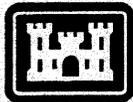

JANUARY 1999

NAVIGATION STUDY FOR

**PONCE DELEON INLET, FLORIDA
VOLUSIA COUNTY, FLORIDA - 14310**

**FINAL FEASIBILITY REPORT
WITH FINAL ENVIRONMENTAL ASSESSMENT**



**US Army Corps
of Engineers®**
Jacksonville District
South Atlantic Division

WATER RESOURCES DEVELOPMENT ACT OF 1999

August 5, 1999.--Ordered to be printed

Mr. SHUSTER, from the committee of conference, submitted
the following

CONFERENCE REPORT

[To accompany S. 507]

The committee of conference on the disagreeing votes of the two Houses on the amendment of the House to the bill (S. 507), to provide for the conservation and development of water and related resources, to authorize the Secretary of the Army to construct various projects for improvements to rivers and harbors of the United States, and for other purposes, having met, after full and free conference, have agreed to recommend and do recommend to their respective Houses as follows:

That the Senate recede from its disagreement to the amendment of the House to the text of the bill and agree to the same with an amendment as follows:

In lieu of the matter proposed to be inserted by the House amendment, insert the following:

SECTION 1. SHORT TITLE; TABLE OF CONTENTS.

(a) SHORT TITLE.--This Act may be cited as the "Water Resources Development Act of 1999".

(b) TABLE OF CONTENTS.--The table of contents of this Act is as follows:

TITLE I--WATER RESOURCES PROJECTS

- Sec. 101. Project authorizations.
Sec. 102. Small flood control projects.

Sec. 101 (b)

BEACH AND PIERCES POINT, NEW JERSEY.--The project for shore protection and ecosystem restoration, Delaware Bay coastline, Delaware and New Jersey: Reeds Beach and Pierces Point, New Jersey, at a total cost of \$4,057,000, with an estimated Federal cost of \$2,637,000 and an estimated non-Federal cost of \$1,420,000.

(7) LITTLE TALBOT ISLAND, DUVAL COUNTY, FLORIDA.--The project for hurricane and storm damage prevention and shore protection, Little Talbot Island, Duval County, Florida, at a total cost of \$5,915,000, with an estimated Federal cost of \$3,839,000 and an estimated non-Federal cost of \$2,076,000.

(8) PONCE DE LEON INLET, FLORIDA.--The project for navigation and related purposes, Ponce de Leon Inlet, Volusia County, Florida, at a total cost of \$5,454,000, with an estimated Federal cost of \$2,988,000 and an estimated non-Federal cost of \$2,466,000.

(9) SAVANNAH HARBOR EXPANSION, GEORGIA.--

(A) IN GENERAL.--Subject to subparagraph (B), the project for navigation, Savannah Harbor expansion, Georgia, including implementation of the mitigation plan, with such modifications as the Secretary considers appropriate, at a total cost of \$230,174,000 (of which amount a portion is authorized for implementation of the mitigation plan), with an estimated Federal cost of \$145,160,000 and an estimated non-Federal cost of \$85,014,000.

(B) CONDITIONS.--The project authorized by subparagraph (A) may be carried out only after--

(i) the Secretary, in consultation with affected Federal, State of Georgia, State of South Carolina, regional, and local entities, reviews and approves an environmental impact statement for the project that includes--

(I) an analysis of the impacts of project depth alternatives ranging from 42 feet through 48 feet; and

(II) a selected plan for navigation and an associated mitigation plan as required under section 906(a) of the Water Resources Development Act of 1986 (33 U.S.C. 2283(a)); and

(ii) the Secretary of the Interior, the Secretary of Commerce, the Administrator of the Environmental Protection Agency, and the Secretary approve the selected plan and determine that the associated mitigation plan adequately addresses the potential environmental impacts of the project.

(C) MITIGATION REQUIREMENTS.--The mitigation plan shall be implemented before or concurrently with construction of the



DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
WASHINGTON, D.C. 20314-1000

REPLY TO
ATTENTION OF:

CECW-PE (10-1-7a)

29 SEP 1999

SUBJECT: Ponce de Leon Inlet, Florida

THE SECRETARY OF THE ARMY

1. I submit for transmission to Congress my report on the navigation study for Ponce de Leon Inlet in Volusia County, Florida. It is accompanied by the report of the district and division engineers. These reports are in final response to a resolution by the Committee on Public Works and Transportation of the United States House of Representatives dated 21 May 1991. The resolution requested the U.S. Army Corps of Engineers review the existing Federal project for Ponce de Leon Inlet to determine if modifications are advisable in the interest of navigation and other purposes.
2. Section 101 (b) (8) of the Water Resources Development Act of 1999 (WRDA 1999), Public Law 106-53, authorized construction of the Ponce de Leon Inlet in Volusia County, Florida project for navigation subject to completion of a favorable final report of the Chief of Engineers on or before December 31, 1999. This report constitutes the final report of the Corps of Engineers in response to this legislation.
3. The reporting officers recommend modifying the Ponce de Leon Inlet navigation project by constructing a 1,000-foot-long seaward extension of the exiting south jetty, with scour apron, and placing aids to navigation at the inlet. The Federal Government would share the cost of maintaining this feature of the modified project with the non-Federal project sponsor. The 1,000-foot long extension of the south jetty would extend seaward, parallel to the existing north jetty, and have a crest elevation of +7 feet, referenced to mean low water (MLW). The jetty extension would be constructed of stone and be 15-foot wide at its crest. A 30-foot-wide by 4-foot-thick scour apron would extend the length of the jetty extension to protect against scour damage within the inlet throat. Both the jetty and scour apron would be founded on 2-foot-thick stone bedding. The foundation of the jetty extension would be at elevation -10 feet MLW. The jetty extension would be sand tight up to elevation -3 feet MLW and permeable from -3 feet MLW to +7 feet MLW. The total footprint at the base of the south jetty extension would be 105 feet wide. The construction would require excavating approximately 25,000 cubic yards of material. All excavated material is expected to be beach quality sand, and would be placed on the south side of the south jetty. The proposed length and orientation of the jetty extension are based on the results of physical and numerical model studies of hydraulic, wave, current, and bathymetric interactions in the Ponce de Leon Inlet. Based on these studies, construction of the south jetty extension is expected to induce the deep-water channel to migrate toward the center of the inlet. Additionally, the jetty extension is expected to significantly reduce sediment

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SUBJECT: Ponce de Leon Inlet, Florida

transport and deposition in the inlet and in the adjacent reach of the Atlantic Intracoastal Waterway. There is no identified requirement for compensatory mitigation for the proposed project modification.

4. Based on October 1998 prices, the estimated first cost is \$5,454,000 of which \$2,985,000 would be the Federal share while \$2,469,000 would be the non-Federal share. Average annual benefits and costs based on a discount rate of 6.875 percent and a 50-year period of economic evaluation are estimated at \$567,000 and \$426,000 respectively. The average annual net benefit is \$141,000, and the benefit-to-cost ratio is 1.3 to 1.

5. I concur in the findings, conclusions, and recommendation of the reporting officers. The plan developed is technically sound, economically justified, and environmentally and socially acceptable. The plan conforms to essential elements of the U.S. Water Resources Council's Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies and complies with other administration and legislative policies and guidelines. Also, the views of interested parties, including Federal, State, and local agencies, have been considered.

6. Accordingly, I recommend that modifications to Ponce de Leon Inlet, Volusia County, Florida, be implemented generally in accordance with the reporting officers' recommended plan, and with such modifications as in the discretion of the Chief of Engineers may be advisable. This recommendation is subject to non-Federal interests agreeing to comply with applicable Federal laws and polices, including the following requirements:

- a. Enter into an agreement which provides, prior to construction, 25 percent of design costs;
- b. Provide, during construction, any additional funds needed to cover the non-Federal share of design costs;
- c. Provide, during construction, 50 percent of total project costs allocated to recreational navigation as further specified below:

- (1) Provide all lands, easements, and rights-of-way, including suitable borrow and dredged or excavated material disposal areas, and perform or assure the performance of all relocations determined by the Government to be necessary for the construction, operation, and maintenance of the recreational navigation features of the project;

- (2) Provide or pay to the Government the cost of providing all retaining dikes, wasteweirs, bulkheads, and embankments, including all monitoring features and stilling basins, that may be required at any dredged or excavated material disposal areas required for the construction, operation, and maintenance of the recreational navigation features of the project; and

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(3) Provide, during construction, any additional costs as necessary to make its total contribution equal to 50 percent of total project costs allocated to recreational navigation;

d. For project costs allocated to commercial navigation, provide, during the period of construction, a cash contribution equal to 10 percent of the total cost of construction of the general navigation features attributable to channel depths not in excess of 20 feet;

e. Pay with interest, over a period not to exceed 30 years following completion of the period of construction of the project, up to an additional 10 percent of the total cost of construction of general navigation features. The value of lands, easements, rights-of-way, and relocations provided by the non-Federal sponsor for the general navigation features, described below, may be credited toward this required payment. If the amount of credit exceeds 10 percent of the total cost of construction of the general navigation features, the non-Federal sponsor shall not be required to make any contribution under this paragraph, nor shall it be entitled to any refund for the value of lands, easements, rights-of-way, and relocations in excess of 10 percent of the total cost of construction of the general navigation features;

f. Provide to the Government 100 percent of the cost to operate, maintain, replace, repair, and rehabilitate (OMRR&R) all features of the project allocated to recreational navigation. The OMRR&R costs for the 1,000-foot south jetty extension are allocated to commercial navigation (15 percent) and recreational navigation (85 percent) purposes. The non-Federal sponsor will pay its proportional share of OMRR&R costs at the time of each maintenance event. Accordingly the non-Federal sponsor's share of OMRR&R costs for the 1,000-foot south jetty extension, is currently estimated to be 85 percent and the Federal Government's share, is estimated to be 15 percent;

g. Provide all lands, easements, and rights-of-way, and perform or ensure the performance of all relocations determined by the Federal Government to be necessary for the construction, operation, maintenance, repair, replacement, and rehabilitation of the commercial navigation features of the project (including all lands, easements, and rights-of-way, and relocations necessary for dredged material disposal facilities);

h. Accomplish all removals determined necessary by the Federal Government other than those removals specifically assigned to the Federal Government;

i. Grant the Federal Government a right to enter, at reasonable times and in a reasonable manner, upon property that the non-Federal sponsor owns or controls for access to the general navigation features for the purpose of inspection, and, if necessary, for the purpose of operating, maintaining, repairing, replacing, and rehabilitating the project;

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- j. Hold and save the United States free from all damages arising from the construction, operation, maintenance, repair, replacement, and rehabilitation of the project, any betterments, and the local service facilities, except for damages due to the fault or negligence of the United States or its contractors;
- k. Keep, and maintain books, records, documents, and other evidence pertaining to costs and expenses incurred pursuant to the project, for a minimum of 3 years after completion of the accounting for which such books, records, documents, and other evidence is required, to the extent and in such detail as will properly reflect total cost of construction of project, and in accordance with the standards for financial management systems set forth in the Uniform Administrative Requirements for Grants and Cooperative Agreements to State and local governments at 32 CFR, Section 33.20;
- l. Perform, or cause to be performed, any investigations for hazardous substances as are determined necessary to identify the existence and extent of any hazardous substances regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. 9601-9675, that may exist in, on, or under lands, easements, or rights-of-way that the Federal Government determines to be necessary for the construction, operation, maintenance, repair, replacement, or rehabilitation of the project. However, for lands that the Government determines to be subject to the navigation servitude, only the Government shall perform such investigation unless the Federal Government provides the non-Federal sponsor with prior specific written direction, in which case the non-Federal sponsor shall perform such investigations in accordance with such written direction;
- m. Assume complete financial responsibility, as between the Federal Government and the non-Federal sponsor, for all necessary cleanup and response costs of any CERCLA regulated materials located in, on, or under lands, easements, or rights-of-way that the Federal Government determines to be necessary for the construction, operation, maintenance, repair, replacement, and rehabilitation of the project;
- n. To the maximum extent practicable, perform its obligations in a manner that will not cause liability to arise under CERCLA;
- o. Comply with the applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, as amended by Title IV of the Surface Transportation and Uniform Relocation Assistance Act of 1987, and the Uniform Regulations contained in 49 CFR Part 24, in acquiring lands, easements, and rights-of-way, required for construction, operation, maintenance, repair, replacement, and rehabilitation of the project, and inform all affected persons of applicable benefits, policies, and procedures in connection with said act;

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p. Comply with all applicable Federal and State laws and regulations, including, but not limited to, Section 601 of the Civil Rights Act of 1964, Public Law 88-352 (42 U.S.C. 2000d), and Department of Defense Directive 5500.11 issued pursuant thereto, as well as Army Regulation 600-7, entitled "Nondiscrimination on the Basis of Handicap in Programs and Activities Assisted or Conducted by the Department of the Army;"

q. Provide a cash contribution equal to the non-Federal cost share of the project's total historic preservation mitigation and data recovery costs attributable to commercial navigation and recreational navigation that are in excess of 1 percent of the total amount authorized to be appropriated for commercial navigation and recreational navigation; and

r. Do not use Federal funds to meet the non-Federal sponsor's share of total project costs unless the Federal granting agency verifies in writing that the expenditure of such funds is authorized.



JOE N. BALLARD
Lieutenant General, U.S. Army
Chief of Engineers

**PONCE DELEON INLET, FLORIDA
VOLUSIA COUNTY
NAVIGATION STUDY**

ADDENDUM

1. In keeping with the policy compliance assessment (attached) dated 13 May 1999, the information in the following paragraphs supercedes that in the main body of the feasibility report for Ponce DeLeon Inlet, dated January 1999.

2. Future Operations and Maintenance Costs. Future operations and maintenance costs for the 1,000-foot south jetty extension will be cost shared with the non-Federal sponsor paying its proportional share of these costs at the time of each maintenance event. The non-Federal sponsor's share of future operations and maintenance costs for the 1,000-foot south jetty extension is 85%; the Federal government's share is 15%. A letter from the non-Federal sponsor stating their understanding of the operations and maintenance cost sharing follows. The revised items of local cooperation are the following:

a. Enter into an agreement which provides, prior to construction, 25 percent of design costs;

b. Provide, during construction, any additional funds needed to cover the non-Federal share of design costs;

c. Provide, during construction, 50 percent of total project costs allocated to recreational navigation as further specified below:

(1) Provide all lands, easements, and rights-of-way, including suitable borrow and dredged or excavated material disposal areas, and perform or assure the performance of all relocations determined by the Government to be necessary for the construction, operation, and maintenance of the project;

(2) Provide or pay to the Government the cost of providing all retaining dikes, wasteweirs, bulkheads, and embankments, including all monitoring features and stilling basins, that may be required at any dredged or excavated material disposal areas required for the construction, operation, and maintenance of the project; and

(3) Provide, during construction, any additional costs as necessary to make its total contribution equal to 50 percent of total project costs allocated to recreational navigation.

d. For project costs allocated to commercial navigation, provide, during the period of construction, a cash contribution equal to 10 percent of the total cost of construction of the general navigation features attributable to dredging to a depth not in excess of 20 feet;

e. Pay with interest, over a period not to exceed 30 years following completion of the period of construction of the project, up to an additional 10 percent of the total cost of construction of general navigation features. The value of lands, easements, rights-of-way, and relocations provided by the non-Federal sponsor for the general navigation features, described below, may be credited toward this required payment. If the amount of credit exceeds 10 percent of the total cost of construction of the general navigation features, the non-Federal sponsor shall not be required to make any contribution under this paragraph, nor shall it be entitled to any refund for the value of lands, easements, rights-of-way, and relocations in excess of 10 percent of the total cost of construction of the general navigation features;

f. Provide all lands, easements, and rights-of-way, and perform or ensure the performance of all relocations determined by the Federal Government to be necessary for the construction, operation, maintenance, repair, replacement, and rehabilitation of the project (including all lands, easements, and rights-of-way, and relocations necessary for dredged material disposal facilities).

g. Assume responsibility for operating, maintaining, replacing, repairing, and rehabilitating (OMRR&R) all features of the project allocated to recreational navigation, including mitigation features without cost to the Government, in a manner compatible with the project's authorized purpose and in accordance with applicable Federal and State laws and specific directions prescribed by the Government in the OMRR&R manual and any subsequent amendments thereto.

h. Accomplish all removals determined necessary by the Federal Government other than those removals specifically assigned to the Federal Government;

i. Grant the Federal Government a right to enter, at reasonable times and in a reasonable manner, upon property that the non-Federal sponsor owns or controls for access to the general navigation features for the purpose of inspection, and, if necessary, for the purpose of operating, maintaining, repairing, replacing, and rehabilitating the general navigation features;

j. Hold and save the United States free from all damages arising from the construction, operation, maintenance, repair, replacement, and rehabilitation of the project, any betterments, and the local service facilities, except for damages due to the fault or negligence of the United States or its contractors;

k. Keep, and maintain books, records, documents, and other evidence pertaining to costs and expenses incurred pursuant to the project, for a minimum of 3 years after completion of the accounting for which such books, records, documents, and other evidence is required, to the extent and in such detail as will properly reflect total cost of construction of the general navigation features,

and in accordance with the standards for financial management systems set forth in the Uniform Administrative Requirements for Grants and Cooperative Agreements to State and local governments at 32 CFR, Section 33.20;

l. Perform, or cause to be performed, any investigations for hazardous substances as are determined necessary to identify the existence and extent of any hazardous substances regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. 9601-9675, that may exist in, on, or under lands, easements, or rights-of-way that the Federal Government determines to be necessary for the construction, operation, maintenance, repair, replacement, or rehabilitation of the general navigation features. However, for lands that the Government determines to be subject to the navigation servitude, only the Government shall perform such investigation unless the Federal Government provides the non-Federal sponsor with prior specific written direction, in which case the non-Federal sponsor shall perform such investigations in accordance with such written direction;

m. Assume complete financial responsibility, as between the Federal Government and the non-Federal sponsor, for all necessary cleanup and response costs of any CERCLA regulated materials located in, on, or under lands, easements, or rights-of-way that the Federal Government determines to be necessary for the construction, operation, maintenance, repair, replacement, and rehabilitation of the general navigation features;

n. To the maximum extent practicable, perform its obligations in a manner that will not cause liability to arise under CERCLA;

o. Comply with the applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, as amended by Title IV of the Surface Transportation and Uniform Relocation Assistance Act of 1987, and the Uniform Regulations contained in 49 CFR Part 24, in acquiring lands, easements, and rights-of-way, required for construction, operation, maintenance, repair, replacement, and rehabilitation of the general navigation features, and inform all affected persons of applicable benefits, policies, and procedures in connection with said act;

p. Comply with all applicable Federal and State laws and regulations, including, but not limited to, Section 601 of the Civil Rights Act of 1964, Public Law 88-352 (42 U.S.C. 2000d), and Department of Defense Directive 5500.11 issued pursuant thereto, as well as Army Regulation 600-7, entitled "Nondiscrimination on the Basis of Handicap in Programs and Activities Assisted or Conducted by the Department of the Army;"

q. Provide a cash contribution equal to the non-Federal cost share of the project's total historic preservation mitigation and data recovery costs attributable to commercial navigation; and recreational navigation that are in excess of 1

percent of the total amount authorized to be appropriated for commercial navigation and recreational navigation.

r. Do not use Federal funds to meet the non-Federal sponsor's share of total project costs unless the Federal granting agency verifies in writing that the expenditure of such funds is expressly authorized by statute.

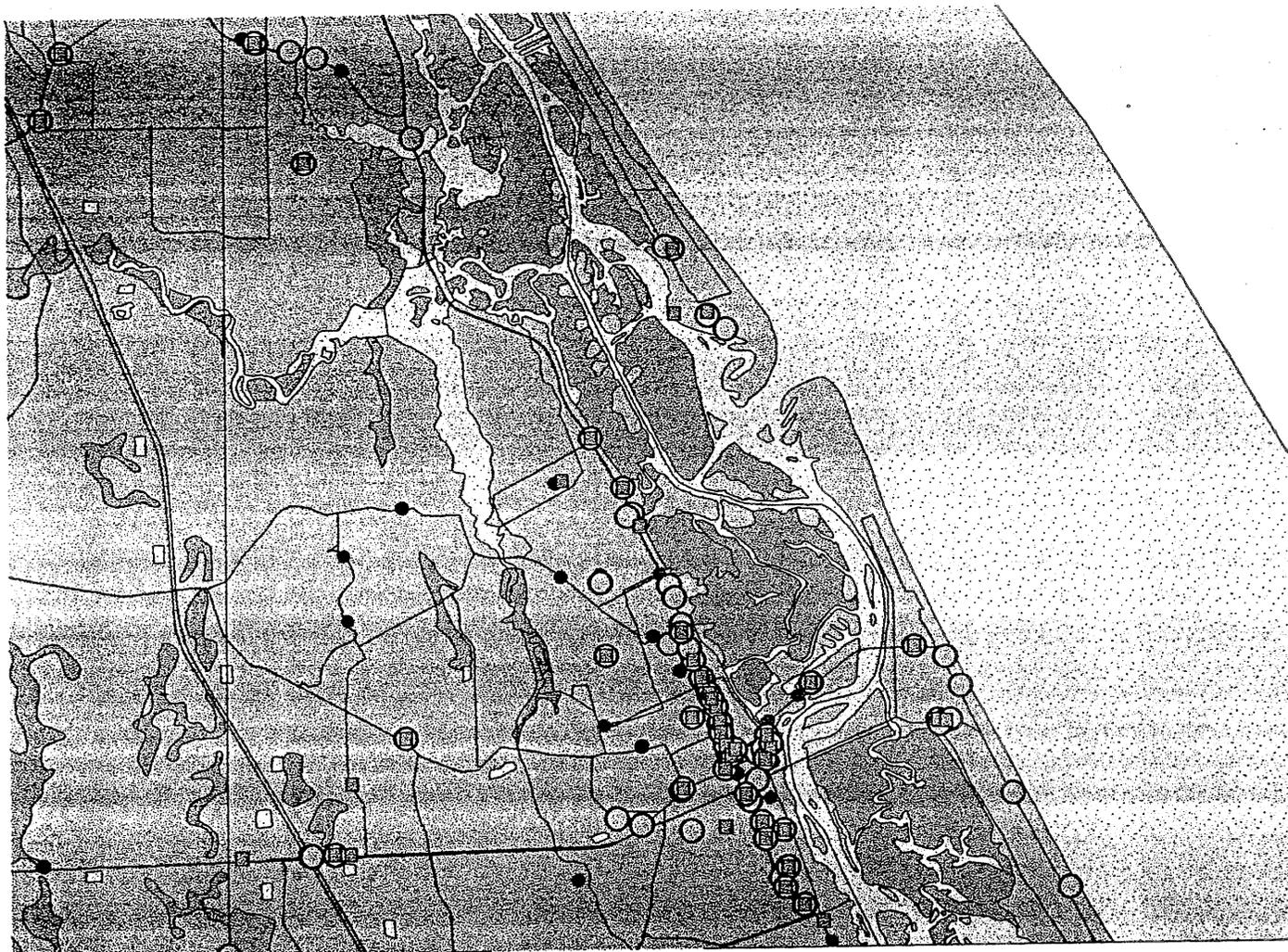
3. Environmental Compliance. A hazardous, toxic, and radioactive waste (HTRW) preliminary assessment was conducted for the vicinity of the Federal navigation project at Ponce DeLeon Inlet. The preliminary assessment indicated no evidence of HTRW on the project lands. The proposed project sites are mostly underwater, adjacent to popular beaches. The preliminary assessment also indicated that no contamination exists in the vicinity of Ponce DeLeon Inlet, with the exception of a leaking underground storage tank (UST) approximately one-quarter of a mile north of the project area. UST's are to be upgraded by 1999, with associated contamination remediated. The leaking UST does not appear to be impacting the proposed project area.

During construction, HTRW awareness should be practiced. If contaminants are found during project construction they must be remediated. Contaminants not detected during the preliminary assessment may be disturbed or released by increasing water levels, or by removing unnatural structures or landscape features. Experience has shown that residual HTRW levels are difficult to detect during flooding because of dispersion and biological activity.

A map showing results of the HTRW review follows.

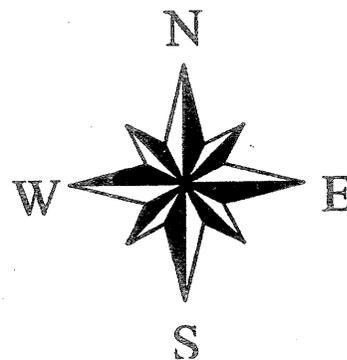
4. In 1998 the Corps of Engineers and the State of Florida Department of Environmental Protection entered into a Standard Operating Procedure (SOP) related to Corps coastal activities (copy attached). In item 3 of the SOP, pertaining to water quality conditions, the Corps agrees to incorporate appropriate resource protection measures into plans and specifications. This is in accordance with the Federal Coastal Zone Management Act and to comply with the State's Coastal Zone Management Plan. Water Quality Certification is therefore issued during plans and specifications phase and not during feasibility phase. By letter dated November 25, 1998 (found in the Environmental Assessment Appendix C-Correspondence) the State has determined that the project is consistent with the Florida Coastal Management Program at this stage.

Ponce De Leon Inlet HTRW Review



3 0 3 6 Miles

- Ust_leak.shp
- Ust.shp
- Tsd_fac.shp
- Transporter.shp
- ▲ Stat_prior_ist.shp
- Spills.shp
- ▲ Stat_cercla_ist.shp
- Smal_gener.shp
- ☆ Nat_prior.shp
- Large_gener.shp
- Landfill.shp
- ☆ Cercla_ist.shp
- Abovgrnd.shp
- Mj_roads
- Hydro
- land
- water
- wetland



**STANDARD OPERATING PROCEDURE
RELATED TO
CORPS COASTAL ACTIVITIES
· BETWEEN THE UNITED STATES ARMY CORPS OF ENGINEERS AND
THE STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION**

This Standard Operating Procedure (SOP) is entered into this ____ day of _____, 1998, by and between the U.S. Army Corps of Engineers, Jacksonville District and Mobile District (hereinafter the "Corps"), and the State of Florida Department of Environmental Protection (hereinafter the "Department").

WITNESSETH:

Whereas, the Corps is engaged in the execution of its mission in Florida which includes but is not limited to flood control, navigation, hurricane and shore protection, ecosystem restoration, recreation and fish and wildlife enhancement and is required: (1) to obtain water quality certification from the State of Florida pursuant to 33 USC 1341; (2) to be consistent to the maximum extent practicable with the Florida Coastal Zone Management Plan under 16 USC 1456; and (3) to obtain state permits to the extent that sovereign immunity has been waived under 33 U.S.C. 1323 and 1344(t); and

Whereas, the Department is responsible for development and maintenance of a comprehensive long-term management plan for the restoration of the state's critically eroding beaches in accordance with Section 161.161, Florida Statutes (F.S.); and the Department is responsible for issuance of an environmental resource or joint coastal permit under Chapter 161 and Part IV of Chapter 373, F.S., which issuance of (unless otherwise stated) constitutes certification of compliance with state water quality standards pursuant to Section 401 of the Clean Water Act, 33 U.S.C. 1341; and where applicable constitutes a finding of consistency with Florida's Coastal Zone Management Program, as required by section 307 of the Coastal Management Act, 16 U.S.C. Section 1456, 15 C.F.R. Part 930, and Section 380.23 of the Florida Statutes; and

Whereas, the Department and the Corps have established a special working relationship in the management, protection and restoration of the state's environmental resources in previous memorandums of understanding; and

Whereas, neither party by entering into this SOP waives any of its rights, arguments or positions regarding their respective authorities but enter into this agreement to promote the interests of both parties.

Now, therefore the parties do hereby agree as follows:

1. The parties within their respective authorities and funding shall ensure that beach ~~compatible~~ dredged material is disposed on Florida's beaches to the extent economically ~~feasible~~ consistent with Florida's beach management plan adopted pursuant to Chapter 161, F.S. and other beneficial uses criteria as may be specified by the Department and applicable federal standards. To further the parties goals for sediment management, the Corps shall provide the Department with existing geotechnical information characterizing the ~~sediments~~ to be dredged and alternative disposal options with projected costs to allow the Department to participate in funding alternative disposal options over the least costly method.
2. Conditions for the protection of federally-listed threatened or endangered species shall be consistent with requirements of the U.S. Fish and Wildlife Service and the National Marine Fisheries Service. The Corps agrees to consult and coordinate with the Florida Bureau of Protected Species to incorporate appropriate protective measures into plans and specifications to assure adequate protection of species of state concern.
3. Water quality conditions shall be developed to assure that state and federal requirements are met and allow the maximum flexibility in project execution. In addition, in accordance with the Federal Coastal Zone Management Act, the Corps agrees to incorporate appropriate resource protection measures into plans and specifications to assure adequate protection of those resources, in order to comply, to the maximum extent practicable, with the State's Coastal Zone Management Plan.
4. The water quality certification that is issued to the Corps through the state's permitting process will contain the following general conditions; which shall be enforceable to the extent sovereign immunity has been waived under 33 U.S.C. 1323 and 1344(t):

General Condition (a) All activities approved shall be implemented as set forth in the drawings incorporated by reference and in compliance with the conditions and requirements of this document. The Corps shall notify the Department in writing of any anticipated significant deviation from this authorization prior to implementation so that the Department can determine whether a modification is required. If the Department determines that a deviation is significant, then the Corps or the local sponsor, as appropriate, shall apply for and obtain the modification prior to its implementation.

General Condition (b) If, for any reason, the Corps does not comply with any condition or limitation specified herein, the Corps shall immediately provide the Department with a written report containing the following information: a description of and cause of noncompliance; and the period of noncompliance, including dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the noncompliance. Compliance with the provisions of this condition shall not preclude the Department from

taking any enforcement action allowed under state law to the extent that federal sovereign immunity has been waived under 33 U.S.C. 1323 and 1344(t).

General Condition (c) The Corps shall obtain any applicable licenses or permits which may be required by federal, state, local or special district laws and regulations. Nothing herein constitutes a waiver or approval of other Department permits or authorizations that may be required for other aspects of the total project. Projects shall not proceed until any other required permits or authorizations have been issued by the responsible agency.

General Condition (d) Nothing herein conveys title to land or water, constitutes State recognition or acknowledgment of title, or constitutes authority for the use of sovereign land of Florida seaward of the mean high-water line, or, if established, the erosion control line, unless herein provided, and the necessary title, lease, easement, or other form of consent authorizing the proposed use has been obtained from the State.

General Condition (e) Any delineation of the extent of a wetland or other surface water submitted as part of the application, including plans or other supporting documentation, shall not be considered specifically approved unless a specific condition of this authorization or a formal determination under section 373.421(2), F.S., provides otherwise.

General Condition (f) Nothing herein conveys to the Corps or creates in the Corps any property right, or any interest in real property, nor does it authorize any entrance upon or activities on property which is not owned or controlled by the Corps or local sponsor, or convey any vested rights or any exclusive privileges.

General Condition (g) This document or a copy thereof, complete with all conditions, attachments, modifications, and time extensions shall be kept at the work site on the authorized activity. The Corps shall require the contractor to review this document prior to commencement of the authorized activity.

General Condition (h) The Corps specifically agrees to allow Department personnel with proper identification, at reasonable times and in compliance with Corps specified safety standards access to the premises where the authorized activity is located or conducted for the purpose of ascertaining compliance with the terms of this document and with the rules of the Department and to have access to and copy any records that must be kept; to inspect the facility, equipment, practices, or operations regulated or required; and to sample or monitor any substances or parameters at any location reasonably necessary to assure compliance. Reasonable time may depend on the nature of the concern being investigated.

General Condition (i) At least forty-eight (48) hours prior to the commencement of authorized activity, the Corps shall submit to the Department a written notice of

commencement of activities ~~indicating~~ the anticipated start date and the anticipated completion date.

General Condition (j) If ~~historic or archaeological~~ artifacts are discovered at any time on the project site, the Corps shall immediately notify the State Historic Preservation Officer, and if a significant deviation is necessary, shall also notify the Department.

General Condition (k) ~~Within a reasonable time after completion of project construction or a periodic maintenance dredging event,~~ the Corps shall submit to the Department a written statement of completion. This statement shall notify the Department that the work has been completed as authorized and shall include a description of the actual work completed. The Department shall be provided, if requested, a copy of any as-built drawings required of the contractor or survey performed by the Corps.

5. This SOP is not intended to alter or affect any other existing agreements between the parties. The procedures in this SOP are intended to describe the application of applicable statutes and rules by the Department and the method of compliance by the Corps for water quality certification and coastal zone consistency through the environmental resource and joint coastal permitting processes related to coastal activities. This SOP does not preclude the parties from utilizing other permitting processes in lieu of this process.

6. The Corps is granted a waiver from the imposition of application processing fees for any environmental resource or joint coastal permit related to coastal activities, when the Corps is to be the applicant or is acting as agent for the local sponsor or military entity.

7. Any party to this Agreement may terminate, with or without cause, its participation hereunder by giving 30 days written notice. In the event of termination by the Department, the Corps waives any right to an administrative hearing under sections 120.569 or 120.57 of the Florida Statutes.

8. All notices or other information required to be directed to the Department shall be addressed to:

Bureau of Beaches and Coastal Systems
Division of Water Facilities
Department of Environmental Protection
3900 Commonwealth Blvd., Mail Station 310
Tallahassee, FL 32399-3000

9. All notices or other information required to be directed to the Army Corps of Engineers shall be addressed to:

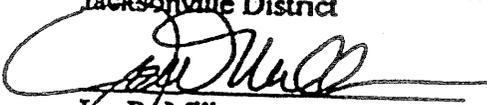
U.S. Army Corps of Engineers
Jacksonville District
400 West Bay St., 9th Flr.
Jacksonville, FL 32232-0019

OR

U.S. Army Corps of Engineers
Mobile District
109 St. Joseph St.
Mobile, AL 36602

This SOP is effective upon the date it is last signed by the parties hereto as indicated below.

The Department of the Army
Jacksonville District


Joe R. Miller
Colonel, U.S. Army
District Engineer

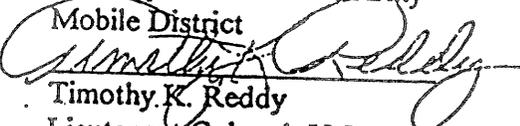
Date: 05 JUNE 1998

Florida Department of Environmental
Protection


for Virginia Wetherell
Secretary

Date: 6.5.98

The Department of the Army
Mobile District


Timothy K. Reddy
Lieutenant Colonel, U.S. Army
District Engineer

Date: 5 June 1998



County of Volusia

Ponce DeLeon Port Authority
700 Catalina Drive, Suite 126 • Daytona Beach, Florida 32114
Telephone: (904) 248-8072 • Fax: (904) 248-8075

Mr. Richard E. Bonner, P.E.
Deputy District Engineer for Project Management
Department of the Army
Jacksonville District Corps of Engineers
Programs and Project Management Division
Project Management Branch
P.O. Box 4970
Jacksonville, Florida 32232-0019

June 1, 1999

Dear Mr. Bonner,

Please accept this letter verifying the financial capability and commitment of the Ponce de Leon Port Authority as the "Local Sponsor" for the USACE Channel Works at Ponce de Leon Inlet.

The final feasibility study for Ponce de Leon Inlet calls for a 1,000-foot eastward extension of the south jetty. The initial cost for this new channel works feature is approximately \$ 5,500,000 with the project sponsor's share of these costs estimated to be \$ 2,500,000.

Additionally, the project sponsor's share of all future maintenance of this feature will be 85% of all future maintenance cost for this feature. These funds are to be forwarded to the USACE prior to the maintenance contract advertisement.

With understanding of the above, please accept this letter as verification that the Ponce de Leon Port Authority supports the USACE recommended plan, has the project construction and maintenance cost-share funds available, and will continue to be the "Local Sponsor" for this project.

We sincerely appreciate your continued efforts on behalf of the stabilization of Ponce de Leon Inlet. Please call for any further information or assistance you may need.

Sincerely,

Ms. Jamie Seaman, Director
Ponce de Leon Port Authority

cc: Mr. Tim Murphy, U.S.-COE Jacksonville District Project Manager
Ponce de Leon Inlet
Mr. Joe Nolin, Special Projects
Ponce de Leon Port Authority





DEPARTMENT OF THE ARMY

U.S. Army Corps of Engineers
WASHINGTON, D.C. 20314-1000

REPLY TO
ATTENTION OF:

S: 13 June 1999

CECW-AR (1110-2-1150a)

19 May 1999

MEMORANDUM FOR Commander, South Atlantic Division, ATTN: Chief of Planning

SUBJECT: Ponce de Leon Inlet, Florida, Volusia County, Florida, Final Feasibility Report and Environmental Assessment (January 1999)--HQUSACE Policy Compliance Assessment

1. The HQUSACE policy compliance assessment of subject report is complete. The enclosed comments identify concerns that need to be addressed by the reporting officers before the feasibility report can be considered by decisionmakers.
2. A feasibility resolution conference was held on 3 March 1998. Except as noted in the enclosed HQUSACE policy compliance assessment, the final report adequately responds to review concerns stated in the 12 March 1998, project guidance memorandum (PGM), and subsequent CECW-AR memoranda dated 4 September 1998, and 27 November 1998. The HQUSACE policy compliance assessment notes where revised pages, or report addenda, will be required to complete report documentation.
3. Based on information obtained in response to this assessment and any additional information provided as a result of review of subject report by other agencies, groups, and individuals, the HQUSACE review manager will document the results of the report review. The documentation of review findings will be used during the subsequent Washington level decisionmaking process. If you believe that a conference to discuss the review comments would be beneficial, the time and location for the conference should be arranged with the HQUSACE review manager. At the conclusion of the review conference, the HQUSACE review team will be available to brief you and the district engineer, if desired.
4. In order to meet Civil Works Directorate goals for timely processing of feasibility reports, your written responses to comments should reach CECW-AR by 13 June 1999. The mailing address is as follows:

Policy Division
Policy Review Branch, CECW-AR
7701 Telegraph Road
Alexandria, VA 22315-3861

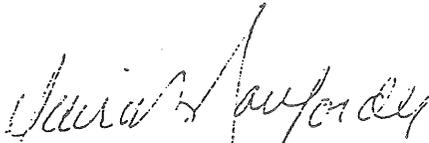
CECW-AR

SUBJECT: Ponce de Leon Inlet, Florida, Volusia County, Florida, Final Feasibility Report and Environmental Assessment (January 1999)--HQUSACE Policy Compliance Assessment

5. Questions on the review comments and the Washington level review process can be discussed with Jay Warren, the HQUSACE review manager, 703-428-6465.

FOR THE COMMANDER:

Encl
as



DAVID B. SANFORD, JR.
Chief, Policy Division
Directorate of Civil Works

CF (w/encl):

DIVENGR, South Atlantic

DISTENGR, Jacksonville

SACW, ATTN: Deputy Assistant Secretary for Planning Policy and
Legislation

SACW, ATTN: Deputy Assistant Secretary for Management and Budget
Chief

CECW-P

CECW-E

CECW-B

CECW-O

Director, CERE, ATTN: Sue Fugitt, CERE-AM

Chief Counsel, CECC

CECW-ZB

CECW-PE

**HQUSACE POLICY COMPLIANCE ASSESSMENT
PONCE DE LEON INLET, FLORIDA
FEASIBILITY REPORT AND ENVIRONMENTAL ASSESSMENT
(JANUARY 1999)**

1. **GENERAL.** With exception of the following remaining concerns, all prior review comments have satisfactorily addressed by revisions made to the report. The following review comments focus on unresolved policy-related issues raised in the PGM and review of the final report.

2. **Comment 14. d. Lump-Sum Payment Recommendation for Future O&M Costs.** The policy compliance review team is concerned that the proposal to accept a lump-sum payment for the non-Federal sponsor's share of future O&M may not be in the best interest of the Federal Government. The original project anticipated the non-Federal sponsor paying 30.2 percent of the O&M cost of the project. An arrangement was made where the sponsor made a lump-sum payment of \$1,379,000 to cover its share of future O&M expenditures. However, the cost of project O&M was severely underestimated. Since construction of the Federal project in 1972, maintenance costs for the channel and jetties have averaged about \$1,000,000 per year. Given the history of predicted versus actual O&M expenditures at Ponce de Leon Inlet, we believe it appropriate that non-Federal sponsor's share of O&M costs be paid at each maintenance event.

ACTION TAKEN. Paragraph 246, page 124, has been revised. Maintenance costs for the project to date include costs for the north jetty and for the entrance, north and south channels. The cost in question is for O&M of the extension of the south jetty only and is based on actual expenditures for the existing south jetty and for the north jetty. Because of this and because of the history of the construction of the project, the projected cost for O&M of the south jetty extension is more certain. An amount equal to the present worth of the non-Federal sponsor's share of the future O&M costs for the south jetty extension will be placed in an interest-bearing escrow account. These funds will be used toward O&M costs for the south jetty extension as they are incurred. This amount is \$190,000, calculated at an interest rate of 6 7/8%.

POLICY COMPLIANCE REVIEW TEAM ANALYSIS. The review concern is not resolved. The social discount rate used to determine the present value of the estimate of future O&M costs is appropriate for use in the NED evaluation of alternatives. However, this discount rate is not appropriate for uses that relate to project financing. The value of future payments that must be cost shared will be determined by unknown future inflation. Consequently, the actual present value of those future expenditures may be more or less than that estimated based on the use of the current social discount rate. More importantly, estimates of future O&M costs associated with features of the Ponce de Leon Inlet project are highly speculative. The project proposal assumes that extending

Enclosure

CECW-AR-M

SUBJECT: Ponce DeLeon Inlet, Florida, Volusia County, Florida, Final Feasibility Report--HQUSACE
Policy Compliance Assessment

the south jetty will induce the deep-water channel to migrate toward the approximate center of the jettied inlet. However, the report clearly documents a long history of instability of the inlet despite our past best efforts. According to the report, unexpected migration of the deep-water channel has undermined portions of the scour apron at the north jetty. The estimates of costs associated with future scour apron repairs to the south jetty may be the best available; however, given the unstable nature of the inlet, these estimates are most probably inaccurate. Consequently, acceptance of a one-time payment to cover the non-Federal sponsor's share of unknown future O&M costs is not considered in the best interest of the Government. The non-Federal sponsor should be required to pay its proportional share of the south jetty O&M costs at the time of each future maintenance event. The district should provide an addendum or revisions to the items of local cooperation for inclusion in the final report that reflects this non-Federal sponsor requirement.

3. ENVIRONMENTAL COMPLIANCE

a. HTRW. The report provides no discussion on any level of HTRW potential (or lack of) as required by ER 1165-2-132, paragraph 8g. This ER states that feasibility report must fully document any HTRW impact or potential. The report needs to conclude that either 1) there is no known HTRW or that HTRW has been identified. The district should provide revised pages or a report addendum to address this issue.

b. Missing Documentation. The report is missing documentation of State Water Quality Certification, Section 401 of the Clean Water Act, as required by ER 1105-2-100, paragraph 7-64. The report needs to include the necessary documentation. The district should provide revised pages or a report addendum to address this issue.



JAMES E. WARREN, PE
Policy Compliance Review Manager



DEPARTMENT OF THE ARMY
SOUTH ATLANTIC DIVISION, CORPS OF ENGINEERS
ROOM 9M15, 60 FORSYTH ST., S.W.
ATLANTA, GEORGIA 30303-8801

March 16, 1999

NOTICE OF COMPLETION
Feasibility Report
Ponce de Leon Inlet
Volusia County, Florida

COMPLETION OF STUDY

Notice is hereby given that the Jacksonville District and the South Atlantic Division, U.S. Army Corps of Engineers, have completed a Feasibility Report and Environmental Assessment for navigation improvements to Ponce de Leon Inlet, Volusia County, Florida. This report was prepared in response to a resolution of the Committee on Public Works and Transportation of the United States House of Representatives dated May 21, 1991.

FINDINGS AND RECOMMENDATIONS

The recommended plan is the construction of a 1,000-foot seaward extension of the South Jetty at the entrance to Ponce de Leon Inlet. A 30-foot scour apron will be constructed along the inside (north side) of the jetty extension.

Based on October 1998 price levels, the estimated first cost of the recommended project is \$5,454,000 of which \$2,988,000 would be the Federal share and \$2,466,000 would be the non-Federal share. Based on an interest rate of 6 7/8 percent, the average annual benefits and average annual cost are estimated at \$567,000 and \$419,000, respectively. The benefit-cost ratio is 1.4.

The recommendations contained herein reflect the information available at this time and current departmental policies governing formulation of individual projects. They do not reflect program and budgeting priorities inherent in the formulation of a national civil works construction program nor the perspective of higher review levels within the Executive Branch. Consequently, the recommendations may be modified before they are transmitted to the United States Congress as a proposal for authorization and/or implementation funding.

COORDINATION

The report has been coordinated with concerned local interests and the responsible state and Federal agencies. The Final Coordination Act Report from the U.S. Fish and Wildlife Service is included in the report. A Finding of No Significant Impact (FONSI) statement was signed on February 5, 1999 and is included in the report.

The Ponce de Leon Port Authority is the project sponsor and by letter dated January 11 1999 expressed support for the project and their intent to secure funding for project implementation.

PUBLIC INVOLVEMENT

The draft feasibility report and Environmental Assessment were circulated for public review between September 22 and November 25, 1998 and comments provided during this review are incorporated in the report.

REVIEW AND AUTHORIZATION PROCESS

Prior to adoption of the proposed project, the study evaluations and report findings will be reviewed by the Chief of Engineers and the Assistant Secretary of the Army for Civil Works. A coordinated review, including the state of Florida and other Federal agencies, will also be accomplished at that time. The Chief of Engineers will review the report and forward a recommendation to the Secretary of the Army.

If the recommendation of the Chief of Engineers is significantly different from the recommendation coordinated with the state of Florida and Federal agencies, interested parties will be afforded an opportunity to comment further prior to submission of the Chief's report to the Secretary. The Assistant Secretary of the Army, in consultation with the Office of Management and Budget, then establishes the Administration position on whether the proposal should be recommended to Congress for authorization.

VIEWS OF INTERESTED PARTIES

Interested parties may present written views on the report to the Chief of Engineers and the Secretary of the Army through the Directorate of Civil Works. Such communications should be mailed to the Policy Division, Policy Review Branch, ATTN: CECW-AR, 7701 Telegraph Road, Alexandria, Virginia 22315-3861, in time to reach the Policy Review Branch within 30 days from the date of this notice. Copies of information received by mail will be regarded as public information unless the correspondent requests otherwise. Such a request will limit the usefulness of the information because of the need for full public disclosure of all factors relevant to the decision on project approval.

FINAL ACTION BY THE CHIEF OF ENGINEERS

The Chief of Engineers will not submit a recommendation to the Secretary on the report until after the expiration of this notice or

any extension thereof that may be granted, and full consideration of all information submitted in response thereto.

REPORT INFORMATION

Further information concerning the study and report may be obtained from the District Engineer, Jacksonville. Requests should be addressed to the District Engineer, U.S. Army Engineer District Jacksonville, P.O. Box 4970, Jacksonville, Florida 32232-0019. The report may be viewed by interested parties at the above office. Interested parties may purchase copies of the report at the cost of reproduction (\$50.00). Checks or money orders should be made payable to the Finance and Accounting Officer, U.S. Army Engineer District, Jacksonville. Please pass along a copy of this public notice to anyone who may be interested in the report and who has not received a copy.



J. Richard Capka
Brigadier General, U.S. Army
Division Engineer

CESAD-ET-P (CESAJ-PD/) (1105-2-10) 1st End
Mr. Meyer/bjg/404 562-5224
SUBJECT: Ponce de Leon Inlet, Volusia County, Florida

Commander, South Atlantic Division, U.S. Army Corps of Engineers,
Room 9M15, 60 Forsyth Street, S.W., Atlanta, Georgia 30303-8801

12 MAR 1999

FOR CDR, HQUSACE, ATTN: CECW-ZA, WASH DC 20314-1000

I concur in the recommendation of the District Engineer. The cost apportionment for the proposed project is consistent with the existing authorized Federal project. The report shows that the majority of the costs are assigned to recreation as a project purpose and that the cost savings from this project to our on-going Operations and Maintenance program for Ponce de Leon Inlet are substantial. The stabilization of the channel through the improvement to the South Jetty will protect the investment that has been committed to the rehabilitation of the North Jetty. It will also reduce a considerable safety hazard to boaters using the inlet. Therefore, it is clearly in the best interests of the Federal Government to construct this project.



J. RICHARD CAPKA
Brigadier General, USA
Commanding

**PONCE DELEON INLET, FLORIDA
VOLUSIA COUNTY
NAVIGATION STUDY**

**FINAL FEASIBILITY REPORT
WITH FINAL ENVIRONMENTAL ASSESSMENT**

**U.S. ARMY CORPS OF ENGINEERS
JACKSONVILLE DISTRICT
JACKSONVILLE, FLORIDA**

JANUARY 1999

**PONCE DELEON INLET, VOLUSIA COUNTY, FLORIDA
FINAL FEASIBILITY REPORT WITH FINAL ENVIRONMENTAL ASSESSMENT
SYLLABUS**

A cooperative study has been conducted in response to a House Public Works and Transportation Committee resolution, dated May 21, 1991. The resolution requests review of the Corps reports pertaining to Ponce DeLeon Inlet to determine whether modifications to the recommendations presented in those reports are advisable. The reconnaissance report for the feasibility study was approved December 1993. In April 1994 funding was received to continue the feasibility phase of the study process. The purpose of the study is to determine the Federal interest in navigation improvements for the Ponce DeLeon Inlet Federal navigation project.

Problems addressed during the study include instability and erosion. These problems have created the need for frequent maintenance. They have also caused safety problems.

Early in the feasibility study navigation features that would satisfy planning objectives and constraints (measures) were identified. A no action plan was defined. The measures were combined into plans. The plans, referred to in the plan selection step of the formulation process as alternatives, were evaluated. The evaluation involved, in part, a comparison of alternative benefits and costs. Another round of evaluation took place after it was determined that there was no longer an opportunity for construction of a fishing park. The proposed fishing park had contributed both benefits and costs for the alternatives initially evaluated. The second round of evaluation included a refined no action (without project) alternative, a nonstructural alternative, and the alternative of construction of a 1,000-foot south jetty extension.

The selected plan would modify the existing Federal navigation project through construction of a 1,000-foot south jetty extension toward the ocean and parallel to the north jetty, with scour apron, placement of navigation aids, assumption of maintenance for the new work 1,000-foot ocean extension of the south jetty, with scour apron, and channel maintenance in natural deep water. The total initial cost of the selected plan is \$5,454,000, including construction and navigation aids. The currently estimated Federal share of the initial cost is \$2,988,000 and the non-Federal share is \$2,466,000. The currently estimated Federal share of the present worth value of operation, maintenance, repair, replacement and rehabilitation (OMRR&R) costs for the south jetty extension is \$35,000. The currently estimated non-Federal share of the present worth value of the OMRR&R costs for the south jetty extension is \$190,000.

Recommendations for modifications to the authorized project are the following: construction of a 1,000-foot south jetty extension toward the ocean and parallel to the north jetty, with scour apron; assumption of maintenance for the new work 1,000-foot ocean extension of the south jetty, with scour apron; and maintenance of channels in natural deep water.

**PONCE DELEON INLET, FLORIDA
VOLUSIA COUNTY
FINAL FEASIBILITY REPORT**

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SUPPLEMENTAL REPORTS

NUMERICAL MODEL REPORT (Taylor Engineering, Inc.)

Ponce DeLeon Inlet Feasibility Study Numerical Modeling and Shoaling Analysis Volume I July 1966 (Chapters 1 - 6)

Ponce DeLeon Inlet Feasibility Study Numerical Modeling and Shoaling Analysis Volume II July 1966 (Chapters 7 - 9)

Ponce DeLeon Inlet Feasibility Study Numerical Modeling and Shoaling Analysis, Addendum 1 - ICWW Deepening and Flood Sinus Evaluations

PHYSICAL MODEL REPORT (Coastal Engineering Research Center)

Physical Model Studies of Ponce DeLeon Inlet, Florida

ENGINEERING BENEFITS (Taylor Engineering, Inc.)

Ponce DeLeon Inlet Feasibility Study, Engineering Benefits of the Proposed South Jetty Extension, July 1998

INTRODUCTION

1. In April 1991 the Ponce DeLeon Inlet Port Authority working through the House Public Works and Transportation Committee requested the Corps study the feasibility of improving navigation in Ponce DeLeon Inlet. Local interests believe the existing navigation project could be improved for operational efficiency and safety of charter, commercial fishing, as well as recreational boats, by providing a more stable inlet. Such stabilization could also reduce existing maintenance costs for the current project. A reconnaissance study and report completed in January 1993 indicated sufficient justification for investigations to continue in more detail assessing project feasibility. Funding to initiate the study was received in April 1994. Additional funding enabled completion of the feasibility study with the results provided in this report.

STUDY AUTHORITY

2. A resolution from the Committee on Public Works and Transportation, United States House of Representatives, dated May 21, 1991, provides the study authority as follows:

Resolved by the Committee on Public Works and Transportation of the United States House of Representatives, That the Board of Engineers for Rivers and Harbors, is requested to review the report of the Chief of Engineers on Ponce DeLeon Inlet, Florida published as House Document 74, Eighty-ninth Congress, First Session, and other pertinent reports, to determine whether modifications of the recommendations contained therein are advisable at the present time, in the interest of navigation and other purposes.

3. Approval of the reconnaissance report in December 1993 and receipt of funds in April 1994 enabled the continuation of the study process to determine the feasibility of a Federal navigation improvement for that area.

STUDY PURPOSE AND SCOPE

4. The study involved an evaluation of stability, maintenance, and related navigation problems in the Ponce DeLeon Inlet area. Specifically, the study reviewed the needs of the Port Authority, charter boat operators, commercial fishermen, and concerns of the United States Coast Guard (U.S.C.G) and general recreational boaters. Overall environmental, social, and economic concerns were evaluated in the study area and identified to the extent possible within the limits of available technology and study funding restrictions.

5. Alternative solutions for satisfying inlet stability needs in the study area were identified for evaluation of costs, benefits, and environmental impacts associated with

implementation. Base data for that evaluation came from existing survey and maintenance work records of the inlet channels and jetties as well as information from the sponsor, charter boat operators, commercial fishermen, U.S.C.G., Federal and State agencies. Field work provided core borings, hydrographic surveys, shoreline surveys, and aerial photography along with tidal data and velocity profile data in support of numerical and physical modeling work.

6. Economic investigations provided tangible navigation and maintenance reduction benefits. An environmental assessment included U.S. Fish and Wildlife Service Coordination, cultural resource investigations as well as aesthetic and recreational resource investigations. The study resulted in the formulation of a plan that appears to safely, effectively, and economically resolve the inlet stability problems with a minimum impact on the environment.

PRIOR STUDIES AND REPORTS

7. Federal interest in navigation at Ponce DeLeon Inlet started as early as 1884. Interest in improving the stability of Ponce DeLeon Inlet continued through World War II to the present. Table 1 contains the prior studies and reports on Ponce DeLeon Inlet (known as Mosquito Inlet prior to 1931, figure 1).

8. Another study currently in progress involves a special research program. The U.S. Army Engineer Waterways Experiment Station, Coastal Engineering Research Center's, Coastal Inlets Research Program (CIRP) selected Ponce DeLeon Inlet for intensive study in support of the research and development needs of CIRP. The inlet was selected from a nation wide list. The purpose of the study is to improve the fundamental knowledge of inlet systems so that Federal water resources studies, construction and operation practices and procedures can be improved. The data gathering portion of that study began in April 1995.

A T L A N T I C O C E A N

NOTES

The bar at the entrance of Mosquito Inlet is said to shift with every gale; no leading marks or courses can be given for crossing it.

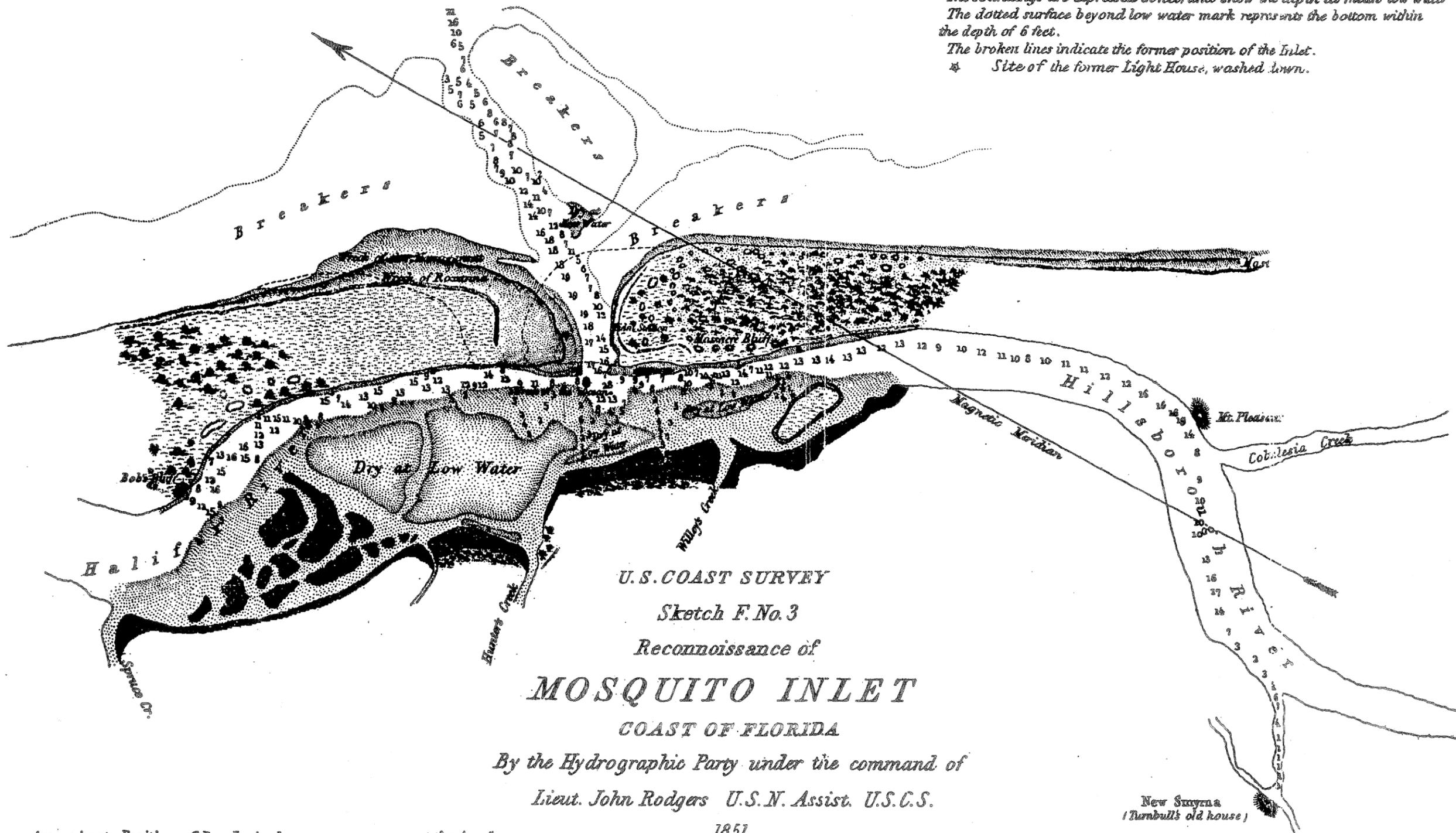
According to local information the depth has varied from 15 feet at high water to 8 feet. At the time of this reconnaissance June 23rd to June 17th 1851 there was a depth on the bar of 8 feet at low water.

Vessels run in between the breakers, judging by the eye where the most water is to be found.

The soundings are expressed in feet, and show the depth at mean low water. The dotted surface beyond low water mark represents the bottom within the depth of 6 feet.

The broken lines indicate the former position of the Inlet.

* Site of the former Light House, washed down.



U.S. COAST SURVEY
 Sketch F. No. 3
 Reconnoissance of
MOSQUITO INLET
 COAST OF FLORIDA

By the Hydrographic Party under the command of
 Lieut. John Rodgers U.S.N. Assist. U.S.C.S.

1851

A.D. BACHE Sup't.

Scale 40 000

New Smyrna
 (Turnbull's old house)

Approximate Position of Bar, Latitude 28° 59' 20"
 do..... do..... Longitude W. from Greenwich 80° 50' 30"
 Time of High Water at full and change..... 7^h 45^m
 Observed Rise of Tide (by 3 observations)..... 3^{ft} 5ⁱⁿ

FIGURE 1 (MOSQUITO INLET SURVEY 1851)

Table 1							
Prior Studies and Reports							
		CHIEF OF ENGINEERS RECOMMEN- DATIONS	PUBLISHED DOCUMENTS				
TYPE OF STUDY ¹	REPORT DATE		CONGRESSIONAL DOCUMENTS				OTHER
			TYPE ²	NO.	CONGRESS	SESSION	
PE	11/03/1884	Favorable					3
S	01/31/1885	Unfavorable					3
PE	06/03/1909	Unfavorable	H	362	61	2	
PE	04/30/1913	Unfavorable	H	219	63	1	
PE	06/30/1927	Unfavorable					4
PE	02/14/1931	Unfavorable					4
PE	07/09/1935	Unfavorable					4
S	02/14/1955	Unfavorable					4
S	06/19/1964	Favorable	H	74	89	1	
UF	09/1973	N/A					5
UF	07/1977	N/A					6
T	02/1992	N/A					7
R	12/1993	Favorable					

1 Abbreviations are: PE = Preliminary Evaluation; R = Reconnaissance Report; S = Surveys; T = Taylor Engineering; UF = University of Florida

2 Symbols are: H = U.S. House of Representative Document

3 Annual Report of the Chief of Engineers, 1885, page 1287.

4 Report not published.

5 Coastal and Oceanographic Engineering Laboratory. Florida Engineering and Industrial Experiment Station. "Report on the Performance of the Ponce DeLeon Inlet, Florida Improvement System." University of Florida. Gainesville, Florida. September 1973.

6 Purpura, J.A., and Chiu, T.Y., "Second Report on the Performance Ponce DeLeon Inlet, Florida Improvement System." UFL/COEL-77/004. Coastal and Oceanographic Engineering Laboratory. University of Florida. Gainesville, Florida. July 1977.

7 Taylor, R.B. M.A. Yanez. and T.J. Huil. "Port District Inlet Management Program, Phase III Technical Addendum." Taylor Engineering, Inc. Jacksonville, FL. February, 1992.

WATER PROJECTS

PRIOR INLET HISTORY

9. In 1935 the Corps of Engineers awarded a contract for deepening the ocean bar channel by experimental dragging and propeller wash. After repeated unsuccessful attempts the contractor abandoned that work.

10. In 1943 the Corps of Engineers dredged the inlet and interior connecting channels. That was done as a war measure with U. S. Navy funds, to aid passage of Navy and Coast Guard craft. About 860,000 cubic yards of material were removed by a 22-inch pipeline dredge at a cost of \$209,000. The dredging resulted in a 14-foot-deep channel across the seaward bar. Within a year, shoaling severely restricted use of the inlet. The Navy Department provided \$175,000 additional to redredge the inlet. About 317,000 cubic yards of material were removed by a 26-inch pipeline dredge to provide a 16-foot depth. Subsequent surveys in 1944 and 1945 revealed rapid and continued shoaling of the dredged channel.

EXISTING INLET PROJECT

11. The existing navigation project was authorized in the Rivers and Harbors Act of October 1965. That project, figure 2, consists of an entrance channel which provides access to a northwesterly channel along the Halifax River and a southeasterly channel along the Indian River. Both inner harbor channels connect with the Intracoastal Waterway. The authorized project includes:

- a. An entrance channel 15 by 200 feet across the ocean bar;
- b. A channel 12 by 200 feet in the inlet;
- c. A channel 12 by 100 feet inside the inlet and southward in the Indian River to the Intracoastal Waterway;
- d. A channel 7 by 100 feet northward in the Halifax River;
- e. Ocean jetties about 4,200 feet long and about 2,700 feet long on the north and south sides, respectively;
- f. A weir in the north jetty with an impoundment basin just to the south for accumulating littoral drift material for transport across the inlet to the south by use of a conventional pipeline dredge (U.S. House of Representatives, 1965).

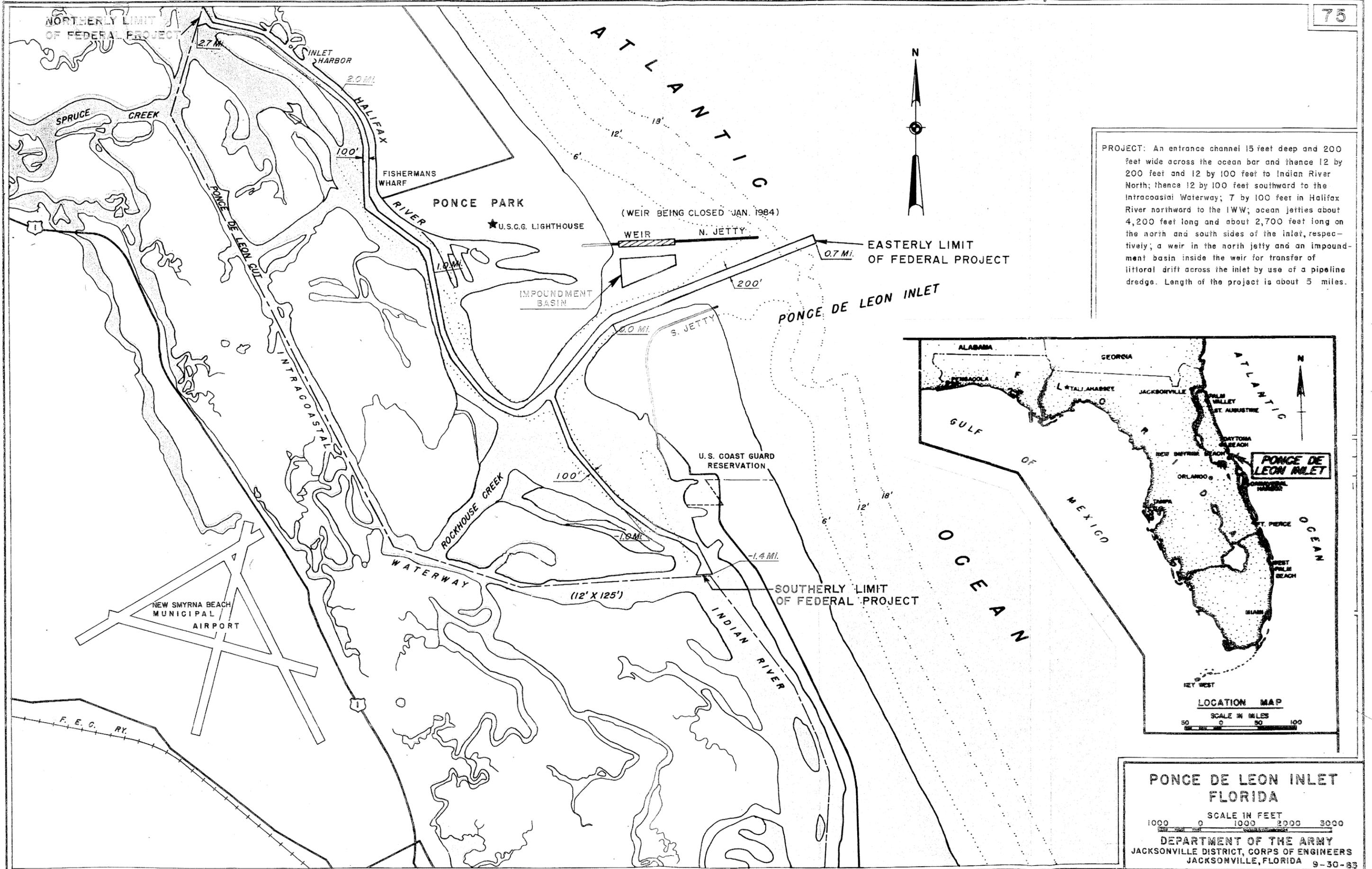


FIGURE 2 (EXISTING PROJECT)

12. In the preparation of the General and Detailed Design Memorandum (GDDM- November 1967) the field work for soundings, probings, and core borings showed significant change from the condition surveys done prior to project authorization. The subsequent plan for construction of the project was somewhat different from the authorization. The latter fieldwork indicated different design conditions were necessary for the project prior to preparing plans and specifications and showed that the channel and jetties needed to be realigned (U.S. Army Corps of Engineers, 1967)

13. Construction started on the south jetty in July 1968 and was completed in October 1969. Work on the north jetty began in September 1968 and was complete in July 1971. Construction of the north jetty and final channel dredging occurred in the following sequence (University of Florida, 1973):

- a. Sheet piling installation started in September 1968 and ended in March 1969;
- b. Driving of king piles for the weir section started in October 1968 and was completed in March 1969;
- c. The 1800-foot rubble-mound section began January 1970 and was completed in July 1971;
- d. The horizontal beam placement in the weir occurred between March and July 1971. The elevation of the first 300 feet of the 1,800-foot long weir is +4.00 feet and that of the remaining 1,500 feet is +0.00 feet referenced to a mean low water datum;
- e. Small riprap placed adjacent to concrete weir sections to prevent scour occurred in mid-1972;
- f. Impoundment Basin dredging began in August 1971 but bad weather interrupted work in February 1972;
- g. Interior channel (Indian River) dredging of a 100-foot channel started in September 1971 and ended in February 1972; and
- h. The entrance channel dredging started in July 1971 but stopped in February 1972 due to bad weather conditions. General dredging and construction of the north and south jetties was considered completed by July 27, 1972 (U.S. Army Corps of Engineers, 1973).

OTHER NAVIGATION PROJECTS

14. The Intracoastal Waterway section, Jacksonville to Miami, generally traverses lagoons along the east coast of Florida. It is an important tributary of the Intracoastal Waterway system which reaches northward to Trenton, N.J., New York City, and

Boston, Mass. Commercial and recreational boat traffic share the waterway. The waterway carries large numbers of yachts between the populous upper east coast of the Nation and the vacation areas of south Florida. Numerous side channels and basins with attendant berthing and service facilities have been developed, largely by local efforts, along the Florida section of the waterway.

15. In the area of Ponce DeLeon Inlet, the Intracoastal Waterway traverses the Halifax River to the north and the Indian River to the south except near Ponce DeLeon Inlet. At the inlet the waterway follows a cut through the marshes about a mile to the west. The waterway along those sections provides a depth of 12 feet with a width of 125 feet.

PLAN FORMULATION

16. Ponce DeLeon Inlet, located on the east coast of Florida about 10 miles south of the City of Daytona Beach, provides access to the Atlantic Ocean for commercial and recreational boaters. Fishing parties and shrimp and commercial fishermen bound for New Smyrna Beach or Daytona Beach use the inlet as well as others entering for an anchorage. Nearby fisheries enhanced by an artificial reef program attract both commercial and sport fishermen. Head boat operators also provide trips to view marine life and space shuttle launches from Cape Canaveral.

EXISTING CONDITIONS

17. Ponce DeLeon Inlet, shown in figure 2, is in Volusia County on the east coast of Florida, about 65 miles south of St. Augustine Harbor and 57 miles north of Canaveral Harbor. The inlet is a natural harbor connecting the Atlantic Ocean with the Halifax River and the Indian River North. According to historical accounts, the inlet has been in use for navigation for more than 200 years. In 1882, Congress provided for construction of a lighthouse that now exists on the north shore of the inlet. There is a U. S. Coast Guard Lifeboat Station on the east shore of the Indian River North about 0.7 of a mile south of the inlet.

18. Published Advice. According to the *United States Coast Pilot*, the inlet, protected at the entrance by jetties, is entered through a channel that leads over a bar and through the jetties. The outer end of the north jetty is marked by a light, and the inner end of the jetty is awash. With the constant shifting of the channel the Coast Guard has problems with navigation markers. The Coast Pilot publication does not advise passage through the inlet as buoys for the channel may not be marking the best water. Navigation through the inlet is also hampered by numerous recreational vessels anchored in the navigation channel along the south side of the north jetty. The publication advises that local knowledge and extreme caution be used in navigating the inlet.

19. Tides and Currents. The currents through the inlet are strong. It is reported that the average ebb is three knots; however, this can increase to five or six knots with southeasterly winds (probably meaning winds blowing from the southwest to the southeast). The mean tidal range is 2.3 feet (U.S. Department of Commerce, 1993).

20. Facilities. Ponce DeLeon Inlet connects with the Intracoastal Waterway (IWW) in two locations and provides access to the ocean from several communities in the Daytona Beach-New Smyrna Beach area. That area is within a 15-mile radius of the inlet.

21. Daytona Beach is a large resort city with excellent boating facilities and marinas to serve the public. The city has a municipal facility and dock with fuel, ice, water, and electricity available as well as meals and lodging nearby. Other facilities include two boatyards with a marine railway in each one for all types of repair, several marine hoists for repairs, and 225 open and covered berths with the same services as the public dock.

22. On the Halifax River between the inlet and Daytona Beach there are three communities with facilities for boaters. Port Orange is about 5.5 miles south of Daytona Beach with a boatyard and marina on the east side of the waterway. It is also the location of a commercial fishing facility. Inlet Harbor is a small fishing port on the northern channel of the Ponce DeLeon Inlet project about 0.5 miles southeast of the IWW. The facilities there include a marina with berthing, electricity, fuel, ice, water, some marine supplies, and a marine railway for repairs on small craft 65 feet or less in length. The third community of Ponce Inlet about one mile below Inlet Harbor has several small-craft facilities with berthing, electricity, fuel, water, ice, marine supplies, and marine railway for hull, engine, and electronic repairs on vessels 60 feet or less in length. Those communities also have facilities that handle existing charter and head boat operations.

23. To the south of the inlet along the Indian River portion of the existing Federal project is New Smyrna Beach about 2.6 miles from the inlet. Several small-boat facilities and a municipal marina provide services and supplies similar to those north of the inlet. Two commercial fishing facilities operate from New Smyrna Beach with fuel, ice, supplies, and berths for transient craft.

24. Traffic. Ponce DeLeon Inlet is the only access for recreational and commercial boaters in Volusia County to the ocean. Commercial traffic consists of charter and head boats as well as commercial fishing vessels. From available information obtained in local interviews both recreational and commercial use of the inlet are apparently heavy.

25. The Volusia County charter industry has been growing over the past 10 years. This is the result of an artificial reef program which has built 12 reefs within a distance of 6-12 miles offshore. Natural reefs are 25-30 miles offshore. The artificial reefs are very

attractive to sport fishermen. That attraction is what helps support the charter and head boat fleets in the vicinity of the inlet.

26. The charter and head boats use the inlet almost daily. On the average charter boats make 2,391 trips a year to carry about 16,380 persons of which 33 percent are residents and 67 percent are tourists. Head boats average about 1,872 trips a year through the inlet with 41,184 persons of which 64 percent are tourists and 36 percent are residents. About 40 percent of the charter boat trips and 50 percent of the head boat trips are to the artificial reefs.

27. Estimated recreational boat traffic, from local observations, in the inlet can range from 18,000 to 20,000 trips a year. That traffic comprises both local and transient boats from both inside and outside the county. Just in Volusia County boat registration records show over 17,000 recreational boats in the 1991-1992 license year. With the public parks on both sides of the inlet and the artificial reefs offshore, visitation on weekends is heavy and boaters from outside the local area are numerous.

28. Information from the Florida Cooperative Extension Service indicates commercial fishermen in Volusia County for the year ending in 1990 numbered 756. That source also had the number of commercial fishermen in the Port Orange area at about 100. Based on information in Florida Department of Natural Resources records, offshore commercial fishing trips (resulting in a landing of catch) numbered 5,614 in 1990 for Volusia County. The estimate is probably low considering transient and local traffic that enter and leave without landing a catch.

29. Commerce. The commercial fishing vessels handle the primary cargo through the inlet. From Marine Fisheries records in the Florida Department of Natural Resources landings in Volusia from July-December 1991 totaled 3,918,918 pounds. The offshore portion of that catch is an estimated 2,044,310 pounds. The catch consisted primarily of shrimp, grouper, snapper, mackerel, shark, swordfish, and tuna. Records from the Waterborne Commerce of the United States, Part I, for commerce through the inlet from 1984-1993 are in the following table:

Year	Fish	Shellfish	Ice	Total
1995	1,000	1,000	NR	2,000
1994	NR	NR	NR	NR
1993	2,000	1,000	NR	3,000
1992	2,000	2,000	NR	4,000
1991	1,000	1,000	NR	2,000
1990	1,000	10,000	2,000	13,000
1989	816	126	1,000	1,942
1988	1,494	1,431	2,085	5,010
1987	1,226	528	1,912	3,666
1986	1,384	1,112	1,912	4,408
1985	851	1,695	2,160	4,706
1984	1,143	1,175	2,097	4,415

PROBLEMS AND OPPORTUNITIES

30. Since project construction was completed in July 1972, Ponce DeLeon Inlet has had operation and maintenance problems. Table 3 summarizes maintenance and additional work costs from FY-73 to FY-91 or since completion of the project. The costs shown are from the financial statements in the *Annual Report of the Chief of Engineers on Civil Works Activities* for years 1974-1991.

31. Channel Breakthrough Inside Inlet. A sand spit inside the inlet and adjacent to the western end of the north jetty underwent intense erosion just after completion of the north jetty. In February 1973, under the influence of a strong northeast storm, dramatic forces caused conditions in the area of the spit to deteriorate resulting in a breach. The breach occurred in a narrow sand section that was the old channel of the Halifax River. The old channel section still exists and is accessible from the Halifax River side of the spit. Appendix E contains a 1961 photo (#11) of the old channel before shoaling closed it in about 1964. When the breakthrough occurred, intense shoaling essentially closed navigation access to marinas located north of the old channel. The series of photos in appendix E numbered 1 through 10 show the inlet conditions leading up to and during the breakthrough (University of Florida, 1973).

32. The boatyard owner near the inlet and other commercial fishermen in the area provided information on the extent of the problem caused by the February 1973 breakthrough. The event, according to their records, caused shoaling in the channel to the boatyard along with part of the Halifax River channel to depths of approximately 2 to

3 feet. As a temporary measure to get around the problem, use of small, shallow-draft boats 16-18 feet in length provided a means of ferrying customers between the boatyard and their boats anchored in deeper water. The boatyard owner also sued the builder of the north jetty and the dredging company responsible for the original dredging of authorized channels to obtain relief.

