) lakes as well as securing financial assistance from various County and State programs to off-set the implementation costs.

This Regional Lakes Restoration Study Program will be a cooperative and joint effort implemented by various of strategic public agencies, which may include but not be limited to;

1. Borough of Point Pleasant Beach - Governing Council
2. Borough of Point Pleasant Beach - Environmental Committee
3. Borough of Point Pleasant Beach - Department of Public Works
3. Borough of Point Pleasant Beach - Recreation Department
4. Borough of Bay Head – Governing Council
5. Borough of Bay Head - Environmental Committee
6. Borough of Point Bay Head - Department of Public Works

7. Borough of Bay Head - Recreation Department
8. The County of Ocean – Engineering and Planning Departments
9. N.J.D.E.P. - Bureau of Freshwater & Biological Monitoring
10. N.J.D.E.P. - Land Use Regulation Program
11. Ocean County Soil Conservation District
12. Private Homeowners residing adjacent to the lakes.

For the purposes of this study the project will be considered as two (2) separate study programs with individual budgets for each of the lakes. The rehabilitation study of "Lake Louise" will be a stand alone project while the rehabilitation study of the "Lake of the Lilies" and "Twilight Lake" will be studied together as a joint service Municipal project between Point Pleasant Beach and Bay Head since the Lakes are connected through existing drainage improvements.

Rehabilitation Study - "Lake Louise" - Point Pleasant Beach

II. Inventory

A. Location

The Project site is located within the statutory New Jersey Coastal Zone as shown on the N.J.D.E.P. - Coastal Zone Map. (Exhibit No. 8).

"Lake Louise" is bordered by the following local street roadways:

1. Harvard Ave, Riverside Place & Broadway to the North
2. Baltimore Avenue to the West
3. Niblick Street to the South
4. Randall Avenue to the East

This lake is known as Block 127, Lot 1 on sheet numbers 5 and 7 of the official Borough of Point Pleasant Beach Tax Map (Exhibit 2). The total water area of the Lake is approximately 24.7± Acres.

A local street map and various other environmental resource maps showing the project site as it relates to the site's proximity to residential and commercial development, roadways and other man-made features can be found within the exhibits.

As shown by the enclosed local tax mapping there are approximately 97 lots surrounding "Lake Louise", which contain single family residential lots, condominium type residential development and commercial developments.

B. Ownership of Site and Adjacent Properties

"Lake Louise" is owned by the State of New Jersey and maintained by the Borough of Point Pleasant Beach. As indicated on the enclosed tax maps the entire "Lake Louise" is located within one (1) lot. A Title Search of the subject property shall be conducted to confirm the publics' ownership and rights and/or responsibilities to the Lake.

C. Existing Site Conditions

"Lake Louise" has been designated by the N.J.D.E.P. - Land Use Regulation Program as State Tidal Waters. Based upon our investigation we have determined that "Lake Louise" acts as a natural detention basin for the stormwater management of the local roadway system within the Borough of Point Pleasant Beach. Due to the significant long period of time that has passed without routine lake maintenance and dredging program, "Lake Louise" is in severe need of a Lake Restoration Management and Implementation Plan. Under this plan the Borough of Point Pleasant Beach will cooperatively work with other County and State agencies to secure financial assistance to evaluate, assess and create a restoration plan and encourage implementation of remedial activities in order to revitalize "Lake Louise".

1. Soils

According to the Ocean County Soil Survey (Exhibit 4) the surrounding soil type for "Lake Louise" is as follows;

A. (PN) - Psamments, nearly level

This unit consists of excessively drained to well drained soils that are dominantly made up of mainly yellowish brown, sandy fill placed in low, poorly drained or very poorly drained areas. The permeability of the fill material is rapid.

2. Vegetation

The majority of the site consists as "Tidal Waters" with a limited amount and limited variety of vegetation along the shoreline. Most vegetation expected to be associated with the fringe of the Lake has been cleared for previous residential and roadway development. The vegetative composition along the lake bank is essentially phragmites with limited scrub/shrub vegetation. Several specific reaches of the lake bank areas are completely lacking vegetation and are experiencing severe bank erosion into the lake.

As one (1) component of the "Lake Restoration Management Plan," a landscape/natural bank stabilization plan will be inventoried and assessed in order to stabilize the lake banks, reduce soil erosion into the lake, and provide a more diverse vegetative wildlife habitant to enrich the ecosystem currently depressed within "Lake Louise.

3. Wildlife

The existing conditions of the lake is anticipated not to provide ideal habitat for threatened or endangered species due to the intensity of existing development surrounding the Lake. Bay Pointe Engineering conducted several investigations of the project sites during the course of the preparation of this report. Although these investigations were not specifically for a flora and fauna study or survey, field observations for wildlife were conducted each time Bay Point Engineering personnel were on site. These observations included indirect observation of wildlife or the presence of wildlife signs (tracks, burroughs, feathers, scat, water movement, etc.) and listening for wildlife calls.

As part of the "Lake Restoration Program", "Lake Louise" will be remediated to enhance the wildlife communities along the lake bank as well as within the lake primarily by performing a flora and fauna inventory and assessment and through recommendation of the anticipated stocking of fish under the guidance of the N.J.D.E.P. Bureau of Freshwater and Biological Monitoring.

4. Regulated Wetlands

Site investigation to inventory and delineate any freshwater or tidal wetlands must be performed in order to determine the limits of any lands on or adjacent to the project site which contain freshwater wetlands or tidal coastal wetlands regulated under the Wetland Act of 1970 and the N.J.D.E.P. – Freshwater Wetland Act. "Lake Louise" has been determined to be "Tidal Waters" by the N.J.D.E.P - Freshwater Wetland Map (Exhibit 6).

5. Transition Areas

Transition Areas are upland areas adjacent to freshwater wetlands and the width varies depending upon the "Natural resource value of the Wetland." Based upon the types of wetlands that exist at the site if any, the N.J.D.E.P. may establish buffers of various widths. This study would determine the appropriate buffer area from the lakes and the recommended types of enhancement strategies to be developed within this transition zone.

6. Flood Hazard Area

As per the FEMA Flood Map (Exhibit 5) the entire "Lake Louise" is depicted in Zone-A6 with a flood elevation of 9 as of 2/15/96.

Based upon this resource mapping, both Lakes experience severe influences from stormwater and flooding events. As part of the Lake Restoration Program, inventory of existing stromwater management facilities as well as recommendation for improved water quality of the Lakes and control of stromwater must be evaluated to control siltation build up in the Lakes from roadways, recommend improvements to drainage infrastructure influencing the Lakes and recommend implementation of enhanced water quality control techniques based on the Flood Hazard Control Act rules and regulations governing this project.

III. Project Description

A. Program Coordination

Continued observation by our staff over the past several years has determined that "Lake Louise" is severely malfunctioning and is on the edge of "drying out" and disappearing as a lake due to the lack of maintenance and siltation build up over a long period of time.

It is the intention of the Borough of Point Pleasant Beach to petition to the N.J.D.E.P Bureau of Freshwater & Biological Monitoring to assist in order to enable the creation of the Point Pleasant Beach Lake Restoration Program. This Lake Restoration Program will enable the municipality along with other governmental agencies and special interest groups to formulate a Management Plan to restore the wildlife, water quality and stormwater management function of the "Lake Louise".

As previously mentioned in this report, the creation and implementation of the Lake Restoration Program will be a cooperative effort from several public agencies and special interest groups. As a strategic work plan and possible other sources of funding we recommend the Borough of Point Pleasant Beach Governing Council create a lake restoration sub-committee consisting of representatives from the following departments/agencies in order to comprehensively address all issues in the proposed Lake Restoration Program. This lake restoration sub-committee will be chaired by the Borough Engineer. Recommended representatives on this sub-committee may consist of but not be limited to;

1. Point Pleasant Beach Governing Council
2. Borough Engineer
3. Point Pleasant Beach Environmental Committee
4. Point Pleasant Beach Department of Public Works
5. N.J.D.E.P- Bureau of Freshwater and Biological Monitoring
6. N.J.D.E.P. - Land Use Regulation Program
7. Ocean County Soil Conservation District
8. County of Ocean – Engineering and Planning Departments

This sub-committee would meet to discuss all aspects of the study program and identify all Lake Restoration Issues and develop and carry out the goals and objectives of the Lake Restoration and Mitigation Plan.

Enclosed as Appendix 2 of this report we have attached a brief outline established by Rutgers University as a guidance document to implementing a Lake Restoration Program for the Borough of Point Pleasant Beach Study Project. It is the intention to refer and use this document as a key guide in studying the lake.

B. Preliminary Budget

The budget anticipated to complete the investigation and study of the "Lake Louise" Restoration Plan would be $55,000.00. This would specifically include the scope of services outlined in

Section IV of this report entitled "Project Phasing". The specific scope of services included in the study as outlined includes;

-Preliminary Assessment (PA)
-Site Investigation (SI)
-Remedial Alternative Analysis (RAA)
-Remedial Action Plan (RAP)
-Permit Identification and Application Schedule (PIAS)

Rehabilitation Study - "Lake of the Lilies" - Point Pleasant Beach

Rehabilitation Study - "Twilight Lake" - Bay Head

II. Inventory

A. Location

The Project site is located within the statutory New Jersey Coastal Zone as shown on the N.J.D.E.P. – New Jersey Coastal Zone Map. (Exhibit No. 8).

"Lake of the Lilies" is bordered by the following local street roadways:

1. Newark Ave, Washington Ave & Baltimore Ave. to the North
2. St. Louis Avenue to the West
3. Elizabeth Avenue to the South
4. Ocean Avenue & Baltimore Avenue to the East

This tidally influenced lake is known as Block 18.05, Lot 1 and 8 on sheet numbers 2 of the official Point Pleasant Beach Tax Map (Exhibit 2). The total water area of the Lake is approximately 21± Acres.

"Twilight Lake" is bordered by the following local street roadways:

1. Twilight Road to the North
2. Park Avenue & West Lake Avenue to the West
3. Bridge Avenue to the South
4. Lake Avenue to the East

This lake is known as Block 17, Lots 3, 7 and 8 and Block 25, Lots 13, 13.01, 14, 14.01, 15, 16.01, 16.02, and 16.03 on sheet number 2 of the official Borough of Bay Head Tax Map (Exhibit 2). The total water area of the Lake is approximately 25± Acres.

A local street map and various other environmental resource maps showing the project site as it relates to the site's proximity to residential and commercial development, roadways and other man-made features can be found within the exhibits.

As shown by the enclosed local tax mapping there are approximately 45 single family residential lots surrounding "Lake of the Lilies" and approximately 50 single family residential lots surrounding "Twilight Lake".

B. Ownership of Site and Adjacent Properties

The "Lake of the Lilies" is owned and maintained by the Borough of Point Pleasant Beach, while "Twilight Lake" is partially owned by the Borough of Bay Head and State of New Jersey and maintained by the Borough of Bay Head. "Twilight Lake" is also bisected by a NJ transit train R.O.W.

"Lake of the Lilies" has a shoreline adjacent to two (2) lots owned by the municipality known as Block 18.05, Lot 1 & 8. However, Block 18.05, Lot 9 which has substantial lake shoreline is privately owned. As indicated on the attached tax map of "Twilight Lake", portions of the lake are owned by the Borough of Bay Head and by the State of New Jersey. A Title Search of all

Lake Tax Lots shall be conducted to ascertain the publics' ownership and rights and/or responsibilities to the Lake.

C. Existing Site Conditions

Based upon our preliminary investigation we have determined the two (2) existing lakes act as a natural detention basins for the stormwater management of the local roadway system within the Borough of Point Pleasant Beach and the Borough of Bay Head. Due to the significant long period of time that has passed without routine lake maintenance and dredging, the two (2) lakes are in severe need of a Lake Restoration Management and Implementation Plan. Under this plan the Boroughs of Point Pleasant Beach and Bay Head will cooperatively work with other County and State agencies to secure financial assistance to evaluate, assess and create a restoration plan and implement the construction of revitalizing these two (2) Municipal Lakes.

The project site boundaries and adjacent development are best indicated on the Tax Maps provided.

1. Soils

According to the Ocean County Soil Survey (Exhibit 5) the surrounding soil type at the two (2) existing Lakes are as follows;

A. (PN) - Psamments, nearly level

This unit consists of excessively drained to well drained soils that are dominantly made up of mainly yellowish brown, sandy fill placed in low, poorly drained or very poorly drained areas. The permeability of the fill material is rapid.

B. (PO) – Psamments, sulfidic substratum

This unit consists of deep, moderately well drained and somewhat poorly drained, sandy fill material over sulfaguents and sulfihemists. The fill material is also very rapidly permeable. Before being filled, these sites were subject to daily tidal flooding. Sufficient fill has been added to prevent the normal tidal flooding, but the areas are subject to flooding during storms.

C. (LhA) – Lakehurst sand, 0 to 3 percent slopes

This nearly level, moderately well drained or somewhat poorly drained soil is in depressed areas and on low terraces. The permeability of this soil is rapid in the subsoil and substratum.

D. (SS) – Sulfaquents and Sulfihemists, frequently flooded

This unit consists of deep, poorly drained or very poorly drained soils and areas of organic material underlain by mineral material. The soils are in tidal marsh areas and are subject to tidal flooding. The areas have numerous shallow ponds.

E. (UP) – Urban land – Fripp complex

This complex consists of areas of Urban land and excessively drained Fripp soils in urbanized areas of the coastal dunes on the barrier islands. Permeability is rapid in areas of this complex where the soils are relatively undisturbed, and it is variable in areas dominated by cuts, fills, and Urban land.

2. Vegetation

The majority of the sites consist as "Tidal Waters" with a limited amount and limited variety of vegetation along the shoreline. Most vegetation expected to be associated with the fringe of the Lake has been cleared for previous residential and roadway development. The vegetative composition along the lake bank is essentially phragmites with limited scrub/shrub vegetation. Several specific reaches of the lake bank areas are completely lacking vegetation and are experiencing severe bank erosion into the lake.

As one (1) component of the "Lake Restoration Management Plan," a landscape/natural bank stabilization plan will be inventoried and assessed in order to stabilize the lake banks, reduce soil

erosion into the lake, and provide a more diverse vegetative wildlife habitat to enrich the ecosystem currently depressed within the two (2) lakes.

3. Wildlife

The existing conditions of the lakes are anticipated not to provide ideal habitat for threatened or endangered species due to the intensity of existing development surrounding the Lakes. Bay Pointe Engineering conducted several investigations of the project sites during the course of the preparation of this report. Although these investigations were not specifically for a flora and fauna study or survey, field observations for wildlife were conducted each time Bay Pointe Engineering personnel were on site. These observations included indirect observation of wildlife or the presence of wildlife signs (tracks, burroughs, feathers, scat, water movement, etc.) and listening for wildlife calls.

As part of the "Lake Restoration Program", the two (2) lakes will be remediated to enhance the wildlife communities along the lake bank as well as within the lake primarily performing a flora and fauna inventory and assessment and through recommendation of the anticipated stocking of fish under the guidance of the N.J.D.E.P. Bureau of Freshwater and Biological Monitoring.

4. Regulated Wetlands

Site investigation to inventory and delineate any freshwater or tidal wetlands must be performed in order to determine the limits of any lands on or adjacent to the project sites which contain freshwater wetlands or tidal coastal wetlands regulated under the Wetland Act of 1970 and the

N.J.D.E.P. – Freshwater Wetland Act. However, both lakes have been determined to be "Tidal Waters" by the N.J.D.E.P - Freshwater Wetland Map (Exhibit 6). Based upon Bay Pointe Engineering Associates, Inc. site inspections there are "Tidal Waters" as well as Freshwater Wetlands on site at "Lake of the Lilies". As such, a N.J.D.E.P - Letter of Interpretation to verify the wetland limits will not be secured under this Lake Restoration Program.

5. Transition Areas

Transition Areas are upland areas adjacent to freshwater wetlands and the width varies depending upon the "Natural resource value of the Wetland." Based upon our inspections we have determined since there are freshwater wetlands on the fringe of the "Lake of the Lilies", a fifty (5) foot wide transition zone would be established by N.J.D.E.P.

6. Flood Hazard Area

As per the FEMA Flood Map (Exhibit 6) the entire "Lake of the Lilies" is depicted in Zone-A6 with a flood elevation of 9 as of 2/15/96.

The FEMA Flood Map depicts "Twilight Lake" is within Zone AE with a flood elevation of 5 as of January 21, 2000.

Based upon this resource mapping, both Lakes experience severe influences from stormwater and flooding events. As part of the Lake Restoration Program, steps must be taken to better control siltation build up from roadways, improve drainage infrastructure influencing the Lakes

and implement better water quality controls based on the Flood Hazard Control Act rules and regulations governing this project.

III. Project Description

A. Program Coordination

Continued observation by our staff over the past several years has determined that both lakes is severely malfunctioning and is on the edge of "drying out" and disappearing as a lake due to the lack of maintenance and siltation build up over a long period of time.

It is the intention of the Borough of Point Pleasant Beach and the Borough of Bay Head to petition to the N.J.D.E.P Bureau of Freshwater & Biological Monitoring to assist in order to enable the creation of the Point Pleasant Beach and Bay Head Lake Restoration Program. This Lake Restoration Program will enable the municipality along with other governmental agencies and special interest groups to formulate a Management Plan to restore the wildlife, water quality and stormwater management function of the two (2) lakes.