33. Breakthrough Closure. Local businesses on the north side of the breakthrough experienced severe hardship as a result of shoaling. The difficulties with navigation caused a considerable amount of publicity for removal of the shoal blocking access to those businesses. The U.S. Army Corps of Engineers hired a small dredge to remove the shoal. The dredge could not successfully keep the channel open as shoal material deposited faster than it was being removed. The U.S. Army Corps of Engineers stopped dredging and closed the breakthrough. Once closed, a locally hired dredge was able to reopen the access channels. As a result of that breakthrough, local business owners in the vicinity of the breakthrough indicated that it took about two years for business to return to normal.

34. Maintenance. Closure of the breakthrough by August 25, 1974 involved use of material from the entrance channel and the impoundment basin at a cost of \$517,153 and \$582,198, respectively (U.S. Army Corps of Engineers, 1975). Other costs (\$21,534) associated with the breakthrough involved the unsuccessful operation to dredge a channel in the cove north of the inlet which started July 3, 1973. The contract for that work was terminated at the convenience of the Government (U.S. Army Corps of Engineers, 1974). Since the 1973 breakthrough, changing conditions at the inlet caused extensive maintenance efforts to preserve the authorized navigation project as follows:

- Contract 77-B-0030 extended the landward end of the north jetty to station 55+00.
- From 1975 through 1978 the entrance channel shifted to the north and several dredging efforts made to realign it.
- Contract 78-C-0067 placed additional stone sections along the south side of the north jetty (contract for that protection was \$1,485,589 as given in the FY 1979 Annual Report).
- Annual monitoring surveys of the north jetty were taken through 1985.
- Contract 81-C-0020 extended the north jetty landward for the second time to station 58+75.
- Contract 83-B-0042 provided for closure of the north jetty weir.

Reference Survey No. 98-C013,
dated March and December 1998
Project Authorized 1965
Construction Completed 1972
Weir Closed 1984



FROM THIS POINT NORTH
EXISTING DEEP WATER
APPROXIMATELY FOLLOWS
THE AUTHORIZED PROJECT

EXISTING DEEP WATER

FROM THIS POINT SOUTH
EXISTING DEEP WATER
APPROXIMATELY FOLLOWS
THE AUTHORIZED PROJECT

Fondo de Leon, Jalisco
Pais de Jalisco, Mexico

Guerrero, Jalisco, Jalisco
Mexico

35. Due to erosion problems north of and stability in the inlet, work to close the weir occurred between October 1983 and March 1984. Since that time a number of changes have occurred in the area of the inlet. The entrance channel has migrated from its original location shown in figure 2 north toward the north jetty as shown in figure 2a. The shoreline of the spit to the west of the north jetty has receded approximately 300 to 1,000 feet while the emerging shoreline north of the south jetty has grown in a northeasterly direction as shown in figures 4 and 5. To minimize maintenance costs the connecting channels extending north and south of the inlet have been shifted with the movement of natural deep water. The 7-foot deep project to the north has shifted from its original location to a natural deep water channel with depths of 10 to 18 feet west of the north spit as in figure 3. The original 12-foot deep project to the south has shifted eastward toward naturally deep water.

36. Since completion of the project, \$19,222,243 has been spent on maintenance through FY-93. At the sponsor's request in September 1994 to help prevent a potential breakthrough, approximately 215,000 cubic yards of material from maintenance dredging of the adjacent Intracoastal Waterway (IWW) Federal channel was placed along the north spit beach west of the north jetty. The north spit area provided a less expensive location for disposal of maintenance material than the normal IWW disposal area. While that contract is not settled as of this writing the contracted price was \$1,000,000. That represents an average of approximately \$963,000 per year through 1994. Other maintenance may be required along the landward end of the north jetty since recent site visits reveal exposure of the concrete sheetpiling. In early summer 1998 a scour apron was placed along the landward end of the north jetty and armor stone was placed to fill in slumped areas. Associated maintenance costs in 1995 and 1996 were incurred to determine the location for placement of the scour apron include \$16,019 for a multi-beam sonar survey and \$11,416 for a U.S. Army Diver's survey of the underwater portion of the north jetty. The bid award for the construction contract for the scour apron and additional armor stone to fill in slumped areas of the north jetty was \$1,067,000. This cost does not include profit for the contractor.

Table 3
Ponce DeLeon Inlet New Work Costs and Maintenance
Since Project Completion in 1972

DATE	NEW WORK		MAINTENANCE		COMMENTS
	FEDERAL FUNDS	CONTRIBUTED FUNDS	FEDERAL FUNDS	CONTRIBUTED FUNDS	
FY-73	\$ 99,298	\$120,523	\$ 234,704		
FY-74	\$ 9,712	\$ 11,822	\$ 301,660		
FY-75	\$ 9	\$ -9	\$ 1,237,000		BREAKTH ¹
FY-76	\$ 0	\$ 0	\$ 675,299		ENT CH ²
FY-77	\$ 0	\$ -172	\$ 124,533		³
FY-78	\$ 0	\$ 0	\$ 1,501,274	\$107,000	EN CHSS ⁴
FY-79	\$ 0	\$ 0	\$ 1,136,384	\$469,409	NJSTONE ⁵
FY-80	\$ 0	\$ 37,887	\$ 164,883		EMJREPR ⁶
FY-81	\$ 0	\$ 0	\$ 214,089	\$ 20,629	JREPAIR ⁷
FY-82	\$ 0	\$ 0	\$ 139,086	\$ 15,624	JREPAIR ⁸
FY-83	\$ 0	\$ 0	\$ 161,230		COOPSTD ⁹
FY-84	\$ 0	\$ 0	\$ 2,742,016	\$ 15,624	JREPAR ¹⁰
FY-85	\$ 0	\$ 0	\$ 6,477,022		¹¹
FY-86	\$ 0	\$ 0	\$ 108,285		
FY-87	\$ 0	\$ 0	\$ 140,306		
FY-88	\$ 0	\$ 0	\$ 114,769		
FY-89	\$ 0	\$ 0	\$ 2,801,297		DREDGE ¹²
FY-90	\$ 0	\$ 0	\$ 808,954		DREDGE ¹³
FY-91	\$ 0	\$ 0	\$ 65,656		DREDGE ¹⁴
FY-92	\$ 0	\$ 0	\$ 40,134		O&M Study
FY-93	\$ 0	\$ 0	\$ 33,662		O&M Study
FY-94	\$ 0	\$ 0	\$ 77,510		
FY-95	\$ 0	\$ 0	\$ 47,947		See footnotes on next page.
TOTALS	\$ 109,019	\$170,051	\$19,347,700	\$628,286	

1. 139,009 cubic yards of material from entrance channel removed at a cost of \$517,153. Closure of breakthrough near, and beach fill from, impoundment basin was completed August 25, 1974 at a contract cost of \$582,198. E&D& S&A costs were \$40,848. Hired labor surveys, inspections, and reports cost \$96,801.
2. 72,515 cubic yards of material dredged from entrance channel.
3. FY-77 Annual Report not available.
4. Contract dredging of the entrance channel and south shoal was completed at a cost of \$1,454,502. A contract for North Jetty Stone protection was awarded late in the fiscal year, but no costs were incurred during the fiscal year.
5. Final costs for contract dredging of the entrance channel and south shoal were \$41,000. Condition and operation studies cost \$30,012. A contract for North Jetty Stone protection cost \$1,485,589.
6. Condition and operation studies cost \$59,955. Emergency jetty repair by hired labor cost \$4,097. Jetty repair by contract cost \$20,659.
7. Jetty repair by contract cost \$68,310. Condition and operation studies cost \$59,199.
8. Condition and operation studies cost \$94,252. Jetty repair by contract cost \$31,009.
9. Condition and operation studies cost \$84,888.
10. Maintenance of breakwaters costs \$1,499,999. Dredging cost \$904,989. Condition and operation studies cost \$11,840. Engineering and design and supervision and administration costs were \$228,304 and \$96,885 respectively. Repair of the north jetty should be completed in FY-85.
11. FY-85 & 86 Annual Reports not available.
12. Repair of north jetty was completed in FY-86. A continuing contract for maintenance dredging was awarded in the amount of \$2,609,099.
13. Maintenance dredging cost \$671,818.
14. Repair of north jetty completed FY 1986. Authorized project depths were restored as of January 1990.

37. Inlet Changes. The extent of the northward migration of the entrance channel is shown in figure 6. Figures 4-5 indicate loss of shoreline along an area west of the north jetty and shifting of the entrance channel toward the north jetty. Figure 6 indicates the bottom of the entrance channel has shifted from approximately -23 feet MLW at a distance of 750 feet from the north jetty in 1986 to a depth of -27 feet MLW within 50-100 feet of the north jetty in 1994. Recent trips to the inlet indicate the continued erosion along the spit adjacent to the west end of the north jetty. Photograph number 13 of appendix E shows monument PDI-39 on July 8, 1992 with its concrete foundation undermined. The same monument on September 22, 1992 is shown in photograph number 15 with approximately 18 inches more of its foundation exposed. The sponsor provided photographs numbered 16 through 21 which were taken September 25, 1992. PDI-39 can be seen in the surf zone of photograph 20 as a northeaster overtops the spit area near the north jetty and threatens to create a breakthrough.

38. Safety Concerns. The United States Coast Guard (USCG) search and rescue data provided for fiscal years 1981-1991 indicates that 20 lives were lost in the area of the inlet during that period. Most of the lives lost were associated with the 109 vessels that have capsized in the inlet. In addition the records show 347 vessels ran aground. The density plot of USCG letter dated December 16, 1992, of appendix C indicates the majority of these incidents were in the area of the inlet. Appendix D contains drawings locating the approximate vessel grounding positions over aerials of the inlet. Those locations were obtained from a September 25, 1995 meeting with USCG representatives and commercial salvage boat operators at Ponce DeLeon Inlet.

39. At present to try and discourage its usage the USCG does not mark the north channel. It is considered too unstable. The USCG continues to move the channel markers along the south channel and entrance channel as conditions change in those areas. Those changes add to the time and cost associated with the operation and maintenance of navigation aids on the project.

40. Conversations with commercial and recreational vessel operators who traverse the inlet have also revealed safety concerns. Commercial shrimp vessels have outriggers that are kept down while traveling in and out of the inlet for stability. The commercial vessel operators must be very careful to avoid collisions with vessels anchored along the north jetty to fish since the deepwater channel is up against and continues to move toward the north jetty. This safety issue is expected to be of ever greater concern as the deepwater channel moves closer to the north jetty.

41. Recreational vessel operators who are not familiar with the conditions in Ponce DeLeon Inlet may expect the deepwater channel to be found in the center of the jetties. Those who have such expectations maneuver their vessels in the center and then may ground on the shoal toward the end of the entrance channel, on the south side. Sheet 3 of 6 at the end of Appendix D shows the shoal and the locations of some groundings on the shoal.

PROSPECTIVE FUTURE CONDITIONS

42. The *1991 Florida Statistical Abstract* projects the State's population growth to be between 13 and 30 percent from 1990 to the year 2000. In that same period the population in Volusia County has a projected growth of 10 to 48 percent. Since Ponce DeLeon Inlet provides the only navigable access to the Atlantic Ocean between St. Augustine (about 65 miles to the north) and Canaveral Harbor (about 57 miles to the south), use of Ponce DeLeon Inlet is likely to increase with the population.

43. With no change in the existing navigation project the anticipated usage of Ponce DeLeon Inlet would have a lesser increase than with modifications to help stabilize the inlet. The without project future condition would most likely have a usage increase of 8 to 10 percent for the inlet. A more stabilized inlet with fewer problems would be likely to produce an increase of 20 to 25 percent. Those projected increases would apply to commercial as well as the recreational use of the waterway.

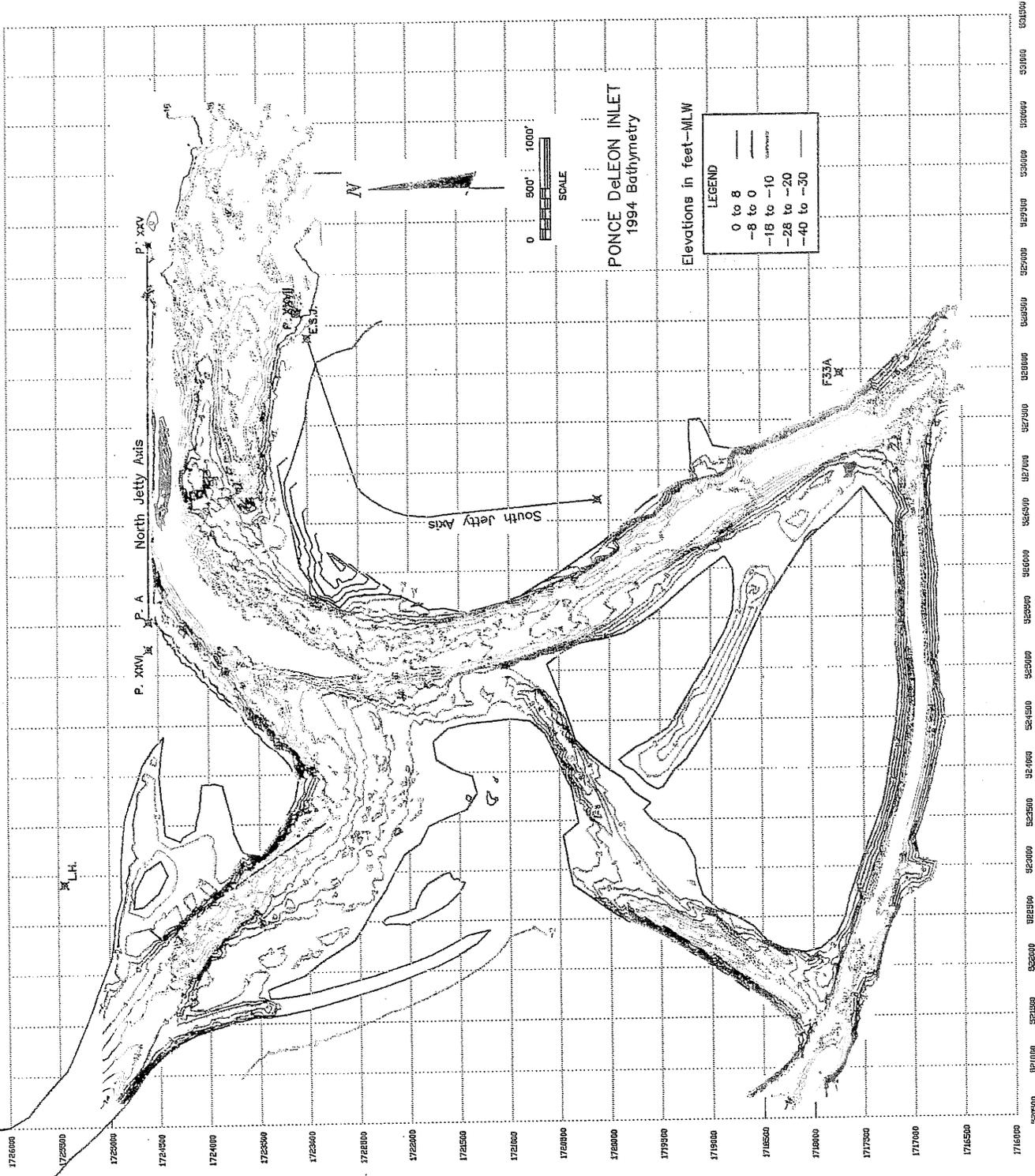


Figure 3. Contour Plot Representation of 1994 Bathymetry
Taylor Engineering, Inc. Ponce DeLeon Inlet Feasibility Study Numerical Modeling and Shoaling Analysis. Volume I. July 1996 P.2-2

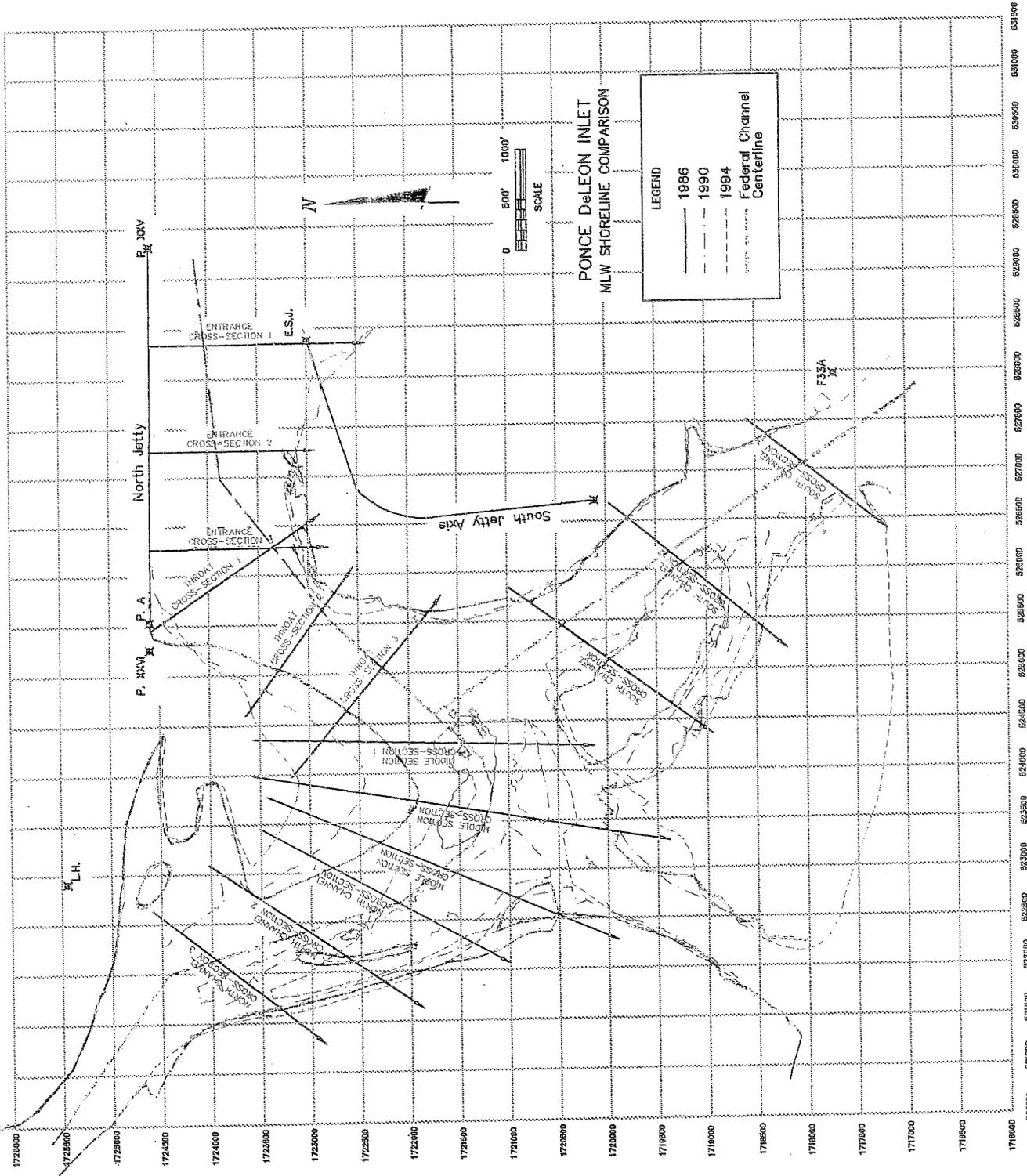


Figure 5 MLW Shoreline Comparisons - 1986, 1990, and 1994
 Taylor Engineering, Inc. Ponce DeLeon Inlet Feasibility Study Numerical Modeling and Shoaling Analysis. Volume 1. July 1996. P2-11

ENTRANCE CHANNEL

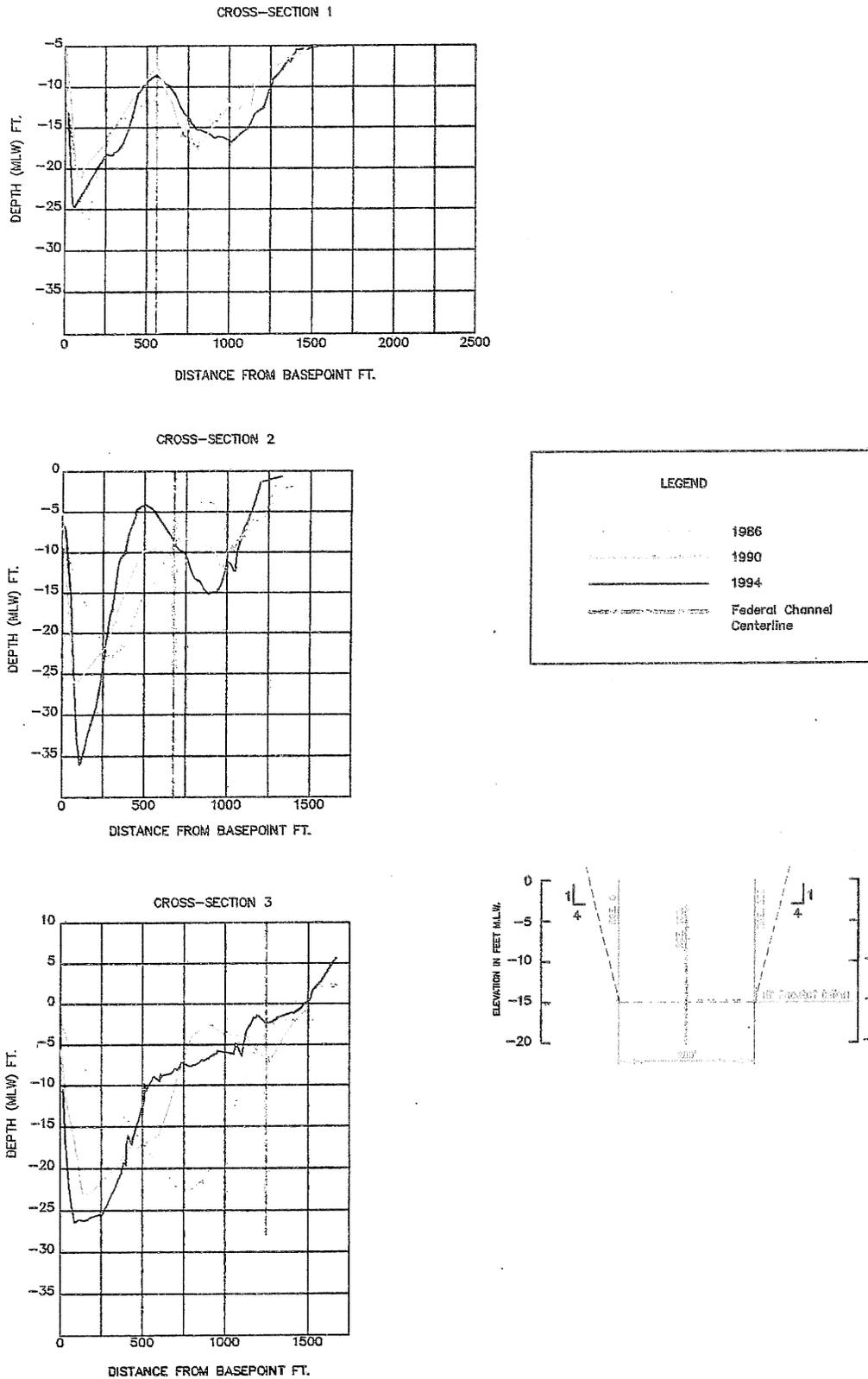


Figure 6 Entrance Channel - Comparisons of Cross Sections from 1986, 1990, 1994

44. Not only would a more stable inlet help provide a safer, more direct route for navigation to the ocean, it would help reduce future maintenance costs on the project. Assuming no improvements to help stabilize the inlet, the expectation is for erosion of the sand spit southwest of the north jetty within 8-9 years from 1994 without the occurrence of a major storm. Based on erosion rates occurring in the inlet, that projection appears very likely considering the model work completed for this study (Taylor Engineering, 1996). With the occurrence of a major storm, there is also a very real probability that a breakthrough could occur a lot sooner. Once a breakthrough happens, Federal action would likely include measures, as in the past, to block the flow through the breach and restore pre-breakthrough conditions. With no improvements in the inlet, the spit of land west of the north jetty will naturally erode until it reaches the area of the landward end of the north jetty in 8-9 years from 1994. At that time, about the year 2002, the threat of the entrance channel outflanking the north jetty will require maintenance work to extend the landward end of the north jetty to prevent outflanking.

45. A breach almost occurred during the week of September 21, 1992, when high tides combined with a northeaster resulted in intense erosion and overtopping of the spit adjacent to the north jetty (See appendix E photographs 16 through 21). Continued erosion of that area resulted in the Corps of Engineers responding to the sponsor's request to prevent a potential breakthrough by placing about 215,000 cubic yards of material in that area in September 1994 as a least cost IWW disposal option. An unexpected breakthrough is likely to duplicate the problems that occurred in February 1973. During that event the local access channel to the commercial charter/head boat facilities and boatyard on the north side of the breakthrough as well as the federal channel on the Halifax River near the breach all shoaled rapidly creating a major problem. The larger boats at those facilities did not have sufficient water to leave and other similar size boats could not gain access those facilities. With another catastrophic breach the problems faced will likely be similar.

46. Other commercial charter/head boat operators and fishermen on the Halifax River away from the immediate area of the breakthrough used an alternative route to the inlet. They traveled north along the Halifax River channel to the Intracoastal Waterway. At that point they turned south and moved along the Intracoastal Waterway to the junction with the south channel from Ponce DeLeon Inlet in Indian River. Here they turned north and traveled along the project channel to the inlet for access through the entrance channel to the ocean. The travel along the alternative route is estimated to take about 45 minutes one way. Deeper draft shrimp boats operating from New Smyrna Beach to the south would attempt to use the south channel to the entrance channel at high tide until the risk to their boats became too great. If shoaling occurred in both the north and south channels from the inlet to the extent that both channels became unusable, the closest alternative access to the ocean would be Canaveral Harbor about 57 miles to the south.

47. If quick action to close the breakthrough did not occur, a new channel would form in the breakthrough with other major changes possibly occurring in the inlet. The Lighthouse Point Park property and parking lot adjacent to the north jetty is in the erosion path of a potential outflanking. The erosion along the breakthrough route could eventually, if not immediately, result in the loss of those facilities. The north jetty could be undermined or outflanked on the west end.

ALTERNATIVE PLANS

48. The Federal objective in water and related land resources planning is to develop a plan which provides the maximum contribution to national economic development consistent with protecting the Nation's environment. In accordance with that goal, the following specific objectives apply to the navigation study for Ponce DeLeon Inlet in establishment of structural and non-structural plans:

PLANNING OBJECTIVES

49. Planning objectives for the feasibility study are the following:

- Improve the integrity of the north jetty;
- Provide a more stable system of navigation channels resulting in prevention of north jetty undermining and outflanking by the inlet channel system;
- Prevent a catastrophic breakthrough of the north spit to prevent shoaling of commercial boat access channels as well as the federal channel in the Halifax River;
- Minimize shoaling rates in the entrance channel resulting from south to north sediment transfer around the south jetty;
- Increase navigational safety of the inlet;
- Reduce maintenance costs associated with protection of the north jetty from entrance channel scouring effects;
- Minimize shoreline erosion related impacts associated with project alternatives;
- Determine the most economical construction processes for navigation improvements;
- Determine the effects of navigation improvements on overall transportation costs of commercial fishing and head boat operations;

- Consider measures and plans to minimize adverse effects on the environment and water quality during construction and maintenance of the navigation improvements;
- Identify threatened and endangered species that frequent or inhabit the area and establish means of protecting them from adverse project-related impacts;
- Identify historic properties which may be located within the area affected by proposed navigation improvements; and
- Preserve or enhance aesthetic attributes that may be disturbed by navigation improvements.

50. The formulation and preliminary analysis of alternative plans to achieve planning objectives were based on the Water Resources Council's Principles and Guidelines, the National Environmental Policy Act of 1969, and related Corps regulations. These guidelines provide for developing alternative resource management systems that address planning objectives.

CONSTRAINTS

51. During the process of plan formulation and selection, certain constraints must be a consideration in the evaluations to arrive at the planning objectives:

- Plan selection must be consistent with local planning for land use and area development;
- Selection of a plan must not negatively impact the shoreline ten miles to the north or south of the inlet;
- Plan selected must be feasible to construct and enable safe movement of vessels to serve existing and future commerce and traffic;
- Tangible national economic development (NED) benefits must exceed economic project costs on an average annual equivalent (AAEQ) basis or net present worth basis for plan justification;
- Plan with the maximum net benefits (largest increment of benefits over or above costs) is designated the NED plan;
- Plan must protect significant historic properties as well as endangered species of wildlife and marine habitat; and

- Plan implementation must satisfy State and Federal water quality standards.

CONSIDERED MEASURES FOR INLET STABILIZATION

52. In the development of alternative structural and non-structural plans certain navigation features were a consideration:

- Various length extensions and orientations of the south jetty;
- Reopening the north jetty weir to various lengths;
- Realignment of the entrance channel by construction of a channel through the north spit overlying the past historical breakthrough location;
- Construction of a groin field along the sand spit inside the inlet and adjacent to the north jetty spit; and
- Landward extension of the north jetty in conjunction with a revetment along the north sand spit.

53. Combinations of the above measures for stabilizing the inlet resulted in an array of plans for improvement to the navigation project. The development of those plans is summarized in the subsequent paragraphs and discussed in appendix A.

PRELIMINARY ASSESSMENT

54. On starting the feasibility study after completion of the reconnaissance phase, initial work involved assembling the numerical and physical model study team to review data gathering requirements. Bathymetric surveys of the study area including bank to bank coverage of the interior channels, an ebb shoal survey, shoreline surveys of the north and south beaches combined with aerials of the study area provided a baseline of existing conditions for the model work. To help establish the profile of the north jetty a centerline survey was performed.

55. Data Gathering for Model Work. In addition to the bathymetric surveys a SHOALS (Scanning Hydrographic Operational Airborne Lidar Survey) survey of the inlet provided even greater detail. The SHOALS hydrographic survey provided detailed bathymetry for both the physical and numerical models. Other information gathered for calibration of the modeling effort included current and tide data. Appendix A contains details of the entire data gathering process in combination with the supplemental report of this document.

56. Review of Measures to Stabilize Inlet. Completion of survey work enabled a preliminary assessment of existing conditions. Shoreline surveys of the throat of the inlet revealed that the sand spit west of the north jetty (Figure 5) had eroded quicker than expected. Placement of a groin field in that area to protect the land that was remaining was no longer a practical approach. A significant portion of the spit had already been removed and the erosional process was projected to continue before action to protect it could occur. Of the original 80 acres purchased in 1986 by the State of Florida and the Port Authority, 40 acres had eroded by 1992. Of the remaining 40 acres owned by the State of Florida only an estimated 22 acres existed in 1994.

57. Groin Field. Under existing conditions the hydrodynamics of the inlet continue to severely erode the spit as shown in figure 5. With the revised shoreline and the orientation of the entrance channel and Halifax River channel to the north eroding the north spit from the east and northwest sides, groin fields would no longer provide an effective measure in stopping erosion. If actually put in place the accelerated erosion from the west and east sides of the spit could leave the groins detached. In addition to being ineffective in protecting the shoreline the detached groin field would negatively impact navigation. The natural rapid recession of the north spit shoreline does not allow installation of a groin field in a timely manner. As a result of the north spit's rapid recession rate, the groin field was removed from discussion as a measure to help stabilize the inlet.

NUMERICAL/PHYSICAL MODEL TESTING

58. Other measures received additional consideration in light of the surveys received. A large scour hole along the entrance channel side of the north jetty with depths of 30 to over 40 feet confirmed the continued migration of the entrance channel up against the north jetty. The 30- to 40-foot depths are located within 50 feet of the north jetty (figure 6). To relieve the hydraulic pressure on the north jetty and help stabilize shifting navigation channels, the following measures were considered in more detail for model testing.

59. Alternative Measures for Model Testing. Other study goals in addition to relieving the hydraulic pressure on the north jetty addressed by the model testing program involve:

- Improve integrity of the north jetty;
- Provide a more stable system of navigation channels;
- Increase navigational safety of the inlet; and
- Prevent a catastrophic breakthrough of the north spit.

60. The study team met with representatives from the Coastal And Hydraulics Laboratory (CHL) of the Waterways Experiment Station in Vicksburg, Mississippi and Taylor Engineering of Jacksonville, Florida, a consultant for the study sponsor, to discuss study goals. A hybrid model testing program was developed that included a physical model developed by CHL combined with a numerical model from Taylor Engineering to evaluate measures to stabilize the inlet.

61. Beginning with the previously mentioned initial meeting of the study team and modelers to review data gathering requirements for the model work, a test program was developed to review measures to stabilize the inlet. Over a series of meetings from 3 June 1994 involving a review of data gathering needs through 31 August 1995 the following model testing program developed. The supplemental report to this document contains calibration information and other details of the model testing program.

62. South Jetty Extension. As suggested during the Reconnaissance Review Conference and by the Feasibility Cost Sharing Agreement, testing of an extension of the south jetty should occur in combination with other measures to stabilize the inlet. As a result, the numerical and physical model test plan centered on studying different orientations and lengths of the south jetty first. Jetty lengths of 500, 800, and 1,000 feet received evaluation along two different orientations. One consisted of a straight extension along the centerline of the existing south jetty. The other extended parallel to the north jetty as shown in figure 7. An optimum orientation and length was desired for the south jetty extension before adding other measures to the test program.

63. The objective of model testing different orientations and lengths of the south jetty involved determining the degree to which each option improved hydrodynamic conditions and decreased sediment transport potential into the inlet. Both the numerical and physical models indicated that a 1,000-foot extension fulfilled study goals the best. Dye and coal tracer tests in the physical model revealed the 1,000-foot jetty extension parallel to the north jetty would be needed as the most effective alternative in reducing northward sediment transport around the tip of the jetty without adversely impacting navigation in the inlet. Physical model results were inconclusive in determining the most effective orientation. The numerical model clearly identified that the 1,000-foot south jetty extension parallel to the north jetty would provide the most improved hydraulic conditions for the outer portions of the inlet channel. This alternative was found to provide a more uniform flow distribution across the width of the inlet as well as smaller increases in velocities. It provided an added benefit in that it lowered some of the hydraulic pressure along the south side of the north jetty distributing the flow more uniformly across the inlet.

64. From a surfer's perspective, model results show that the 1,000-foot extension of the south jetty parallel to the north jetty should improve wave conditions. The physical model indicated that during ebb normal flow wave heights in the surfing area south of the south jetty increased by an average of about 10%. During flood tide there was no change in the average wave height.

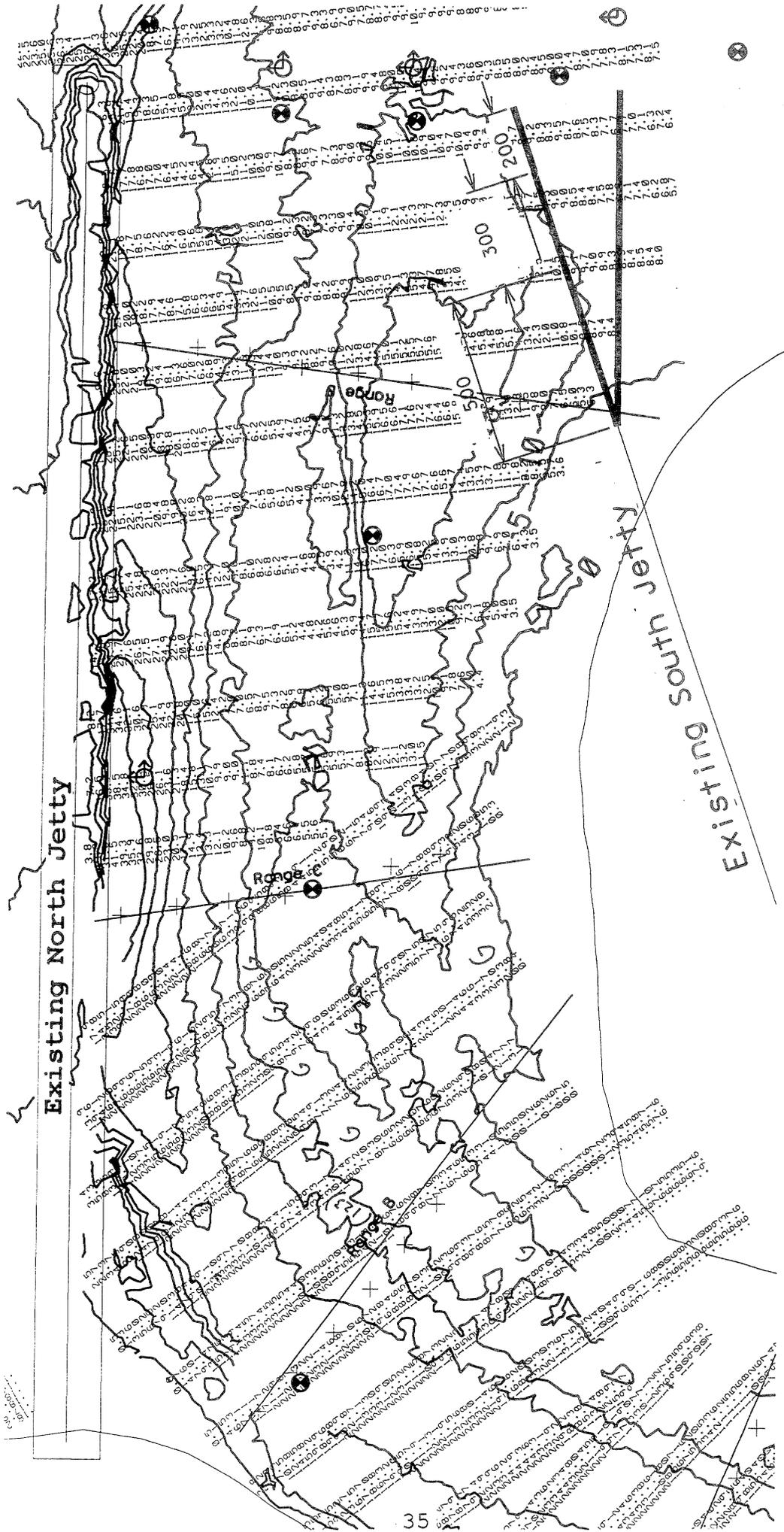


FIGURE 7 (SOUTH JETTY EXTENSION LENGTHS AND ORIENTATIONS)

65. For the remaining test program, the 1,000-foot extension of the south jetty parallel to the north jetty was used in combination with the other measures. Both the reopening of the north jetty weir and dredging of a channel through the north spit were tested with the 1,000-foot extension of the south jetty parallel to the north jetty.

66. North Jetty Weir Opening Options. The model testing program examined 500, 1,000 and 1,540-foot openings of the north jetty weir starting from the seaward end of the original weir opening and extending landward as shown in figure 8. Those openings were tested in combination with a 1,000-foot extension of the south jetty parallel to the north jetty. The objective of examining various weir openings included determining the optimum weir length to ease scour pressure along the north jetty and spit while not adversely impacting navigation. Wave and current conditions during physical model testing of the north jetty weir openings provided insight relative to sediment transport potential and wave energy overtopping the weir which adversely impacts navigation.

67. Numerical model results indicate re-opening the weir in the north jetty would produce minimal positive impacts on the hydraulic processes of Ponce DeLeon Inlet. Some localized changes in velocities might occur near the weir in the existing channel but not in the center or entrance portions of the inlet. Physical model tests provided similar results. Dye and coal tracer tests revealed that none of the weir openings improved flows near the center of the inlet. The physical model revealed limited increase in sediment transport potential in the vicinity of the weir. Wave heights within the inlet under all weir openings tested showed an increase over existing conditions.

68. Physical and numerical model tests confirmed that none of the weir openings improved conditions in the inlet. Migration of the channel up against the north jetty has resulted in a scour hole that continues to deepen with depths of over 48 feet and a length of approximately 500 feet. The continued natural straightening and deepening of the entrance channel along with the reorientation of the throat of the inlet (Halifax and Indian River channels) evidently entrains too much water for a mean low water weir to effect an ebb dominated flow. The Sponsor notes that as the sand spit west of the north jetty continues to erode, vessel operators enjoy the resulting deeper-than-normal Halifax River channel depths. The authorized Federal channel in the Halifax River has a project depth of seven feet and a bottom width of 100 feet. Surveys dated September 1994 and October 1995 confirm that depths varying from seven to over fifteen feet and spanning widths of over 300 feet exist in the Halifax River channel west and north of the north jetty sand spit.

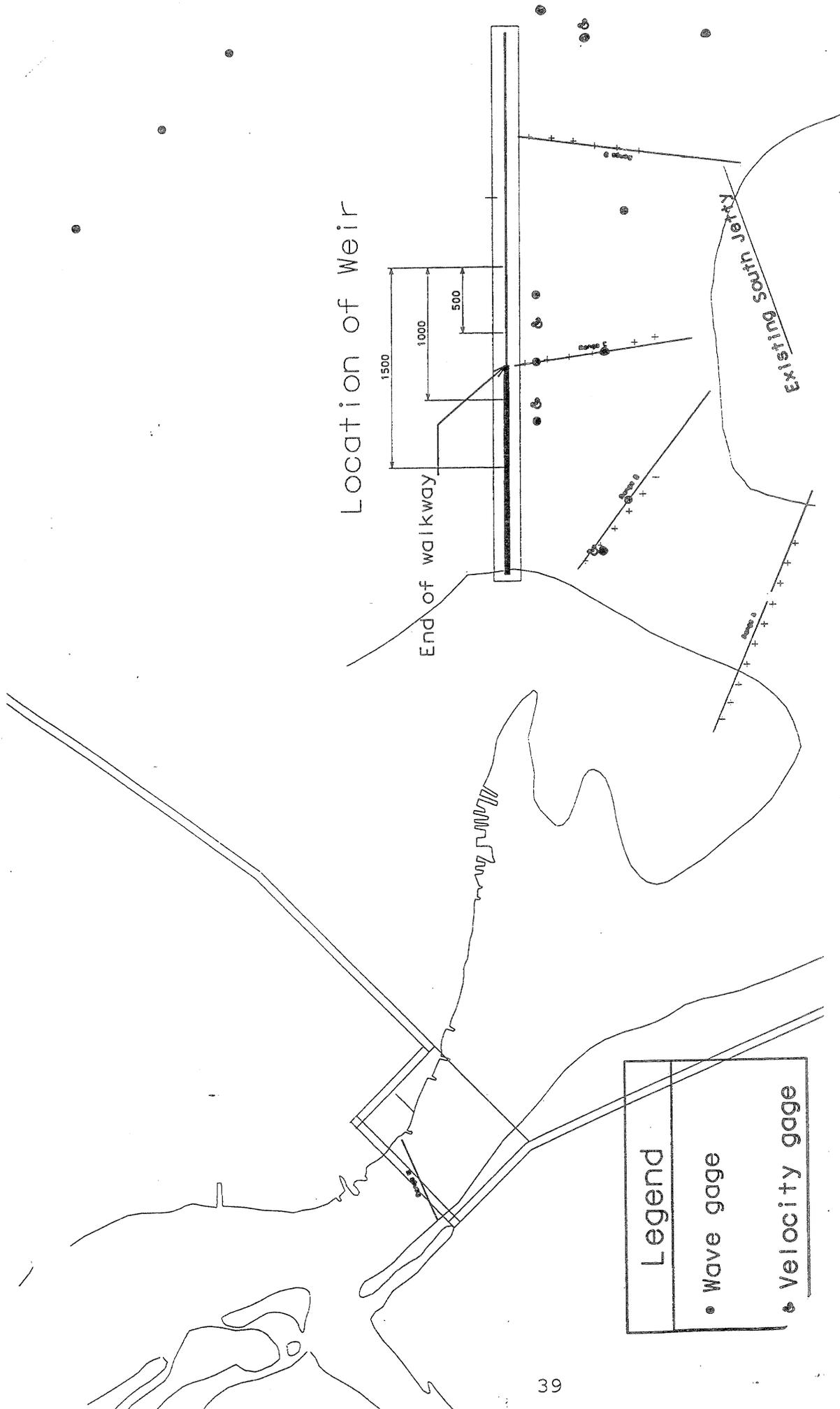
69. Opening the weir would allow a supply of sand into the inlet. However, results indicated that currents south of the weir are strong and can move material out of the area. That area would not function well as an impoundment basin since it is located along an area of the entrance channel with excessively high current velocities. For the most part, sediment passing over the weir in that area would not deposit in an impoundment basin as planned. A portion would settle in existing shallow areas of the inlet.

70. Opening the weir increased the amount of wave energy inside the inlet. Although wave heights were below the safe navigation limits discussed in the physical model report of appendix A, they were about twice as large as when the weir was closed. The direction of wave approach (across the weir) and any crosscurrents through the weir would further increase the difficulty of navigating through the inlet. For those reasons the study team agreed at CHL on February 6, 1996 that reopening the weir was not considered a viable measure. In addition the physical model report concludes that the benefits of opening the weir are far outweighed by the negative impacts on navigation and sediment accretion within the inlet.

71. Channel Realignment. Testing a realignment of the entrance and Halifax River channels through the north spit involved use of the numerical model. During a 30-31 August 1995 meeting at CHL, study team members in consultation with CHL, Taylor Engineering, SAD, and sponsor representatives agreed the numerical model provided a more flexible vehicle for testing channel realignment than the physical model. The old Halifax River channel (the location to which the existing channel is most likely to migrate) provided a location for the realigned channel configuration. An October 1944 Condition After Maintenance Dredging Survey provided the location of the old channel along with a survey of the breakthrough area in May 1973. The February 1973 breakthrough location shown on the May 1973 survey occurred in the area of the old Halifax River channel.

72. For model testing of channel realignment, a 200-foot wide by 12-foot deep channel was used as shown in figure 9. Numerical model tests indicated that the island, a remnant of the north spit, created by the channel would continue to erode from both the west and east sides. During a flood flow velocities of 5 feet per second are estimated to attack the east side of the island. Velocities of 7 feet per second were predicted at the west side of the island on an ebb flow (See figures 7.57 and 7.58 of the Taylor Engineering Volume II Report). Before a state of equilibrium is reached with the new channel, deposition of that material could occur at the back of the inlet throat and along the existing deep water channel of the Halifax River. Navigational depths along the Halifax River channel to the north could be impacted. Other impacts to navigation could occur as the shoal at the back of the inlet throat builds and extends eastward toward the Indian River channel. The numerical model shows adequate depths for navigation would prevail for most vessels in both channels once a quasi-equilibrium condition is reached. During the time it takes the inlet system to get to that point negative navigation impacts are likely to occur.

73. Due to the high erosion rates expected on the west and east sides of the island created by the engineered channel, the possibility for shoaling exists along the Federal channels in the Halifax River to the north and the Indian River to the south. With the realigned channel, revetment along the north shore of the alignment is required to keep the ebb and flood flows within the design channel and prevent the new channel from eroding that shoreline and outflanking the north jetty. Straightening of the entrance



Re-open Weir Section

FIGURE 8 (NORTH JETTY WEIR OPENING LENGTHS)

channel, however, would reduce scouring and relieve hydraulic pressure on the north jetty.

74. Channel realignment as a measure to stabilize the inlet is kept for further consideration.

OTHER MEASURES

75. Other measures for providing a more stable and safe inlet included two different revetment alternatives. During the Reconnaissance Study three different revetment alignments received consideration. Figure 10 shows the location of each alignment in relation to the north spit and jetty. Alignment one provided shore protection for the entire north spit area as it existed at that time. Alignments two and three protected other upland/wetland areas closer to the main shoreline of the inlet. All three revetments would tie into the landward end of the north jetty.

76. As mentioned earlier more recent surveys (July 1994) of the inlet revealed that approximately 75 percent of the area that would have been protected by revetment alignment one had eroded since that aerial photograph was taken. Figure 5 also provides a comparison of shoreline changes from 1986-1994. Most of the north spit eroded before it could be protected. For that reason, alignment three or some variation of it would not be practical due to the accelerated erosion rate of the north spit. Before a revetment could be designed and built to protect that area, it would erode past the planned alignment. Alignment three assumes the entire north spit erodes and only protects the north jetty from outflanking. Commercial charter boats and salvage boats located behind and to the west of the remaining spit would no longer receive protection from waves and currents. Since alignment three only meets one of the study goals, it was not considered further in the feasibility study.

77. Alignment two protects approximately nine acres of upland and wetland areas. Approximately 6.6 acres of that nine acre protected area are wetlands. While the revetment covers about 2.1 acres of wetlands, a net 4.5 acres (6.6-2.1) of wetlands are protected. It also provides protection from currents and waves for the commercial boatyard and marina located behind and west of that area. Further investigation during the feasibility study resulted in development of two different segments of the revetment along alignment two as shown in figure 11.

78. 800-Foot Landward Extension of the North Jetty. The first segment of that revetment along alignment two is an 800-foot landward extension of the north jetty to the west. That portion of the revetment is designed with stones the same size as the north jetty. For design details see appendix A. The 800-foot landward extension of the north jetty is considered an operations and maintenance measure.

79. That portion of the revetment will require construction with or without a project due to the continuing erosion of the north sand spit. A recession analysis indicates that under current conditions the north spit will erode to the area of the armor alignment in approximately eight to nine years from 1994 (Taylor Engineering, 1996). Figure 5 identifies the rapid erosion of the north spit from 1986 to 1994. By the year 2002 an 800-foot extension is required to prevent outflanking of the north jetty. To protect the integrity of the north jetty Operation and Maintenance plans should include construction of the 800-foot extension prior to or not later than the year 2002.

80. The 800-foot extension of the north jetty is the minimum required to effectively tie back the landward end far enough west to prevent outflanking from both the flood and ebb currents converging in that area. Figures 3.1 through 3.3 of Volume I of the Taylor Engineering study provide a look at the anticipated bathymetry, erosion, and shorelines in the expected breakthrough area as compared to 1994 bathymetry and shoreline data. An examination of those figures reveals about a 1,000-foot section from the west end of the north jetty to an old Halifax River channel which requires protection to prevent outflanking.

81. 1,540-Foot Revetment. As shown in figure 11 a 1,540-foot revetment extends from the end of the 800-foot landward extension of the north jetty along a portion of the north spit. The footprint of the revetment follows what remains of the north bank of an old Halifax River channel. The old river channel is also the location of the 1973 breakthrough and a current area of concern during times of high water associated with a northeaster. That portion of the revetment prevents currents and waves from eroding the remaining upland/wetland areas of the north spit. Erosion of the north spit must be stopped at the alignment of the 1,540-foot revetment to prevent current and wave action from impacting the boatyard and marina behind and to the west of that area. Figures 12 and 13 provide views of the commercial vessel operations protected by the revetment. Portions of Lighthouse Park could also be subject to erosive current and wave action if erosion of the north spit was not prevented by a revetment in that area. The 1,540-foot revetment also adds to the effectiveness of the 800-foot landward extension of the north jetty in preventing outflanking of the north jetty.

82. Model testing of the 1,000-foot extension of the south jetty indicated the shift in velocities away from the north jetty only occurred within the area of the entrance channel. No changes to currents at the throat of the inlet occurred as shown in figures 7.5 and 7.6 of the Volume II Taylor Engineering Report. For that reason the 1,540-foot revetment measure is needed to prevent further current and wave action from impacting the commercial vessel operations behind the remaining portion of the north spit as well as an enhancement to prevention of outflanking of the north jetty. For those reasons the 1,540-foot revetment is a non-separable element and is considered an integral part of any plan to stabilize the inlet system.

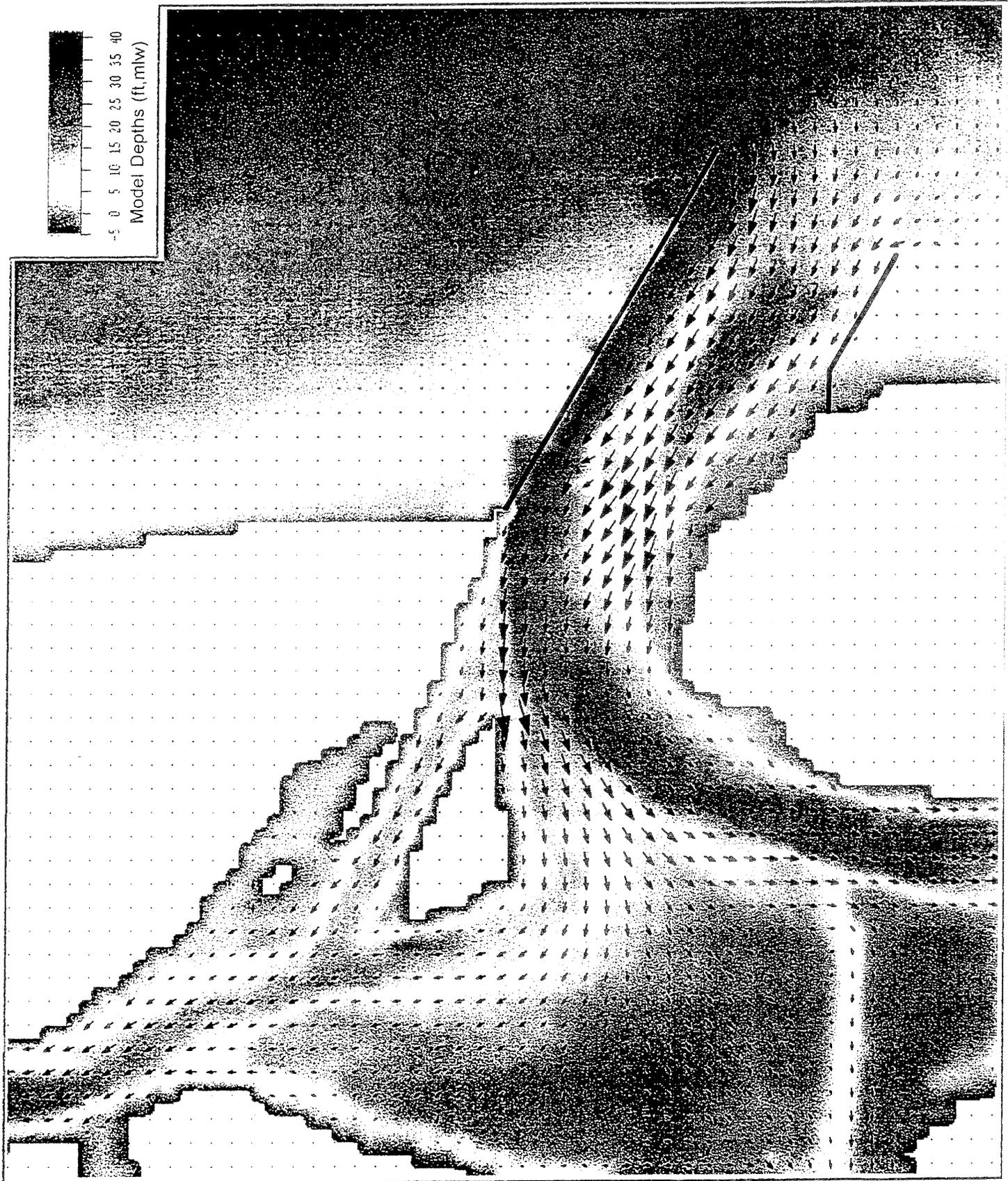


FIGURE 9 (CHANNEL REALIGNMENT)

Flood Velocity Vectors for Engineered Channel, Initial Conditions (Case 3)
Taylor Engineering, Inc.

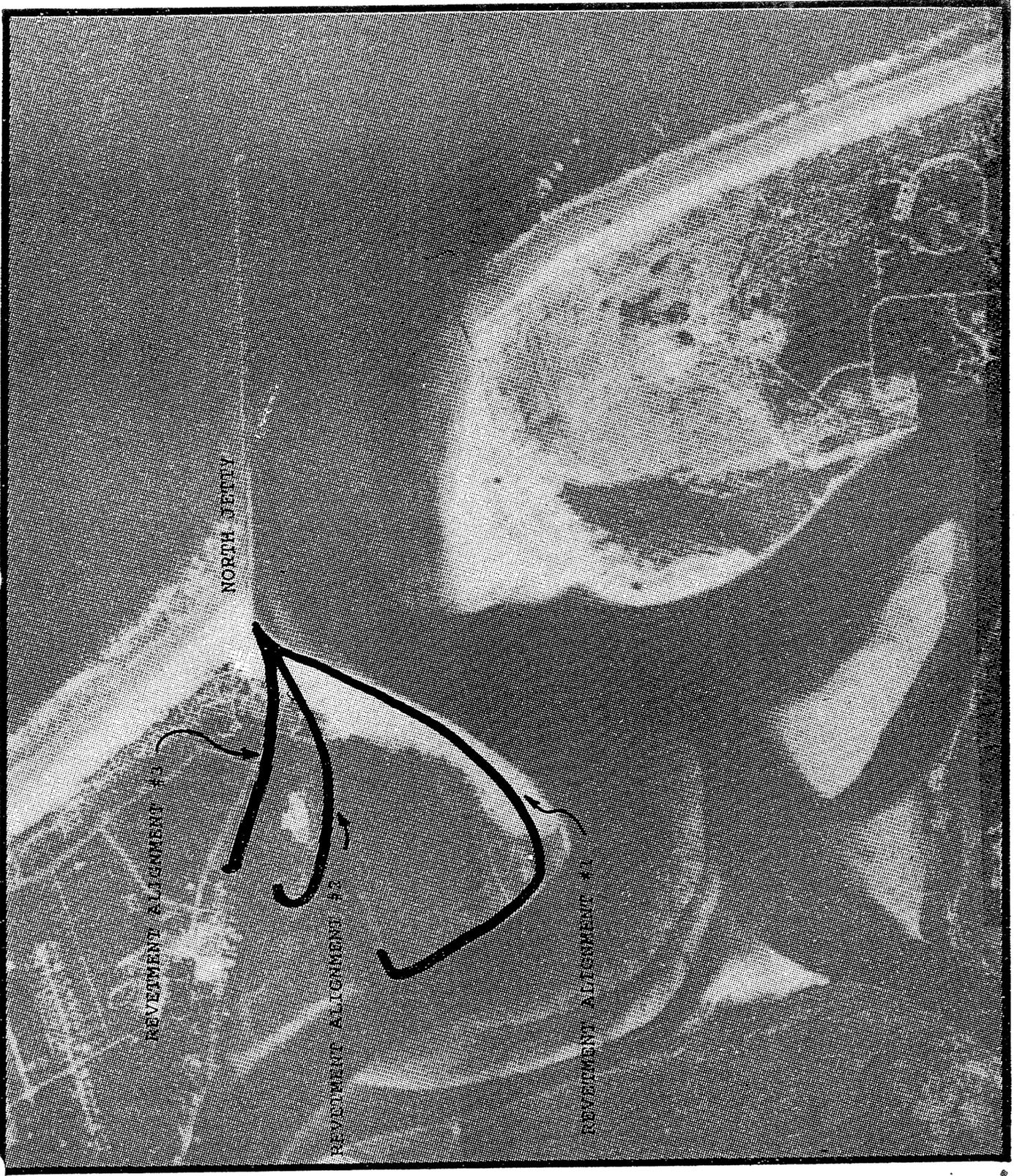
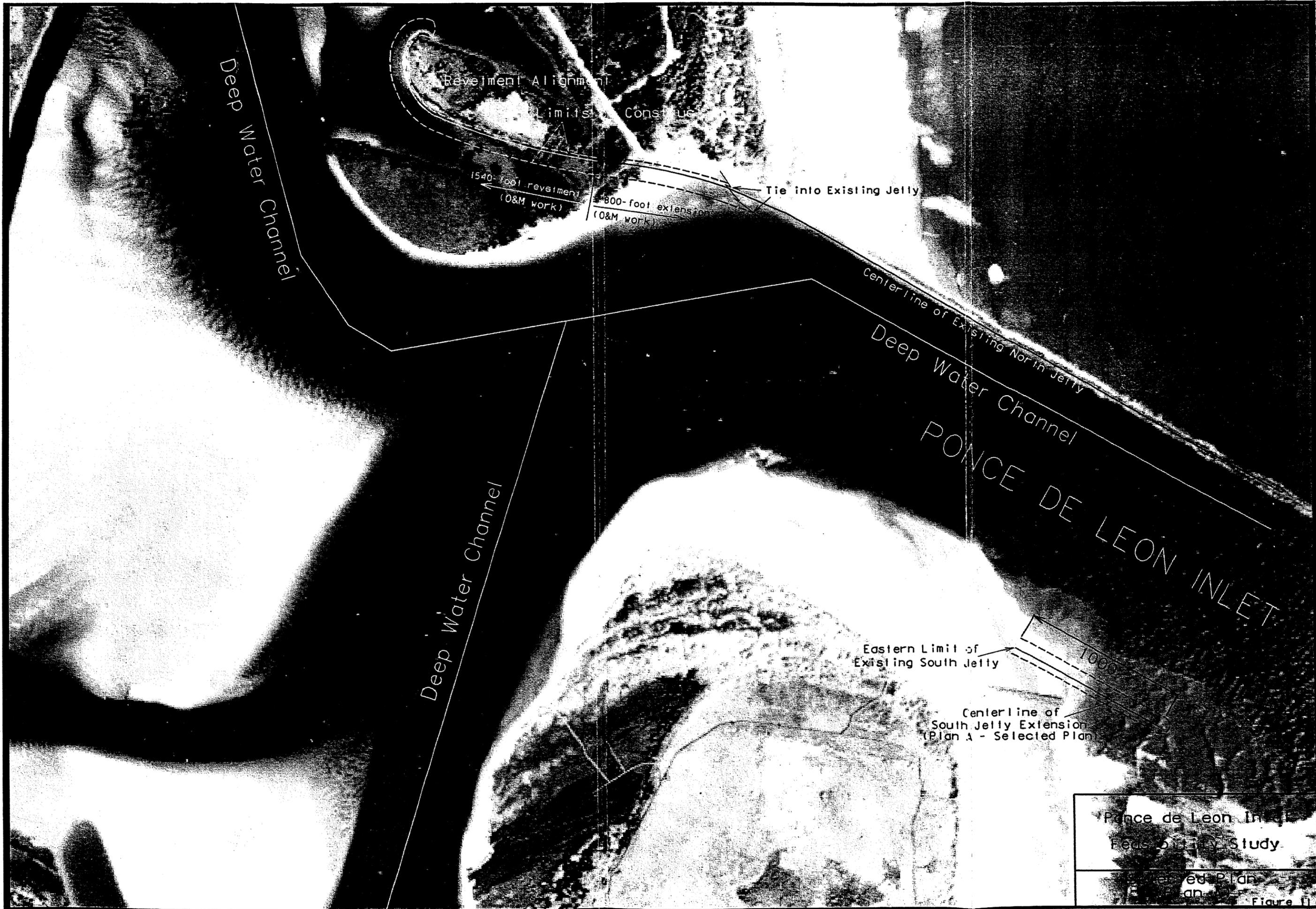


FIGURE 10 (REVEMENT ALIGNMENTS)



Deep Water Channel

Revelment Alignment

Limits of Construction

1540-foot revelment
(O&M work)

800-foot extension
(O&M work)

Tie into Existing Jetty

Centerline of Existing North Jetty

Deep Water Channel

PONCE DE LEON INLET

Deep Water Channel

Eastern Limit of Existing South Jetty

Centerline of South Jetty Extension
(Plan A - Selected Plan)

1000

Ponce de Leon Inlet
Feasibility Study

Selected Plan

Figure 11

NO ACTION PLAN

83. No Action Plan (Without Project Condition). If no action is taken, the most probable future conditions for the inlet without further project modifications would involve the following:

84. Catastrophic Channel Breakthrough of the Old Halifax River Channel. The formation of another channel will likely cause a change in flow conditions with shoaling occurring in some areas. The resulting shallower depths will probably necessitate emergency maintenance work as they have in the past. This future condition could be worse than those previously experienced. The weir was open at that time causing an influence on channel flow vectors in the area of the breakthrough. With the weir closed on a flood tide the forces will be greater at the point of the breakthrough.

85. Once a breach occurs, past experience indicates the altered hydrodynamics within the inlet would cause rapid shoaling in certain areas for the short to intermediate term. That shoaling would likely close the water access to the marinas and boatyard on the north side of the expected breakthrough. Shoaling is a likely probability in the Halifax River portion of the Federal channel near the breakthrough. The Federal Halifax River channel would likely be temporarily unusable for ocean access and boaters would attempt to use other access routes via the Intracoastal Waterway (IWW) to the southern channel in Indian River or farther south to Canaveral Harbor. That condition would last until Federal maintenance work could block the breach and remove shoals. A total shoaling volume of approximately 230,000 cubic yards will result (Taylor Engineering, 1996, page 3-3).

86. Estimated erosion rates along the shoreline of the spit west of the north jetty are about 70 to 80 feet a year. At that rate the next breakthrough is possible before the year 2000 without the occurrence of a major storm. The force of such a storm could cause a breakthrough sooner. Site visits after storm activity late in 1992 indicate historical conditions support the engineering estimates. The area had experienced minor overtopping and the erosion rate had apparently increased during the event. Again in 1994 storm activity resulted in overtopping of the north spit and the start of a breakthrough in that same area. To prevent an actual breakthrough from occurring and threatening the landward end of the north jetty the Corps of Engineers used maintenance material from a section of the IWW near Rockhouse Creek. Approximately 215,000 cubic yards of material was placed from the landward end of the north jetty to the area of the past breakthrough from April through September 1994.

87. Numerical modeling of a catastrophic breach condition as shown in figures 3.1 and 3.3 of Volume I of the Taylor Engineering report, "Ponce DeLeon Inlet Feasibility Study Numerical Modeling and Shoaling Analysis", indicates controlling depths in the breakthrough area of six feet with maximum depths of 12 feet. Shoaling in the north channel results in depths of about four feet. A total shoaling volume of approximately

230,000 cubic yards will occur (Taylor Engineering, 1996, page 3-3). Depending on the shoreline erosion rate and extent of fill material to close the breach in the spit and restore the shoreline in that area, the occurrence of a breakthrough will likely occur again and be cyclical.

88. North Jetty Stability. Conditions at the inlet threaten the stability of the north jetty. A deep water channel is very close to the jetty with existing depths ranging from 30 feet to nearly 50 feet. The scour apron installed on the south side of the jetty for protection was with channel depths at 20 feet or less. Prevailing velocities in the entrance channel have been sufficient to erode a deeper channel which may now be below the protective scour apron in places. A 1994 survey showed depths of 30-40 feet along a section of the north jetty with a significant portion approaching 40 feet as shown in figure 3. A more recent survey by U.S. Army Divers from June 3-15 of 1996 along the length of the north jetty indicates depths of over 48 feet in the area of the scour hole. The exposed sand in vulnerable areas along the jetty is subject to erosion. The scour apron constructed in 1979 is still mostly intact and is providing adequate protection to the jetty. The deep scour hole observed at the north jetty occurs along an area which begins immediately landward of the 1979 scour apron. In July 1998 construction of a scour apron along the scour hole area was completed; this apron extends from the western limit of the 1979 scour apron to the eastern limit of the scour apron on the 800-foot landward extension of the jetty. The entire length of the north jetty is then protected against scouring damages. Portions of the north jetty crest have already slumped 3 feet or more since initial construction. Continued maintenance costs are likely to be high for repair work to maintain the integrity of the existing jetty structure.

89. Erosion of Spit Adjacent to North Jetty (With Maintenance). The State of Florida and the port authority in 1986 purchased about 40 acres, shown in appendix E photograph number 24, as part of the Lighthouse Point Park. As indicated on the photograph, a portion of that area, marked "GONE", has eroded since the purchase. Erosion of the shoreline in that area will continue until there is a breakthrough. As a temporary preventative measure, material from maintenance work has been placed along the eastern side of the spit in the past. As mentioned in paragraph (a) above about 215,000 cubic yards was placed from the landward end of the north jetty to the area of the breakthrough in April through September 1994. That material still may not be enough in the event of a major storm to prevent a breakthrough. A public park building had to be moved from its original location south of the parking lot to an area north of the parking lot when erosion of the north spit threatened to undermine its foundation in 1994. The area also had to be marked as dangerous and unsafe for the public due to a high scarp and strong currents.

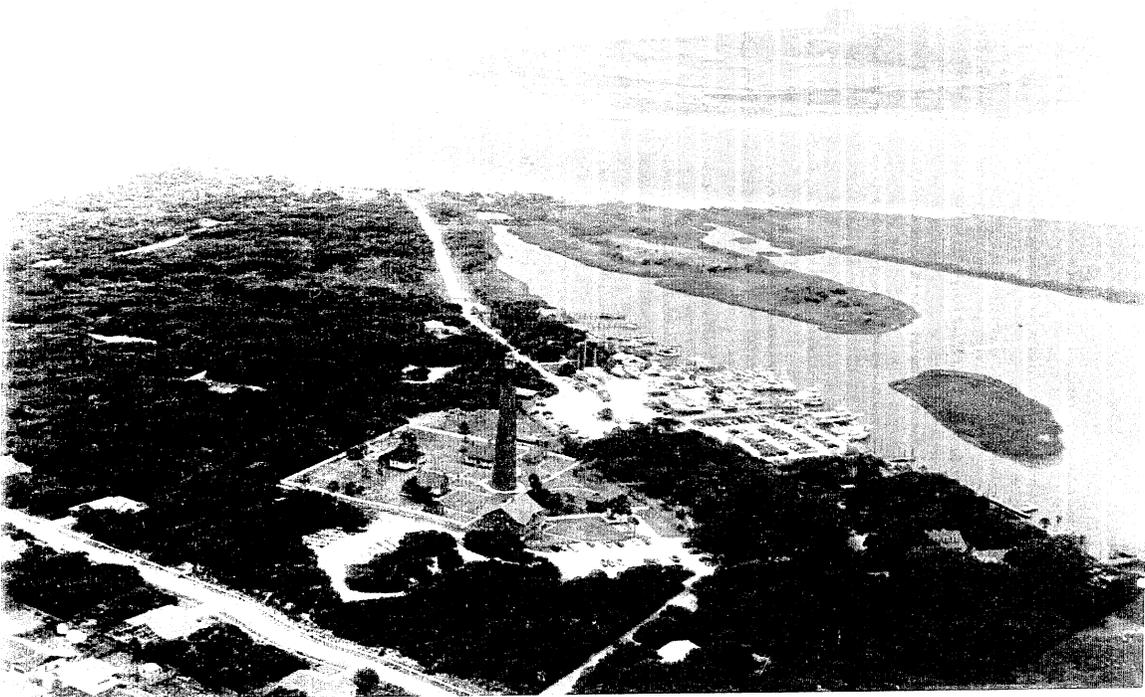


FIGURE 12 (NORTH SPIT AND COMMERCIAL VESSEL FACILITIES)

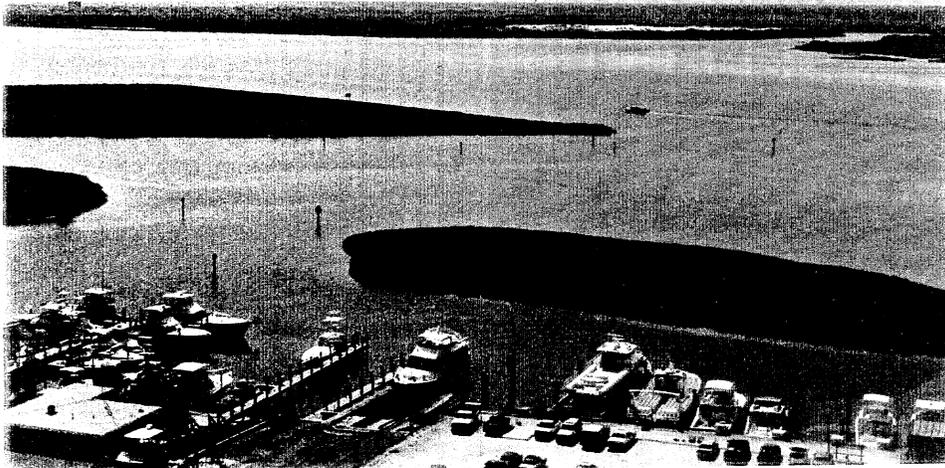


FIGURE 13 (COMMERCIAL VESSEL REPAIR AND CHARTER OPERATIONS)

90. Outflanking of the North Jetty. Once a breach begins, the public park building and parking lot could be lost in the ensuing erosion from high velocities in the developing channel flow. The channel erosion could also cause the loss of material from outflanking on the west end of the north jetty. Emergency maintenance would be necessary to try and minimize the damage impacts. Damage to the west end of the jetty with its concrete walkway is possible if measures to stop erosion do not occur in time. Continued outflanking of the west end of the north jetty could produce an entire new outlet for the Halifax and Indian Rivers resulting in major changes to the inlet. Shoaling of both the north and south channels as well as changes in entrance channel would result making passage through the inlet extremely dangerous and unpredictable.

91. Natural Erosion of the North Spit (Without Maintenance-Allowing a Breakthrough). Under normal conditions without a major storm event the north spit will continue to erode. If dredged material is not placed along the north spit to prevent a breakthrough, the north spit will continue to erode from the east and west sides until it is eroded away to the area of an old Halifax River channel. During that gradual process the material eroded from the north spit will continue to build up islands at the back of the inlet throat on either side of Rockhouse Creek as shown in figure 7.73, Volume II of the 1996 Taylor Engineering Report. The Federal navigation channels which currently follow the area of deepest existing water are expected to continue to provide adequate depths for navigation. In the spring and summer of 1996 the sponsor indicates regular users of the Federal channel in the Halifax River to the north of the inlet report deeper water than has existed in recent times. That trend is expected to continue with a natural erosion of the north spit. Eventually over the long term depths of 10 to 12 feet will develop in the area of the old Halifax River channel (implied from numerical modeling of that condition as shown in figures 7.93 and 7.94 of the Taylor Engineering Report Volume II).

92. A review of the above measures in relation to the study goals of providing a more stable and safe inlet for navigation and reduction of ongoing operation and maintenance produced the need to combine some of the measures. The combination of various measures to form new alternative plans satisfied study goals better than individual measures.

93. As mentioned earlier, hydrodynamic model testing of the 1,000-foot jetty extension by itself and in combination with reopening the north jetty weir and a channel realignment narrowed the field of measures to consider. Model tests showed that the 1,000-foot jetty extension by itself produced desirable results for the outer portion of the inlet. Some study goals were met by combining it with a channel realignment. Reopening the north jetty weir in combination with the 1,000-foot jetty extension did not satisfy major goals of shifting the entrance channel away from the north jetty and improving navigation. A combination of the above measures resulted in the following plans.

COMBINING MEASURES

94. Plan A - South Jetty Extension. Both physical and numerical model results indicate that a 1,000-foot extension of the south jetty parallel to the north jetty provides the best hydrodynamic improvements to the inlet of the two different orientations and three different lengths tested (i.e. six alternatives examined). Figure 11 shows the location of the jetty extension in relation to the existing south jetty. The physical model indicated the potential for the greatest reduction in sediment transport into the inlet from that alternative. The numerical model confirmed the velocities and flows with that alternative increased the least. The smaller the velocity changes the lesser the impact on increasing wave heights relating to navigation concerns. In addition to wave height, wave steepness is a concern. In Ponce DeLeon Inlet, in the entrance channel, wave steepness is a safety issue. On the ebb flow, incoming waves hit outgoing currents, slowing wave velocities and compressing waves. The waves are therefore steeper. Extending the jetty would decrease the heights of waves entering the inlet, especially waves coming from southerly directions, because the jetty extension will block the waves. Conditions will be safer as a result, particularly during ebb flow. Potential for a natural relocation of the federal channel toward the center of the inlet also exists. As a result Plan A is carried forward for further review in combination with other measures.

95. Plan B - North Jetty Weir Opening. Plan B involves reopening the north jetty weir from the seaward end of the original opening landward for lengths of 500, 1,000, and 1,500 feet in combination with Plan A. Both physical and numerical model testing of Plan B indicates that none of those north jetty weir openings satisfies study goals. Numerical model results of flow and velocity distribution comparisons showed for the most part very little change in comparison to existing conditions. Some localized changes in velocities occurred near the weir in the existing channel but not in the center or entrance portions of the channel. Physical model dye and coal tracer tests revealed that none of the openings improved flows near the center of the inlet. The model revealed a limited increase in sediment transport potential in the vicinity of the weir. Wave heights within the inlet under all weir openings tested showed an increase over existing conditions. The physical model confirmed findings of the numerical model that no beneficial results for stabilizing the inlet and improving navigational safety accrued. Therefore, Plan B is not considered any further.

96. Plan C - Channel Realignment. Plan C involves a realignment of the entrance channel with the Federal channel in the Halifax River to the north of the inlet as shown in figure 9 in combination with Plan A. An engineered cut through the north sand spit provides a 12-foot deep by 200-foot wide channel 2000 feet long. The dredged channel requires removal of approximately 193,000 cubic yards of material. Approximately 50 percent of that material is beach quality and would be placed within a 2000-foot reach on the beach north of the north jetty. Model tests indicate high erosion rates expected on the west and east sides of the island created by the engineered channel resulting in shoaling to the south of the channel and closure of the existing north channel which hugs the spit with the engineered channel eventually becoming

dominant (Taylor Engineering, 1996, Vol. 2, pp. 7-149 and 7-155). The possibility for shoaling along the Halifax River channel to the north and the Indian River channel to the south while the inlet adjusts to that change seems to outweigh the benefits of straightening out the entrance channel with the realignment. With the realigned channel, revetment along the north shore of the alignment is a likely requirement to keep the ebb and flood flows within the design channel and prevent the new channel from eroding that shoreline and outflanking the north jetty. Straightening of the entrance channel would reduce scouring and relieve hydraulic pressure on the north jetty. Plan C is not kept for further consideration since that area is expected to establish a channel through natural processes.

97. Plan D - Groin Field. The groin field described in figure 14 received consideration early in the feasibility study. Approximately 75 percent of the area shown in that illustration has been degraded. Under existing conditions the ebb and flood tidal currents continue to severely erode the spit. With the revised shoreline and the orientation of the entrance channel and Halifax River channel to the north eroding the north spit from the east and west sides, groin fields would no longer provide an effective measure in stopping erosion. If actually put in place the accelerated erosion from the west and east sides of the spit could leave the groins detached. In addition to being ineffective in protecting the shoreline the detached groin field would negatively impact navigation. As a result of the shoreline survey analysis the groin field was removed from discussion as a measure to help stabilize the inlet. During a Plan Formulation and Engineering Technical Review Conference at the Jacksonville District on July 12, 1995, the sponsor, District, and SAD personnel agreed on removal of the groin fields from further consideration.

98. Plan E - Landward North Jetty Extension (Maintenance). As mentioned earlier three landward north jetty extension alignments existed during the Reconnaissance Study for consideration as shown in figure 10. Due to the dynamics of the inlet, erosion of the north spit occurred before any action to provide a landward extension of the north jetty in the area of alignment one could occur. Figure 5 illustrates the rapid shoreline recession. Alignment three does not provide any protection for the remaining areas of Lighthouse Point Park nor the commercial vessel marinas in the area. Alignment two provides protection for those areas as well as preventing the north jetty from being outflanked. Plan E as shown in figure 11 consists of a 800-foot landward extension of the north jetty along alignment two. Appendix A contains engineering design and construction details.

99. Plan E is a maintenance requirement that requires construction with or without the project. An analysis of the north spit erosion indicates that the entire area will continue to erode back to the Plan E alignment by the year 2002 with or without improvements (Taylor Engineering, 1996, Vol. 1, p. 3-7). Plan E must exist by the year 2002 to prevent outflanking of the north jetty. Continued outflanking of the west end of the north jetty could produce a entire new outlet for the Halifax and Indian Rivers resulting in major changes to the inlet. Shoaling of both the north and south channels as well as

changes in entrance channel would result making passage through the inlet extremely dangerous and unpredictable.

100. Plan F - Revetment. As shown in figure 11 Plan F consists of a 1,540-foot revetment extending from the end of the 800-foot landward extension of the north jetty (Plan E) along the north shoreline of an old Halifax River channel. As mentioned earlier model testing of the 1,000-foot extension of the south jetty indicated a shift in velocities away from the north jetty only occurred within the area of the entrance channel. No changes to currents at the throat of the inlet occurred as shown in figures 7.5 and 7.6 of Volume II of the 1996 Taylor Engineering Report. For that reason the 1,540-foot revetment measure is needed to prevent further current and wave action from impacting the commercial vessel operations behind the remaining portion of the north spit as well as an enhancement to prevent the outflanking of the north jetty.

101. Plan F also protects approximately nine acres of upland/wetland areas from erosion. Approximately 6.6 acres of that nine acre protected area are wetlands. Placement of stone or other shoreline hardening material is expected to provide a net 4.5 acre (6.6-2.1) savings of wetlands when compared to the without project condition which results in a loss of all the existing wetlands/uplands located west of the north jetty.

102. Appendix A contains an engineering and design analysis of revetment design for Plans A and F (Design of Revetment Section #2). Plan F is considered a non-separable element in combination with Plan A. Both are needed together to satisfy study goals. Plan A is the best alternative for reducing sediment transport around the south jetty and helps shift currents away from the north jetty and toward the center of the inlet. However, model testing shows that no change in currents occur at the throat with Plan A so erosion of the north spit will continue without a revetment along the alignment of plan F to stop it (Taylor Engineering, 1996, Vol. II, p. 9-2).

103. Plan G - South Channel Extension. Plan G extends the existing south channel northward along the Intracoastal Waterway (IWW) to a planned commercial fishing park facility located at the former Swoope Power Plant site shown in figures 15-18. The channel extension provides access for deeper draft commercial fishing vessels to potential new docking, fish processing, and repair facilities. The channel extension involves deepening of only the 12-foot by 125-foot wide IWW portion since existing deep water is available with a channel realignment of the current south Ponce DeLeon Inlet channel. The existing 125-foot width of the IWW is kept. Depths considered for the evaluation included 1-foot increments from 13 to 22 feet. Quantities for each depth are in Table 4.

104. The same numerical, two-dimensional hydrodynamic model and companion sediment transport methodology used earlier was modified to test plan G channel deepening on three different inlet conditions. The conditions included existing 1994 inlet bathymetry, an expected future inlet bathymetry (channel through the inlet's north

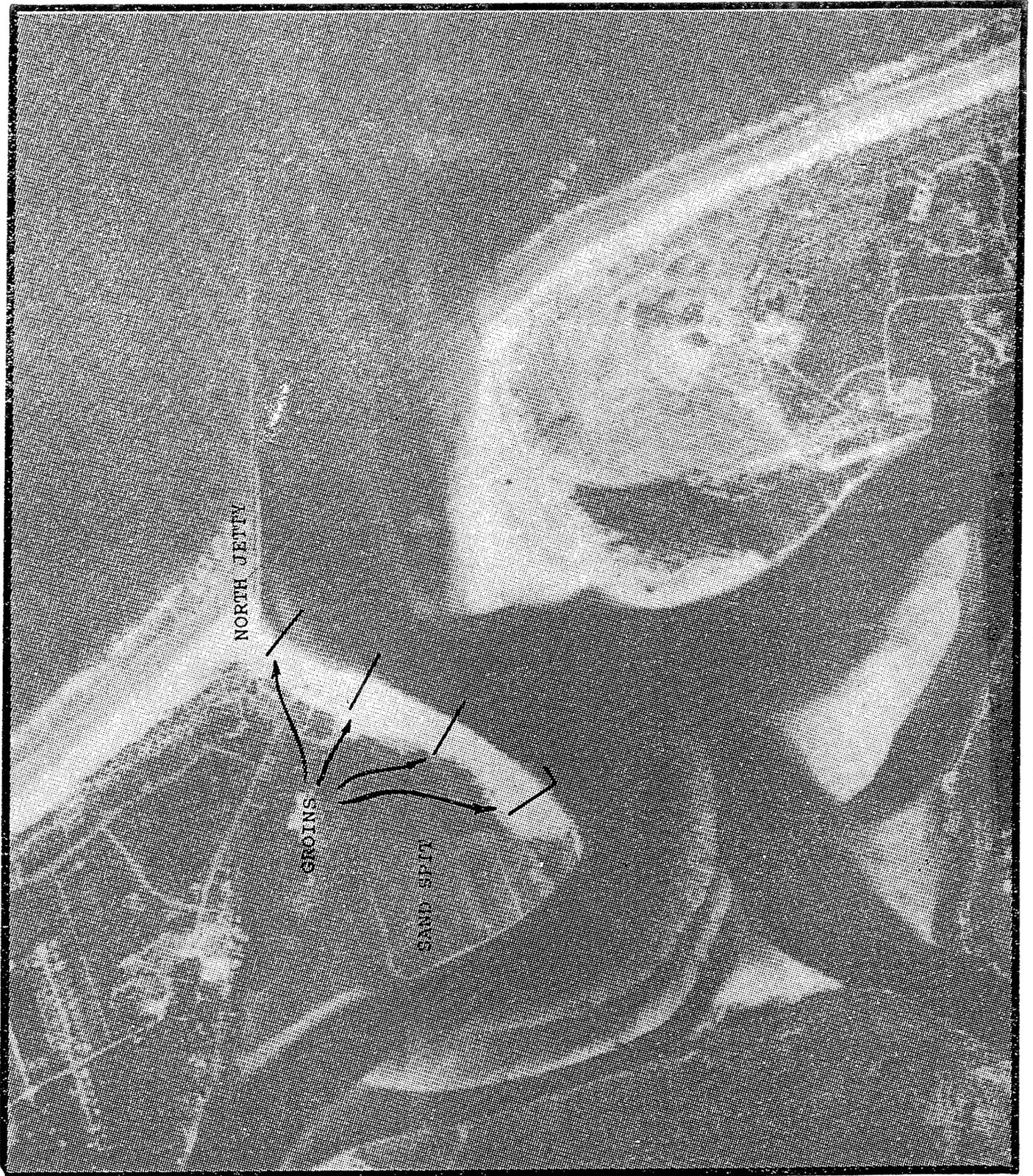


FIGURE 14 (GROIN FIELD)

spit with a submerged shoal), and an alternative future inlet bathymetry (channel through the north spit with an emergent island). Each of the three conditions contained the proposed 1,000-foot south jetty extension.

Depth (feet)	Volume (cubic yards)				
	IWW	Proposed fish processing facility (berthing areas)			Total
	Cuts V-24 to V-27	Side channel	Adjacent to Cut V-24	Subtotal	
13	40,856	27,353	19,993	47,346	88,202
14	79,374	29,095	24,467	53,562	132,936
15	127,635	30,836	28,941	59,777	187,412
16	183,624	32,578	33,415	65,993	249,617
17	256,785	34,319	37,890	72,209	328,994
18	323,087	36,060	42,365	78,425	401,512
19	404,702	37,801	46,840	84,641	489,343
20	492,558	39,542	51,315	90,857	583,415
21	585,327	41,283	55,790	97,073	682,400
22	682,945	43,024	60,265	103,289	786,234

105. The model testing revealed minimal hydrodynamic and sediment transport impacts for all three inlet conditions. Changes in velocities within the deepened IWW cuts ranged from 0.02-0.04 feet per second during both flood and ebb. According to Taylor Engineering, operating under the limitations of the present sediment transport methodology, existing sedimentation/erosion regimes are expected to be largely unaffected by the proposed deepening of the IWW (Taylor Engineering, 1997, pp. 60-62).

106. After a public workshop on July 24, 1997, sponsored by the Volusia County Council Port Authority Advisory Board, three additional locations for the commercial fishing park facility were considered. Plan G reviewed a total of four different sites for that facility. In addition to the Swoope Power Plant location, Feger's Seafood fish processing facility in the City of New Smyrna Beach, a marine industrial zoned site adjacent to the Boston Whaler Plant south of New Smyrna, and an existing location for commercial fishing charter vessels and repair facilities located on the north side of the inlet by the lighthouse represent other alternative locations. The existing Ponce DeLeon Inlet commercial charter fishing/repair facilities on the north side of the inlet are limited for expansion by the adjacent Lighthouse Point Park, Lighthouse Museum, and the Town of Ponce Inlet. Access to commercial highways such as U.S. 1 requires traveling north about 5.5 miles to the Port Orange bridge over various types of roads. Some of those roads are not currently designed for commercial traffic. Due to the limited room for expansion and inadequate commercial transportation access, the

existing commercial fishing and repair facilities on the north side of the inlet near Lighthouse Point Park were dropped from further consideration.

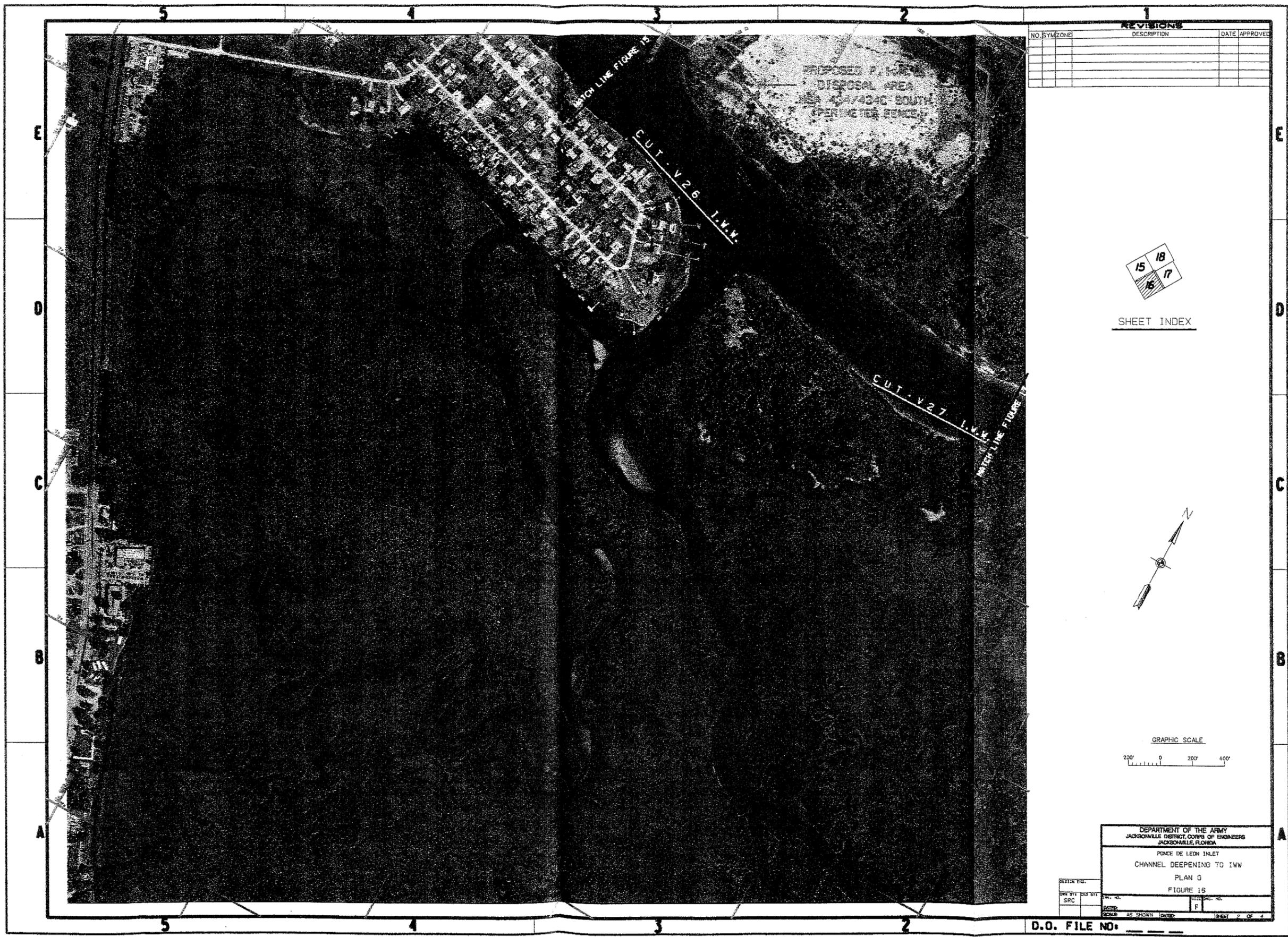
107. A comparison of the costs to deepen the existing IWW to the other three locations is shown in Table 5. For each of the depths shown the Swoope Power Plant options are less than the cost to deepen the Federal IWW channel to either the Feger or the Boston Whaler sites.

Plan G Fishing Park Locations/ Disposal Options			
Locations/Disposal Options	14' Depth	15' Depth	16' Depth
Swoope Power Plant Site			
South Beach 1 (OP)	\$2,096,000	\$2,426,000	\$2,756,000
South Beach 2 (Revised Access)	\$1,572,000	\$1,803,000	\$2,042,000
Upland MSA 434/434C N&S	\$1,349,000	\$1,550,000	\$1,740,000
Shoals - Inlet Throat	\$1,269,000	\$1,467,000	\$1,662,000
Feger Site (MSA 434/434C N&S)	\$2,505,000	\$2,736,000	\$2,877,000
Boston Whaler Site (V-26/V-21)	\$9,548,000	\$10,801,000	\$11,772,000

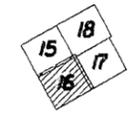
108. The disposal areas considered for each of the above plan G alternatives include current IWW disposal sites for dredged material from the section of the IWW containing that particular alternative. For example, according to the current disposal plan for the IWW, the Swoope Power Plant and Feger's are located in Reach IV of the IWW. The primary site for disposal of material from that reach is a beach placement area located south of Ponce DeLeon Inlet and designated as Beach Placement Area V-PDI. The secondary site for Reach IV is an upland disposal area called MSA 434/434C North and South (Taylor Engineering, 1997). The Boston Whaler Plant alternative is located in Reach V of the IWW. The primary disposal sites for that reach include V-26 and V-21 (Taylor Engineering).

109. Of the four disposal options shown for the Swoope Power Plant, the least expensive location is listed as Shoals-Inlet Throat and shown on figures 15, 17, and 18. That disposal option consists of open water discharge of material on existing shoals located at the back of the inlet throat on each side of Rockhouse Creek. Controlling the discharge of dredge material onto those existing shoals may prove difficult. Dredged material might flow into the adjacent Federal navigation channels resulting in a shoaling problem. U.S. Fish and Wildlife Service also considers the shoal areas as the least favorable of all the potential disposal areas since those areas provide feeding sites for shore and wading birds. For those reasons no further consideration of that alternative was made. With that option eliminated, Table 5 indicates the resulting least cost disposal option is an upland disposal area called MSA 434/434C North and South.

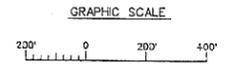
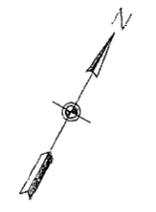




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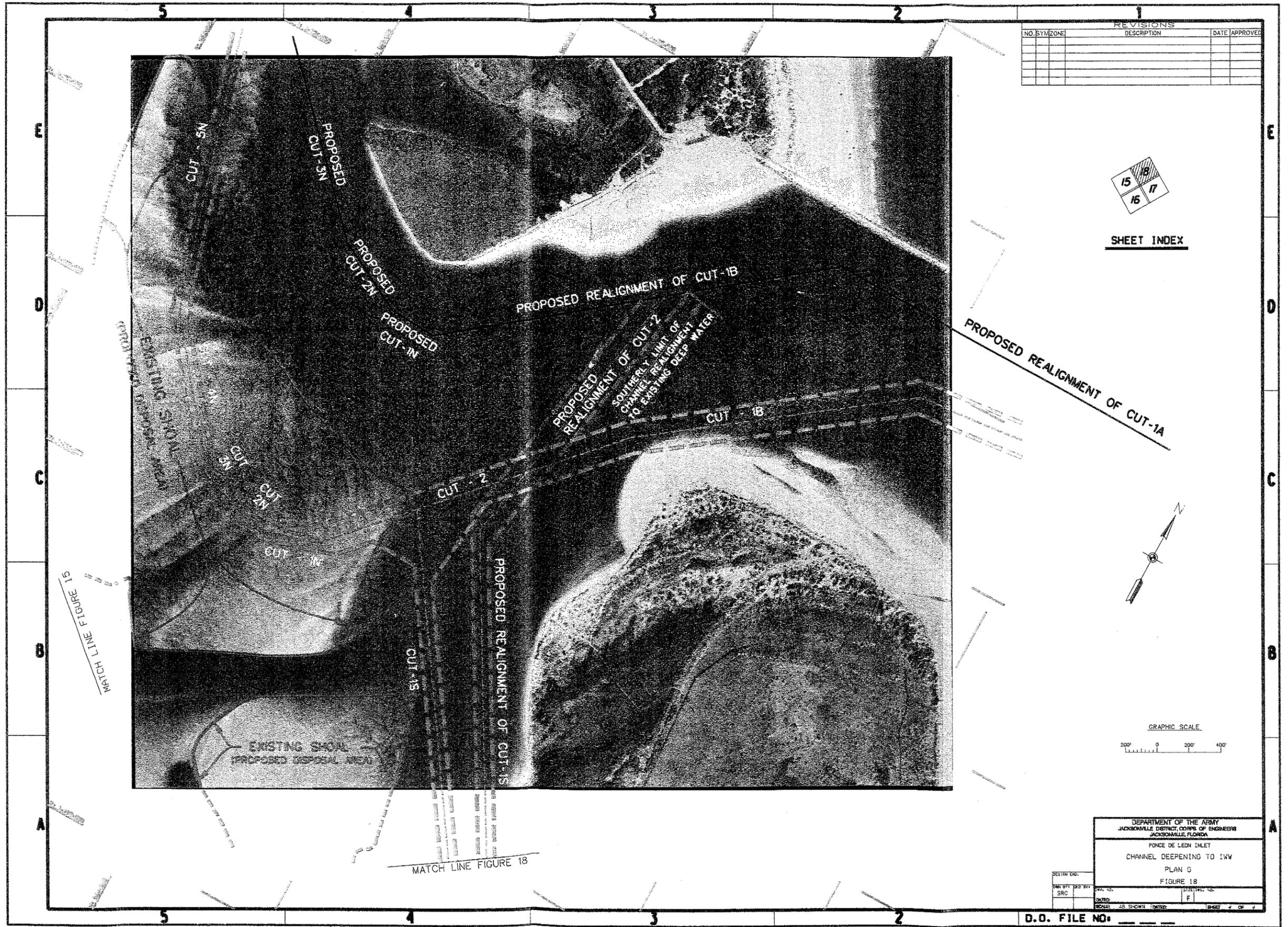
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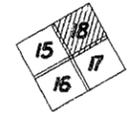
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DEPARTMENT OF THE ARMY JACKSONVILLE DISTRICT, CORPS OF ENGINEERS JACKSONVILLE, FLORIDA			
PONCE DE LEON INLET CHANNEL DEEPENING TO IWW PLAN G FIGURE 15			

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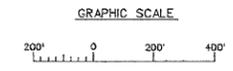
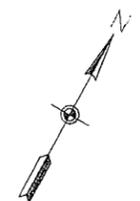




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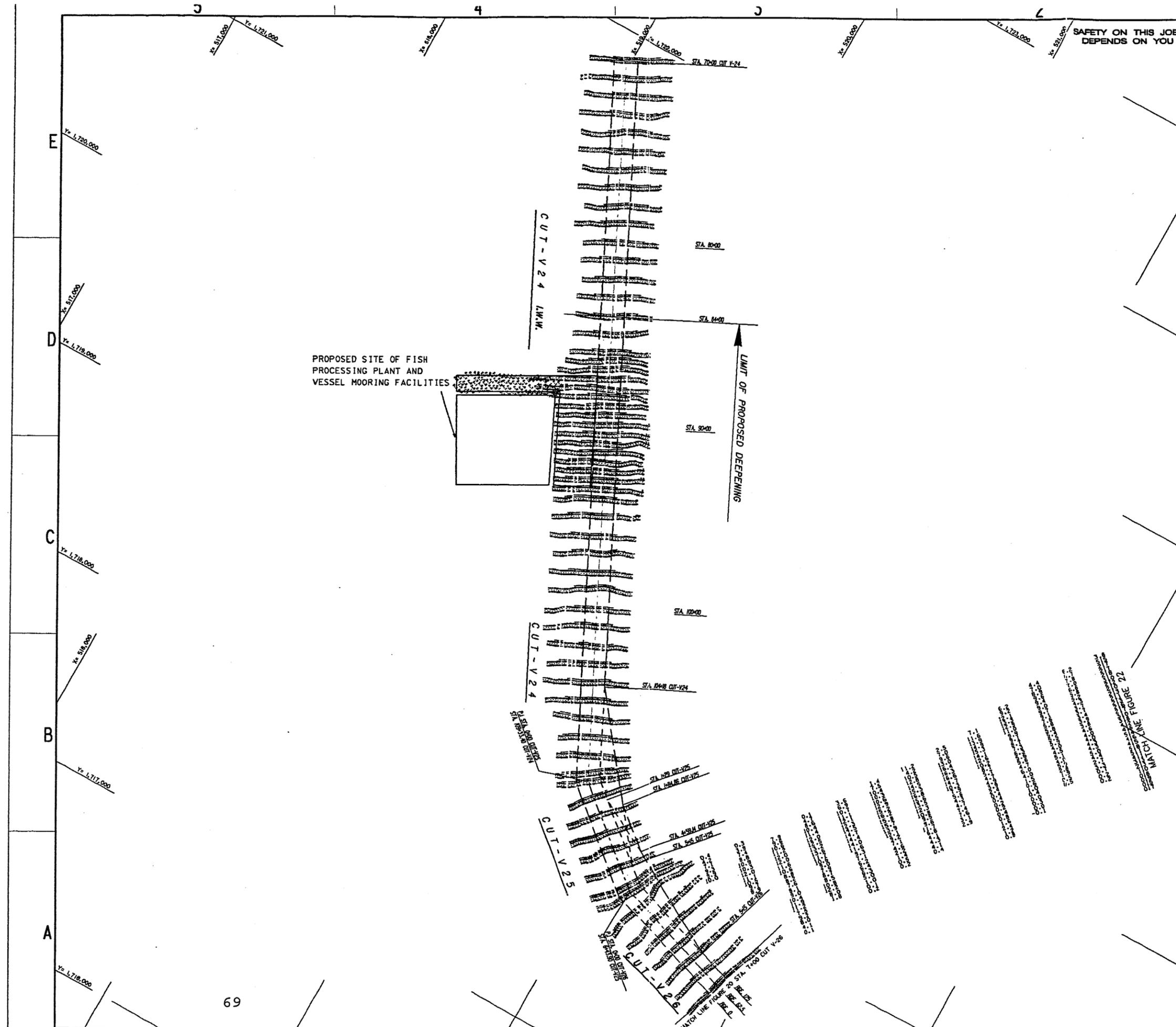
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 JACKSONVILLE, FLORIDA
 PONCE DE LEON INLET
 CHANNEL DEEPENING TO IWW
 PLAN G
 FIGURE 18

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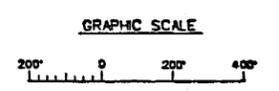
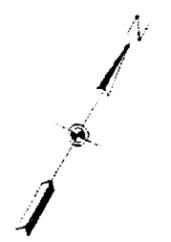


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PONCE DE LEON INLET
FEASIBILITY STUDY
7-, 12-, 15-FOOT PROJECT
IWW EXTENSION
FIGURE 19

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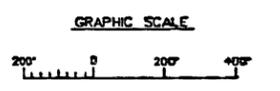
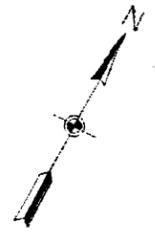


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PONCE DE LEON INLET
 FEASIBILITY STUDY
 7-, 12-, 15-FOOT PROJECT
 INW EXTENSION

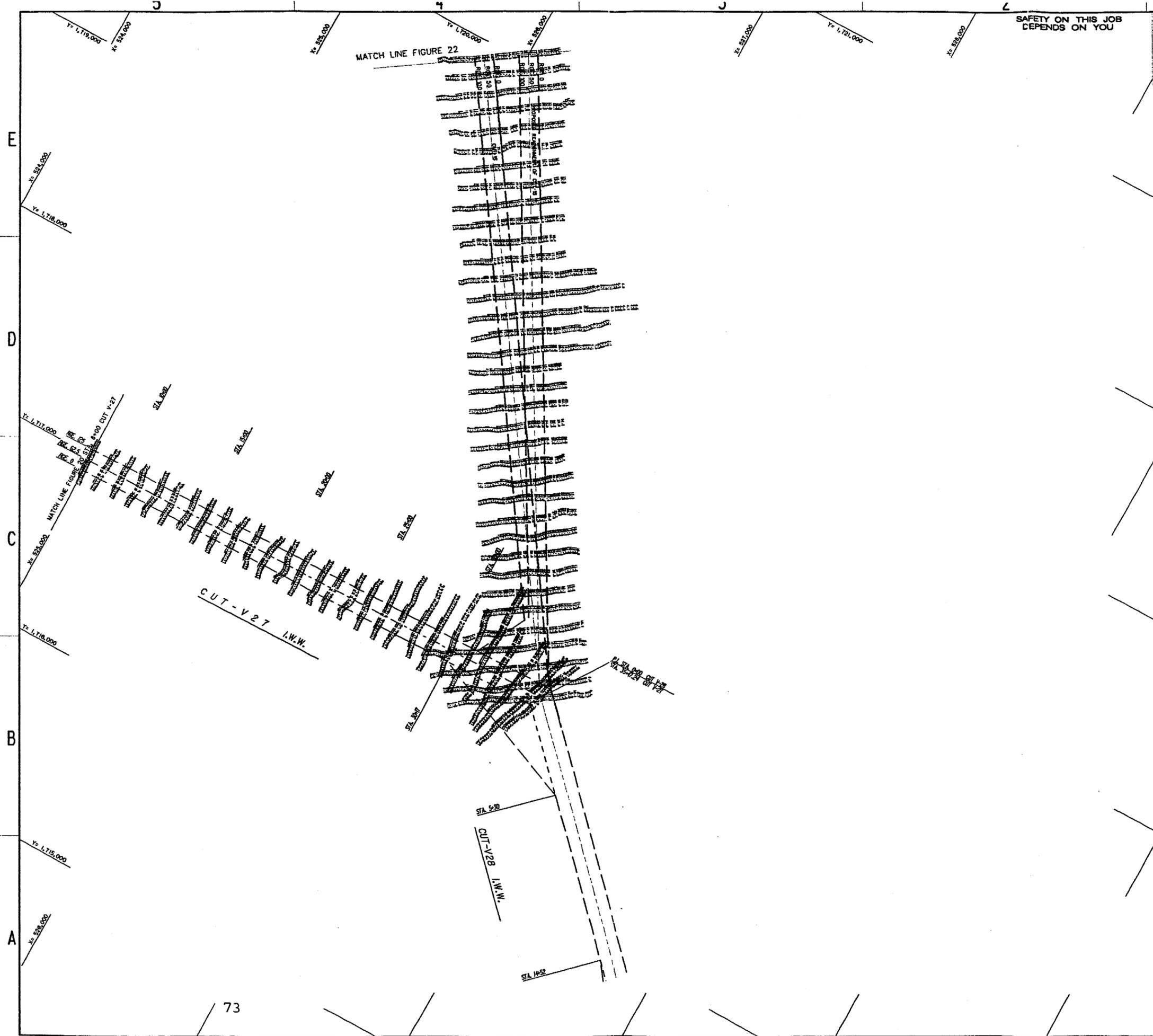
FIGURE 20

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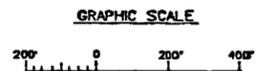
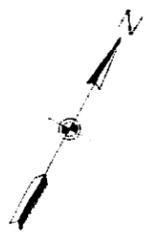
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PONCE DE LEON INLET
FEASIBILITY STUDY
T-12-, 15-FOOT PROJECT
IWW EXTENSION

FIGURE 21

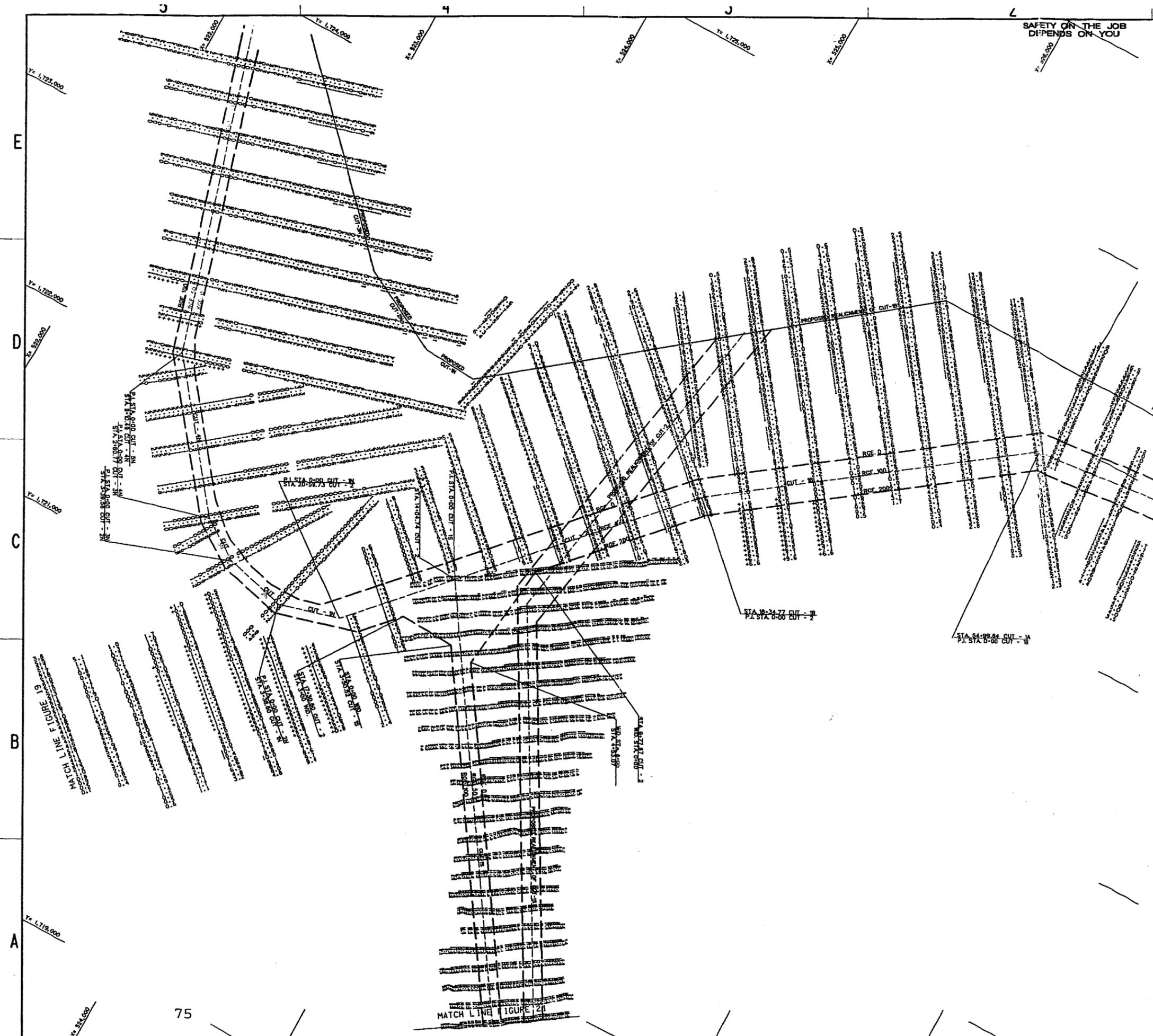
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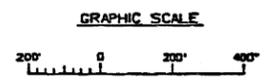
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PONCE DE LEON INLET
FEASIBILITY STUDY
7-, 12-, 15-FOOT PROJECT
IWW EXTENSION
FIGURE 22

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110. Plan G in combination with plans A and F provides additional project features that allow an increase in commercial benefits for project consideration. The increased commercial benefits result from the sponsor providing public dockage for commercial fishing vessels along with private development of a commercial marina and seafood processing facilities at the site of the former Swoope Power Plant as shown in figure 15.

111. An estimate of costs for a potential commercial marina and seafood processing facilities is included in the following Table 6. Of the total costs shown (\$8,689,000) approximately \$7,139,000 can be considered a without-project or sunk cost resulting in a total of \$1,550,000 in associated costs to be included in the total project first costs.

ENVIRONMENTAL CONSIDERATIONS

112. Initial environmental coordination with appropriate Federal, State, and local organizations during the Reconnaissance Study began with a September 29, 1992, letter describing alternatives under consideration. That letter was followed by a February 7, 1995, letter during the Feasibility Study adding two additional alternatives not previously considered. With the addition of a deepening alternative involving the extension of the south channel along the IWW, a coordination letter dated March 18, 1997 was provided. All environmental and other coordination correspondence is included in appendix C and/or referenced in the Environmental Assessment (EA).

113. Implementation of the proposed alternatives will help stabilize the inlet and associated environments. Placement of armor stone for the south jetty extension will provide additional hardground in the area for colonization by organisms similar to those now inhabiting the area. Hardening and protection of the shoreline along the sand spit on the west end of the north jetty will cover approximately 2.1 acres of wetlands but at the same time protect nine acres of existing wetlands/uplands habitat. Approximately 6.6 acres of that nine acre protected area are wetlands. Placement of stone or other shoreline hardening material is expected to provide a net 4.5 acre (6.6-2.1) savings of wetlands when compared to the without project condition which results in a loss of all the existing wetlands/uplands located west of the north jetty.

114. No Action Plan. If nothing is done to stabilize the inlet, wetland areas within the immediate vicinity of the inlet will continue to have impacts. The sand spit with adjacent wetlands will continue to be impacted by erosion and filling to correct for erosion. While that area is impacted through changing conditions, other areas nearby are accreting with the overall impact to wetlands being somewhat minimal. Shoaling north of the south jetty is covering the rock jetty in that area which is a loss of hard ground. The north jetty instability and shifting of the rocks impacts the attached marine life. Boating accidents in the inlet may result in minor spills of oil and fuels as well as other chemicals.

Table 6	
Commercial Fishing Facility Estimated Total First Costs	
ITEM	COST
Stormwater Retention	\$28,000
RE- Land	\$1,125,000
RE- Site Preparation/Remediation/Permits	\$212,500
Seafood Processing Fit-Out	\$1,550,000
Marine Ramp Railway Fit-Out	\$43,000
Commercial Facility	
Docking Facility	\$236,947
Fish Processing Facility	\$3,231,134
Ice Plant Facility	\$198,463
Fuel Storage Facility	\$28,590
Bulkhead	\$485,778
Roadway Improvement	\$131,511
Outdoor Lighting	\$10,292
Tie in to local utilities/sewage	\$55,721
Pavement for parking area	\$522,359
35X70 Warehouse for Storage	\$180,000
Boat Ramp / Railway	\$10,423
Total Associated General Items	\$8,049,718
Contingencies	\$639,512
Total First Costs	\$8,689,230

115. As stated in the U.S. Fish and Wildlife Service (USFWS) Coordination Act Report:

The most significant impact to natural resources for the no action alternative would be the projected loss of the remaining salt marsh and mangrove swamp habitat, and all the associated biomass, from continued advanced erosion of the north spit of the old riverbed. The accompanying movement of sediment and nutrients into the water column is also likely to affect organisms within the benthic and sub-littoral zones. These effects, especially for the open water fauna and flora, likely will be transitory due to the speed and range of shifting physical conditions typical of most inlets. The presence of an extensive marsh and mangrove system both north and south of the inlet would also tend to lessen the overall impacts

of wetland loss. Additional shoaling in the Halifax River resulting from a break-through would impact the local benthos at that site. Shoaling may also reduce exchange of water and sediment from the boat basin cove, creating conditions favorable for expansion of the adjacent salt marsh and mangrove swamp. Degradation of the north jetty would expose more rock to the littoral and sub-littoral zone and provide additional shelter for fish and some crustacea as well as living surface for various algae and molluscs. Further expansion of the littoral zone adjacent to the inlet side of the south spit would likely benefit some benthic organisms, shorebirds, and nesting turtles. A breach behind the north jetty would remove some beach and foredune habitat and encroach on the transitional dune area. Fish, sub-littoral benthic organisms, and other tidal rock inhabitants would, on the other hand, have new habitats to exploit.

116. Plan A - South Jetty Extension. Construction and post-construction impacts from extending the south jetty 1,000 feet include the following as stated in the USFWS Coordination Act Report, found in the Environment Assessment section of this report:

Impacts from increased boat and barge traffic expected during construction of the jetty extension include temporary displacement of fish, plankton, and some loafing and feeding shorebirds, permanent loss of some sand-bottomed, benthic habitat within the jetty footprint, and possible impacts to manatees and sea turtles, which will be covered in the section on threatened and endangered species. Direct habitat impacts expected or predicted during the post-construction period include the addition of more dry and tidally-influenced, hard rock substrate; sand accretion to varying degrees along the beach upwards of a mile south of the new jetty; and loss of some shoals and extended beach along the north side of the south spit. The sand accretion predicted for the south beach will directly benefit shorebirds, benthic species found within the littoral and sub-littoral zones, nesting sea turtles, and other upper beach fauna and flora. The dune habitat in this area and its associated biotic community will also benefit from the increased availability of sand necessary for the maintenance and growth of this habitat type. These benefits will more than offset the predicted loss of some littoral and sublittoral habitat adjacent to the south side of the inlet throat.

117. Plan B - North Jetty Weir Opening. USFWS has the following comments on reopening the weir in the north jetty:

Reopening of 1,000 feet of weir would require removal of 255 feet of concrete walkway atop the jetty and approximately 17,000 tons of armor stone. If walkway demolition and rock removal is a land-based operation, the work would involve transporting equipment over the beach, then filling in jetty voids with stone to create a smooth, driveable surface for the heavy equipment. Part of the beach may be used as a staging

area for materials. Some transient impacts to upper beach fauna and flora may occur, as well as temporary displacement of feeding and loafing shorebirds. A water-based operation may temporarily effect shorebirds, fish, plankton, and the sub-littoral benthos. Removal of the submerged rock would reduce the total amount of hard substrate available to algae and aquatic and semi-aquatic marine invertebrates. Dredging of the impoundment basin would have short-term, open water and benthic impacts. Dredged spoil used for beach renourishment may impact nesting sea turtles, crustacea and other littoral benthos, while careful deposition in already existing and permitted spoil disposal sites is likely to have only minor impacts on an already disturbed plant and animal community.

The major change expected from the weir reopening is movement of additional sediment into the inlet from renewed littoral drift across the north jetty. Some of this sediment is expected to be deposited in the adjacent impoundment, where it may be piped or dredged to renourish south jetty beaches. Other sediment may be carried further into the inlet, where it will likely be involved in formation and maintenance of shoals, sandflats, and possibly accretion of remaining interior sand beaches bordering the north and south spits. The beach and dunes adjacent to the north jetty may become narrower due to transport of sediment formerly available to renourish these habitats. With the exception of dredging and artificial beach renourishment, the major expected change would potentially add new plant and animal habitat to the inlet. Since the greatest possible change to the north beach and dune system is likely to occur in the immediate vicinity of the north jetty, the overall impact to fauna and flora is not expected to be significant.

118. Plan C - Channel Realignment. According to USFWS:

The dredging in open water will remove the existing benthic community within the excavated area. Turbidity, especially within the old riverbed, will likely have a temporary, though possibly significant impact, on plankton and fish. Water-based operations may temporarily increase the risk of impacts to manatees and sea turtles. Land-based operations will remove some terrestrial plants and temporarily displace some animals, possibly including the Atlantic salt marsh snake. Up to three acres of mixed salt marsh, mangrove swamp, and sand beach will be lost due to their location within the footprint of the channel. In-kind mitigation would be required for the loss of the vegetated wetlands. Dredging would generate approximately 193,000 cubic yards of spoil. Beach-quality material may be used in renourishment projects, subject to further review for potential impacts to nesting sea turtles. Other spoil should be deposited within permitted and active disposal sites to minimize potential impacts to fish and wildlife resources. Permitted but inactive sites and

new sites without wetlands under consideration for disposal should first be assessed for occurrence of and potential impacts to federally-listed species. New potential sites with possible wetland impacts would first require a review of all fish and wildlife resources for possible impacts.

Some recolonization of dredged areas within the vicinity of the inlet and Halifax River should occur, and produce a benthic structure similar to the existing community. Significant changes in depth, current, salinity, and bottom sediments are expected within the old riverbed following dredging. This new habitat and the organisms which will colonize and otherwise use it should more closely resemble that occurring within the inlet and Halifax River. If this alternative produces greatly reduced water velocities on the flood tide in the vicinity of the spoil disposal peninsula, some accretion and low and high marsh formation may occur on the peninsula's southwest shore. If landward water velocities are not significantly diminished over current conditions, some erosion, possibly significant, may occur along the same shoreline. This in turn would likely have short-term impacts on the open water and benthic communities.

119. Plan D - Groin Field. USFWS acknowledges that:

The construction of a set of three groins along the sand spit inside the inlet adjacent to the north jetty was originally considered to preserve the remaining shoreline and prevent breaching of the spit by deflecting flood tide currents away from the spit. Since this alternative was considered in the Reconnaissance Report, more than 60 acres of remaining sand spit and marsh have been lost to erosion. As a result these physical changes to the north spit since publication of the Reconnaissance Report, the Corps has reviewed this alternative and determined that the current conditions no longer matched the parameters under which the groin field was to operate. The Corps therefore decided to drop this alternative from the project consideration and the biological assessment of its impacts to natural resources became unnecessary.

120. Plan E - Landward North Jetty Extension (Maintenance).
USFWS says the 800-foot long landward extension of the north jetty:

would impact approximately 2.85 acres and transverse a portion of the existing sand barrier as well as some backdune habitat. The few plants which colonized the sand barrier were found adjacent to the backdunes and marsh. Animal use of this sand deposit is likely to be transitory rather than permanent. The permanent loss of the backdune habitat within this section will not be significant since the adjacent Lighthouse Point Park consists primarily of this type of habitat.

121. Plan F - Revetment. According to USFWS the 1,540-foot revetment:

would impact a total of approximately 4.27 acres including between two and three acres (2.1 according to Corps calculations) of tidal mud flat, low and high salt marsh, and mangrove swamp. Impacts to tidal mud flats would be temporary, since sedimentation and backfill would be expected to cover at least that portion of the revetment where the impacts occur below mean low water. In-kind mitigation would be required for the loss of the vegetated wetlands. This habitat is also within the range of the federally endangered, Atlantic salt marsh snake. The discussion of possible impacts to this species may be found in the section on threatened and endangered species. Impacts to the additional 1.72 acres of open spoil field is not likely to be significant since this sparsely vegetated habitat appears to offer minimum wildlife function and value. The loss of the mixed herbaceous and woody transitional area also will not be significant because similar habitat on the peninsula still exists as well as more extensive habitat on the north side of the marina cove.

An indirect impact of the revetment is the possible mortality of some sections of mangroves adjacent to the revetment due to the blocking of tidal flow between the old riverbed and the peninsula's wetlands. Depending upon rainfall and tidal influence, these areas may convert into a more herbaceous, high marsh, or become a salt barren. Both of these habitats have unique functions and values which can be of special benefit to both resident and transient wildlife. Any indirect loss of mangrove swamp must be added to the mitigation required for the direct impacts.

Few upland or transitional plants, and terrestrial animals are likely to utilize the dry portions of the revetment. Estuarine organisms may utilize that portion of the revetment on both sides that are under regular and irregular tidal influence. Should the remaining north spit marsh erode and inlet breakthrough occur, some portion of the entire southwest side of the revetment is predicted to be under littoral and sublittoral influence. The pattern of floral and faunal use of this area is then expected to be more like that of the north and south jetties.

122. Plan G - South Channel Extension. The July 23, 1997, U.S. Fish and Wildlife Coordination Act Addendum for the Ponce DeLeon Inlet states:

Upland Disposal Sites Concerning the upland disposal sites MSA 434/434C North and South, Both sites historically were used as disposal sites for the IWW.

The north site (MSA 434) is approximately 378 acres, and appears not to have been used as a disposal site for many years based on the growth of the vegetation throughout the area (figures 8-10). The

predominant vegetation is wax myrtle, cabbage palm, red cedar, lantana (*Lantana* spp.), smilax (*Smilax* spp.), and sea oats (*Uniola paniculata*). During a cursory survey, four active gopher tortoise (*Gopherus polyphemus*) burrows were found, and one gopher tortoise was observed in a burrow (figure 11).

The south site (MSA 434C) is approximately 47 acres, and appears to have been used more recently than the north site (figures 12-14). There has been little recruitment of vegetation on the disposal site. The predominant vegetation is sea oats.

The Service believes the use of the south site would have less environmental impact than the north site because it lacks the plant or animal diversity observed on the north site.

Shoal Sites The shoaled areas are located between the inlet and the mouth of Rockhouse Creek. As shown in figures 15-19, the shoals are unvegetated, except one small patch of smooth cordgrass found on the extreme south end of the south shoal. Between the shoals and the islands, there were exposed tidal flats. Several unidentified shore birds were feeding on invertebrates found on these flats.

Of the three proposed methods of disposal available to the Corps for this project, the Service ranks the shoaled sites as the least favorable. The shoaled areas do provide feeding sites for shore and wading birds.

Beach Disposal Site The proposed beach disposal site begins south of the south jetty and will continue south along the beach until 360,000 cubic yards of sand is disposed of. The Corps did not identify a termination point.

Sandy beaches are populated by small, short-lived infauna with high species density and substantial reproductive potential and recruitment, for example decapods crustaceans, bivalves, spionid worms, and burrowing haustoriid amphipods. These communities occur in relatively well-defined zones and depend to some extent on the nature of substrate.

The southeastern beach mouse (*Peromyscus polionotus niveiventris*), a Federally listed threatened species, may be found in the dune system. The marine turtles identified above may nest on the intertidal beach and supralittoral zones.

The dredged material will be piped from the project site to the beach to be dispersed. Work will be confined to the intertidal beach and supralittoral beach zones; no work will be conducted in the dunes.

Other than the impacts and conditions discussed in the enclosed biological opinion, the Service believes the impacts of beach disposal will be temporary. The invertebrates will recolonize the intertidal and supralittoral beach zones shortly after disposal.

123. Historic Properties. The area of impact for the proposed project includes both uplands and submerged lands. Therefore, historic property analysis for the Feasibility Study included consideration of both terrestrial and submerged cultural resources. Significant historic properties have been identified in the inlet vicinity. Unidentified historic properties may also be located in the area.

124. Based on archival research and consultation with the Florida State Historic Preservation Officer (SHPO), it was decided that a magnetometer survey should be conducted for the proposed jetty extension. During diver investigation of seven potentially significant targets, no historic materials were identified in the study area.

125. Terrestrial archaeological surveys were conducted for Lighthouse Point Park, north of Ponce DeLeon Inlet. The landward extension of the north jetty may affect the foundation remains of the Hotel Inlet Terrace. The survey archaeologist and the SHPO agreed that this site is not eligible for listing in the National Historic Register of Historic Places. Although the Corps of Engineers does not have any responsibility for this site for compliance with Section 106 of the National Historic Preservation Act, the non-Federal sponsor may want to relocate an interpretive sign and part of the foundation.

126. Correspondence appendix C contains two letters, dated June 30, 1997, and August 27, 1997, from the SHPO. The first indicates that realignment and extension of the south channel of the Ponce DeLeon Inlet project to about Cut-24 of the IWW will have no effect on historic properties listed or eligible for listing in the National Register of Historic Places. The second letter confirms the same no effect determination for the two proposed Dredged Material Management Areas (DMMA) MSA 434/434C North and South.

127. Aesthetics. An evaluation of the aesthetics of the alternative plans reveals the following considerations:

- Quarry and use native stone for the jetty extension and revetment which would blend with the surrounding environment and fit in its unnatural landform (if engineering design and costs considerations allow);
- Cover the jetty extension and revetment with local sand to conceal the rock and plant with native vines (backfill will be used along revetment to restore existing grades and allow natural re-establishment of flora); and
- Cover the rubble jetty with a capped concrete walkway accessible for recreational purposes (not a Corps option due to budget priorities).

128. Recreation. The impacts to existing and future recreational facilities from consideration of the alternative plans involves the following. Loss of access to the fishing pier located on the north jetty results if the No Action Plan occurs. With the 1,000-foot extension of the south jetty, Plan A, accretion of the beach south of the south jetty will occur for about one mile according to the Genesis Model work discussed in appendix A. That improvement should enhance recreational opportunities for the Smyrna Dunes Park. Future recreational opportunities under investigation by the Ponce DeLeon Inlet Port Authority include possible development of two existing dredged material disposal islands located north and south of Rockhouse Creek. In a report titled *Increasing Recreational Use and Profitability of Parks and Lands in the Ponce Inlet Area: A Conceptual Articulation* (Michael L. Avery and Dr. Daniel K. Rosetti) dated May 21, 1996, the authors recommend developing a water taxi service between the north and south parks and an accessible Mainland site. They suggest development of a Comprehensive Use Plan for the disposal islands and development of a recreational complex on the islands.

MITIGATION RECOMMENDATIONS

129. In a letter dated 10 July 1996 the Environmental Branch of the Jacksonville District explained that a comparison of the without project condition to Plan F resulted in a net gain of approximately 4.5 acres of wetlands. As a result Plan F should not require mitigation (U.S. Fish and Wildlife Service). The footprint and side slope area of the revetment of Plan F covers 2.1 acres of wetlands. The revetment of that plan protects approximately 6.6 acres of wetlands. The area saved or net gain as result of Plan F is 4.5 acres (6.6-2.1). If Plan F is not built, that area will erode and be totally lost by the year 2002 according to a shoaling analysis provided by Taylor Engineering (Taylor Engineering, 1996, Vol. 1, p. 3-7). While no mitigation is required, USFWS recommends as a minimum the Corps should make every effort to maintain the current tidal flat, fringing salt marsh, and mangrove swamp located between the old Halifax riverbed and the adjacent spoil upland.

130. Plan F - Revetment. According to USFWS the Corps should observe the following conditions to the maximum extent practicable:

- Align the channel and/or revetments to reduce their direct or indirect impacts on the preceding jurisdictional wetland.
- Where wetland impacts are unavoidable, dredge and fill operations should be conducted in a manner that restores the existing grade and dimensions of those wetlands prior to completion of the projects. This strategy will promote natural re-establishment of the biota associated with the tidal flat, salt marsh, and mangrove swamp.

- Artificially plant the dominant salt marsh and mangrove flora on the appropriate impacted areas at low densities to initially stabilize all areas and provide starter stock for those areas that are furthest from contiguous natural vegetation and less likely to be adequately vegetated through natural re-establishment.

ENDANGERED SPECIES

131. The proposed work for inlet stabilization is not expected to adversely affect any threatened or endangered species. The National Marine Fisheries Service (NMFS) in their September 10, 1996 letter in appendix C determined that endangered or threatened species under their purview would not be adversely affected by the proposed project.

132. In response to the District letter dated March 18, 1997, requesting comments on realignment of the south Ponce DeLeon Inlet channel and extension of it along the IWW north to the site of the former Swoope Power Plant, NMFS provided comments on the deepening and location of a commercial marina in their letter dated April 16, 1997, of appendix C. NMFS requested that the models (numerical and physical) used in testing of alternatives for the study be modified to assess the impacts of channel deepening on tidal flows, freshwater input flows, currents and salinity regimes.

133. The numerical model was modified to include testing of increasing the design depths of the affected channel reaches from 12 feet to 16 feet. While impacts on hydrodynamics and sediment transport were obtained, salinity changes were not part of the modeling process. The same numerical, two-dimensional hydrodynamic model and companion sediment transport methodology used earlier was modified to test channel deepening on three different inlet conditions. The conditions included existing 1994 inlet bathymetry, an expected future inlet bathymetry (channel through the inlet's north spit with a submerged shoal), and an alternative future inlet bathymetry (channel through the north spit with an emergent island). Each of the three conditions contained the proposed 1,000-foot south jetty extension.

134. The model testing revealed minimal hydrodynamic and sediment transport impacts for all three inlet conditions. Changes in velocities within the deepened IWW cuts ranged from 0.02-0.04 feet per second during both flood and ebb. According to Taylor Engineering, operating under the limitations of the present sediment transport methodology, existing sedimentation/erosion regimes are expected to be largely unaffected by the proposed deepening of the IWW (Taylor Engineering, 1997).

135. A review of bathymetric surveys of the Ponce DeLeon Inlet in appendix A indicates naturally occurring depths of 16-27 feet already exist in the entrance and south channel of the inlet over an area approximately three times the width of the existing south 100-foot wide channel. Some depths within 50-100 feet of the north jetty

range up to 40 feet. Due to the naturally occurring depths of 16-27, the south channel of the inlet requires only realignment with little or no dredging. Since the cross-sectional areas of the existing deep water are much greater than the dredging prism of 14-16 feet deep by 100 feet wide, no significant change in the salinity regime of the inlet is expected.

136. Based on model testing hydrodynamic results, velocity changes in the IWW indicate no to subtle variations. Therefore, salinity variations within the waterway are also considered to be non-detectable.

WATER QUALITY CERTIFICATION

137. The District prepared a document entitled *Draft Preliminary Environmental Assessment for Maintenance Dredging of Ponce DeLeon Inlet* (dated June 1996). A Florida Department of Environmental Protection (FDEP) request for additional information was responded to on January 4, 1999. The permit request for maintenance dredging of the study area involves removing an anticipated 500,000 cubic yards of material every four years. Placement alternatives for the dredged material include the north (secondary) and south (primary) beaches. FDEP notice of intent to issue a Water Quality Certificate is scheduled for February 1999. As of this writing no plans for maintenance dredging are funded or scheduled through FY-1999.

INITIAL ALTERNATIVE EVALUATION

138. The planning objectives, previously discussed, provided the basis for evaluating each of the alternatives. Plan consideration had to consider several problem areas at the inlet for stabilization. One was possible solutions to prevent the undermining and outflanking of the north jetty. Another was potential solutions to prevent a catastrophic or periodic breakthrough of the spit on the west end of the north jetty in the future. Cumulative problems from the breakthroughs have a negative economic impact on commercial fleet operations in the area. Yet another consideration was protective measures for public property in the way of a potential breakthrough. The fourth consideration involves solutions to minimize changing conditions in the navigation channels to improved navigation safety. A fifth concern involved providing adequate public docking facilities to attract sufficient commercial vessels to provide benefits for justification of the improvements. To address those problems, several improvement features were identified as alternative plans for consideration. An initial assessment of those plans in appendix A provides an engineering evaluation on each alternative. To achieve the planning objectives, a combination of plans would be necessary for an overall solution to problems.

139. Cost Estimates. A description of each alternative plan is discussed under the ALTERNATIVE PLANS section of this report. The engineering analysis and cost estimates provide information to make evaluations in preparing the design conditions for estimating costs. The estimates of total first cost for the following alternatives are in Table 7: Plan A/F, Plan A/F/G14, Plan A/F/G15, Plan A/F/G16, Plan A/F/G17, Plan A/F/G18, and Plan A/F/G19. The costs for Plans A/F and G are estimates just for those plan features. The combination of plans A/F or Plans A, F, and G are required to meet planning objectives. Plans A and F represent non-separable elements. Plan A, the 1,000-foot extension of the south jetty, causes the entrance channel to relocate toward the center of the inlet away from the north jetty. Plan F, the 1,540-foot revetment, protects commercial vessel marinas in addition to remaining wetland/upland areas and prevents the north jetty from being outflanked. Plans B, C, and D did not satisfy planning objectives and were removed from consideration. Plan E, the 800-foot landward extension of the north jetty, involves future maintenance work and requires implementation by the year 2002 either with or without a project to prevent outflanking of the north jetty.

140. The average annual equivalent costs for each of the alternatives are shown in Table 7. The combination of various alternative plans is required to accomplish stabilized conditions in the inlet and an overall reduction in maintenance cost. Currently a natural process of relocation of the existing deepwater channel toward the north jetty is occurring which results in greater than required depths for navigation. With the 1,000-foot south jetty extension improvement a shifting of the entrance channel away from the north jetty and more toward the center of the inlet is expected. Allowing the channel to shift northward naturally will gradually shift the channel with little or no maintenance. Future maintenance costs are discussed in the SELECTED PLAN section. Savings in prospective future maintenance are provided in that discussion. Interest and amortization of first costs plus interest during construction is at an interest rate of 7 1/8 percent over an economic analysis period of 50 years.

141. Assessment. The various alternative plans offer the potential for a number of combinations. However, cost was a major consideration since testing of plans with a combined numerical and physical model reduced the evaluations to just Plans A, F, and G which met planning objectives. Model tests indicate that the south jetty extension (Plan A) is a necessary component of all plans. A combination of Plans A, F, and G seems to best meet the planning objectives. Model tests indicate that Plans A and F should help shift the entrance channel away from the north jetty reducing impacts on that structure and possible loss of public property, wetlands, and structures. With a more stable system of channels boater safety should improve to help reduce damages and loss of life in the area. Plan G provides access to public docking facilities for commercial fishing vessels requiring a 14-foot or greater project depth. The additional features of plan G allow an increase in commercial benefits.

INITIAL BENEFIT ANALYSIS

142. The proposed improvements are to provide more stability for the navigation project at Ponce DeLeon Inlet. With a more stable inlet the navigation problems associated with the shifting channels and shoaling will be reduced significantly. Maintenance will also be less of a problem and the USCG will be able to mark the north channel for the project. The benefit analysis provides the economic impact of existing and prospective future conditions on boaters using the inlet with and without improvements. The analysis also evaluates past maintenance problems and possible future conditions with and without project improvement. Appendix D provides a description of the benefit analysis categories. The two main groups of benefit categories described in appendix D include transportation savings for both commercial and recreational vessels. The discussion on transportation savings that follows presents savings for alternatives considered with the fishing park and without the fishing park.

143. Commercial Small Boat Traffic. The benefit analysis evaluated the impact of the with and without project improvement conditions on existing and prospective commercial small boat usage in the inlet. Those boats included charter boats, head boats, and commercial fishing and shrimp boats. During the reconnaissance and feasibility studies, interviews with commercial fishermen, charter and head boat operators, and boatyard operators indicated that the commercial fleet for Ponce DeLeon Inlet consists of 80-85 vessels. Of that 58 boats were home port vessels and 26 were transient commercial fishing boats.

144. The 58 home port vessels were at marina, commercial fish houses, and boatyard locations within a 15-mile radius north and south of the Inlet. The identified fleet north and south of the inlet consists of 38 percent commercial fishing boats, 59 percent charter fishing boats, and 15 percent commercial passenger vessels or "head boats". The commercial fleet, identified south of the inlet, consisted of one head boat, eight commercial fishing boats, and six charter boats. About 26 transient commercial fishing boats visit a commercial fish house to the south on a regular basis.

145. Reductions in Damages to Commercial Boats. The USCG letter in appendix D provides a record of actual incidents in the inlet from search and rescue data on file. That information indicates a total of 347 vessel groundings from 1981 to 1991. Almost all of those groundings resulted from shoaling conditions on the Federal project. Those conditions occurred between the north and south jetties of the inlet, in the Halifax River channel to the north, in the Indian River channel to the south, and in the throat of the inlet at the junction of those two channels near Rock House Creek as shown on plate 1 of appendix D. Discussions with USCG personnel at their Ponce DeLeon Inlet Station indicate that those records do not reflect all the incidents. If a vessel runs aground and is not in immediate danger, the USCG does not respond nor record the incident. Operators of grounded vessels not in immediate danger must rely on others such as

146. Interviews with personnel at four marinas with boatyards as well as one propeller and shaft repair facility on the north side of the inlet provided information for estimating damages. Those facilities apparently experience the major portion of repairs associated with damage in the inlet. From their information the estimated boat damage on the Federal project at the inlet averages about 12 propeller and shaft jobs per week during the course of a year. Those boatyards have the capability to haul the boats for removal of propellers and shafts. Once off the boat, the propellers and shafts go to a separate facility that actually does the repair work then returns the repaired parts to the boatyard. The boatyard then puts the parts back on the boat. Estimated costs for such repairs for commercial vessels range from a low of about \$220 to a high of over \$2,300. The average cost estimate for that repair work is about \$860 per boat.

147. With improvements to the inlet and more stable inlet channels, the USCG would be more agreeable to reestablishing the navigation markers in the north channel. With the channel markers and more stable inlet conditions, the propeller and shaft repairs could be reduced.

148. Existing Commercial Boat Benefits Summary (with inlet stabilization measures only - plans A&F). Categories of average annual benefits for existing commercial vessels include the following:

- Reductions in general vessel damages/maintenance avoided for commercial vessels, \$200,710;
- Avoidance of charters lost or forgone, \$47,520;
- Avoidance of severe damages/catastrophic losses, \$10,750;
- Reduction in labor and damage costs for sea trials, \$32,000.

149. Those average annual equivalent (AAEQ) benefits total \$290,980 for the existing vessel fleet using the inlet.

150. New Commercial Fishing Vessel Benefits (with public docking facilities and commercial marina - plans A, F, & G). Recent information indicates that a new fishery will soon be open for the harvest of golden and red crab. Projections reveal this new fishery will bring approximately 11 vessels to the inlet area for operations. With commercial fish processing facilities and dockage, fishing vessels with drafts requiring a 14-foot project depth will be able to visit Ponce DeLeon Inlet. Average annual equivalent benefits of approximately \$321,950 per year are expected. Appendix D contains a description of the benefit analysis.

Table 7

Estimate of Initial¹ Alternative First Costs, Interest During Construction, Economic Investment, & Annualized Costs
Plans B, C, D, & E Not Shown

ITEM	PLAN A/F	PLAN A/F/G14	PLAN A/F/G15	PLAN A/F/G16	PLAN A/F/G17	PLAN A/F/G18	PLAN A/F/G19
Construction Costs	\$6,987,000	\$9,741,000	\$9,914,000	\$10,064,000	\$10,258,000	\$10,509,000	\$10,773,000
Non-Construction Costs							
Real Estate	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000
Navigation Aids	\$12,000	\$12,000	\$12,000	\$12,000	\$12,000	\$12,000	\$12,000
Planning, Engineering, Design	\$209,000	\$314,000	\$314,000	\$314,000	\$314,000	\$314,000	\$314,000
Construction Management.	\$256,000	\$384,000	\$384,000	\$384,000	\$384,000	\$384,000	\$384,000
Contingencies	\$1,405,000	\$1,585,000	\$1,611,000	\$1,634,000	\$1,663,000	\$1,701,000	\$1,740,000
Total First Costs	\$8,889,000	\$12,055,000	\$12,255,000	\$12,427,000	\$12,650,000	\$12,939,000	\$13,242,000
Interest During Construction	\$605,000	\$821,000	\$834,000	\$846,000	\$862,000	\$881,000	\$902,000
Economic Investment	\$9,494,000	\$12,876,000	\$13,089,000	\$13,273,000	\$13,512,000	\$13,820,000	\$14,144,000

Average Annual Equivalent (AAEQ) Costs

Economic Investment	\$699,000	\$948,000	\$963,000	\$977,000	\$995,000	\$1,017,000	\$1,041,000
Cost Savings With Project							
North Jetty Maint. Savings	(\$28,000)	(\$28,000)	(\$28,000)	(\$28,000)	(\$28,000)	(\$28,000)	(\$28,000)
Inlet Maintenance Savings	(\$72,000)	(\$72,000)	(\$72,000)	(\$72,000)	(\$72,000)	(\$72,000)	(\$72,000)
IWW Maintenance Savings	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total AAEQ Costs	\$599,000	\$848,000	\$863,000	\$877,000	\$895,000	\$917,000	\$941,000

¹After the Feasibility Review Conference in March 1998 benefits and costs for the proposed fishing park could no longer be considered (see Refined Alternative Evaluation section) and these plans were no longer viable. They are included here to present a complete explanation of plan formulation.

Table 8
Initial¹ Benefit Summary

Benefit Category	With Fishing Park	Without Fishing Park
Commercial Vessel/Use	\$612,900	\$291,000
Recreational Vessel Use	\$466,200	\$466,200
Total Benefits	\$1,079,100	\$757,200

¹After the Feasibility Review Conference in March 1998 benefits and costs for the proposed fishing park could no longer be considered (see Refined Alternative Evaluation section) and these plans were no longer viable. They are included here to present a complete explanation of plan formulation.

Table 9
Comparison of Initial¹ Plan Benefits/Costs

ITEM	PLAN A/F	PLAN A/F/G14	PLAN A/F/G15	PLAN A/F/G16	PLAN A/F/G17	PLAN A/F/G18	PLAN A/F/G19
Annual Benefits	\$857,000	\$1,079,000	\$1,079,000	\$1,079,000	\$1,079,000	\$1,079,000	\$1,079,000
Annual Costs	\$599,000	\$848,000	\$863,000	\$877,000	\$895,000	\$917,000	\$941,000
Net Benefits	\$258,000	\$231,000	\$216,000	\$202,000	\$184,000	\$162,000	\$138,000
Benefit to Cost (B/C) Ratio	1.43 ¹	1.27 ¹	1.25 ¹	1.23 ¹	1.21 ¹	1.18 ¹	1.15 ¹

¹After the Feasibility Review Conference in March 1998 benefits and costs for the proposed fishing park could no longer be considered (see Refined Alternative Evaluation section) and these plans were no longer viable. They are included here to present a complete explanation of plan formulation.

151. Total Commercial Vessel Benefits. Commercial vessel benefits derived from the existing (without commercial fish processing facilities and dockage - plans A&F) and new fleets (with commercial fish processing facilities and dockage - plans A,F, & G) are the sum of \$290,980 and \$321,950. That value totals \$612,930 in average annual equivalent benefits.

152. Total Recreational Vessel/Use Benefits (Plans A&F and plans A, F, & G). Benefits for reductions in damages to recreational craft and value of time saved for inlet users results in \$307,840 and \$158,330 respectively. Those values total \$466,170 in average annual equivalent benefits. Those benefits are for recreational vessels and apply either with or without commercial fishing park facilities.

153. Maintenance. As a result of the continued migration of all the Federal navigation channels at Ponce DeLeon Inlet, operation and maintenance have been a continuous problem. A brief analysis of maintenance costs associated with historical repairs to the north jetty and past breakthrough indicate a significantly high maintenance record. Under current conditions plans for future maintenance work anticipate problems with the entrance channel up against the north jetty and spit. As a protective measure for the eroding eastern shoreline of the spit, maintenance work on the IWW was started in April 1994 and was completed in September 1994 with the placement of 215,000 cubic yards of material on that shoreline at an originally contracted cost of \$1,000,000. Final settlement of that contract has not occurred as of this writing. That plan involved removing shoal material from the IWW near Rock House Creek and placing it on the east shoreline of the spit for protection against a breakthrough.

154. In early summer 1998 a scour apron was placed along the landward end of the north jetty and armor stone was placed to fill in slumped areas. Associated maintenance costs in 1995 and 1996 were incurred to determine the location for placement of the scour apron include \$16,019 for a multi-beam sonar survey and \$11,416 for a U.S. Army Diver's survey of the underwater portion of the north jetty. The contract award for the construction contract for the scour apron and additional armor stone to fill in slumped areas of the north jetty was \$1,067,000 (Contract No. DACW17-97-B-0024).

155. Approximately 8-9 years from 1994, a recession rate analysis indicates that under current conditions, the north spit will erode to the area of the landward end of the north jetty (Taylor Engineering, 1996, Vol. 1, page 3-7). To protect the integrity of the north jetty Operation and Maintenance plans should include construction of an 800-foot landward extension of the north jetty prior to or not later than the year 2002.

156. North Jetty Repairs Savings. Stability of the north jetty is in question with the deep water very close to the structure. Jetty maintenance is expected to be a major expenditure in the future. A review of repairs to the north jetty in table 3 indicates the north jetty underwent both major and minor repairs over a period of time from FY-79

through FY-95. Major maintenance has just been completed on the north jetty to provide a scour apron and armor stone as previously described.

157. Without improvements to the inlet, three additions to the north jetty scour apron are anticipated once every 14 years from placement of the above mentioned scour apron in 1996. Using the cost of \$1,350,000 for each of the three future scour aprons in the years 2010, 2024, and 2038 results in an Average Annual Equivalent (AAEQ) cost of \$82,000. That figure is based on a 50-year economic project life starting in 2001 at a 7 1/8 percent interest rate. With improvements to the inlet the entrance channel is expected to shift away from the north jetty toward the center of the inlet. Under those conditions only one additional scour apron is anticipated in the year 2010. Using the \$1,350,000 figure for its cost provides an AAEQ of \$54,000. The difference in the without and with project conditions results in an AAEQ maintenance savings of \$28,000.

158. Inlet Maintenance Dredging Savings. Since closure of the weir, past maintenance experience on the Federal channels of the inlet indicates removal of a total of 1,838,000 cubic yards of material from 1984-1997 (Table 10). Over that 13-year period the annual shoaling rate is 141,000 cubic yards.

159. Future maintenance dredging of the project with the 1,000-foot south jetty extension and the 1,540-foot revetment appendage to the landward extension of the north jetty is expected to be about 68,000 cubic yards per year. Dredging will probably occur at 5-year intervals when approximately 340,000 cubic yards of material has accumulated. As shown in table 10 no dredging of the Federal channels related to the inlet system has occurred since 1989. No dredging is planned for 1998 as of the date of this report.

160. While the Federal system of inlet channels has been unstable and required moving of the USCG navigation markers, adequate depths and widths have existed for navigation interests. Even though the USCG refuses to mark the north channel in the Halifax River due to its unstable condition, existing deep water for navigation has existed since 1989 in that and all Federal channels of the inlet system. As a result no dredging has been required. With a project in place adequate depths are expected to continue to exist while the inlet system of channels readjusts naturally to the project modifications. Without any navigation improvements the estimated average annual equivalent (AAEQ) maintenance dredging costs for a 50-year economic life of the project are \$540,000. Starting with a 50-year economic life beginning in 2001 that figure assumes a \$2,700,000 cost every five years to dredge 340,000 cubic yards plus a cost of \$5,100,000 to dredge 887,000 cubic yards once in the year 2025. With navigation improvements the estimated AAEQ cost are \$468,000. That figure assumes a \$2,700,000 cost of dredging every five years. The addition of the 1,000-foot south jetty extension and the 1,540-foot revetment result in an AAEQ maintenance dredging savings of \$72,000.

161. Other Considered Benefits. Other areas that would be affected include impacts associated with ongoing USCG maintenance. The owner of the boatyard on the north side of the inlet indicated that he is constantly on the radio to assist boaters passing along the Halifax River channel which has no navigation markers. The USCG removed the markers along the north Halifax River channel to discourage usage because of erratic channel conditions. Many vessels still run aground in the river trying to use the waterway for access. Those that do run aground often turn around and go back in fear of having further groundings.

162. As a result of the grounding problem, some boaters avoid the unmarked Halifax River channel and go around by way of the IWW to the south channel for inlet access. Those boaters to the north of the inlet must use more fuel to go around. The USCG also moves channel markers frequently along the south channel of the Indian River and in the entrance channel of the inlet. With a more stable inlet the monitoring and location of temporary channel markers until the regularly scheduled buoy tender arrives will result in a lower maintenance cost. Scallop boats also provide another source of benefits not currently claimed. A ship repair facility capable of handling larger fishing vessels will also provide additional benefits.

163. Summary of Benefits. Table 8 summarizes the initially estimated benefits from potential improvements to the Ponce DeLeon Inlet Federal navigation project. Average annual equivalent (AAEQ) benefits in that table are based on an economic period of analysis of 50 years for a project with a base year of 2001 and an interest rate of 7 1/8 percent. Benefits for the without fishing park Plan A/F and the with fishing park Plan A/F/G14 scenarios relate to commercial and recreational boating and to north jetty and inlet maintenance savings. Without a deeper channel to fish processing facilities and public docking the potential project consists of plans A and F (1,000-foot south jetty extension and a 1,540-foot revetment extending from the end of the 800-foot landward extension of the north jetty). AAEQ commercial and recreational boat benefits for plans A and F consist of \$290,980 for commercial boats and \$466,170 for recreational boats. Total benefits for plans A and F equal \$757,150. AAEQ maintenance cost savings for plans A and F are \$28,000 for the north jetty and \$72,000 for the inlet. With a deeper channel (plan G) to commercial fish processing and public docking facilities combined with plans A and F, benefits increase to \$612,930 for commercial boats and \$466,200 for recreational boats. Total AAEQ benefits for plans A, F, and G are \$1,079,100. The cost savings remain the same for maintenance of the north jetty and inlet.

INITIAL ECONOMIC SUMMARY

164. Table 9 is an initial comparison of plan benefits and costs. As indicated earlier, annual benefits are provided in AAEQ values and represent benefits from commercial and recreational vessel use. Annual costs are also provided in AAEQ values and represent economic investment, including construction costs, non-construction costs (real estate, navigation aids, planning, engineering and design, and construction

management), contingencies, interest during construction, and cost savings for maintenance of the north jetty and inlet dredging. Net benefits are calculated by subtracting annual costs from annual benefits. Benefit to cost ratios are calculated by dividing annual benefits by annual costs.

165. The analysis did not consider additional benefits in the areas of potential location of new boat construction/repair facilities nor scallop boats that might either off-load or provide scallops for processing at the new commercial marina facility. No savings claimed in USCG maintenance costs for monitoring and temporary marking of channels while waiting on buoy tender to make changes.

REFINED ALTERNATIVE EVALUATION

166. On July 24, 1997 a workshop/public meeting was held that discussed proposed plans to stabilize Ponce DeLeon Inlet. Included was a review of how Federal navigation projects are justified and the role of benefits in that justification. It was pointed out that Federal interest in stabilization measures for the inlet was highly unlikely due to a low proportion of commercial use benefits. It was suggested that with adequate commercial fishing facilities, if waterway usage occurred as a result of improvements and costs were reduced or revenues increased for commercial operations, benefits could be quantified to offset waterway improvement costs. These benefits could be used for project justification. A commercial fishing park was proposed at the site of the Swoope Generating Plant. Many of the alternatives evaluated during plan formulation included the commercial fishing park. After the proposal at the workshop there arose much public opposition to the commercial fishing park. As a result, the commercial fishing park will not be constructed.

167. In a letter dated March 2, 1998 (Appendix C) the County of Volusia presented a sponsor's preferred plan, which is Plan A, the 1,000-foot south jetty extension. This letter was presented by the County during the Feasibility Review Conference (FRC) on March 3, 1998. The letter requests removal from the project recommendations of the proposed commercial fishing park at the Swoope Power Plant location. The County investigated three other locations for a proposed facility, including the Feger's Seafood fish processing facility in the City of New Smyrna Beach, a marine industrial zoned site adjacent to the Boston Whaler boat plant south of New Smyrna Beach, and an existing location for commercial fishing charter vessels and repair facilities located on the north side of the inlet by the lighthouse. It was subsequently determined that the dredging costs associated with these alternatives were very costly which prevented further consideration. Also during the FRC it was discussed that plan F, the 1,540-foot revetment, could be constructed under the Corps' operations and maintenance program at a future date when necessary, after having been shown justified and approved as a warranted operations and maintenance expenditure. Therefore, the only viable plan is Plan A. The without project condition has been modified to include an assumption that

the Corps' would construct a 1,540-foot revetment under its operations and maintenance program.

REFINED COST ESTIMATE

168. The cost estimate prepared for the 1,000-foot south jetty extension is found in the Engineering Appendix, Appendix A. Table 12 presents the total cost for the 1,000-foot south jetty extension, interest during construction, and the average annual equivalent cost of the economic investment for the jetty extension.

REFINED BENEFIT ANALYSIS

169. Benefits associated with both commercial vessels and recreational vessels decreased since the proposed fishing park will not be constructed. The navigation benefits have been refined as presented in the following paragraphs. In addition, the benefits for maintenance savings have been refined. The additional numerical model analysis presented in Taylor Engineering's July 1998 report, "Engineering Benefits of the Proposed South Jetty Extension", serves as the basis for the refined maintenance savings benefits.

170. Commercial Vessel Benefits, Plan A (1,000-foot south jetty extension). Estimates for benefits to commercial vessels with just the 1,000-foot south jetty extension total an average annual equivalent value of \$48,000.

171. Recreational Vessel Benefits, Plan A (1,000-foot south jetty extension). Estimates for benefits to recreational vessels with just the 1,000-foot south jetty extension total an average annual equivalent value of \$262,600.