As previously mentioned in this report, the creation and implementation of the Lake Restoration Program will be a cooperative effort from several public agencies and special interest groups. As a strategic work plan and possible other sources of funding we recommend the Borough of Point Pleasant Beach Governing Council create a lake restoration sub-committee consisting of representatives from the following departments/agencies in order to comprehensively address all

issues in the proposed Lake Restoration Program. This lake restoration sub-committee will be administered by the Borough Engineer. Recommended representatives on this sub-committee may consist of but not be limited to;

1. Point Pleasant Beach Governing Council
2. Point Pleasant Beach Environmental Committee
3. Point Pleasant Beach Department of Public Works
4. Bay Head Governing Council
5. Bay Head Environmental Committee
6. Bay Head Department of Public Works
7. Borough Engineers
8. N.J.D.E.P- Bureau of Freshwater and Biological Monitoring
9. N.J.D.E.P. - Land Use Regulation Program
10. Ocean County Soil Conservation District
11. County of Ocean – Engineering and Planning Departments

This sub-committee would meet to discuss all aspects of the study program and identify all Lake Restoration Issues and develop and carry out the goals and objectives of the Lake Restoration and Mitigation Plan.

Enclosed as Appendix 2 of this report we have attached a brief outline established by Rutgers University as a guidance document to implementing a Lake Restoration Program for the Borough of Point Pleasant Beach, Project.

B. Preliminary Budget

The budget anticipated to complete the investigation and study of the "Lake of the Lilies" and Twilight Lake" Restoration Plan would be $55,000.00 per lake for a total of $110,000.00. This would specifically include the scope of services outlined in Section IV of this report entitled "Project Phasing". The specific scope of services included in the study as outlined includes;

Preliminary Assessment (PA)
Site Investigation (SI)
Remedial Alternative Analysis (RAA)
Remedial Action Plan (RAP)
Permit Identification and Application Schedule (PIAS)

IV. Scope of Services - Project Phasing and Economic Budget

A. Preliminary Assessment (PA)

Purpose of the Preliminary Assessment is to identify and inventory the physical features of the lakes and associated areas of special concern through literature research. This may include features and / or conditions at the lakes that indicate erosion problem areas and siltation discharge points.

The Preliminary assessment for each Lake will involve but may not be necessarily limited to the following principal components:

- Historical search/review
- Detailed site reconnaissance of existing mapping
- Governmental record review
- Tax Record, Deeds, and Title Search investigations.

*No site investigation work will be performed under this phase.

B. Site Investigation (SI)

This phase is the detailed inventory and analysis through site inspection of all physical features and attributes of the lakes. This scope of work would include;

- Environmental Impact Study
- Freshwater Wetland Delineation
- Transition Area (Buffer) Designation
- Flora and Fauna Study
- Detailed Surveying to Determine,
    - A) Tree/vegetation lines.
    - B) Edge of lake banks.
    - C) Locate all stormwater outfalls with inverts discharging into lake.
    - D) Topographic survey
    - E) Outbound property survey
    - F) Soundings of Lake Water depths
    - G) Locate all structures within a fifty foot off-set from lake property.

- Establish and Implement a Water Quality Testing Program to establish;
    - A) Number of water samples to be taken
    - B) Protocol of testing perimeters
    - C) Testing of implementation (field sampling)
    - D) Laboratory testing of samples
    - E) Analysis of test results

C. Remedial Alternative Analysis (RAA)

This phase will consist of three (3) Alternation Remedial Action plans based on analysis and results of the prior phases and addressing the following main limitations for each alternative,

A) Total project cost analysis
B) Quantity of dredging required to be performed
C) Environmental/regulatory value of the dredge material
D) Dredge disposal methods and disposal site.

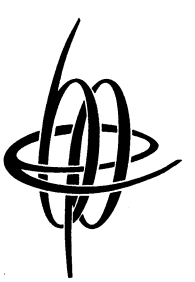
D. Remedial Action Plan

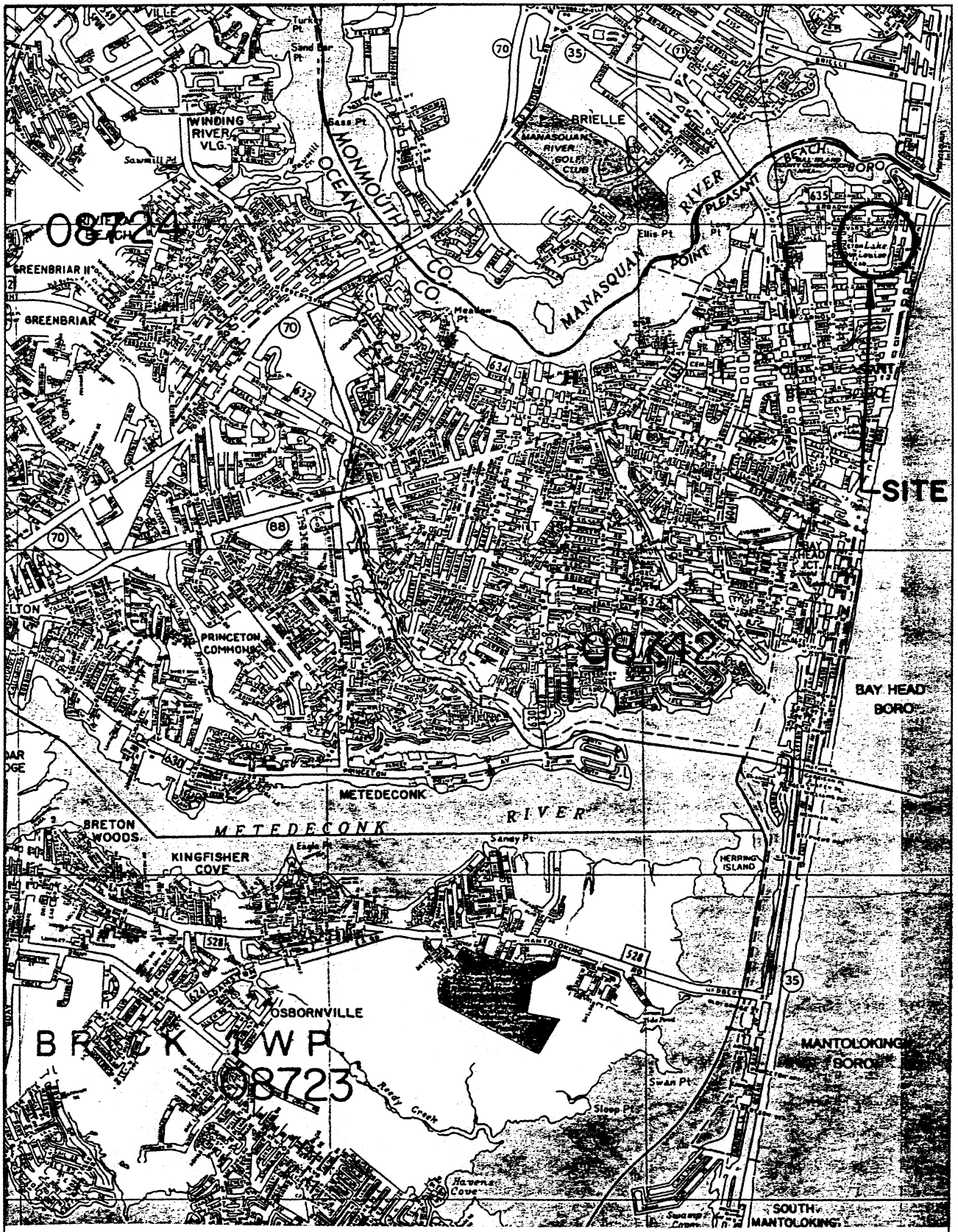
Based on the Alternative Remedial action Plan selected and approved by the local Governing Body, this phase would consist of performing the necessary engineering, planning, survey and environmental services to complete plans and specifications in order to solicit bids from outside contractor to bid on the project as well as to secure all applicable required permits. This phase would also consist of a detailed Engineer's Cost Estimate with construction schedule to complete the project.

E. Permit Identification and Application Schedule (PIAS)

Based on the selected Remedial Action Plan chosen, this phase would include a listing of all local, county, state and federal regulatory permit applications which may be required. The permit inventory would recognize the application fees to regulatory agencies, permit application documents necessary to submit to appropriate agencies and the specific permit conditions and/or threshold which may need to be met in order to secure the required permit. This phase would also include a permit schedule with anticipate dates to submit, regulatory review, and secure final permits and perform permit compliance tasks.

EXHIBITS
FOR
"LAKE LOUISE"