172. North Jetty Maintenance Cost Savings. Without improvements to the inlet, three additions to the north jetty scour apron, including crest restoration, are anticipated once every 14 years beginning in 2010. In addition, annual inspections are anticipated for the north jetty each year. Using the cost of \$1,340,000 for each of the three future scour aprons in the years 2010, 2024, and 2038, and a cost of \$7,500 for each inspection results in an Average Annual Equivalent (AAEQ) cost of \$89,000. That figure is based on a 50-year economic analysis period starting in 2001 at a 7 1/8 percent interest rate. With improvements to the inlet the entrance channel is expected to shift away from the north jetty toward the center of the inlet. Under those conditions only one additional scour apron is anticipated in the year 2024, the midpoint of project period of analysis, and inspection is anticipated once every three years. Using the \$1,340,000 figure for the scour apron repair and crest elevation cost and \$7,500 for the inspection cost provides an AAEQ cost of \$23,000. The difference in the without and with project conditions results in an AAEQ maintenance savings of \$66,000.

Table 10

PONCE DELEON INLET MAINTENANCE DREDGING QUANTITIES FROM 1971

Reference: CO-ON O&M Dredging History Ponce DeLeon Inlet, FL - Final Contract Quantities (File MPONCD)

AREA BY REACH OR CUT	DATE	SITE	FINAL CONTRACT QUANTITY TOTAL (CY) ¹	DISPOSAL AREA	North Jetty Weir
Entrance Channel	7/71 - 2/72	Beach	178,000	South of South Jetty	Open
Impoundment Basin	8/71 - 8/72	Beach	400,000	South of South Jetty	Open
Entrance Channel	3/73	Ocean	25,000	Open Water	Open
Entrance Channel	3 - 4/73	Ocean	95,000	Open Water Offshore	Open
South Shoal/Entrance	4 - 8/74	Beach	89,000	North Beach	Open
South Shoal/Entrance	4 - 8/74	Beach	434,000	(Beach) Beach Closure	Open
Entrance Channel	5 - 6/75	N. Shore	138,000	Open Water N. Shore Beach	Open
Entrance Channel	3/76	N. Shore	13,000	Open Water N. Shore Beach	Open
Entrance Channel	8 - 9/76	Ocean	38,000	Open Water	Open
Not Listed	11/77 - 7/78	Beach	435,000	North Beach	Open
Entrance Channel	11/78 - 3/78	N. Shore	41,000	Near Shore at North Beach	Open
Entrance Channel	5 - 8/84	Beach	82,000	Not Listed	Closed (March 1984)
Entrance/Inner/S. Channels	4 - 5/85	Beach	887,000	Not Listed	Closed
Entrance Channel	89	Ocean	869,000	Not Listed	Closed
None	1990 - 1997	N/A	None	None	Closed
None Planned/Scheduled	1998	N/A	None	None	Closed
None Planned/Scheduled	1999	N/A	None	None	Closed

¹ Final Contract Quantity Rounded to Nearest 1,000 Cubic Yards

Table 11

**INTRACOASTAL WATERWAY MAINTENANCE DREDGING QUANTITIES FROM 1952
Cuts V-22 to V-29**

Reference: Taylor Engineering, Personal communication

CUT RANGE	DATE	QUANTITY (CY) ²	DISPOSAL AREA	North Jetty Weir
V-22 to V-27	1958	149,000	Unknown	Open
V-22 to V-27	1960	120,000	Unknown	Open
V-22 to V-27	1962	88,000	MSA 434/434C	Open
V-22 to V-27	1963	38,000	MSA 434/434B	Open
V-24 to V-26	1964	81,000	MSA 434/434C	Open
V-24 to V-29	1966	66,000	MSA 434/434C	Open
V-22 to V-28	1967	110,000	MSA 434/434C	Open
V-22 to V-28	1968	225,000	MSA 434AR	Open
V-22 to V-28	1970	104,000	Unknown	Open
V-22 to V-28	1979	736,000	MSA 434/434C	Open
V-24 to V-26	1986	193,000	MSA 434/434C	Closed (March 1984)
V-23 to V-29	1994	215,000	South of North Jetty ³	Closed
V-22 to V-29 ¹	1996	193,000	Not applicable	Closed

¹In 1996 the IWW was surveyed. The reported quantity represents the quantity of maintenance material in the channel at the time of the survey. There was no maintenance dredging event in 1996.

²Quantities rounded to the nearest thousand.

³Placement intended to slow erosion of spit south of North Jetty.

173. Inlet and Intracoastal Waterway (IWW) Maintenance Dredging Cost Savings.

Maintenance dredging savings are based on a reduction of sediment transported around the 1,000-foot south jetty extension into the inlet system. The inlet system consists of the Federal inlet project and the Federal Intracoastal Waterway (IWW) project, Cuts 22-29 (Taylor Engineering, July 1998, p.4). Taylor Engineering calculated an ongoing net shoaling rate within the immediate inlet interior (entrance channel, throat, middle section, north channel, and south channel) of 10,000-20,000 cubic yards per year (cy/yr) for the closed-weir phase (1984-present) (Taylor Engineering, July 1998, p.4). The average dredging volume for the IWW stretch influenced by the inlet, since weir closure is 46,000 cy/yr. Cumulative inlet shoaling for existing conditions is therefore between 56,000 and 66,000 cy/yr. This range is substantiated by the northerly transport rate of 55,000-60,000 cy/yr estimated using GENESIS modeling (Taylor Engineering, July 1998, p.5). With the south jetty extension, the backpassing sand volume into the inlet from the south should reduce markedly. About 20 percent of the current backpassing volume is assumed to persist given the unfilled length of the south jetty extension, the nature of the ambient wave climate, and the bathymetry in the vicinity of the south jetty (Taylor Engineering, July 1998, p.4). Taking 20 percent of the lower and upper bounds of the cumulative inlet system shoaling rates (55,000-66,000) yields a reduction in shoaling for the inlet system of 44,000-53,000 cy/yr.

174. For the closed-weir phase of Ponce DeLeon Inlet, ongoing net shoaling in the inlet is 10,000 to 20,000 cubic yards per year (Taylor Engineering, July 1998, p.4). While the Federal system of inlet channels has been unstable and required moving of the USCG navigation markers, adequate depths and widths have existed for navigation interests, although not always within the boundaries delineated on plans showing the authorized project. Even though the USCG refuses to mark the north channel in the Halifax River due to its unstable condition, existing deep water for navigation has existed since 1989 in that and other channels of the inlet system. To iterate, the existing deep water is not necessarily within the boundaries delineated on plans showing the authorized project. As a result no dredging has been required to achieve project depths, however, the areas with the deep water may not coincide with the locations described on plans of the authorized project. The last maintenance dredging for the inlet occurred in 1989 (Table 11); no maintenance is scheduled or anticipated for the future. Figure 23 shows the history of construction and maintenance dredging for the Federal inlet project and for the IWW, Cuts V-22 through V-29. It is assumed for the without project condition that there will be a maintenance event once every 10 years in the inlet. An assumed maintenance dredging interval beyond 10 years is unreasonable due to the high probability of a storm event causing shoaling in a given 10-year period. For example, using the formula

$$P = [1 - (1 - 1/T)^t] \times 100$$

where P = % chance encounter any given year in time interval

T = return period, years, and

L = maintenance dredging interval, years

the probability of a 10-year event occurring in a 10-year interval is 65.1%. The probability of a 20-year event occurring in a 10-year interval is 40.1%. The following statistics substantiate the choice of 10 years for the maintenance dredging interval: the greatest average number of years between events for the inlet system is 8 (for the IWW since the weir was closed), the maximum number of years between events is 9 (for the IWW since construction), and the minimum number of years between events is 1. These statistics are shown in a bar chart as Figure 24.

175. Using 20,000 cy/yr as the shoaling rate and a 10-year interval, each future maintenance dredging event would then consist of 200,000 cy of material. No advanced maintenance analysis was conducted for the inlet since such an analysis would lengthen the interval between events and doing so would be unreasonable. Material dredged from the inlet is expected to be beach quality and to be placed south of the south jetty. The average annual equivalent value for placing 200,000 cy of material on the beach every 10 years over the 50-year economic analysis period is \$152,000.

176. The average shoaling rate for the IWW since the weir was closed is 46,000 cy/yr. The interval for maintenance dredging in the IWW is once every seven years. Both of these figures are calculated from the record of maintenance events in the IWW between Cuts V-22 and V-29, the area of influence of the inlet on the IWW. Using 46,000 cy/yr as the shoaling rate and a 7-year interval, each future maintenance dredging event would consist of 322,000 cy of material. An advanced maintenance analysis was conducted for the IWW in order to determine the most efficient maintenance dredging routine for this section of waterway. The analysis was conducted by considering dredging additional depth at each event and therefore lengthening the time between events. The analysis was completed for additional depths of one, two, three and four feet. The material dredged from the IWW is expected to be beach quality material. Both beach placement and placement in an upland disposal area with subsequent offloading of the disposal area when at capacity were considered. Using the same logic of a 10-year cap for the maintenance dredging interval, the advanced maintenance analysis resulted in a most efficient routine at an additional depth of two feet with an interval of once every 10 years, and placement directly on the beach. The average annual equivalent cost of maintenance dredging in the IWW, for the without project condition, is \$226,000.

Ponce DeLeon Inlet Vicinity Dredging History

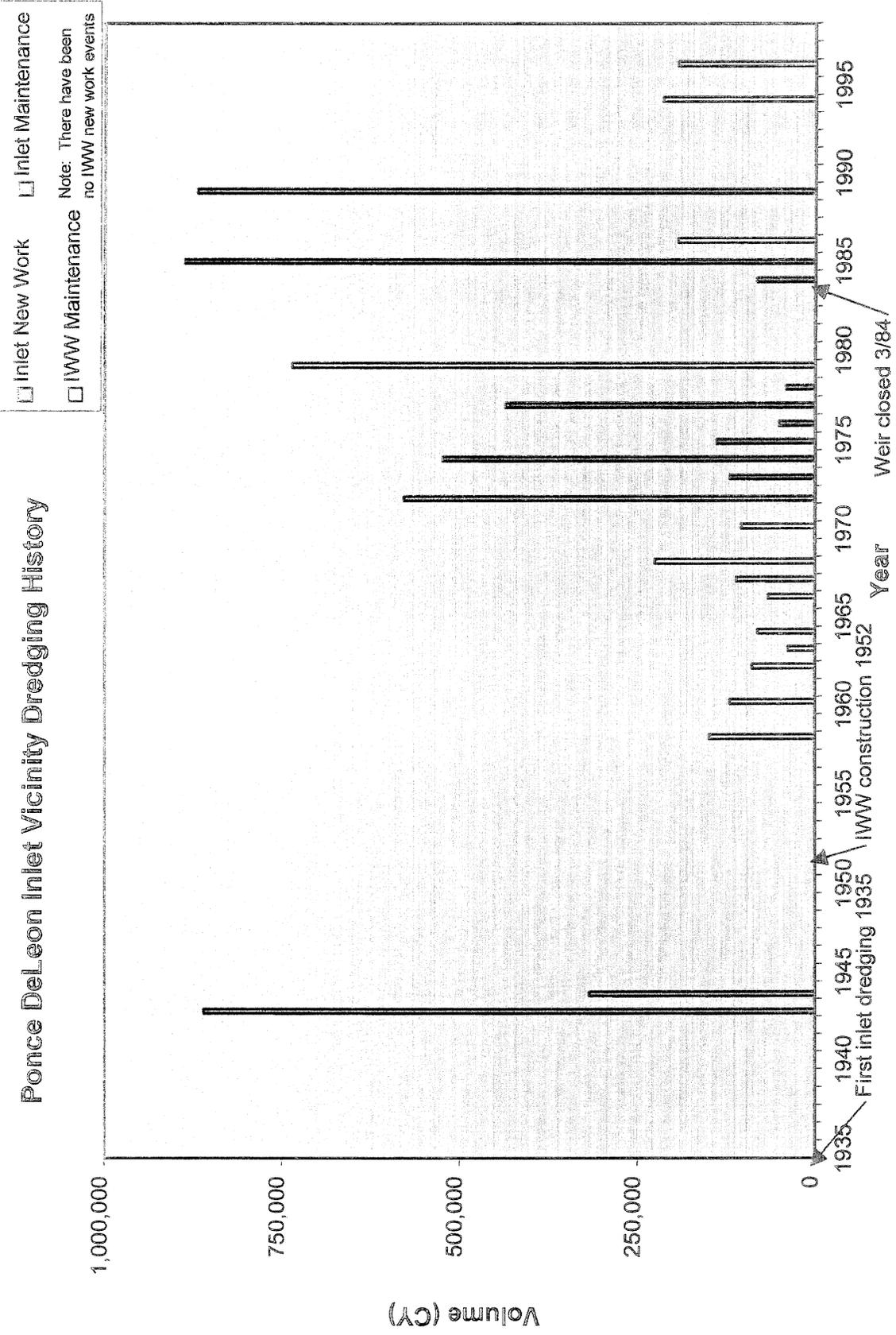


Figure 23

Maintenance Dredging Event Statistics
Project Construction: Inlet 1935, IWW 1972
Weir Closed: 1984

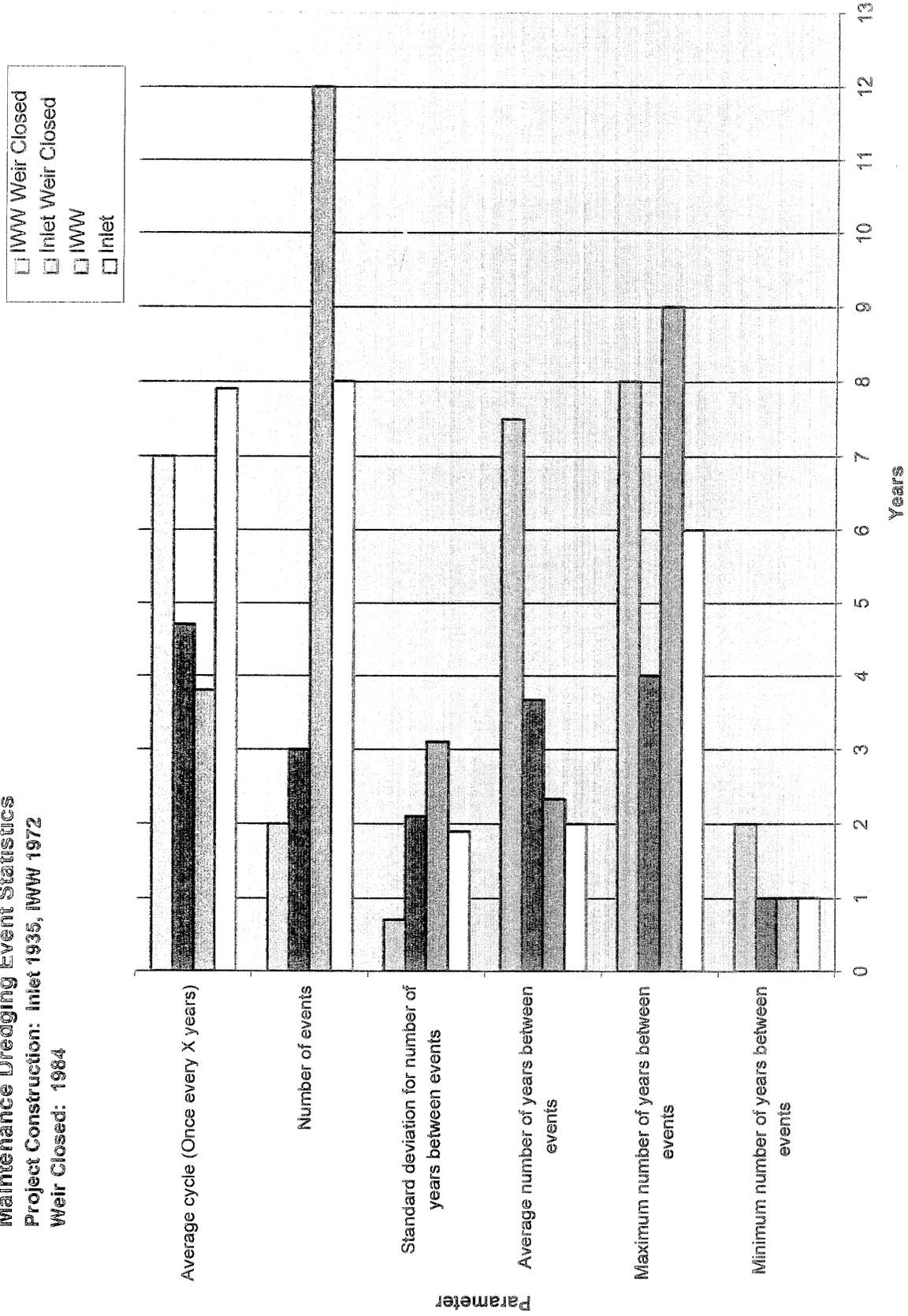


Figure 24

177. With the 1,000-foot south jetty extension in place, 50,000 cubic yards of material are expected to be prohibited from entering the inlet system [including the Federal inlet project and the Federal Intracoastal Waterway (IWW) project, Cuts 22-29 (Taylor Engineering, July 1998, p.5)] per year (Taylor Engineering, July 1998, p.4). As a result shoaling rates will be reduced for both the inlet project and the IWW project. For the IWW a reduction of 80 percent is assumed for the 46,000 cy/yr shoaling rate, resulting in a with project shoaling rate of 9,200 cy/yr. Using a 10-year interval, each maintenance dredging event would remove 92,000 cy of material. The average annual equivalent with project maintenance dredging cost over the 50-year economic analysis period is \$106,000. For the inlet, the with project shoaling rate is 6,800 cy/yr. Using a 10-year interval, each maintenance dredging event would remove 68,000 cy of material. The average annual equivalent with project maintenance dredging cost for the inlet over the 50-year economic analysis period is \$84,000. Maintenance savings result when comparing the without and the with project conditions of \$68,000 for the inlet and \$120,000 for the IWW (AAEQ).

	Without project			With project			Savings
	Shoaling rate	Dredging interval	AAEQ cost	Shoaling rate	Dredging interval	AAEQ cost	(\$)
	(cy/yr)	(yr)	(\$)	(cy/yr)	(yr)	(\$)	
Inlet	20,000	10	152,000	6,800	10	84,000	68,000
IWW	46,000	10	226,000	9,200	10	106,000	120,000

Note: Shoaling reductions are 36,800 cy/yr for the IWW and 13,200 cy/yr for the inlet, or 50,000 cy/yr for the entire inlet system.

178. Summary of Benefits. These benefits were computed based on the assumptions that new fish processing facilities will not be constructed and that the Corps will construct the 1,540-foot revetment and 800-foot landward extension associated with the north jetty under its operations and maintenance program. The potential project consists of Plan A (1,000-foot south jetty extension). AAEQ benefits for Plan A are the following: commercial vessel/use, \$48,000; recreational vessel/use, \$261,600; north jetty maintenance cost savings, \$66,000; IWW maintenance cost savings, \$120,000; inlet maintenance cost savings, \$68,000. Total AAEQ benefits for the 1,000-foot south jetty extension (Plan A) are \$563,600.

SENSITIVITY ANALYSIS

179. The cost estimates are sensitive to future market price levels and interest rates. They are also subject to the level of accuracy in the topographic, hydrographic and

geological data used as a basis for determining the size, placement, quantity, and type of stone used in design of the jetty extensions and the revetment. The area of the proposed work is well known from previous studies, numerical and physical modeling, and project work. Therefore, the degree of variation in estimates would be based more on differences between actual versus recorded data. Overall the estimates appear reasonable with the contingency item in the cost estimates likely to absorb any unforeseen increases.

180. The benefits are sensitive to projections of future conditions as shown in Tables 7 and 8. The variation in benefits between considered savings in reductions in damages to commercial vessels, opportunity costs saved in association with reductions in physical damages, harvest yield foregone, operations costs for diversions and delays, net income associated with business lost or foregone for charter fishing vessels, and savings in damages to commercial docks and marinas is related to stabilizing the inlet system channels. The potential for stabilizing the inlet with the combination of measures selected is good, based on results of numerical and physical model tests. The difference between the with- and without-project conditions tested by the models combined with a detailed review of past historical data as well as interviews of inlet users helps assure a greater probability of success in selection of effective measures for inlet stabilization. The potential that the benefits are overstated is small, based on information and support from the model testing program and inlet users.

181. The environmental impacts outlined in the environmental assessment are sensitive to individual interpretations of field data and on-site inspections. Although some variance may occur in the estimated impacts, the relative environmental impacts between the alternative plans and the without project (no action plan) conditions in the Environmental Assessment depend on the ability of the inlet system channels to naturally realign with improvements and the estimates for the rates of erosion of the remaining sand spit west of the north jetty. Once Plan A is constructed, the entrance channel is expected to move away from the north jetty along with related interior channel shifts, based on model testing. Erosion of the sand spit west of the north jetty continues as predicted by shoaling analysis and past historical data. The only variable is how fast erosion will occur since a major storm could accelerate that process. Basically, the alternative plans involve extensions of already existing structures. The ocean extension of the south jetty and the landward extension of the north jetty with an additional revetment appendage are necessary for inlet stabilization. The net overall result of both extensions saves wetlands and provides added environmental values.

182. Specific to the maintenance dredging benefits for Plan A, there is uncertainty in the following:

- the cumulative inlet interior shoaling rate,
- the amount of sediment that will be prohibited from entering the inlet system as a result of the construction of the 1,000-foot south jetty extension,
- the distribution of that sediment within the inlet system, and

- the maintenance dredging cycles used in the with and without project maintenance dredging scenarios.

183. In the supplemental report entitled, "Engineering Benefits of the Proposed South Jetty Extension", the cumulative inlet interior shoaling rate is determined two ways. One way used both changes in inlet bathymetry and historical dredging records. Comparison of changes in inlet bathymetry yielded volume change rates of 22,300 and 9,900 cubic yards per year (cy/yr) for the periods 1990-1994 and 1986-1994. This range was rounded to 20,000-10,000 cy/yr in the supplemental report. An examination of historical dredging records for the IWW since weir closure in 1984 yielded an average dredging volume of 46,000 cy/yr. The cumulative inlet system shoaling rate range of 56,000-66,000 cy/yr is the sum of the 10,000-20,000 cy/yr range and the average dredging volume of 46,000 cy/yr. The second way is by estimating littoral drift rates using the GENESIS shoreline change model (Hanson and Kraus). The northerly longterm (over 10 year) transport rate resulting from the model work is between 55,000 and 60,000 cy/yr along the beach until about two miles south of the inlet. The ranges 56,000-66,000 and 55,000-60,000 cy/yr match well.

184. The amount of sediment that will be prohibited from entering the inlet system as a result of construction of the 1,000-foot south jetty extension is about 80% of the current backpassing volume (Taylor Engineering, July 1998, Ch. 3). Taking 80% of the minimum and the maximum of the ranges presented in the previous paragraph, 55,000 cy/yr and 66,000 cy/yr, yields a range of 44,000-52,800 cy/yr for the amount of sediment that will be prohibited from entering the inlet system. The amount from which the maintenance dredging savings benefit is calculated is 50,000 cy/yr. This amount seems reasonable given the possible ranges.

185. The distribution between the Federal inlet project and the Federal IWW project of the amount of sediment to be prohibited from entering the inlet system was determined using the 50,000 cy/yr as a base, as well as the volume change range of 10,000-20,000 cy/yr for the inlet project and the average of 46,000 cy/yr for the IWW project. It was assumed that 80% of the 46,000 cy/yr, or 36,800 cy/yr, would be kept from entering the dredgeable areas of the IWW with the project (with 1,000-foot south jetty extension). The reduction in the dredging rate for the inlet project would be 50,000 cy/yr minus 36,800 cy/yr or 13,200 cy/yr. Using 20,000 cy/yr for the average dredging rate for the without project condition, this is 6,800 cy/yr, a 66% reduction. A more aggressive scenario could have used 100% for the IWW reduction initially and less over time. In this case the percent reduction for the inlet project would have been zero initially and would have increased over time.

186. In reference to the with and without project maintenance dredging cycles, the following assumptions were made: for the IWW project, the with project cycle is one maintenance dredging event every seven years and the without project cycle is one event every 10 years; and for the inlet project, the with project cycle is one event every 10 years (advanced maintenance included) and the without project cycle is one event every 10 years. The with project IWW cycle was calculated by averaging the number of

events since weir closure. The other cycles use the maximum cycle felt reasonable for a Federal navigation project in Florida, considering non-uniform shoaling and storm events. Uncertainty in these cycles might be lessened by using a Monte Carlo simulation or some other probability technique for maintenance dredging events (this could be done for both amounts and cycles-see Table 13 for a complete list of amounts and cycles).

187. Another method of dealing with uncertainty in the amount of sediment to be trapped by the 1,000-foot jetty extension and in the distribution of sediment deposition in the Federal inlet project and the Federal IWW project would be to use a more refined analytic technique for sediment movement. For example, a fluid bed sediment model could be used to analyze sediment movement within the inlet system.

PLAN SELECTION

188. The formulation and evaluation process requires inclusion of structural and nonstructural alternatives in a final analysis. The natural realignment and stabilization, after construction of the south jetty extension, of the entrance channel away from the north jetty along with related gradual adjustments of the north and south Federal channels in the inlet throat is part of the nonstructural alternative. The associated natural erosion of the sand spit west of the north jetty will occur with the nonstructural plan. The structural alternative is Plan A.

189. Plan A consists of a 1,000-foot extension of the south jetty parallel to the existing north jetty (figure 11). It provides the most effective alternative in reducing sediment transport around the tip of the jetty without adversely impacting navigation within the inlet. It provides the most uniform flow distribution across the width of the inlet as well as smaller increases in velocities and lowers the hydraulic pressure along the south side of the north jetty. Model testing shows that the changes to inlet hydrodynamics resulting from construction of the 1,000-foot extension of the south jetty mainly affect the outer portion of the inlet in the entrance channel area as shown in figures 7.5 and 7.6 of the Volume II of the 1996 Taylor Engineering Report.

190. The nonstructural plan takes effect after Plan A is implemented. It consists of allowing the entrance channel to naturally realign itself toward the center of the inlet. Instead of dredging the entrance channel to force it back into its authorized location between the two jetties, a gradual shifting of the channel towards the center of the inlet is expected to produce the natural realignment as a result of Plan A. That process will be helped as the natural erosion of the sand spit west of the north jetty continues to allow the entrance channel to straighten out in a more east to west orientation. Erosion of the sand spit west of the north jetty will be stopped at the point of the 1,540-foot revetment to be constructed by the Corps under the operations and maintenance program.

191. Dredging the entrance channel to help it reorient itself towards the center of the inlet is neither cost effective nor practical. Past experience with dredging to maintain an authorized Ponce DeLeon Inlet channel in an area where deep water did not exist has proven to be ineffective and cost prohibitive. Current practice involves a flexible maintenance plan which shifts buoy locations to areas of existing deep water instead of trying to maintain the originally authorized channel locations.

192. The no-action plan (the without project condition) is as described on page 57, with the addition of the 800-foot landward extension of the north jetty and the 1,540-foot revetment in the vicinity of the north spit, which are assumed to be constructed under the operations and maintenance program by the base year, 2001.

193. Table 14 summarizes these three alternatives.

Plan A		No Action Plan	Non-structural Alternative
Annual Benefits	\$564,000	<ul style="list-style-type: none"> • High north jetty maintenance costs • Undesirable spit erosion • North jetty outflanking 	<ul style="list-style-type: none"> • Takes effect after Plan A is implemented • Natural realignment of entrance channel away from north jetty
Annual Costs	\$438,000		
Net Benefits	\$126,000		
Benefit to Cost (B/C) /Ratio	1.29		

¹When the proposed fishing park dropped out from further consideration, the alternatives for plan selection had to be refined. The refinement resulted in the three alternatives presented in this table.

194. Plan A meets the economic criteria for selection and is environmentally acceptable.

195. NED Plan. The Federal objective of water resources planning is to contribute to national economic development consistent with protection of the nation's environment. Plan A is selected as the national economic development (NED) plan. Plan A is the construction of a 1,000-foot south jetty extension parallel to the north jetty, with scour apron.

196. The selected orientation and selected length of the south jetty extension are products of the model study. In the model study, two orientations (parallel to the north jetty and straight) and two lengths (500-foot and 1,000-foot) were considered. Longer lengths were eliminated prior to the start of the model study since they would involve more cost with no additional benefits. The selection of the 1,000-foot length and parallel orientation was made based on the following summary from the Taylor Engineering report, 'Numerical Modeling and Shoaling Analysis, Volume II, November 1996 (p. 7-36)':

The straight extensions produce the most dramatic changes; however, some of the changes are undesirable, such as reduced velocities in the middle of the entrance and increased velocities near the existing scour hole along the north jetty. Therefore, the two straight extension alternatives were discarded as viable solutions. Both parallel extensions produce generally desirable hydraulic effects, that is, increased and more uniform velocities across the jetty entrance and reduced velocities on the south side of the jetty extension and along the south beach. However, the hydraulic effects of the 1,000 ft parallel extension are much greater than the effects of the 500 ft extension and are more likely to produce the desired bathymetric response-that is, a more stable and uniform entrance channel which will (1) reduce maintenance dredging requirements, (2) produce safer navigation conditions (reduce the threat of vessel grounding or collision with the north jetty), and (3) reduce the threat of undermining of the north jetty, a key element of the navigation project. Furthermore, physical model results indicate the 1,000 parallel extension (1) provides much more protection against sediment moving into the inlet from the south, and (2) produces small, insignificant increases in wave height between the jetties due to wave-current-bathymetry interaction (not expected to adversely [sic] impact navigation).

197. The jetty extension with the 1,000-foot length and parallel orientation is selected over extensions of longer length and over an extension with a 500-foot length because it results in the most benefits for the cost.

THE SELECTED PLAN

198. The selected plan for navigation improvements at Ponce DeLeon Inlet is responsive to sponsor needs and desires as well as the economic and environmental criteria established by Federal and State law. To do this the plan must be able to handle current and forecasted vessel traffic safely with minimum impact on the environment and without excessive delays and damage. Subsequent paragraphs outline the design, construction, operation and maintenance procedures for the selected plan as well as summarize the plan's economic and environmental effects. For more detailed information on design, refer to appendix A. Refer to appendix D for an economic analysis. For environmental matters refer to the Environmental Assessment (EA).

SOUTH JETTY SEAWARD EXTENSION DESIGN

199. The selected plan provides for construction of a 1,000-foot extension to the south jetty, with a scour apron. The purpose of the south jetty extension is to reduce the northward transport of material into the inlet and to distribute tidal currents more

evenly across the inlet throat. The 1,000-foot extension of the south jetty will bring the seaward end of the south jetty to approximately the same eastern limit as the north jetty, as shown in figure 11. The design cross-section of the south jetty extension is shown in Appendix A on Figure 4. Side slopes are 1 on 1.5, and the crest elevation is +7 feet, mean low water (MLW). The crest width is 15 feet (a minimum of 3 stones). A taper will provide a smooth transition from the existing jetty's 10-foot width to the extension's 15-foot width. The seaward end of the south jetty extension consists of 8 to 12-ton armor stones, 500 to 2,500-lb core stones (50 percent weighing 1,500 lb. or more), and a gradation of bedding stone from 1 to 12 inches. The weights of armor and core stone required for construction are 165 lb/cubic foot. Bedding stone tonnages are based on a unit weight of 140 lb/cubic foot.

200. A 30-foot scour apron will be constructed on the north side of the south jetty to prevent damage to the jetty from the scouring which is expected upon completion of the extension. The stone to be used for the scour apron is 500 to 2,500 lb. stone, with 50 percent of the stones weighing 1,500 lb. or more. The scour apron will be four feet thick.

201. Both the jetty extension and the scour apron are underlain by a bedding layer. The bedding layer is two feet thick. It is constructed using standard gradations for limerock.

202. Total quantities of material required for construction of the south jetty extension are the following: 32,740 tons of 10-ton armor stone, 12,856 tons of 1,500-lb. core stone, 10,307 tons of bedding stone, and 11,780 square yards of filter fabric. The jetty extension will be 100 percent sand tight up to elevation -3 MLW. From -3 to +7 MLW the jetty will be permeable.

203. The jetty extension alignment runs across a shoal on the south side of the inlet. Water depths average 6-10 feet along the alignment. Approximately 25,000 cubic yards of material will be excavated during construction of the jetty extension. Excavated material will be placed on the south side of the extended jetty as shown on Figure 11.

NAVIGATION AIDS

204. The United States Coast Guard (USCG) has the responsibility to provide and maintain the proper number of navigation aids needed for day and night navigation on a Federal project. The estimated cost, as provided by that agency is \$4,000. The \$12,000 amount shown in Table 9 includes the \$4,000 plus costs for fabrication of a concrete foundation by the Corps at the seaward end of the south jetty extension. The Corps will mount a USCG supplied tower on the foundation. Once the tower is placed, the USCG will install a solar powered warning light. Appendix C contains their letter dated August 9, 1996 and describes annual maintenance costs of approximately \$250

a year for the new equipment. No additional aids to navigation or related costs are required for the expected channel realignment.

REAL ESTATE REQUIREMENTS

205. The selected plan features will be constructed on lands owned by the Federal government or the State. For more details on lands see the Real Estate appendix B.

CONSTRUCTION

206. The selected plan calls for the construction of a 1,000-foot seaward extension of the south jetty, with scour apron. Staging areas for storage of jetty stone include existing public lands. On the south side of the inlet, the area leased by the sponsor from the Federal government includes an area of 250 acres with a perpetual pipeline and stockpile easement. The sponsor has used this area of the park for past maintenance. That site is within the project construction limits.

207. Since sufficient core boring information was obtained during the feasibility study, no additional pre-construction drilling is required. Other pre-construction activities will include hydrographic surveys of the seaward south jetty extension location.

208. Construction of the seaward south jetty extension will most likely involve barge-mounted equipment using ocean access. It may be possible to chink the existing south jetty and move equipment out on it for excavation and placing jetty stone. However, the same staging area mentioned above would still be used.

209. Environmental monitoring during project construction will require several activities. Installation of warning signs for manatee protection in the area of the south jetty extension will precede construction activities. Monitoring of sea turtles may be required if construction occurs during the nesting season. Although the Corps of Engineers does not have any responsibility for the foundation remains of the old Hotel Inlet Terrace, the sponsor may want to relocate an interpretive sign and part of the foundation. The sign and foundation may be located within the footprint of the 800-foot landward extension of the north jetty.

IMPACTS TO CHANNEL NAVIGABILITY CONDITIONS

210. Navigability of the channel will improve with the 1,000-foot south jetty extension in place. Both the physical model (U.S. Army Corps of Engineers, Waterways Experiment Station, Ch. 5) and the numerical model (Taylor Engineering, 1998, p.4) reveal that the deepwater channel is expected to migrate toward the south, away from the north jetty, after construction of the south jetty extension. With the deepwater

channel nearer the center of the jetties the safety concerns for the commercial vessels and for the recreational vessels should be alleviated. The shrimp vessels that traverse the inlet with their outriggers down for stability should be able to stay farther away from the recreational vessels anchored along the north jetty to fish. The recreational vessel operators who are unfamiliar with the inlet channels and who expect the deepwater channel to be in the middle of the jetties will be more likely to find it toward the middle and to not run aground on the shoal near the end of the entrance channel on the south side.

IMPACTS TO SURFING

211. Results of the numerical and physical model studies may be used to infer impacts to surfing south of the south jetty. The physical model includes three nearshore gages positioned to determine the effects of the south jetty extension on wave heights at the surfing area. With the 1,000-foot south jetty extension in place there is expected to be a 10 percent increase in wave height during ebb flow and no increase in wave height on flood flow as compared to existing wave conditions. Accretion is expected to occur south of the 1,000-foot south jetty extension and may result in a shifting of the most desirable surfing location to the south and east from its present location. A discussion of the impact of the 1,000-foot south jetty extension on surfing is found in the discussion on physical and numerical modeling of alternative plans in the Engineering Appendix, Appendix A, and on page 46 of the physical model study report in the discussion entitled, "Impacts of Preferred South Jetty Extension on Waves and Velocities."

FIRST COSTS

212. The estimated first cost of the selected plan is in Table 15. All costs are based on May 1997 price levels. Planning, engineering, design, and construction management costs are estimated based on actual experience for similar projects. There is no known relocation work required for construction. Lands needed for the project include access, staging, and stockpile areas. Access to any staging or stockpile areas will be by barge and/or public access. Those lands are owned by the Federal government, the non-Federal sponsor or are leased by the non-Federal sponsor. Real estate acquisition/administrative costs are shown in Table 15.

213. The estimated cost for construction of the 1,000-foot seaward extension of the south jetty is in the cost estimate of Table 15. Interest during construction in that table is for an equal dispersion of payments over a 23-month period. That duration consists of a 12-month preparation period for plans and specifications (planning, engineering, and design) plus 9 months for construction of the south jetty extension.

Table 15	
	8/24/98
Plan A	
ITEM	COST
Construction Costs	
Plan A	\$4,182,000
Total Const. Cost	\$4,182,000
Real Estate Activities	
Aquisition/Administration Federal	\$8,000
Aquisition/Administration Non-Federal	\$12,000
Total Real Estate	\$20,000
Navigation Aids	\$12,000
Planning, Eng, & Design (PED)	\$123,000
Construction Mgt	\$207,000
Total Non-Construction Costs	\$362,000
Contingencies	\$910,000
Total First Costs	\$5,454,000
Interest During Construction	\$286,000
Economic Investment	\$5,740,000

FUTURE OPERATIONS AND MAINTENANCE

214. Future operations and maintenance (O&M) costs for the south jetty 1,000-foot extension consist of costs for inspections and scour apron and armor layer repairs. Inspections are estimated at \$1,000 once every three years. Anticipated repairs include one scour apron repair and crest elevation restoration midway through project period of analysis (year 2024) at an estimated cost of \$1,017,000.

215. Future O&M costs for the inlet consist of maintenance dredging costs. Using 20,000 cy/yr as the shoaling rate and a 10-year interval, each future maintenance dredging event would then consist of 200,000 cy of material. No advanced maintenance analysis was conducted for the inlet since such an analysis would lengthen the interval between events and doing so would be unreasonable. Material dredged from the inlet is expected to be beach quality and to be placed south of the south jetty. The average annual equivalent value for placing 200,000 cy of material on the beach every 10 years over the period of analysis of the project is \$152,000.

216. With the 1,000-foot south jetty extension in place, 50,000 cubic yards of material are expected to be prohibited from entering the inlet system [including the Federal inlet project and the Federal Intracoastal Waterway (IWW) project, Cuts 22-29 (Taylor Engineering, personal communication)] per year (Taylor Engineering, 1998, p. 4). As a

result shoaling rates will be reduced for both the inlet project and the IWW project. For the inlet, the with project shoaling rate is 6,800 cy/yr. Using a 10-year interval, each maintenance dredging event would remove 68,000 cy of material. The average annual equivalent with project maintenance dredging cost for the inlet over the 50-year economic analysis period is \$84,000. The annual cost estimate includes no net increase for additional project maintenance since there are maintenance dredging savings for the inlet.

217. Construction of a \$1.3 million scour apron was completed in July 1998 along the inlet side of the north jetty. With construction of the south jetty extension, the entrance channel is expected to shift away from the north jetty toward the center of the inlet. Removal of hydraulic pressure away from the north jetty should result in a reduction in north jetty maintenance. Estimated AAEQ maintenance costs for the north jetty without any navigation improvements are \$89,000. With navigation improvements AAEQ costs for the north jetty are estimated at \$23,000. An AAEQ savings of \$66,000 results. The estimated reduction in current project features maintenance is more than the estimated maintenance cost for the 1,000-foot south jetty extension (\$16,000). Therefore, the annual cost estimate includes no net increase for additional project maintenance.

ANNUAL COSTS

218. The estimated average annual equivalent (AAEQ) costs for the selected plan are shown in Table 16. The costs are presented as a function of two interest rates since the interest rate went down from 7 1/8% in late 1998 to 6 7/8% in early 1999. The first item of \$403,000 is interest and amortization at 6 7/8 percent over the economic period of analysis of 50 years to pay back the economic investment cost of \$5,454,000. The second item (\$250) is the annual maintenance of an additional illuminated aid to navigation (ATON) to be placed on the offshore end of the proposed south jetty extension. The third item (\$16,000 annually) is the cost for future maintenance on the 1,000-foot south jetty extension. The total AAEQ cost associated with the selected plan is \$419,250.

Table 16
ECONOMIC SUMMARY OF THE SELECTED PLAN

	AMOUNT (AAEQ)	
	Interest Rate=6.875%	Interest Rate=7.125%
ANNUAL COSTS		
Economic Investment	\$403,000	\$422,000
Navigation Aids	\$250	\$250
Future O&M (South jetty extension)	\$16,000	\$16,000
Total Annual Costs	\$419,250	\$438,250
ANNUAL BENEFITS		
Commercial Use/Activities	\$48,000	\$48,000
Recreational Use/Activities	\$263,000	\$262,000
North Jetty Maintenance Savings	\$66,000	\$66,000
AIWW Maintenance Savings	\$121,000	\$120,000
Inlet Maintenance Savings	\$69,000	\$68,000
Total Annual Benefits	\$567,000	\$564,000
NET BENEFITS	\$147,750	\$125,750
BENEFIT-TO-COST RATIO	1.4	1.29

ENVIRONMENTAL EFFECTS

219. During construction of the selected plan, species that could be affected are the saltmarsh snake, manatees and sea turtles. According to USFWS the saltmarsh snake could easily be captured at night and removed from the area; therefore this species should not be impacted by construction activities. Standard manatee and sea turtle precautions will be in effect during construction to minimize impacts to those species. If trucks are used to haul rock along the beach during construction of the south jetty extension, arrangements will be made to locate and move sea turtle eggs during the nesting season.

220. Six potentially significant submerged magnetic targets located outside a 400-foot wide construction easement containing the 105-foot wide footprint area of the south jetty extension will be included in archeological no-work zones. Diver investigation of another seven potentially significant magnetic targets within and around the 400-foot construction easement for the selected plan revealed modern materials with no historic properties.

BENEFITS

221. An evaluation of benefits to be derived from implementation of the selected plan is in appendix D. Benefits result from operational and transportation cost savings due to:

- Reductions in physical damages to all commercial vessels;
- Opportunity costs saved in association with reductions in physical damages;
- Harvest yield foregone for commercial vessels;
- Net income associated with business lost or foregone for charter operations;
- Operations costs for diversion and delays for charter fishing vessels due to inlet conditions;
- Opportunity costs saved in association with reductions in physical damages;
- Operations costs for diversion and delays for transient or seasonal commercial fishing vessels due to inlet conditions;
- Opportunity costs saved in association with reductions in physical damages;
- Reduction in damages to recreational vessels and value of time saved for inlet users.

222. To obtain average annual equivalent values all future values of projected benefits are discounted at an interest rate of 6 7/8 percent over a period of 50 years. The total average annual benefits for the selected plan are \$567,000. A summary of those benefits is in Table 16. The benefits are presented as a function of two interest rates since the interest rate went down from 7 1/8% in late 1998 to 6 7/8% in early 1999.

ECONOMIC SUMMARY

223. On the selected plan the benefits exceed the costs by \$147,750 annually (\$567,000-\$419,250). The benefit to cost ratio is equal to the total average annual equivalent benefit of \$567,000 divided by the total average annual equivalent cost of \$419,250. That ratio is 1.35 to 1.00.

PLAN IMPLEMENTATION

224. To implement a plan at Ponce DeLeon Inlet, certain conditions and requirements are necessary to meet State, Local, and Federal standards set by law. A discussion of those responsibilities is in the subsequent paragraphs. On August 19, 1996 a meeting with the sponsor in DeLand, Florida occurred to explain the sponsor's cost sharing requirements and related responsibilities. The sponsor understands both areas of accountability.

PROJECT COOPERATION AGREEMENT

225. As of July 8, 1994, there is no longer a requirement to include an initial draft project cooperation agreement (PCA) when submitting draft feasibility reports. The model PCA and possible deviations based on the recommended plan were fully discussed with the non-Federal sponsor at the Feasibility Review Conference (FRC) in March 3, 1998. The non-Federal sponsor by their letter dated January 11, 1999 indicate that they understand the type of agreement that they will be expected to sign prior to the start of construction and that they must provide items of cooperation. The terms of local cooperation are in the recommendations section of this report.

226. No Federal commitments relating to a construction schedule or specific provisions of the PCA can be made to the non-Federal sponsor on any aspect of this project or separable element until:

- (1) The feasibility report is approved by the U.S. Congress;
- (2) The project is budgeted as a new construction start, or construction funds are added by Congress, apportioned by the Office of Management and Budget, and their allocation is approved by the Assistant Secretary of the Army for Civil Works (ASA(CW)); and
- (3) The draft PCA has been reviewed and approved by the office of the (ASA(CW)).

227. The PCA will not be executed nor will construction be initiated on this project until the National Environmental Policy Act, the Clean Water Act, the Coastal Zone Management Act, the Endangered Species Act, the Fish and Wildlife Coordination Act, and the National Historic Preservation Act planning phase requirements are met. In the case of the Ponce DeLeon Inlet project, these requirements are met once the Draft Environmental Assessment (DEA) has been coordinated, comments prepared, and a Final Environmental Assessment (FEA) has been submitted to the Environmental Protection Agency for filing.

228. Final PCA negotiations with the non-Federal sponsor may be conducted, and the draft PCA package submitted through the Corps higher authority for review and approval by the ASA(CW), once the feasibility report is approved and the project is budgeted for construction. The PCA for this project will be executed only after the feasibility report is approved, and an Appropriations Bill containing funds for the project is enacted into Law. The Chief of Engineers will not allocate Federal construction funds for a project until the ASA(CW) approves the non-Federal sponsor's financing plan and executes the PCA.

PRELIMINARY FINANCIAL ANALYSIS

229. Financial analysis is required for any plan being considered for U.A. Army Corps of Engineers implementation that involves non-Federal cost sharing. The ultimate purpose of the financial analysis is to ensure that non-Federal sponsors understand the financial commitment involved and have reasonable plans for meeting that commitment. The financial analysis shall include the non-Federal sponsor's statement of financial capability, the non-Federal sponsor's financing plan, and an assessment of the sponsor's financial capability. These plans and analysis are part of the draft PCA package submitted to higher authority for review and approval once the feasibility report is approved and the project is budgeted for construction.

DIVISION OF PLAN RESPONSIBILITIES

230. In meeting its responsibilities, the non-Federal sponsor shall provide all lands, easements, rights-of-way, relocations, and dredged material disposal (LERRD) required for project modifications which are not otherwise available due to the construction of the existing project. As a general rule, fee title will be required for all lands needed to support implementation, operation, maintenance, repair, replacement or rehabilitation of the project modification.

231. Further, the non-Federal sponsor shall accomplish, or arrange for accomplishment, at no cost to the Government, all relocations (excluding existing railroad bridges and approaches thereto) determined by the Government to be necessary for implementation of the project modification.

232. The value and credit to LERRD provided for the project modification by the non-Federal sponsor shall be determined as described in Engineer Regulation 1165-2-131, "Project Cooperation Agreements for New Start Construction Projects," and Engineer Regulation 405-2-12. If the value of the identified LERRD represents less than 25 percent of the total project modification costs, the non-Federal sponsor shall provide, during the period of implementation, a cash contribution in the amount necessary to make its total contribution equal to 25 percent.

233. If the value of LERRD contributions exceeds 25 percent of the total project modification costs, the Government shall refund the excess to the non-Federal sponsor. However, the non-Federal sponsor shall not receive any credit for LERRD previously provided as an item of cooperation for another Federal project nor shall the value thereof be included in the total project modification costs.

234. Credit will be allowed for work-in-kind provided that these services do not result in a reimbursement by the Government and their combination with the LERRD does not exceed 25 percent of restoration project costs.

COST ALLOCATION

235. Under the Water Resources Development Act (WRDA) 1986, Federal participation in navigation projects is limited to sharing costs for design and construction of the general navigation features (GNF) consisting of breakwaters and jetties, entrance and primary access channels, turning basins, anchorage areas, structures designed to protect the channel from shoreline erosion, and locks. Non-federal interests are responsible for and bear all costs for provision of necessary lands, easements, rights-of-way and relocations; dredged material disposal areas with retaining dikes for the construction, operation, and maintenance of the GNF; local service facilities such as terminal facilities; dredging berthing areas and interior access channels to those berthing areas; and operation, maintenance, repair, replacement, and rehabilitation of dredged material disposal areas including dikes and other facilities.

236. Section 101(a)(1)(A) of WRDA 1986 specifies that for commercial navigation projects with a depth not in excess of 20 feet, cost sharing for construction of general navigation features is 90 percent Federal and 10 percent non-Federal. Aids to navigation are a 100 percent Federal cost. Section 103(c)(4) of WRDA 1986 mandates a non-Federal share equal to 50 percent of joint and separable costs allocated to recreational navigation. That cost share is paid during construction. Section 101(a)(2) of WRDA 1986 specifies that non-Federal interests shall pay an additional 10 percent of the cost of the general navigation features in cash over a period not to exceed 30 years, at an interest rate determined pursuant to Section 106 of WRDA 1986. The value of lands, easements, rights-of-way and dredged material disposal areas necessary for the project shall be credited toward this 30-year cash payment.

237. For commercial navigation projects with a depth less than 20 feet, cost sharing for operation and maintenance of general navigation features is 100 percent Federal. Operation and maintenance of navigation aids is a 100 percent Federal cost. Section 103(j)(1) requires the non-Federal sponsor to enter into an agreement to pay 100 percent of operation, maintenance, repair, replacement and rehabilitation (OMRR&R) costs associated with recreation.

238. For navigation projects producing commercial and recreational benefits, the costs of specific or separable project features will be allocated to the purposes served. The costs of jointly used general navigation facilities producing commercial and recreational benefits will be allocated to each use in proportion to the remaining benefits expected to accrue to each use (ER 1105-2-100, 1990, pages 6-181 & 6-182).

COST APPORTIONMENT

239. The total first cost of construction is the amount used for cost apportionment. That cost does not include the navigation aids provided by the USCG. The costs of construction eligible for cost apportionment are \$5,438,000 and were determined as follows:

Total First Cost of Plan	\$5,454,000
Less: Navigation Aids (USCG)	\$ (14,000)
RE Credit (Sponsor)	<u>\$ (4,000)</u>
Cost Shared Amount	\$5,436,000

240. For construction of the selected plan the amounts for cost apportionment are shown in Table 18. Amounts for cost apportionment for operations and maintenance are shown in Table 19.

241. Using an interest rate of 6 7/8% the cost shared percentages of 54.63 percent Federal and 45.37 percent non-Federal are applied to the cost shared amount of \$5,436,000 for construction of the south jetty extension. The resulting sponsor's share of the construction costs is \$2,466,000.

242. At the time of initial project construction the non-Federal sponsor paid a one-time fee for future operations and maintenance on the Ponce DeLeon Inlet project. Items of local cooperation state, "...Contribute in cash \$1,379,000 as the local share of cost of future maintenance to be performed by the Corps of Engineers, that amount to be placed in escrow when required by the Chief of Engineers prior to start of project construction and to be contributed upon completion of project construction by the Corps of Engineers...".

243. As mentioned under the future operations and maintenance section, O&M costs for the new navigation feature includes annual inspections and repairs. The AAEQ value for the \$1,000 per year inspection cost and the \$1,017,000 scour apron repair and crest restoration cost amounts to \$16,000. The AAEQ value is figured for an economic analysis period of 50 years at a current interest rate of 6.875 percent. The present value of the O&M \$16,000 AAEQ cost is \$225,000.

244. The cost shared percentages of 15.43 percent Federal and 84.57 percent non-Federal are applied to the O&M present value cost of \$225,000 for operations and maintenance of the south jetty extension using an interest rate of 6 7/8%. The resulting sponsor's share of the O&M costs is a one-time payment of \$190,000. This amount will be put into an interest-bearing escrow account. Funds in the account will be used toward operations and maintenance costs associated with the south jetty extension.

FEDERAL RESPONSIBILITY

245. The U.S. Army Corps of Engineers is responsible for budgeting for the Federal share of construction costs for all future work for Federal projects. The Federal share of construction costs is estimated to be \$2,970,000. Federal funding is subject to budgetary constraints inherent in the formation of the national Civil Works budget for a given fiscal year. The Corps would perform the necessary preconstruction engineering and design needed prior to construction. The Corps would obtain all necessary permits (including State water quality certification) and would construct the project.

246. The total Federal cost of the project is \$2,988,000. This cost includes the Federal share of the construction costs (\$2,970,000), the cost of the navigation aids (\$14,000), and the real estate credit.

247. The Federal government is responsible for a portion of the operation and maintenance costs, including replacement costs necessary to maintain conditions as constructed throughout project life. The present worth of the Federal share of operation and maintenance costs is estimated to be \$35,000 at a 6 7/8% interest rate.

NON-FEDERAL RESPONSIBILITY

248. The non-Federal sponsor would provide an up-front cash contribution for initial construction costs of the proposed project. The non-Federal share of the construction costs is estimated to be \$2,466,000 if the entire 10% cash contribution over 30 years required by Section 101(a)(2) is paid at the time of construction. Other non-Federal responsibilities must be assumed by the non-Federal sponsor before the project can be constructed. The items of local cooperation are listed in the section of this report entitled, "Recommendations". The delineation of Federal and non-Federal responsibility will be legally defined in the project cooperation agreement.

249. The non-Federal sponsor is responsible for a portion of the operation and maintenance costs, including replacement costs necessary to maintain conditions as constructed throughout project life. The non-Federal share of operation and maintenance costs is estimated to be \$190,000, if a one-time payment is made to the Government at the time of construction.

Table 17

**PONCE DE LEON INLET COST SHARING PERCENTAGES
Apportionment for First Costs and Operations and Maintenance Costs**

Cost Allocation		Annual Costs Apportioned to Project Purposes							
Project Purposes	Federal Share (a)	Non-Federal Share (b)	Total Annual Costs		Federal Share		Non-Federal Share		
			Dollars (d)	Percentage (e)	Dollars (a x d)	Percentage (f / 311,000)	Dollars (b x d)	Percentage (h / 311,000)	
Commercial Navigation	80.00%	20.00%	48,000	15.43%	38,400	12.35%	9,600	3.09%	
Recreation	50.00%	50.00%	263,000	84.57%	131,500	42.28%	131,500	42.28%	
Summary			311,000	100.00%	169,900	54.63%	141,100	45.37%	

Table 18

COST APPORTIONMENT FOR FIRST COSTS

Item	Initial Costs	Federal Share		Non-Federal Share	
		Dollars	Percent	Dollars	Percent
Initial Construction Cost	5,436,000	2,970,000	54.63%	2,466,000	45.37%
Navigation Aids	14,000	14,000	100.00%	0	0.00%
Real Estate Credit	4,000	4,000	100.00%	0	0.00%
Total	5,454,000	2,988,000	54.79%	2,466,000	45.21%

Table 19

COST APPORTIONMENT FOR OPERATION AND MAINTENANCE

Item	Initial Costs	Federal Share		Non-Federal Share	
		Dollars	Percent	Dollars	Percent
Operation and Maintenance	225,000	35,000	15.43%	190,000	84.57%
Total	225,000	35,000	15.43%	190,000	84.57%

ENVIRONMENTAL CONSIDERATIONS

250. Major environmental considerations taken into account during the formulation of the selected plan were the presence of the saltmarsh snake, manatees, and sea turtles in the project area, and preservation of significant historical cultural resources. The saltmarsh snake could easily be captured at night and removed from the construction area. Standard manatee and sea turtle precautions will be in effect during construction to minimize impacts to those species. If trucks are used to haul rock along the beach during construction of the south jetty extension, arrangements will be made to locate and move sea turtle eggs during nesting season. Potentially significant magnetic targets will be included in archeological no-work zones. Diver investigation of other significant magnetic targets reveals modern materials with no historic properties. All available and practicable means and measures have been incorporated into the plan formulation process to ensure that the selected plan is environmentally sound.

FLOOD PLAIN ASSESSMENT

251. Executive Order 11988 requires the Federal Government to avoid, if possible, adverse impacts associated with the occupancy and modification of flood plains as well as direct or indirect support of development in those areas where there is a practical alternative. The existing port facilities on Ponce DeLeon Inlet are already in the 100-year flood plain (National Flood Insurance Program). Federal improvement of the existing navigation project will encourage continued use of existing facilities on those lands as well as those already planned for future growth in commerce. Port development will occur with or without the proposed improvement.

252. Relocation of commercial fishing, charter boat, and repair facilities is not practical for a port serving those types of vessels. The port facilities are about the 100-year elevation to avoid any serious damages from flooding. Use of alternative Florida ports is impractical as most are in similar flood plain situations. In addition, a seaward extension of the south jetty will cause no negative flood plain or wetland impacts. Therefore, the proposed plan is in compliance with the Executive Order calling for enumeration of those possible impacts.

COASTAL ZONE BARRIER RESOURCES ACT

253. The proposed new Federal investment decision for the Ponce DeLeon Inlet navigation project does not include any recommendations which would result in any new Federal expenditures or financial assistance prohibited by the Coastal Barrier Resources Act (Public Law 97-348); nor were funds obligated in past years for this project for purposes prohibited by this Act.

COASTAL ZONE MANAGEMENT ACT

254. The Coastal Zone Management (CZM) Act of 1972, as amended (PL 92-583) requires all Federal activities inside or outside a state's coastal zone to be consistent with the state's coastal zone management plan if the activities affect natural resources, land uses, or water uses within the coastal zone. By issuance of State Water Quality Certifications on completed projects, the State determines that the authorized projects for which initial construction has been completed where consistent with the state CZM Act. The state will review the permit application and project plans and specifications in order to make a final consistency determination prior to any future project construction.

SUMMARY OF COORDINATION, PUBLIC VIEWS, AND COMMENTS

255. Public views and comments have been solicited at various points during the study process. Pertinent correspondence received to that coordination is in the Environmental Assessment and Appendix C of this feasibility report along with a discussion of the study coordination effort. Coordination of the reconnaissance and feasibility study alternatives began on February 1995 with various public agencies and individuals. In general, public agencies concurred with the study approach and list of measures presented for stabilization of the inlet. Additional comments were solicited during the review of the draft EA. No comments were received. The Florida State Clearinghouse in their November 25, 1998 letter found the study, based on the information contained in the notification of intent and enclosed comments provided by their reviewing agencies, consistent with the Florida Coastal Management Program (FCMP). This letter will be found in Appendix C of the EA.

CONCLUSIONS

256. Both structural and nonstructural alternatives received consideration to resolve navigation needs and inlet stability problems on the existing Federal project.

257. Initial structural alternatives included six different south jetty configurations, three different north jetty weir openings, an entrance channel realignment, three revetment locations, and a south channel realignment and extension to new public docking facilities. After model testing and other evaluations, a combination of one south jetty extension (Plan A), one revetment measure (plan F), and a dredging alternative (plan G) satisfied planning objectives. Structural alternatives (plans A and F) involve extension of the south jetty further into the ocean and revetment of a portion of the remaining sand spit west of the north jetty. Plan G realigns the entrance and south channels and extends the existing project to public docking facilities on the IWW.

258. The nonstructural plan takes effect after plans A and F are implemented. Instead of dredging the entrance channel in its authorized location between the two jetties, a gradual shifting of the channel towards the center of the inlet is expected. That process will be helped as the natural erosion of the sand spit west of the north jetty continues to allow the entrance channel to straighten out in a more east to west orientation. Rather than the northeast to southwest direction it currently follows around the sand spit.

259. Plan A consists of a 1,000-foot extension of the south jetty parallel to the existing north jetty. All plans except Plan A and the nonstructural plan had to be eliminated from further consideration when public opposition arose to the proposed fishing park. Then the benefits previously associated with the park could no longer be applied in plan formulation.

260. Plan A was identified as the National Economic Development Plan (NED) and is the recommended plan. The total first cost of the recommended plan is estimated at \$5,454,000. The estimated average annual equivalent benefits and costs are \$567,000 and \$419,250 respectively. The benefit to cost ratio is 1.4 to 1.

261. Based on the selected plan, modification of the authorized project for navigation improvements at Ponce DeLeon Inlet would include:

- Construction of a 1,000-foot south jetty extension toward the ocean and parallel to the north jetty, with scour apron and
- Assumption of maintenance for the new work 1,000-foot ocean extension of the south jetty, with scour apron
- Maintenance of project channels in deep water as practicable.

262. The Ponce DeLeon Inlet Port Authority of Volusia County supports the recommended plan and will provide a letter of intent and preliminary financial plan for securing the non-Federal share of project costs, currently estimated at \$2,466,000 for the new work and a one-time cash contribution at a present worth value at 6 7/8% of \$190,000 for the operation and maintenance costs of the new work.

RECOMMENDATIONS

263. I recommend the Federal navigation project at Ponce De Leon Inlet, Florida, be modified by construction of a 1,000-foot south jetty extension toward the ocean and parallel to the north jetty with scour apron, assumption of maintenance for the new work 1,000-foot ocean extension of the south jetty with scour apron, and maintenance of the project channels in natural deep water.

264. The recommendation for Federal participation in the selected plan described in this report is made with the provisions that, prior to implementation, the non-Federal sponsor shall be required to enter into a written Project Cooperation Agreement, as required by Section 221 of PL 91-611, as amended, to provide local cooperation satisfactory to the Secretary of the Army, to include the following non-Federal responsibilities:

a. Enter into an agreement which provides, prior to construction, 25 percent of design costs;

b. Provide, during construction, any additional funds needed to cover the non-Federal share of design costs;

c. Provide, during construction, 50 percent of total project costs allocated to recreational navigation as further specified below:

(1) Provide all lands, easements, and rights-of-way, including suitable borrow and dredged or excavated material disposal areas, and perform or assure the performance of all relocations determined by the Government to be necessary for the construction, operation, and maintenance of the project;

(2) Provide or pay to the Government the cost of providing all retaining dikes, wasteweirs, bulkheads, and embankments, including all monitoring features and stilling basins, that may be required at any dredged or excavated material disposal areas required for the construction, operation, and maintenance of the project; and

(3) Provide, during construction, any additional costs as necessary to make its total contribution equal to 50 percent of total project costs allocated to recreational navigation.

d. For project costs allocated to commercial navigation, provide, during the period of construction, a cash contribution equal to 10 percent of the total cost of construction of the general navigation features attributable to dredging to a depth not in excess of 20 feet;

e. Pay with interest, over a period not to exceed 30 years following completion of the period of construction of the project, up to an additional 10 percent of the total cost

of construction of general navigation features. The value of lands, easements, rights-of-way, and relocations provided by the non-Federal sponsor for the general navigation features, described below, may be credited toward this required payment. If the amount of credit exceeds 10 percent of the total cost of construction of the general navigation features, the non-Federal sponsor shall not be required to make any contribution under this paragraph, nor shall it be entitled to any refund for the value of lands, easements, rights-of-way, and relocations in excess of 10 percent of the total cost of construction of the general navigation features;

f. Provide all lands, easements, and rights-of-way, and perform or ensure the performance of all relocations determined by the Federal Government to be necessary for the construction, operation, maintenance, repair, replacement, and rehabilitation of the project (including all lands, easements, and rights-of-way, and relocations necessary for dredged material disposal facilities).

g. Assume responsibility for operating, maintaining, replacing, repairing, and rehabilitating (OMRR&R) all features of the project allocated to recreational navigation, including mitigation features without cost to the Government, in a manner compatible with the project's authorized purpose and in accordance with applicable Federal and State laws and specific directions prescribed by the Government in the OMRR&R manual and any subsequent amendments thereto.

h. Accomplish all removals determined necessary by the Federal Government other than those removals specifically assigned to the Federal Government;

i. Grant the Federal Government a right to enter, at reasonable times and in a reasonable manner, upon property that the non-Federal sponsor owns or controls for access to the general navigation features for the purpose of inspection, and, if necessary, for the purpose of operating, maintaining, repairing, replacing, and rehabilitating the general navigation features;

j. Hold and save the United States free from all damages arising from the construction, operation, maintenance, repair, replacement, and rehabilitation of the project, any betterments, and the local service facilities, except for damages due to the fault or negligence of the United States or its contractors;

k. Keep, and maintain books, records, documents, and other evidence pertaining to costs and expenses incurred pursuant to the project, for a minimum of 3 years after completion of the accounting for which such books, records, documents, and other evidence is required, to the extent and in such detail as will properly reflect total cost of construction of the general navigation features, and in accordance with the standards for financial management systems set forth in the Uniform Administrative Requirements for Grants and Cooperative Agreements to State and local governments at 32 CFR, Section 33.20;

l. Perform, or cause to be performed, any investigations for hazardous substances as are determined necessary to identify the existence and extent of any hazardous substances regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. 9601-9675, that may exist in, on, or under lands, easements, or rights-of-way that the Federal Government determines to be necessary for the construction, operation, maintenance, repair, replacement, or rehabilitation of the general navigation features. However, for lands that the Government determines to be subject to the navigation servitude, only the Government shall perform such investigation unless the Federal Government provides the non-Federal sponsor with prior specific written direction, in which case the non-Federal sponsor shall perform such investigations in accordance with such written direction;

m. Assume complete financial responsibility, as between the Federal Government and the non-Federal sponsor, for all necessary cleanup and response costs of any CERCLA regulated materials located in, on, or under lands, easements, or rights-of-way that the Federal Government determines to be necessary for the construction, operation, maintenance, repair, replacement, and rehabilitation of the general navigation features;

n. To the maximum extent practicable, perform its obligations in a manner that will not cause liability to arise under CERCLA;

o. Comply with the applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, as amended by Title IV of the Surface Transportation and Uniform Relocation Assistance Act of 1987, and the Uniform Regulations contained in 49 CFR Part 24, in acquiring lands, easements, and rights-of-way, required for construction, operation, maintenance, repair, replacement, and rehabilitation of the general navigation features, and inform all affected persons of applicable benefits, policies, and procedures in connection with said act;

p. Comply with all applicable Federal and State laws and regulations, including, but not limited to, Section 601 of the Civil Rights Act of 1964, Public Law 88-352 (42 U.S.C. 2000d), and Department of Defense Directive 5500.11 issued pursuant thereto, as well as Army Regulation 600-7, entitled "Nondiscrimination on the Basis of Handicap in Programs and Activities Assisted or Conducted by the Department of the Army;"

q. Provide a cash contribution equal to the non-Federal cost share of the project's total historic preservation mitigation and data recovery costs attributable to commercial navigation; and recreational navigation that are in excess of 1 percent of the total amount authorized to be appropriated for commercial navigation and recreational navigation.

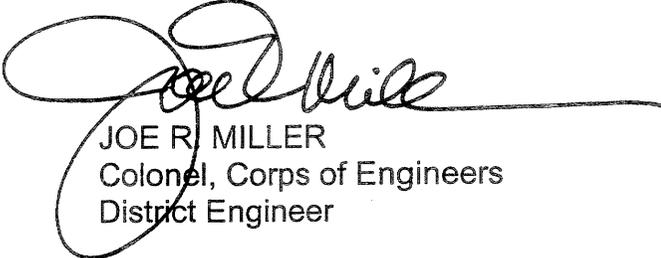
r. Do not use Federal funds to meet the non-Federal sponsor's share of total project costs unless the Federal granting agency verifies in writing that the expenditure of such funds is expressly authorized by statute.

s. Consistent with the original authorization the non-Federal sponsor will make a one-time advance payment to the government's benefit in an interest-bearing escrow account held by the non-Federal sponsor. All fees to set up and administer the account will be paid by the non-Federal sponsor. All interest generated from this account is to be used by the government for future operations and maintenance of the south jetty extension. The present value of the costs for operations and maintenance is \$225,000 (operation and maintenance of the south jetty extension only). The sponsor's share of these operations and maintenance costs is a one-time payment of \$190,000, calculated at an interest rate of 6 7/8%.

265. The non-Federal sponsor furnishes the above assurances after the project has been authorized for construction by execution of a Project Cooperation Agreement with the United States Government.

DISCLAIMERS

266. The recommendations contained herein reflect the information available at this time and current Departmental policies governing formulation of individual projects. They do not reflect program and budgeting priorities inherent in the formulation of a national Civil Works construction program nor the perspective of higher review levels within the Executive Branch. Consequently, the recommendations may be modified before proposals are made for authorization and implementation funding. However, prior to transmittal to the Congress, the Sponsor, the State, interested Federal agencies, and other parties will be advised of any modifications and will be afforded the opportunity to comment further.



JOE R. MILLER
Colonel, Corps of Engineers
District Engineer

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**ENVIRONMENTAL ASSESSMENT
PONCE DELEON INLET NAVIGATION IMPROVEMENTS
VOLUSIA COUNTY, FLORIDA**

FINDING OF NO SIGNIFICANT IMPACT
PONCE DELEON INLET NAVIGATION IMPROVEMENTS
VOLUSIA COUNTY, FLORIDA

I have reviewed the planning document and the Environmental Assessment (EA) for the proposed action. Based on information analyzed in the EA, reflecting pertinent information obtained from cooperating Federal agencies having jurisdiction by law and/or special expertise, I conclude that the proposed action will have no significant impact on the quality of the human environment. Reasons for this conclusion are, in summary:

- a. There will be no significant impact on threatened or endangered species or sites of cultural or historic significance.
- b. State water quality standards will be met.
- c. Measures to eliminate, reduce or avoid potential adverse impacts to fish and wildlife resources will be implemented during project construction
- d. The proposed navigation improvements will assist in the continued functional capability of the Federal navigation project at Ponce DeLeon Inlet. The placement of revetment west of the north jetty will protect wetlands and human resources in that area.

In consideration of the information summarized, I find that the proposed action will not significantly affect the human environment and does not require an Environmental Impact Statement.

05 FEBRUARY 1999
Date



Joe R. Miller
Colonel, U.S. Army
District Engineer

ENVIRONMENTAL ASSESSMENT
PONCE DELEON INLET NAVIGATION IMPROVEMENTS
VOLUSIA COUNTY, FLORIDA

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ENVIRONMENTAL ASSESSMENT
PONCE DELEON INLET NAVIGATION IMPROVEMENTS
VOLUSIA COUNTY, FLORIDA

1.00. Need for and Objectives of the Proposed Action. The existing Ponce DeLeon Inlet navigation project was authorized under the Rivers and Harbors Act of October 27, 1965. The harbor area consists of an entrance channel which provides access to a northwesterly channel along the Halifax River and a southeasterly channel along the Indian River. Both inner harbor channels connect with the Intracoastal waterway (Figure 1).

1.01. The local sponsor has requested that the Corps of Engineers (Corps) examine navigation and channel improvements for the following reasons:

- a. Navigation is a safety problem as documented by the Coast Guard which has recorded numerous groundings and occasional loss of life in the vicinity of the inlet.
- b. The entrance and inner channels are quite unstable, requiring the Coast Guard to frequently monitor the area and relocate navigational aids. The northward migration of the entrance channel also threatens to undermine the north jetty.
- c. The cost of maintenance for project features is quite expensive as a result of the unstable inlet channel.
- d. Shoreline changes following project construction remain a public concern.
- e. A potential breach through the north shore inside the inlet threatens property in the area.
- f. Expand the Federal project to accommodate a proposed marina and seafood processing facility to be constructed on County property on the Intracoastal Waterway in the vicinity of Rockhouse Creek.

2.00. Alternatives. The Federal objective in water and related land resources planning is to develop a plan which provides maximum contribution to national economic development consistent with protecting the nation's environment. The formulation and preliminary analysis of alternative plans to achieve planning objectives were based on the Water Resource Council's Principles and Guidelines, the National Environmental Policy Act and related Corps regulations. These guidelines provide for developing alternative resource management systems that address planning objectives. A combination of measures for stabilizing the inlet resulted in an array of alternatives for improvement of Ponce DeLeon Inlet. Eight alternatives, including the no-action alternative, were initially considered and are described below:

- a. Lengthening the south jetty approximately 1000 feet.
- b. Construction of a scour apron on the south side of the north jetty for a distance of 700 feet.
- c. Repair damaged portions of the north jetty, which have slumped up to 3 feet since initial construction because of scouring or rock displacement due to wave action.
- d. Construction of a groin field along the sand spit inside the inlet and adjacent to the north jetty.
- e. Construct a storm revetment to prevent erosion of the sand spit inside the inlet, adjacent to the north jetty, and for protection of wetlands, public property and commercial docking facilities.
- f. Re-open the weir in the north jetty.

- g. Construct a channel at the site of the potential breakthrough along the sand spit inside the inlet.
- h. Take no action.

2.01. Alternatives (b), construction of a scour apron along the south side of the north jetty, and (c), repair damaged portions of the north jetty were identified as maintenance features in the Reconnaissance Report. Because of the need for more immediate attention on the north jetty, these two alternatives are no longer considered as construction alternatives.

2.02. Subsequent to completion of the draft feasibility report, local interests proposed a new commercial marina and seafood processing facility which would be constructed on county property adjacent to the Intracoastal Waterway in the vicinity of Rockhouse Creek. The local sponsor requested that the Corps study the feasibility of expanding the Federal project to accommodate these facilities.

2.03. Locally Preferred Plan. As a result of a Public Workshop held on July 24, 1997 the local sponsor presented a preferred plan (See Volusia County letter dated March 2, 1998 in Appendix C , Correspondence). The locally preferred plan is the 1000- foot extension of the south jetty.

3.00. Existing Conditions. This section describes the existing environmental resources of the areas that would be affected if any or all of the alternatives were implemented. It describes only those resources that are relevant to the decision to be made.

3.01. Ponce DeLeon Inlet is located in Volusia County on the east coast of Florida, about 65 miles south of St. Augustine and 60 miles north of Canaveral Harbor. The inlet is a natural waterway connecting the Halifax River and Indian River Lagoon to the Atlantic Ocean (Figure 1). The original project included the following features:

- a. An entrance channel 15 feet deep by 200 feet wide from the 15-foot contour line in the ocean into the mouth of the harbor; and
- b. A channel 12 feet deep by 100 feet wide inside the inlet and extending southward in the Indian River to the Intracoastal waterway; and
- c. A channel 7 feet deep and 100 feet wide extending northward in the Halifax River to the Intracoastal waterway; and
- d. Ocean jetties about 4000 feet long on the north and south sides of the inlet; and
- e. A weir in the north jetty with an impoundment basin on the south side of the north jetty to accumulate littoral drift material for transport across the inlet to the beach south of the inlet. The weir has subsequently been closed.

3.02. Vicinity of Ponce DeLeon Inlet. The area in and around Ponce DeLeon Inlet is a combination of natural and man-made features, including rock jetties on the north and south sides of the inlet, boardwalks, buildings, parking lots, and docks associated with two county parks and a U.S. Coast Guard station, and a commercial marina and boat yard. In addition, there are several man-made disposal islands associated with the jetties and inside the inlet. The natural environment consists of a combination of sub-littoral habitat and fauna associated with the Atlantic Ocean, inlet mouth and throat, the Halifax and Indian Rivers, north spit coves, sand beach and tidal sand flats, coastal dunes and tidal marshes. The marsh and open-water areas support a wide variety of marine and brackish fauna and flora.

3.03. Intracoastal Waterway. Because of existing water depths and clarity, there is no submerged aquatic vegetation in or adjacent to the channel that would be affected by dredging. The eastern shoreline of the

IWW is vegetated by a mixture of black mangrove *Avicennia germinans*, and smooth cordgrass *Spartina alterniflora*. Landward of this vegetation is Brazilian pepper *Shinus terebinthifolius* and waxmyrtle *Myrica cerifera*, intermixed with cabbage palm *Sabal palmetto* and redcedar *Juniperus virginiana*. Most of the western shoreline is developed with single-family residences and the shoreline is bulkheaded.

3.04. Two potential upland disposal sites are located on the east bank of the IWW, on the north and south sides of Rockhouse Creek. Both sites historically were used as disposal sites for the IWW. The north site (MSA 434) is approximately 378 acres and appears not to have been used for disposal for many years based on existing vegetation. The FWS observed four active gopher tortoise burrows and one gopher tortoise. The south site (MSA 434C) is approximately 47 acres and appears to have been used more recently than the north site. There has been little recruitment of vegetation on this site with sea oats being the predominant vegetation.

3.05. Shoal Areas. Two shoal areas are located between the inlet and mouth of Rockhouse Creek and were considered as possible disposal areas for material from the IWW. Except for a small patch of smooth cordgrass found on the extreme south end of the south shoal, these areas are unvegetated. Adjacent to the shoal areas are tidal flats which are periodically exposed. Shore birds were observed feeding on these flats.

3.06. Migratory Birds. The sand spit adjacent to the north jetty is utilized by both breeding and wintering shorebirds. In 1994 the area was renourished with approximately 1.8 million cubic yards of sand from the Intracoastal waterway near the inlet. However a large portion of the nourished area has already eroded. Given present conditions in the inlet, it is expected that this area will continue to erode.

3.07. Threatened or Endangered Species. The Corps, FWS and NMFS have identified the following listed species whose ranges include the study area: saltmarsh snake, bald eagle, piping plover, wood stork, manatee, shortnose sturgeon, green, hawksbill, loggerhead, Kemp's ridley and leatherback sea turtles, and right, finback, humpback, sei and sperm whales. A marine seagrass, Johnson's seagrass, proposed for listing as threatened, has also been identified as possibly occurring in the project area. There is no designated critical habitat in the area. The southeastern beach mouse was identified as possibly occurring south of the inlet in the area where consideration was given to using stone from the western end of the south jetty for the south jetty extension. This alternative was dropped from consideration; therefore, recommendations for beach mouse protection are no longer applicable.

3.08. Coastal Barrier Resources Act. The Coastal Barrier Resources Act (CBRA), first enacted in 1982 (16 U.S.C. 3502 *et seq.*), was reauthorized and amended by the Coastal Barrier Improvement Act (CIBA) of 1990 (U.S.C. 3501) Its purpose, as stated in section 2(b), is "...to minimize the loss of human life, wasteful expenditure of Federal revenues, and damage to fish, wildlife and other natural resources associated with the coastal barriers.....". CBRA established the Coastal Barrier Resources System, and mapped a series of undeveloped coastal barriers on the Atlantic and Gulf coasts, including the Great Lakes region, Virgin Islands and Puerto Rico. Areas within the system are designated as either "units" or "otherwise protected areas" (OPA's). Section 5(a) prohibits all new Federal expenditures and financial assistance within unit boundaries, with some exceptions as determined through a process of consultation. Ponce DeLeon Inlet is located on the Florida east-central coast between the cities of Daytona Beach and New Smyrna Beach. The inlet and much of the adjacent coastal river wetlands east of Route 1 are grouped within the P08 unit of the Coastal Barrier Resources System.

3.09. Habitats found within the Ponce DeLeon Inlet unit include marine, estuarine, brackish riverine, salt marsh, tidal mud and sand flats, beaches and coastal dunes. These habitats not only support diverse communities of both resident plants and animals, but are also important for migratory birds, including waterfowl and neotropical migrants. The extensive coastal wetlands support both shellfish and adults and juveniles of many commercially valuable finfish.

ATLANTIC OCEAN



PONCE DE LEON INLET
VOLUSIA COUNTY, FLORIDA
PROJECT LOCATION

Figure 1

3.10. Historic Properties. Ponce DeLeon Inlet, known as Mosquito Inlet until the 1920's, has changed significantly over the past 200 years. The bar at the entrance to Mosquito Inlet was said to *change with every gale*. An 1851 U.S. Coast Guard Survey map depicts an opening south of the current inlet. The survey also indicates that previously the inlet had been about 3500 feet north of the 1851 location.

3.11. Because of the unpredictable channel and shoals, many ships have been lost in this inlet. More than 40 wrecks are recorded in the vicinity and other unrecorded wrecks are likely to have occurred there. To determine if potentially significant historic properties might be in the study area, a magnetometer survey was conducted for the south jetty extension. The archeologist identified 13 potentially significant magnetic targets during the survey (Hall, 1995a). The magnetic signatures of these targets had a duration and frequency that may represent an historic shipwreck.

3.12. Diver investigations were conducted for 7 magnetic targets that were determined to be in the jetty footprint. The source of each magnetic signal was determined to be modern materials (Hall, 1995b). Although no historic properties were identified during diver investigations, the 6 remaining magnetic targets may represent historic shipwreck remains.

3.13. A 1944 survey of Ponce DeLeon Inlet indicated that a channel was located in an area that is now a sand spit west of the north jetty. It is not likely that significant historic properties are located in the proposed realigned channel. A terrestrial survey was conducted for the Lighthouse Point Park. The survey area included the footprint for the proposed revetment and westward extension of the north jetty. Although the foundation remains of the Hotel Inlet Terrace may be located within the affected area, it was the archeologist's opinion that the site is not significant (Piatek). In a July 7, 1994 letter, the Florida State Historic Preservation Officer (SHPO) agreed that the site is not eligible for inclusion in the National Register of Historic Places.

3.14. Compliance with the National Historic Preservation Act of 1966, as amended. Archival research, magnetometer survey diver investigations, in addition to consultation with the SHPO, were completed for this project. It was determined that significant historic properties are not located within the proposed area of impact for this project. Archeological "no-work zones", with a 200-foot radius, will be established around six potentially significant magnetic targets near the south jetty alignment. The SHPO concurred with the Jacksonville District's no-effect determination for this project in letters dated September 20, 1995 and September 11, 1996.

3.15. Aesthetic Conditions. Consideration of aesthetic resources within the project study area is required by the National Environmental Policy Act (NEPA) of 1969 (P.L. 91-190), as amended. Aesthetic resources are defined in ER 1105-2-50 as "those natural and cultural features of the environment which elicit . . . a pleasurable response" in the observer, most notably from the predominant visual sense. Consequently, aesthetic resources are (commonly referred to as) visual resources, . . . features which can potentially be seen.

3.16. The inlet is a very dynamic coastal feature with seasonal high tides, strong winds and striking weather contrasts. The Lighthouse Point Park consists of approximately 135 acres on the north side of the inlet. The park has capped about 1,000 linear feet of the north jetty which provides access and panoramic views of the Atlantic Ocean horizon, north and south Atlantic Ocean shorelines and Ponce DeLeon Inlet. These resources possess good aesthetic values. The nearshore ocean waters take on a tropical hue of blue found in the Caribbean shallows. This a striking contrast to the nearly white beach along the ocean and in the inlet. Vegetated disposal areas backdrop the inlet and provide moderate aesthetics behind the foreground Halifax River.

3.17. Smyrna Dunes County Park consists of 250 acres to the south of the south jetty. Moderate to good aesthetics characterize the park's natural resource zones that range from the Atlantic Ocean shoreline, oceanfront dunes, backdunes, scrub, small maritime forest and western scrub.

3.18. Recreational Use. The Lighthouse Point Park, adjacent Ponce DeLeon Inlet waters and lands, and the Atlantic Ocean and beach north of the inlet are used for a variety of recreational purposes. Smyrna Dunes County Park, adjacent lands and waters to the south of the inlet are also part of the proposed project lands. These lands contain above average aesthetic quality, recreational use and value. Bathers swim in the ocean and along the north jetty shoreline and surfers and windsurfers use the ocean and inlet waters. Sunbathers frequent all shorelines. Fishing in the area includes surfcasting, bank fishing from the shorelines of the inlet and the capped north jetty, or boats anchored in the inlet. Many visitors walk the shorelines beachcombing or out on the breakwater to get a closer view of the water and related activities. Picnickers utilize facilities in the parks where tables are provided, beachside areas or the inlet shoreline.

3.19. Water Quality. The waters of Ponce De Leon Inlet are classified as Class III by the State of Florida.

4.00. Environmental Impacts of the Proposed Action.

4.01. General. In the Reconnaissance Report phase of the proposed action, seven alternatives and taking no action were analyzed. The reasons for either dropping them from further consideration or retaining them for further study are discussed below.

4.02. No-Action. If no action is taken, the most significant impact will be the continued erosion of the southern and western portions of the sand spit on the north side of the inlet and a probable breakthrough to the old bed of the Halifax River, resulting in the continued shoaling of the Halifax River and new shoaling of the north channel and nearby cove in the vicinity of the expected breakthrough. Continued erosion of the north spit south of the old riverbed will result in the probable loss of the remaining salt marsh and mangrove swamp habitat and its associated biomass. There would also be increased instability and slumping along the north jetty caused by increased undermining of the jetty by wave action and tidal currents associated with the northerly position of the deepwater channel in the throat of the inlet. Continued erosion around the toe of the north jetty may result in a breakthrough around the landside of the jetty, resulting in isolation and loss of function of the jetty.

4.03. South Jetty Extension. Modeling of Ponce DeLeon Inlet indicates that an extension of the south jetty of approximately 1000 feet would improve the inlet's navigation and flow characteristics, particularly in the entrance reach of the channel. This would be true with or without implementation of the other alternatives. The jetty extension would enable flood and ebb currents to follow a more central flow through the inlet. Flood tide distribution just south of the seaward end of the extended south jetty would reduce littoral drift and sand deposition within the inlet. Initial plans considered use of rock from the embedded western end of the south jetty for the extension, with known and unknown possible impacts occurring from removal of the rock. Subsequent investigations have shown that the old jetty rock is unsuitable for project use; therefore, any potential impacts from the use of this material are avoided.

4.04. Transporting rock to the construction site will involve the use of trucks, barges, or a combination of the two. The actual method or methods are left to the contractor's discretion. The rock will be brought to the general vicinity of the project site by rail and off-loaded. From that point the rock will be trucked either directly to the south jetty or placed in a staging area for transport to the construction site by barge. If the material is trucked directly to the site, the route taken would be from the rail staging area to a beach access road and then along the beach to the jetty. If trucks are used on the beach, appropriate precautions, such as sea turtle nest removal and compaction testing and tilling after construction, will be done. If the rock is moved by barge, some truck transport will still be required, from the railroad staging area to an upland staging area along the Intracoastal Waterway north of Rockhouse Creek. This method may not be feasible because the waters adjacent to the upland staging area are shallow, and fully loaded barges cannot operate in the area.

4.05. Re-opening the North Jetty Weir. Another alternative considered in early planning was the re-opening of an 1800-foot weir in the north jetty. The weir and an accompanying impoundment basin were

designed to collect littoral drift through the jetty for transport across the inlet by pipeline dredge. Further model testing indicated that, because of changes in flow patterns, a re-opened weir would no longer have the desired effect of reducing erosional forces on the north sand spit. This alternative has been dropped from further consideration.

4.06. North Jetty Repair and Scour Apron Extension. Rebuilding slumping portions of the north jetty and extending the scour apron along the south side of the north jetty were originally considered as alternative features of the project. However, because of the severity of the scouring problem at the south side of the north jetty, these alternatives are now considered as maintenance features of the project, and in need of more immediate attention. Completion of these features, however, are expected to contribute to improving overall inlet stability.

4.07. Groin Field Construction. A set of three groins along the sand spit inside the inlet adjacent to the north jetty was originally proposed to preserve the remaining shoreline and prevent breaching of the spit by deflecting tidal current away from the spit. However, erosion has occurred at a faster rate than expected. Further investigation has shown that physical conditions at the site will no longer permit the groin field to operate as planned. This alternative has subsequently been dropped from further consideration.

4.08. Placement of Revetment. The use of some type of hardened barrier to provide direct protection to upland property adjacent to the north spit by preventing further erosion was considered in early planning stages. Three alignments were initially considered, all of which would begin at the west toe of the north jetty and afford varying degrees of protection to adjacent lands. The southerly-most alignment would extend 4800 feet and would have afforded maximum protection from shoreline erosion, inlet breaching and ocean flanking of the north jetty by completely encircling the north sand spit. However, because of rapid erosion in the past four years, much of the area has already been lost, and based on estimated erosion rates, most of the area designed for protection by this alignment will also disappear. Therefore, this alignment has been dropped from further consideration.

4.09. The second, or middle alignment, would extend approximately 2300 feet to the tip of a mixed marsh and upland disposal peninsula along its southern and western borders. This alignment is expected to protect against jetty flanking and potential erosion of the marsh/disposal peninsula, although it would offer no protection against breaching. The overall impact of this alternative will be to protect the remaining 9 acres of habitat, including 6.6 acres of wetlands, between the revetment and the old Halifax River channel, at the expense of 2.1 acres of wetlands lost due to construction activities. This is a net preservation of 6.9 acres of habitat, including 4.5 acres of wetlands, which otherwise would be lost to erosion. It will also offer protection to the commercial harbor area and the Lighthouse Park area. Rock used for revetment construction can be trucked by road directly to one of several staging areas in or adjacent to Lighthouse Park with minimal disturbance to the area. The material would be hauled to the site over the route of the revetment, restricting damage to the area which will be the site of revetment placement.

4.10. The third, or most northerly alignment, would extend approximately 1600 feet from the toe of the north jetty. Because this alignment would provide only minimal protection, it was dropped from further consideration.

4.11. Engineered Channel at Breakthrough Site. This alternative would provide a 12-foot-deep, 200-foot-wide channel at the site of the potential breakthrough between the inlet and old Halifax River channel. This alternative is still under consideration although modeling results indicated that little protection would be afforded and severe erosion would continue to occur between the engineered channel and existing channel alignment. In addition, preliminary economic analysis shows that this alternative is not cost effective. Several other alternatives would be needed whether this feature is built or not, including the south jetty extension, north jetty work and revetment construction. Construction of this feature would result in the destruction of nearly 3 acres of mixed salt marsh, mangrove swamp and sand beach. Approximately

one million cubic yards of material will be dredged during construction, requiring suitable disposal sites in the area. Beach quality sand could be placed on nearby beaches, but other material would have to be placed in an upland disposal area. This could result in the loss of additional upland habitat and impacts to associated biota.

4.12. IWW Dredging and Disposal Activities. The proposed dredging and material placement activities associated with the IWW will be minimal. The FWS has recommended that the south disposal site (MSA 434C) be used for upland disposal and recommended against use of the shoal areas for placement of dredged material. There were no objections to use of the beach for disposal of suitable material providing that recommended measures for protection of nesting sea turtles be done

4.13. Threatened or Endangered Species. Species of concern that could be affected by construction activities are the saltmarsh snake, southeastern beach mouse, manatees and sea turtles. According to the U.S. FWS, the saltmarsh snake can easily be captured at night and removed from the area. This requirement will be put into the Plans and Specifications; therefore this species should not be impacted by construction activities. Standard manatee and sea turtle precautions, such as the use of observers and “no-wake” speeds by vessels associated with construction activities will be in effect during construction to minimize the possibility of impacts to those species. If trucks are used to haul rock along the beach, arrangements will be made to locate and move sea turtle eggs during the nesting season. All of the “Reasonable and Prudent Measures” pertaining to sea turtles contained in the Fish and Wildlife Coordination Report will be incorporated into Contract Plans and Specifications where appropriate. The southeastern beach mouse was identified as possibly occurring south of the inlet where consideration was given to use of stone from the west end of the south jetty to south jetty extension. This alternative was dropped from consideration; therefore, recommendations for beach mouse protection are no longer applicable.

4.14. Water Quality. State water quality standards will be met at all times during construction.

4.15. Aesthetic Considerations. The proposed north jetty maintenance extension and revetment westward through the Lighthouse Point Park will be approximately 12 feet above mean low water, very visible, and drastically alter the existing aesthetics. As proposed, it will contrast sharply with the existing sandy inlet beach. The park scrub and marsh/mangrove zones will also be visually degraded by the jetty extension and revetment. The extension of the south jetty into further into the ocean could collect sand on its south side and act to build up the Smyrna Dunes County Park shoreline and beach.

4.16. Aesthetic Measures Plan. The concept of an aesthetic measures plan is to harmoniously blend the project into the setting. The aesthetic measures to counter construction impacts will be compatible with project purposes and in no way compromise the safety, integrity or function of the project. The Ponce DeLeon Inlet scrub and marsh/mangrove zones will be the most visibly impacted project areas.

4.17. The following measures are proposed to help maintain the character of the Lighthouse Point Park landscape; a) quarry and use native stone for the jetty extension and revetment which would blend with the surrounding environment and fit in it's surroundings regardless of it's unnatural landform, b) cover the jetty extension and revetment with local sand to conceal the rock and plant with native vines such as *Smilax spp.*, beach morning glory *Impomoea stolonifera*, and dune sunflower *Helianthus debilis*, native grasses such as sea oats *Uniola paniculata*, Love grass *Eragrostis spp.*, and beach cordgrass *Canavalia rosea*, shrubs such as sea oxeye *Borrchia frutescens*, cactus *Opuntia spp.* and saltbush *Bacharrus halimifolia* var. *angustior* and trees such as redbay *Persea borbonia*, sand live oak *Quercus virginia* var. *geminata* and waxmyrtle *Myrica cerifera* on it's north side. c) cover the rubble jetty with a capped concrete walkway accessible for recreational purposes.

4.18. Recreational Impacts.

4.19. South Jetty Extension. Extension of the south jetty should not adversely affect recreation resources within the Smyrna Dunes County Park and sand accretion should enhance recreational opportunities by increasing available beach area.

4.20. North Jetty Landward Extension. This project feature provides an 800-foot-long westward extension of the north jetty but will be done as an aspect of the inlet maintenance program. This extension could be as much as 12 feet above mean low water and could effectively eliminate pedestrian access to what remains of the inlet north shoreline from the Lighthouse Point Park area. The extended 800-foot long jetty could also effectively increase the rate of park inlet beach erosion in front of it, reducing, if not eliminating, the park inlet beach.

4.21. Revetment. A 1500 foot long revetment is proposed to connect with the inlet north jetty 800 foot extension, at a finished elevation of 10 feet mlw. The revetment will curve to the north as it extends west. The proposal, as designed, could effectively deny pedestrian access to the inlet north shoreline from the Lighthouse Point Park. The revetment could also effectively increase the rate of park inlet erosion in front of it, reducing, if not eliminating, the park inlet beach.

4.22. Coastal Barrier Resource Act. Section 6(a) of the Coastal Barrier Resources Act (CBRA) requires that the appropriate Federal officer consult with the Secretary of the Interior (Secretary) prior to making commitments on Federal expenditures or financial assistance within CBRA units. The Secretary has delegated his consultation responsibility to the U.S. Fish and Wildlife Service (Service). The Service, therefore, offers the following comments on Ponce DeLeon Inlet, a designated CBRA unit, pursuant to Section 6.

4.23. Section 6(a)(2) of CIBA provides an exception to Section 5, Limitations on Federal Expenditures Affecting the System, if the expenditure is for “the maintenance or construction of improvements of existing Federal navigation channels (including the Intracoastal Waterway) and related structures (such as jetties), including the disposal of dredged materials related to such maintenance or construction”. The proposed jetty extensions, north jetty weir re-opening and north jetty repair and scour aprons are actions which qualify under this exception.

4.24. Subsections 6(a)(6A-F) of CBRA also provide exceptions to Section 5, provided that the actions or projects are consistent with the purposes of CBRA as previously stated. The proposed new channel and rock revetment would greatly reduce, or eliminate, the erosion potential of facilities within Lighthouse Point County Park, located adjacent to the north spit. These measures thus could be considered under subsection 6(F), which exempts expenditures and assistance for the “maintenance, replacement, reconstruction, or repair, but not the expansion, of publicly owned or operated roads, structures or facilities”. Both actions are also consistent with the purposes of CBRA because:

- a. They will contribute to increased inlet navigability, which should minimize the existing risk of loss of human life
- b. Current Federal expenditures for containment of inlet breaching will be eliminated and dredging for shoal removal will be greatly reduced, and
- c. Mitigation for habitat loss and other measures proposed in the Fish and Wildlife Coordination Report for each action will minimize any damage to fish, wildlife and other natural resources associated with the unit.

4.25 Based on the preceding review, the Service concludes that the proposed jetty extensions, weir re-opening and north jetty repair, scour apron, deepening of the IWW and disposal of dredged material are exempted under Section 6(a)(2) and the engineered channel and rock revetment are exempted under Section 6(a)(6F).

4.26. Migratory Birds. The sand spit on the inside of the north jetty has been used for nesting and overwintering by migratory birds. In 1994 approximately 1.8 million cubic yards of sand from the IWW was placed on the spit. However, the spit is in an area of extremely high erosion and much of the area has already eroded and, regardless of which alternative is selected, the remaining portion is expected to disappear in a short period of time.

4.27. Historic Properties. As discussed in paragraphs 3.05 through 3.08 (above), both terrestrial and underwater historic property investigations have been conducted in the Ponce DeLeon Inlet study area. Potentially significant submerged magnetic targets are located in the vicinity of the south jetty extension. Targets in the jetty alignment were investigated by archeological divers and were determined to be modern materials. Two -hundred-foot radius archeological "no-work zones" will be required to protect the six remaining potentially significant magnetic targets from construction activities. Although one historic terrestrial site was identified along the revetment alignment, the site is not eligible for the National Register of Historic Places.

4.28. Executive Order 12898, Environmental Justice. The purpose of the proposed action is to enhance navigational safety in and around Ponce DeLeon Inlet by stabilizing the inlet and by doing so reduce future maintenance costs for the inlet. The proposed action will enhance human health and environmental effects by increasing safety in and around the inlet and stabilizing the environment of the area. The proposed activity will not (a) exclude persons from participation in, (b) deny persons the benefits of, or (c) subject persons to discrimination because of their race, color or national origin, nor will the proposed action adversely impact "subsistence consumption of fish and wildlife".

4.29. Irreversible and Irrecoverable Commitment of Resources. Mobilization of equipment and construction operations will require the expense of time and resources such as labor, energy and project materials. Species of concern that could be affected by construction activities are the saltmarsh snake, southeastern beach mouse, manatees and sea turtles. According to the U.S. FWS, the saltmarsh snake can easily be captured at night and removed from the area. This requirement will be put into the Plans and Specifications; therefore this species should not be impacted by construction activities. Standard manatee and sea turtle precautions, such as the use of observers and "no-wake" speeds by vessels associated with construction activities will be in effect during construction to minimize the possibility of impacts to those species. If trucks are used to haul rock along the beach, arrangements will be made to locate and move sea turtle eggs during the nesting season. All of the "Reasonable and Prudent Measures" pertaining to sea turtles contained in the Fish and Wildlife Coordination Report (Appendix D) will be incorporated into Contract Plans and Specifications where appropriate. The southeastern beach mouse was identified as possibly occurring south of the inlet where consideration was given to use of stone from the west end of the south jetty to south jetty extension. This alternative was dropped from consideration; therefore, recommendations for beach mouse protection are no longer applicable.

5.00. Coordination. The proposed action was coordinated with appropriate Federal, State and local governmental agencies and interested groups and individuals in scoping letters dated 29 September 1992 and 7 February 1995. Responses are included in Appendix C. The proposed action was coordinated with the FWS and NMFS under Section 7 of the Endangered Species Act and with the FWS under the Fish and Wildlife Coordination Act. A Draft Coordination Act Report was received on 20 June 1996, and a Final Report was received on 26 September 1996, which determined that the proposed action is exempted under

the Coastal Barrier Resources Act (Appendix D). The proposed action was coordinated with the Florida State Historic Preservation Officer (SHPO) under the National Historic Preservation Act. In a letter dated September 20, 1995, the SHPO concurred with the Jacksonville District's no effect determination for the south jetty extension. A no effect determination for an engineered channel and revetment west of the north jetty was coordinated with the SHPO in a June 25, 1996 letter. Concurrence with this determination is expected. The Environmental Assessment and Feasibility Report will be coordinated with appropriate Federal, State and Local agencies, organizations and individuals.

6.00. Environmental Commitments. The following precautions will be taken to ensure the safety of sea turtles, manatees and the saltmarsh snake during the construction period.

6.01. Manatee and Sea Turtle Protection. The Contractor will instruct all personnel associated with project construction activities about the possible presence of sea turtles and/or manatees in the area and the need to avoid contact with them. All vessels associated with the project will operate at "no-wake" speeds at all times while in shallow water or channels where the draft of the boat provides less than 4 feet clearance of the bottom. Boats used to transport personnel will be shallow-draft vessels, preferably of the light-displacement category where navigational safety permits. Vessels transporting personnel between the dock and work area will follow routes of deep water where possible. All personnel will be advised that there are civil and criminal penalties for harming, harrassing, injuring or killing manatees, which are protected under the Endangered Species Act and the Marine Mammal Protection Act, and sea turtles, which are protected under the Endangered Species Act. The Contractor will be held responsible for any sea turtle or manatee harmed, harrassed , injured or killed as a result of construction activities.

6.02. Manatee Signs. The Contractor will install and maintain a minimum of two(2) manatee awareness signs at prominent locations within the construction area. Placement of the signs will be in prominent locations such as adjacent to safety boards or in the dining area. Photo(s) of the signs in place will be sent to the Florida Department of Natural Resources (DNR) Marine Mammal Recovery Program at 100 Eighth Avenue, S.E., St. Petersburg, Florida 33701-5095, prior to commencement of construction activities or use of facilities associated with construction. The manatee signs may be removed upon completion of the project.

6.03. Manatee or Sea Turtle Sightings. The Contractor will keep a log detailing all sightings, collisions, injuries or deaths of manatees or sea turtles that occur during the construction period. The data will be recorded on forms provided by the Contracting Officer. All data, in original form, will be forwarded directly to Dr. Hanley K. Smith, Chief, Environmental Branch, U.S. Army Corps of Engineers, P.O. Box 4970, Jacksonville, Florida 32232-0019, within 10 days of collection, and copies furnished to the Contracting Officer's representative.

6.04. Other Activities. The recommendations presented in the "Reasonable and Prudent Measures" section of the Fish and Wildlife Coordination Act Report will be put into Contract Plans and Specifications, where appropriate.

7.00 Preparers and Reviewers.

Preparers:

Environmental Assessment Preparation and CoordinationRea N. Boothby, Ecologist
Cultural and Historic Resources Coordination..... Janice E. Adams, Archeologist
Aesthetic and Recreation Resource Assessment..... Paul C. Stevenson, Landscape Architect

Reviewers:

Supervisory BiologistKenneth R. Dugger, Biologist
Supervisory BiologistHanley K. Smith, Biologist

8.0 REFERENCES

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APPENDIX A
PONCE DELEON INLET NAVIGATION IMPROVEMENTS
SECTION 404 (b)(1) EVALUATION

I. Project Description:

a. Location. Ponce DeLeon Inlet is located in Volusia County, on the Atlantic Coast of Florida, south of Daytona Beach.

b. Authority and Purpose. The existing Ponce DeLeon Inlet navigation project was authorized under the Rivers and Harbors Act adopted 27 October 1965. The harbor area consists of an entrance channel which provides access to a northwesterly channel along the Halifax River and a southwesterly channel along the Indian River. Both channels connect to the Intracoastal waterway. The local sponsor has requested that the Corps of Engineers (Corps) examine navigation and channel improvements for the following reasons: a) Navigation is a safety problem as documented by the Coast Guard which has recorded numerous groundings and occasional loss of life; b) the entrance and inner channels are quite unstable, requiring the Coast Guard to frequently monitor the area and relocate navigational aids; c) the northward migration of the entrance channel threatens to undermine the north jetty; d) the cost of maintenance for project features is quite expensive as a result of the unstable inlet channel; e) shoreline changes following project construction remain a public concern; and f) a potential breach around the west end of the north jetty threatens property in the area.

c. General Description. A number of alternatives were originally considered but after further study, only 2 alternatives were retained as the proposed plan, a 1000-foot extension of the south jetty and placement of revetment beginning at the west end of the north jetty and extending approximately 2300 feet west. Modeling of Ponce DeLeon Inlet indicates that an extension of the south jetty approximately 1000 feet would improve the inlet's navigation and flow characteristics, particularly in the entrance reach of the channel. This would be true with or without implementation of other alternatives considered. The jetty extension would enable ebb and flow currents to follow a more central flow through the inlet. Flood tide distribution just south of the seaward end of the extended south jetty would reduce littoral drift and sand deposition within the inlet. The second alternative is the construction of 2300 feet of revetment beginning at the western end of the north jetty. This component is comprised of two parts. The first part is construction of 800 feet of north jetty extension beginning at the west end of the north jetty. The second part is the construction of 1500 feet of revetment beginning at the west end of the jetty extension and extending west. After initial plan formulation, the local sponsor requested that the Corps study the feasibility of an additional alternative. This alternative would have expanded the Federal project to accommodate a proposed commercial marina and seafood processing facility to be constructed on county property on the Intracoastal Waterway in the vicinity of Rockhouse Creek and would involve widening and deepening the IWW in that area. As a result of a Public Workshop held on July 24, 1997, the local sponsor presented a preferred alternative (See Volusia County letter dated March 2, 1998 in Appendix C, Correspondence, of the EA). The preferred plan is the 1000-foot extension of the south jetty.

d. General Description of Dredged or Fill Material.

(1). General Characteristics of Material. The material to be used for the south jetty extension and revetment is granite rock and boulders. Material dredged from the IWW is clean, beach quality sand.

(2). Quantity of Material. Approximately 59,550 tons of stone will be required for the south jetty extension and 39,450 tons for the revetment, for a total of about 100,000 tons. Approximately 360,000 cubic yards of sand will be dredged from the IWW.

(3). Source of Material. The source of the material for the jetty and revetment will be determined by the contractor.

e. Description of the Proposed Disposal Site. The jetty extension will be on sandy bottom in the Atlantic Ocean south of the inlet. The revetment will be placed in a predominantly sandy upland site north and west of the inlet throat. Material from dredging the IWW will be placed either in an upland site adjacent to the IWW (MSA 434C) or the beach south of Ponce DeLeon Inlet.

f. Description of Disposal Method. The material used for the jetty extension can be placed either from a barge, by trucking to the site or a combination of both. Material from the IWW will be disposed of by pipeline dredge.

II. FACTUAL DETERMINATIONS

a. Physical Substrate Determinations.

(1) Substrate Elevation and Slope. The jetty extension will be on gently sloping sandy bottom in water between -15 and -30 feet mlw. The revetment will be on gently sloping sandy uplands and some wetlands between -3 feet and +15 feet mlw. The IWW will be deepened from -12 feet to -16 feet.

(2) Sediment Type. Sand and shell.

(3) Fill Material Movement. Because of the nature of the material there is expected to be no movement.

(4) Physical Effect on Benthos. Any benthic organisms at the site will be covered. Losses at the site of the jetty extension are expected to be minimal because of the shifting nature of the sandy bottom. At the site of revetment construction some wetland organisms will be lost. Benthic organisms at the dredge site will be killed, but rapid recovery of the community is expected.

(5) Other effects. Some wetland vegetation and associated organisms will be lost at the site of revetment construction. Environmental impacts at the site, other than loss of benthic organisms are expected to be minimal.

b. Water Circulation, Fluctuation and Salinity Determinations. The main purpose of the south jetty extension is to effect a change in water circulation patterns in the inlet and in the vicinity of the inlet entrance. Water fluctuation and salinity will not be affected. As with the jetty extension, the purpose of the revetment is to control water circulation within the inlet. Water fluctuation and salinity will not be affected.

c. Suspended Particulate/Turbidity Determinations

(1) Expected Changes in Suspended Particulates and Turbidity Levels in the Vicinity of the Disposal Sites. Except for minor bottom disturbance at the south jetty extension site, little or no turbidity is expected. At the site of revetment construction there may be short-term increases in suspended particulate/turbidity during construction, as will be the situation at the dredge site. Levels are not expected to exceed State standards.

(2) Effects (degree and duration) on Chemical and Physical Values.

(a) Light Penetration. No difference in light penetration at the south jetty extension is expected. Some slight reduction may occur adjacent to the revetment construction and dredge site but should be of very short duration.

(b) Dissolved Oxygen. Dissolved oxygen (DO) levels should be unaffected by construction activities at the south jetty extension, revetment construction site or the dredge and disposal sites.

(c) Toxic Metals and Organics. No effect expected.

(d) Pathogens. Not applicable.

(e) Aesthetics. The proposed north jetty extension and revetment through Lighthouse Point Park will be approximately 12 feet above mean low water very visible and will drastically alter the existing aesthetics. As proposed, it will contrast sharply with the existing sandy inlet beach. The park scrub and marsh/mangrove areas will be visually degraded by the jetty extension and revetment. Measures to decrease the visual effects including covering much of the revetment with sand and replanting native vegetation. Extension of the south jetty and dredging of the IWW should have little or no adverse aesthetic impacts.

(f) Others as Appropriate. None.

d. Contaminant Determinations. No sources of pollution have been identified in the project area; therefore, no contaminants are expected to be encountered.

e. Aquatic Ecosystem and Organism Determinations.

(1) Effects on Plankton. None expected.

(2) Effects on Benthos. Benthos at the construction and dredging sites will be lost. Rapid recovery is expected.

(3) Effects on Nekton. No significant impacts expected.

(4) Effects on Aquatic Food Web. No significant adverse impacts to the food web are expected.

(5) Effects on Special Aquatic Sites.

(a) Sanctuaries and Refuges. Ponce DeLeon Inlet is in unit P08 of the Coastal Barrier Resource System. The U.S. Fish and Wildlife Service has determined that the proposed project features are exempt under Section 6(a)(2) of the Coastal Barrier Improvement Act (CIBA) and /or Section 6(a)(6F) of the Coastal Barrier Resource Act (CBRA).

(b) Wetlands. Approximately 2.1 acres of wetlands will be lost during revetment construction. This will be offset by protection of 4.5 acres of wetlands which otherwise would be lost to erosion. No wetlands will be affected by dredging.

(c) Mud Flats. Changes in current patterns in and adjacent to the inlet may affect mud flats in the area. Whether there will be a gain or loss is not known at this time.

(d) Vegetated Shallows. no impacts expected.

(e) Coral Reefs. Not applicable.

(f) Riffle and Pool Complexes. Not Applicable.

(g) Threatened and Endangered Species. The ranges of a number of listed species include the project area. Where appropriate, protective measures will be taken.

(h) Other Wildlife. Some smaller animals may be affected by habitat loss at the site of revetment construction.

(i) Actions to Minimize Impacts. Standard precautions will be taken to avoid impacting listed species.

f. Proposed Disposal Site Determinations.

(1) Mixing Zone Determination. Not applicable.

(2) Determination of Compliance with Applicable Water Quality Standards. Construction activities will comply with State Water Quality Standards.

(3) Potential Effects on Human Use Characteristic. No adverse impacts expected.

(a) Municipal or Private Water Supply. No affect.

(b) Recreational and Commercial Fisheries. No adverse impacts expected.

(c) Water Related Recreation. By increasing the stability of the inlet water related recreational activities will be afforded increased protection.

(d) Aesthetics. The proposed north jetty extension and revetment placement westward through Lighthouse Point Park will be approximately 12 feet above mean low water, highly visible and drastically alter the existing aesthetics. As proposed, it will contrast sharply with the existing sandy inlet beach. The park scrub and marsh/mangrove areas will also be visually degraded by the jetty extension and revetment. Measures to lessen the visual impact include partially covering the rock with sand and planting native vegetation.

(e) Parks, National and Historic Monuments, National Seashores, Wilderness Areas, Research Sites and Similar Preserves. Ponce DeLeon Inlet is in unit P08 of the Coastal Barrier Resource System. The U.S. Fish and Wildlife Service has determined that the proposed project features are exempt under Section 6(a)(2) of the Coastal Barrier Improvement Act (CIBA) and /or Section 6(a)(6F) of the Coastal Barrier Resource Act.

g. Determination of Cumulative Effects on the Aquatic Ecosystem. Over the long term stabilization of the inlet will reduce the cumulative effects of frequent maintenance dredging operations and result in a more stable ecosystem in the area.

h. Determination of Secondary Effects on the Aquatic Ecosystem. Secondary effects on the aquatic ecosystem will be stabilization of the system.

APPENDIX B
PONCE DELEON INLET NAVIGATION IMPROVEMENTS
FLORIDA COASTAL ZONE CONSISTENCY PROGRAM
FEDERAL CONSISTENCY EVALUATION PROCEDURE

1. Chapter 161, Beach and Shore Preservation: The intent of the coastal construction permit program established by this chapter is to regulate construction projects located seaward of the line of mean high water and which might have an effect on natural shoreline processes.

Consistency Statement: The purpose of the proposed action is to stabilize the navigation channel and inlet at Ponce DeLeon Inlet, Volusia County, Florida. It is intended to alter the pattern of water and, as a result, sand movement in and through the inlet. Information will be submitted to the State for a permit in compliance with this chapter.

2. Chapters 186 and 187, State and Regional Planning: These chapters establish the State Comprehensive Plan which sets goals that articulate a strategic vision of the State's future. It's purpose is to define in a broad sense, goals and policies that provide decision-makers directions for the future and long-range guidance for orderly social, economic and physical growth.

Consistency Statement: The work has been coordinated with the State without objection.

3. Chapter 252, Disaster Preparation, Response and Mitigation: This chapter creates a State Emergency Management Agency, with authority to provide for the common defense; to protect the public peace, health and safety; and to preserve and protect the lives and property of the people of Florida.

Consistency Statement: Stabilization of the inlet and navigation channel will enhance use of the inlet for boaters seeking sanctuary during periods of rough weather. Under present conditions, during such occasions the unstable inlet exacerbates dangerous boating conditions for those seeking shelter. Therefore, this work would be consistent with the efforts of Division of Emergency Management.

4. Chapter 253, State Lands: This chapter governs the management of submerged State lands and resources within State lands. This includes archeological and historical resources; water resources; fish and wildlife resources; beaches and dunes; submerged grass beds and other benthic communities; swamps, marshes and other wetlands; mineral resources; unique natural features; submerged lands; spoil islands; and, artificial reefs.

Consistency Statement: Maintenance dredging, jetty construction and use of local disposal areas have been previously been performed. The use of these State lands has previously been approved by the State. The proposed activity has been coordinated with the State and appropriate State permits will be obtained. The proposed action would comply with the intent of this chapter.

5. Chapters 253, 259,260 and 375, Land Acquisition: These chapters authorizes the State to acquire land to protect environmentally sensitive areas.

Consistency Statement: As the property is already in public ownership, these chapters do not apply.

6. Chapter 258, State Parks and Aquatic Preserves. This chapter authorizes the State to manage State parks and preserves. Consistency with this chapter would include consideration of projects that would directly or indirectly adversely impact park property, natural resources, park programs or management or operations.

Consistency Statement: The proposed action will not affect State parks or preserves, and is consistent with the intent of this chapter.

7. Chapter 267, Historic Preservation: This chapter establishes the procedures for implementing the Florida Historic Resources Act responsibilities.

Consistency Statement: The construction of revetment and extension of the south jetty has been coordinated with the State Historic Preservation Officer and a magnetometer survey conducted. The work will be consistent with the goals of this chapter.

8. Chapter 288, Economic Development and Tourism: This chapter directs the State to provide guidance and promotion of beneficial development through the encouragement of economic diversification and promotion of tourism.

Consistency Statement: The stabilization of the inlet will encourage increased tourist and recreational use of facilities such as party boats at nearby marinas and increased use of recreational boats by individuals previously concerned about unsafe conditions in the inlet. Therefore, the work is consistent with the goals of this chapter.

9. Chapters 334 and 339, Public Transportation: This chapter authorizes the planning and development of a safe and efficient transportation system.

Consistency Statement: The proposed action will not adversely affect public transportation.

10. Chapter 370, Living Saltwater Resources: This chapter directs the State to preserve, manage and protect the marine, crustacean, shell and anadromous fishery resources in State waters; to protect and enhance the marine and estuarine environment; to regulate fishermen and vessels of the state engaged in the taking of such resources within or without state waters; to issue licenses for the taking and processing of fisheries products; to secure and maintain statistical records of the catch of each such species; and to conduct scientific, economic and other studies and research.

Consistency Statement: The stabilization of the inlet will not adversely affect such activities and is consistent with the goals of this chapter.

11. Chapter 372, Living Land and Freshwater Resources: This chapter establishes the Game and Freshwater Fish Commission and directs it to manage freshwater aquatic life and wild animal life and their habitat to perpetuate a diversity of species with densities and distributions which provide sustained ecological, recreational, scientific, educational, aesthetic and economic benefits.

Consistency Statement: Some upland habitat will be lost by constructing the revetment; However, additional acreage will be saved from erosion loss. Therefore, the work will comply with the goals of this chapter.

12. Chapter 373, Water Resources: This chapter provides the authority to regulate the withdrawal, diversion, storage and consumption of water.

Consistency Statement: This work does not involve water resources as described by this chapter.

13. Chapter 376, Pollutant Spill Prevention and Control: This chapter regulates the transfer, storage and transportation of pollutants and the cleanup of pollutant discharges.

Consistency Statement: This work does not involve the transportation or discharge of pollutants. Conditions will be placed in the contract to handle inadvertent spills of pollutants such as vehicle fuels. The proposed action will comply with this chapter.

14. Chapter 377, Oil and Gas Exploration and Production: This chapter authorizes the regulation of all phases of exploration, drilling and production of oil, gas and other petroleum products.

Consistency Statement: The proposed action does not involve the exploration, drilling or production of oil, gas or other petroleum products and therefore does not apply.

15. Chapter 380, Environmental Land and Water Management: This chapter establishes criteria and procedures to assure that local land development decisions consider the regional impact of large-scale development.

Consistency Statement: The proposed action has been coordinated with the local regional planning council. The work will conform with the goals of this chapter.

16. Chapter 388, Arthropod Control: This chapter provides for a comprehensive approach for abatement or suppression of mosquitoes and other arthropod pests within the state.

Consistency Statement: The proposed action will be consistent with the goals of this chapter.

17. Chapter 403, Environmental Control: This chapter authorizes the regulation of pollution of the air and waters of the State by the Department of Environmental Protection.

Consistency Statement: Appropriate State permits will be obtained for this project.

18. Chapter 582, Soil and Water Conservation: This chapter establishes policy for the conservation of State soils and water through the Department of Agriculture. Land use policies will be evaluated in terms of their tendency to cause or contribute to soil erosion or to conserve, develop and utilize soil and water resources both on-site or on adjoining properties affected by the work. Particular attention will be given to work on or near agricultural lands.

Consistency Statement: The proposed work is not located near agricultural lands. Therefore, this chapter does not apply.

Appendix C
Correspondence



STATE OF FLORIDA

DEPARTMENT OF COMMUNITY AFFAIRS

"Helping Floridians create safe, vibrant, sustainable communities"

LAWTON CHILES
Governor

November 25, 1998

JAMES F. MURLEY
Secretary

Mr. Michael A. Moore
Department of the Army
Jacksonville District Corps of Engineers
Post Office Box 4970
Jacksonville, Florida 32232-0019

RE: Department of the Army - Draft Environmental Assessment and
Draft Feasibility Report for the Navigation Channel
Improvements at Ponce DeLeon Inlet - Volusia County, Florida
SAI: FL9809230638C

Dear Mr. Moore:

The Florida State Clearinghouse, pursuant to Presidential Executive Order 12372, Gubernatorial Executive Order 95-359, the Coastal Zone Management Act, 16 U.S.C. §§ 1451-1464, as amended, and the National Environmental Policy Act, 42 U.S.C. §§ 4321, 4331-4335, 4341-4347, as amended, has coordinated a review of the above-referenced project.

Based on the information contained in the draft environmental assessment and the draft feasibility report and the enclosed comments provided by our reviewing agencies, the state has determined that, at this stage, the above-referenced project is consistent with the Florida Coastal Management Program (FCMP). All subsequent environmental documents prepared for this project must be reviewed to determine the project's continued consistency with the FCMP. The state's continued concurrence with the project will be based, in part, on the adequate resolution of issues identified during this and subsequent reviews. Comments received from the East Central Florida Regional Planning Council are also enclosed for your review.

Thank you for the opportunity to review this project. ~~If~~ you have any questions regarding this letter, please contact Ms. Cherie Trainor, Clearinghouse Coordinator, at (850) 922-5438.

Sincerely,

A handwritten signature in cursive script, appearing to read "R. Cantral".

Ralph Cantral, Executive Director
Florida Coastal Management Program

RC/cc

Enclosures

cc: Teri Bryant-Hunalp, East Central Florida Regional Planning
Council

2555 SHUMARD OAK BOULEVARD • TALLAHASSEE, FLORIDA 32399-2100
Phone: 850.488.8466/Suncom 278.8466 FAX: 850.921.0781/Suncom 291.0781
Internet address: www.state.fl.us/comaff/dca

FLORIDA KEYS
Area of Critical State Concern Field Office
2796 Overseas Highway, Suite 212
Marathon, Florida 33050-2227

GREEN SWAMP
Area of Critical State Concern Field Office
205 East Main Street • Suite 104
Bartow, Florida 33830

COUNTY: State

DATE: 09/23/1998

COMMENTS DUE-2 WKS: 10/08/1998

CLEARANCE DUE DATE: 11/06/1998

SAI#: FL9809230638C

Message:

STATE AGENCIES

WATER MANAGEMENT DISTRICTS

OPB POLICY UNITS

- X Agriculture
- Community Affairs
- Environmental Protection
- Game and Fresh Water Fish Comm
- Marine Fisheries Commission
- OTTED
- State
- Transportation

St. Johns River WMD

Environmental Policy/C & ED

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The attached document requires a Coastal Zone Management Act/Florida Coastal Management Program consistency evaluation and is categorized as one of the following:

- Federal Assistance to State or Local Government (15 CFR 930, Subpart F). Agencies are required to evaluate the consistency of the activity.
- X Direct Federal Activity (15 CFR 930, Subpart C). Federal Agencies are required to furnish a consistency determination for the State's concurrence or objection.
- Outer Continental Shelf Exploration, Development or Production Activities (15 CFR 930, Subpart E). Operators are required to provide a consistency certification for state concurrence/objection.
- Federal Licensing or Permitting Activity (15 CFR 930, Subpart D). Such projects will only be evaluated for consistency when there is not an analogous state license or permit.

Project Description:

Department of the Army - Draft Environmental Assessment and Draft Feasibility Report for the Navigation Channel Improvements at Ponce DeLeon Inlet - Volusia County, Florida.

To: Florida State Clearinghouse
 Department of Community Affairs
 2555 Shumard Oak Boulevard
 Tallahassee, FL 32399-2100
 (850) 922-5438 (SC 292-5438)
 (850) 414-0479 (FAX)

EO. 12372/NEPA

- No Comment
- Comments Attached
- Not Applicable

Federal Consistency

- No Comment/Consistent
- Consistent/Comments Attached
- Inconsistent/Comments Attached
- Not Applicable

Florida Division of Forestry
 Forest Resource Planning
 & Support Services Bureau
 3125 Conner Boulevard
 Tallahassee, Florida 32399-1650

From: _____
 Division/Bureau: _____
 Reviewer: _____
 Date: 9/29/98

COUNTY: State

DATE: 09/23/1998

COMMENTS DUE-2 WKS: 10/08/1998

CLEARANCE DUE DATE: 11/06/1998

SAI#: FL9809230638C

Message:

STATE AGENCIES

WATER MANAGEMENT DISTRICTS

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 OCT 08 1998
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 OFFICE OF ENVIRONMENTAL SERVICES

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 (850) 414-0479 (FAX)

EO. 12372/NEPA

Federal Consistency

- No Comment
- Comments Attached
- Not Applicable

- No Comment/Consistent
- Consistent/Comments Attached
- Inconsistent/Comments Attached
- Not Applicable

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From:
 Division/Bureau: F&FWFC
 Reviewer: [Signature]
 Date: 10/6/98

COUNTY: State

DATE: 09/23/1998

COMMENTS DUE-2 WKS: 10/08/1998

CLEARANCE DUE DATE: 11/06/1998

SAI#: FL9809230638C

Message:

STATE AGENCIES

WATER MANAGEMENT DISTRICTS

OPB POLICY UNITS

- Agriculture
- Community Affairs
- Environmental Protection
- Game and Fresh Water Fish Comm
- X Marine Fisheries Commission
- OTTED
- State
- Transportation

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SEP 28 1998

MARINE FISHERIES COMMISSION

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 (850) 414-0479 (FAX)

EO. 12372/NEPA

Federal Consistency

- No Comment
- Comments Attached
- Not Applicable

- No Comment/Consistent
- Consistent/Comments Attached
- Inconsistent/Comments Attached
- Not Applicable

MARINE FISHERIES COMMISSION
 2540 EXECUTIVE CENTER CIRCLE WEST
 SUITE 108
 TALLAHASSEE, FL 32301

From: _____
 Division/Bureau: _____
 Reviewer: *Ruby Sheehy*
 Date: *9/28/98*

COUNTY: State

DATE: 09/23/1998

COMMENTS DUE-2 WKS: 10/08/1998

CLEARANCE DUE DATE: 11/06/1998

SAI#: FL9809230638C

Message:

STATE AGENCIES

WATER MANAGEMENT DISTRICTS

OPB POLICY UNITS

Agriculture
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- Not Applicable

Federal Consistency

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- Consistent/Comments Attached
- Inconsistent/Comments Attached
- Not Applicable

From: Division/Bureau: OTTED
 Reviewer: M Blakeslee
 Date: 9/26/98

COUNTY: State

DATE: 09/23/1998

COMMENTS DUE-2 WKS: 10/08/1998

CLEARANCE DUE DATE: 11/06/1998

SAI#: FL9809230638C

Message:

STATE AGENCIES

WATER MANAGEMENT DISTRICTS

OPB POLICY UNITS

Agriculture
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 Marine Fisheries Commission
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- Inconsistent/Comments Attached
- Not Applicable

From:

Division/Bureau: DIVISION OF HISTORICAL RESOURCES
 Reviewer: [Signature] Laura Q. Kammann
 Date: 11/19/98

COUNTY: State

DATE: 09/23/1998
COMMENTS DUE-2 WKS: 10/08/1998
CLEARANCE DUE DATE: 11/06/1998
SAI#: FL9809230638C

Message:

- STATE AGENCIES**
- Agriculture
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 - Game and Fresh Water Fish Comm
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WATER MANAGEMENT DISTRICTS

St. Johns River WMD

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- Inconsistent/Comments Attached
- Not Applicable

FROM: Florida Department of Transportation
Division/Bureau: _____
Reviewer: Jim Hayden 9/29/98
Date: _____
Jim Hayden, Systems Planning Supervisor Date

C

COUNTY: State

DATE: 09/23/1998

COMMENTS DUE-2 WKS: 10/08/1998

CLEARANCE DUE DATE: 11/06/1998

SAI#: FL9809230638C

Message:

STATE AGENCIES

WATER MANAGEMENT DISTRICTS

OPB POLICY UNITS

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OFFICE OF PLANNING
 & BUDGETING
 ENVIRONMENTAL POLICY UNIT

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Department of the Army - Draft Environmental Assessment and Draft Feasibility Report for the Navigation Channel Improvements at Ponce DeLeon Inlet - Volusia County, Florida.

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- Not Applicable

- No Comment/Consistent
- Consistent/Comments Attached
- Inconsistent/Comments Attached
- Not Applicable

Fr

Division/Bureau: OPB/Environmental Unit
 Reviewer: Caroline [Signature]
 Date: 11-9-98

East Central Florida
REGIONAL
PLANNING
COUNCIL

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OCT 15 1998

13 October, 1998

Ms. Cherie L Trainor
Coordinator
State of Florida Clearinghouse
Florida State Clearinghouse
2555 Shumard Oak Boulevard
Tallahassee, FL 323992100

Subject: Department of the Army
ECFRPC# Volusia 106
SAI# FL9809230638C

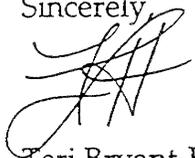
Dear Ms. Trainor:

In accordance with the Office of Planning and Budgeting Intergovernmental Coordination and Review Process, this office has conducted a clearinghouse review of the above referenced proposal.

Based on this review, the Council offers the following comments and/or recommendations:

The proposed project, as presented for review and when considered in its entirety, is consistent with the adopted Goals, Policies and Objectives of the East Central Florida Regional Planning Council.

Should there be any questions concerning this review, please contact the Project Review Division at the Council Office.

Sincerely,

Teri Bryant-Hunalp
Technical Assistant
Planning Services

TLH:JA

Council Chairman
Larry Whaley
Clerk of Courts
Osceola County

Vice Chairman
Evelyn Smith
Vice Mayor
City of Eustis

Secretary-Treasurer
Carole Barice
Governor's Appointee
Seminole County

Acting
Executive Director
Greg Gologowski, AICP

The Council's mission is to take a leadership role in representing identified regional resources and interests through a strategic planning program; develop and maintain a regional data system; provide coordination and assistance to governments at all levels; develop a shared vision of the region's future; and coordinate the region's resources and energies to achieve common goals.

Serving Brevard, Lake, Orange, Osceola, Seminole and Volusia counties and the 67 cities in the East Central Florida region.

1011 Wymore Road
Suite 105
Winter Park, Florida
32789-1797

Phone 407.623.1075
Fax 407.623.1084

Suncom 334.1075
Suncom Fax 334.1084

**FLOIDA STATE CLEARINGHOUSE
RPC INTERGOVERNMENTAL COORDINATION
AND RESPONSE SHEET**

SAI: FL9809230638C

DATE: 09/23/1998

COMMENTS DUE TO CLEARINGHOUSE: 10/23/1998

AREA OF PROPOSED ACTIVITY: COUNTY: State **RECEIVED SEP 23 1998**

FEDERAL ASSISTANCE DIRECT FEDERAL ACTIVITY FEDERAL LICENSE OR PERMIT OCS

PROJECT DESCRIPTION

Department of the Army - Draft Environmental Assessment and Draft Feasibility Report for the Navigation Channel Improvements at Ponce DeLeon Inlet - Volusia County, Florida.

ROUTING:

RPC

X E. Central FL RPC

PLEASE CHECK ALL THE LOCAL GOVERNMENTS BELOW FROM WHICH COMMENTS HAVE BEEN RECEIVED; ALL COMMENTS RECEIVED SHOULD BE INCLUDED IN THE RPC'S CLEARINGHOUSE RESPONSE PACKAGE. IF NO COMMENTS WERE RECEIVED, PLEASE CHECK "NO COMMENT" BOX AND RETURN TO CLEARINGHOUSE.

COMMENTS DUE TO RPC: 10/14/1998

NO COMMENTS:

(IF THE RPC DOES NOT RECEIVE COMMENTS BY THE DEADLINE DATE, THE RPC SHOULD CONTACT THE LOCAL GOVERNMENT TO DETERMINE THE STATUS OF THE PROJECT REVIEW PRIOR TO FORWARDING THE RESPONSE PACKAGE TO THE CLEARINGHOUSE.)

NOTES:

ALL CONCERNS OR COMMENTS REGARDING THE ATTACHED PROJECT (INCLUDING ANY RPC COMMENTS) SHOULD BE SENT IN WRITING BY THE DUE DATE TO THE CLEARINGHOUSE. PLEASE ATTACH THIS RESPONSE FORM AND REFER TO THE SAI # IN ALL CORRESPONDENCE.

IF YOU HAVE ANY QUESTIONS REGARDING THE ATTACHED PROJECT, PLEASE CONTACT THE STATE CLEARINGHOUSE AT (904) 922-5438 OR SUNCOM 272-5438.



STATE OF FLORIDA
DEPARTMENT OF COMMUNITY AFFAIRS

"Helping Floridians create safe, vibrant, sustainable communities"

LAWTON CHILES
Governor

JAMES F. MURLEY
Secretary

November 5, 1998

Mr. Michael A. Moore
Department of the Army
Jacksonville District Corps of Engineers
Post Office Box 4970
Jacksonville, Florida 32232-0019

RE: Department of the Army - Draft Environmental Assessment
and Draft Feasibility Report for the Navigation Channel
Improvements at Ponce DeLeon Inlet - Volusia County,
Florida
SAI: FL9809230638C

Dear Mr. Moore:

The Florida State Clearinghouse has been advised that our reviewing agencies require additional time to complete the review of the above-referenced project. In order to receive comments from all agencies, an additional fifteen days is requested for completion of the state's consistency review in accordance with 15 CFR 930.41(b). We will make every effort to conclude the review and forward the consistency determination to you on or before November 21, 1998.

Thank you for your understanding. If you have any questions regarding this matter, please contact Ms. Cherie Trainor, Clearinghouse Coordinator, at (850) 922-5438.

Sincerely,

Ralph Cantral, Executive Director
Florida Coastal Management Program

RC/cc

2555 SHUMARD OAK BOULEVARD • TALLAHASSEE, FLORIDA 32399-2100
Phone: 850.488.8466/Suncom 278.8466 FAX: 850.921.0781/Suncom 291.0781
Internet address: www.state.fl.us/comaff/dca

FLORIDA KEYS
Area of Critical State Concern Field Office
2796 Overseas Highway, Suite 212
Marathon, Florida 33050-2227

GREEN SWAMP
Area of Critical State Concern Field Office
205 East Main Street • Suite 104
Bartow, Florida 33830



PD-EL (B-0064) by

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Southeast Regional Office
9721 Executive Center Drive North
St. Petersburg, Florida 33702

October 19, 1998

Colonel Joe R. Miller, District Engineer
Jacksonville District Corps of Engineers
Planning Division, Environmental Branch
P.O. Box 4970
Jacksonville, Florida 32232-0019

Dear Colonel Miller:

The National Marine Fisheries Service (NMFS) has reviewed, as requested by your staff on September 21, 1998, the Draft Finding of No Significant Impact, Draft Environmental Assessment, and Draft Feasibility Report for proposed navigation improvements at Ponce DeLeon Inlet, Volusia County, Florida. Various alternatives to improve navigation and safety within the inlet were investigated with the selected plan calling for a 1000-foot seaward extension of the existing south jetty.

The subject documents adequately identify and assess the potential impacts to NMFS trust resources that could occur from implementation of the various alternatives examined. The NMFS concurs with the findings which indicate that adverse impacts to living marine resources would be minimal from implementation of the selected plan. If we can be of further assistance, please advise. Related comments, questions or correspondence should be directed to Mr. David N. Dale in St. Petersburg, Florida. He may be contacted at 727/570-5317 or at the letterhead address above.

Sincerely,

Andreas Miager, Jr.
Assistant Regional Administrator
Habitat Conservation Division

cc:
F/SER4
F/SER43
EPA-Atlanta
FWS-Jacksonville





UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Southeast Regional Office
9721 Executive Center Drive North
St. Petersburg, FL 33702
(727) 570-5312; FAX (727) 570-5517

OCT 1 1998

F/SER3:EGH:jbm

Lieutenant Colonel Michael A. Moore, USA
Acting Chief, Planning Division
Jacksonville District Corps of Engineers
P.O. Box 4970
Jacksonville, FL 32232-0019

Dear Colonel Moore:

This responds to your September 21, 1998 request for comments on the September 1998 draft feasibility report entitled Navigation Study for Ponce de Leon Inlet, Florida. This plan for navigation improvements at Ponce de Leon Inlet provides for construction of a 1,000-foot extension to the south jetty, with a scour apron.

Our Protected Resources Division reviewed the navigation project in September 1996 when the Corps requested consultation under section 7 of the Endangered Species Act of 1973 (ESA). At that time the Corps submitted a Biological Assessment (BA) pursuant to section 7 of the ESA. We reviewed the BA and concurred with the Corps' determination that populations of endangered or threatened species under our purview would not be adversely affected by the proposed project. This concurrence was based in part on the protective measures called for in the BA. The present project described in the navigation study document has been pared down from the original proposal we consulted on. Essentially, only extension of the south jetty and construction of the scour apron remains. If anything, this project is *less* likely to adversely affect listed species under NMFS jurisdiction. Therefore, our original conclusions are unchanged, assuming the original protective measures are enforced.

Ponce de Leon Inlet is regularly maintained using hopper dredges, though the Navigation Study states that no maintenance dredging is scheduled until after 1999. Any dredging involved in this project would be subject to the August 25, 1995 biological opinion on dredging in the Southeastern United States.

This concludes COE consultation responsibilities with NMFS under section 7 of the ESA. However, consultation should be reinitiated if new information reveals impacts of the identified activity that may affect listed species or their critical habitat, a new species is listed, the



identified activity is subsequently modified or critical habitat determined that may be affected by the proposed activity. If you have any questions, please contact Eric Hawk at 727/570-5312.

Sincerely yours,

for 
Andrew J. Kemmerer
Regional Administrator

cc: F/SER4 - A. Mager
F/PR3



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Southeast Regional Office
9721 Executive Center Drive North
St. Petersburg, Florida 33702

October 19, 1998

Colonel Joe R. Miller, District Engineer
Jacksonville District Corps of Engineers
Planning Division, Environmental Branch
P.O. Box 4970
Jacksonville, Florida 32232-0019

Dear Colonel Miller:

The National Marine Fisheries Service (NMFS) has reviewed, as requested by your staff on September 21, 1998, the Draft Finding of No Significant Impact, Draft Environmental Assessment, and Draft Feasibility Report for proposed navigation improvements at Ponce DeLeon Inlet, Volusia County, Florida. Various alternatives to improve navigation and safety within the inlet were investigated with the selected plan calling for a 1000-foot seaward extension of the existing south jetty.

The subject documents adequately identify and assess the potential impacts to NMFS trust resources that could occur from implementation of the various alternatives examined. The NMFS concurs with the findings which indicate that adverse impacts to living marine resources would be minimal from implementation of the selected plan. If we can be of further assistance, please advise. Related comments, questions or correspondence should be directed to Mr. David N. Dale in St. Petersburg, Florida. He may be contacted at 727/570-5317 or at the letterhead address above.

Sincerely,

Andreas Mager, Jr.
Assistant Regional Administrator
Habitat Conservation Division

cc:
F/SER4
F/SER43
EPA-Atlanta
FWS-Jacksonville





UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

OCT 9 1993

District Engineer, Jacksonville
P.O. Box 4970
Jacksonville, FL 32232

Attn.: Mr. Rea N. Boothby

Subject: Environmental Assessment (EA) and Finding of No
Significant Impact (FONSI) for the Improvements to
Ponce Deleon Inlet Navigation, Volusia County, FL

Dear Sir:

Pursuant to Section 309 of the Clean Air Act, EPA, Region 4 has reviewed the subject document which discusses the immediate impacts and long-term consequences of lengthening the south jetty approximately 1000 feet. This action is an attempt to stabilize the entrance and inner channels between the Intracoastal Waterway and the Atlantic Ocean. This in turn should improve boating safety in the vicinity of the Inlet where numerous groundings have been reported.

The scope/consequences of the action appear to be within acceptable limits in order to achieve project objectives. Overall, we have no significant objections to the use of an EA to evaluate the consequences of the proposal rather than the more comprehensive environmental impact statement format.

Thank you for the opportunity to comment on ~~this action~~. If we can be of further assistance in this matter, Dr. Gerald Miller (404-562-9626) will serve as initial point of contact.

Sincerely,

A handwritten signature in cursive script that reads "Heinz J. Mueller".

Heinz J. Mueller, Chief
Office of Environmental Assessment



United States Department of the Interior

FISH AND WILDLIFE SERVICE
6620 Southpoint Drive South
Suite 310
Jacksonville, Florida 32216-0912

IN REPLY REFER TO:
FWS/R4/ES-JAFL

FEB 17 1998

Colonel Joe R. Miller
District Engineer
U.S. Army Corps of Engineers
P.O. Box 4970
Jacksonville, Florida 32232-0019

Attn: Planning Division

Dear Colonel Miller:

Thank you for your December 18, 1997, letter regarding lighting requirements under the sea turtle incidental take statements for several beach nourishment projects. In your letter you identified problems associated with the restricted lighting requirements and requested that the red filters and low pressure sodium lighting requirements be deleted from all existing and future beach nourishment projects. The Fish and Wildlife Service's South Florida Ecosystem Office has already responded regarding projects within its area of jurisdiction. This letter addresses three projects you identified within the Jacksonville Field Office's area of jurisdiction: Ponce de Leon Inlet Navigation, Nassau County Shore Protection Program, and Brevard County Shore Protection Program.

The Service revises the Terms and Conditions regarding project-associated lighting for the Ponce de Leon Inlet Navigation and Nassau County Shore Protection Program projects to read as follows:

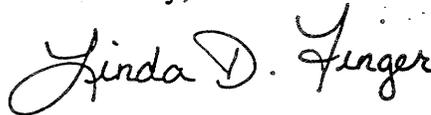
From April 15 through November 30, all on-beach lighting associated with the project shall be limited to the immediate area of active construction only. Shielded low pressure sodium vapor lights are recommended to minimize illumination of the nesting beach and nearshore waters. Lighting on offshore equipment shall be minimized through reduction, shielding, lowering, and appropriate placement of lights to avoid excessive illumination of the water, while meeting all U.S. Coast Guard and OSHA requirements. Shielded low pressure sodium vapor lights are highly recommended for lights on offshore equipment that cannot be eliminated.

The Service revises the Term and Condition regarding project-associated lighting for the Brevard County Shore Protection Program project to read as follows:

From March 1 through April 30 and November 1 through November 30, all on-beach lighting associated with the project shall be limited to the immediate area of active construction only. Shielded low pressure sodium vapor lights are recommended to minimize illumination of the nesting beach and nearshore waters. Lighting on offshore equipment shall be minimized through reduction, shielding, lowering, and appropriate placement of lights to avoid excessive illumination of the water, while meeting all U.S. Coast Guard and OSHA requirements. Shielded low pressure sodium vapor lights are highly recommended for lights on offshore equipment that cannot be eliminated.

Please contact Don Palmer of our office at (904)232-2580 (extension 115) if you have any questions.

Sincerely,



for David L. Hankla
Field Supervisor

cc: Sandy MacPherson, Fish and Wildlife Service, Jacksonville, FL
David Arnold, Florida Department of Environmental Protection, Tallahassee, FL



FLORIDA DEPARTMENT OF STATE
Sandra B. Mortham
Secretary of State
DIVISION OF HISTORICAL RESOURCES

August 27, 1997

Mr. Dennis R. Duke
Planning Division, Environmental Branch
Jacksonville District, Corps of Engineers
P.O. Box 4970
Jacksonville, Florida 32232-0019

In Reply Refer To:
Scott B. Edwards
Historic Sites Specialist
Project File No. 973791

RE: Cultural Resource Assessment Request
Florida Inland Navigation District (FIND)
Two Proposed Dredged Material Management Area (DMMA)
MSA 434/434C North and MSA 434/434C South
Volusia County, Florida

Dear Mr. Duke:

In accordance with the procedures contained in 36 C.F.R., Part 800 ("Protection of Historic Properties"), we have reviewed the referenced projects for possible impact to historic properties listed, or eligible for listing, in the *National Register of Historic Places*. The authority for this procedure is the National Historic Preservation Act of 1966 (Public Law 89-665), as amended.

A review of the Florida Master Site File indicates that no significant archaeological or historical sites are recorded for or likely to be present within the project area. Furthermore, because of the project location and/or nature it is unlikely that any such sites will be affected. Therefore, it is the opinion of this office that the proposed project will have no effect on historic properties listed, or eligible for listing, in the *National Register of Historic Places*.

If you have any questions concerning our comments, please do not hesitate to contact us. Your interest in protecting Florida's historic properties is appreciated.

Sincerely,

For George W. Percy, Director
Division of Historical Resources
and
State Historic Preservation Officer

GWP/Ese

DIRECTOR'S OFFICE

R.A. Gray Building • 500 South Bronough Street • Tallahassee, Florida 32399-0250 • (850) 488-1480
FAX: (850) 488-3353 • WWW Address <http://www.dos.state.fl.us>

ARCHAEOLOGICAL RESEARCH
(850) 488-3353 • FAX: 488-3353

HISTORIC PRESERVATION
(850) 487-2333 • FAX: 922-0496

HISTORICAL MUSEUMS
(850) 488-1484 • FAX: 921-2503



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Southeast Regional Office
9721 Executive Center Drive North
St. Petersburg, Florida 33702

April 16, 1997

Colonel Terry Rice
District Engineer, Jacksonville District
Department of the Army, Corps of Engineers
Planning Division, Environmental Branch
P.O. Box 4970
Jacksonville, Florida 32232-0019

Dear Colonel Rice:

The National Marine Fisheries Service (NMFS) has reviewed your staff's letter, dated March 18, 1997, requesting comments and study objectives for proposed navigation improvements at Ponce DeLeon Inlet, Volusia County, Florida. The Corps of Engineers (COE) has been studying a series of alternatives to address navigation problems which have occurred since project construction was completed in July 1972. In addition to navigation problems, the COE is now studying the feasibility of deepening portions of the south channel and Atlantic Intracoastal Waterway from 12-foot deep to 16-foot deep to accommodate a proposed commercial marina at the old Swoope Power Plant site.

Deepening and/or widening navigation channels at Ponce DeLeon Inlet could adversely affect living marine resources for which we are responsible. The project area contains wetlands and other aquatic habitats that are recognized by the NMFS as public trust resources that provide habitat and water quality functions that are essential to maintaining viable recreational and commercial fisheries in the Halifax River and Indian River North/Mosquito Lagoon ecosystems. Freshwater, brackish and salt marshes, mangrove wetlands, shellfish reefs, tidal flats and seagrasses could be affected by the proposed action.

In its March 1995 Status Report to the NMFS's Regional Administrator, the COE identified data gathering activities undertaken for a model study and physical model of the proposed navigational improvements at Ponce DeLeon Inlet. These models should be modified or new models constructed to assess the impact of the proposed action. Impacts on tidal flows, freshwater input flows, currents and salinity regimes should be addressed. The NMFS is concerned, for instance, that altering salinity regimes could have significant effects on the existing environments within the Inlet. The conversion or loss of emergent wetlands or seagrasses could occur and the physical/chemical components of niches could be lost thus impacting food-chain and population dynamics. For example, oyster drills could be introduced into shellfish areas which were previously protected from predation by salinity barriers.



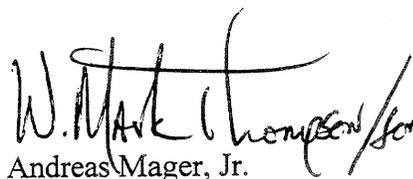
In view of the above, the NMFS recommends that in its study the COE should address the following:

- 1). The alternatives to the proposed action;
- 2) The aquatic habitats within the Inlet and the potential direct (e.g. dredging) and indirect (e.g. modified salinity) alterations that may occur to various habitats;
- 3) The affect of habitat alterations from the proposed action on commercial and recreational fisheries in the area as well as the effect on ecologically important (i.e. food chain) species; and,
- 4) The alternatives available to compensate for the loss or alteration of aquatic habitats.

Also, it is our understanding that the proposed marina facility, which has prompted this study, has not received all necessary authorizations to be constructed including a Department of the Army permit pursuant to Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act. The NMFS has provided comments and recommendations to previous marina permit applications including recommendations to deny Department of the Army authorization of a marina at the Swoope Power Plant site. The need for the proposed action should be clearly identified prior to committing irretrievable resources to this project that would adversely affect living marine resources.

If we can be of further assistance, please advise. Related comments, questions or correspondence should be directed to Mr. David N. Dale of our Panama City Branch Office in St. Petersburg, Florida. He may be contacted at 813/570-5317 or at the letterhead address above.

Sincerely,



Andreas Mager, Jr.
Assistant Regional Director
Habitat Conservation Division

cc:

EPA,ATL
DEP,TALL
GFWFC,TALL
FWS,JACKSONVILLE
F/SEO2
F/SEO23-ST PETE



DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P. O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019



REPLY TO
ATTENTION OF

Planning Division
Environmental Branch

March 18, 1997

TO WHOM IT MAY CONCERN:

U.S. Army Corps of Engineers (Corps), Jacksonville District, is continuing to gather information to define issues and concerns that will be addressed in a feasibility-level report on proposed navigation improvements at Ponce DeLeon Inlet, Volusia County, Florida.

In letters dated September 29, 1992, and February 7, 1995, the Corps presented a series of alternatives for navigation improvements and requested views, comments and information regarding those alternatives. Responses were incorporated into the Reconnaissance Report and further comments will be considered in the Feasibility Report.

Subsequent to completion of the draft Feasibility Report, local interests proposed a new commercial marina and seafood processing facility to be constructed on county property adjacent to the Intracoastal Waterway in the vicinity of Rockhouse Creek. The local sponsor has requested that the Corps study the feasibility of expanding the Federal project to accommodate these facilities (see attached sheet for description).

The Corps welcomes your views, comments and any pertinent information about resources, study objectives and important features within the described study area, as well as any suggested improvements. Letters of comment or inquiry should be addressed to the letterhead address to the attention of Planning Division, Environmental Studies Section and received by this office within 30 days of the date of this letter.

Sincerely,

Hanley K. Smith
Acting Chief, Planning Division

Enclosure

**PONCE DELEON INLET
VOLUSIA COUNTY, FLORIDA
DESCRIPTION OF ADDITIONAL PROJECT FEATURES**

1.0 Proposed New Project Features. The Corps has been requested to consider additional project features for the Ponce DeLeon Inlet Navigation Improvements study. The proposal is to realign the southern portion of the Ponce DeLeon Inlet Federal channel in the Indian River to Cut-24 of the IWW and to deepen the existing IWW channel from Cut-24 north to the site of the old Swoope Power Plant site on the west side of the IWW north of Rockhouse Creek (Figure 1). The channel would be deepened from an authorized depth of 12 feet to 16 feet with a width of 125 feet for a distance of approximately 16,00 feet from Cut-24. About 360,000 cubic yards of beach quality material will be removed from the channel and placed on the beach south of Ponce DeLeon Inlet.

2.0 Proposed Docking and Marina Facilities. Local interests are proposing construction of commercial marina and seafood processing facilities on county property adjacent to the IWW to support part of the regional shrimp and fish fleet harvesting operations in nearby Atlantic Ocean waters (Figure 1). Docking facilities will be constructed to support berthing areas which are needed for offloading the catch and provisioning of the fleet. Additional landside facilities will include buildings or facilities to house and facilitate operation of seafood processing machinery, mainly for handling the catch from regional shrimp fisheries and the evolving fisheries for red and golden crabs. Anticipated requirements are for the construction of both docks and processing facilities to accommodate a fleet of both homeport and transient vessels with a combined total of 100 to 120 vessels of which 25 to 40 are expected to be in port at any given time. Facilities are being designed to accommodate about 35 vessels at one time. Therefore, total dockage requirements vary from a minimum of 700 feet to a more probable maximum of nearly 1100 feet. Of this total, approximately 500 to 550 feet of dockage will be built along the south side of an existing service canal on the north side of the site while the remaining footage will be built on the east side of the site along the IWW.

2.1 Docks will be constructed using one of two methods or a combination of both. One type will be of sheet pile construction with a concrete cap and solid backfill/underfill to provide a solid dock and bulkhead. The second type will be a concrete piling and cap constructed above and adjacent to (or in front of) riprap or armour stone. Landside facilities for commercial fishery operations will require one or two buildings or similar facilities each of approximately 25,000 to 35,000 square feet depending upon equipment requirements or configuration and refrigerated storage space. The width of these facilities will be about 130 feet.

2.2 In addition to the primary specifications of the processing buildings and dockage, there will likely be requirements on-site for the handling or storage of fishing equipment such as rigging or traps, ice production facilities for packing landside and aboard vessels and storage of fuel for vessel operations. Handling and/or shipment of marine food products by heavy trucks will probably require paving of the primary access road leading to the site as well as paving of wheeled vehicle access and marshaling areas on-site.