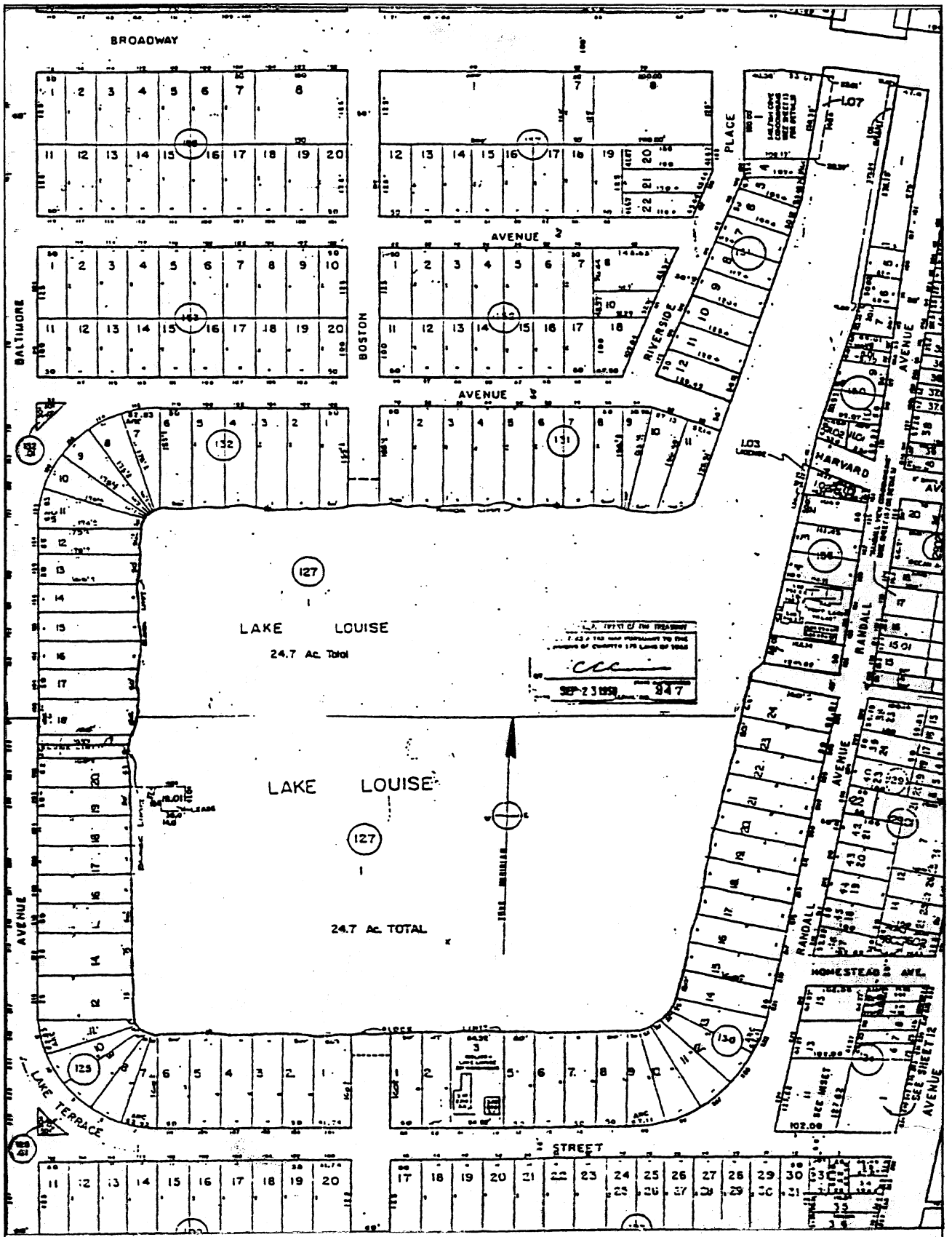




HAGSTROM LOCAL STREET MAP

LAKE RESTORATION PROGRAM
LAKE LOUISE
POINT PLEASANT BEACH, OCEAN COUNTY, NJ

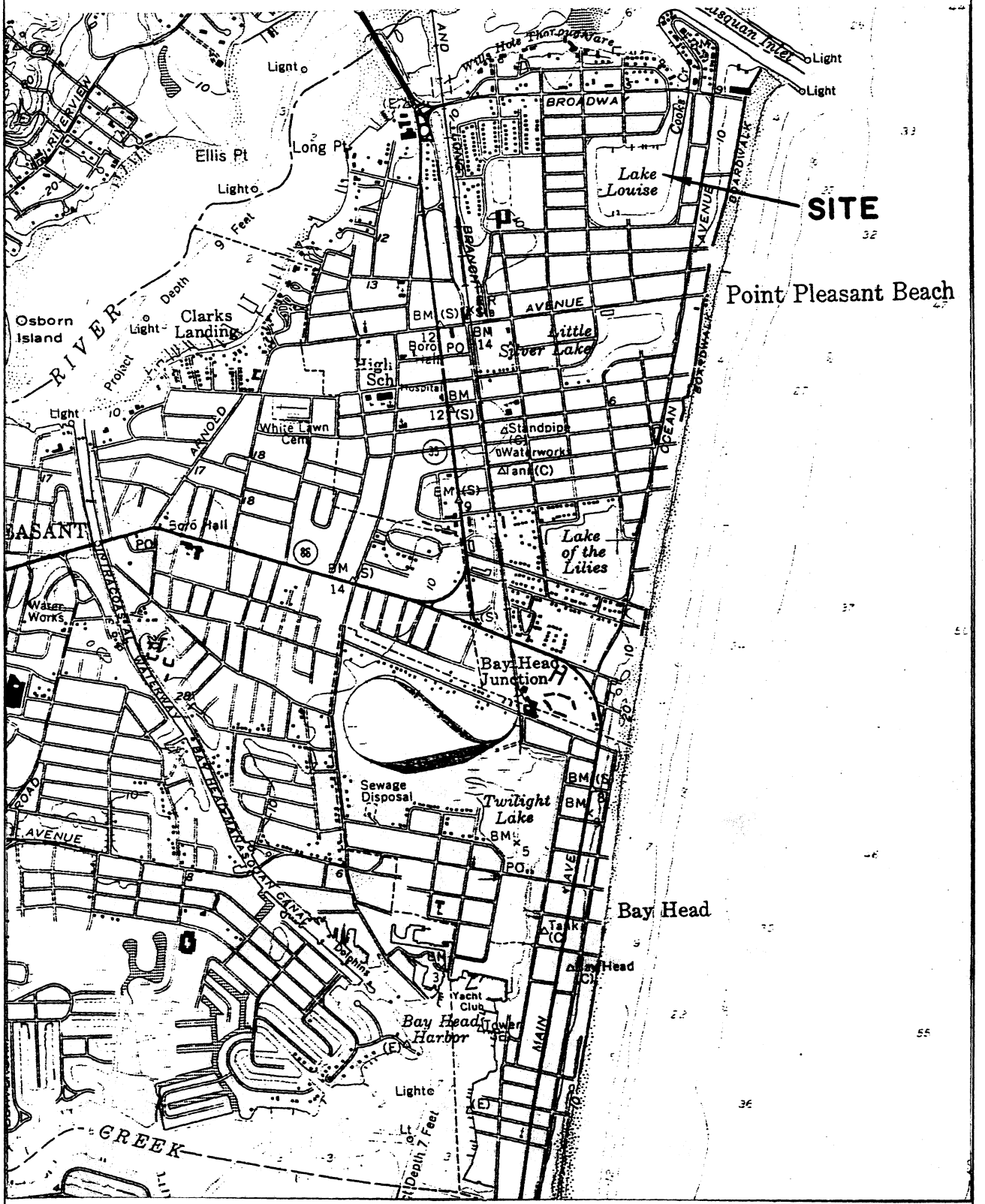
EXHIBIT 1



BOROUGH OF POINT PLEASANT TAX MAP

LAKE RESTORATION PROGRAM
LAKE LOUISE
POINT PLEASANT BEACH, OCEAN COUNTY, NJ

EXHIBIT 2



U.S. GEOLOGICAL SURVEY MAP

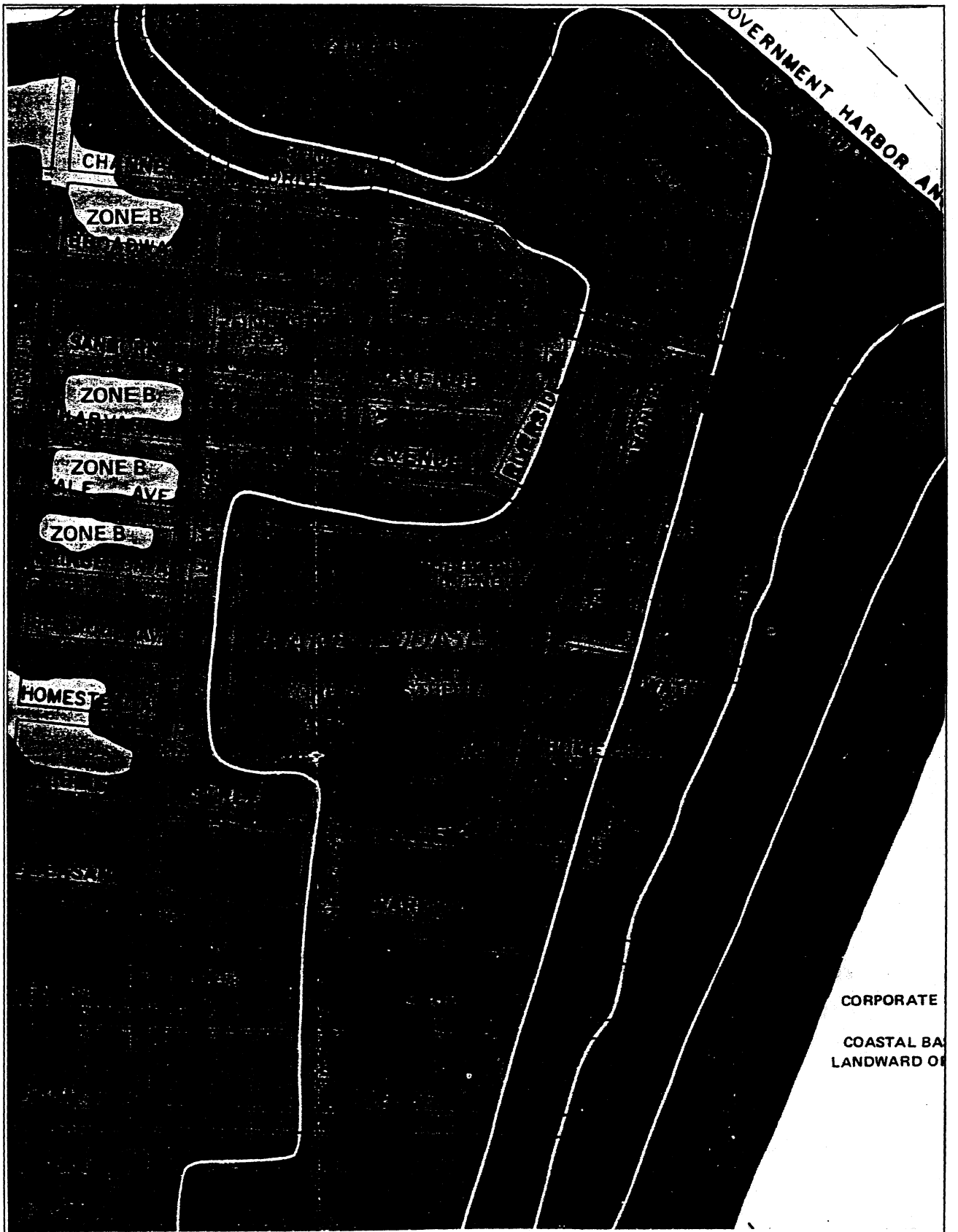
LAKE RESTORATION PROGRAM
LAKE LOUISE
POINT PLEASANT BEACH, OCEAN COUNTY, NJ

EXHIBIT 3

OCEAN COUNTY SOIL SURVEY MAP

LAKE RESTORATION PROGRAM
LAKE LOUISE
POINT PLEASANT BEACH, OCEAN COUNTY, NJ

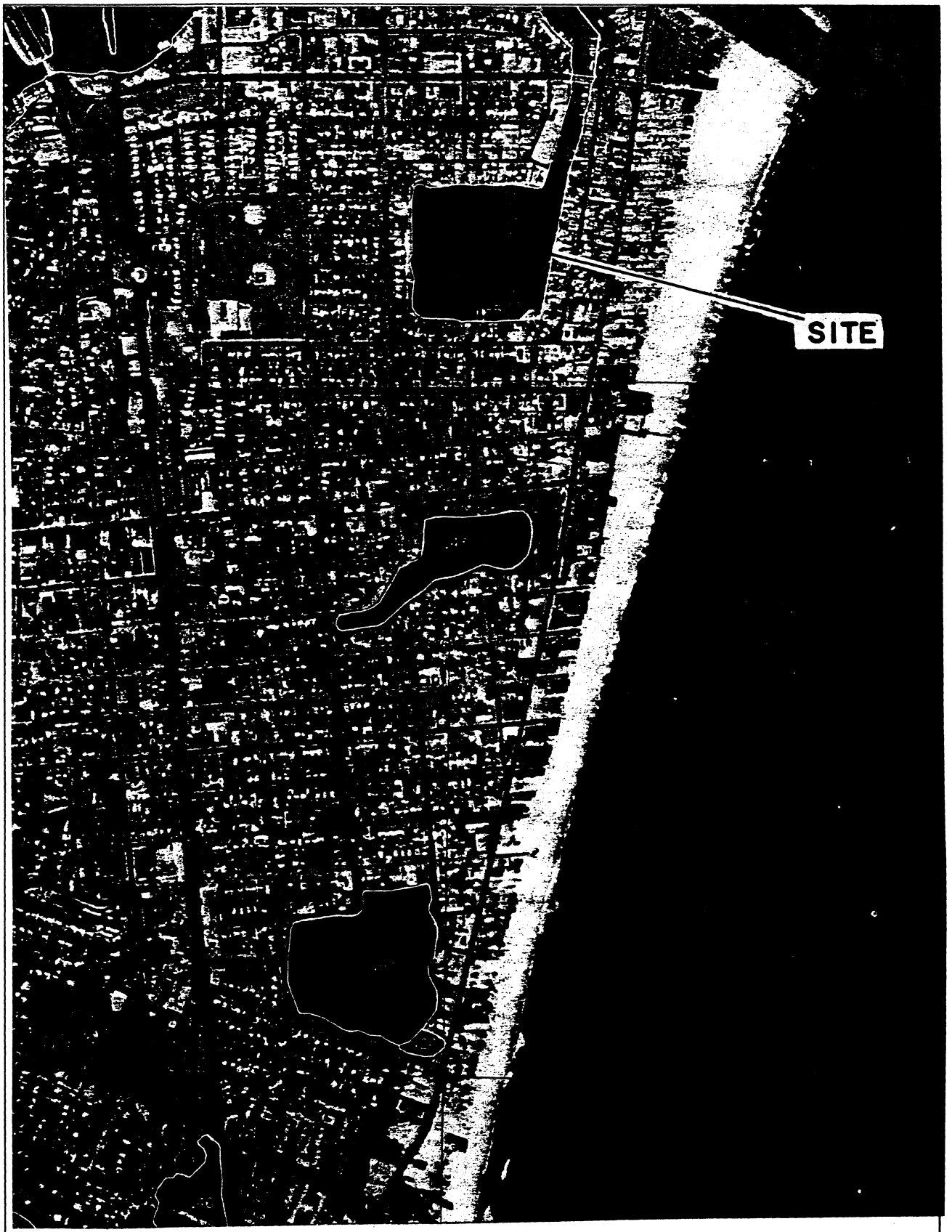
EXHIBIT 4



FEMA FLOOD MAP

LAKE RESTORATION PROGRAM
LAKE LOUISE
POINT PLEASANT BEACH, OCEAN COUNTY, NJ

EXHIBIT 5



N.J.D.E.P. – FRESHWATER WETLANDS MAP

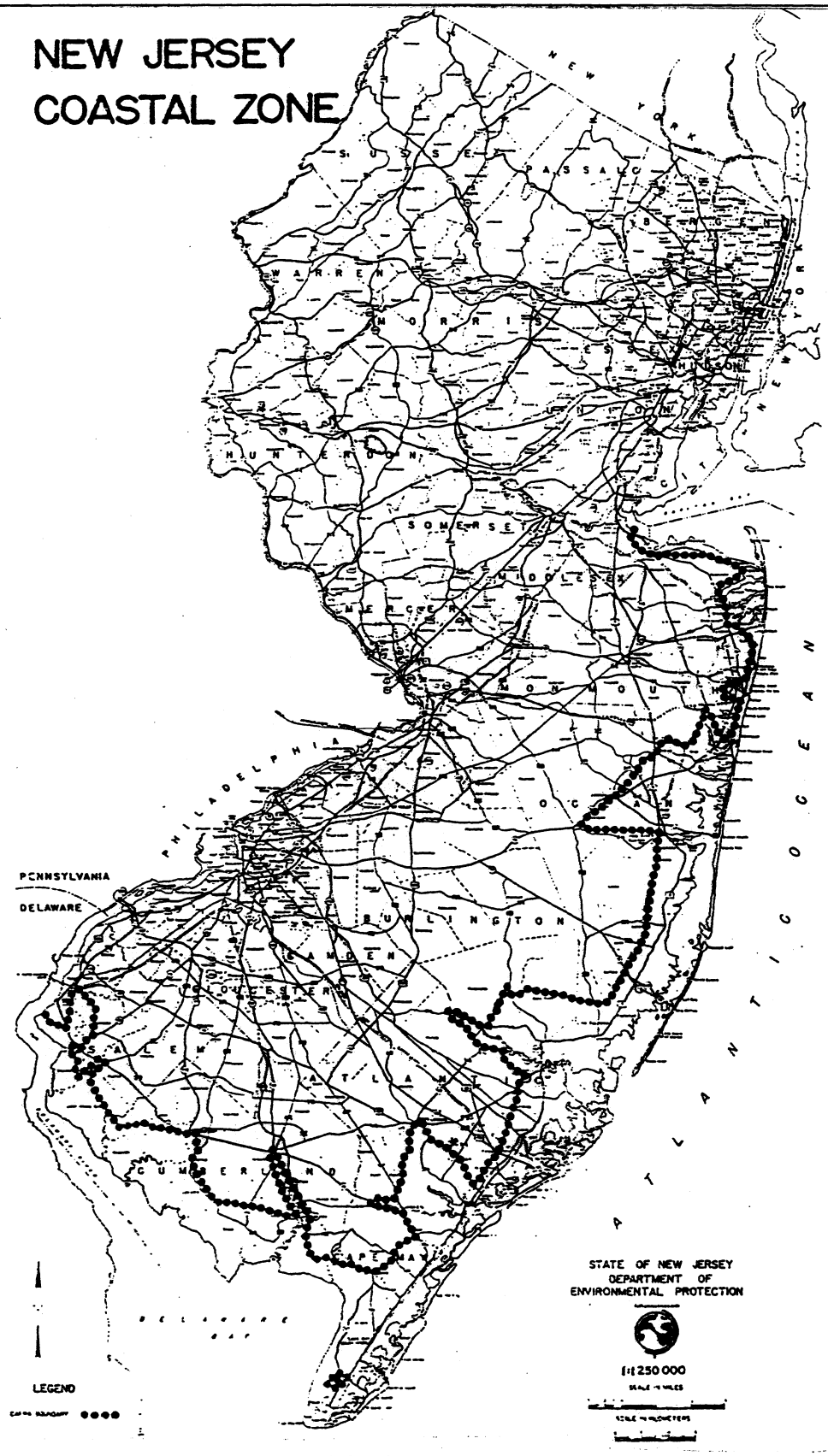
LAKE RESTORATION PROGRAM
LAKE LOUISE
POINT PLEASANT BEACH, OCEAN COUNTY, NJ

EXHIBIT 6

D.O.I. NATIONAL WETLANDS INVENTORY MAP

LAKE RESTORATION PROGRAM
LAKE LOUISE
POINT PLEASANT BEACH, OCEAN COUNTY, NJ

EXHIBIT 7

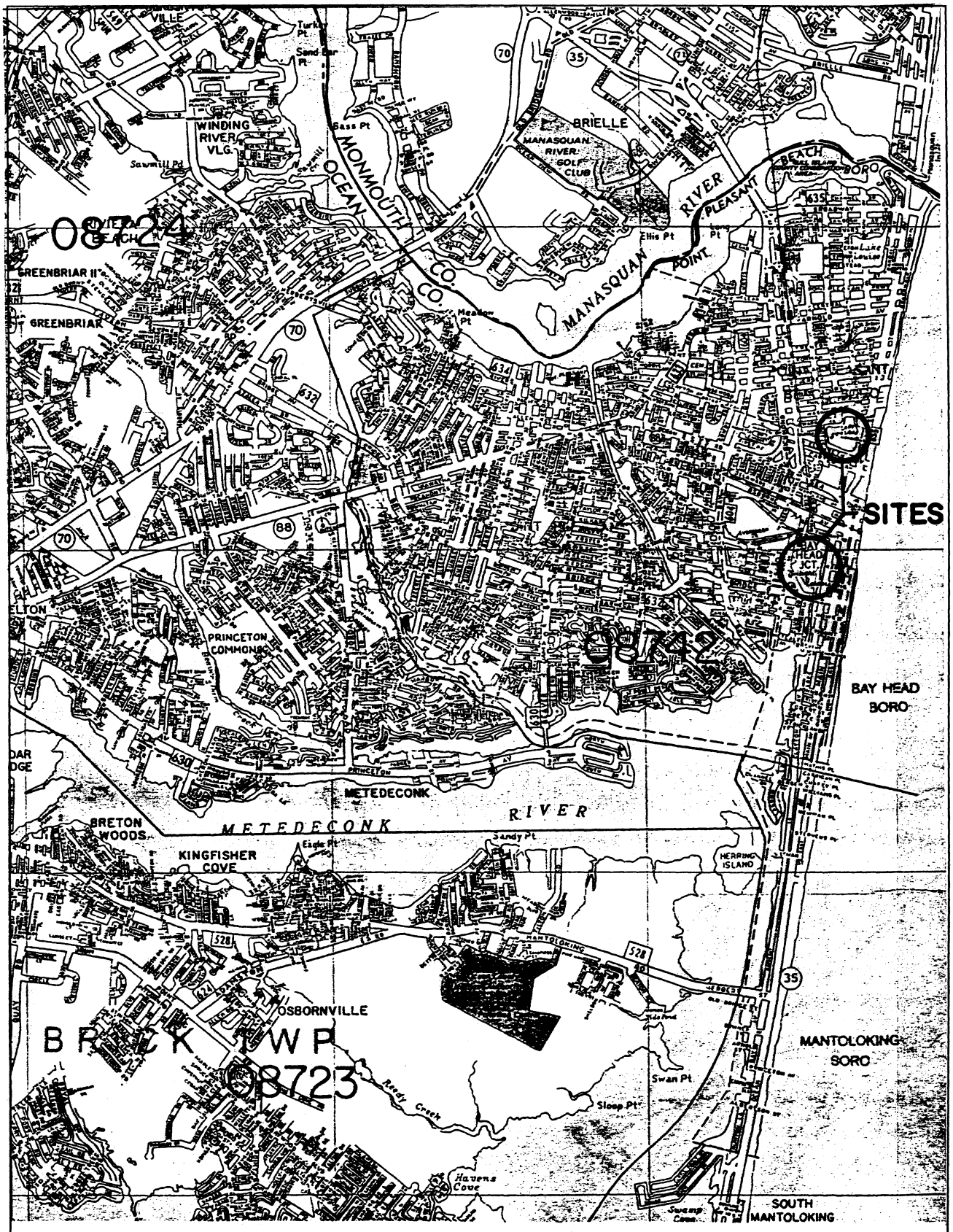


N.J.D.E.P. – COASTAL ZONE MAP

LAKE RESTORATION PROGRAM
LAKE LOUISE
POINT PLEASANT BEACH, OCEAN COUNTY, NJ

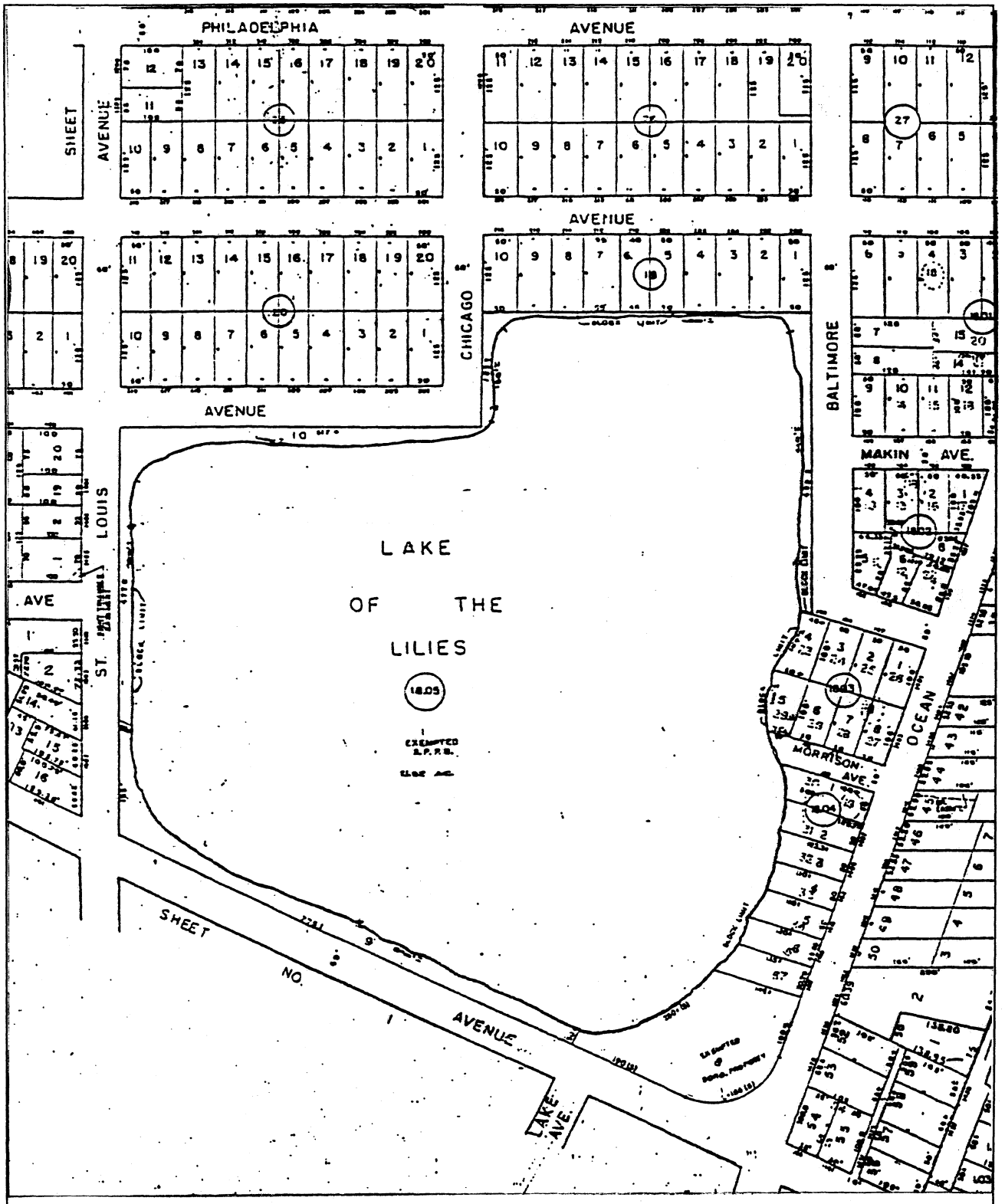
EXHIBIT 8

EXHIBITS
FOR
"LAKE OF THE LILIES" AND TWILIGHT LAKE"