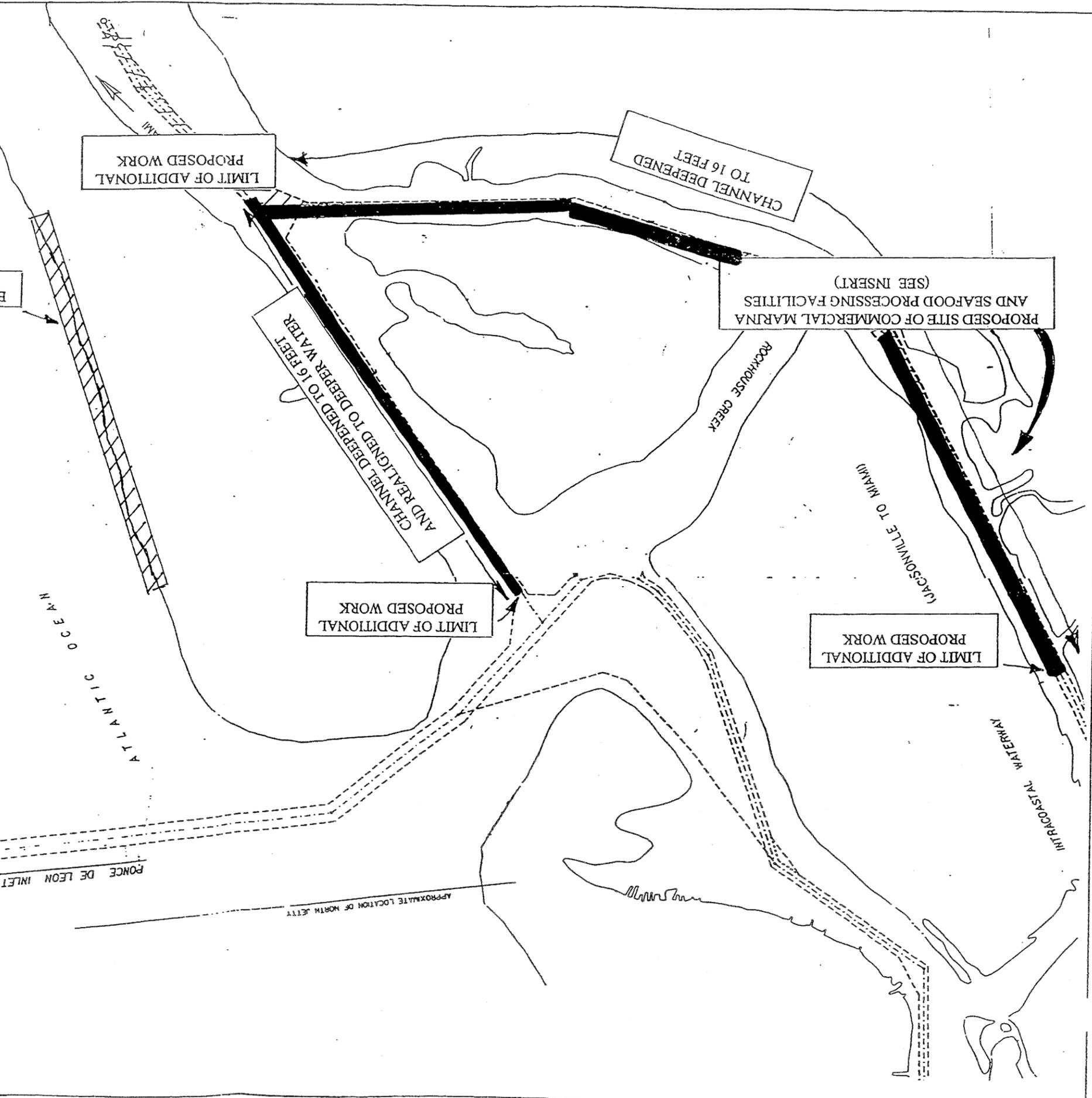
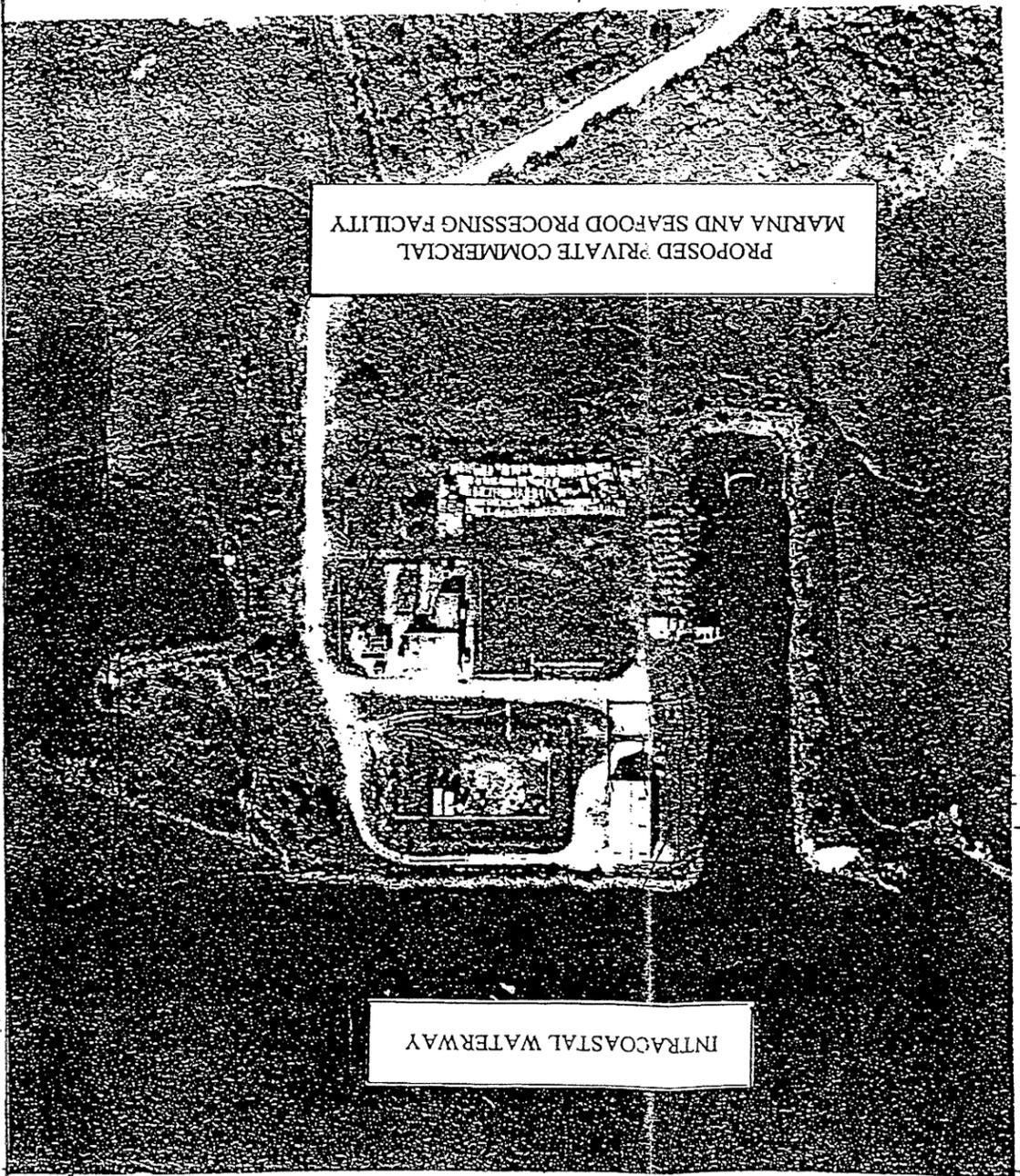


Figure 1
PONCE DE LEON INLET
PROPOSED ADDITIONAL PROJECT FEATURES

PONCE DE LEON INLET
MAILING LIST

Director
Office of Federal Activities (A-104)
Environmental Protection Agency
401 M Street SW
Washington, D.C. 20024-2610 (5 cys)

Director
Department of Commerce
NOAA/CS/EC/Room 6222
14 and Constitution Ave., NW
Washington, DC 20230 (4 cys)

Mr. Bruce Blanchard, Director
Office of Environmental Project
Review
Department of the Interior,
Room 4241
18th and C Streets, NW
Washington, D.C. 20240 (12 cys)

Executive Director
Advisory Council on Historic
Preservation
The Old Post Office Building
1100 Pennsylvania Avenue NW 809
Washington, D.C. 20004-2590

Florida Audubon Society
1101 Audubon Way
Maitland, FL 32751-5451

Mr. John Rains, Jr.
Isaak Walton League of America, Inc.
5314 Bay State Road
Palmetto, Florida 33561-9712

Field Supervisor
U.S. Fish and Wildlife Service
P. O. Box 2676
Vero Beach, FL 32961-2676

State Clearinghouse
Office Of Planning & Budgeting
Executive Office of the Governor
The Capitol
Tallahassee, FL 32301-8074 (16 cys)

Florida Wildlife Federation
P. O. Box 6870
Tallahassee, FL 32314-6870

Florida Defenders of the Environment
2606 NW 6th Street
Gainesville, FL 32609

State Conservationist
Soil Conservation Service
U.S. Department of Agriculture
401 First Ave., SE
P. O. Box 1280
Gainesville, FL 32602-1280

Regional Environmental Officer
Housing & Urban Development
Room 600-C
75 Spring St., SW
Atlanta, GA 30303-3309 (2 cys)

Mr. Heinz Mueller
Environmental Policy Section
EPA, Region Iv
345 Courtland Street, N.E.
Atlanta, GA 30365-2401 (5 cys)

Wilderness Society
4203 Ponce de Leon Boulevard
Coral Gables, FL 33416

State Director, ASCS
U.S. Department of Agriculture
P. O. Drawer 670
Gainesville, Florida 32602-0670

Dr. Elaine Harrington
Florida Chapter
Sierra Club
927 Delores Drive
Tallahassee, FL 32301-2929

National Marine Fisheries Service
Environmental Assessment Branch
3500 Delwood Beach Road
Panama City, FL 32407-7499

National Marine Fisheries Service
Office of the Regional Director
9450 Koger Boulevard
St. Petersburg, FL 33702-2496

National Marine Fisheries Service
Chief, Protected Species Branch
9450 Koger Boulevard
St. Petersburg, FL 33702-2496

Mr. Steve Fitch
Forest Supervisor
U.S. Forest Service
227 N. Bronough Street
Suite 4061
Tallahassee, Florida 32301

St. Johns River Water
Management District
P.O. Box 1429
Palatka, Florida 32178-1428

Mr. John Hutchinson
Lighthouse Boatyard
4958 S. Peninsula Dr.
Ponce Inlet
Daytona Beach, Florida 32127

Mr. Charlie Schammel
Critter Fleet
4950 S. Peninsula Dr.
Ponce Inlet, Florida 32127

Mr. Bob Stone
Critter Fleet
4950 S. Peninsula Dr.
Ponce Inlet, Florida 32127

Mr. Tim Garrett
Critter Fleet
4950 S. Peninsula Dr.
Ponce Inlet, Florida 32127

Mr. Carey St. Clair
Sea Love Marina
4884 Front St.
Ponce Inlet, Florida 32127

Mr. Greg DeBrango
King's Seafood
79 Dunlawton Avenue
Port Orange, Florida 32119

Mr. George C. Francis
King's Seafood
79 Dunlawton Avenue
Port Orange, Florida 32119

Mr. Oliver Joyner
Adventure Yacht Harbor
3948 S. Peninsular
Daytona Beach, Florida 32127

Mr. William Feger
Feger's Seafood
P.O. Box 24
New Smyrna Beach, Florida 32170

Mr. John Began
Feger's Seafood
6714 Ramoth Drive
Jacksonville, Florida 32226

Mr. George Reynolds
Feger's Seafood
120 B Jackson Avenue
Cape Canaveral, Florida 32920

Mr. Jimmy Rodgers
Feger's Seafood
P.O. Box 24
New Smyrna Beach, Florida 32170

Mr. Paul Pickett
Sea Harvest Seafood
107 North Riverside Drive
New Smyrna Beach, Florida 32169

Mr. Bill Brehm
The Boat Club Marina
111 N. Riverside Drive
New Smyrna Beach, Florida 32168

Commander
United States Coast Guard
State Ponce DeLeon
P.O. Box 370
New Smyrna Beach, Florida 32170

Commander
Seventh Coast Guard District
United States Coast Guard
Brickell Plaza Federal Building
Miami, Florida 33131-3050

Mr. Daniel M. O'Brien
Port Authority Coordinator
Ponce DeLeon Port Authority
440 S. Beach Street
Daytona Beach, Florida 32114



STATE OF FLORIDA
DEPARTMENT OF COMMUNITY AFFAIRS

EMERGENCY MANAGEMENT • HOUSING AND COMMUNITY DEVELOPMENT • RESOURCE PLANNING AND MANAGEMENT

LAWTON CHILES
Governor

May 13, 1997

JAMES F. MURLEY
Secretary

Mr. Hanley K. Smith
U.S. Army Corps of Engineers
Jacksonville District Corps of Engineers
Post Office Box 4970
Jacksonville, Florida 32232-0019

RE: U.S. Army Corps of Engineers - Proposed Navigation
Improvements and Commercial Facilities - Ponce de Leon
Inlet, Volusia County, Florida
SAI: FL9210021642CR

Dear Mr. Smith:

The Florida State Clearinghouse, pursuant to Presidential Executive Order 12372, Gubernatorial Executive Order 95-359, the Coastal Zone Management Act, 16 U.S.C. §§ 1451-1464, as amended, and the National Environmental Policy Act, 42 U.S.C. §§ 4321, 4331-4335, 4341-4347, as amended, has coordinated a review of the above-referenced project.

The Department of Environmental Protection (DEP) offers general comments regarding dredging, dock expansion and the protection of manatees, sea turtles, and right whales. The DEP and the St. Johns River Water Management District (SJRWMD) indicate that permits will be required for both the dredging and the proposed dock expansion prior to the start of construction. A Joint Coastal Permit issued by DEP's Bureau of Beaches and Coastal Systems will be required for the realignment and deepening of the navigation channels and the placement of dredged material seaward of the Coastal Construction Control Line. Early coordination with the DEP may help to eliminate problems in the permitting process. Please refer to the enclosed DEP and SJRWMD comments.

2555 SHUMARD OAK BOULEVARD • TALLAHASSEE, FLORIDA 32399-2100

FLORIDA KEYS AREA OF CRITICAL STATE CONCERN
FIELD OFFICE
2796 Overseas Highway, Suite 212
Marathon, Florida 33050-2227

SOUTH FLORIDA RECOVERY OFFICE
P.O. Box 4022
8600 N.W. 36th Street
Miami, Florida 33159-4022

GREEN SWAMP AREA OF CRITICAL STATE CONCERN
FIELD OFFICE
155 East Summerlin
Bartow, Florida 33830-4641

Mr. Hanley K. Smith
May 13, 1997
Page Two

Based on the information contained in the notification of intent and the enclosed comments provided by our reviewing agencies, the state has determined that the above-referenced project is consistent with the Florida Coastal Management Program.

Thank you for the opportunity to review this project. If you have any questions regarding this letter, please contact Ms. Keri Akers, Clearinghouse Coordinator, at (904) 922-5438.

Sincerely,



Ralph Cantral, Executive Director
Florida Coastal Management Program

RC/cc

Enclosures

cc: Dan Pennington, Department of Environmental Protection
Margaret Spontak, St. Johns River Water Management District



Department of Environmental Protection

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

Lawton Chiles
Governor

Virginia B. Wetherell
Secretary

May 6, 1997

Ms. Keri Akers, Coordinator
Department of Community Affairs
Suite 305
2740 Centerview Drive
Tallahassee, Florida 32399-2100

Re: SAI # FL9210021642CR - U.S. Army Corps of Engineers - Proposed Navigation Improvements and Commercial Facilities - Ponce de Leon Inlet, Volusia County

Dear Ms. Akers:

The department has reviewed the proposed navigation improvements and offers the following comments.

Protected Species

Manatees, sea turtles and right whales may all be impacted by the construction or operation phases of this proposal. As requested by the USCOE we offer these comments/questions concerning this proposal:

1. In the areas proposed for channel deepening, will there be any impacts to existing submerged and/or emergent vegetation?
2. Regarding the proposed fishing fleet, what will be the expected increase in vessel traffic and expected traffic pattern, in the vicinity of the inlet, due to the proposed commercial marina?
3. How was it established that the 360,000 cubic yards of material removed from the channel is of beach quality? Where will the material that is not beach quality be placed?

We will be able to address impacts related to manatees, sea turtles and right whales after we have evaluated the answers to the above questions and during the permitting process.

Dredging

Review of the project indicates that dredging is being proposed to increase the navigability of the channels in Ponce de Leon Inlet. It appears that the majority of the dredging proposed will occur in areas which have been previously dredged, but which will be re-dredged to increase depth. In these areas, unless the channel width increases substantially as a result of the dredging, there should be few expected impacts.

Post-It* Fax Note	7671	Date	# of pages	2
To	Keri Akers	From	Dan Pennington	
Co./Dept		Co.		
Phone #		Phone #	487-2231	
Fax #		FAX #		

irces"

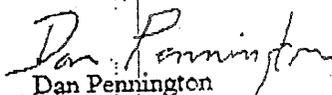
Mention was made to realigning the southern portion of Ponce de Leon Federal Channel in the Indian River to Cut- 24 of Intracoastal Water Way. No details were provided regarding this realignment proposal, nor were details provided regarding the existing resources in this area. New dredging may have substantial impact to resources such grass beds.

No details were provided regarding the dock expansion, so the impacts of the proposed work are impossible to appraise. If the dock expansion is to occur in undisturbed areas, then there could be potential for resource impact.

A DEP, Environmental Resource Permit (ERP) will be required for both the dredging and the proposed dock expansion. Evaluation of impacts, as well as stormwater management concerns are within the jurisdiction of the ERP process. The process also determines the status of the proposed project with respect to State Water Quality Certification, required to obtain a Army Corps of Engineers permit. In addition, construction of the portion of project involving realignment and deepening of the navigation channels and placement of dredged material seaward of the Coastal Construction Control Line (CCCL) would require issuance of a Joint Coastal Permit (JCP) by the DEP Bureau of Beaches and Coastal Systems, pursuant to Chapters 161, 373, and 253, F.S. Sediment geotechnical information will be required to determine whether the material dredged from the navigation channels is suitable for placement on the beach disposal area. A portion of the dredged material that is not beach quality (over 10% fines), may be determined to be suitable for placement in the nearshore disposal area. An alternative disposal site should also be established for dredged material determined to be unsuitable for placement at either of these sites.

If you have any questions please call me at (904) 487-2231.

Cordially,



Dan Pennington

Office of Intergovernmental Programs

DP

cc: Ruth McLemore-Price, Central District DEP - Orlando
Lauran Milligan, Beaches and Coastal System
Carol Knox, Office of Protected Species Management
Fritz Wettstein, Division of Marine Resources
Terry Zable, Central District DEP - Orlando

Message:

STATE AGENCIES

WATER MANAGEMENT DISTRICTS

OPB POLICY UNITS

Community Affairs
Environmental Protection
Game and Fresh Water Fish Comm
X Marine Fisheries Commission
OTED
State
Transportation

RECEIVED

MAR 27 1997

MARINE FISHERIES
COMMISSION

St. Johns River WMD

Environmental Policy/C & ED

RECEIVED

MAR 28 1997

State of Florida Clearinghouse

The attached document requires a Coastal Zone Management Act/Florida Coastal Management Program consistency evaluation and is categorized as one of the following:

- Federal Assistance to State or Local Government (15 CFR 930, Subpart F). Agencies are required to evaluate the consistency of the activity.
- Direct Federal Activity (15 CFR 930, Subpart C). Federal Agencies are required to furnish a consistency determination for the State's concurrence or objection.
- Outer Continental Shelf Exploration, Development or Production Activities (15 CFR 930, Subpart E). Operators are required to provide a consistency certification for state concurrence/objection.
- Federal Licensing or Permitting Activity (15 CFR 930, Subpart D). Such projects will only be evaluated for consistency when there is not an analogous state license or permit.

Project Description:

U.S. Army Corps of Engineers - Proposed Navigation Improvements and Commercial Facilities - Ponce de Leon Inlet, Volusia Co Florida

To: Florida State Clearinghouse
Department of Community Affairs
2555 Shumard Oak Boulevard
Tallahassee, FL 32399-2100
(904) 922-5438 (SC 292-5438)
(904) 414-0479 (FAX)

EO. 12372/NEPA

- No Comment
- Comments Attached
- Not Applicable

Federal Consistency

- No Comment/Consistent
- Consistent/Comments Attached
- Inconsistent/Comments Attached
- Not Applicable

From: MARINE FISHERIES COMMISSION
2540 EXECUTIVE CENTER CIRCLE WEST
SUITE 106
TALLAHASSEE, FLORIDA 32301

Division/Bureau: _____
Reviewer: _____
Date: 3-27-97

Message:

SAI#:

FL9210021642CR

STATE AGENCIES

WATER MANAGEMENT DISTRICTS

OPB POLICY UNITS

Community Affairs
 Environmental Protection
 Game and Fresh Water Fish Comm
 Marine Fisheries Commission
 OTED
 X State
 Transportation

St. Johns River WMD

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 APR 15 1997

Environmental Policy/C & ED

VOLUSIA
 SAI - CORPS

State of Florida Clearinghouse

971567 16 II

Ref: 963207 clm

(Signature)

The attached document requires a Coastal Zone Management Act/Florida Coastal Management Program consistency evaluation and is categorized as one of the following:

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U.S. Army Corps of Engineers - Proposed Navigation Improvements and Commercial Facilities - Ponce de Leon Inlet, Volusia County, Florida

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X Direct Federal Activity (15 CFR 930, Subpart C). Federal Agencies are required to furnish a consistency determination for the State's concurrence or objection.

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 Department of Community Affairs
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 Tallahassee, FL 32399-2100
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- No Comment
- Comments Attached
- Not Applicable

Federal Consistency

- No Comment/Consistent
- Consistent/Comments Attached
- Inconsistent/Comments Attached
- Not Applicable

RECEIVED

MAR 27 1997

From:

Division/Bureau: DIVISION OF HISTORICAL RESOURCES

Reviewer: Laura A. Kammerer

Date: 4/10/97 4-11-97

COMPLIANCE & REVIEW SECTION

Message:

STATE AGENCIES

WATER MANAGEMENT DISTRICTS

OPB POLICY UNITS

Community Affairs
Environmental Protection
Game and Fresh Water Fish Comm
Marine Fisheries Commission
OTED
State
X Transportation

St. Johns River WMD

Environmental Policy/C & ED

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Project Description:

U.S. Army Corps of Engineers - Proposed Navigation Improvements and Commercial Facilities - Ponce de Leon Inlet, Volusia County, Florida

To: Florida State Clearinghouse
Department of Community Affairs
2555 Shumard Oak Boulevard
Tallahassee, FL 32399-2100
(904) 922-5438 (SC 292-5438)
(904) 414-0479 (FAX)

EO. 12372/NEPA

Federal Consistency

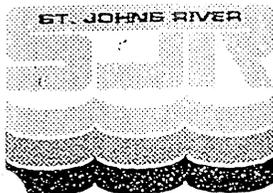
- No Comment
- Comments Attached
- Not Applicable

- No Comment/Consistent
- Consistent/Comments Attached
- Inconsistent/Comments Attached
- Not Applicable

FROM: Florida Department of Transportation

Jim Hayden
Jim Hayden, Systems Planning Supervisor

DATE: 4/2/97



**WATER
MANAGEMENT
DISTRICT**

POST OFFICE BOX 1429

PALATKA, FLORIDA 32178-1429

TELEPHONE 904-329-4500

SUNCOM 904-860-4500

TDD 904-329-4450

TDD SUNCOM 860-4450

FAX (EXECUTIVE/LEGAL) 329-4125

(PERMITTING) 329-4315

(ADMINISTRATION/FINANCE) 329-4508

SERVICE CENTERS

618 E. South Street
Orlando, Florida 32801
407-897-4300
TDD 407-897-5960

7775 Baymeadows Way
Suite 102
Jacksonville, Florida 32256
904-730-6270
TDD 904-448-7900

PERMITTING:
305 East Drive
Melbourne, Florida 32904
407-984-4940
TDD 407-722-5368

OPERATIONS:
2133 N. Wickham Road
Melbourne, Florida 32935-8109
407-254-1762
TDD 407-253-1203

April 16, 1997

Ms. Keri Akers
Florida State Clearinghouse
Department of Community Affairs
2555 Shumard Oak Blvd.
Tallahassee, FL 32399-2100

RECEIVED
APR 24 1997

State of Florida Clearinghouse

Re: SAI #: FL9210021642CR

Name of Project: USACE - Proposed Navigation Improvements and Commercial Facilities - Ponce de Leon Inlet, Volusia County, Florida.

Dear Ms. Akers:

The staff of the St. Johns River Water Management District (SJRWMD) has reviewed the above referenced project and offers the following comments regarding the District's areas of responsibility which include water quality, water supply, flood protection, and natural systems.

Staff believes that the proposed project would be consistent with SJRWMD's goals and objectives as long as all projects conform to SJRWMD design and construction criteria defined in Chapter 40C-4, F.A.C. A particular project may be considered "consistent" with SJRWMD rules when a District permit is issued or the project is exempted from our permitting requirements.

In this project, any individual Environmental Resource Permit (ERP) that may be required owing to the project's size or probable wetland impacts would be reviewed by the Department of Environmental Protection (DEP). DEP assumes ERP responsibilities for projects involving large commercial marinas, navigational dredging, and work seaward of the coastal construction control line according to the August 1994 Operating Agreement between the District and DEP. Staff believes the project could be designed and constructed to avoid unacceptable, adverse impacts to adjacent properties and natural resources.

For additional information on the permitting process, the applicant can contact SJRWMD's Orlando Service Center at (407) 897-4300.

This letter does not constitute or substitute for a permit review. Permit reviews require more specific information.

William M. Segal, CHAIRMAN
MAITLAND

Dan Roach, VICE CHAIRMAN
FERNANDINA BEACH

James T. Swann, TREASURER
COCOA

Otis Mason, SECRETARY
ST. AUGUSTINE

Kathy Chinoy
JACKSONVILLE

Griffin A. Greene
VERO BEACH

James H. Williams
OCALA

Patricia T. Harden
SANFORD

Reid Hughes
DAYTONA BEACH

If you have any questions about our comments, please contact me at (904) 329-4374.

Sincerely,

A handwritten signature in cursive script that reads "Margaret Spontak". The signature is written in dark ink and has a fluid, connected style.

Margaret Spontak, Director
Division of Policy and Planning

EJ/REG/lb

Message:

STATE AGENCIES

WATER MANAGEMENT DISTRICTS

OPB POLICY UNITS

Community Affairs
Environmental Protection
Game and Fresh Water Fish Comm
Marine Fisheries Commission
OTED
State
Transportation

X St. Johns River WMD

Environmental Policy/C & ED

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Project Description:

U.S. Army Corps of Engineers - Proposed Navigation Improvements and Commercial Facilities - Ponce de Leon Inlet, Volusia County, Florida

To: Florida State Clearinghouse
Department of Community Affairs
2555 Shumard Oak Boulevard
Tallahassee, FL 32399-2100
(904) 922-5438 (SC 292-5438)
(904) 414-0479 (FAX)

EO: 12372/NEPA

Federal Consistency

- No Comment
- Comments Attached
- Not Applicable

- No Comment/Consistent
- Consistent/Comments Attached
- Inconsistent/Comments Attached
- Not Applicable

From:

Division/Bureau: Policy & Planning
Reviewer: Margaret H. Spontak
Date: 4-16-97

Message:

STATE AGENCIES

WATER MANAGEMENT DISTRICTS

OPB POLICY UNITS

Community Affairs
Environmental Protection
Game and Fresh Water Fish Comm
Marine Fisheries Commission
OTED
State
Transportation

St. Johns River WMD

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MAY 2 1997
State of Florida Clearinghouse

X Environmental Policy/C & ED

RECEIVED
MAR 26 1997
OFFICE OF PLANNING
& BUDGETING
ENVIRONMENTAL POLICY UNIT

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Project Description:

U.S. Army Corps of Engineers - Proposed Navigation Improvements and Commercial Facilities - Ponce de Leon Inlet, Volusia Co Florida

To: Florida State Clearinghouse
Department of Community Affairs
2555 Shumard Oak Boulevard
Tallahassee, FL 32399-2100
(904) 922-5438 (SC 292-5438)
(904) 414-0479 (FAX)

EO. 12372/NEPA

- No Comment
- Comments Attached
- Not Applicable

Federal Consistency

- No Comment/Consistent
- Consistent/Comments Attached
- Inconsistent/Comments Attached
- Not Applicable

From:

Division/Bureau: EOG-OPB Env. Policy
Reviewer: m Tenney
Date: 4/30/97

June 9, 1997

Planning Division
Environmental

Mr. David Hankla
Field Supervisor
U. S. Fish and Wildlife Service
Suite 310
6620 Southpoint Drive, South
Jacksonville, Florida 32217

Dear Mr. Hankla:

The U.S. Army Corps of Engineers (Corps), Jacksonville District, is initiating consultation under Section 6(a)(2) of the Coastal Barrier Resources Act (CBRA) for Unit P08 of the Coastal Barrier Resources System, Ponce De Leon Inlet, Florida. Section 6(a)(2) of the Act states that " In General - Notwithstanding Section 5, the appropriate Federal officer, after consultation with the Secretary, may make Federal expenditures and may make financial assistance available within the System for the following: (2) The maintenance or construction of improvements of existing Federal navigation channels (including the Intracoastal Waterway) and related structures (such as jetties), including the disposal of dredge materials related to such maintenance or construction."

Based on the Exceptions listed in Section 6(a)(2) above, the Corps believes that the proposed expansion of the Ponce De Leon Inlet Navigation project to include dredging of the Intracoastal Waterway is exempt from the Coastal Barrier Resources Act and requests your concurrence in this matter. If you have further questions, please feel free to contact this office.

Sincerely,

Hanley K. Smith
Acting, Chief, Planning Division

Boothby/CESAJ-PD-ER *3/8/97*
Dugger/CESAJ-PD-ER
Smith/CESAJ-PD-E
Murphy/CESAJ-PD-PN
Strain/CESAJ-PD-P
Smith/CESAJ-PD-E/CESAJ-PD

w/boothby/pdicbra

FEGER SEAFOOD, INC.
P.O BOX 24
244 N. CAUSEWAY
NEW SMYRNA BEACH, FL 32170-0024

March 28, 1997

Mr. Hanley K. Smith
Acting Chief, Planning Division
Environmental Studies Section
Department of The Army
Jacksonville District Corps of Engineers
P.O. Box 4970
Jacksonville, Florida 32232-0019

Reference: Proposed navigation improvements at Ponce DeLeon Inlet, Volusia County, Florida

Dear Mr. Smith:

As per your document dated March 18, 1997 soliciting views and comments concerning the above reference, we wish to submit the following:

1. Being established in 1938, Feger Sea Food, Inc. is the oldest retail/wholesale business in New Smyrna Beach. Our Manager, Steve Feger is the third generation relying on our commercial activity for his livelihood and his son Joshua will be the fourth (4th) generation.
2. We strongly protest the development of a new facility as proposed for seafood processing. This new facility will impact on the private business of Feger Sea Food, Inc. Being in business for all these years, it should be obvious that we are not opposed to any business coming into the area, however we are opposed to the use of our public tax dollars for assisting a business that will be in competition with and that would so greatly impact the future of the business and the livelihood of the family and all our employees.
3. We have repeatedly requested a minimal dredging of the Inlet to assist in the safety of navigation of the fleet that we serve, only to be denied by the CORPS. The proposed project seems to be a double standard and "smacks" of discrimination to us to deny the oldest business of New Smyrna while at the same time considering the expenditure of hundreds of thousands of dollars at the expense of our livelihood at Feger Seafood, Inc.
4. It is our belief (view) that there is more than ample dockage and supporting facilities that currently exist that could be expanded and/or improved that would have minimal economic and environmental impact, compared to the proposed project.
5. We at Feger Seafood, Inc. have a long history of concern for the environment and consider ourselves and insist that our employees exhibit stewardship of the environment and nature in general. The proposed projects dredging of 360,00 cubic

yards and the subsequent building of 25-35,000 square feet of buildings can only adversely affect an already fragile ecosystem.

6. It does not take a rocket scientist to realize that since seafood harvest quotas have already been drastically reduced for all species, there must be a diminishing supply of same. Shrimp harvesting is seasonal; six months per year (winter season of October, November, December and summer season of June, July and August). Your document of a yearly average number of vessels is misleading. It would seem that common sense has fallen by the wayside or there are those that insist upon ignoring common sense in proposing a project that would further reduce an already limited supply of seafood. With a proposed homeport/transient 100-120 vessel fleet, where are the shrimp and other seafood for this size fleet? Is it not short sighted to add a greater harvest that would expedite the over harvest of an already fragile population of seafood? Bigger is not always better and we feel that the "proposed project is a "paper tiger" that is misleading to say the least and serves a few developers at the cost of those of us established businesses.

7. We are not opposed to the correction of the shifting channels of Ponce DeLeon Inlet as evidenced by our requests to the CORPS and support the removal of the Inlet as the 7th worst in the United States. However, our support and concern is not driven by monetary motives as one would have to think the developers of the proposed project are. During our long tenure, Feger Seafood, Inc. has lost six (6) shrimp boats and the life of one of our crew. Even those these tragedies were not Inlet related, as a serendipity, we realize the devastating effects of 109 capsized boats on the economy of those in business. More importantly, the 20 seamen that have lost their lives should be the driving force in the Inlet project, not the driving force of development.

8. As previously stated, "bigger is not always better", we can also state without fear of contradiction that development and growth does not pay for itself. It is obvious to us that read between the lines of the proposed project that the developers that are the driving force does not want the public to know that the channelization and associated improvements will be only the "tip of the iceberg". With no area ice production facilities for packing, fuel storage, proper roads needed for the increased traffic (adding to an already significant problem), associated support services, etc, our current natural beauty and environmental integrity of the area and Inlet will be in jeopardy. All of us that live in this area, along with the tourist will have a reduced quality of life. Some things are best left as they are in order to protect us, the human species, along with all the endangered and threatened wildlife.

9. It is worthy of note that though we support expenditure of our public tax dollars to assure safe navigation of vessels through the Inlet, we will strongly contest and will fight for our right to refuse to allow the use of governmental tax dollars to assist the development of facilities, (not only in direct competition of Feger Seafood, Inc. and many of our friends that own marinas) by a hand full of developers tottering on the side of greed.

Page 3 Feger Seafood, Inc.

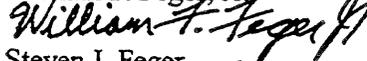
Joshua Feger, our fourth (4th) generation is too young to fight his fight to preserve his heritage but rest assured that we will fight the fight for him.

If common sense should not prevail and the powers beyond our influence and/or control decided that an expanded seafood processing business is a must, then we wish to go on record that Feger Seafood, Inc. has all the dockage and associated services necessary and are open to negotiating the sale of our business in lieu of losing the same after a one-half century of back breaking work. Joshua will not understand, but then neither will we. However, we intend to not only remain as the oldest business in New Smyrna Beach but remain as a viable enterprise for not only the Fegers, but for all our employees and their families.

To assist us in the fairness of the "fight", we hereby request, under the 1973 United States Freedom of Information Act, copies of ALL correspondence concerning the proposed project, current and in the future. This request includes ALL document and ALL names of parties associated with the request(s) of the proposed project, whether they be private, public and/or governmental. The request for ALL documents includes telephone logs, letters, memos, minutes of meetings and any other documents. The information should be sent in a timely manner, as mandated by law, to the address on the letterhead.

Respectfully yours,

William F. Feger, Jr.



Steven J. Feger



C: Legal Council

Environmental Consultant, Bayliss Prater, Certified Environmental Professional
File

Aug. 18, 1997

MD
Scarbrough
W/1/17
W25A9

Memo to Corps of Engineers: (Mr. Murphy) (Jerry Scarborough??)

From: Lawrence E. Decker, concerned citizen

1. Information for your files on the Ponce Inlet commercial Port project by Dan O'Brien, Volusia County Port Authority
2. A lot of the local people and some govt. officials feel it is illogical to waste scarce federal and County tax dollars on a feasibility study re: a commercial fishing port at Ponce Inlet.
3. They feel things are too uncertain on the local level to even start thinking about such a study. Please hold off on the study until ownership of the Swoope's Electric Power Plant issue is decided by NSB and Volusia County. Right now NSB doesn't want to sell.
4. If this fishing port is finally built, local people believe it will be a subsidized "white Elephant", costing taxpayers millions initially and millions in the future to keep it going. Thank you---



Lawrence E. Decker
5906 John Anderson Hiway
Flagler Beach, Fla. 32136

904-672-7867

Enclosures:



County of Volusia

Ponce DeLeon Port Authority

700 Catalina Drive, Suite 125 • Daytona Beach, Florida 32114
Telephone: (904) 248-8072 • Fax: (904) 248-8075

TO: Hal Buckland, Director
Economic Resource Service Center

FROM: Dan O'Brien, Director
Port Authority Service Group

DATE: August 6, 1997

RE: F.I.N.D. Reimbursement Grant to Analyze Deepening the Inlet - \$50,000

Please find enclosed (2) two letters:

- (1) Feger Seafood
- (2) City of New Smyrna Beach

These letters were used by Mr. Lawrence Decker a long time anti-port person to challenge the F.I.N.D. staff recommendation to fund our grant, thus killing the grant for this year.

The County Council entered an agreement with the Corps to evaluate the deepening of the inlet to allow the more modern and larger fishing fleets to use our proposed facility at the Swoope power plant. The Port Authority has sent \$100,000.00 and executed this agreement months ago to initiate the project. This department applied for a \$50,000.00 F.I.N.D. reimbursement grant. Mr. Decker did not curtail the project. He just cost the taxpayers of Volusia County \$50,000.00 and accomplished nothing.

What bothers me are the letters. Mr. Feger has always been a proponent of re-stabilizing the inlet. He has his property up for sale. He has talked to me about moving to the proposed facility. I don't know where he is coming from unless he is scared of possible competition.

The City of New Smyrna Beach letter is the one that really concerns me. After two meetings with the City Manager and the Mayor discussing the issue, i.e., we discussed buying the Feger property that they need for their Riverside Re-Development plan and swapping the Feger parcel for the Swoope Plant, I was authorized by the City to proceed with negotiation with Mr. Feger. Based on an MAI appraisal I offered Mr. Feger verbally \$600,000.00 for his property, subject to the city swapping the power plant site. Mr. Feger talked with his wife and contacted me and



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RECYCLED PAPER

asked if we could increase the offer a little and I told him I would get back to him. I informed the city of the offer, no one said anything. I have kept you apprised of what was going on. In fact you attended one of the meetings with the Mayor and Manager. When County Councilperson Northey brought up the issue of a workshop, you told me not to proceed any further until after the workshop, which I have done.

This city letter flies in the face of reality and also cost the citizens of the district and New Smyrna Beach \$50,000.00 for no reason.

In my opinion the restabilization of this inlet is paramount for the safety of boaters and the economic well being of our Marine and Tourist Industry.

It is of the utmost importance to meet with the city regarding these issues.

Please keep me advised.

C: Lawrence Arrington, County Manager
City of New Smyrna Beach
Bill Feger



City of New Smyrna Beach

Office of the Mayor & City Commissioners

July 30, 1997

Mr. Art Wilde, Executive Director
FIND
1314 Marcinski Road
Jupiter, Florida 33477

Re: Ponce Inlet

Dear Mr. Wilde:

I learned today that Volusia County has applied for a grant for a Ponce Inlet project. The project, as I understand it, would only happen if the City agreed to allow the County to use our Swoope power site. I would like to inform you that the City has no agreement with the County and the possibility exists that no such agreement will occur for the Swoope site.

Thanks for your time, and I hope this information is helpful to you.

Sincerely,

James L. Vandergriff
Mayor



City of New Smyrna Beach

Office of the Mayor & City Commissioners

July 29, 1997

Mr. Edward Aftuck
Inlet Shores Homeowners Association
32 Cunningham Drive
New Smyrna Beach, FL 32168

Dear Mr. Aftuck,

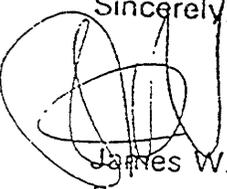
I am in receipt of your recent letter and express like sentiments regarding the Swoope Power Plant site.

As one Commissioner, I personally do not feel use of the site as a commercial fish processing plant would be a beneficial venture for the community as a whole. I will express my feelings in that regard during any discussion that entertains that proposal.

There are other possibilities and I am sure they will be carefully reviewed by the Commission prior to making any decision regarding the use of that site.

Thank you for expressing your concern regarding use of the Swoope site.

Sincerely,



James W. Hathaway
Commissioner, Zone 3

JWH/rjh

Edward Aftuck
Inlet Shores Homeowners Association
32 Cunningham Dr.
New Smyrna Beach, FL 32168

City of New Smyrna Beach
100 Sams Ave.
New Smyrna Beach, FL 32168

To the City of New Smyrna Beach City Commissioners and Planning Board Members;

I am writing to request that the City of New Smyrna Beach look into other alternatives for the use of the Swoop Power Plant before selling the property to the county to be used as a commercial fish processing plant. Please take into consideration the tax payers of Inlet Shores as well as adjoining property owners in a two mile radius of Swoop Power Plant.

A fish processing plant would adversely impact the value of the properties in the north section of New Smyrna Beach. I lived in Fernandina Beach, FL, and the smell coming from the fish processing plant there was terrible. I can't imagine trying to sell a home with that aroma in the air.

It is my understanding that according to the deed for the Swoop plant property (copy attached), that the property is to be used for public purposes only, and that the city can not sell or lease the property to any private person, firm or corporation.

Surely, there must be a better usage for this property; one that would not have a negative effect on the existing taxpayers the area.

Sincerely,



Edward Aftuck
Pres. Inlet Shores Homeowners Association

Feger Seafood Inc.

PO BOX 24
NEW SMYRNA BEACH, FL 32170
FAX (904) 427-5716
PHONE (904) 428-4441

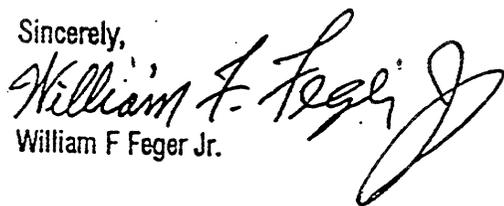
July 31, 1997

Dear Volusia County Commissioners,

During our meeting in Deland some of the untruths that were stated were that we had plenty of fishing grounds here, which is untrue. I have four boats ("Bold Challenge", "Big Eric", "2nd Stage", and "Miss Emma") leaving now for the west coast due to the rules, regulations, and permits involved here. The shark season was open three weeks and then closed. You have to catch 20,000 pounds of snapper per year to qualify for that permit, and only a couple of boats have been able to do that in the last several years. Right now there are already too many boats for the size of our fishing grounds off Ponce Inlet and for the amount of fish we are allowed to catch.

If you would like to know the truth about the catches off the east coast of Florida you can contact Claudia Dennis at 904-427-6562. She is the National Marine Fisheries Service Biologist whose office is in New Smyrna Beach.

Sincerely,



William F Feger Jr.

Copy to: Army Corps of Engineers, Jacksonville, Fla.
Fla. Inland Navigation District, Jupiter, Florida
City of New Smyrna Beach, Fla.
Claudia Dennis, Biologist, National Marine Fisheries Service
at New Smyrna Beach, Fla.



Department of Environmental Protection

Lawton Chiles
Governor

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

Virginia B. Wetherell
Secretary

020
Orig to PO-E
CF. DP-I (copy)
CO

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

May 21, 1997

Mr. Richard E. Bonner, P.E.
Jacksonville District
U. S. Army Corps of Engineers
Post Office Box 4970
Jacksonville, Florida 32232-0019

Dear Mr. Bonner:

Permit No. 64-286420-9, Volusia County
U. S. Army Corps of Engineers, Jacksonville District
Ponce De Leon Inlet Scour Apron

Your request to modify this permit has been received and reviewed by Department staff. The proposed modification is to authorize a landward extension of the authorized scour apron to be constructed along the inlet side of the north jetty of Ponce De Leon Inlet. The scour apron is to be extended approximately 900 feet landward from station 51+00 to station 60+05. The extension will require an additional 5,000 tons of bedding stone and 13, 800 tons of rip-rap.

The above changes are not expected to adversely affect water quality and will be clearly in the public interest provided the Project Description is amended to the permit as issued:

The activity is to construct a scour apron approximately ~~1600~~ 2500 feet in length along the inlet side of the north jetty of Ponce De Leon Inlet in 25 to 45 feet of water between stations 35+00 and 51+00 60+05. A two-foot thick bedding layer will be placed, extending from the toe of the jetty outward approximately 50 feet. A four-foot layer of granite rip-rap will then be placed on top of the bedding layer and will extend approximately 10 feet up the slope of the jetty, as shown on the approved drawings. The median size of the rip-rap will be 300 lbs. Total stone quantities are estimated to be ~~8900~~ 13,900 tons of bedding stone and ~~24,500~~ 38,300 tons of rip-rap.

Since the proposed modification is not expected to result in any water quality degradation or environmental resource impacts, the permit is hereby modified as requested. By copy of this letter and the attached drawings, we are notifying all necessary parties of the modification.

"Protect, Conserve and Manage Florida's Environment and Natural Resources"

Printed on recycled paper.

This letter of approval does not alter the October 28, 2001 expiration date, other Specific or General Conditions, or monitoring requirements of the permit. This letter and the accompanying drawings must be attached to the original permit.

A person whose substantial interests are affected by the Department's action may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Tallahassee, Florida 32399-3000. Petitions filed by the permittee and the parties listed below must be filed within 14 days of receipt of this letter. Petitioner shall mail a copy of the petition to the permittee at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

The Petition shall contain the following information:

- (a) The name, address, and telephone number of each petitioner, the permittee's name and address, the Department Permit File Number and the county in which the project is proposed;
- (b) A statement of how and when each petitioner received notice of the Department's action or proposed action;
- (c) A statement of how each petitioner's substantial interests are affected by the Department's action; or proposed action;
- (d) A statement of the material facts disputed by petitioner, if any;
- (e) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or proposed action;
- (f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and
- (g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

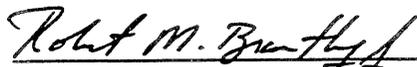
If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this letter. Persons whose substantial interests will be affected by any decision of the Department with regard to the permit have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of receipt of this notice in the Office of General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person

has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

This Notice constitutes final agency action unless a petition is filed in accordance with the above paragraphs or unless a request for extension of time in which to file a petition is filed within the time specified for filing a petition and conforms to Rule 62-103.070, F.A.C. Upon timely filing of a petition or a request for an extension of time this Notice will not be effective until further Order of the Department.

Any party to this letter has the right to seek judicial review of the Order pursuant to Section 120.68, Florida Statutes, by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Office of General Counsel, 3900 Commonwealth Boulevard, Tallahassee, Florida 32399-3000; and by filing a copy with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 days from the date the Notice of Permit Modification is filed with the Clerk of the Department.

Sincerely,



Robert M. Brantly, Jr., P.E.
Professional Engineering Administrator
Bureau of Beaches and Coastal Systems

RMB/rvl

cc: DEP, Central District

DEP, Office of General Counsel

Bradley Hartman, Florida Game and Fresh Water Fish Commission

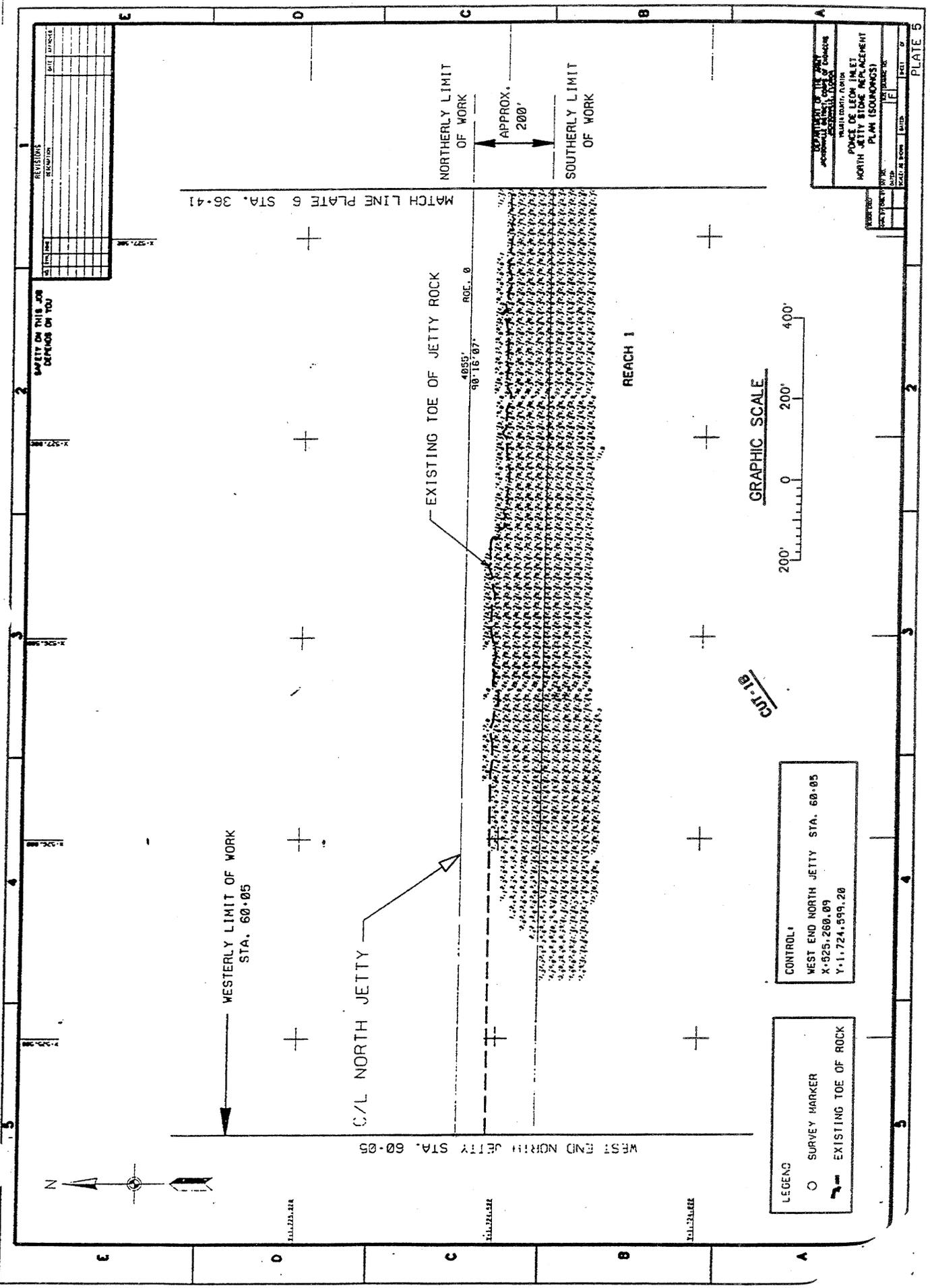
DEP, Division of State Lands

FILING AND ACKNOWLEDGMENT

FILED, on this date, pursuant to Section 120.52,
Florida Statutes, with the designated Department Clerk,
receipt of which is hereby acknowledged.

Debra M. Murrell 5/23/97
Clerk Date

Enlarged 4



DESIGNER		DATE		OFFICE	
U.S. ARMY CORPS OF ENGINEERS DISTRICT OFFICE NORTH JETTY SLIDE REPAIRMENT PLAN (SOUNDINGS)					
SCALE	DATE	BY	CHKD.	APP'D.	PLT.

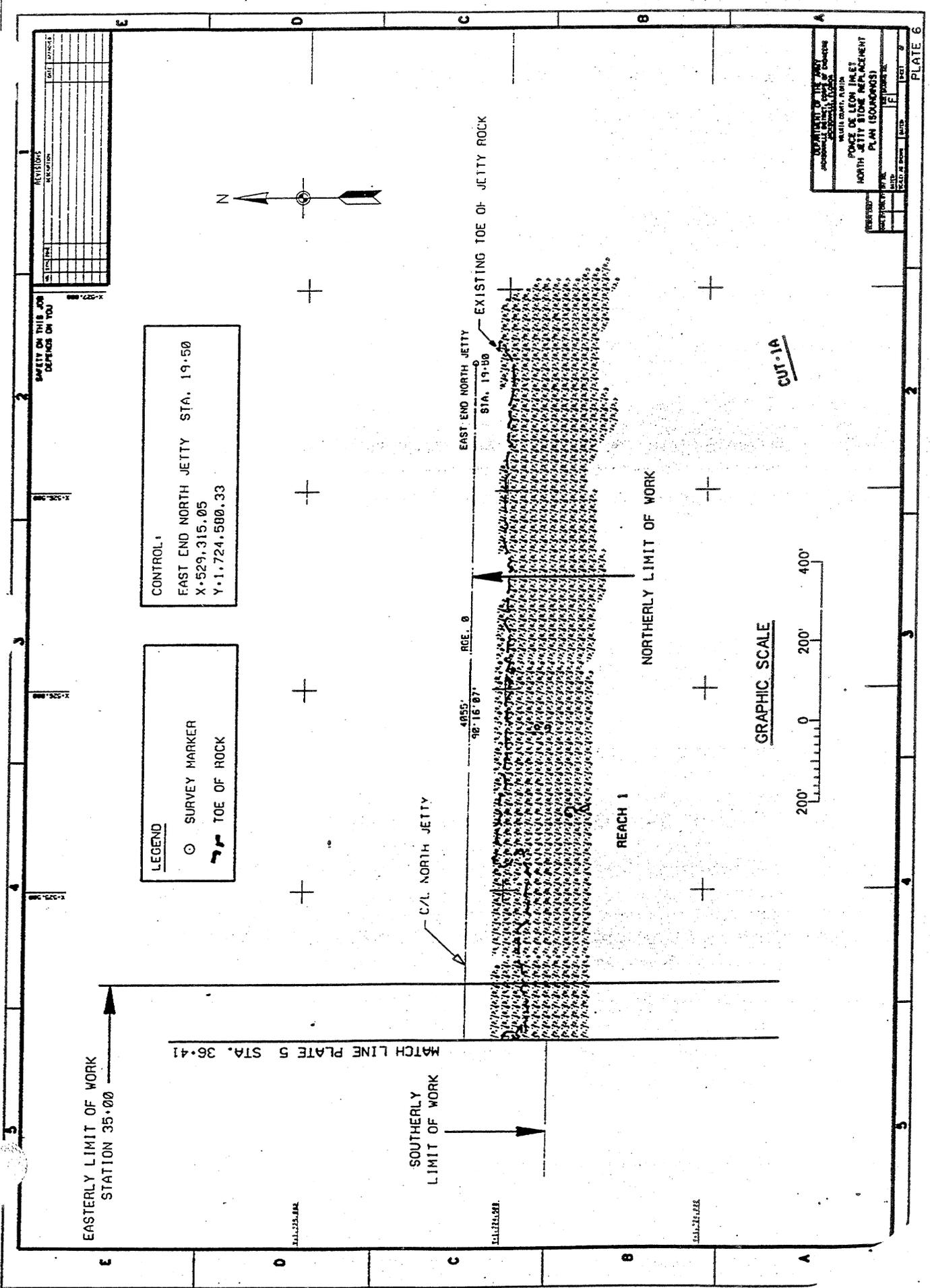
NO.	REVISIONS	DATE	OFFICE

GRAPHIC SCALE
 200' 0 200' 400'

CONTROL
 WEST END NORTH JETTY STA. 60+05
 X=525,260.09
 Y=1,724,599.20

LEGEND
 ○ SURVEY MARKER
 ▨ EXISTING TOE OF ROCK

PLATE 5



DEPARTMENT OF THE ARMY ENGINEERING DISTRICT, CORP. OF ENGINEERS	
PROJECT: FORCE OF LEWIS LEST NORTH JETTY BIDGE REPAIRMENT PLAN (SOAKWAYS)	
DESIGNED BY	DATE
CHECKED BY	DATE
APPROVED BY	DATE
SCALE	NO.

NO.	REVISIONS	DATE

SAFETY ON THIS JOB
DEPENDS ON YOU

U.S. Department
of Transportation

United States
Coast Guard



Commander
Seventh Coast Guard District

909 S.E. 1st Avenue
Miami, FL 33130-3050
Staff Symbol: (oan)
Phone: (305) 536-5621
FAX: (305) 530-7655

16500
JBE 05-97

DEC - 1 1997

Mr. Dennis R. Duke
Acting Chief, Planning Division
Jacksonville District Corps of Engineers
P.O. Box 4970
Jacksonville, FL 32232-0019

Dear Mr. Duke:

Thank you for your letter of August 14, 1997 regarding the proposed extension of the Ponce DeLeon Inlet south channel. After review of the documentation enclosed in your letter, it does not appear that any change in the aid to navigation system will be necessary.

If you have any questions regarding this matter, please do not hesitate to call me at (305) 536-5621.

A handwritten signature in dark ink, appearing to read "J. B. Embres".

J. B. EMBRES

Chief, Planning and Marine Information Section
Aids to Navigation and
Waterways Management Branch
Seventh Coast Guard District
By direction of the District Commander



United States Department of the Interior

FISH AND WILDLIFE SERVICE

6620 Southpoint Drive, South

Suite 310

Jacksonville, Florida 32216-0912

IN REPLY REFER TO:

SEP 26 1996

Mr. A.J. Salem
Chief, Planning Division
U.S. Army Corps of Engineers
P.O. Box 4970
Jacksonville, Florida 32232-0019

ATTN: Rae Boothby

Dear Mr. Salem:

The U.S. Fish and Wildlife Service (Service), in accordance with an FY 1996 funding agreement with the U.S. Army Corps (Corps) of Engineers' Jacksonville District, is submitting the attached final Fish and Wildlife Coordination Act Report (CAR) for inclusion in the Feasibility Study of proposed navigation improvements to Ponce de Leon Inlet, Volusia County, Florida. The Service provided a Planning Aid Letter to the Corps on December 11, 1992, with reference to this project. This information is needed to enable the Corps to evaluate the proposed project alternatives to insure that they conform to current environmental needs and criteria. The report includes an analysis of expected wetland impacts and recommendations to lessen these impacts. There are also sections on endangered species and coastal barrier resources. The Service has determined that the alternatives proposed for improving navigation at Ponce Inlet are not likely to adversely impact the continued existence of any federally listed species within the action area. We also determined that the proposed alternatives are exempt from federal funding restrictions designated under the Coastal Barrier Resources Act of 1982, as amended.

The attached document constitutes the final report of the Secretary of the Interior as required by Section 2(b) of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), and completes the consultation requirements pursuant to Section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.) and Section 6 of the Coastal Barrier Resources Act of 1982, as amended (16 U.S.C. 3501 et seq.). This report represents the views of the Department of the Interior.

Sincerely yours,

Michael M. Bentzien
Assistant Field Supervisor

Attachment:

DIVISIONS OF FLORIDA DEPARTMENT OF STATE
Office of the Secretary
Office of International Relations
Division of Administrative Services
Division of Corporations
Division of Cultural Affairs
Division of Elections
Division of Historical Resources
Division of Library and Information Services
Division of Licensing



MEMBER OF THE FLORIDA CABINET
Historic Florida Keys Preservation Board
Historic Palm Beach County Preservation Board
Historic Pensacola Preservation Board
Historic St. Augustine Preservation Board
Historic Tallahassee Preservation Board
Historic Tampa/Hillsborough County
Preservation Board
Ringling Museum Art

FLORIDA DEPARTMENT OF STATE
Sandra B. Mortham
Secretary of State
DIVISION OF HISTORICAL RESOURCES

September 11, 1996

Mr. A. J. Salem, Chief
Planning Division, Environmental Resources Branch
Jacksonville District Corps of Engineers
P.O. Box 4970
Jacksonville, Florida 32232-0019

In Reply Refer To:
Robin D. Jackson
Historic Sites Specialist
(904) 487-2333
Project File No. 962505

RE: Cultural Resource Assessment Request
Proposed Construction of Improvements to Ponce de Leon Inlet
Extension of South Jetty/Reopening Weir in North Jetty/Construct Channel through Sand Spit West of North Jetty with Revetment along North Shore/Groin Field to Protect North Spit from Erosion/Construction of Revetment along North Shore of Breakthrough Area Volusia County, Florida

Dear Mr. Salem:

In accordance with the procedures contained in 36 C.F.R., Part 800 ("Protection of Historic Properties"), we have reviewed the referenced project(s) for possible impact to archaeological and historical sites or properties listed, or eligible for listing, in the *National Register of Historic Places*. The authority for this procedure is the National Historic Preservation Act of 1966 (Public Law 89-665), as amended.

The mentioned U.S. Army Corps of Engineers Planning Division project has been reviewed by this agency. We note that several cultural resource surveys (terrestrial and underwater) have been conducted in the project areas. We concur with the conclusions in your letter that none of the proposed alternatives will effect significant historic properties. It is the opinion of this agency that because of the project locations and/or nature the proposed projects will have no effect on any sites listed, or eligible for listing, in the *National Register*

DIRECTOR'S OFFICE

R.A. Gray Building • 500 South Bronough Street • Tallahassee, Florida 32399-0250 • (904) 488-1480
FAX: (904) 488-3353 • WWW Address <http://www.dos.state.fl.us>

ARCHAEOLOGICAL RESEARCH
(904) 487-2299 • FAX: 414-2207

HISTORIC PRESERVATION
(904) 487-2333 • FAX: 922-0496

HISTORICAL MUSEUMS
(904) 488-1484 • FAX: 921-2503

Mr. Salem
September 11, 1996
Page 2

If you have any questions concerning our comments, please do not hesitate to contact us. Your interest in protecting Florida's historic properties is appreciated.

Sincerely,

for 
George W. Percy, Director
Division of Historical Resources
and

GWP/Jrj



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Southeast Regional Office
9721 Executive Center Drive N.
St. Petersburg, FL 33702

SEP 10 1996

F/SEO13:JEB

Mr. A. J. Salem
Chief, Planning Division
Jacksonville District
U. S. Army Corps of Engineers
P. O. Box 4970
Jacksonville, FL 32232-0019

Dear Mr. Salem:

This responds to your request for consultation on the Ponce De Leon Navigation Improvement Study located south of Daytona Beach, Volusia County, Florida. The project may involve various improvements of Ponce De Leon Inlet including lengthening the south jetty approximately 1000 feet, rebuilding damaged portions of the north jetty, reopening the weir in the north jetty, construction of a scour apron on the south side of the north jetty, construction of a groin field along the sand spit inside the inlet adjacent to the north jetty, construction of a storm revetment to seal a potential breach along the sand spit, or constructing of a channel at the site of the potential breakthrough. All construction activities associated with the jetties would be conducted from a barge or the jetties. A Biological Assessment (BA) was submitted pursuant to Section 7 of the Endangered Species Act of 1973 (ESA).

We have reviewed the BA and concur with your determination that populations of endangered or threatened species under our purview would not be adversely affected by the proposed project. This concurrence is based, in part, upon the protective measures called for in the BA. Any dredging involved in this project is subject to the August 25, 1995, biological opinion on dredging in the Southeastern United States.

This concludes consultation responsibilities under Section 7 of the ESA. However, consultation should be reinitiated if new information reveals impacts of the identified activity that may affect listed species or their critical habitat, a new species is listed, the identified activity is subsequently modified, or critical habitat is determined that may be affected by the proposed activity.



Printed on Recycled Paper



If you have any questions please contact Jeffrey Brown, Fishery Biologist, at (813) 570-5312.

Sincerely,

A handwritten signature in black ink, appearing to read "Andrew J. Kemmerer". The signature is written in a cursive style with a horizontal line at the end.

Andrew J. Kemmerer
Regional Administrator

cc: F/PR8
F/SEO2



June 24, 1996

Planning Division

Mr. David Hankla
Field Supervisor
U.S. Fish and Wildlife Service
Suite 310
6620 Southpoint Drive South
Jacksonville, Florida 32217

Dear Mr. Hankla:

Enclosed is a biological assessment prepared by the U.S. Army Corps of Engineers (Corps), Jacksonville District, under Section 7 of the Endangered Species Act, as amended, for the Ponce de Leon Inlet Navigation Study.

The U.S. Fish and Wildlife Service (FWS) and Corps have identified the salt marsh snake, loggerhead sea turtle, bald eagle, piping plover, wood stork and manatee as possibly occurring in the project area. There is no designated critical habitat in the project area.

Based on the enclosed biological information, the Corps has determined that the proposed activity will not adversely affect listed species or critical habitat.

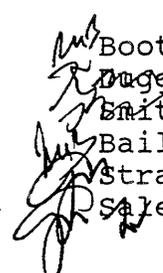
This completes coordination under the Act, unless new information should indicate that the proposed action may affect listed species or their habitat, or that the proposed action is substantially modified, or a new species is proposed for listing, which may be affected by the proposed action, or you request consultation. Your written response to this notification is requested.

Point of contact is Rea Boothby at phone number 904-232-3453.

Sincerely,

A. J. Salem
Chief, Planning Division

Enclosures

 Boothby/CESAJ-PD-ER/3453/mw
Dugger/CESAJ-PD-ER
Smith/CESAJ-PD-E
Bailey/CESAJ-PD-PN
Strain/CESAJ-PD-PC
Salem/CESAJ-PD

w/boothby/pdls7fws.doc

BIOLOGICAL ASSESSMENT
PONCE DE LEON INLET NAVIGATION STUDY
VOLUSIA COUNTY, FLORIDA

1. Location. Ponce de Leon Inlet is located south of Daytona Beach, in Volusia County, Florida (attachment 1).

2. Identification of Listed Species and Critical Habitat in the Vicinity of the Proposed Action. The U.S. Fish and Wildlife Service (FWS) and the U.S. Corps of Engineers (Corps) have identified the salt marsh snake, loggerhead sea turtle, bald eagle, piping plover, wood stork and manatee as possibly occurring in the project area. There is no designated critical habitat in the area.

3. Description of the proposed activity. Alternatives being considered include lengthening the south jetty approximately 1000 feet, using rock from the far landward end of the south jetty, rebuilding damaged portions of the north jetty, reopening the weir in the north jetty, construction of a scour apron on the south side of the north jetty, construction of a groin field along the sand spit inside the inlet adjacent to the north jetty and construction of a storm revetment to seal a potential breach along the shoreline of the sand spit inside the inlet or constructing a channel in the area of the potential breakthrough (Figures 1,2 and 3). All construction activities associated with the jetties will be done either from a barge or the jetties.

4. Assessment of Potential Impacts of the Proposed Action on Listed Species or Critical Habitat. Based on the precautions proposed in paragraph 5 below, the Corps has determined that the proposed action will not adversely affect listed species or critical habitat.

5. Efforts to Eliminate Potential Impacts to Listed Species or Critical Habitat.

a. Conditions Involving the Protection of Manatees and Sea Turtles. The following precautions will be taken during construction activities to ensure the safety of manatees and sea turtles in the area.

The Contractor will instruct all personnel associated with the construction of the project about the possible presence of manatees and/or sea turtles in the area and the need to avoid collisions with them. If either are sighted within 100 yards of construction activities, all appropriate precautions will be implemented by the contractor to ensure protection of the animals. These actions shall include cessation of construction activities if necessary. All vessels associated with the project shall operate at "no wake" speeds at all times while in shallow waters or channels where the draft of the boat provides less than

3 feet clearance of the bottom. Boats used to transport personnel shall be shallow-draft vessels, preferably of the light-displacement category where navigational safety permits, and should follow deep water routes where possible. All personnel shall be advised that there are civil and criminal penalties for harming, harassing or killing manatees, which are protected under the Endangered Species Act and the Marine Mammal Protection Act, and sea turtles, which are protected under the Endangered Species Act. The Contractor shall be held responsible for any manatee or sea turtle harmed, harassed, injured or killed as a result of construction activities.

b. Manatee Signs. The Contractor shall install and maintain a minimum of one manatee awareness sign at a prominent location within the construction area. Photo(s) of the sign(s) in place shall be sent to the Florida Department of Natural Resources (DNR) Marine Mammal Recovery Program, 100 Eighth Avenue, SE, St. Petersburg, Florida 33701-5095 prior to construction or use of the facility. Temporary signs may be removed when construction is completed.

c. Manatee Sightings. The Contractor shall keep a log detailing all sightings, collisions, or manatee deaths during the construction period. The data shall be recorded on forms provided by the Contracting Officer. All data in original form shall be forwarded to Dr. Hanley K. Smith, Chief, Environmental Branch, P.O. Box 4970, Jacksonville, Florida 32232-0019, within 10 days of collection, and copies of the data shall be supplied to the Contracting Officer's representative. Any collision with a manatee or sighting of an injured or incapacitated manatee shall be reported immediately to the Corps

d. Other Listed Species. The project area is within the range of the salt marsh snake, bald eagle, piping plover and wood stork. However, none of those species are known to inhabit the immediate project area at this time. Therefore, the proposed action is not expected to adversely affect those species.

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June 24, 1996

Planning Division
Environmental Branch

Mr. Charles A. Oravetz
Chief, Protected Species Management Branch
National Marine Fisheries Service
9721 Executive Center Drive North
St. Petersburg, Florida 33702

Dear Mr. Oravetz:

Enclosed is a biological assessment prepared by the U.S. Army Corps of Engineers (Corps), Jacksonville District, under Section 7 of the Endangered Species Act, as amended, for the Ponce De Leon Navigation Improvement Study.

The National Marine Fisheries Service (NMFS), and the Corps have identified the finback, humpback, right, sei and sperm whales, shortnose sturgeon, and green hawksbill, Kemp's Ridley, leatherback, and loggerhead sea turtles as possibly occurring within the project area. A marine seagrass, Johnson's seagrass, proposed for listing as threatened, has also been identified by NMFS as possibly occurring in the area. There is no designated critical habitat in the project area.

Based on the enclosed biological assessment, the Corps has determined that the proposed activity will not adversely affect listed species or critical habitat.

This completes coordination under the Act, unless new information should indicate that the proposed action may affect listed species or their habitat, or that the proposed action is substantially modified, or a new species is proposed for listing which may be affected by the proposed action, or you request consultation. Your written response to this notification is requested.

Point of contact is Rea Boothby at phone number 904-232-3453.

Sincerely,

A. J. SALEM
Chief, Planning Division

Enclosure

RB Boothby/CESAJ-PD-ER/3453/mw
JD Dugger/CESAJ-PD-ER
JM Smith/CESAJ-PD-E
J Bailey/CESAJ-PD-PN
J Strain/CESAJ-PD-PC
J Salem/CESAJ-PD

w/boothby/pdis7nmf.doc

BIOLOGICAL ASSESSMENT
PONCE DE LEON INLET NAVIGATION STUDY
VOLUSIA COUNTY, FLORIDA

1. Location. Ponce De Leon Inlet is located south of Daytona Beach, in Volusia County, Florida (Figure 1).

2. Identification of Listed Species and Critical Habitat in the Vicinity of the Proposed Action.

The National Marine Fisheries Service (NMFS) and the Corps of Engineers (Corps) have identified the finback, humpback, sei, right and sperm whales, the shortnose sturgeon, and green hawksbill, Kemp's Ridley, leatherback and loggerhead sea turtles as possibly occurring in the project area. A marine seagrass, Johnson's seagrass, proposed for listing as threatened, has also been identified by NMFS as possibly occurring in the project area. There is no designated critical habitat in the project area.

3. Description of the Proposed Activity. Alternatives under consideration include lengthening the south jetty approximately 1000 feet, using rock from the landward end of the south jetty, rebuilding damaged portions of the north jetty, re-opening the weir in the north jetty, construction of a scour apron on the south side of the north jetty, construction of a groin field along the sand spit inside the inlet adjacent to the north jetty and construction of a storm revetment to seal a potential breach along the shoreline of the sand spit inside the inlet or constructing a channel at the site of the potential breakthrough (Figures 1, 2 and 3). All construction activities associated with the jetties will be done either from a barge or from the jetty.

4. Assessment of Potential Impacts of the Proposed Action on Listed Species or Critical Habitat.

a. Whales. All of the proposed construction activities will be done within approximately one-quarter mile of the shoreline or inside the inlet. Because of the proximity of the inlet and shallow depths, the proposed action should have no adverse impacts on any listed species of whale.

b. Shortnose sturgeon. The shortnose sturgeon has not been recorded from the vicinity of Ponce De Leon Inlet and should, therefore, be unaffected by construction activities.

c. Sea turtles. The Contractor will instruct all personnel associated with construction of the project about the possible presence of sea turtles in the area and the need to avoid collisions with them. During construction hours, observer(s) approved by the NMFS shall be aboard the construction vessel to monitor for the presence of sea turtles. If sea turtles are

spotted within 100 yards of construction activities, all appropriate precautions will be implemented by the Contractor to ensure protection of the animals, including cessation of operations if deemed necessary. All vessels associated with the project shall operate at "no-wake" speeds at all time while in shallow water or channels where the draft of the boat provides less than 3 feet clearance of the bottom. Boats used to transport personnel shall be shallow-draft vessels, preferably of the light-displacement category where navigational safety permits, and follow deep water routes where possible. All personnel shall be advised that there are civil and criminal penalties for harming, harassing, injuring or killing sea turtles, which are protected under the Endangered Species Act. The Contractor shall be held responsible for any sea turtle harmed, harassed, injured or killed as a result of construction activities.

d. Johnson's seagrass. Because of the nature of the project area, i.e., strong tidal action, currents, and wave action in an inlet, no sea grasses of any kind grow in the area of proposed construction.

5. Efforts to Eliminate Potential Impacts to Listed Species or Critical Habitats. The steps listed in 4 above, will be taken to eliminate potential impacts to listed species.

June 24, 1996

Planning Division

Mr. David Hankla
Field Supervisor
U.S. Fish and Wildlife Service
Suite 310
6620 Southpoint Drive South
Jacksonville, Florida 32217

Dear Mr. Hankla:

Enclosed is a biological assessment prepared by the U.S. Army Corps of Engineers (Corps), Jacksonville District, under Section 7 of the Endangered Species Act, as amended, for the Ponce de Leon Inlet Navigation Study.

The U.S. Fish and Wildlife Service (FWS) and Corps have identified the salt marsh snake, loggerhead sea turtle, bald eagle, piping plover, wood stork and manatee as possibly occurring in the project area. There is no designated critical habitat in the project area.

Based on the enclosed biological information, the Corps has determined that the proposed activity will not adversely affect listed species or critical habitat.

This completes coordination under the Act, unless new information should indicate that the proposed action may affect listed species or their habitat, or that the proposed action is substantially modified, or a new species is proposed for listing, which may be affected by the proposed action, or you request consultation. Your written response to this notification is requested.

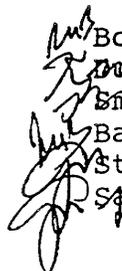
Point of contact is Rea Boothby at phone number 904-232-3453.

Sincerely,

A. J. Salem
Chief, Planning Division

Enclosures

w/boothby/pdls7fws.doc

 Boothby/CESAJ-PD-ER/3453/mw
Dugger/CESAJ-PD-ER
Smith/CESAJ-PD-E
Bailey/CESAJ-PD-PN
Strain/CESAJ-PD-PC
Salem/CESAJ-PD

May 31, 1996

Planning Division
Environmental Branch

Mr. Michael Bentzein
Acting Supervisor
U.S. Fish and Wildlife Service
Suite 310
6620 Southpoint Drive South
Jacksonville, Florida 32217

Dear Mr. Bentzein:

Pursuant to the Endangered Species Act, as amended, the Jacksonville District, U. S. Army Corps of Engineers, is requesting a list of Threatened or Endangered species and critical habitat for species under the jurisdiction of the Fish and Wildlife Service for Ponce DeLeon Inlet, Volusia County, Florida (see enclosed map).

The point of contact for this project is Mr. Rea N. Boothby at 904 232-3453.

Sincerely,

A. J. Salem
Chief, Planning Division

Enclosure

AMS
Boothby/CESAJ-PD-ER/3453/mw
XAV Dugger/CESAJ-PD-ER
B Smith/CESAJ-PD-E
J Strain/CESAJ-PD-P
Salem/CESAJ-PD
DS

w/boothby/pdifws7a

BIOLOGICAL ASSESSMENT
PONCE DE LEON INLET NAVIGATION STUDY
VOLUSIA COUNTY, FLORIDA

1. Location. Ponce de Leon Inlet is located south of Daytona Beach, in Volusia County, Florida (attachment 1).

2. Identification of Listed Species and Critical Habitat in the Vicinity of the Proposed Action. The U.S. Fish and Wildlife Service (FWS) and the U.S. Corps of Engineers (Corps) have identified the salt marsh snake, loggerhead sea turtle, bald eagle, piping plover, wood stork and manatee as possibly occurring in the project area. There is no designated critical habitat in the area.

3. Description of the proposed activity. Alternatives being considered include lengthening the south jetty approximately 1000 feet, using rock from the far landward end of the south jetty, rebuilding damaged portions of the north jetty, reopening the weir in the north jetty, construction of a scour apron on the south side of the north jetty, construction of a groin field along the sand spit inside the inlet adjacent to the north jetty and construction of a storm revetment to seal a potential breach along the shoreline of the sand spit inside the inlet or constructing a channel in the area of the potential breakthrough (Figures 1,2 and 3). All construction activities associated with the jetties will be done either from a barge or the jetties.

4. Assessment of Potential Impacts of the Proposed Action on Listed Species or Critical Habitat. Based on the precautions proposed in paragraph 5 below, the Corps has determined that the proposed action will not adversely affect listed species or critical habitat.

5. Efforts to Eliminate Potential Impacts to Listed Species or Critical Habitat.

a. Conditions Involving the Protection of Manatees and Sea Turtles. The following precautions will be taken during construction activities to ensure the safety of manatees and sea turtles in the area.

The Contractor will instruct all personnel associated with the construction of the project about the possible presence of manatees and/or sea turtles in the area and the need to avoid collisions with them. If either are sighted within 100 yards of construction activities, all appropriate precautions will be implemented by the contractor to ensure protection of the animals. These actions shall include cessation of construction activities if necessary. All vessels associated with the project shall operate at "no wake" speeds at all times while in shallow waters or channels where the draft of the boat provides less than

June 25, 1996

Planning Division
Environmental Branch

Mr. George W. Percy
State Historic Preservation Officer
Division of Historical Resources
500 South Bronough Street
Tallahassee, Florida 32399-0250

Dear Mr. Percy:

The U.S. Army Corps of Engineers (Corps), Jacksonville District, is studying the environmental effects of constructing improvements to Ponce de Leon Inlet, Volusia County, Florida. A map of the study area is enclosed.

Alternatives under consideration include: extension of the south jetty; reopening the weir within the north jetty; construction of a channel through the sand spit west of the north jetty with a revetment along the north shoreline; a groin field to protect the north spit from erosion; allowing the channel to realign through the north sand spit with construction of a revetment along the north shore of the breakthrough area.

Ponce de Leon Inlet is a dynamic area that has changed significantly over the past 200 years. In 1944, a channel was located through an area that is now a sand spit west of the north jetty. Depths in the 1944 north channel ranged from 10 to 19 feet. Therefore, the Corps believes that it is unlikely that significant historic properties would be affected by channel construction through the sand spit or by construction of a groin field along the existing shoreline southwest of the north jetty.

A 1993 terrestrial archeological survey was completed by Bruce Piatek and Associates. Their study area included the north jetty area park and the proposed revetment footprint. The foundation of the Hotel Inlet Terrace, site number VO 5263, was the only historic property identified in the study area vicinity. In a July 7, 1994, letter to Mr. Piatek, your office concurred with the archeologist's recommendation that the site is not significant.

A magnetometer survey and diver investigation of potentially significant targets were completed for the south jetty extension. In a September 20, 1995, letter, your office concurred with the Corps' no effect determination for the south jetty extension.

It is the Corps' determination that none of the proposed alternatives will affect significant historic properties. We request your written concurrence with our no effect determination. According the requirements established in Section 106 of the National Historic Preservation Act and 36 CFR Part 800 *Protection of Historic Properties*, a written response is requested within 30 calendar days.

Sincerely,

A. J. Salem
Chief, Planning Division

Enclosure

PONCE DELEON INLET

DAYTONA BEACH AND
NEW SMYRNA BEACH

DAYTONA BEACH

INLET HARBOR

20 M.

HALIFAX RIVER

FISHERMANS WHARF

TOWN OF PONCE INLET

★ U.S.C.G. LIGHTHOUSE

(WEIR BEING CLOSED JAN. 1984)

WEIR S. JETTY

PONCE DELEON INLET

IMPOUNDMENT BASIN

20 M.

S. JETTY

NORTH NEW SMYRNA BEACH AREA

SWOOPE POWER PLANT

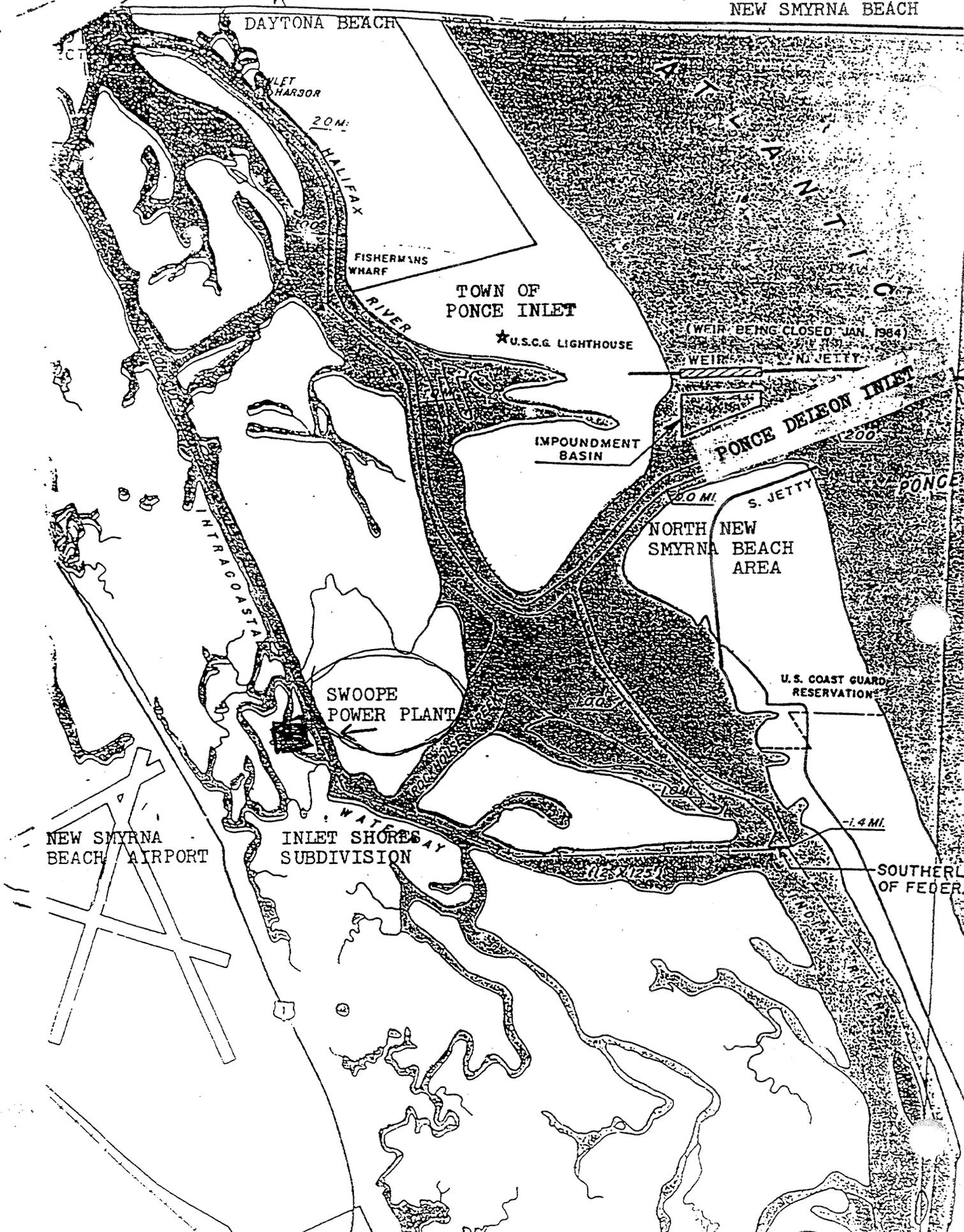
U.S. COAST GUARD RESERVATION

NEW SMYRNA BEACH AIRPORT

INLET SHORES SUBDIVISION

1.4 MI.

SOUTHERN FEDERAL



It is the Corps' determination that none of the proposed alternatives will affect significant historic properties. We request your written concurrence with our no effect determination. According the requirements established in Section 106 of the National Historic Preservation Act and 36 CFR Part 800 *Protection of Historic Properties*, a written response is requested within 30 calendar days.