HAGSTROM LOCAL STREET MAP

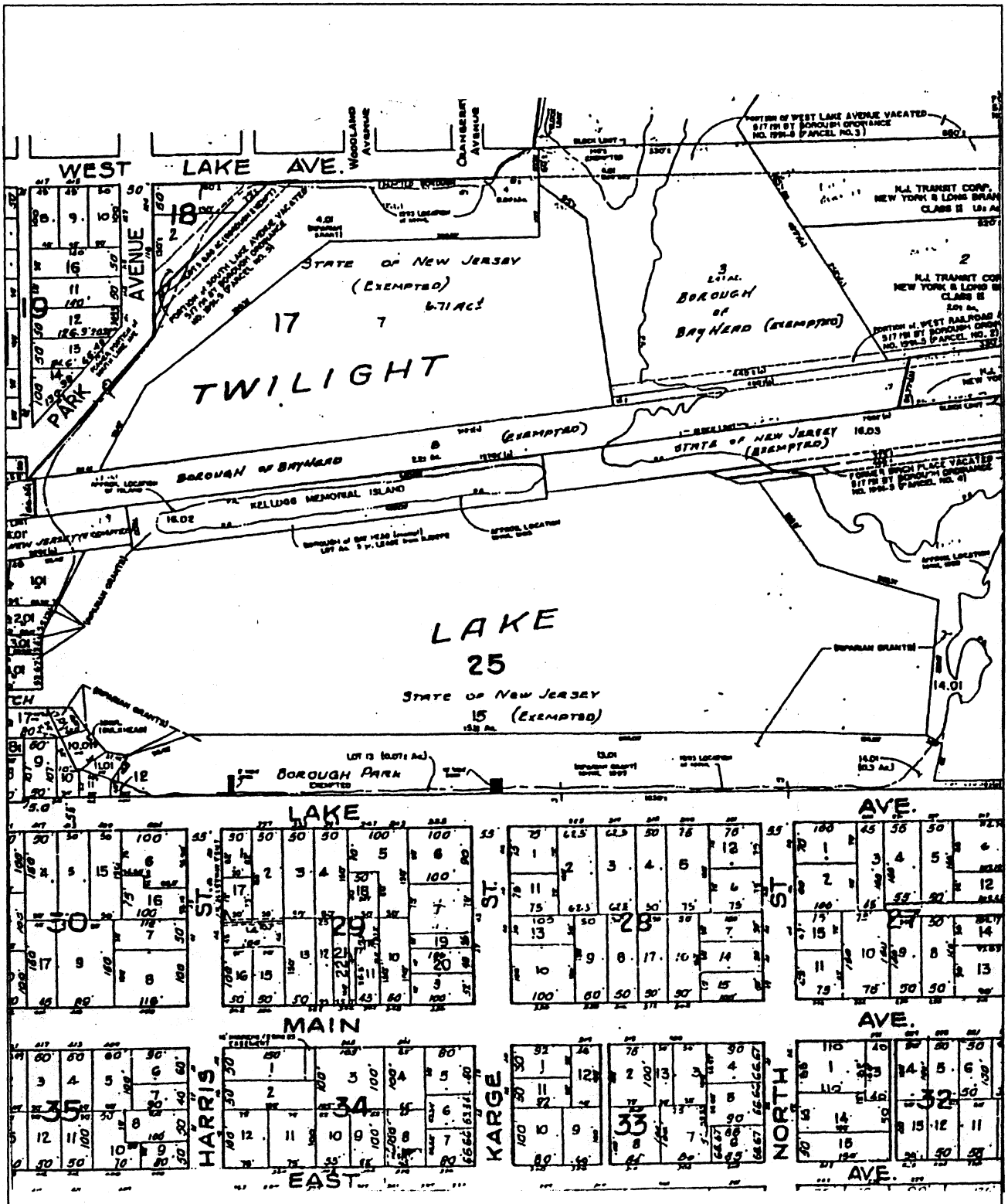
LAKE RESTORATION PROGRAM
LAKE OF THE LILIES & TWILIGHT LAKE
POINT PLEASANT BEACH / BAY HEAD, OCEAN COUNTY, NJ EXHIBIT 1



BOROUGH OF POINT PLEASANT TAX MAP

LAKE RESTORATION PROGRAM
LAKE OF THE LILIES
POINT PLEASANT BEACH, OCEAN COUNTY, NJ

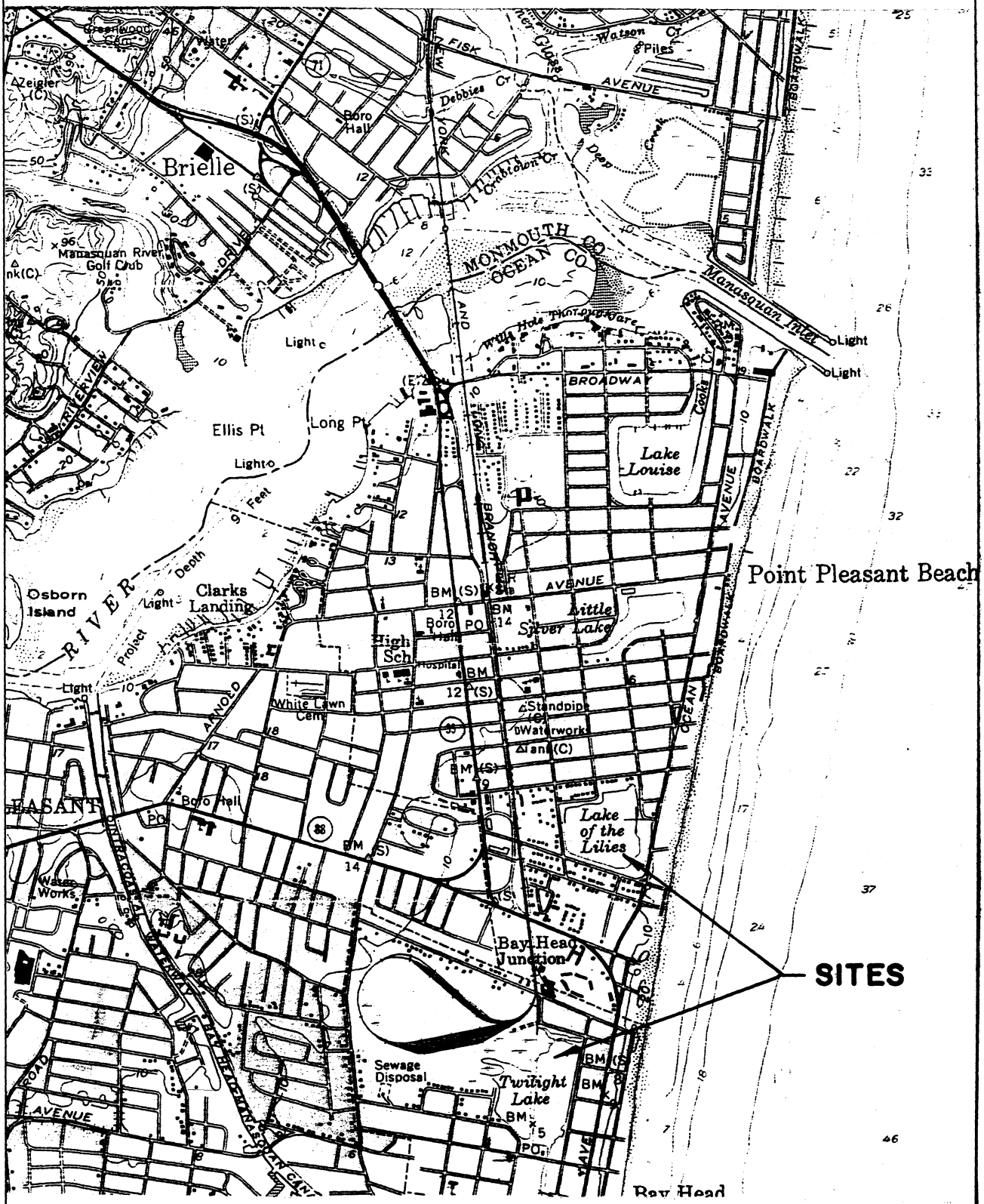
EXHIBIT 2A



BOROUGH OF BAY HEAD TAX MAP

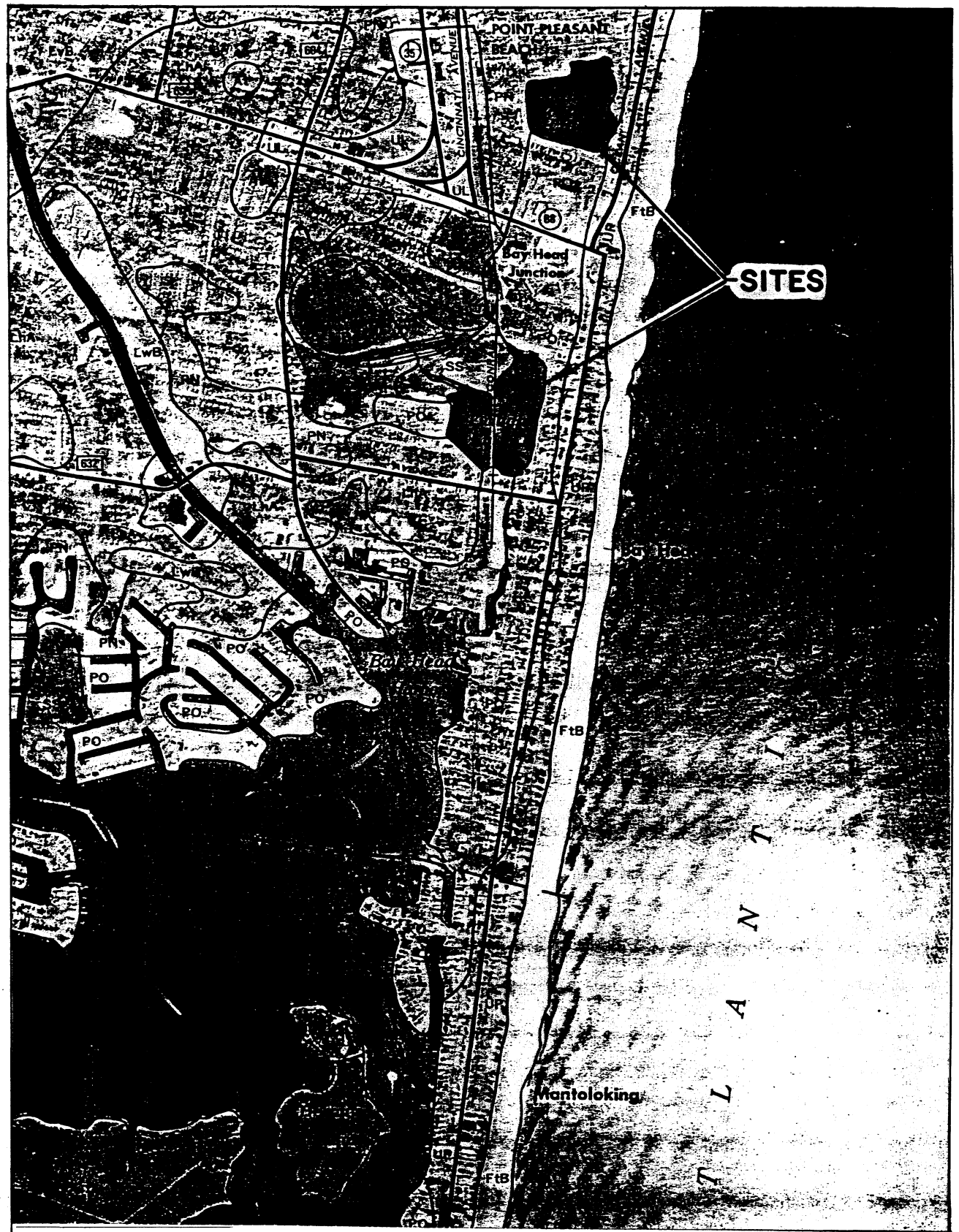
LAKE RESTORATION PROGRAM
TWILIGHT LAKE
BAY HEAD, OCEAN COUNTY, NJ

EXHIBIT 2B



U.S. GEOLOGICAL SURVEY MAP

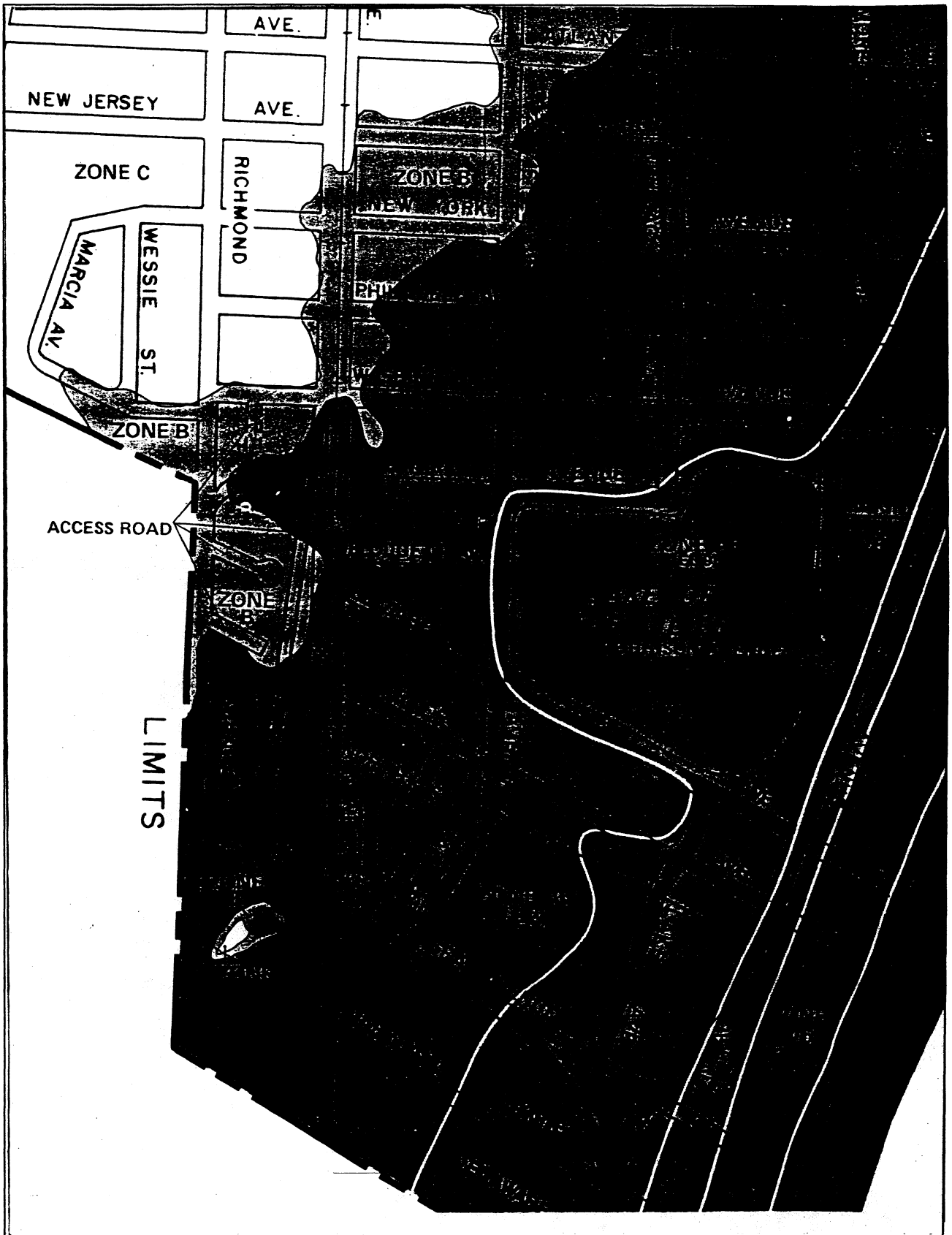
LAKE RESTORATION PROGRAM
LAKE OF THE LILIES & TWILIGHT LAKE
POINT PLEASANT BEACH / BAY HEAD , OCEAN COUNTY, NJ EXHIBIT 3



OCEAN COUNTY SOIL SURVEY MAP

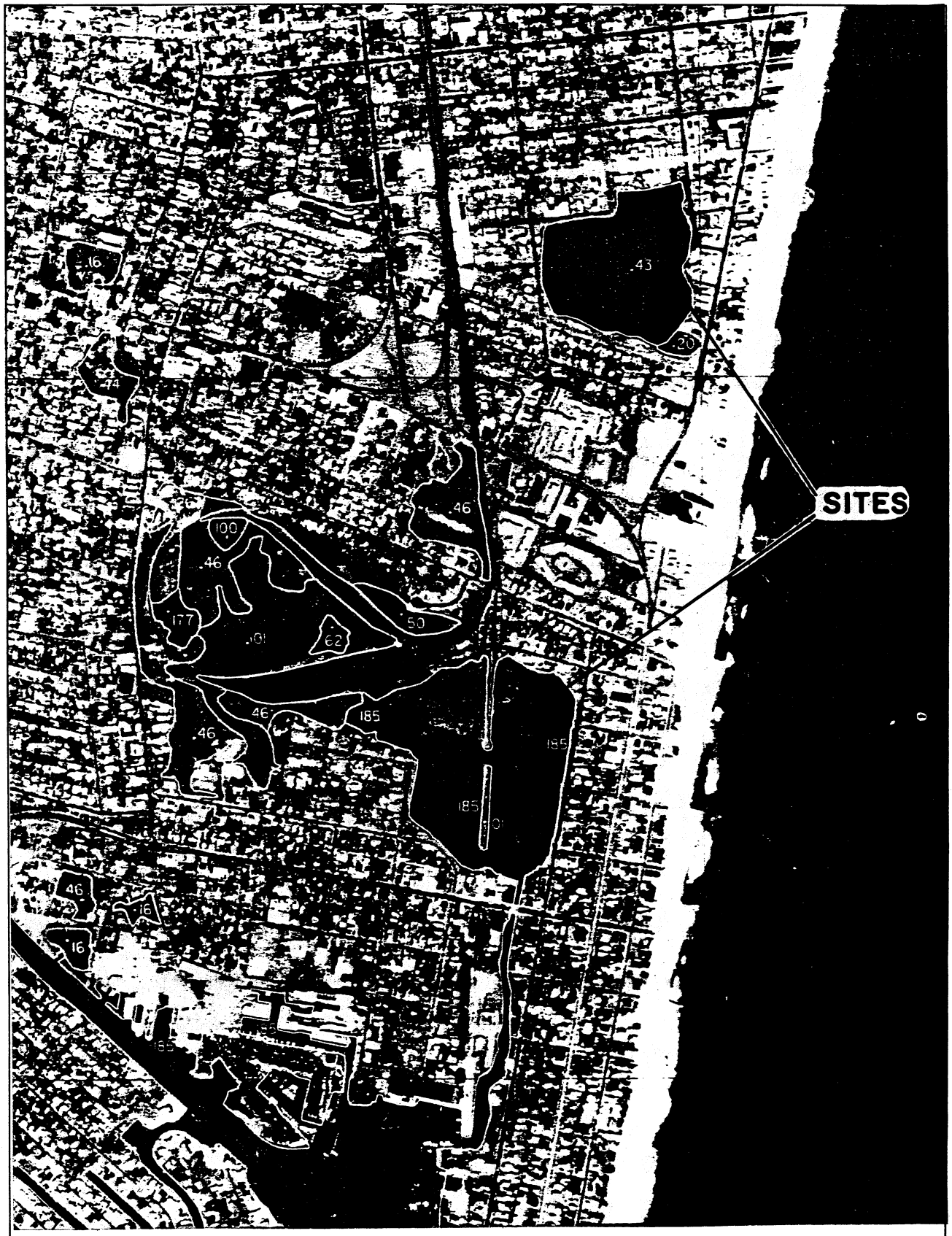
LAKE RESTORATION PROGRAM
LAKE OF THE LILIES & TWILIGHT LAKE
POINT PLEASANT BEACH / BAY HEAD, OCEAN COUNTY, NJ

EXHIBIT 4



FEMA FLOOD MAP

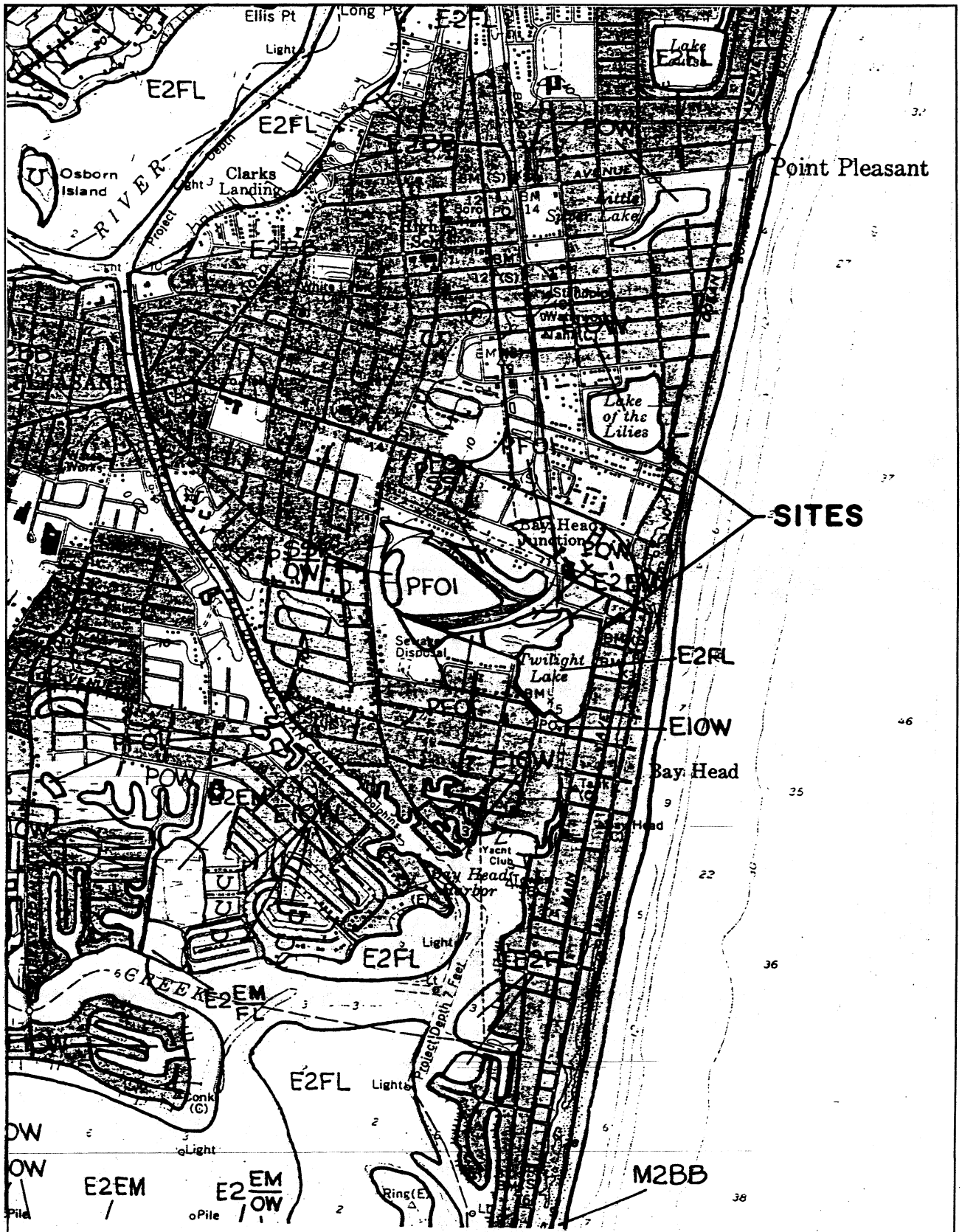
LAKE RESTORATION PROGRAM
LAKE OF THE LILIES & TWILIGHT LAKE
POINT PLEASANT BEACH / BAY HEAD, OCEAN COUNTY, NJ EXHIBIT 5



N.J.D.E.P. – FRESHWATER WETLANDS MAP

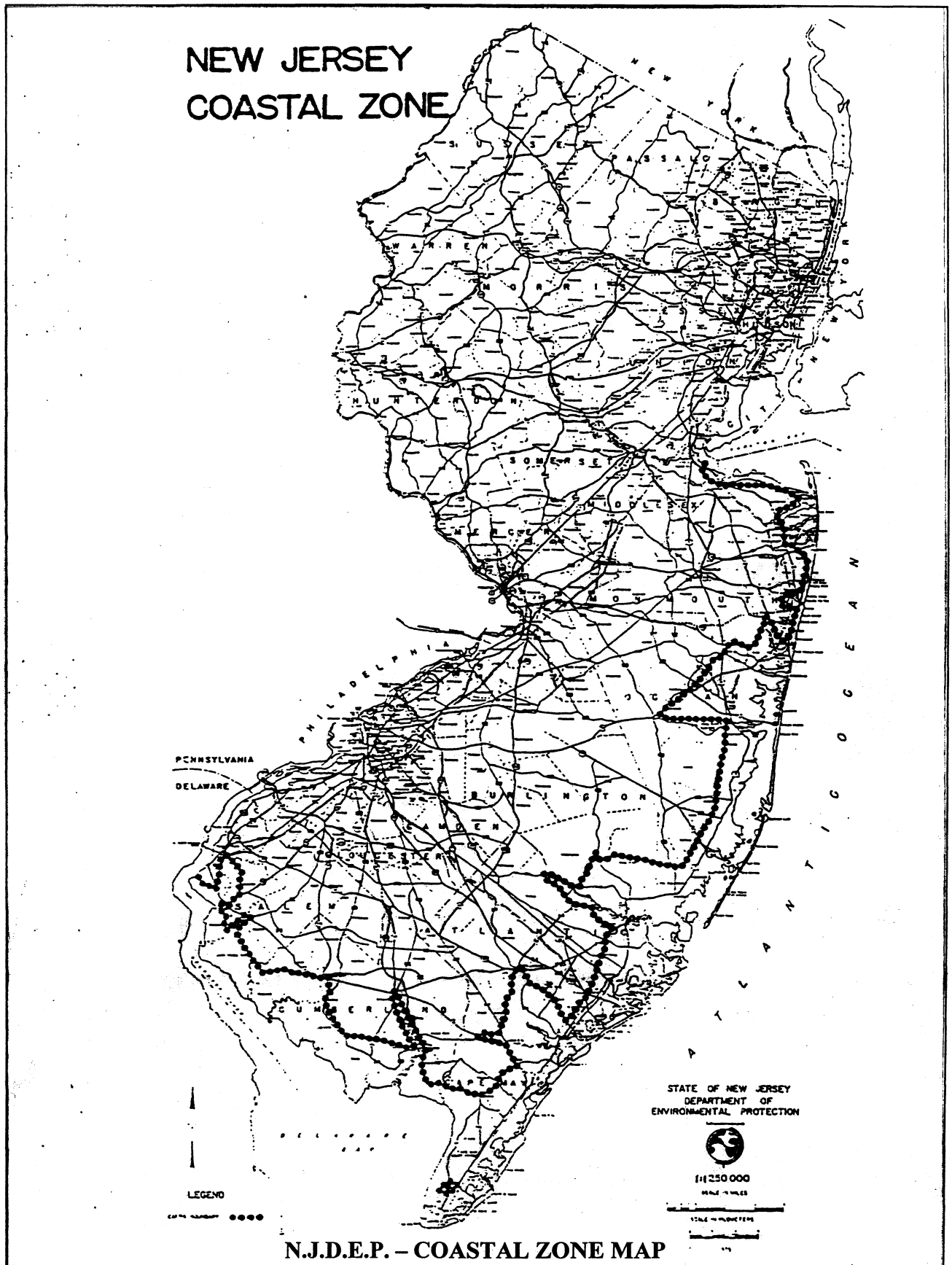
LAKE RESTORATION PROGRAM
LAKE OF THE LILIES & TWILIGHT LAKE
POINT PLEASANT BEACH / BAY HEAD, OCEAN COUNTY, NJ

EXHIBIT 6



D.O.I. NATIONAL WETLANDS INVENTORY MAP

LAKE RESTORATION PROGRAM
LAKE OF THE LILIES & TWILIGHT LAKE
POINT PLEASANT BEACH / BAY HEAD, OCEAN COUNTY, NJ EXHIBIT 7



N.J.D.E.P. – COASTAL ZONE MAP

LAKE RESTORATION PROGRAM
LAKE OF THE LILLIES & TWILIGHT LAKE
POINT PLEASANT BEACH / BAY HEAD, OCEAN COUNTY, NJ

EXHIBIT 8

APPENDIX I - N.J. Register - Proposal For Lake Restoration Funds
Dated July 7, 1997

ENVIRONMENTAL PROTECTION

(a)

DIVISION OF ENVIRONMENTAL SAFETY, HEALTH AND ANALYTICAL PROGRAMS

Water Monitoring
Lake Restoration Funds
Proposed New Rules: N.J.A.C. 7:9-2

Authorized By: Robert C. Shinn, Jr., Commissioner, Department of Environmental Protection.

Authority: P.L. 1996, c.70, Section 2 (Port of New Jersey Revitalization, Dredging, Environmental Cleanup, Lake Restoration, and Delaware Bay Area Economic Development Bond Act of 1996).

DEP Docket Number: 12-97-05/628.

Proposal Number: PRN 1997-270.

Submit written comments by August 6, 1997 to:

Ann Zeloof, Esq.
Attn: DEP Docket Number: 12-97-05/628
Office of Legal Affairs
N.J. Department of Environmental Protection
PO Box 402
Trenton, NJ 08625-0402

The agency proposal follows:

Summary

The proposed new rules create a process for the distribution of lake restoration funds authorized in the Port of New Jersey Revitalization, Dredging, Environmental Cleanup, Lake Restoration, and Delaware Bay Area Economic Development Bond Act of 1996, P.L. 1996, c.70, Section 2 (Bond Act). The Bond Act allocates a total of five million dollars for public and State-owned lakes in the form of grants, and private lakes in the form of loans.

The Department invited a number of citizens groups with extensive experience in the current lake restoration process to attend a workshop in order to discuss the proposed rules. Comments from the attendees were considered and incorporated into the rules where appropriate.

Pursuant to the Bond Act, the Commissioner shall submit to the State Treasurer and the New Jersey Commission on Capital Budgeting and Planning with the Department's annual budget request a plan for the expenditure of funds from the "1996 Lake Restoration Fund," for the upcoming fiscal year. The plan shall include the following information: a performance evaluation of the expenditures made from the fund to date; a description of programs planned during the upcoming fiscal year; a copy of the regulations in force governing the operation of program that is financed, in part or in whole, by funds from the "1996 Lake Restoration Fund"; and an estimate of expenditures for the upcoming fiscal year.

Immediately following the submission to the Legislature of the Governor's annual budget message, the Commissioner shall submit to the relevant standing committees of the Legislature, as designated by the President of the Senate and the Speaker of the General Assembly, and to the Joint Budget Oversight Committee, or its successor, a copy of the expenditure plan, as described above.

Pursuant to the Bond Act, lake restoration projects are administered in two distinct phases. A Phase I Diagnostic Feasibility Study is the first step initiated in the lake restoration process and includes an intensive water quality monitoring program of the lake and its watershed. Objectives of the study include identification of the lake's "pollution" problem and its source(s), and an analysis of alternative restoration and management solutions. The Phase II Implementation stage includes execution of selected in-lake and watershed restoration activities including measures to control non point sources of pollution. Subject to appropriation by the Legislature, for year 1, the Department proposes to allocate 10 percent of the public lakes portion of the bond for the initiation of new Phase I studies. The Department in year 1 also proposes to allocate 25 percent of the public lakes portion to fund Phase II projects for which a Phase I study has been completed. The remaining funds in the public lakes portion of the bond act would then be available to fund restoration projects in year 2 and beyond if necessary. This shall enable those groups completing a Phase I study to compete for Phase II funding.

For public lake grants and private lake loans, the grantee or debtor shall be responsible for a portion of the cost of the restoration project. The grantee or debtor is responsible for 50 percent of the total cost of a Phase I Diagnostic Feasibility study and 25 percent of the total cost of a Phase II Implementation project. The grantee's or debtor's cost share (match) for the project can be in the form of either matching funds or in-kind services. A local matching share of the total project cost ensures local interest and involvement, which is considered critical to a successful lake restoration project.

The proposed new rules will also establish a prioritization process which will rank all lake restoration applications for available funding. The objective of the prioritization process is to distribute these funds in a way that provides the greatest environmental/recreational benefits to the greatest number of people. The categories used to prioritize the applications include lake recreational usage (boating, fishing, swimming and aesthetics), population (county and local), degree of public participation, and coordination with other lake associated restoration activities.

A brief description of the provisions of the proposed new rules follows:

N.J.A.C. 7:9-2.1, Scope and construction, states that the rules govern grants and loans made pursuant to the Bond Act.