Sincerely,

A. J. Salem
Chief, Planning Division

Enclosure

APR 30 1996

Planning Division
Environmental Branch

Mr. Charles A. Oravetz
Chief
Protected Species Management Branch
National Marine Fisheries Service
9721 Executive Center Drive North
St. Petersburg, Florida 33702

Dear Mr. Oravetz:

Pursuant to the Endangered Species Act, as amended, the U.S. Army Corps of Engineers, Jacksonville District, is requesting a list of endangered or threatened species and critical habitat for species under the jurisdiction of the National Marine Fisheries Service in the vicinity of Ponce deLeon Inlet, Volusia County, Florida. (see enclosed map).

The point of contact for this project is Mr. Rea N. Boothby at 904-232-3453.

Sincerely

A. J. Salem
Chief, Planning Division

Enclosure

bcc:
CESAJ-DP
CESAJ-PD-PN

lwd Boothby/CESAJ-PD-ER/3453/ljd *P*
Dugger/CESAJ-PD-ER
~~Smith~~/CESAJ-PD-E 4/24
Strain/CESAJ-PD-P
Salem/CESAJ-PD
lwd



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Protected Species Management Branch
Southeast Regional Office
9721 Executive Center Drive North
St. Petersburg, FL 33702

May 2, 1996

F/SEO13:JBM

Mr. Rea N. Boothby
Environmental Branch, Planning Division
Jacksonville District Corps of Engineers
Department of the Army
P.O. Box 4970
Jacksonville, Florida 32232-0019

Dear Mr. Boothby:

This responds to a letter from Mr. Salem dated April 23 and three letters dated April 30, 1996, requesting species and critical habitat lists under the jurisdiction of the National Marine Fisheries Service that may be present in the following project areas:

- Jacksonville Harbor, St. Johns River, Florida
- Hillsboro Inlet, Broward County, Florida
- Ponce deLeon Inlet, Volusia County, Florida
- St. Lucie Inlet, Martin County, Florida

Enclosed are lists for the Gulf and Atlantic Coasts of Florida, which identify those endangered or threatened species of marine mammals, sea turtles, and fish likely to be present in the project area.

If you have questions, please contact Colleen Coogan at 813-570-5312.

Sincerely,

Charles A. Oravetz
Branch Chief

Enclosures

cc: A. J. Salem, Chief, Planning Division



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FLORIDA DEPARTMENT OF STATE

Sandra B. Mortham
Secretary of State

DIVISION OF HISTORICAL RESOURCES
R.A. Gray Building
500 South Bronough Street
Tallahassee, Florida 32399-0250

Director's Office
(904) 488-1480

Telecopier Number (FAX)
(904) 488-3353

September 20, 1995

Mr. A. J. Salem, Chief
Planning Division, Environmental Resources Brance
Jacksonville District Corps of Engineers
P.O. Box 4970
Jacksonville, Florida 32232-0019

In Reply Refer To:
Frank J. Keel
Historic Sites Specialist
(904) 487-2333
Project File No. 952959

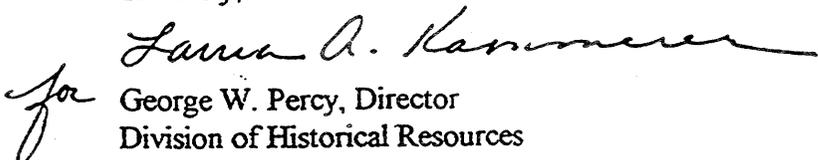
RE: Cultural Resource Assessment Review Request
*Diver Investigations of Seven Potentially Significant Magnetic Anomalies in the
Vicinity of Ponce de Leon Inlet, Volusia County, Florida.* By Mid-Atlantic
Technology, July 30, 1995

Dear Mr. Salem:

In accordance with the procedures contained in 36 C.F.R., Part 800 ("Protection of Historic Properties"), we have reviewed the results of the referenced investigations conducted by Mid-Atlantic Technology and find them to be complete and sufficient. The investigations concluded the previously identified magnetic anomalies as modern debris. Therefore, it is the opinion of this agency that the proposed undertaking will have no effect on any sites listed, or eligible for listing, in the *National Register of Historic Places*.

If you have any questions concerning our comments, please do not hesitate to contact us. Your interest in protecting Florida's historic properties is appreciated.

Sincerely,


George W. Percy, Director
Division of Historical Resources
and
State Historic Preservation Officer

GWP/Kfk



STATE OF FLORIDA
DEPARTMENT OF COMMUNITY AFFAIRS

2740 CENTERVIEW DRIVE • TALLAHASSEE, FLORIDA 32399-2100

LAWTON CHILES
Governor

LINDA LOOMIS SHELLEY
Secretary

April 7, 1995

Mr. A.J. Salem
Army Corps of Engineers
Jacksonville District
Post Office Box 4970
Jacksonville, FL 32232-0019

RE: Navigation Projects - Scoping Letter for Feasibility
Report - Ponce de Leon Inlet Improvements - Volusia
County, Florida
SAI: FL9210051642CR

Dear Mr. Salem:

The Florida State Clearinghouse, pursuant to Presidential Executive Order 12372, Governor's Executive Order 93-194, the Coastal Zone Management Act, 16 U.S.C. §§ 1451-1464, as amended, and the National Environmental Policy Act, 42 U.S.C. §§ 4321, 4331-4335, 4341-4347, as amended, has coordinated a review of the above-referenced project.

The Department of Environmental Protection (DEP) indicates that Alternative A may result in adverse impacts to marine turtle nesting habitat. Therefore, the Corps of Engineers (Corps) is advised to evaluate the potential shoreline response for Alternative A and to coordinate project planning with the DEP's Office of Protected Species. Please refer to the enclosed DEP comments.

The Department of State (DOS) indicates that the Corps is required to provide the results of the magnetometer survey to the DOS for review. The Corps is also required to consult with the DOS regarding avoidance or mitigation of any impacts to any historic site located in the project area. Please refer to the enclosed DOS comments.

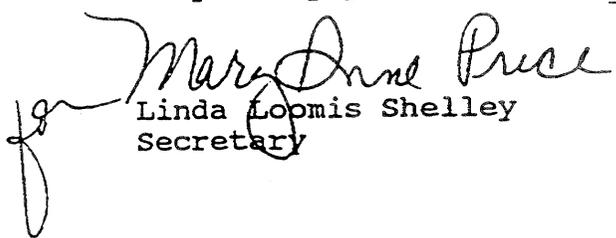
Based on the available information and the enclosed comments provided by our reviewing agencies, the state has determined that, at this stage, the above-referenced project is consistent with the Florida Coastal Management Program (FCMP). All subsequent environmental documents prepared for this project

Mr. A.J. Salem
April 7, 1995
Page Two

must be reviewed to determine the project's continued consistency with the FCMP. All future documents prepared for this project must be submitted to the Florida State Clearinghouse for interagency review. The state's continued concurrence with the project will be based, in part, on the adequate resolution of issues identified during this and subsequent reviews.

In addition, the Department of Community Affairs (Department) notes that the area proposed for improvement is located within the federal Coastal Barrier Resources System Unit P08 which was designated under the Coastal Barrier Resources Act (CBRA). The Corps is advised to consult with Mr. James Pulliam, Jr., U.S. Department of Interior, Fish and Wildlife Service, Region 4, regarding the applicability of the CBRA requirements to this project. Please refer to the Department's enclosed comments.

Very truly yours,


Linda Loomis Shelley
Secretary

LLS/rk

Enclosures

cc: Carliane Johnson, Department of Environmental Protection
George Percy, Department of State



Department of Environmental Protection

Lawton Chiles
Governor

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

Virginia B. W. rell
Secretary

March 20, 1995

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MAR 22 1995

Suzanne Traub-Metlay
State Clearinghouse
Executive Office of the Governor
The Capitol
Tallahassee, Florida 32399-0001

Florida Coastal
Management Program

RE: COE/Navigation Study for Ponce de Leon Inlet, Volusia County
SAI: FL9210051642CR

Dear Ms. Traub-Metlay:

The Department has reviewed the referenced notice to conduct additional studies associated with the Ponce de Leon Inlet Feasibility Study, funded in part by the Department. Specifically, two additional alternatives will be investigated; A) the reopening of the weir on the north jetty, and B) the construction of a channel through the north interior spit.

The Office of Protected Species Management (OPSM) states that there would be very substantive concerns with Alternative A because such a weir may adversely impact marine turtle nesting habitat on the beach north of the inlet and from potential impacts associated with the additional maintenance dredging when the sand trap inside the inlet filled. The continued study of Alternative A should carefully consider the increased dredging requirements and perform computer assisted modeling of the shoreline in response to such an option. The OPSM has identified no marine turtle issues in association with the additional inlet stabilization as proposed with Alternative B.

Based on the information provided for this review, the study of the alternatives is consistent with our authorities in the Florida Coastal Management Program and with the recommendations of the Department's Ponce de Leon Inlet Management Plan.

For information regarding the Ponce de Leon Management Plan, the Corps should contact Phil Flood, Bureau of Beaches and Coastal Systems, at 904/487-1262. Questions concerning marine turtles may be directed to David Arnold, OPSM, at 904/922-4330.

Sincerely

Carliane D. Johnson
Environmental Specialist
Office of Intergovernmental Programs

/cdj

cc: Phil Flood
Ed Irby

"Protect, Conserve and Manage Florida's Environment and Natural Resources"



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MAR 27 1995

Florida Coastal Management Program

FLORIDA DEPARTMENT OF STATE

Sandra B. Mortham
Secretary of State

DIVISION OF HISTORICAL RESOURCES

R.A. Gray Building
500 South Bronough Street
Tallahassee, Florida 32399-0250

Director's Office
(904) 488-1480

Telecopier Number (FAX)
(904) 488-3353

March 24, 1995

Ms. Suzanne Traub-Metlay
State Clearinghouse
Executive Office of the Governor
Room 1603, The Capitol
Tallahassee, Florida 32399-0001

In Reply Refer To:
Frank J. Keel
Historic Sites
Specialist
(904) 487-2333
Project File No. 950675

RE: Cultural Resource Assessment Request
SAI# FL9210051642CR
Improvements to the Ponce de Leon Inlet
Volusia County, Florida

Dear Ms. Traub-Metlay:

In accordance with the provisions of Florida's Coastal Zone Management Act and Chapter 267, Florida Statutes, as well as the procedures contained in 36 C.F.R., Part 800 ("Protection of Historic Properties"), we have reviewed the referenced project(s) for possible impact to historic properties listed, or eligible for listing, in the National Register of Historic Places, or otherwise of historical or architectural value.

We understand that the Corps of Engineers have recently completed a magnetometer survey for this project. When a report has been completed, the Corps of Engineers will coordinate with this office concerning potential effects to historic properties.

If you have any questions concerning our comments, please do not hesitate to contact us. Your interest in protecting Florida's historic properties is appreciated.

Sincerely,

Laura A. Kammerer
for George W. Percy, Director
Division of Historical Resources
and

State Historic Preservation Officer

GWP/Kfk
xc: Jasmin Raffington, FCMP-DCA
Archaeological Research Florida Folklife Programs
(904) 487-2299 (904) 397-2192

Historic Preservation
(904) 487-2333

Museum of Florida History
(904) 488-1484

COUNTY: VOLUSIA

DATE: 02/27/95

COMMENT DUE DATE: 03/14/95

SAI#: FL9210051642

STATE AGENCIES

LOCAL/OTHER

OPB POLICY UNITS

<input checked="" type="checkbox"/>	Agriculture
<input type="checkbox"/>	Board of Regents
<input checked="" type="checkbox"/>	Commerce
<input checked="" type="checkbox"/>	Community Affairs
<input type="checkbox"/>	Education
<input checked="" type="checkbox"/>	Environmental Protection
<input checked="" type="checkbox"/>	Game & Fish Comm
<input type="checkbox"/>	Health & Rehab Srv
<input type="checkbox"/>	Highway Safety
<input type="checkbox"/>	Labor & Employmnt
<input type="checkbox"/>	Law Enforcement
<input checked="" type="checkbox"/>	Marine Fish Comm
<input type="checkbox"/>	State Library
<input checked="" type="checkbox"/>	State
<input checked="" type="checkbox"/>	Transportation
<input type="checkbox"/>	Trans Disad. Comm
<input type="checkbox"/>	DEP District
<input type="checkbox"/>	
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<input type="checkbox"/>	SFWMD
<input type="checkbox"/>	SWFWMD
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<input type="checkbox"/>	

<input type="checkbox"/>	Public Safety
<input type="checkbox"/>	Education
<input type="checkbox"/>	Environment/C & ED
<input type="checkbox"/>	General Government
<input type="checkbox"/>	Health & Human Srv
<input type="checkbox"/>	Revenue & Eco. Ana
<input type="checkbox"/>	SCH
<input checked="" type="checkbox"/>	SCH/CON

The attached document requires a Coastal Zone Management Act/Florida Coastal Management Program consistency evaluation and is categorized as one of the following:

- Federal Assistance to State or Local Government (15 CFR 930, Subpart F). Agencies are required to evaluate the consistency of the activity.
- Direct Federal Activity (15 CFR 930, Subpart C). Federal Agencies are required to furnish a consistency determination for the State's concurrence or objection.
- Outer Continental Shelf Exploration, Development or Production Activities (15 CFR 930, Subpart E). Operators are required to provide a consistency certification for state concurrence/objection.
- Federal Licensing or Permitting Activity (15 CFR 930, Subpart D). Such projects will only be evaluated for consistency when there is not an analogous state license or permit.



Florida Coastal Management Program

FOR CONSISTENCY PROJECTS, SEE REVERSE SIDE FOR INSTRUCTIONS.

To: State Clearinghouse
 Executive Office of the Governor -OPB
 Room 1603, The Capitol
 Tallahassee, FL. 32399-0001
 (904) 488-8114 (SC 278-8114)

Florida Coastal Management Director
 Department of Community Affairs
 Suite 305, Rhyne Building
 Tallahassee, FL. 32399-2100
 (904) 922-5438 (SC 292-5438)

EO. 12372/NEPA

Federal Consistency

- No Comment
- Comments Attached
- Not Applicable

- No Comment/Consistent
- Consistent/Comments Attached
- Inconsistent/Comments Attached
- Not Applicable

From:

Division/Bureau: TRANSPORTATION

Reviewer: James D. Kimbler JAMES D. KIMBLER, DISTRICT DIRECTOR OF PLANNING AND PUBLIC TRANSPORTATION

Date: 3/6/95

COUNTY: VOLUSIA

DATE: 02/27/95

COMMENT DUE DATE: 03/14/95

SAI#: FL9210051642CR

STATE AGENCIES

LOCAL/OTHER

OPB POLICY UNITS

- Agriculture
- Board of Regents
- Commerce
- Community Affairs
- Education
- Environmental Protection
- Game & Fish Comm
- Health & Rehab Srv
- Highway Safety
- Labor & Employmnt
- Law Enforcement
- Marine Fish Comm
- State Library
- State
- Transportation
- Trans Disad. Comm
- DEP District

- NFWWMD
- SFWMD
- SWFWMD
- SJRWMD
- SRWMD

- Public Safety
- Education
- Environment/C & ED
- General Government
- Health & Human Srv
- Revenue & Eco. Ana
- SCH
- SCH/CON

RECEIVED

FEB 28 1995

MARINE FISHERIES COMMISSION

attached document requires a Coastal Zone Management Act/Florida Coastal Management Program consistency evaluation and is categorized one of the following:

- Federal Assistance to State or Local Government (15 CFR 930, Subpart F). Agencies are required to evaluate the consistency of the activity.
- Direct Federal Activity (15 CFR 930, Subpart C). Federal Agencies are required to furnish a consistency determination for the State's concurrence or objection.
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- Federal Licensing or Permitting Activity (15 CFR 930, Subpart D). Such projects will only be evaluated for consistency when there is not an analogous state license or permit.

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MAR 4 1995

Florida Coastal Management Program

FOR CONSISTENCY PROJECTS, SEE REVERSE SIDE FOR INSTRUCTIONS.

To: State Clearinghouse
Executive Office of the Governor -OPB
Room 1603, The Capitol
Tallahassee, FL 32399-0001
(904) 488-8114 (SC 278-8114)

EO. 12372/NEPA

Federal Consistency

Florida Coastal Management Director
Department of Community Affairs
Suite 305, Rhyne Building
Tallahassee, FL 32399-2100
(904) 922-5438 (SC 292-5438)

- No Comment
- Comments Attached
- Not Applicable

- No Comment/Consistent
- Consistent/Comments Attached
- Inconsistent/Comments Attached
- Not Applicable

From:

Division/Bureau: Marine Fisheries Comm

Reviewer: [Signature]

Date: 3-12-95

STATE AGENCIES

LOCAL/OTHER

OPB POLICY UNITS

- Agriculture
- Board of Regents
- Commerce
- Community Affairs
- Education
- Environmental Protection
- Game & Fish Comm
- Health & Rehab Srv
- Highway Safety
- Labor & Employmnt
- Law Enforcement
- Marine Fish Comm
- State Library
- State
- Transportation
- Trans Disad. Comm
- DEP District

- NFWFMD
- SFWMD
- SWFWMD
- SJRWMD
- SRWMD

- Public Safety
- Education
- Environment/UC & ED
- General Government
- Health & Human Srv
- Revenue & Eco. Ana
- SCH
- SCH/CON

RECEIVED

MAR 6 1995

Florida Coastal Management Program

The attached document requires a Coastal Zone Management Act/Florida Coastal Management Program consistency evaluation and is categorized one of the following:

- Federal Assistance to State or Local Government (15 CFR 930, Subpart F). Agencies are required to evaluate the consistency of the activity.
- Direct Federal Activity (15 CFR 930, Subpart C). Federal Agencies are required to furnish a consistency determination for the State's concurrence or objection.
- Outer Continental Shelf Exploration, Development or Production Activities (15 CFR 930, Subpart E). Operators are required to provide a consistency certification for state concurrence/objection.
- Federal Licensing or Permitting Activity (15 CFR 930, Subpart D). Such projects will only be evaluated for consistency when there is not an analogous state license or permit.

FOR CONSISTENCY PROJECTS, SEE REVERSE SIDE FOR INSTRUCTIONS.

To: State Clearinghouse
 Executive Office of the Governor -OPB
 Room 1603, The Capitol
 Tallahassee, FL 32399-0001
 (904) 488-8114 (SC 278-8114)

Florida Coastal Management Director
 Department of Community Affairs
 Suite 305, Rhyne Building
 Tallahassee, FL 32399-2100
 (904) 922-5438 (SC 292-5438)

EO. 12372/NEPA

Federal Consistency

- No Comment
- Comments Attached
- Not Applicable

- No Comment/Consistent
- Consistent/Comments Attached
- Inconsistent/Comments Attached
- Not Applicable

From: Florida Department of Commerce
 Division of Economic Development
 Bureau of Economic Analysis

Division/Bureau: _____

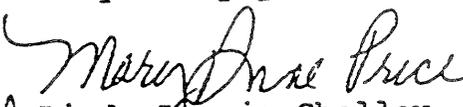
Reviewer: Wesley A. Greenwood

Date: 3/2/95

Ms. Janice L. Hatter
March 21, 1995
Page Two

Thank you for the opportunity to comment on this proposed project. If you have any questions, please contact Rosalyn Kilcollins, Florida Coastal Management Program, at (904) 922-5438.

Very truly yours,


for Linda Loomis Shelley
Secretary

LLS/rk



FLORIDA AUDUBON SOCIETY

March 17, 1995

A.J. Salem
Department of the Army
Jacksonville District Corps of Engineers
P.O. Box 4970
Jacksonville, Fl 32232-0019

Re: Ponce de Leon Inlet Improvements

Dear Mr. Salem:

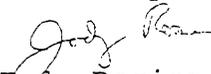
The Florida Audubon Society is pleased to review the proposed Ponce de Leon Inlet improvements, as requested by the Army Corps of Engineers. After reviewing the Reconnaissance Report dated January 1993 and the February 7, 1995 correspondence, it appears that a channel may be constructed in the potential breakthrough area. If this alternative is selected, the vegetation in the area of the channel should be relocated to another site at Lighthouse Point Park to aid in stabilization and habitat creation.

Since the sand spit area is included in the Lighthouse Point Park, public access should be provided to the spit if the channel severs the park. However, public access should not impact the wintering and breeding behavior of listed shorebirds, terns and gulls. To avoid disturbance during the breeding season, March 1 through July 31, public access should be restricted to areas that are at least 100 yards from the nesting colony. Florida Audubon Society concur with the recommendations of the Florida Game and Fresh Water Fish Commission in relation to the timing and location of construction during the shorebird nesting season.

Although the modeling has not been completed for the alternatives discussed in the Reconnaissance Report, I would like to recommend that the model analyze the long term consequences of the proposed alternatives on beach shoreline erosion. Since beach shoreline erosion negatively effects listed sea turtle populations and existing residential development, the results of the model should be reviewed closely.

Please continue to inform Florida Audubon Society on the projects associated with Ponce de Leon Inlet. Please address questions or comments concerning this letter to me at 407/260-8300.

Sincerely,


Jedy Rosier
Permit Coordinator

The Voice of Conservation Since Nineteen Hundred

March 16, 1995

Planning Division
Environmental Branch

Mr. David N. Dale
Southeast Regional Office
9721 Executive Center Drive North
St. Petersburg, Florida 33702

Dear Mr. Dale:

Mr. Andreas Mager, Jr., in a letter dated March 8, 1995, requested that the U.S. Army Corps of Engineers, Jacksonville District, send you a copy of the Reconnaissance Report for Ponce De Leon Inlet, Volusia County, Florida.

A copy of the Reconnaissance Report is enclosed for your use.

Sincerely,

A. J. Salem
Chief, Planning Division

Enclosure

~~AP~~ Bozeman/CESAJ-PD-ER/1688

ljd

~~AP~~ Dugger/CESAJ-PD-ER

~~AP~~ Smith/CESAJ-PD-E

~~AP~~ Salem/CESAJ-PD

PONCE-RR.NMF



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Southeast Regional Office
9721 Executive Center Drive North
St. Petersburg, Florida 33702

March 8, 1995

Colonel Terry Rice
District Engineer, Jacksonville District
Department of the Army, Corps of Engineers
P.O. Box 4970
Jacksonville, Florida 32232-0019

Dear Colonel Rice:

This responds to your February 7, 1995 letter requesting comments to assist the Corps of Engineers in identifying study objectives for a feasibility-level report regarding proposed improvements to Ponce Inlet in Volusia County, Florida.

A model study will evaluate two measures for stabilizing the inlet in combination with a 1000-foot extension of the south jetty. The first involves reopening the north jetty weir. The second involves constructing a channel through the southern tip of the peninsula.

The location and description of emergent and submergent vegetation and hard bottom communities within the study area and potential impacts to those resources should also be addressed in the report. The National Marine Fisheries Service requests the opportunity to review the study results when available.

Your letter indicates that a January 1993 Reconnaissance Report is available upon request. Please send one copy of the report to Mr. David N. Dale at the letterhead address above. Mr. Dale is available to discuss any related comments or questions you may have. He may be contacted at 813/570-5317.

Sincerely,

Andreas Mager, Jr.
Assistant Regional Director
Habitat Conservation Division



cc:

Mr. A. J. Salem
Chief, Planning Division
Department of the Army, Corps of Engineers
Planning Division, Environmental Branch
P.O. Box 4970
Jacksonville, Florida 32232-0019

F/SEO2

F/SEO23-ST PETE

PONCE DE LEON INLET
MAILING LIST

Director
Office of Federal Activities (A-104)
Environmental Protection Agency
401 M Street SW
Washington, D.C. 20024-2610 (5 cys)

Director
Department of Commerce
NOAA/CS/EC/Room 6222
14 and Constitution Ave., NW
Washington, DC 20230 (4 cys)

Mr. Bruce Blanchard, Director
Office of Environmental Project
Review
Department of the Interior,
Room 4241
18th and C Streets, NW
Washington, D.C. 20240 (12 cys)

Executive Director
Advisory Council on Historic
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The Old Post Office Building
1100 Pennsylvania Avenue NW 809
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1101 Audubon Way
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Isaak Walton League of America, Inc.
5314 Bay State Road
Palmetto, Florida 33561-9712

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U.S. Fish and Wildlife Service
P. O. Box 2676
Vero Beach, FL 32961-2676

State Clearinghouse
Office Of Planning & Budgeting
Executive Office of the Governor
The Capitol
Tallahassee, FL 32301-8074 (16 cys)

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Tallahassee, FL 32314-6870

Florida Defenders of the Environment
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Gainesville, FL 32609

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U.S. Department of Agriculture
401 First Ave., SE
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Gainesville, FL 32602-1280

Regional Environmental Officer
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Room 600-C
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Atlanta, GA 30303-3309 (2 cys)

Mr. Heinz Mueller
Environmental Policy Section
EPA, Region IV
345 Courtland Street, N.E.
Atlanta, GA 30365-2401 (5 cys)

Wilderness Society
4203 Ponce de Leon Boulevard
Coral Gables, FL 33416.

State Director, ASCS
U.S. Department of Agriculture
P. O. Drawer 670
Gainesville, Florida 32602-0670

Dr. Elaine Harrington
Florida Chapter
Sierra Club
927 Delores Drive
Tallahassee, FL 32301-2929

National Marine Fisheries Service
Environmental Assessment Branch
3500 Delwood Beach Road
Panama City, FL 32407-7499

National Marine Fisheries Service
Office of the Regional Director
9450 Koger Boulevard
St. Petersburg, FL 33702-2496

National Marine Fisheries Service
Chief, Protected Species Branch
9450 Koger Boulevard
St. Petersburg, FL 33702-2496

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Forest Supervisor
U.S. Forest Service
227 N. Bronough Street
Suite 4061
Tallahassee, Florida 32301

St. Johns River Water
Management District
P.O. Box 1429
Palatka, Florida 32178-1428

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Lighthouse Boatyard
4958 S. Peninsula Dr.
Ponce Inlet
Daytona Beach, Florida 32127

Mr. Charlie Schammel
Critter Fleet
4950 S. Peninsula Dr.
Ponce Inlet, Florida 32127

Mr. Bob Stone
Critter Fleet
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Mr. Tim Garrett
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Mr. Carey St. Clair
Sea Love Marina
4884 Front St.
Ponce Inlet, Florida 32127

Mr. Greg DeBrango
King's Seafood
79 Dunlawton Avenue
Port Orange, Florida 32119

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Mr. Bill Brehm
The Boat Club Marina
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United States Coast Guard
State Ponce DeLeon
P.O. Box 370
New Smyrna Beach, Florida 32170

Commander
Seventh Coast Guard District
United States Coast Guard
Brickell Plaza Federal Building
Miami, Florida 33131-3050

Mr. Daniel M. O'Brien
Port Authority Coordinator
Ponce DeLeon Port Authority
440 S. Beach Street
Daytona Beach, Florida 32114

PONCE DE LEON INLET
PROPOSED ALTERNATIVES

1. Five alternatives are currently under consideration and are described below:

a. Construct a 1,000-foot extension of the south jetty. The jetty would be constructed at a base elevation of -15 feet m.l.w. and extend to a crest elevation of +7.0 feet m.l.w.

b. Construct a scour apron along the south side of the north jetty. The apron would be 30 feet wide and 3 feet thick and would be placed along the landward 700 feet of the north jetty.

c. Rebuild the damaged portions of the north jetty with stone similar to that now in place. Portions of the north jetty have slumped up to 3 feet since initial construction because of scouring or storm displacement due to wave action. Approximately 1,000 cy of stone will be required for repairs.

d. Construct a groin field along the sand spit inside the inlet, adjacent to the north jetty. Four (4) rubble-mound groins are anticipated at this time.

e. Construct a storm revetment to seal a potential breach along the sand spit inside the inlet, adjacent to the north jetty.

2. Construction of all improvements to the north jetty will be from a barge. South jetty improvements may be constructed by driving over the jetty or from a barge.

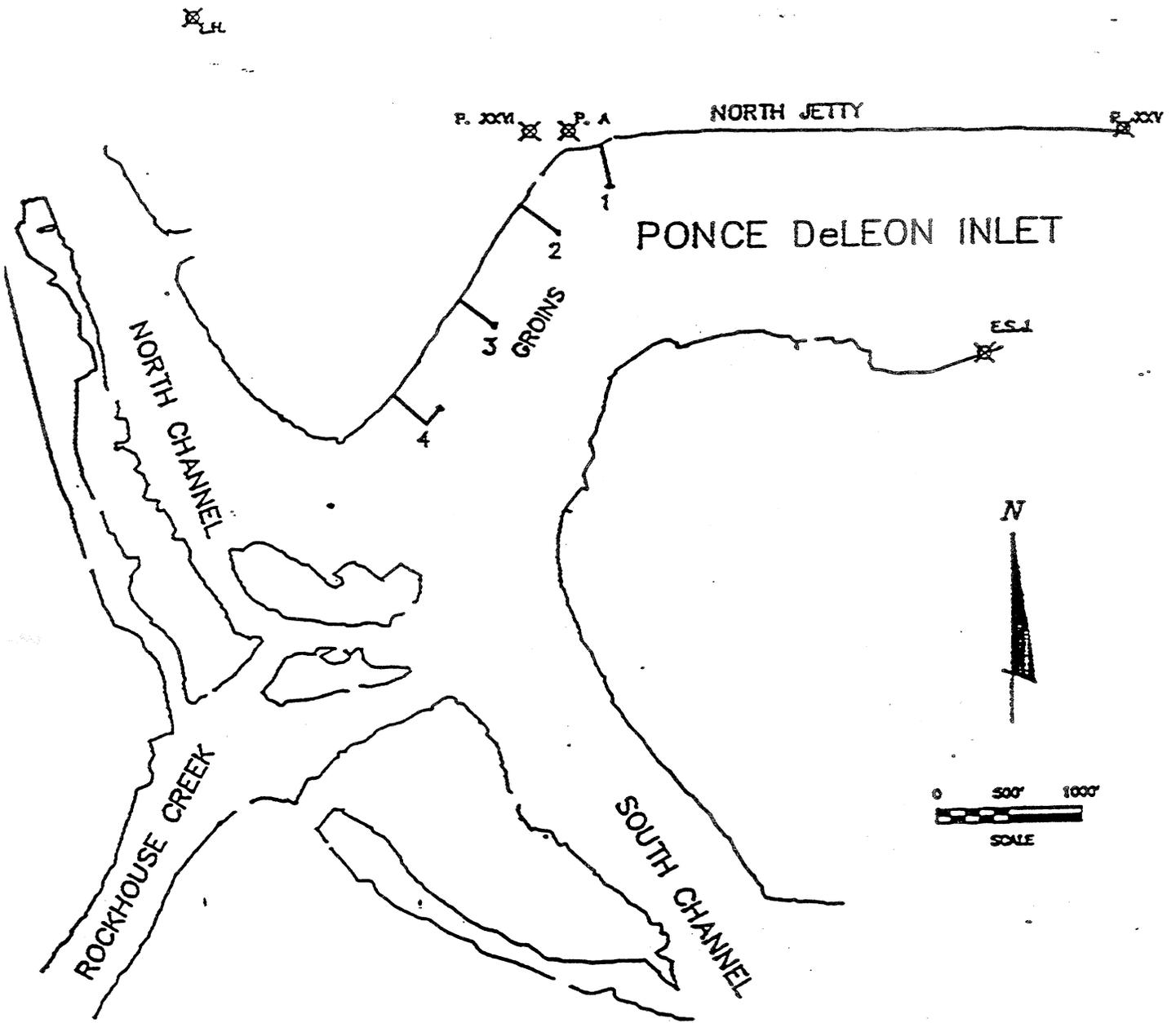
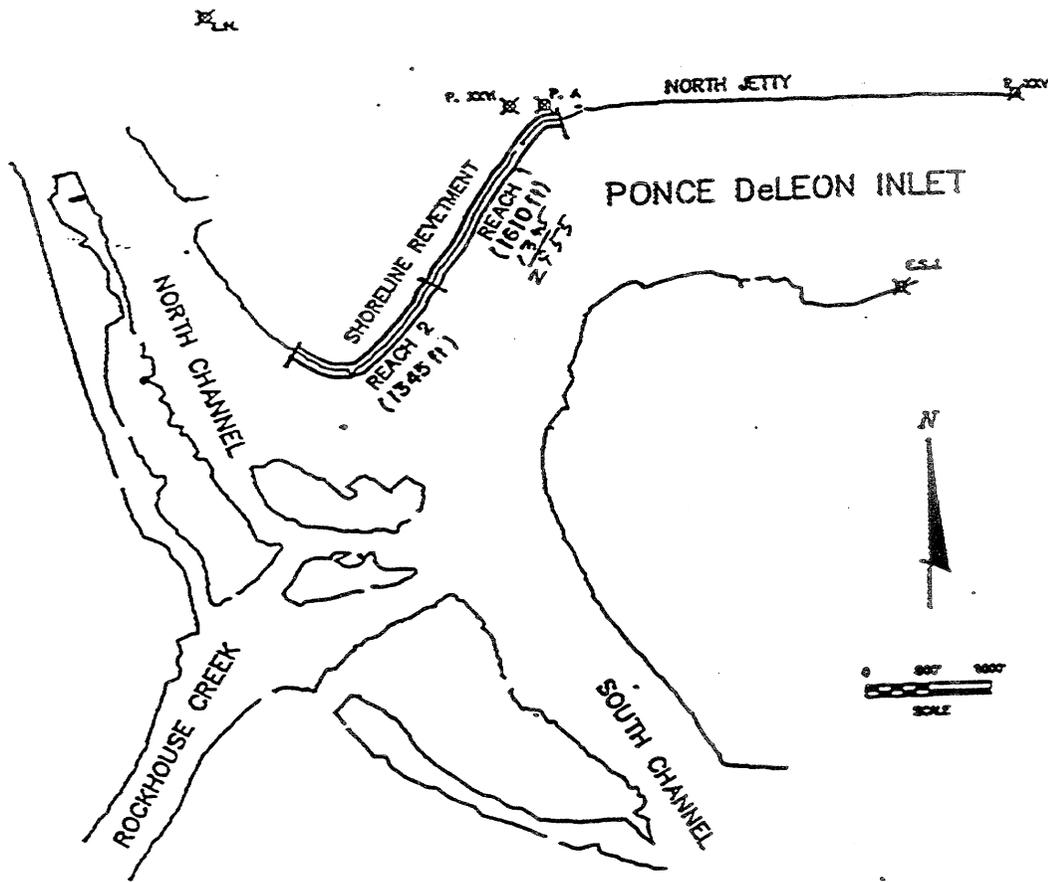
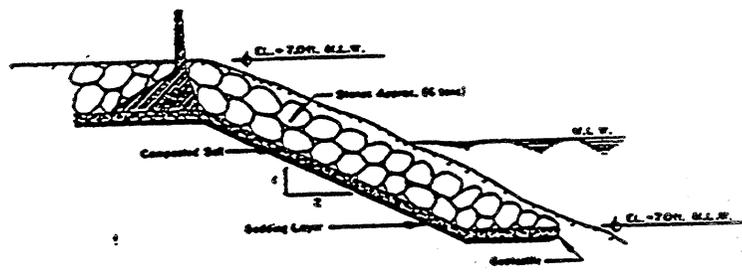


Figure 1 Four Groin System

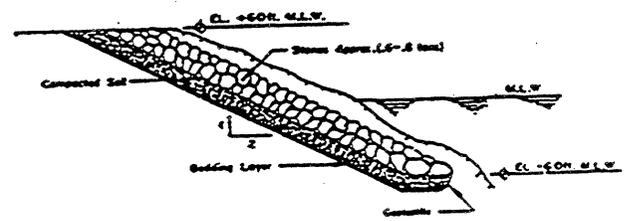


Reach 1 - Typical Cross-Section
K.T.S.



Conceptual Design Only

Reach 2 - Typical Cross-Section
K.T.S.



Conceptual Design Only

Figure 2 Conceptual Design, North Spit Shoreline Revetment



DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P. O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019



REPLY TO
ATTENTION OF

February 7, 1995

Planning Division
Environmental Branch

TO THE ADDRESSEES ON THE ENCLOSED LIST:

The Jacksonville District, U.S. Army Corps of Engineers (Corps), is gathering information to define issues and concerns that will be addressed in a feasibility-level report on proposed inlet improvements at Ponce de Leon Inlet, Volusia County, Florida.

In a letter dated September 29, 1992, the Corps presented a series of alternatives and requested views, comments, and information regarding those alternatives. Responses were incorporated into the environmental considerations for the Reconnaissance Report dated January 1993. That report is available from the Jacksonville District, upon request.

During the feasibility phase, two additional alternatives will receive consideration. (See enclosed map, figure 1.) One involves reopening the north jetty weir (A on enclosed map). The second consists of constructing a channel in the area of the potential breakthrough (B on enclosed map). A model study will evaluate those measures for stabilizing the inlet in combination with a 1000-foot extension of the south jetty. Extension of the south jetty may include reuse of existing stone from the landward end of the south jetty or from reopening the weir in the north jetty.

The Corps welcomes your views, comments, and information about resources, study objectives, and important features within the described study area, as well as any suggested improvements. Letters of comment or inquiry should be addressed to the letterhead address to the attention of Planning Division, Environmental Studies Section, and received by this office within 30 days of the date of this letter.

Sincerely,

A. J. Salem
Chief, Planning Division

Enclosure

PONCE DE LEON INLET

MAILING LIST

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Captain Ernie Endicott
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Captain Steve Dresser
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Captain Scott Frierson
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Captain Mike DeBloom
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New Smyrna Beach, FL 32168

Captain Bob McWhorter
Fishin Cove Marina
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Captain Bill Fulton
Fishin Cove Marina
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New Smyrna Beach, FL 32168

Captain Moors
Feger's Seafood
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New Smyrna Beach, FL 32170-0024

Captain Frank Martinez
Feger's Seafood
P.O. Box 24
New Smyrna Beach, FL 32170-0024

Captain David Baird
Path Finder
P.O. Box 818
Sharpes, FL 32959

Captain Robert Smith
The Charlie
P.O. Box 818
Sharpes, FL 32959

Captain R. Christiansen
Charter Boat, The Charlie
P.O. Box 818
Sharpes, FL 32959

Captain Tony Crane
Charter Boat, Lucky Strike
P.O. Box 818
Sharpes, FL 32959

Captain Timmons
Manager Sea Love Marina
4884 Front Street
Ponce Inlet, FL 32127

Captain Joe Camp
Sea Love Marina
4884 Front Street
Ponce Inlet, FL 32127

Captain Lingo
Sea Love
4884 Front Street
Ponce Inlet, FL 32127

Captain David Stokes
Charter Boat, Sea Lover
4884 Front Street
Ponce Inlet, FL 32127

Captain David Thompson
Charter Boat, Square One
4884 Front Street
Ponce Inlet, FL 32127

Captain Scott Laney
Charter Boat, Rockin Robin
4884 Front Street
Ponce Inlet, FL 32127

Captain Chris Forman
Charter Boat, Taylor made
4884 Front Street
Ponce Inlet, FL 32127

Mr. Sam Fernandez
Dockside Charters
4888 Front Street
Ponce Inlet, FL 32127

Captain Danny Day
Charter Boat, Mommas Money II
4888 Front Street
Ponce Inlet, FL 32127

Captain Bob Sorenson
Charter Boat, High Roller
4888 Front Street
Ponce Inlet, FL 32127

Captain Tom Wagner
Charter Boat, Sun Dancer
4888 Front Street
Ponce Inlet, FL 32127

Mr. Paul Pickett
Sea harvest
107 North Riverside Drive
New Smyrna Beach, FL 32168

Captain Johnny Lloyd
Charter Boat, Triple Header
107 North Riverside Drive
New Smyrna Beach, FL 32168

Captain Tom Harold
Charter Boat, Pier Three
107 North Riverside Drive
New Smyrna Beach, FL 32168

Mr. Richard Kirk
Ponce Deep Water Landing
133 Inlet Harbor Road
Ponce Inlet, FL 32127

Captain George Locke
Little Dolphin
133 Inlet Harbor Road
Ponce Inlet, FL 32127

Captain John Ellis
Charter Boat, Rainbow II
133 Inlet Harbor Road
Ponce Inlet, FL 32127

Captain Steve Ellis
Charter Boat, Rainbow III
133 Inlet Harbor Road
Ponce Inlet, FL 32127

Captain David Grubbs
Charter Boat, Heavy Hitter
133 Inlet Harbor Road
Ponce inlet, FL 32127

Captain William Albright
Daytona Marine & Boat Works
645 South Beach Street
Daytona Beach, FL 32114

Mr. Clete Oakley
Halifax Harbor Marina
450 Basin Street
Daytona Beach, FL 32114

Captain William Nixon
Charter Boat, Gerry J
450 Basin Street
Daytona Beach, FL 32114

Captain Don Withers
Howard's Bait & Tackle
96 Dunlawton Avenue
Port Orange, FL 32119

Captain Doug McCarver
Haf N Haf Charters
79 East Dunlawton Avenue
Port Orange, FL 32119

Mr. & Mrs Kennedy
Popeye Fishing Charters
3300 South Peninsula Drive
Daytona Beach, FL 32118

Captain George Johnson
Charter Boat, Lady J
Riverview Charlies Restaurant
North Causeway
New Smyrna Beach, FL 32169

RECEIVED JUL 13 1994



FLORIDA DEPARTMENT OF STATE

Jim Smith
Secretary of State

DIVISION OF HISTORICAL RESOURCES

R.A. Gray Building
500 South Bronough

Tallahassee, Florida 32399-0250

Director's Office

Telecopier Number (FAX)

(904) 488-1480

(904) 488-3353

July 7, 1994

Mr. Bruce Piatek
Bruce Piatek & Associates
13 Marilyn Avenue
St. Augustine, FL 32084

In Reply Refer To:
Susan M. Herring
Historic Preservation
Planner
(904) 487-2333
Project File No. 942168

RE: *Archaeological and Historical Survey of Lighthouse Point
Park, Ponce Inlet, Volusia County, Florida (Bruce John
Piatek, November 1993)*

Dear Mr. Piatek:

In accordance with this agency's responsibilities under Section 267.061, Florida Statutes, we have reviewed the referenced survey report and find it complete and sufficient. We note that one new site, 8V05253, Hotel Inlet Terrace, was encountered. We concur with the archaeologist's determination that this site is not significant.

Thus, it is the opinion of this agency that park development activities will have no effect on any historic properties listed, or eligible for listing, in the National Register of Historic Places, or otherwise of historic or archaeological value, and may proceed.

If you have any questions concerning our comments, please do not hesitate to contact us. Your interest in protecting Florida's historic properties is appreciated.

Sincerely,

for *Laura R. Kammerer*
George W. Percy, Director
Division of Historical Resources

GWP/Hsh

Ci Ginny Kent

December 11, 1992

Bentzen	12/11

Mr. A. J. Salem
 Chief, Planning Division
 U.S. Army Corps of Engineers
 P.O. Box 4970
 Jacksonville, Florida 32232-0019

Dear Mr. Salem:

The U. S. Fish and Wildlife Service has received your request for information concerning issues and concerns pertinent to proposed inlet improvements at Ponce de Leon Inlet, Volusia County, Florida.

The Corps has described various alternatives which would result in improvements to navigation in this area. These descriptions portray activities which may significantly impact threatened and endangered species known to occur in this area.

The following listed species are known to occur within the project area:

West Indian manatee	<i>Trichechus manatus</i>
Loggerhead sea turtle	<i>Caretta caretta</i>
Green sea turtle	<i>Chelonia midas</i>
Leatherback sea turtle	<i>Dermochelys coriacea</i>
Kemp's ridley sea turtle	<i>Lepidochelys kempii</i>
Hawksbill turtle	<i>Eretmochelys imbricata</i>
Piping plover	<i>Charadrius melodus</i>
Bald eagle	<i>Haliaeetus leucocephalus</i>
Wood stork	<i>Mycteria americana</i>

The Service is concerned with possible impacts to these listed species and is available to assist the Corps, pursuant to the Fish and Wildlife Coordination Act, in developing required reports through transfer fund agreements.

Lighthouse Point State Park, Smyrna Dunes State Park, and Spruce Creek Aquatic Preserve, administered by the Florida Department of Natural Resources, are located within the project area. Federal sites in proximity to the site include Canaveral National Seashore and the Ponce Inlet Coast Guard Station. These offices should be contacted to ensure that their needs and concerns are appropriately addressed.

We look forward to working with the Corps on this project. Should you have any questions, please contact Jim Valade in this office.

Sincerely,

Michael M. Bentzen
 Assistant Field Supervisor



United States Department of the Interior



FISH AND WILDLIFE SERVICE

3100 University Blvd. South
Suite 120
Jacksonville, Florida 32216

December 11, 1992

Mr. A. J. Salem
Chief, Planning Division
U.S. Army Corps of Engineers
P.O. Box 4970
Jacksonville, Florida 32232-0019

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Loggerhead sea turtle	<i>Caretta caretta</i>
Green sea turtle	<i>Chelonia midas</i>
Leatherback sea turtle	<i>Dermochelys coriacea</i>
Kemp's ridley sea turtle	<i>Lepidochelys kempii</i>
Hawksbill turtle	<i>Eretmochelys imbricata</i>
Piping plover	<i>Charadrius melodus</i>
Bald eagle	<i>Haliaeetus leucocephalus</i>
Wood stork	<i>Mycteria americana</i>

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We look forward to working with the Corps on this project. Should you have any questions, please contact Jim Valade in this office.

Sincerely,

Michael M. Bentzien

Michael M. Bentzien
Assistant Field Supervisor

**Endangered and Threatened Species and Critical Habitats
Under the Jurisdiction of the National Marine Fisheries Service**

Florida - Atlantic Coast

Listed Species	Scientific Name	Status	Date Listed
Marine Mammals			
finback whale	<i>Balaenoptera physalus</i>	Endangered	12/02/70
humpback whale	<i>Megaptera novaeangliae</i>	Endangered	12/02/70
right whale	<i>Eubalaena glacialis</i>	Endangered	12/02/70
sei whale	<i>Balaenoptera borealis</i>	Endangered	12/02/70
sperm whale	<i>Physeter macrocephalus</i>	Endangered	12/02/70
Turtles			
green sea turtle	<i>Chelonia mydas</i>	Endangered ¹	07/28/78
hawksbill sea turtle	<i>Eretmochelys imbricata</i>	Endangered	06/02/70
Kemp's ridley sea turtle (Atlantic)	<i>Lepidochelys kempii</i>	Endangered	12/02/70
leatherback sea turtle	<i>Dermochelys coriacea</i>	Endangered	06/02/70
loggerhead sea turtle	<i>Caretta caretta</i>	Threatened	07/28/78
Fish			
shortnose sturgeon	<i>Acipenser brevirostrum</i>	Endangered	03/11/67

Species Proposed for Listing

Seagrass			
Johnson's seagrass	<i>Halophila johnsonii</i>	Threatened	

Proposed Critical Habitat

None

Designated Critical Habitat

right whale: Between 31°15'N (approximately the mouth of the Altamaha River, Georgia) and 30°15'N (approximately Jacksonville, Florida) from the coast out to 15 nautical miles offshore; the coastal waters between 30°15'N and 28°00'N (approximately Sebastian Inlet, Florida) from the coast out to 5 nautical miles.

¹ Green turtles are listed as threatened, except for breeding populations of green turtles in Florida and on the Pacific Coast of Mexico, which are listed as endangered.

Endangered and Threatened Species and Critical Habitats
Under the Jurisdiction of the National Marine Fisheries Service

Florida - Gulf Coast

Listed Species	Scientific Name	Status	Date Listed
Marine Mammals			
finback whale	<i>Balaenoptera physalus</i>	Endangered	12/02/70
humpback whale	<i>Megaptera novaeangliae</i>	Endangered	12/02/70
right whale	<i>Eubalaena glacialis</i>	Endangered	12/02/70
sei whale	<i>Balaenoptera borealis</i>	Endangered	12/02/70
sperm whale	<i>Physeter macrocephalus</i>	Endangered	12/02/70
Turtles			
green sea turtle	<i>Chelonia mydas</i>	Endangered ¹	07/28/78
hawksbill sea turtle	<i>Eretmochelys imbricata</i>	Endangered	06/02/70
Kemp's ridley sea turtle (Atlantic)	<i>Lepidochelys kemp</i>	Endangered	12/02/70
leatherback sea turtle	<i>Dermochelys coriacea</i>	Endangered	06/02/70
loggerhead sea turtle	<i>Caretta caretta</i>	Threatened	07/28/78
Fish			
gulf sturgeon	<i>Acipenser oxyrhynchus desotoi</i>	Threatened	09/30/91

Species Proposed for Listing

None

Proposed Critical Habitat

None

Designated Critical Habitat

None

¹ Green turtles are listed as threatened, except for breeding populations of green turtles in Florida and on the Pacific Coast of Mexico, which are listed as endangered.



LAWTON CHILES
GOVERNOR

STATE OF FLORIDA

Office of the Governor

THE CAPITOL
TALLAHASSEE, FLORIDA 32399-0001

November 18, 1992

Mr. A. J. Salem
Chief, Planning Division
Department of the Army
Jacksonville District Corps
of Engineers
Post Office Box 4970
Jacksonville, Florida 32232-0019

RE: Reconnaissance-Level Report on Proposed Inlet Improvements
at Ponce de Leon Inlet, Volusia County, Florida

SAI: FL9210021642C

Dear Mr. Salem:

The Florida State Clearinghouse, pursuant to Presidential Executive Order 12372, Gubernatorial Executive Order 83-150, the Coastal Zone Management Act Reauthorization Amendments of 1990 and the National Environmental Policy Act, has coordinated a review of the above referenced project.

Pursuant to Presidential Executive Order 12372, the project will be in accord with State plans, programs, procedures and objectives when consideration is given to and action taken on the enclosed comments and requirements of our reviewing agencies.

The Department of Environmental Regulation (DER) notes the following general concerns that should be addressed in the study and subsequent environmental documents: current status of the inlet that necessitates alteration of the environment; identification of resources at risk under each alternative; secondary and cumulative impacts resulting from each alternative; non-structural alternatives; and mitigation for unavoidable resource impacts. The DER recommends close coordination with the permitting staff in the DER Bureau of Wetland Resource Management to develop alternatives consistent with the provisions of Chapter 403, Florida Statutes. Please refer to the enclosed DER comments.

The Department of Natural Resources (DNR) indicates that the report must be coordinated closely with the inlet management plan, and should address the following concerns: expand alternatives to include the null alternative and channel realignment; beach renourishment should be considered separately or in combination with the proposed alternatives; justification for the inlet armoring must be fully substantiated by economic

Mr. A. J. Salem
Page Two

and navigation safety needs; environmental assessments should include consideration of marine turtle and manatee construction impacts, changes to physical and chemical characteristics of associated estuaries and the use of the inlet area by colonial seabirds. Please refer to the enclosed DNR comments.

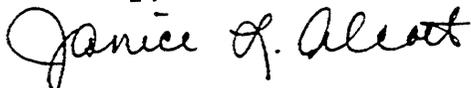
Please refer to the enclosed comments provided by the Department of State (DOS) noting that the proposed project is located in an area with a high potential for submerged cultural resources. The DOS indicates that although no historic properties are currently recorded within the proposed project area, a survey to locate possible submerged cultural resources may be required.

The Game and Fresh Water Fish Commission (GFWFC) indicates that construction activities in the vicinity of the sand spit adjacent to the north jetty should take place outside of the seasonal window from March 1 through July 31 or while maintaining a disturbance buffer of at least 100 yards from nests during the nesting season. Please refer to the enclosed GFWFC comments.

The State of Florida has completed a review of the consistency determination for this project and, based on the information available at this time, agrees that the project, at this stage, is consistent with the Florida Coastal Management Program. However, certain issues of concern have been identified by our reviewing agencies which will require resolution in federal consistency reviews conducted at subsequent decision points. Pursuant to 15 CFR 930.34 and .37, you should prepare a consistency determination at each major decision point for the State's review. Continued State agreement will be based, in part, on adequate reconciliation of previously identified concerns.

This letter reflects your compliance with Presidential Executive Order 12372.

Sincerely,



Janice L. Alcott, Director
State Clearinghouse

JLA/bl

Enclosure(s)

cc: Department of Environmental Regulation
Department of Natural Resources
Department of State
Game and Fresh Water Fish Commission
St. Johns River Water Management District
Department of Commerce



Florida Department of Environmental Regulation

Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400

Carol M. Browner, Secretary

Division Chief, Governor

PANAFAX TRANSMITTAL FORM

FAX # 904/487-4938

(SUNCOM) 277-4938

DATE: 17 NOV 92
TO: Barbara Leighty
ORGANIZATION: State Clearinghouse
FAX #: 488-9005
PHONE #: 488-8114

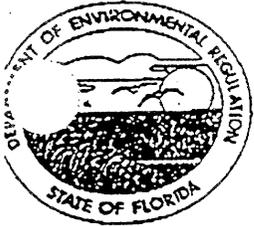
NUMBER OF PAGES (including cover sheet): 2

FROM: Susan Goggin
OFFICE: Intergovernmental Programs
PHONE #: 488-0784

IF ANY OF THE PAGES ARE NOT CLEARLY RECEIVED, PLEASE CALL
THE PERSON LISTED ABOVE OR

_____ AT _____

COMMENTS: _____



Florida Department of Environmental Regulation

Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400

Lawton Chiles, Governor

16 November 1992

Carol M. Browner, Secretary

Janice L. Alcott
Director, State Clearinghouse
Office of Planning and Budgeting
Budget Management and Planning Policy Unit
Executive Office of the Governor
The Capitol
Tallahassee, Florida 32399-0001

RE: Reconnaissance Report, Ponce de Leon Inlet Proposed
Improvements, Volusia County
SAI: FL9210021642C

Dear Ms. Alcott,

The US Army Corps of Engineers (COE) is gathering information on issues and concerns regarding proposed improvements to Ponce de Leon Inlet. The brief notice issued by the COE does not provide sufficient information on the current situation at the inlet for our office to respond in detail to the proposed improvements.

Given this caveat, general concerns that should be addressed in detail in the study and subsequent environmental documents include: 1) the current status of the inlet that necessitates alteration of the environment; 2) identification of resources that will be at risk under each alternative; 3) the secondary and cumulative impacts that will result from each alternative; 4) non-structural alternatives; and 5) mitigation for unavoidable resource impacts.

We appreciate the opportunity to review the reconnaissance study when it is available. We recommend close coordination with the permitting staff in the Bureau of Wetland Resource Management (DER, Tallahassee) to develop alternatives consistent with the provisions of Chapter 403, Fla. Statutes. If you should have any questions concerning this letter, please call me at 904/488-0784.

Sincerely,

Susan Goggin
Environmental Specialist
Office of Intergovernmental Programs

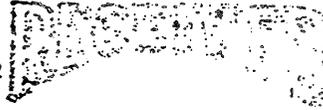
SEG:LG:s



FLORIDA DEPARTMENT OF NATURAL RESOURCES

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399

November 6, 1992



NOV 9 1992

Governor
Jim Smith
Secretary of State
Bob Butterworth
Attorney General
Gerald Lewis
State Comptroller
Tom Gallagher
State Treasurer
Bob Crawford
Commissioner of Agriculture
Betty Castor
Commissioner of Education

Ms. Janice Alcott
State Clearinghouse
Office of Planning and Budget
Executive Office of the Governor
The Capitol
Tallahassee, Florida 32399-0001

STATE CLEARINGHOUSE

RE: USACE-SAJ Reconnaissance Report, Ponce de Leon Inlet

SAI: FL9210021642C

Dear Ms. Alcott:

The Department of Natural Resources has reviewed the above referenced document as requested. Due to insufficient information, and the fact that an approved inlet management plan is not available at this time, the Department will not comment on the federal consistency of the proposed alternatives. The report must be coordinated closely with the inlet management plan, and should address the following concerns.

Alternatives should be expanded to include the null alternative and channel realignment. In addition, currently the State is reviewing a proposal to place dredged material on the shoreline area in question. Beach nourishment should be considered separately or in combination with the proposed alternatives. Justification for the inlet armoring must be fully substantiated by economic and navigation safety needs. Environmental assessments should include consideration of marine turtle and manatee construction impacts, changes to physical and chemical characteristics of associated estuaries, and the use of the inlet area by colonial seabirds.

Thank you for your time and the opportunity to provide comments on this project. Please address questions or comments concerning this letter to me at 904/488-1555.

Sincerely,

John F. Wettstein
Senior Management Analyst

cc: Ed Conklin, DNR-DMR
Kirby Green, DNR-DBS
Dan O'Brien, Ponce de Leon Port Authority
A.J. Salem, USACE-SAJ-PD
Frank Votra, DNR-DSL



Office of the Governor

THE CAPITOL

TALLAHASSEE, FLORIDA 32399-0001

Date: OCT-07-1992

W. J. B. CHILES
GOVERNOR

Comment Due Date: OCT-21-1992

SAIF# FL92100216420

STATE AGENCIES

<input checked="" type="checkbox"/> Agriculture/Forestry
<input type="checkbox"/> Board of Regents
<input checked="" type="checkbox"/> Commerce
<input checked="" type="checkbox"/> Community Affairs
<input type="checkbox"/> Education
<input checked="" type="checkbox"/> Environmental Regulation
<input checked="" type="checkbox"/> Game & Fish Comm.
<input type="checkbox"/> Health & Rehab. Services
<input type="checkbox"/> Highway Safety
<input type="checkbox"/> Labor & Employment
<input type="checkbox"/> Law Enforcement

STATE AGENCIES

<input checked="" type="checkbox"/> Marine Fisheries Commission
<input checked="" type="checkbox"/> Natural Resources
<input checked="" type="checkbox"/> State
<input checked="" type="checkbox"/> Transportation
<input type="checkbox"/> Trans. Disad. Comm.
<input type="checkbox"/> Elder Affairs
<input type="checkbox"/>

LOCAL/OTHER

<input type="checkbox"/> RPOV
<input checked="" type="checkbox"/> WMD <u>SJR</u>
<input type="checkbox"/>

OPB POLICY UNITS

<input type="checkbox"/> Criminal Justice
<input type="checkbox"/> Education
<input type="checkbox"/> Environmental/C & ED
<input type="checkbox"/> General Government
<input type="checkbox"/> Health & Human Services
<input type="checkbox"/> Revenue & Eco. Analysis
<input type="checkbox"/> SCH
<input checked="" type="checkbox"/> SCH/CON

The attached document requires a Coastal Zone Management Act/Florida Coastal Management Program consistency evaluation and is categorized as one of the following:

Federal Assistance to State or Local Governments (15 CFR 930, Subpart F). State Agencies are required to evaluate the consistency of the activity.

Direct Federal Activity (15 CFR 930, Subpart C). Federal agencies are required to furnish a consistency determination for the State's concurrence or objection.

Outer Continental Shelf Exploration, Development or Production Activities (15 CFR 930, Subpart E). Operators are required to provide a consistency certification for state concurrence/objection.

Federal Licensing or Permitting Activity (15 CFR 930, Subpart D). Such projects will only be evaluated for consistency when there is not an analogous state license or permit.

SEE REVERSE SIDE FOR INSTRUCTIONS.

To: State Clearinghouse
Executive Office of the Governor-OPB
Room 411, Carlton Building
Tallahassee, Florida 32399-0001
(904)488-8114 (Suncom 276-8114)

From: DHR

Division/Bureau Executive Office

Prepared by Fritz Wettstein

Date: 11/6/92

EO. 12372

No Comment

Comments Attached

Not Applicable

Federal Consistency

No Comment/Consistent

Consistent/Comments Attached

Inconsistent/Comments Attached



FLORIDA DEPARTMENT OF STATE

Jim Smith
Secretary of State

DIVISION OF HISTORICAL RESOURCES

R.A. Gray Building
500 South Bronough

Tallahassee, Florida 32399-0250

Director's Office Telecopier Number (FAX)

(904) 488-1480

(904) 488-3353

PFN: 922968

October 27, 1992

In Reply Refer To:
Susan Hammersten
Compliance Review
Section, DHR
(904) 487-2333

Ms. Janice L. Alcott, Director
State Clearinghouse
Executive Office of the Governor, OPB
Room 411, Carlton Building
Tallahassee, Florida 32399-0001

RE: SAI# FL9210021642C
Improvements to the Ponce de Leon Inlet
Volusia County, Florida

RECEIVED
OCT 29 1992
STATE CLEARINGHOUSE

Dear Ms. Alcott:

In accordance with the provisions of Florida's Coastal Zone Management Act and Chapter 267, Florida Statutes, as well as the procedures contained in 36 C.F.R., Part 800 ("Protection of Historic Properties"), we have reviewed the above referenced project(s) for possible impact to historic properties listed, or eligible for listing, in the National Register of Historic Places.

It is the opinion of this office that all of the project alternatives under consideration by the Corps have the potential to adversely affect historic properties. The project is located in an area with a high potential for submerged cultural resources. Therefore, although no historic properties are currently recorded within the project area, a survey to locate such properties may be required.

We look forward to reviewing the final specifications for the project once they have been selected. If you have any questions concerning our comments, please do not hesitate to contact us. Your interest in protecting Florida's historic properties is appreciated.

Sincerely,

for 
George W. Percy, Director
Division of Historical Resources

and
State Historic Preservation Officer

GWP/Hsh

FLORIDA GAME AND FRESH WATER FISH COMMISSION

JOHN WRIGHT
Orlando

QUINTON L. HEDGEPEETH, DDS
Miami

MRS. GILBERT W. HUMPHREY
Micosaukee

JOE MARLIN ILLIARD
Clewiston

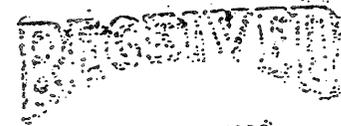
BEN ROWE
Gainesville

ROBERT M. BRANTLY, Executive Director
ALLAN L. EGBERT, Ph. D., Assistant Executive Director



FARRIS BRYANT BUILDING
620 South Meridian Street
Tallahassee, Florida 32399-1600
(904) 488-1960

October 29, 1992



NOV 2 1992

STATE CLEARINGHOUSE

Ms. Janice L. Alcott, Director
Florida State Clearinghouse
Executive Office of the Governor
Office of Planning and Budgeting
The Capitol
Tallahassee, Florida 32399-0001

RE: SAI #FL9210021642C, Volusia
County, Inlet improvements at
Ponce de Leon Inlet

Dear Ms. Alcott:

The Office of Environmental Services of the Florida Game and Fresh Water Fish Commission (GFC) has reviewed the proposed project and offers the following comments.

The proposed project would take place at Ponce de Leon Inlet in Volusia County, Florida. Several inlet improvement alternatives are being considered by the U.S. Army Corps of Engineers. Construction improvements to the south jetty would be facilitated by driving over the jetty or from a barge, while improvements to the north jetty would be accomplished via a barge. Proposed construction improvements include: 1) a 1,000-foot extension of the south jetty, 2) a scour apron 30 feet wide and 3 feet thick along the north jetty, 3) rebuilding damaged portions of the north jetty with about 1,000 cubic yards of stone, 4) construction of a groin field along the sand spit adjacent to the north jetty, and 5) construction of a storm revetment to seal a potential breach along the sand spit adjacent to the north jetty.

The sand spit adjacent to the north jetty is excellent habitat for both wintering and breeding species of shorebirds, terns, and gulls. Some of these species are listed by the GFC as endangered (E), threatened (T), or species of special concern (SSC).

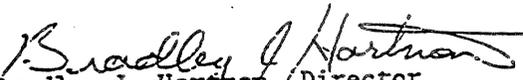
During the non-nesting period, this habitat would provide resting and roosting opportunities for a host of bird species including brown pelican (SSC), American oystercatcher (SSC), and piping plover (T). During the spring nesting season, this area should be monitored for the presence of least terns



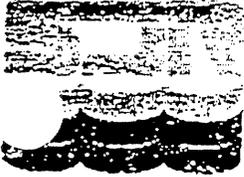
Ms. Janice L. Alcott
October 29, 1992
Page 2

(T) and American oystercatchers. These species can be expected to engage in breeding activities from March 1 through July 31. Because they are especially sensitive to disturbance during this time, construction activities in the vicinity of the sand spit adjacent to the north jetty should take place outside of this seasonal window or while maintaining a disturbance buffer of at least 100 yards from nests during the nesting season.

Sincerely,


Bradley J. Hartman, Director
Office of Environmental Services

BJH/BT/rs
ENV 1-3-2
ponce
cc: U.S. Army Corps of Engineers, Jacksonville



**WATER
MANAGEMENT
DISTRICT**

Henry Dean, Executive Director
John R. Wehle, Assistant Executive Director

POST OFFICE BOX 1429 PALATKA, FLORIDA 32178-1429
TELEPHONE 904/329-4500 SUNCOM 904/860-4500
FAX (EXECUTIVE/LEGAL) 329-4125 (PERMITTING) 329-4315 (ADMINISTRATION/FINANCE) 329-4508

FIELD STATIONS

518 E. South Street Orlando, Florida 32801 407/894-5423	7775 Baymeadows Way Suite 102 Jacksonville, Florida 32256 904/730-4270	PERMITTING: 305 East Drive Melbourne, Florida 32904 407/984-4840	OPERATIONS: 2133 N. Wickham Road Melbourne, Florida 32935-8109 407/254-1782
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November 16, 1992

State Clearinghouse
Executive Office of the Governor, OPB
Room 411, Carlton Building
Tallahassee, FL 32399-0001

Re: SAI #FL9210021642C; Ponce de Leon Inlet improvements.

Dear Sir or Madam:

The St. Johns River Water Management District is pleased to review proposed Ponce de Leon Inlet improvements, as requested by the State Clearinghouse. We believe this project would be consistent with District rules and policies on condition that the construction details conform with criteria to be defined by the Florida Department of Environmental Regulation (FDER).

Whereas it was difficult to fully assess the project from the description provided, we doubt the proposed work would be subject to regulation by the District. Under Section III. 2. (f) of the Operating Agreement between the District and the FDER, the District does not review dredge-and-fill issues for public works projects not requiring a Management and Storage of Surface Waters (MSSW) permit. Hence, the construction of jetties, groins, dolphins, breakwaters, boat ramps, seawalls, etc., in state waters shall be authorized exclusively by the FDER. (This agreement is effective after November 15, 1992.)

Should any aspect of the project change so as to require an MSSW, the District can meet with the Army Corps of Engineers to identify fully any subsequent permit requirements. Please direct any questions to Lee Kissick, Environmental Specialist (307) 897-4337 (Suncom 342-4337).

Sincerely,

Lee Kissick, for

Lance D. Hart, Lead Environmental Specialist
Department of Resource Management

RECEIVED
NOV 17 1992
STATE CLEARINGHOUSE

LDH:db

cc: David Dewey
Pat Frost
Lee Kissick
Glenn Lowe

Post-It™ brand fax transmittal memo 7671		# of pages	2
To	State Clearinghouse	From	Lance Hart
Co.		Co.	STJRWMD
Dept.		Phone #	
Fax #	904-922-6200	Fax #	SunCom 342-4354

Joe E. Hill, CHAIRMAN
LEESBURG

Joseph D. Collins, VICE CHAIRMAN
JACKSONVILLE

Jesse J. Parnish, III, TREASURER
TITUSVILLE

Lenora N. McCullagh, SECRETARY
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Ralph E. Simmons
FERNANDINA BEACH

Sandra H. Gray
DE BARY

Patricia T. Harden
DE BARY

James H. Williams



STATE OF FLORIDA DEPARTMENT OF COMMERCE
Division of Economic Development

October 12, 1992

RECEIVED

OCT 21 1992

Ms. Janice L. Alcott, Director
State Clearinghouse
Office of Planning and Budgeting
Executive Office of the Governor
The Capitol
Tallahassee, Florida 32399-0001

STATE CLEARINGHOUSE

RE: SAI# FL 92 10 02 1642C (Ponce de Leon Inlet/Volusia County)

Dear Ms. Alcott:

We appreciate being asked to review this request for comments from the U. S. Army Corps of Engineers. Improvements are being planned at Ponce de Leon Inlet in Volusia County. Under consideration are lengthening a jetty, rebuilding damaged areas, and constructing a groin field and a storm revetment.

At the planning stage, pursuing this project is consistent with the economic criteria of those portions of the Coastal Zone Management Act of 1972 and the Florida Coastal Management Program for which the Department of Commerce has responsibility.

Very respectfully,

Wynnette Wilson
Economist Supervisor
Bureau of Economic Analysis

WW/rdp

Director's
Office
904/488-6300

Business
Assistance
904/488-9357

Economic
Analysis
904/487-2568

Industry
Development
904/488-9360

Motion Picture
and Television
904/487-1100

International
Trade and
Development
904/488-6124

COLLINS BUILDING

TALLAHASSEE, FLORIDA 32399-2000

FAX 904/487-1407



Office of the Governor

THE CAPITOL
TALLAHASSEE, FLORIDA 32399-0001

RECEIVED
10-12-92

K1

WATSON CHILES
GOVERNOR

Date: OCT-07 1992

Comment Due Date: OCT-21 1992

SAI# FL92100216420

STATE AGENCIES	STATE AGENCIES	OPB POLICY UNITS
<input checked="" type="checkbox"/> Agriculture/Forestry	<input checked="" type="checkbox"/> Marine Fisheries Commission	<input type="checkbox"/> Criminal Justice
<input type="checkbox"/> Board of Regents	<input checked="" type="checkbox"/> Natural Resources	<input type="checkbox"/> Education
<input checked="" type="checkbox"/> Commerce	<input checked="" type="checkbox"/> State	<input type="checkbox"/> Environmental/C & ED
<input checked="" type="checkbox"/> Community Affairs	<input checked="" type="checkbox"/> Transportation	<input type="checkbox"/> General Government
<input type="checkbox"/> Education	<input type="checkbox"/> Trans. Dist. Comm.	<input type="checkbox"/> Health & Human Services
<input checked="" type="checkbox"/> Environmental Regulation	<input type="checkbox"/> Elder Affairs	<input type="checkbox"/> Revenue & Eco. Analysis
<input checked="" type="checkbox"/> Game & Fish Comm.	<input type="checkbox"/>	<input type="checkbox"/> SCH
<input type="checkbox"/> Health & Rehab. Services	LOCAL/OTHER	<input checked="" type="checkbox"/> SCH/CON
<input type="checkbox"/> Highway Safety	<input type="checkbox"/> RPEY	
<input type="checkbox"/> Labor & Employment	<input checked="" type="checkbox"/> WMD SJR	
<input type="checkbox"/> Law Enforcement	<input type="checkbox"/>	

The attached document requires a Coastal Zone Management Act/Florida Coastal Management Program consistency evaluation and is categorized as one of the following:

- Federal Assistance to State or Local Governments (15 CFR 930, Subpart F). State Agencies are required to evaluate the consistency of the activity.
- Direct Federal Activity (15 CFR 930, Subpart C). Federal agencies are required to furnish a consistency determination for the State's concurrence or objection.
- Outer Continental Shelf Exploration, Development or Production Activities (15 CFR 930, Subpart E). Operators are required to provide a consistency certification for state concurrence/objection.
- Federal Licensing or Permitting Activity (15 CFR 930, Subpart D). Such projects will only be evaluated for consistency when there is not an analogous state license or permit.

SEE REVERSE SIDE FOR INSTRUCTIONS.

To: State Clearinghouse
Executive Office of the Governor-OPB
Room 411, Carlton Building
Tallahassee, Florida 32399-0001
(904)486-2114 (Suncom 275-2114)

From: FLA DEPT OF COMM
Division/Bureau ECon Developm/BEA
Reviewer R Peterson WW

Date: OCT 12, 1992

<u>EO. 12372</u>	<u>Federal Consistency</u>
<input type="checkbox"/> No Comment	<input type="checkbox"/> No Comment/Consistent
<input type="checkbox"/> Comments Attached	<input checked="" type="checkbox"/> Consistent/Comments Attached
<input type="checkbox"/> Not Applicable	<input type="checkbox"/> Inconsistent/Comments Attached



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P. O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

September 29, 1992

Planning Division
Environmental Branch

TO ADDRESSEES ON ATTACHED LIST:

The Jacksonville District, U.S. Army Corps of Engineers, is gathering information to define issues and concerns that will be addressed in a reconnaissance-level report on proposed inlet improvements at Ponce de Leon Inlet, Volusia County, Florida.

Alternatives under consideration include lengthening the south jetty approximately 1,000 feet, construction of a scour apron on the south side of the north jetty, rebuilding damaged areas of the north jetty, construction of a groin field along the sand spit inside the inlet adjacent to the north jetty and construction of a storm revetment to seal a potential breach along shoreline of the sand spit inside the inlet (enclosure 1).

The Corps welcomes your views, comments and information about resources, study objectives and important features within the described study area, as well as any suggested improvements. Letters of comment or inquiry should be addressed to the letterhead address to the attention of Planning Division, Environmental Studies Section and received by this office within thirty (30) days of the date of this letter.

Sincerely,

A handwritten signature in cursive script, reading "A. J. Salem".

A. J. Salem
Chief, Planning Division

Enclosure

PONCE DE LEON INLET
PROPOSED ALTERNATIVES

1. Five alternatives are currently under consideration and are described below:

a. Construct a 1,000-foot extension of the south jetty. The jetty would be constructed at a base elevation of -15 feet m.l.w. and extend to a crest elevation of +7.0 feet m.l.w.

b. Construct a scour apron along the south side of the north jetty. The apron would be 30 feet wide and 3 feet thick and would be placed along the landward 700 feet of the north jetty.

c. Rebuild the damaged portions of the north jetty with stone similar to that now in place. Portions of the north jetty have slumped up to 3 feet since initial construction because of scouring or storm displacement due to wave action. Approximately 1,000 cy of stone will be required for repairs.

d. Construct a groin field along the sand spit inside the inlet, adjacent to the north jetty. Four (4) rubble-mound groins are anticipated at this time.

e. Construct a storm revetment to seal a potential breach along the sand spit inside the inlet, adjacent to the north jetty.

2. Construction of all improvements to the north jetty will be from a barge. South jetty improvements may be constructed by driving over the jetty or from a barge.