N.J.A.C. 7:9-2.2, Purpose, states that the purpose of the rules is to set forth the criteria for grant and loan eligibility under the Bond Act and to establish procedures for the distribution of funds in this regard.

N.J.A.C. 7:9-2.3, Definitions, sets forth the definitions of terms which are used in the rules.

N.J.A.C. 7:9-2.4, Types of grant/loan assistance, describes the types of grants and loans which the Department will administer pursuant to the rules.

N.J.A.C. 7:9-2.5, Application ranking/evaluation criteria, sets forth the categories which the Department will use to rank lake restoration applications. Applicants which achieve the highest point totals under the priority system set forth in this section will be given priority for funding.

N.J.A.C. 7:9-2.6, Public participation, sets forth procedures which applicants are required to undertake in order to assure public participation pursuant to the rules.

N.J.A.C. 7:9-2.7, Program administration, provides that this funding program shall be administered by the Department's Bureau of Freshwater and Biological Monitoring. This section also states that the Department expects to award funds over two consecutive fiscal years, that applications for the first year of funding are due 30 days after the effective date of the rules, that applications for the second year of funding are due by December 31, 1998, and that the Department shall either approve an application, or disapprove an application within 30 days of the application deadlines.

Social Impact

The proposed new rules will provide a positive social impact to all persons of the State who have access to lakes that utilize these grants and loans. Lakes restored under these grants and loans will provide greater recreational and environmental value. Secondly, some lakes provide a back up source of drinking water for the State during times of drought. Improved water quality associated with restoration activities will benefit those people who use the back up source of drinking water.

Economic Impact

The proposed new rules will provide an economic benefit for both citizens and businesses of the State. For some citizens who own property on or near a lake which is restored, property values may increase due to improved lake water quality. Businesses that perform lake or watershed restoration work will benefit from jobs created by these funds. Businesses that provide recreational lake products or services will benefit economically from increased recreational usage associated with improved water quality.

For grants for public lakes, the grantee will incur administrative costs associated with project activities. Some examples of these costs are routine costs incurred to prepare applications, review legal and financial documents associated with grants, and maintain necessary records for grant administration. These costs, however can be included in the project's budget and therefore, be included in the funding request.

For loans for private lakes, the loan program will have an economic impact on the borrowers in terms of payment of interest on the loans. As a co-borrower, the local government unit may incur the cost of payment of the principal and interest on the loan if the lake association or lake owner defaults on the loan agreement. Also, the local government unit will incur administrative costs as a co-borrower. Some examples of these costs are routine costs incurred to prepare applications, review legal and financial documents associated with loans, and maintain necessary records for project administration. Additional administrative costs will be incurred by the local government unit if it is necessary to assess the cost of payment of principal

and interest on a loan against the real estate benefited by the project. These administrative costs can be financed through the loan.

Environmental Impact

The proposed new rules will have a positive environmental impact on the State's lakes. Lake restoration activities should provide stormwater management and should reduce nuisance algal blooms and aquatic macrophyte growth. Improved water quality will enhance fisheries, swimmability and boating. For those lakes that are a back-up drinking water source, improved water quality will be beneficial.

Federal Standards Statement

The proposed new rules do not contain any standards or requirements which exceed standards or requirements imposed by Federal law. As a result, an explanation or an analysis of the proposed new rules pursuant to Executive Order No. 27(1994) is not required.

Jobs Impact

The proposed new rules will generate jobs in businesses associated with lake restoration studies and construction activities such as consulting, engineering and construction firms. Businesses that provide recreational services or products for lakes such as fishing tackle and boating stores could generate jobs from increased business activity associated with improved water quality. Entertainment type businesses such as restaurants and nightclubs could also generate employment from increased business activity.

Regulatory Flexibility Analysis

Private lake associations, in some cases, may be defined as small businesses under the Regulatory Flexibility Act, N.J.S.A. 52:14B-16 et seq. Any private lake association applying for a loan under this rule must follow the application process and comply with the conditions imposed by the Department. The administrative costs of applying for, and complying with, the conditions of the loan will be minimized by the technical assistance provided by the Department. The professional services to be acquired by the private lake association may include lake restoration and/or engineering consultants and, construction contractors.

The cost associated with complying with the loan requirements and conditions will involve repayment of the loan plus interest. The interest rate is to be established at a rate not to exceed two percent per year. The loan maturity period will not exceed 20 years. Some additional costs may be incurred to comply with the accounting procedures required under the loan agreement.

Since the purpose of this program is to assist local government units and private lake associations with the restoration of their lakes, and the requirements imposed are the minimum necessary for efficient management of the program, no lesser requirements or exemptions for private lake associations who may be small businesses have been provided.

Full text of the proposal follows (additions indicated in boldface thus; deletions indicated in brackets [thus]):

SUBCHAPTER[S] 1. [THROUGH 4.] (RESERVED)

SUBCHAPTER 2. LAKE RESTORATION FUNDS

7:9-2.1 Scope and construction

This subchapter sets forth the rules governing grants and loans to assist local governmental units and private lake associations or owners of private lakes or similar organizations for lake restoration projects pursuant to the Port of New Jersey revitalization, Dredging, Environmental Cleanup, Lake Restoration, and Delaware Bay Area Economic Development Bond Act of 1996, P.L. 1996, c.70, Section 2.

7:9-2.2 Purpose

(a) The purposes of this subchapter are as follows:

1. To set forth the criteria for grant and loan eligibility; and

2. To establish policies and procedures for distribution of funds to State agencies, local governments or similar organizations, or private lake associations or similar organizations for Phase I Diagnostic-Feasibility studies and for Phase II Implementation activities, as described in P.L. 1996, c.70, Section 2.

7:9-2.3 Definitions

The following words and terms, when used in this subchapter, shall have the following meanings, unless the context clearly indicates otherwise.

"Applicant" means the governmental agency which has jurisdiction over or controls access to the freshwater lake, or the governmental agency which is representing the private owner with this jurisdiction or control.

"Center" means a compact form of development with a core, as defined in the "State Development and Redevelopment Plan." Centers can range in scale from Urban Center, Regional Center, Town, Village, or Hamlet.

"Commissioner" means the Commissioner of the New Jersey Department of Environmental Protection.

"Department" means the Department of Environmental Protection.

"Freshwater lake" means any inland pond, reservoir, impoundment, or other similar body of water that has recreational value, that exhibits no oceanic and tidal influences, and that has a total dissolved solids concentration of less than one percent.

"Phase I Diagnostic-Feasibility Study" means a two part study to determine a lake's current condition and to develop possible methods for lake restoration and protection. The two parts of this study are the diagnosis of water quality conditions, to include determination of pollutant loading sources, and the development of a feasible management/restoration plan which would address water quality conditions at the lake.

"Phase II Implementation Project" means the implementation of any water quality improvement process(es) which have been recommended by a Phase I Diagnostic-Feasibility Study.

"Public lake" means a lake owned, leased, or managed by a local government unit.

"Private lake" means lakes owned by private lake associations or similar organizations, or lakes which do not provide access to the general public.

"State-owned lakes" means lakes owned, leased, or managed by the State.

"State Development and Redevelopment Plan" means the Plan adopted pursuant the State Planning Act, N.J.S.A. 52:18A-196, et seq. The plan in effect as of (the effective date of these rules) was adopted on June 12, 1992.

7:9-2.4 Types of grant/loan assistance

(a) The Department shall administer the following types of grants or loans pursuant to this subchapter for public lakes:

1. For Phase I Diagnostic-Feasibility Studies, a maximum 50 percent of allowable costs, as grants, shall be funded by the Department and the remainder of the costs shall be funded by the applicant.

2. For Phase II Implementation Projects, a maximum 75 percent of allowable costs, as grants, shall be funded by the Department and the remainder of the costs shall be funded by the applicant.

(b) The Department shall administer the following types of grants or loans pursuant to this subchapter for State-owned lakes:

1. For Phase I Diagnostic-Feasibility Studies or Phase II Implementation Projects, up to 100 percent of allowable costs shall be funded by the Department.

(c) The Department shall administer the following types of grants or loans pursuant to this subchapter for private lakes:

1. For Phase I Diagnostic-Feasibility Studies, a maximum 50 percent of allowable costs, as loans, shall be funded by the Department and the remainder of the costs shall be funded by the applicant.

2. For Phase II Implementation Projects, a maximum 75 percent of allowable costs, as loans, shall be funded by the Department and the remainder shall be funded by the applicant.

(d) Loans to private lake associations or similar organizations or owners of private lakes as co-applicants with local government units shall bear interest of not more than two percent per year, and shall be for a term of not more than 20 years.

(e) The local government unit that is a co-applicant for a loan made to a private lake association or similar organization or owner of a private lake shall assess the cost of payment of principal and interest for any loan made pursuant to this subchapter upon the real

estate benefited thereby in proportion to and not in excess of the benefits conferred. Upon failure to pay an assessment imposed pursuant to this subchapter, the property owner shall pay interest and penalties from the same time and at the same rate as for failure to pay assessments for local improvements in the municipality where imposed, and from the date of confirmation the unpaid assessment shall be a first and paramount lien upon the real estate assessed to the same extent, and to be enforced and collected in the same manner, as assessments for local improvements.

(f) All monies returned to the fund in the form of repayment of principal or payment of interest on loans for private lake restoration shall be made available to additional private lake owners.

7:9-2.5 Application ranking/evaluation criteria

(a) The categories used to rank lake restoration applications are as follows. Those lakes with the highest point totals shall receive priority for funding.

1. Lake use and recreational potential: Four major uses including boating, fishing, swimming and aesthetics are utilized in evaluating lake use and recreational potential. Up to three points each are awarded if the potential use includes boating, fishing or aesthetics. The following tables show points awarded for each recreational use:

Boating

Criteria for Ranking Public, State-owned and Private Lakes

Category	Points
Access/use for sailboats/powerboats (Drive-up boat ramp)	3 points
Limited access for boats (Open shoreline available from which to launch a car-top type boat)	1 point

Fishing

Criteria for Ranking Public and State-owned Lakes

Category	Points
High quality fishery (Lake exhibits potential as a high quality, recreational facility)	3 points
Other fishery	1 point

Aesthetics

Criteria for Ranking Public, State-owned and Private Lakes

Category	Points
Significant contact use Park has restroom facilities, visitor/ environmental center, and/or athletic/recreational facilities)	3 points
User facilities development (Open space adjacent to the lake)	1 point

Swimming

Criteria for Ranking Public, State-owned and Private Lakes

Up to six points shall be awarded for swimming potential. This number is higher than for other uses because swimming requires consistently higher quality water than the other recreational uses.

Category	Points
Use available but threatened	6 points
Use impaired	3 points
No designated swimming	0 points

2. Population served by the lake: Local and county populations are both considered in determining potential user populations. The following criteria shall be used for ranking public and State-owned lakes only:

Local population	Points
<1,000	0 points
1,000-5,000	2 points
5,000-15,000	4 points
15,000-30,000	6 points
30,000-50,000	8 points
>50,000	10 points

County population	Points
<100,000	1 point
100,000-200,000	2 points
200,000-400,000	3 points
400,000-600,000	4 points
>600,000	5 points

3. Local interest/involvement: Local interest and involvement is considered to be the critical element in a successful lake restoration project. As such, this category shall receive the highest maximum point value. The following criteria shall be used for ranking public, State-owned and private lakes:

Category	Points
Minor involvement in management/restoration (Contact from local government and lake users; written expressions of interest; private lake association meetings)	5 points
Average involvement in management/restoration (Written expression of interest, governmental and volunteer support; private lake association meetings and volunteer activities associated with water quality)	10 points
Very involved in management/restoration (Lake association/group meetings, financial commitment, strong governmental and volunteer support; includes the adoption and/or designation of a lake management or restoration district; private lake association meetings with volunteer and financial investment in water quality activities)	20 points

4. Consistency with the State Development and Redevelopment Plan: Up to 10 points are awarded for projects that are consistent with the goals and policies of the State Development and Redevelopment Plan. The following criteria shall be used for ranking public and State-owned lakes only:

	Points
The lake is located within a center formally designated by the State Planning Commission:	8 points
The lake is located within a Critical Environmental/Historical Site formally designated by the State Planning Commission, located within Planning Area 5 (Environmentally Sensitive Planning Area), located within Planning Area 4B (Rural/Environmentally Sensitive Planning Area), or located within the jurisdiction of the Pinelands Protection Act.	2 points

5. Coordination with other restoration/maintenance programs: The Department encourages comprehensive approaches to lake restoration projects. Accordingly, any applications which involve other Department sponsored activities shall receive the following. These criteria shall be used for ranking public, State-owned and private lakes:

Other Activity	Points
Dam Safety Restoration	3 points
Wastewater Treatment Financing Program for non-point source projects; and/or lake water quality recognized as component of watershed management activities	5 points

6. Priority for Phase II Implementation Projects: The following criteria shall be used for ranking public, State-owned and private lakes:

	Points
Applicant has completed a Phase I Diagnostic-Feasibility Study	5 points

7:9-2.6 Public participation

(a) The applicant for a Phase I grant shall provide for, encourage, and assist public participation in developing a proposed lake restoration project. The applicant shall solicit public comment on the plan of study, prepare a summary of responses to the public comment, and submit the summary as part of the Phase I application.

(b) Phase I grant recipients shall solicit public comment in developing, evaluating, and selecting alternatives, in assessing potential adverse environmental impacts, and in identifying measures to mitigate any adverse impacts that were identified.

1. The grantee shall provide information describing the methods used in developing, evaluating, and selecting alternatives, in assessing potential adverse environmental impacts, and in identifying measures to mitigate any adverse impacts that were identified and distribute such information to the public at least 30 days before selecting a proposed method of lake restoration.

2. The grantee shall hold a meeting with the public after all pertinent information is distributed.

3. Phase II grant applicants shall hold a public hearing if one has not been held subsequent to completion of Phase I and prepare a summary of the responses to all public comments. The applicant shall submit the summary along with copies of any written comments to the Department with the Phase II application.

7:9-2.7 Program administration

(a) The Lake Restoration Bond Act of 1996 program shall be administered by the Bureau of Freshwater and Biological Monitoring, Division of Science and Research, Department of Environmental Protection.

(b) Funding availability is dependent on legislative approval. The Commissioner shall submit to the State Treasurer and the New Jersey Commission on Capital Budgeting and Planning with the Department's annual budget request a plan for the expenditure of funds from the "1996 Lake Restoration Fund," for the upcoming fiscal year. The Department anticipates that funding shall be awarded in two consecutive fiscal years. In order to be considered for funding in the first year of funding, applications shall be submitted to the Department no later than (30 days after the effective date of these rules). Applications shall consist of a detailed description of project activities for either a Phase I Diagnostic-Feasibility Project or a Phase II Implementation Project. Applications shall contain descriptions of proposed environmental monitoring, proposed budgets, project timelines, and project objectives. Applications shall also contain all information required to apply the ranking criteria set forth in N.J.A.C. 7:9-2.5. Applications shall be sent to:

New Jersey Department of Environmental Protection
Lakes Management Program
Division of Science and Research
PO Box 427
Trenton, NJ 08625-0427

(c) To be considered for funding in the second year of funding, applications shall be received by the Department no later than December 31, 1998.

(d) Upon receiving an application, the Department shall review it for completeness per the requirements of this subchapter. The Department shall notify the applicant in writing, within 14 days, of any deficiencies in the application. The applicant shall then submit any necessary information within 14 days of this notification. The Department shall notify the applicant of either approval or disapproval within 30 days of submittal of a completed application. Upon this approval, the Department shall submit the necessary appropriations request as described in N.J.A.C. 7:9-2.7.2

(a)

OFFICE OF AIR QUALITY MANAGEMENT

Notice of Public Workshop on Development of Used Oil Combustion Rule

Take notice that the New Jersey Department of Environmental Protection (Department) will hold a public workshop on the development of rules concerning burning used oil.

The Department delisted used oil as a hazardous waste in rules that became operative on December 16, 1996. (See 28 N.J.R. 5360(a), December 16, 1996.) Any combustion of used oil continues to require an air pollution control permit to ensure protection of air quality. Such permit applications are currently reviewed on a case-by-case basis. To further ensure that used oil will be burned without significant harm to the environment or public health and welfare, and to provide more specific requirements for combustion of used oil, the Department will propose used oil combustion rules. After meeting with interested parties, performing a risk assessment, considering various studies and current Department and USEPA rules, the Department drafted strategies to allow the burning of used oil while minimizing environmental, health and welfare impacts. The Department may modify these draft strategies based on comments received at this public workshop.

The draft strategies would allow a person to (1) burn certain types of on-specification used oil from on-road vehicles in certain space heaters at repair shops via a general permit (currently in draft), (2) burn a blend of on-specification used oil with number 6 fuel oil in certain kinds of industrial and utility boilers, (3) burn on-specification used oil in other kinds of fuel burning equipment after obtaining a unit-specific permit which includes a demonstration of acceptable air quality effects, and (4) burn off-specification used oil in industrial furnaces, boilers, and hazardous waste incinerators after obtaining a unit-specific permit, also with a demonstration of acceptable air quality effects.

The **public workshop**, at which the Department will present the draft strategies for burning used oil and seek additional advice from interested parties, will be held at 10:00 A.M. on Wednesday, July 30, 1997 at:

DEP Public Hearing Room—1st floor
401 East State Street
Trenton, New Jersey

At the workshop, the Department expects to have an informal discussion on any used oil combustion issue of interest to those participating. The Department will also request advice from the public on specific issues. Public testimony will not be taken at the workshop. A public hearing will subsequently be held after rule proposal.

Requests for written copies of the draft used oil combustion strategies, the draft general permit, the Department's risk assessment, and the list of specific issues the Department is seeking comments on, may be made by phone, fax or email to:

Lori McGee
Phone: (609) 777-1345
Fax: (609) 633-6198
E-mail: lmcgee@dep.state.nj.us

Electronic copies are available by dialing into the Department's Electronic Bulletin Board Service (BBS) at (609) 292-2006, and downloading USEDOILW.ZIP in File Area #35 (Air:Props, Adopts, & Notices).

The documents are also available for inspection during normal office hours at the Department's public information center at DEP offices in Trenton, and at various locations around the state. A list of these locations can be obtained by contacting the Office of Air Quality Management at (609) 777-1345; fax: (609) 633-6198; or E-mail: aporter-brown@dep.state.nj.us.

APPENDIX II - Rutgers University Guidelines For Lake and Pond Management

POTENTIAL WATER QUALITY CONCERNS FOR PARK MANAGEMENT PERSONNEL

ALGAE BLOOMS

EXCESSIVE WEED GROWTH

BANK EROSION

VISUAL AND/OR ODOR PROBLEMS

WATERFOWL

MANAGEMENT STRATEGIES

SOURCE CONTROL - REDUCE THE AMOUNT OF POLLUTION LOADING AT ITS POINT OF ORIGIN USING ENVIRONMENTALLY FRIENDLY PRODUCTS AND/OR BY CHANGING MAINTENANCE OPERATIONS.

BEST MANAGEMENT PRACTICES - UTILIZATION OF STRUCTURAL AND NON-STRUCTURAL MEASURES TO INTERCEPT AND PRE-TREAT RUNOFF THEREBY DECREASING POLLUTANT LOAD.

IN-LAKE RESTORATION - UTILIZATION OF TECHNIQUES DESIGNED TO IMPROVE WATER QUALITY OR AESTHETIC CHARACTERISTICS THEREBY MITIGATING OR DECREASING THE NEGATIVE IMPACTS OF POLLUTANT LOADING.

MANAGING ALGAE AND WEED GROWTH AT ACCEPTABLE LEVELS

- CORRECT THE DESIGN OF POND
- REDUCE NUTRIENT LOADING
- IMPROVE FLUSING AND CIRCULATION
- PROPERLY UTILIZE ALGACIDES AND HERBICIDES

HERBICIDES

- AQUATHOL
- AQUATHOL K
- DIQUAT
- WEEDTRINE II
- KOMENE
- SONAR*
- RODEO

* SYSTEMIC HERBICIDE

APPLICATION OF HERBICIDES AND ALGACIDES

METHOD OF INTRODUCTION

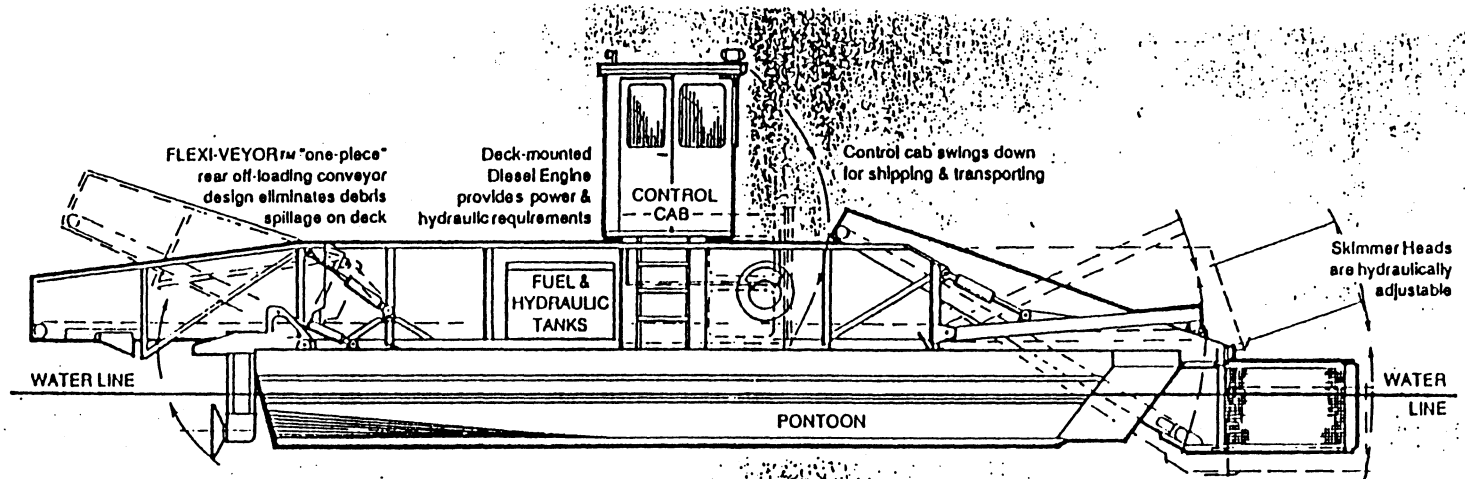
A. LIQUID

- DIRECT DOSE (RODEO)
- TANK MIX
- FIELD MIX

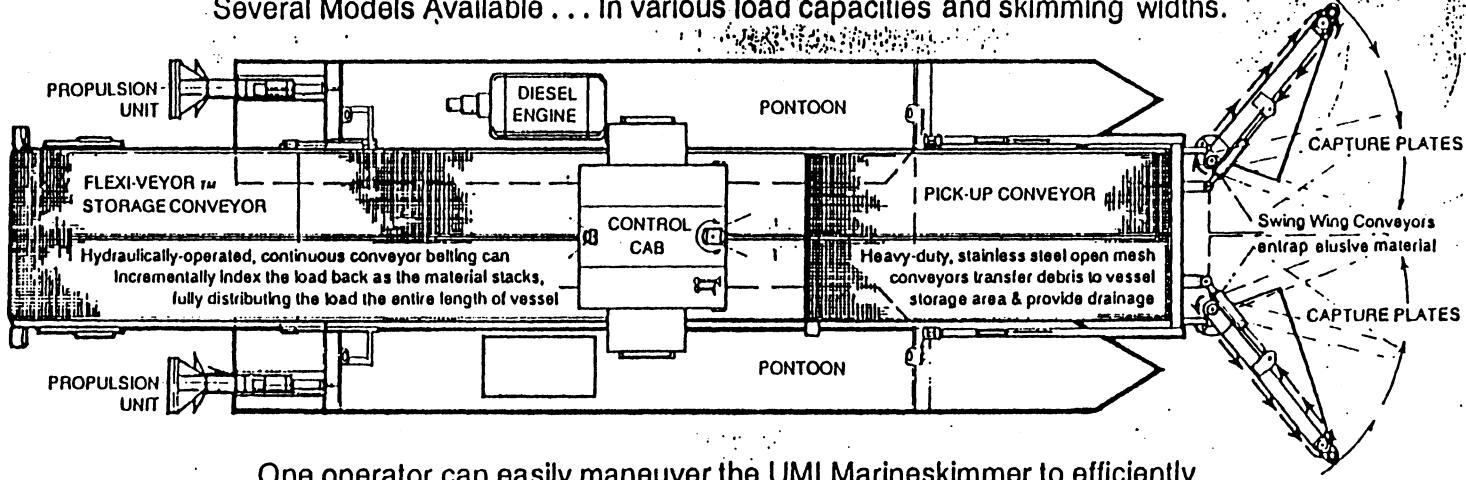
(SURFACE, SUB-SURFACE APPLICATION)

B. GRANULAR

- BROADCAST USING "CYCLONE" SPREADER
- BROADCAST BY HAND



Several Models Available . . . In various load capacities and skimming widths.



One operator can easily maneuver the UMI Marineskimmer to efficiently collect, pickup, load, store, and offload from 3,000 to 12,000 pounds of wet material - without any secondary handling.

AERATION

PURPOSE: INCREASE THE DISSOLVED OXYGEN CONTENT OF A WATERBODY AND ENHANCE ITS VERTICAL CIRCULATION.

APPLICATION: BEST SUITED FOR NON-STRATIFIED SHALLOW LAKES, PONDS AND CANALS. CAN ALSO BE USED FOR SMALL, WEAKLY STRATIFIED WATERBODIES.

POSITIVE BENEFITS:

- INCREASE DISSOLVED OXYGEN LEVELS
- IMPROVE FISHERY HABITAT (AVOID FISH KILLS)
- DECREASE INTERNAL PHOSPHORUS RECYCLING
- REDUCE BLUE GREEN ALGAE AND MAT ALGAE

POTENTIAL NEGATIVE SIDE EFFECTS:

- INCREASE TEMPERATURE OF WATERBODY
- STIMULATION OF ALGAE GROWTH
- DECREASE IN CLARITY

COST:

APPROXIMATELY $1,200 + $200.00/ACRE

DREDGING

PURPOSE: REMOVE ACCUMULATED SEDIMENT

APPLICATION: CAN BE CONDUCTED USING HYDRAULIC DREDGING OR CONVENTIONAL DREDGING EQUIPMENT.

POSITIVE BENEFITS:

- INCREASE DEPTH
- ENHANCE RECREATIONAL USE
- RECLAIM FISH HABITAT
- IMPROVE FLUSHING PATTERNS
- DECREASE WEED GROWTH

POTENTIAL NEGATIVE SIDE EFFECTS:

- INCREASED TURBIDITY
- EXPOSURE OF REDUCED OR NUTRIENT RICH SEDIMENTS

COST:

DRY EXCAVATION - $20.00/YARD
HYDRAULIC - $12.00/YARD + DISPOSAL

DISPOSAL SITE DEVELOPMENT

- Site Preparation
  - Engineering
  - Clearing and Grubbing
  - Dike Requirements
  - Drainage Considerations
  - Access
  - Security Fencing

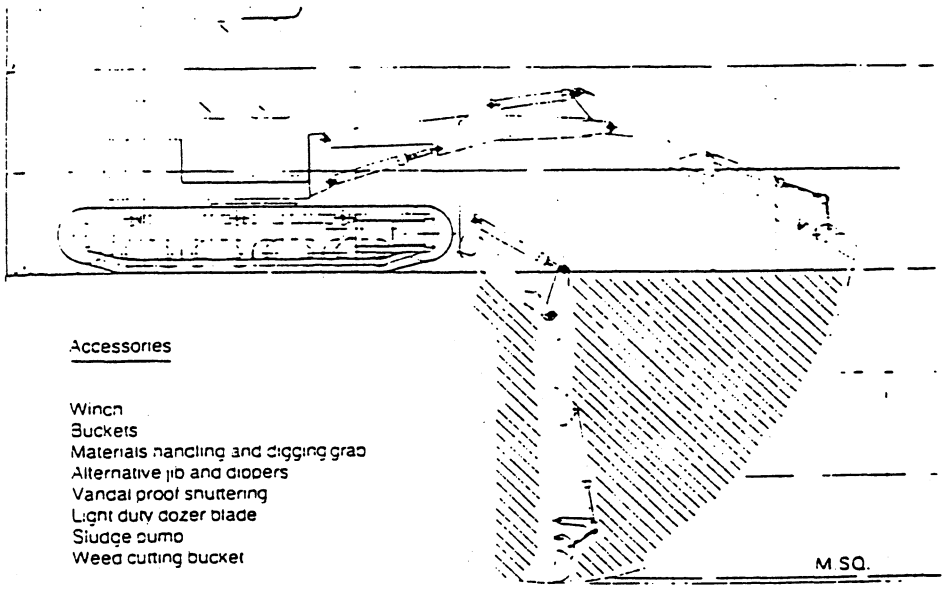
- Environmental Protection
  - Liners
  - Monitoring Wells
  - Chemical Testing

- Site Closure
  - Grading and Seeding
  - Landscaping

DREDGING METHODS

- Hydraulic

- Mechanical:
  Excavation
  Clamshell
  Dragline

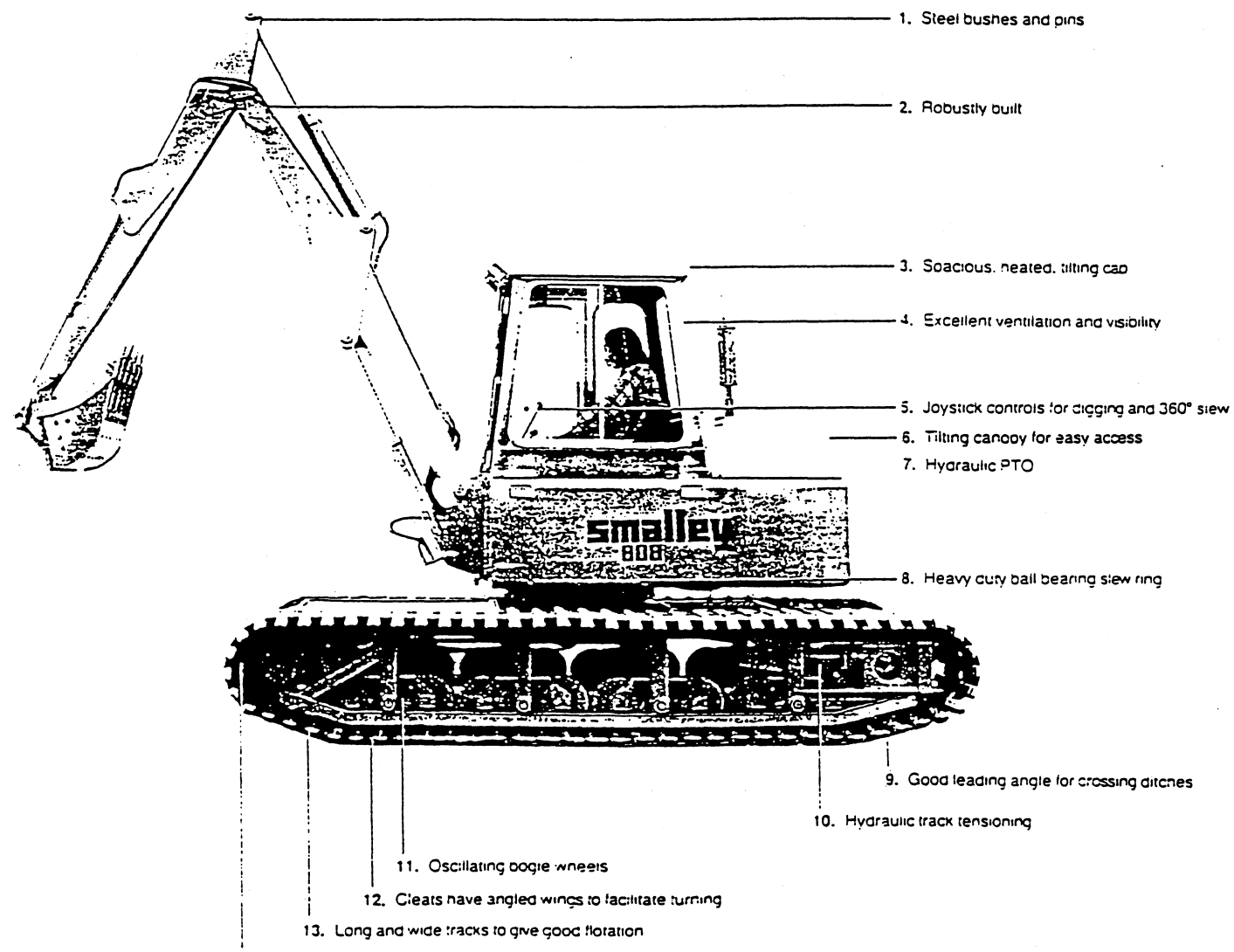


Accessories

Winch
Buckets
Materials handling and digging grab
Alternative jib and dippers
Vandal proof shuttering
Light duty dozer blade
Sludge pump
Weed cutting bucket

Specifications

Weight: Complete with 152cm (60") ditching bucket 4420kg (9742lb) approx.
Ground pressure: 0.12kg/sq cm (1.6psi)
Electrics: 12v system, twin working lights, cab interior light.
Windscreen wiper and washer.
Engine: Lister TL2 air cooled diesel 30 bhp
Lifting capacity: 500kg (1102lb)
Filtration: Full return line
Reach: 5.8m (228")
Unload height: bucket pivot point 4.95m (195")
Digging depth: 3.24m (127.5")
Cab height: 2.6m (102") from ground level
Gradeability: 70% 30°
Travel length: 3.8m (149.5")
Width: 2.43m (95.5")
Spare hydraulic spool for grab rotation
Heater.
Sliding Window.
3 pump hydraulic system
Independent two speed track drive



1. Steel bushes and pins
2. Robustly built
3. Spacious, heated, tilting cab
4. Excellent ventilation and visibility
5. Joystick controls for digging and 360° slew
6. Tilting canopy for easy access
7. Hydraulic PTO
8. Heavy duty ball bearing slew ring
9. Good leading angle for crossing ditches
10. Hydraulic track tensioning
11. Oscillating bogie wheels
12. Cleats have angled wings to facilitate turning
13. Long and wide tracks to give good flotation
14. Rear sprockets driven independantly by two hydraulic motors for outstanding manoeuvrability

DRAWDOWN

PURPOSE: ARTIFICIAL MANIPULATION OF WATERBODY POOL HEIGHT FOR THE CONTROL OF AQUATIC WEEDS.

POSITIVE BENEFITS:

- IMPROVED WEED CONTROL
- CONSOLIDATION OF NEARSHORE SEDIMENTS
- REDUCTION IN ICE DAMAGE

POTENTIAL NEGATIVE SIDE EFFECTS:

- INCREASE GROWTH/DENSITY OF CERTAIN WEEDS
- TEMPORARY LOSS OF BENTHIC INVERTEBRATES
- SHORELINE EROSION

COST:

NONE

NUTRIENT INACTIVATION

PURPOSE: DECREASE AVAILABILITY OF NUTRIENTS THROUGH CHEMICAL BONDING AND PRECIPITATION

APPLICATION: BEST SUITED FOR SLOW FLUSHING WATERBODIES THAT HAVE A LARGE INTERNAL LOAD

POSITIVE BENEFITS:

- INCREASED CLARITY
- DECREASED ALGAE DENSITIES

POTENTIAL NEGATIVE SIDE EFFECTS:

- SHIFTS IN pH
- INCREASED WEED GROWTH
- ALUMINUM TOXICITY TO AQUATIC LIFE

COST:

VARIABLE

NUTRIENT INACTIVATION USING ALUM

USED TO LIMIT THE AMOUNT OF AVAILABLE PHOSPHORUS THEREBY DECREASING THE POTENTIAL TROPHIC STATE OF A WATERBODY.

APPLICATION TECHNIQUES

- LOW DOSE WHOLE LAKE APPLICATION
- HYPOLIMNETIC INJECTION
- SEDIMENT BLANKET
- FLOW METERED DOSING
- INTEGRATION WITH SEDIMENTS

BANK STABILIZATION

PURPOSE: REMEDIATE ERODING SHORELINE

APPLICATION: ANY SITUATION WHERE THE SHORELINE HAS BECOME UNSTABLE AND ERODED DUE TO RUNOFF, WAVE ACTION, FOOT TRAFFIC OR WATERFOWL. MUST IDENTIFY AND ABATE SOURCE OF PROBLEM IF LONG-TERM BENEFITS ARE TO BE REALIZED.

POSITIVE BENEFITS:

- DECREASE TURBIDITY
- IMPROVE AESTHETICS
- RECLAIM FISH HABITAT

POTENTIAL NEGATIVE SIDE EFFECTS:

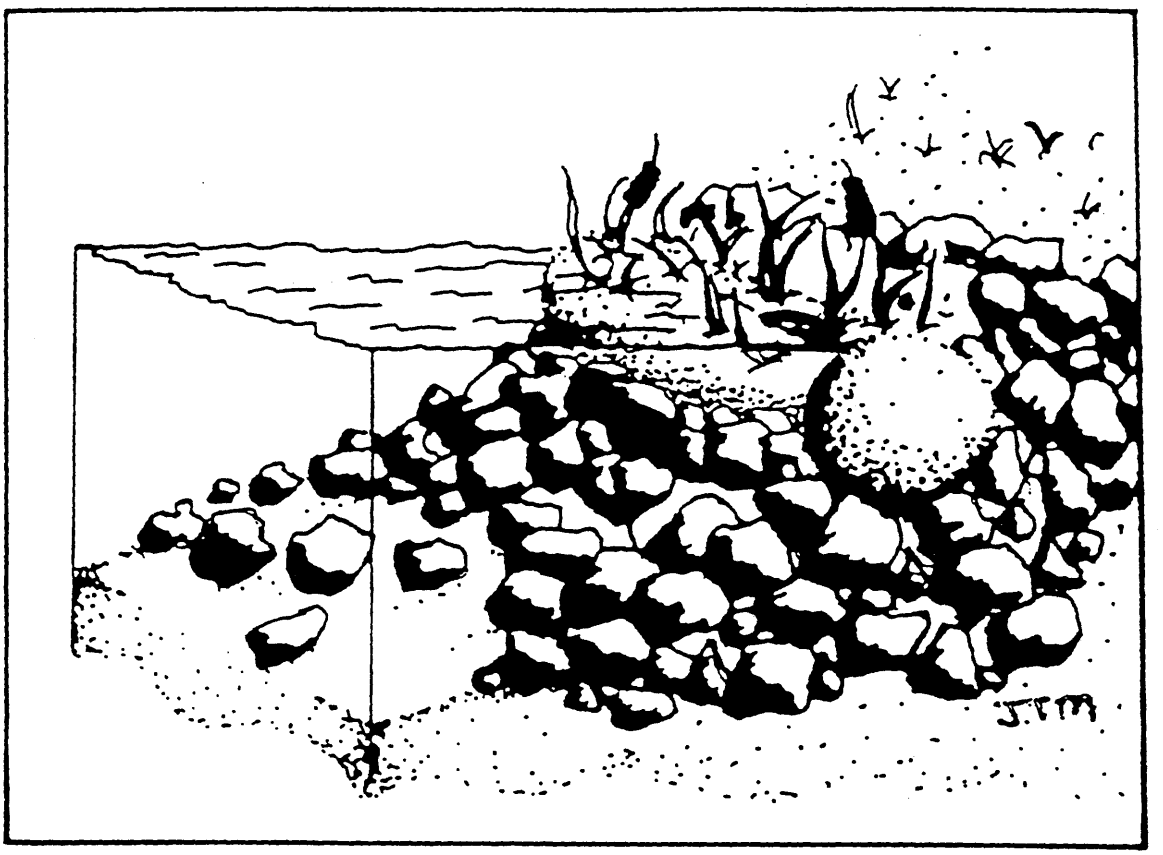
- TEMPORARY CONSTRUCTION-RELATED TURBIDITY IMPACTS

POSSIBLE TECHNIQUES:

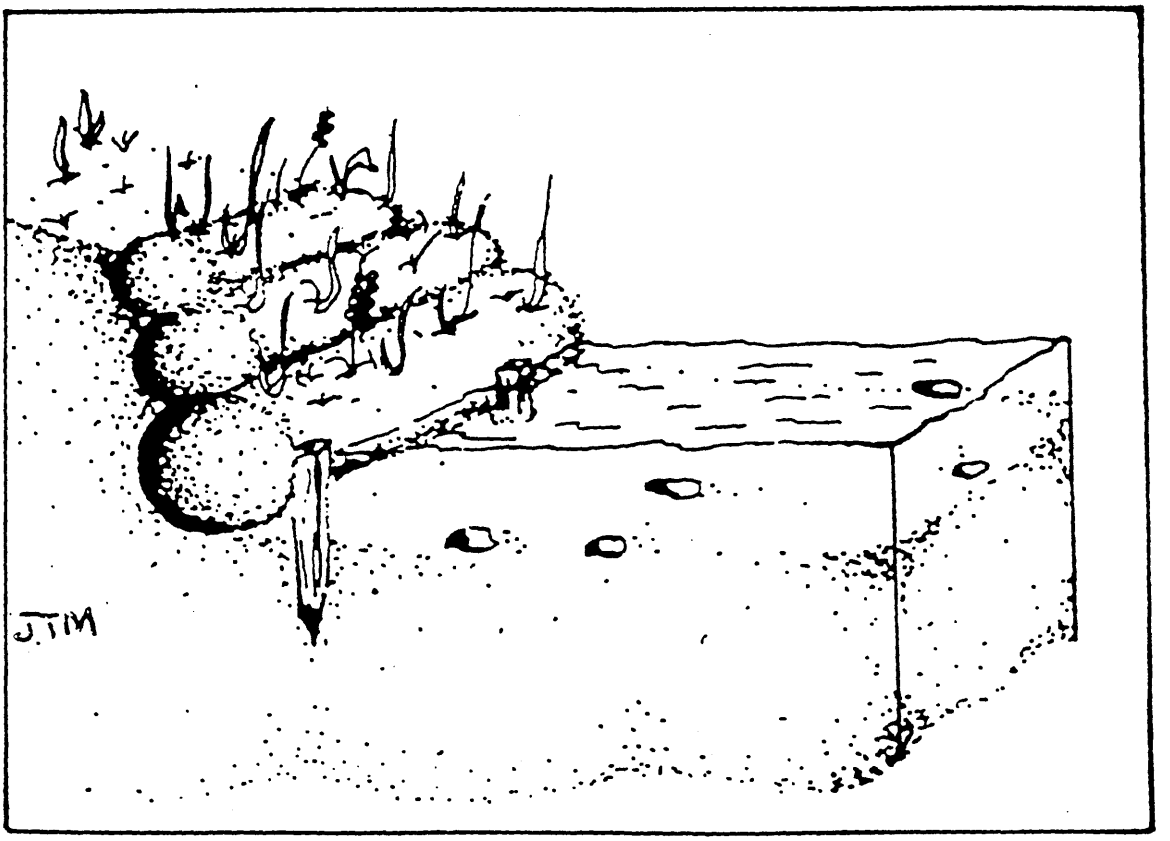
- BULKHEAD
- RIP-RAP, GABION
- FIBERSHEIN
- GEO-TECH FABRICS
- WETLAND VEGETATION

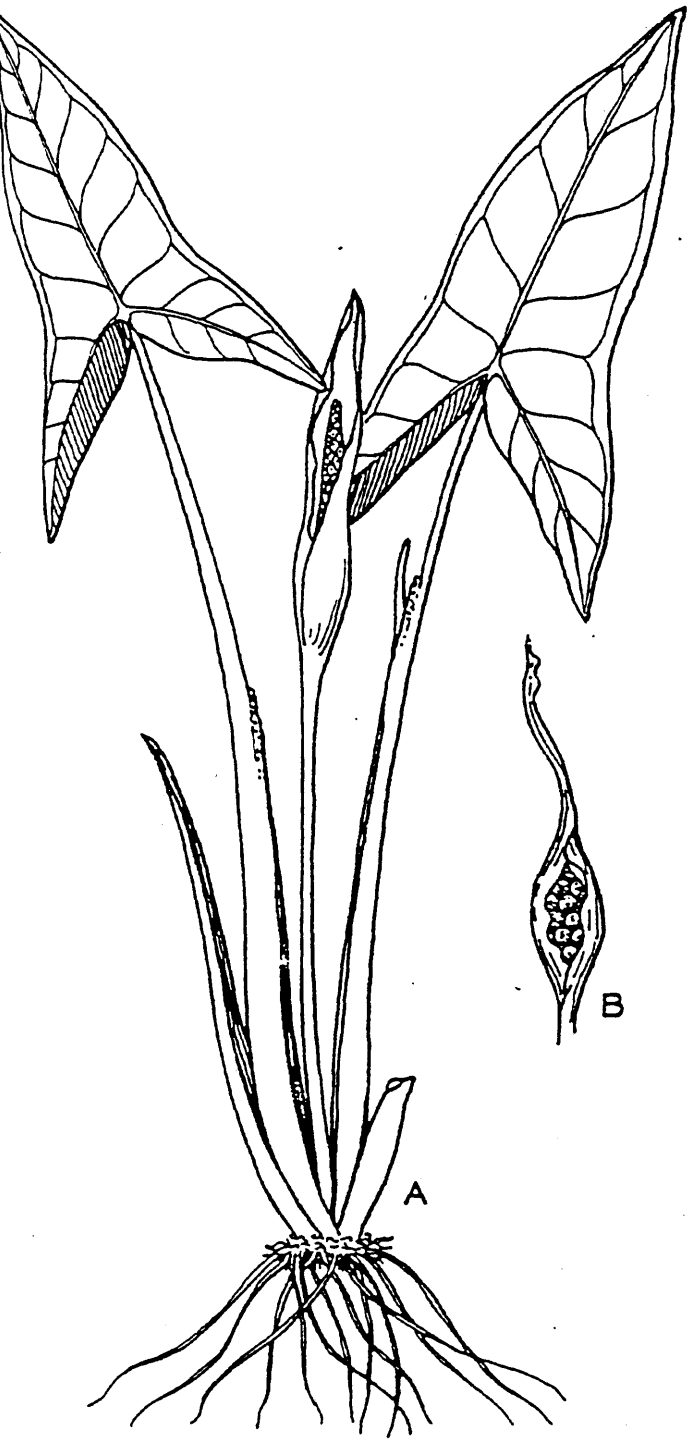
COST:

VARIABLE



Organic Rip-Rap





igure 51. *Peltandra virginica.* Arrow arum. (A) Whole lant showing leaves and spadix in spathe; x 1/3. (B) lature fruits in spathe; x 1/3.

Figure 52. *Pontederia cordata.* Pickerelweed. Whole plant; x 1/3.

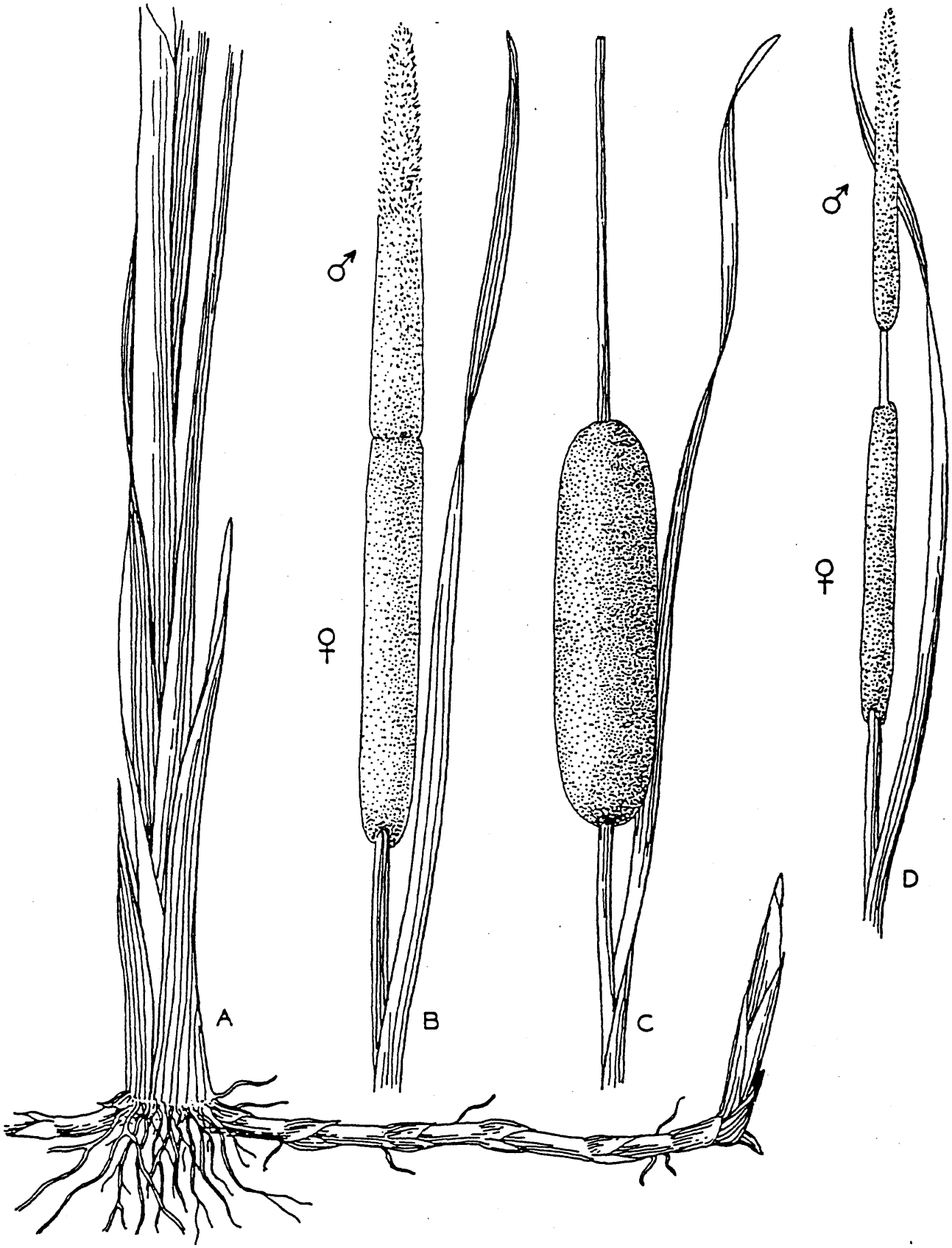


Figure 42. ***Typha latifolia.*** **Cattail. (A) Lower portion of plant with leaves and rootstock. (B) Spike showing male ♂ and female ♀ flowers. (C) Spike in fruit after male flowers have fallen off. (D)** ***Typha angustifolia.*** **Spike in flower with gap between male and female flowers; x 1/2.**

BEST MANAGEMENT PRACTICES

PURPOSE: INTERCEPT AND PRE-TREAT RUNOFF PRIOR TO ITS DISCHARGE INTO LAKE, POND, WETLAND AND/OR STREAM

POSITIVE BENEFITS:

- DECREASE IN POLLUTANT LOADING
- DECREASE IN EROSION
- IMPROVE AESTHETICS
- INCREASE WILDLIFE HABITAT

POTENTIAL NEGATIVE SIDE EFFECTS:

- INCREASED MAINTENANCE
- LOSS OF AVAILABLE LAND
- DECREASE IN ACCESS (BUFFER STRIPS)

COST:

VARIABLE

MANAGEMENT OF STORMWATER POLLUTANT LOADING

- PROMOTE SETTLING OF SOLIDS
- PROMOTE ATTENUATION OF NUTRIENTS
- DECREASE ORGANIC LOADING
- TRAP HEAVY METALS AND PETROLEUM HYDROCARBONS