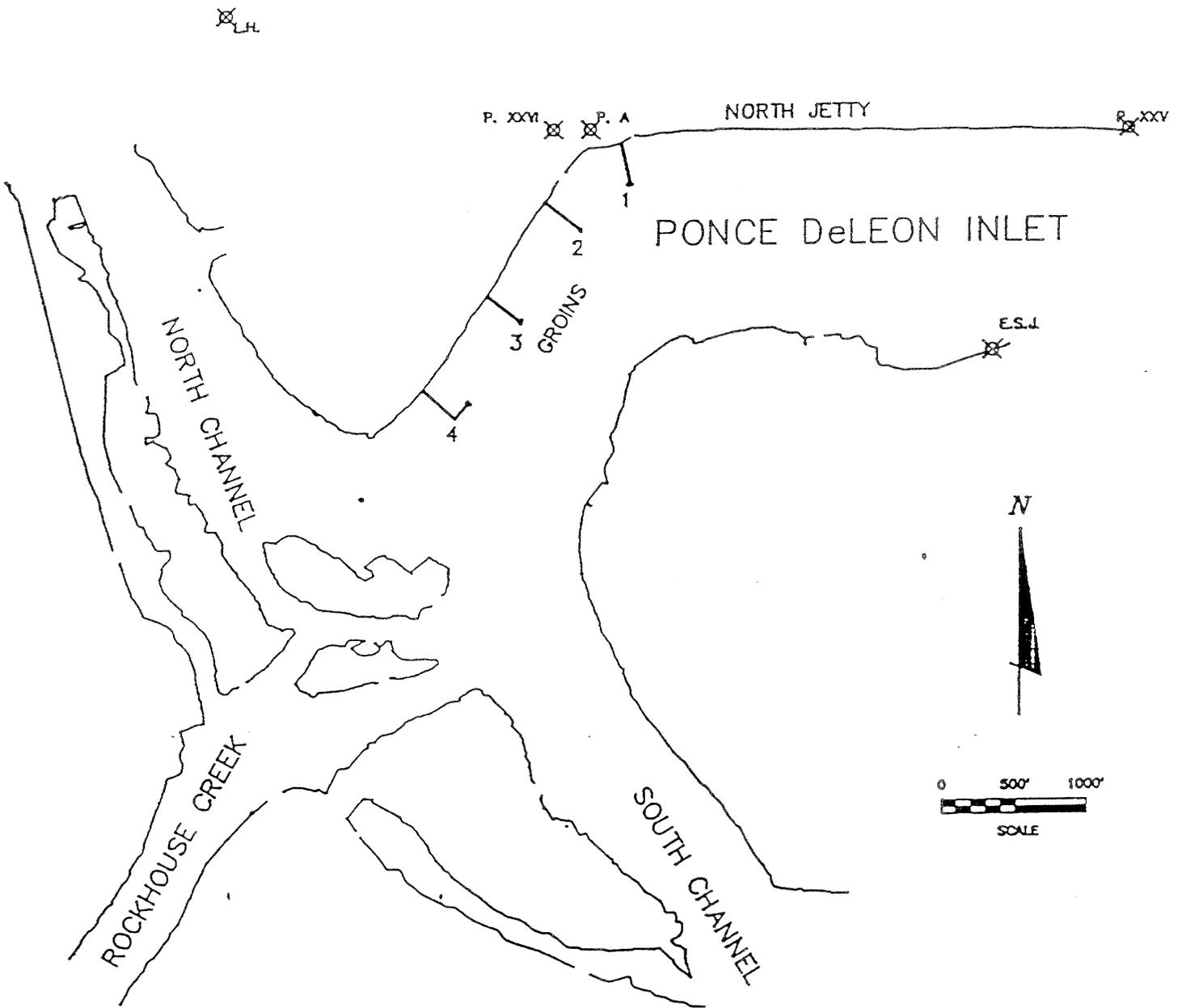
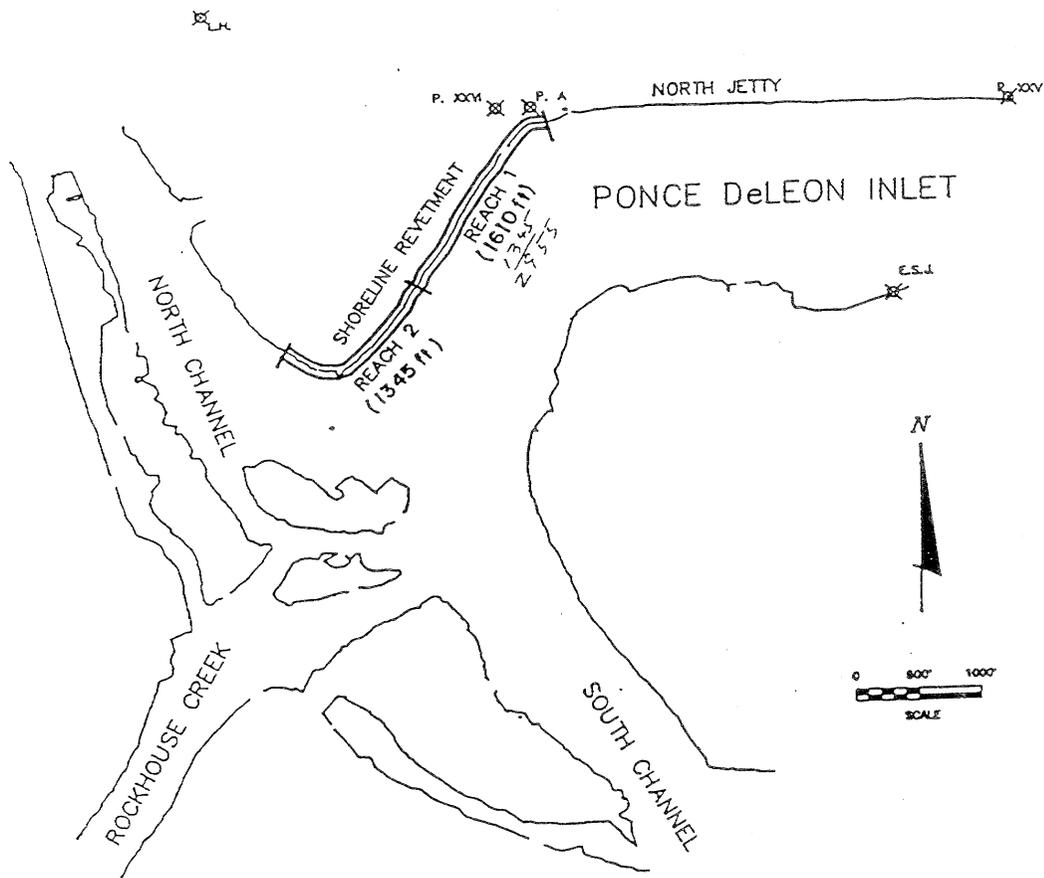
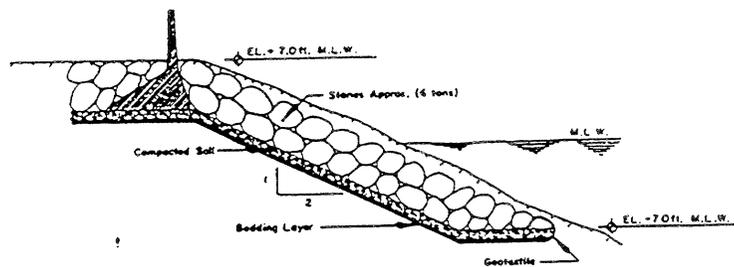


Figure 1 Four Groin System

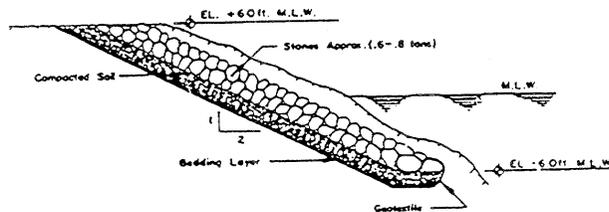


Reach 1 - Typical Cross-Section
N.T.S.



Conceptual Design Only

Reach 2 - Typical Cross-Section
N.T.S.



Conceptual Design Only

Figure 2 Conceptual Design, North Spit Shoreline Revetment

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Appendix D

Fish and Wildlife Coordination Act Report



FISH AND WILDLIFE COORDINATION ACT REPORT

Ponce Inlet Navigation Study

**U.S. Fish and Wildlife Service
Ecological Services Division
Jacksonville Field Office
Jacksonville, Florida**

September 26, 1996

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PONCE DE LEON INLET IMPROVEMENTS

VOLUSIA COUNTY, FLORIDA

Project Description

The proposed project is located on land and adjacent coastal waters of the Atlantic ocean in the vicinity of Ponce de Leon Inlet, at S33, T16S, R34E (Figure 1). The 1993 U.S. Army Corps of Engineers (USACOE) Reconnaissance Report considered various alternatives intended to stabilize the navigation channel near the center of the inlet's mouth and throat, stop the erosion of the inlet's north spit and prevent shoaling resulting from a possible breakthrough of the old bed of the Halifax River with either the inlet or Atlantic Ocean, and eliminate the undermining and settling of the north jetty. The alternatives proposed for consideration include:

- extending the north and south jettys,
- re-opening a portion of the north jetty weir,
- constructing a scour apron on the south side of the north jetty and rebuilding the damaged portions of the north jetty,
- building a groin field along the east shoreline of the north spit within the inlet throat,
- constructing a revetment from the toe end of the north jetty westward along one of three possible alignments, and
- creating a new Federal channel through the old Halifax riverbed.

Description of the Affected Environment

The environment in and around Ponce de Leon Inlet is comprised of both natural and artificial (man-made) habitats. The naturally-occurring systems include open water (sub-littoral zone) and benthos associated with the Atlantic Ocean, inlet mouth and throat, the Indian and Halifax Rivers, and north spit coves; sand beach and tidal flats (littoral zone); coastal sand dunes; and tidal marshes. Artificial habitats include spoil uplands on both north and south spits and on estuarine marsh islands; two rock jettys; a beach-quality sand barrier on the north spit; and various boardwalks, buildings, parking lots, and docks associated with Lighthouse Point and Smyrna Dunes county parks, a U.S. Coast Guard Station, and commercial fishing facility and boat yard.

Natural Habitats

Open Water

The Atlantic Ocean in and around Ponce Inlet is characterized by a north/south longshore current and gradually sloping bottom within 1000 yards of the shore and out to the 4-fathom depth contour. Currents at the inlet mouth have velocities from 1.0 to 2.5 feet per second (fps) and depths between about 6 to 26 feet that tend to increase from the South to the North Jetty. Both

depths and speed of current are highly variable within the inlet throat, varying between less than a foot to over forty feet, and between 0.5 and 4.5 fps, respectively (Figure 2). Water depth in the north Indian River is greater (18 versus 14 feet) and more uniformly distributed between shorelines, than the Halifax River (Figure 3). The distribution of water currents in both rivers is similar, although the Halifax River has greater velocities (3.0 versus 2.0 fps) which change rapidly near shorelines (USACOE 1993). Water depth and velocities at their confluence varies, depending upon location. Average water depths within the two north spit coves (Figures 4 and 5), including the man-made channels, are estimated at five feet.

Net phytoplankton (>20 microns) which may occur in the project area include diatoms of the genera *Skeletonema*, *Thalassiosira*, *Chaetoceros*, *Prorocentrum*, *Nitzschia*, and *Bacillaria* (Steward and VanArman 1987). Other genera prevalent in the lower St. Johns River Basin which also may occur in the vicinity of Ponce de Leon inlet include *Rhizosolenia*, *Melosira*, *Coscinodiscus*, *Thalassionema*, *Thalassiotrix*, and *Gyrosigma* (Department of the Navy 1996). Nanophytoplankton (<20 microns) in one Indian River Lagoon study (Mahoney and Gibson 1983b) accounted for 99% of cell numbers and 91% of the biomass. Mahoney and Gibson (1983a) also identified 232 species of diatoms and 20 species of dinoflagellates in that study. Abundance can vary seasonally and diversity is dependent upon salinity and the type and availability of nutrients (Department of the Navy 1996). Temperature, light penetration, and nutrient load are the principle factors in water which affect phytoplankton abundance and productivity (Steward and VanArman 1987). The nutrient input from New Smyrna Beach and its proximity to the project area may have a positive impact on phytoplankton within the vicinity of Ponce Inlet.

Copepods of various sizes typically dominate the zooplankton (Steward and VanArman 1987, Department of the Navy 1996). Other significant components include the larvae of benthic invertebrates such as arrowworm (*Sagitta* sp.), cirripids, tintinnids, coelenterates, immature stages of crab and shrimp, and various fish eggs. The larval stages of local fish species, known as ichthyoplankton, also may significantly contribute to the zooplankton biomass. Zooplankton density and diversity are generally higher away from inlets and may vary year to year, though their seasonal abundance is usually greatest in spring, and summer or autumn. Abundance around Ponce Inlet may be related to phytoplankton levels and nutrients from nearby cities.

Ocean access, marshes, creeks, varying water depth and bottom contours, and rock jettys are all likely to contribute to the diversity of fish which could occur within the project area. Some of these fish include pinfish, mosquito fish (*Gambusia affinis*), silver perch (*Bairdella chrysura*), mullet (*Mugil* spp.), Atlantic croaker (*Micropogonias undulatus*), menhaden (*Brevoortia* spp.), sea robins (*Priono tribulus*), lizardfish (*Synodus foetens*), ladyfish (*Elops saurus*), sheepshead (*Archosargus probatocephalus*), flatfishes (Bothidae), mackerel (*Scomboromorus* spp.), juvenile snapper and grouper, sea bass (Lutjanidae and Serranidae), bluefish (*Pomatomus saltatrix*), seatrout and weakfish (*Cynoscion* spp.), common snook (*Centropomus undecimalis*), red and black drum (Sciaenidae), cobia (*Rachycentron canadum*), and various sharks (Comp and Seaman 1985, Florida Department of Environmental Protection 1993).

Other animals inhabiting open water within the Ponce Inlet project area include the federally-endangered West Indian manatee, *Trichechus manatus latirostris* (Humphrey 1992), four federally-listed sea turtles: the endangered green (*Chelonia mydas*), Kemp's ridley (*Lepidochelys kempii*), and leatherback (*Dermochelys coriacea*) turtles and the threatened loggerhead (*Caretta caretta*) turtle (Moler 1992), and the diamondback terrapin (*Malaclemys terrapin*) (Behler and King 1979).

Benthos

A site inspection of spoil material from previous dredgings revealed bottom sediments from the nearshore ocean, Ponce Inlet mouth and throat, and river confluence to be mainly unconsolidated sands or sand-shell combinations. Erosion and runoff from adjacent marshes and uplands contribute organic material to the bottom sediment of both rivers and the north spit coves. The rate of accumulation of this material in coves is usually greater due to input from surrounding areas exceeding removal due to the smaller influence of tides and wind on water currents. This accumulation produces an overlying, soft-bottomed "muck layer" of varying thickness.

The benthic community includes those organisms living on the surface of and within bottom sediments. Sediment composition and stability, salinity, light, temperature, oxygen and other chemical concentrations, and nutrient levels are factors which influence species abundance and diversity. Organisms associated with Ponce Inlet are, for the most part, continually exposed to full ocean salinities that likely fluctuate very little. In general, abundance and density are expected to be greatest during winter and spring and lowest towards the end of summer. Some of the benthic organisms expected in and around Ponce Inlet include polychaete worms in the genera *Polycirrus*, *Pectinaria*, *Polychaete*, and *Nereis*; bivalves including oysters (*Crassostrea virginica*), various clams, and mussels (*Mytilus* spp.); various gastropods (snails); crustacea (shrimps, crabs, amphipods, ostracods, and tanaids); echinoderms (starfish and sand dollars); and seagrasses in the genera *Halophila* and *Zostera* (Steward and VanArman 1987, Department of the Navy 1996).

Beach

The beach around Ponce Inlet consists primarily of unconsolidated sand with some shell material extending from mean low water landward to where there is a marked change in material or physiographic form, or to the line of permanent vegetation. Areas of beach exist north and south of the north jetty (Figure 6) and completely around the inlet's south spit to the Coast Guard station on the north Indian River (Figures 3 and 7). Under natural conditions, the combined action of wind, waves, and current produce frequent changes in the size, shape, slope, and location of inlet beaches. Since completion of the Ponce Inlet jetty system in the early 1970's, sand accretion on the south spit has extended the beach area northward both east and west of the spit. While the beach north of the North Jetty has widened somewhat in the vicinity of the jetty, nearly all the natural beach south and west of the jetty is gone (USACOE 1993). A narrow, artificial beach has been maintained near the toe end of the jetty by the addition of beach-quality sand deposited in 1993 (Figures 8 and 9), as a barrier between the inlet and a county parking lot

(Richard Powell, U.S. Army Corps of Engineers, personal communication). Daytime beach driving is currently permitted on the ocean-side of each spit up to the jettys (Volusia County Government 1992).

Animals associated with the beach community include birds, crustaceans, molluscs, sea turtles and beach mice. Specific birds which may occur at Ponce Inlet include gulls (*Larus* spp.); the black skimmer (*Rynchops niger*); American oystercatcher (*Haematopus palliatus*); terns (*Sterna* spp.); plovers in the genera *Pluvialis* and *Charadrius*, including the federally threatened piping plover (*C. melodus*); sandpipers in the genera *Tringa*, *Calidris*, and *Actitis*, marbled godwit (*Limosa fedoa*), willet (*Catotrophorus semipalmatus*), and ruddy turnstone (*Arenaria interpres*) (Stevenson and Anderson 1994). The pallid beach mouse (*Peromyscus polionotus decoloratus*), which once occurred from north Ponce Inlet to the Matanzas Inlet, is now considered extinct. South Ponce Inlet is the northern limit of the southeastern beach mouse, (*Peromyscus polionotus niveiventris*), a federally threatened species (Stout 1992). Bivalves, specifically clams of various species appear to be the most abundant mollusc at Ponce Inlet beaches. Most insects found at beach habitats are transients. Crustaceans inhabiting the littoral zone include, hermit crabs (*Pagurus longicarpus* and *Clibanarius vittatus*), and ghost crabs (*Ocypode quadrata*) (Williams 1984).

Tidal Flats

Sand flats (Figure 10) are normally submerged, sand-bottomed areas which are completely exposed during mean low water, and may be separated from marsh or beach by continuously submerged bottom. A series of large and small sand flats exist within the project area, principally north and south of Rockhouse Creek on the west side of the Halifax and north Indian Rivers. A review of an 1851 U.S. Coast Survey map of Mosquito Inlet (Ponce Inlet) revealed a similar pattern of flats, though flats south of Rockhouse Creek today appear longer and wider. A flat may have existed at one time within the inlet throat adjacent to the south spit beach, but further sand accretion appears to have filled in the submerged area and produced a northward extension of that beach.

Mud flats (Figure 11) are also tidally-exposed areas whose bottom substrate has an upper layer rich in silt and organic material. These flats typically occur along the edges of creeks, coves, rivers, and similar places where the rate of deposition of silt and organic material from adjacent marshes, swamps, and uplands exceeds their removal. Mud flats are present within the marina cove and the old bed of the Halifax River.

Animals expected to occur on Ponce Inlet sand flats during low water include benthic invertebrates such as some bivalves, crustacea, echinoderms, and polychaete worms, and vertebrates including birds and transient terrestrial species such as raccoons (*Procyon lotor*). Besides most of the previously mentioned birds, others which may be found on sand flats include the double-crested cormorant (*Phalacrocorax auritus*), American avocet (*Recurvirostra americana*) and short-billed dowitcher (*Limnodromus griseus*) (Stevenson and Anderson 1994). Higher plants were not observed on the sand flats, though it is likely that various species of algae

could and do occur there. Mud flats are likely to support a similar group of animals, though species composition will likely be different and total diversity may be higher due to the substrate's greater organic component.

Coastal Sand Dunes

The location and extent of sand dunes at Ponce Inlet prior to human intervention depended entirely on the interactions among wind, waves, changes in sea level, and specially-adapted vegetation. Today, in addition to these factors, dunes are strongly influenced by human activities such as construction of buildings, boardwalks, roads, parking lots, and jettys; beach driving and pedestrian foot traffic; and artificial deposition of sand for beach re-nourishment and other dredged spoil disposal. No natural dunes currently exist on the north spit south and west of the north jetty. An area of foredune and partially impacted backdunes and stable dunes exist approximately one mile north and a half mile west of the north jetty (Figure 12). Much of this habitat lies within Lighthouse Point County Park. A foredune encompasses the entire south spit, extending from the U.S. Coast Guard Station on the north Indian River through the southeastern boundary of Smyrna Dunes County Park (Figure 13). Backdunes and stable dunes in this area are naturally limited by marsh along the northwestern border and human impacts elsewhere, particularly a large spoil disposal field which includes a substantial portion of the center of the county park. Dunes formed by sand accreted since completion of the south jetty in 1969 have now partially or wholly buried more than 90% of the south jetty. Much of this area lies within the county park, which has leased the land from the Federal government.

Coastal sand dunes are the principal habitat of beach mice. The southern spit at Ponce Inlet represents the historical northernmost distribution of the federally threatened southeastern beach mouse (*Peromyscus polionotus niveiventris*). The current distribution in Volusia County extends only to the northern boundary of Cape Canaveral National Seashore, approximately 16 km south of Ponce Inlet (Stout 1992, U.S. Fish and Wildlife Service 1993). The dune ecosystem present within Smyrna Dunes Park on the south spit appears capable of supporting at least a small population of beach mice. Scattered burrows were observed on the back sides of the existing foredunes. Without a significant trapping effort, it is not clear whether these burrows were excavated by beach mice, ghost crabs, or perhaps other rodents. Rodents which may occur in the area are the cotton rat (*Sigmodon hispidus*), cotton mouse (*Peromyscus gossypimus*), and house mouse (*Mus musculus*) (Hall 1981). Other animals observed or likely to occur within the dune ecosystem include feral cats (*Felis felis*), red fox (*Vulpes vulpes*), resident and neotropical migrant birds such as sparrows and warblers (Emberizidae), gopher tortoise (*Gopherus polyphemus*), snakes, lizards, and numerous invertebrates.

Vegetation observed along the foredunes included sea oats (*Uniola paniculata*), sea rocket (*Cakile edentula*), seaside spurge (*Chamaesyce* spp.), coastal dropseed (*Sporobolus virginicus*), railroad-vine (*Ipomea pes-caprae*), and panic grass (*Panicum* spp.). Due to the generally disturbed nature of the interior portions of the south spit, the vegetative difference between transitional or backdunes and stable dunes was not always clear. Species observed were characteristic of both saw palmetto, wax myrtle and oak scrub zones and included saw palmetto

(*Serenoa repens*), broomsedge (*Andropogon* spp.), partridge-pea (*Cassia* spp.), prickly-pear (*Opuntia* sp.), yaupon (*Ilex vomitoria*), dune greenbrier (*Smilax auriculata*), pennywort (*Hydrocotyle* spp.), cabbage palm (*Sabal palmetto*), groundsel tree (*Baccharis halimifolia*), southern red cedar (*Juniperus silicicola*), wax myrtle (*Myrica cerifera*), and myrtle oak (*Quercus myrtifolia*).

Tidal Marsh

A review of aerial photographs of Ponce Inlet between 1967 and 1973, revealed that the pre-jetty tidal marsh was limited to portions of the north spit perimeter on the Halifax River and the southern section of the old riverbed cove, either side of the northernmost riverbed cove, and some interior portions of the north spit which were inundated from the southern cove through a then existing tidal creek. Following jetty construction, the area of tidal inundation apparently increased and, along with advanced sediment deposition, converted most of the sand spit into a tidal marsh. Today more than half the marsh and almost all the narrow, inlet-facing beach has been lost to erosion. Less than 20 acres of low salt marsh and mangrove swamp remain in and around the north spit (Figure 14).

Tidal marsh on the south spit is limited to a triangular area less than 10 acres on the spit's west side and mostly north of the Coast Guard Station. A small, open-water, brackish pond has formed at the landward marsh end near a boardwalk (Figure 15). Marsh formation occurred sometime after construction of the south jetty, probably from the conversion and convergence of two open-water coves from sediment buildup due to sand accretion at their juncture with the north Indian River.

Vegetation found within the low salt marsh included smooth cordgrass (*Spartina alterniflora*), glasswort (*Salicornia* spp.) and sea purslane (*Sesuvium portulacastrum*). High marsh plants observed included saltwort (*Batis maritima*), salt grass (*Distichlis spicata*), salt meadow cordgrass (*Spartina patens*), sand cordgrass (*Spartina bakerii*), salt marsh fimbristylis (*Fimbristylis castanea*), sea oxeye (*Borrchia frutescens*), groundsel bush (*Baccharis halimifolia*), marsh elder (*Iva frutescens*), wax myrtle (*Myrica cerifera*), southern red cedar (*Juniperus silicicola*), and the exotic Brazilian pepper (*Schinus terebinthifolius*). The overwash mangrove swamp on the north spit (Figure 16) is occupied by three species of mangroves: red (*Rhizophora mangle*), black (*Avicennia germinans*), and white (*Laguncularia racemosa*). Black and white mangroves predominate on the south spit marsh.

Invertebrate animals observed or expected (Williams 1984) to occur within these tidal marshes include fiddler crabs (*Uca* spp.), portunid crabs (*Callinectes* spp.), a palaemonid shrimp (*Palaemonetes intermedius*), penaeid shrimp (*Penaeus* spp.), other crustacea, bivalve (clams, oysters) and gastropod (snails) molluscs, polychaete worms, and a variety of aquatic, semi-aquatic and arboreal insects. Many of the previously mentioned fish species may be found within marsh habitat either as transient adults or during their immature stages. Other resident fish may include sailfin molly (*Poecilia latipinna*), sheepshead minnow (*Cyprinodon variegatus*), marsh and gulf killifish (*Fundulus confluentus* and *F. grandis*), tidewater silverside (*Menidia beryllina*), fat

sleeper (*Dormitator maculatus*), and rivulus (*Rivulus marmoratus*) (Stewart and VanArman 1987). Birds likely to occur in and around tidal marshes and their mud flats include bitterns, herons, and egrets (Ardeidae), ibis (Threskiornithidae), the federally endangered wood stork (*Mycteria americana*), rails (Rallidae), the marsh wren (*Cistothorus palustris*), boat-tailed grackle (*Quiscalus major*), red-winged blackbird (*Agelaius phoeniceus*), sparrows (*Ammodramus*, *Passerculus*, and *Melospiza* spp.), and many shorebirds also associated with beaches and sand flats (Stevenson and Anderson 1994). Other terrestrial vertebrates include the cotton mouse, cotton rat, and other rodents; shrews (Soricidae); marsh rabbit (*Sylvilagus palustris*); opossum (*Didelphis virginiana*); raccoon; fox; and various reptiles; including the federally threatened Atlantic salt marsh snake (*Nerodia clarkii taeniata*).

Artificial Habitats

Rock Jetty

The existing rock jettys, built between 1968 and 1971, were approximately 4200 feet long and 47.5 feet wide on the north spit (Figure 17) and 2700 feet long and 60 feet wide on the south spit (Figure 18). They consisted of very large (8 to 12 ton) stones over two layers of smaller stones in the shape of a truncated pyramid, that extended about 7.5 feet above and 5.0 feet below mean low water. The original north jetty included an 1800-foot weir and an impoundment basin just to the south for accumulating littoral drift material, which was to be transported across the inlet to the south by use of a conventional pipeline dredge. The weir was closed with armor stone in 1984 due to high cost of removing shoal material from the sediment basin. A concrete walkway was built on top of the jetty sometime thereafter and partially extended over the blockaded weir. Scouring due to channel migration within the inlet has undermined the jetty foundation and caused subsidence and overwash in two locations. Nealy 80 per cent of the north jetty is contiguous with open water on both sides. Heavy sand accretion has occurred on both sides along most of the entire length of the south spit jetty. As a result, only the oceanward tip of this jetty is directly exposed to water on both sides.

Jetty rock provides a hard, irregular, and multi-dimensional substrate with numerous spaces that support many living organisms. All four types of marine algae, blue-green (Cyanophyta), green (Chlorophyta), brown (Phaeophyta) and red (Rhodophyta), collectively known as seaweeds, may occur on these jettys. Bivalves, particularly mussels (pelecypods) anchor themselves to the rock surface and crevices. Various crustacea, including amphipods, ostracods, and decapods, may be found on the jetty both above and below the water's surface. Some shorebirds use jettys for loafing as well as feeding. The landward end may also support plants as well as resident and transient vertebrate and invertebrate animals.

Spoil Uplands

Dredging of waterways has occurred in and around Ponce Inlet for over fifty years. Site visits and a review of aerial photographs and United States Geologic Survey 7.5 minute topographic map (New Smyrna Beach Quadrangle) revealed locations where disposal of dredged sediments

(spoil) occurred on land. Spoil disposal sites occur on the mangrove islands bordering the rivers and ICW, as well as on both Ponce Inlet spits. The site on the south spit is circular and covers approximately 55 acres in the middle of Smyrna Dunes County Park. Vegetation in this area is generally very sparse, and includes prickly pear (*Opuntia*), broomsedge (*Andropogon*), and the occasional sea oats (*Uniola paniculata*) (Figure 19). Two depressional wetlands have formed near the middle of the spoil field and support a more diverse vegetative community, similar to that associated with the wet, interdunal swales of backdune and stable dune areas. These areas are also likely to contain a greater diversity of animal life than the surrounding spoil upland.

A spoil deposit noted on the north spit is located on land between the two coves, the southernmost of which forms the old bed of the Halifax River. The site is roughly cylindrical, covers approximately 4.5 acres, and its average height above the marsh on the south side is about six feet (Figure 20). Salt marsh and mangrove swamp border the area and also occur in two to three corridors which run transversely through the spoil uplands and total less than three acres (Figures 21 and 22). No wading bird rookeries were observed at this site. The spoil material visually resembled that found on the south spit. Grasses, shrubs, and small trees grew vigorously along the perimeter of the spoil site while the more interior portion alternated among patches of bare sand, grass-dominated patches, and woody trees and shrubs (Figure 18). Specific vegetation observed included pennywort, broomsedge, coastal dropseed, foxtail (*Setaria* spp.), goldenrod (*Solidago* spp.), various composites (Asteraceae), greenbriar, nightshade (*Solanum* spp.), prickly pear, wild grape (*Vitis* spp.), saw palmetto, cabbage palm, southern red cedar, and Brazilian pepper. Animals inhabiting this area are expected to be similar to those occupying high and low salt marsh, mangrove swamp, and both transitional and stable backdunes. There was no evidence of past or present occupation by gopher tortoises.

Project Alternatives: Impacts to Fish and Wildlife Resources

No Action Alternative

According to the USACOE 1993 Reconnaissance Report, the no action alternative at Ponce Inlet would likely result in the following conditions: 1) continued erosion of the southern and western portions of the north spit leading to an eventual breakthrough to the old bed of the Halifax River, 2) continued shoaling of the Halifax River and new shoaling around the north channel and nearby cove in the vicinity of the expected breakthrough, and 3) increasing instability and slumping along the entire stretch of the north jetty due to new and continued undermining from water velocities associated with the current northerly position of the deepwater channel within the inlet's throat. Another condition likely to result from the no action alternative is further beach expansion along the north shore of the south spit due to sand accretion adjacent to the inlet throat. Continued erosion around the toe of the north jetty will narrow the gap of land between the inlet and the Atlantic Ocean and predispose the area to a breach during a catastrophic northeast storm. Under this scenario, the jetty would be isolated and unable to protect land areas north and west of it from flooding and erosion.

The most significant direct impact to natural resources from the no action alternative would be the projected loss of the remaining salt marsh and mangrove swamp habitat, and all the associated biomass, from continued advanced erosion of the north spit south of the old riverbed. The accompanying movement of sediment and nutrients into the water column is also likely to affect organisms within the benthic and sub-littoral zones. These effects, especially for the open-water fauna and flora, likely will be transitory due to the speed and range of shifting physical conditions typical of most inlets. The presence of an extensive marsh and mangrove system both north and south of the inlet would also tend to lessen the overall impacts of wetland loss. Additional shoaling in the Halifax River resulting from a breakthrough would impact the local benthos at that site. Shoaling may also reduce exchange of water and sediment from the marina basin cove, creating conditions favorable for expansion of the adjacent salt marsh and mangrove swamp. Degradation of the north jetty would expose more rock to the littoral and sub-littoral zone and provide additional shelter for fish and some crustacea as well as living surface for various algae and molluscs. Further expansion of the littoral zone adjacent to the inlet side of the south spit would likely benefit some benthic organisms, shorebirds, and nesting sea turtles. A breach behind the north jetty would remove some beach and foredune habitat and encroach on the transitional dune area. Fish, sub-littoral benthic organisms, and other tidal rock inhabitants would have new habitats to exploit.

Jetty Extension Alternative

Both the physical and numerical models of Ponce Inlet indicate that a 1000-foot extension of the south jetty would be the best of the extension proposals for improving the inlet's navigation characteristics, particularly within the entrance reach of the channel. The expected changes leading to a more centered channel include more uniform ebb and flood flow distributions at the entrance reach plus flood flow distributions just south of the seaward end of the south jetty.

These changes would reduce littoral drift and sand deposition within the inlet, particularly along the north side of the south spit. Construction of the south jetty extension could be accomplished from land or water. The Corps also proposed removing existing stone from a section of the south jetty near its original toe end for use in constructing the waterward extension. This entire area is land-locked and much of it is at least partially buried beneath shallow sands which accreted rapidly following jetty construction in 1969. Subsequent design studies indicated that this rock is not suitable for the proposed use.

Pre-construction Impacts

Activities preceding construction of the south jetty extension include sampling of bottom sediments within the proposed extension area, and filling in jetty voids (chinking) to create a level surface suitable for access by land-based equipment. The core sampling is done by a slow-moving, self-propelled drilling platform and is expected to have limited, short-term impacts on the benthos. This operation is not expected to have any adverse impacts on manatees or sea turtles. Chinking may temporarily impact portions of the littoral and sub-littoral zones. This operation likewise is not expected to have any adverse impacts on manatees, sea turtles, or the piping plover.

Construction and Post-construction Impacts

Impacts from increased boat and barge traffic expected during construction of the jetty extension include temporary displacement of fish, plankton, and some loafing and feeding shorebirds, permanent loss of some sand-bottomed, benthic habitat within the jetty footprint, and possible impacts to manatees and sea turtles. Land-based operations will impact beaches and possibly sand dunes within Smyrna Dunes County Park if equipment and vehicles must cross dunes in order to reach the jetty. Under these conditions, beach and dune animals and plants, including the federally listed sea turtles, piping plover, and southeastern beach mouse, may be affected. Further discussion of potential impacts to these species is addressed in the section on threatened and endangered species. Direct habitat impacts expected or predicted during the post-construction period include the addition of more dry and tidally-influenced, hard rock substrate; sand accretion to varying degrees along the beach upwards of a mile south of the new jetty; and loss of some shoals and extended beach along the north side of the south spit. The loss of some accreted sand on the south spit within the inlet throat may adversely affect the piping plover. The sand accretion predicted for the south beach will directly benefit other shorebirds, benthic species found within the littoral and sub-littoral zones, nesting sea turtles, and other upper beach fauna and flora. The dune habitat in this area and its associated biotic community will also benefit from the increased availability of sand necessary for the maintenance and growth of this habitat type. These overall benefits will more than offset the predicted loss of some littoral and sublittoral habitat adjacent to the south side of the inlet throat.

North Jetty Weir Re-opening Alternative

An 1800-foot weir constructed in the north jetty and an accompanying impoundment basin were designed to collect littoral drift across the jetty for transport across the inlet by a pipeline dredge.

The weir was closed in 1984 to stop the high cost of maintenance removal of shoal material believed to be crossing the weir. Following weir closure, erosion rates throughout the north spit increased dramatically between 1985-1990 over pre-closure erosion rates. Reopening of the weir was considered in the early phases of the Reconnaissance Report (USACOE 1993) and current Feasibility Study as a way to reduce erosion velocities and add drift material which would hopefully accrete along a portion of the north spit as well as accumulate in the impoundment basin for later use in beach renourishment. Further testing of this alternative using a scale physical model revealed that re-opening various weir lengths would no longer have the desired effect of reducing erosional forces impinging on the north spit. The alternative had called for the removal of up to 1000 feet of armor stone from the seaward end of the original weir and dredging to re-establish a limited impoundment basin. The work would be accomplished by either land or water-based, heavy equipment.

Pre-construction Impacts

Core sampling of bottom sediments within the impoundment basin are expected to have limited and short-term impacts on the area's benthic organisms and no adverse impacts to manatees and sea turtles. Chinking may temporarily impact portions of the littoral and sub-littoral zones. Possible impacts to federally-listed sea turtles and the piping plover are addressed in the section on threatened and endangered species.

Construction and Post-construction Impacts

Re-opening of 1000 feet of weir would require removal of 255 feet of concrete walkway atop the jetty and approximately 17,000 tons of armor stone. If walkway demolition and rock removal is a land-based operation, the work would involve transporting equipment over the beach. Part of the beach may be used as a staging area for materials. Some transient impacts to upper beach fauna and flora may occur, as well as temporary displacement of feeding and loafing shorebirds. Possible impacts to federally-listed sea turtles and the piping plover are addressed in the section on threatened and endangered species. A water-based operation may temporarily effect shorebirds, fish, plankton, and the sub-littoral benthos. Removal of the submerged rock would reduce the total amount of hard substrate available to algae and aquatic and semi-aquatic marine invertebrates. Dredging of the impoundment basin would have short-term, open water and benthic impacts. Dredged spoil used for beach renourishment may impact nesting sea turtles, crustacea and other littoral benthos, while careful deposition in already existing and permitted spoil disposal sites is likely to have only minor impacts on an already disturbed plant and animal community.

The major change expected from the weir re-opening is movement of additional sediment into the inlet from renewed littoral drift across the north jetty. Some of this sediment is expected to be deposited in the adjacent impoundment, where it may be piped or dredged to re-nourish south jetty beaches. Other sediment may be carried further into the inlet, where it will likely be involved in formation and maintenance of shoals, sand flats, and possibly accretion of remaining interior sand beaches bordering the north and south spits. The beach and dunes adjacent to the north jetty

may become narrower due to transport of sediment formerly available to re-nourish these habitats. With the exception of the dredging and artificial beach re-nourishment, the major expected change would potentially add new plant and animal habitat to the inlet. Since the greatest possible change to the north beach and dune system is likely to occur in the immediate vicinity of the north jetty, the overall impact to fauna and flora is not expected to be significant.

North Jetty Repair and Scour Apron Extension Alternative

Rebuilding slumped portions of the north jetty crest and extending the scour apron along the south side of the north jetty are considered separate maintenance projects from the main Ponce Inlet Navigation Improvement Project. These projects were included as alternatives because of their expected contribution to improving the overall inlet stability. The north jetty repair project involves placement of approximately 610 tons of armor stone in three places to raise the jetty to its original crest height. The scour apron consists of filter cloth, foundation and armor stone placed over an approximately one-half acre submerged area at the jetty's base in the vicinity of the existing scour apron. Due to the presence of a concrete boardwalk over a landward portion of the jetty, a water-based operation would be the only practical method available to accomplish both projects.

Impacts

The habitat and fish and wildlife resource impacts from these projects are expected to be about the same as those of the water-based operations for the south jetty extension alternative.

Groin Field Alternative

The construction of a set of three groins along the sand spit inside the inlet adjacent to the north jetty was originally considered to preserve the remaining shoreline and prevent breaching of the spit by deflecting flood tidal currents away from the spit. Since this alternative was considered in the 1993 Reconnaissance Report, more than 60 acres of remaining sand spit and marsh have been lost to erosion. As a result of these physical changes to the north spit, the Corps has re-reviewed this alternative and determined that the current conditions no longer matched the parameters under which the groin field was to operate. The Corps therefore decided to delete this alternative from project consideration.

Revetment Alternatives

Alignment One

The Reconnaissance Report considered the use of a hardened barrier as a permanent alternative which would provide direct protection of some wetlands and upland property adjacent to the north spit by preventing the further landward migration of its shoreline. The report discussed three alignments, all of which would originate from the toe end of the north jetty and offer varying degrees of protection. The first alignment would extend 4800 feet and offer maximum protection

from shoreline erosion, inlet breaching, and ocean flanking of the jetty by completely encircling the north spit. Most of the footprint for the first alignment, however, has been lost due to shoreline erosion of the north spit over the last four years. Based on the estimated rate of continued erosion, the remaining marsh south and west of the old Halifax riverbed will be gone before any action on a revised alignment one can be initiated. The Corps has therefore dropped this alignment from consideration as a viable alternative and an evaluation of its impacts on natural resources is no longer necessary.

Alignment Two

The second alignment would extend approximately 2300 feet to the tip of a mixed marsh and spoil upland peninsula along its southern and western borders. The peninsula is located between the marina cove and the old bed of the Halifax River. This alignment is expected to protect against jetty flanking and potential erosion of the marsh/spoil peninsula, although it offers no protection against inlet breaching. The revetment footprint would total approximately 7.12 acres. Two herbaceous spoil fields totalling 2.42 acres (Figure 23) and located in the middle and west end of the spoil peninsula are being considered for staging areas and stockpiling material and possibly equipment. The entire operation will be land-based. A review of the expected impacts from this alignment are described below.

Pre-construction Impacts

A tracked vehicle was used to transport a survey crew to delineate the midpoint of the revetment and collect soil core samples. The vehicle traversed spoil upland, mangrove swamp and high salt marsh. The wetland area covered by the vehicle was within the footprint of the proposed revetment. No permanent effects from the tracks were noted in the upland areas. Mangroves and salt marsh vegetation within the track path had not recovered two months following the survey. Some fiddler crab burrows were noted in the track path, though they were less than in the surrounding, non-impacted wetland. The area within the footprint would have to be cleared of all vegetation, creating a potential erosion condition into the old riverbed.

Construction and Post-construction Impacts

The first section of this alignment, a landward extension of the north jetty, would impact approximately 2.85 acres and traverse a portion of the existing sand barrier as well as some backdune habitat. The few plants which colonized the sand barrier were found adjacent to the backdunes and marsh. Animal use of this sand deposit is likely to be transitory. The permanent loss of the backdune habitat within this section will not be significant since the adjacent Lighthouse Point County Park consists primarily of this type of habitat.

The second section would directly impact a total of approximately 4.27 acres, including between two and three acres of tidal mud flat, low and high salt marsh, and mangrove swamp. Impacts to tidal mud flats would be temporary since sedimentation and backfill would be expected to cover at least that portion of the revetment where the impacts occur below mean low water. In-kind

mitigation would be expected for the loss of the vegetated wetlands. This habitat is also within the range of the federally threatened Atlantic salt marsh snake. Impacts to the additional 2.42 acres of open spoil fields are not likely to be significant since these areas represent artificial, disturbed habitats characterized by patches of bare sand and a flora limited to mainly one grass and a scattering of herbaceous and woody plants. The loss of the mixed herbaceous and woody transitional area also will not be significant because similar habitat on the peninsula still exists as well as more extensive habitat on the north side of the marina cove.

An indirect impact of the revetment is the possible mortality of some mangroves adjacent to the revetment due to the blocking of tidal flow between the old riverbed and the peninsula's wetlands. Depending upon rainfall and tidal influence, these areas may convert into a more herbaceous, high marsh, or become a salt barren. Any indirect loss of mangrove swamp must be included when considering possible mitigation for direct impacts.

Few upland or transitional plants and terrestrial animals are likely to use the dry portions of the revetment. Estuarine organisms may use those sections of the revetment that are under regular and irregular tidal influence. In the event the remaining north spit marsh erodes and inlet breakthrough occurs, a portion of the entire southwest side of the revetment is predicted to be under littoral and sublittoral influence. The pattern of floral and faunal use of this area is then expected to be more like that of the north and south jettys.

Alignment Three

The third revetment alignment would extend 1600 feet from the north jetty towards the marina along open water, wetlands, and dense transitional uplands which form the northwest boundary of the marina cove. The revetment footprint would total about 4.86 acres and would only protect against ocean flanking of the north jetty.

Pre-construction Impacts

A paved road is adjacent and parallel to the alignment's footprint. This road and the lack of unpaved roads through the transitional area eliminates the need and potential habitat impacts from collecting soil core samples with a tracked vehicle. The area within the footprint would have to be cleared of all vegetation, creating a potential erosion condition into the marina cove.

Construction and Post-construction Impacts

This alignment would directly impact 4.36 acres, 2.85 acres of which traverse a portion of the existing sand barrier as well as some backdune habitat. These sites are the same as those described for section one of the revetment two alignment, with similar expected impacts. The remaining two acres are predominantly transitional uplands plus some tidal mud flat, salt marsh, and mangrove swamp. The impact to tidal mud flats would be temporary, since sedimentation and backfill would be expected to cover at least that portion of the revetment where the impact occurs below mean low water. In-kind mitigation would be expected for the loss of the vegetated

wetlands. The loss of the mostly woody transitional area would be significant since the only other habitat within the north spit area is on the spoil peninsula, where there are concerns about erosion following a breakthrough produced by a catastrophic weather event.

Channel Dredging Alternative

This alternative consists of engineering a channel through the old riverbed to provide a more northern link between Ponce Inlet and the north channel of the Halifax River. The dredged channel would be approximately 2500 feet long, 100-200 feet wide, with an operating depth of 12 feet. Creation of a controlled channel would not protect the remaining north spit marsh or toe end of the north jetty from erosion, nor would it necessarily by itself protect the north jetty from flanking. The benefit would be to protect the spoil peninsula from erosion and maintain navigability by reducing shoaling potential at the mouth of the marina cove and the adjacent Halifax River. The dredging would likely require both land and water-based operations.

Pre-construction Impacts

Samplings of submerged sediment within the proposed dredge area by barge and small boat are expected to have only temporary effects on the benthos. Impacts similar to what occurred with revetment alignment two may be expected if soil sampling of the two to three acres of salt marsh and mangrove swamp within the channel footprint is done using a tracked vehicle.

Construction and Post-construction Impacts

The dredging in open water will remove the existing benthic community within the excavated area. Turbidity, especially within the old riverbed, will likely have a temporary, though possibly significant impact, on plankton and fish. Dredging within the inlet mouth may temporarily increase the risk of impacts to manatees and sea turtles. Land-based operations will remove some terrestrial plants and temporarily displace or kill some animals, possibly including the Atlantic salt marsh snake. Up to three acres of mixed salt marsh, mangrove swamp, and sand beach will be lost due to their location within the footprint of the channel. In-kind mitigation would be expected for the loss of the vegetated wetlands. Dredging would generate approximately one million cubic yards of spoil. Beach-quality material may be used in re-nourishment projects, subject to further review by state and federal agencies. Other spoil should be deposited within permitted and active disposal sites to minimize potential impacts to fish and wildlife resources. Permitted but inactive sites and new sites without wetlands under consideration for disposal should first be assessed for occurrence of and potential impacts to federally listed species. New potential sites with possible wetland impacts would first require a review of all fish and wildlife resources for possible impacts.

Some recolonization of dredged areas within the vicinity of the inlet and Halifax River should occur, and produce a benthic structure similar to the existing community. Significant changes in depth, current, salinity, and bottom sediments are expected within the old riverbed following dredging. These changes are expected to favor a biotic community which will more closely

resemble that occurring within the inlet and Halifax River. If this alternative produces greatly reduced water velocities on the flood tide in the vicinity of the spoil disposal peninsula, some accretion and low and high marsh formation may occur on the peninsula's southwest shore. If landward water velocities are not significantly diminished over current conditions, some erosion, possibly significant, may occur along the same shoreline. This would likely have short-term impacts on the open water and benthic communities.

Alternatives and Mitigation Recommendations

Alternatives Analysis and Recommendations

In order to evaluate and recommend one or more navigation improvement alternatives, the Service first separated them into three broad, subjective categories based on their net average potential impact to fish and wildlife resources. The alternatives were then further ranked within categories based upon a direct comparison of the number and type (beneficial/harmful), size (large/medium/small) and duration (long/short) of individual impacts. Both classifications follow a descending order from potentially best to worst case situations for natural resources.

Category 1 (Alternatives Which Potentially Have a Net Beneficial Impact)

- no action alternative
- water-based construction of a south jetty extension

Category 2 (Alternatives Which Potentially Have No Net Impact)

- construction of an additional north jetty scour apron and a rebuilding of the damaged portion of the north jetty
- water-based re-opening of a portion of the north jetty weir

Category 3 (Alternatives Which Potentially Have At Least A Minimum Net Harmful Impact)

- construction of either revetment alignment
- land-based re-opening of a portion of the north jetty weir
- land-based construction of the south jetty extension
- engineering a new Federal channel through the old Halifax riverbed

The no action alternative was included for comparative purposes only. The separation of land from water-based operations was important because either operation may be logistically suitable for certain alternatives and because of the potential added harmful impacts to beach and dune habitats from land-based activities. According to the analysis, this distinction is most notable with the south jetty construction alternative.

Both the physical and mathematical models of Ponce Inlet indicate that a 1000-foot extension to the south jetty is the best alternative for centering the existing channel at the inlet mouth, which currently impinges on a large portion of the north jetty. This alternative is also expected to reverse the shoaling and buildup of sand flats within the inlet along the northern border of the south spit. This sand will instead be deposited in the nearshore zone within a mile south of the jetty and ultimately add to the beach width and sand dune maintenance. Combined with our analysis, the Service can recommend the water-based operation as the preferred alternative. Measures and conditions associated with this endorsement involve threatened and endangered species and are included in that section of this report. The Service recognizes that although we do not recommend a land-based operation, circumstances may require that this alternative be implemented. We therefore also reviewed this alternative and provided additional measures and

conditions as appropriate to minimize adverse impacts. Possible nighttime work was reviewed and additional measures and conditions provided to account for impacts from this activity.

The Service considered the north jetty repair and scour apron construction to occur only as a water-based operation due to the location of the required work and the presence of the county concrete walkway. As such, the analysis rated this alternative as essentially neutral with respect to natural resource impacts and worth a Service recommendation. Again, the Corps should refer to the section on listed species for the appropriate measures and conditions pertinent to this alternative.

Although the mathematical model initially endorsed the reopening of the north jetty weir as an improvement to navigation, further analysis and the physical model revealed that this alternative would not fulfill its desired role of centering the current channel through the inlet throat nor removing the erosive pressures in this area along the north spit. Since this alternative presently does not appear viable, the Service finds that a specific recommendation on this alternative at this time would not be appropriate. In general, however, the Corps may consider other modifications of this proposal, as long as the Service determines that these modifications maintain or improve the original ranking of the water-based operation with respect to natural resource impacts.

The remaining alternatives were proposed to control erosion of the north spit. The Service believes the second hardened revetment alignment is preferred over alignment three or a new channel. The most significant impact involves loss of jurisdictional wetlands which may result in direct kill of federally threatened Atlantic salt marsh snake and adversely affect its continued existence through habitat loss. Specific measures and conditions addressing this snake may be found in the endangered species section. Analysis, discussion, and recommendations regarding wetlands loss and mitigation are addressed separately in the following subsection.

Wetland Mitigation Analysis

The second and third revetment alignment alternatives will directly and indirectly impact up to four acres of wetlands on the north spit. The creation of a new Federal channel through the old Halifax riverbed is expected to impact an additional three acres in this area. The Corps believes that failure to implement one or more of these alternatives will result not only in the loss of the above wetlands but all remaining salt marsh and mangrove swamp east and south of the existing marina. This prediction on the future extent of north spit erosion results from extrapolation of previously determined erosion rates and an understanding of the general hydrodynamic forces operating at inlets. A review of maps depicting the historical conditions at Ponce Inlet since the beginning of the 17th century (Taylor 1993, Davies 1995) also demonstrates the tendency of the inlet to form parallel shorelines within its throat and have mouths that are at least as wide as the throat. The available information thus strongly suggests that the current erosive pressure on the north spit will likely continue until its shoreline within the throat is aligned in a more nearly parallel direction with the north jetty.

Recommendations

As a result of the above analysis, the Corps' position (Appendix I) is that mitigation should not be required since the proposed alternatives will actually result in a net savings of approximately 4.5 acres of mixed wetlands on the north spit north of the spoil upland. The Corps also agreed to consider some measure of environmental benefits associated with these alternatives provided they are achievable at little or no additional cost. Although the Service accepts the previous interpretation of possible future conditions at the inlet without intervention, no predictions were made regarding the composition of the north spit shoreline waterward of the revetment or landward of the engineered channel. While specific mitigation requirements may not be appropriate, the Service believes the Corps as a minimum should make every effort to maintain the current tidal flat, fringing salt marsh, and mangrove swamp located between the old Halifax riverbed and the adjacent spoil upland. We therefore recommend that the Corps observe the following conditions to the maximum extent practicable.

- Align the channel and/or revetments to reduce their direct or indirect impacts on the preceding jurisdictional wetlands.
- Where wetland impacts are unavoidable, dredge and fill operations should be conducted in a manner that restores the existing grade and dimensions of those wetlands prior to completion of the projects. This strategy will promote natural reestablishment of the biota associated with the tidal flat, salt marsh, and mangrove swamp.
- Artificially plant the dominant salt marsh and mangrove flora on the appropriate impacted areas at low densities to initially stabilize all areas and provide starter stock for those areas that are furthest from contiguous natural vegetation and less likely to be adequately vegetated through natural reestablishment.

Endangered Species Act

Consultation History

On December 11, 1992, the U.S. Fish and Wildlife Service (Service) provided the U.S. Army Corps of Engineers, Jacksonville District (Corps), with information covering issues and concerns pertinent to proposed navigation improvements to Ponce de Leon Inlet, Volusia County, Florida. On June 27, 1996, the Service received a biological assessment prepared by the Corps for the Ponce de Leon Inlet Navigation Study. The Corps identified six species as possibly occurring within the study area: the West Indian manatee (*Trichechus manatus latirostris*), Atlantic salt marsh snake (*Nerodia clarkii taeniata*), loggerhead sea turtle (*Caretta caretta*), bald eagle (*Haliaeetus leucocephalus*), piping plover (*Charadrius melodus*), and wood stork (*Mycteria americana*). The study area does not encompass any designated critical habitat. The Corps, after proposing measures to protect manatees and sea turtles from possible impacts, determined that the potential project activities will not adversely affect these, the other listed species, or critical habitat.

After reviewing the assessment and other information, the Service concurs with the Corps' evaluation on the bald eagle, wood stork, and West Indian manatee. With respect to manatees, we would further recommend that the Corps first attempt to restrict any water-based activities to the months of November through February. Regarding the piping plover, Atlantic salt marsh snake, and the loggerhead, green (*Chelonia mydas*), Kemp's ridley (*Lepidochelys kempii*) and leatherback (*Dermochelys coriacea*) sea turtles, we believe some of the potential actions may adversely affect these species. We also believe possible dune impacts on the southern spit may affect the federally threatened Southeastern beach mouse (*Peromyscus polionotus niveiventris*). The Service initiated formal consultation in our letter of June 20, 1996. The following section represents the Service's biological opinion on the effects of certain project activities on the Atlantic salt marsh snake, piping plover, four species of sea turtles, and the southeastern beach mouse, in accordance with section 7 of the Endangered Species Act of 1973, as amended (Act)(16 U.S.C. 1531 *et seq.*).

This biological opinion is based on field investigations, Service data, the Volusia County draft beach habitat conservation plan and its environmental assessment, conversations with Mr. Paul Moler, Florida Game and Fresh Water Fish Commission, and Ms. Sandy MacPherson, the Service's southeastern turtle coordinator, and other sources of information. A complete administrative record of this consultation is on file in the Service's Jacksonville Field Office.

Biological Opinion

Description of Proposed Actions

The Corps has proposed several measures to control erosion and shoaling in and around Ponce Inlet and realign the existing navigation channel within its mouth and throat. Three of these alternatives may affect threatened and endangered species and include:

- constructing a 1000-foot seaward extension to the existing south spit jetty,
- constructing a 2300-foot rock revetment extending from the toe end of the north spit jetty south and west along the border of a mixed marsh and spoil upland peninsula located between two coves, and
- creating a new 2500-foot Federal navigation channel connecting the inlet with the existing Halifax River channel through the old bed of the Halifax River.

The Corps will construct the jetty extension either from a barge or the jetty. A land-based operation will require transport of materials, equipment, and labor across some portion of the south barrier island beach. Portions of beach adjacent to the south jetty and above mean high water also may be used as both a staging area for construction equipment and supplies and temporary parking of project vehicles. Construction of the rock revetment will require filling approximately 2-3 acres of wetland, while the new channel will remove up to three acres of wetlands and sand beach. No specific mitigation is required for these impacts, since the Corps believes controlled channelization or a hardened revetment will prevent erosion north of those sites and result in a net savings of 4.5 acres of intertidal wetlands. Careful excavation and grading waterward of the revetment and placement of extra fill in open water near the revetment, however, may result in the establishment of additional wetland areas.

Status of the Species

Atlantic salt marsh snake - The subspecies was listed as threatened on November 29, 1977. Its historic distribution is restricted to Volusia and Brevard Counties and northern Indian River County, Florida. Intergrades with the mangrove salt marsh snake (*Nerodia clarkii compressicauda*) are known south of Volusia County, its core area (Kochman and Christman 1992). The snake inhabits coastal mangrove swamps and salt marshes, where it occurs along saltgrass-bordered tidal creeks, ditches, pools, and saltwort flats often in association with fiddler crab burrows (USFWS 1993). Individuals are also likely to use adjacent wetlands that are unoccupied by other water snakes (P. Moler, Florida Game and Fresh Water Fish Commission, personal communication). This species is most active at night during periods of low tides, when it feeds on small fish concentrated by the shallow water.

The major threat to this species in its core area is habitat loss, while habitat fragmentation north, east and south may increase the level of hybridization with congeners and conspecifics, resulting in a potential swamping of the Atlantic salt marsh snake gene pool (Kochman and Christman 1992). Habitat impacts are primarily the result of filling, draining, diking, and impounding areas for human development.

Piping plover - The Atlantic coast population of this species was listed as threatened on January 10, 1986. These birds breed from the Canadian maritime provinces through North Carolina, and winter primarily along the southeastern Atlantic coast from North Carolina through Florida. Several sightings have been recorded in the Caribbean. Wintering plovers on the Atlantic coast in general occur at accreting ends of barrier islands, along sandy peninsulas, and near coastal inlets. They appear to prefer sandflats adjacent to inlets or passes, sandy mudflats along prograding spits, and overwash areas as foraging habitats. They seem to exhibit a relatively high degree of winter site fidelity, and birds within the action area have repeatedly been observed over the years at Smyrna Dunes County Park (Hecht et al. 1996).

Major threats to the wintering population include habitat loss or degradation from inlet and shoreline stabilization, inlet dredging, beach maintenance and nourishment, and late season hurricanes and other winter storms.

Sea turtles - The leatherback and Kemp's ridley sea turtles were listed as endangered on June 2 and December 2, 1970, respectively. The Florida population of green turtles, and loggerhead sea turtles were listed as endangered and threatened, respectively, on July 28, 1978. The U.S. Fish and Wildlife Service has responsibility for regulating sea turtles when they come ashore to nest. The National Marine Fisheries Service has jurisdiction over sea turtles in estuarine and marine environments.

Adult Kemp's ridley occur primarily within the Gulf of Mexico while subadult turtles range widely throughout the Gulf as well as in the North Atlantic from Florida northward to Nova Scotia and eastward to Bermuda, the Azores, and Europe (Ogren 1992). This species is usually associated with benthic habitats having sand or mud bottoms, where they feed on crabs, molluscs, and other bottom-dwelling species. Breeding and nesting occur annually in April through August on sandy beaches during broad daylight (Volusia County Draft Beach Habitat Conservation Plan 1996). All but a few gravid females nest on selected Mexican beaches in synchronized aggregates. In the United States a few individual turtles have nested in south Texas, and five confirmed nests have been recorded in Florida; two in Pinellas County in 1989 and 1994, two in Volusia County in 1996 adjacent to Ponce Inlet (M. Sole, Florida Department of Environmental Protection, pers. comm.), and one on Sanibel Island in Lee County in 1996 (S. MacPherson, U.S. Fish and Wildlife Service, pers. comm.). In 1992, two Kemp's ridley nests were documented in South Carolina and North Carolina. In addition, in 1989, four false crawls were documented from Palm Beach County.

The decline of the Kemp's ridley sea turtle is thought to be primarily due to the collecting of eggs and taking of females for food, and shrimp trawl mortality on the foraging grounds.

The leatherback sea turtle ranges widely from tropical through sub-polar waters of the Atlantic, Pacific and Indian Oceans (Pritchard 1992). Its diet consists mainly of jellyfish taken in open waters. Nesting grounds are distributed circumtropically, with the Pacific Coast of Mexico supporting the world's largest known concentration of nesting leatherbacks (National Marine Fisheries Service and U.S. Fish and Wildlife Service 1992, National Resource Council 1990). In Florida, nesting occurs on both coasts at night, with most located on the east coast within the mid-peninsula, particularly on Hutchinson Island in St. Lucie and Martin Counties (Meylan et al. 1995). The season begins and ends earlier than most other sea turtle species, with the earliest recorded nesting in Volusia County on April 29 and the latest on June 26 (Florida Department of Environmental Protection 1995). Individuals nest an average of five to seven times a year (Tucker 1989a, Tucker and Frazer 1991).

The worldwide population of breeding leatherback females has been estimated at 136,000 (Pritchard 1992). Although some Atlantic turtle rookeries may be experiencing some nesting increases, stresses remain on many others, including excessive egg collecting in Central America, slaughter of nesting females in Guyana and the Antilles, and habitat modification and loss in Florida.

Green sea turtles are distributed worldwide throughout the tropics and subtropics. The species is herbivorous in all its life stages. The largest breeding population in the U.S. occurs on the east coast of Florida, particularly in Brevard, Indian River, St. Lucie, Martin, Palm Beach, and Broward Counties (National Marine Fisheries Service and U.S. Fish and Wildlife Service 1991a). Allard et al. (1994) concluded that this population is genetically distinct, and Meylan et al. (1995) believed the Florida aggregation deserves recognition as a regionally significant colony. Nesting on Florida beaches occurs from May to September, with individuals nesting as many as six times in a season (Ehrhart and Witherington 1992). Females return to the same stretch of beach at predominately two-year intervals.

Observations over the last two decades suggest a consistent trend towards increased green turtle nesting with probably no more than 375 adult females nesting in Florida at the beginning of this decade (Ehrhart and Witherington 1992). Continued threats to this nesting population include habitat loss and modification, other human disturbance, storm-induced beach erosion, predation of hatchlings, and hatchling mortality and adult nesting inhibition due to disorientation from coastal lighting.

The loggerhead sea turtle is global in distribution, inhabiting the continental shelves and estuarine environments along the margins of the Atlantic, Pacific, and Indian Oceans. Its diet consists of various invertebrates, including molluscs, crustaceans, and horseshoe crabs (Dodd 1992). Nesting within the continental United States occurs from Virginia to Louisiana. The southeastern aggregation (North Carolina through the Florida panhandle) is globally significant since it is second in size only to the aggregation on islands in the Arabian Sea off Oman (Ross 1982,

Ehrhart 1989, National Marine Fisheries Service and U.S. Fish and Wildlife Service 1991b). Recent genetic analyses (Bowen et al. 1993, B.W. Bowen, University of Florida, Gainesville, in litt., November 17, 1994, and October 26, 1995) revealed this aggregate to consist of three distinct populations. Approximately 80 percent of loggerhead nesting in the southeastern U.S. occurs in six Florida counties (Brevard, Indian River, St. Lucie, Martin, Palm Beach, and Broward). Nesting in Florida occurs from late April through September, with most females nesting between two and six times during the season within the same general area (Dodd 1988, 1992).

While the number of reported sea turtle nests in Florida has increased since 1979, this trend closely parallels increases in the level of survey effort. To obtain more precise and accurate nesting assessments, the State of Florida, in cooperation with the Fish and Wildlife Service, initiated an Index Nesting Beach Survey (INBS) program in 1989 to scientifically collect and statistically analyze nesting data. The Florida INBS monitoring occurs on 27 beaches, which comprise an average of 80 percent of the reported annual statewide nesting activity of loggerhead and green sea turtles. To date, results of this program have shown small fluctuations in the annual number of loggerhead nests. Continued threats to the Florida nesting population include habitat loss and modification, other human disturbance, storm-induced beach erosion, predation of hatchlings, and hatchling mortality and adult nesting inhibition due to disorientation from coastal lighting.

Southeastern beach mouse - This subspecies of oldfield mouse was listed as threatened on May 12, 1989. Its historic distribution included the southeastern Florida coast from Hollywood Beach in Broward County north to Ponce de Leon Inlet in Volusia County. Local populations currently are distributed from Ft. Pierce Inlet Recreation Area in St. Lucie County to Canaveral National Seashore in Brevard County. Principal habitat includes vegetated coastal foredunes, with mice in some locations also found within the grassy/shrub area of backdunes and the woody scrub area associated with stable dunes (Stout 1992).

Major threats to the species include habitat loss, degradation, and fragmentation resulting from development and catastrophic weather events, predation from feral cats, and competition with other rodents.

Environmental Baseline

Action Area

The action area for this biological opinion is defined as the area within an approximate 1.12-mile radius of the waterward end of the south jetty located at the northeast corner of Smyrna Dunes County Park in S32, T16S, R34E. The action area also includes additional beach habitat up to 1.5 miles south of the south jetty. Naturally-occurring systems within the area include open water (sub-littoral zone) and benthos associated with the Atlantic Ocean, inlet mouth and throat, the Indian and Halifax Rivers, and north spit coves; sand beach, tidal flats (littoral zone), high and low salt marsh, and mangrove swamp. Altered habitats include spoil uplands on both north and south

spits; two rock jettys; and a beach-quality, sand barrier on the north spit. The entire action area lies within the Ponce de Leon conservation unit, identified as P08 in the Coastal Barrier Resources System, and designated under the Federal Coastal Barrier Resources Act of 1982, as amended. In addition, tidal marsh within the action area has been identified as part of a strategic habitat conservation area for the Atlantic salt marsh snake (Cox et al. 1994).

Status of Species in the Action Area

Atlantic salt marsh snake - A survey of the area within the last five years (G. Goode, Volusia County Mosquito District, personal communication) failed to locate any snakes. There are occurrence records for the species, however, on the barrier islands just north and south of the inlet and on the mainland west of the inlet (Cox et al. 1994; P. Moler, pers. comm.).

Piping plover - Smyrna Dunes County Park is one of only six known wintering locations on the southeast Florida coast (Hecht et al. 1996). Results of the annual winter census at Ponce Inlet typically produce a count of from one to ten birds, with three to six birds observed there in January 1996 (L. Karolee Owens, U.S. Fish and Wildlife Service, pers. comm.). These birds occurred on the sand beach and flats between the south jetty and Coast Guard Station on the north Indian River.

Sea turtles - Strandings of the four sea turtle species are known to occur on Volusia County beaches. Nesting of the Kemp's ridley was recently documented (May 1996) for the first time in Volusia County on the barrier island just north of the action area (M. Sole, pers. comm.). Only seven leatherback nests have been recorded from Volusia County beaches between 1988 and 1994 (Meylan et al. 1995, FDEP 1995). Five of the seven nests occurred on a beach segment which encompasses Ponce Inlet. Because leatherbacks can begin nesting in mid-April and systematic nesting surveys do not begin until late April or early May, some nesting events may be overlooked (Meylan et al. 1995). Green turtles nested a total of 319 times during the above seven year period, with nearly 90 percent of that occurring within Canaveral National Seashore. Nesting dates ranged from May 18 to September 28. The total represents approximately three percent of all green turtle nesting in Florida. Loggerheads are by far the most abundant of the nesting sea turtles in Volusia County, with 11,601 nests recorded between 1988 and 1994. About 20 percent of those nests occurred within the 35 mile stretch of county beaches, which encompasses Ponce Inlet. The nesting period runs from April 18 to mid-September. Loggerheads found in Volusia County represent the southernmost limit of the northern nesting population, which runs from Hatteras, North Carolina, to Cape Canaveral, Florida.

Since gene flow among this and the South Florida and Panhandle populations is very low, impacts on loggerheads in the northern nesting population, in particular, become more significant because of the smaller total population, as well as observed population declines in Georgia and South Carolina (Frazer 1983, 1986; J. Richardson, pers. comm. cited in Dodd and Byles 1991; National Marine Fisheries Service and U.S. Fish and Wildlife Service 1991b).

Site specific nesting information for Ponce de Leon Inlet from 1992-1995 revealed a cluster of eight nests approximately one-half mile north of the north jetty and within 800 feet of the Beach Street access ramp. A total of 65 nests were located within the action area south of the inlet, with only three occurring north of the south jetty within the inlet (Volusia Sea Turtle Society, unpublished data).

Southeastern beach mouse - Habitat at Smyrna Dunes Park appears suitable for supporting a population of beach mice. Burrows similar to those excavated by beach mice were observed on the back slope of existing foredunes. According to J. Stout (University of Central Florida, pers. comm.) this area has not been surveyed in the last twenty years.

Effects of the Proposed Actions

Atlantic salt marsh snake - Wetland activities (i.e., dredging and filling) associated with construction of either the rock revetment or engineered channel may kill or injure individual snakes. Each of the proposed alternatives will impact up to 3 acres of intertidal wetlands. The Corps believes that without controlled channelization or a hardened revetment, current erosion rates coupled with storm surges could eliminate all the remaining salt marsh and mangrove swamp along the north spit. Based on the small ratio of impacted (3 acres) to estimated (11,700 acres) snake habitat rangewide (Cox et al. 1994), the proximity of remaining salt marsh and mangrove swamp north of the impact area, and the observation that the potential impact area is not optimum salt marsh snake habitat (G. Goode, Volusia County Mosquito Control District, personal communication), the Service feels the overall impact to the Atlantic salt marsh snake will be minimal.

Piping plover - Land-based operations associated with the south jetty extension alternative occurring from October through March may disturb and temporarily displace foraging birds. This is more likely to take place north and west of the south jetty within the beach and flat area adjacent to the inlet throat. The expected loss of some shoals and sand flats in this area as a result of the jetty extension will likely reduce the overall foraging habitat for wintering birds. Since the jetty extension is not expected to impact all the beach or flats between the jetty and the Coast Guard station, and extensive sand flats occur nearby in both the Halifax and north Indian Rivers, the Service believes the overall impact to the overwintering, Atlantic coast population of piping plovers will be minimal.

Sea turtles - Land-based operations on the south jetty during turtle nesting and hatching seasons can disrupt adult nesting activity as well as expose adults, hatchlings, and eggs to mortality from vehicles. Sand compaction may contribute to adverse effects on nest site selection and digging behavior (Nelson and Dickerson 1987, 1988c; Nelson 1988). Severe compaction has been shown to significantly increase the number of false crawls, thereby reducing nesting success (Fletemeyer 1980, Raymond 1984, Nelson and Dickerson 1987, Nelson et al. 1987, Nelson and Dickerson 1988a,c). The storage of vehicles, equipment and materials on the beach can create barriers to nesting females emerging from the surf, resulting again in a higher incidence of false crawls and unnecessary energy expenditure. Vehicles and equipment can also create sand ruts which may

trap, misdirect, and otherwise detain hatchlings. Driving may also crush nests, as well as adults and hatchlings if it occurs after dark. These impacts may extend as far south as the closest public beach access, Beachway Avenue, approximately 1.5 miles from the south jetty.

Vehicle and other operational lights can also impact sea turtles. Artificial beachfront lighting has caused disorientation (loss of bearings) and misorientation (incorrect orientation) of hatchlings (Philbosian 1976; Mann 1977; Florida Department of Environmental Protection, unpubl. data). Reduction in nesting activity has been documented for beaches illuminated with artificial lights (Witherington 1992). Construction related lights therefore may deter females from coming ashore to nest, disorient females trying to return to the surf after a nesting event, and disorient and misorient emergent hatchlings from adjacent non-project beaches. Any source of bright lighting can profoundly affect the orientation of hatchlings, both during the crawl from the beach to the ocean and once they begin swimming offshore. Hatchlings attracted to light sources on construction barges may not only suffer from interference in migration, but may also experience higher probabilities of predation to predatory fishes that are also attracted to the barge lights. This impact could be reduced by using the minimum amount of light necessary, which may require shielding or low pressure sodium lighting during project construction.

Impacts from land-based operations can be reduced by continued implementation and enforcement of the Beach Code portion of the Volusia County Beach Management Plan and county lighting ordinance during the nesting and hatching season each year.

Based on the small ratio of potentially impacted (1.5 linear miles) habitat to existing county habitat (49.08 linear miles), the extent of these species' ranges elsewhere, and the current and future beach driving and lighting requirements, described within an existing county beach management plan and draft beach habitat conservation plan, the Service believes the overall impact to the four species of sea turtles will be minimal.

Southeastern beach mouse - Land-based operations for the south jetty construction alternative may impact beach mouse habitat if jetty access occurs through the service road and dunes within Smyrna Dunes Park. Excavation of occupied habitat will cause displacement and possible mortality of mice. The Service expects that any impacts will be temporary and not significant since the area affected is expected to be small relative to the available habitat within the park and elsewhere within the species' range.

Cumulative Effects

Cumulative effects include the effects of future state, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA. The Service is not aware of any cumulative effects in the project area.

Conclusion

After reviewing the current status of the Atlantic salt marsh snake, piping plover, Kemp's ridley, leatherback, green, and loggerhead sea turtles, southeastern beach mouse, the environmental baseline for the action area, the effects of the proposed navigation improvements, and the cumulative effects, it is the Service's biological opinion that the Ponce de Leon Inlet navigation improvement project, as proposed, is not likely to jeopardize the continued existence of the Atlantic salt marsh snake, piping plover, southeastern beach mouse, nor the four, above-named species of sea turtles. No critical habitat has been designated in this area for the Atlantic salt marsh snake and Kemp's ridley, green, and loggerhead sea turtles; therefore, none will be affected. Marine and terrestrial critical habitat for the leatherback has been designated at St. Croix, U.S. Virgin Islands; however, this project does not affect locations outside the action area, and no destruction or adverse modification of that critical habitat is anticipated.

Incidental Take

Sections 4(d) and 9 of the ESA, as amended, prohibit taking (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct) of listed species of fish or wildlife without a special exemption. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. Harass is defined as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is any take of listed animal species that results from, but is not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or the applicant. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered a prohibited taking provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are non-discretionary, and must be implemented by the agency so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, in order for the exemption in section 7(o)(2) to apply. The U.S. Army Corps of Engineers has a continuing responsibility to regulate the activity covered by this incidental take statement. If the Corps fails to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, or fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

The Service has reviewed the biological information and other information relevant to the Ponce de Leon Navigation Project. Based on this review, incidental take is anticipated for Atlantic salt marsh snakes, sea turtle adults and hatchlings during the nesting and hatching seasons, and the southeastern beach mouse. Direct and indirect impacts to all snakes are expected from the filling of salt marsh and mangrove swamp on the north spit associated with the proposed revetment construction alternative, and dredging of similarly located habitat for the proposed creation of a

new channel through the old bed of the Halifax River. Direct impacts to all sea turtle hatchlings and adults within a mile of the south jetty are expected from lighted nighttime construction activities there. Further direct impacts to all hatchlings and adults are expected from nighttime collisions with vehicles and motorized equipment between Beachway Avenue to just north of the south jetty. Another direct impact expected with this alternative is site-specific mortality of all beach mice from possible dune excavation. Indirect impacts from a land-based operation at the south jetty may be entrapment of up to 1600 hatchlings within sand ruts, impairment of up to six nesting females resulting from beach storage of vehicles, equipment, and materials, and temporary loss of beach mouse dune habitat due to possible excavation for jetty access.

Effect of the take

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the species or destruction or adverse modification of critical habitat.

Reasonable and prudent measures

When providing an incidental take statement, the Service is required to give reasonable and prudent measures it considers necessary or appropriate to minimize the take, along with terms and conditions required to implement those measures. The Service also must include specific procedures for handling or disposing of any individuals taken. The following are the reasonable and prudent measures the Service believes are necessary and appropriate to minimize take of the Atlantic salt marsh snake, Kemp's ridley, leatherback, green, and loggerhead sea turtles, and southeastern beach mouse.

Atlantic salt marsh snake

The Corps will insure that every reasonable effort is made to remove and allow for movement of Atlantic salt marsh snake from its habitat immediately prior to and throughout construction of the north spit revetment and new engineered channel alternatives.

Sea turtles

1. Every reasonable effort shall be made to insure that type, intensity, direction, and focus of required lighting associated with south jetty nighttime construction activities are adjusted to prevent disruption of adult nesting and hatchling behavior. All non-essential lighting shall be eliminated.
2. Movement of land-based vehicles and equipment on the beach are conducted in a manner which avoids collisions with sea turtle adults, nests, and hatchlings.

3. Nest surveys by a trained, experienced, and permitted individual will be required for any land-based operations. This individual, who should have field experience with turtle hatchling response to lights, shall also be present during nighttime construction activities to reduce impacts to hatchlings from artificial lights and sand ruts.

4. Any storage of materials, equipment, and vehicles on the beach shall be in a manner which will not impair movement of sea turtles to the maximum extent practicable.

5. The Corps shall insure that contractors involved in the proposed work fully understand the sea turtle protection measures detailed in this incidental take statement.

Southeastern beach mouse

The Corps will insure that every reasonable effort is made to minimize the extent of dune excavation and restore the affected dune ecosystem to its original condition beginning immediately after the construction access requirements are completed.

Terms and conditions

In order to implement the above reasonable and prudent measures and be exempt from the prohibitions of section 9 of the ESA, the Service is providing the Corps with the following terms and conditions for incidental take. According to the Interagency Cooperation Regulation (50 CFR 402.14), these terms and conditions are non-discretionary.

Atlantic salt marsh snake

1. A biologist familiar with the life history and ecology of the Atlantic salt marsh snake and capable of identifying, capturing, and handling this species, shall survey the habitat, at appropriate times, 24 hours prior to impact. An accurate record of snakes observed shall be kept, and reasonable efforts made to capture observed specimens. Lengths and weights of captured individuals will be taken at that time and the snake(s) released into adjacent, non-impacted habitat. The biologist must possess the proper collection permits from the Florida Game and Fresh Water Fish Commission (GFC) before preceding with this work.

2. The Corps shall provide information on this species to personnel working at the proposed alternatives sites, including a photograph of the snake for easy identification. If a snake is observed, the work shall cease until the animal has moved or is moved out of the immediate impact area.

3. If an Atlantic salt marsh snake is killed, the specimen should be collected and frozen as soon as possible. All incidental mortalities must be recorded and the U.S. Fish and Wildlife Service in Jacksonville (904-232-2580) notified within 24 hours of each event. The GFC permit should provide further information on the final disposition of the carcass, including proper handling, storage, and any transfer of specimens, if required.

Sea turtles

1. From April 15 through November 30, all on-beach lighting associated with the south jetty alternative shall be limited to the immediate area of active construction only. Such lighting shall be shielded, low wattage, low pressure sodium vapor lights to minimize illumination of the nesting beach and nearshore waters. Red filters should be placed over vehicle and equipment headlights (i.e., trucks, bulldozers, loaders). Lighting on boats, barges, and their water-borne equipment shall be similarly minimized through reduction, shielding, lowering, and appropriate placement of lights to avoid excessive illumination of the work area, while meeting all U.S. Coast Guard and OSHA requirements. Shielded, low wattage, low pressure sodium vapor lights are highly recommended where lights on watercraft and water-borne equipment cannot be eliminated.

2. Nest surveys shall be required where land-based operations for the south jetty alternative impact beaches anytime from April 15 through November 30. Surveys shall be initiated 65 days prior to jetty construction or by April 15, whichever is later, and continue through the end of the project or September 30, whichever is earlier. Only personnel with prior training and experience in nest surveying and hatchling behavior, and possessing the applicable Florida Department of Environmental Protection permit shall engage in this activity. Surveys shall be performed daily between sunrise and 9 a.m. and in such a manner so as to ensure that construction activity does not occur in any location prior to completion of the necessary sea turtle protection measures.

3. Nests located between Beachway Avenue and the south jetty will be clearly marked by a stake and survey tape or string forming a circle with a radius of 10 feet centered at the clutch. No construction-related vehicles, equipment, or supplies shall enter this circle and no adjacent construction will be allowed which might directly or indirectly disturb the area within the staked circle(s).

4. Driving of vehicles and equipment on the beach shall be restricted, to the maximum extent practicable, to the hours between sunrise and sunset from April 15 through November 30. Unavoidable nighttime beach driving shall proceed within the designated beach right-of-way at less than the posted speed. Drivers shall be alert to the possible encounter with nesting adults and turtle hatchlings and will cease movement if turtles are detected in their vicinity. Driving may

resume only after the proximal turtle activity, i.e., adult nesting or hatchling migration to the water, is completed.

5. A marine turtle permit holder shall be present during unavoidable nighttime work which overlaps potential nest hatching events, as determined by the species, nesting dates, and range of incubation times. The permit holder shall continuously observe the section of beach described in section 3 for hatchlings emerging within the immediate project area, those entrapped in sand ruts, or misdirected due to project lighting. Such hatchlings shall be collected and released at another location on the same section of beach where these impacts are not operating. Following release, the permit holder will consult with the nighttime project supervisor to determine if the impact was avoidable and correct it to the maximum extent possible and consistent with the terms and conditions of this opinion.

6. From April 15 through November 30, staging areas for equipment and vehicles shall be located off the beach to the maximum extent practicable. If necessary, overnight storage of vehicles and construction equipment on the beach shall be limited to those in use to minimize disturbance to sea turtle nesting and hatching activities. Beach storage of materials and supplies is appropriate only on a temporary basis and if it is located on the northwest of the south jetty. Any beach storage must comply with the Volusia County beach conservation zone requirements. In addition, beach storage shall be in a manner so as to minimize impact to nesting habitat (placement perpendicular to the shoreline is recommended as the method of storage).

7. The Corps shall provide information on this species to personnel working at the proposed south jetty site to the extent necessary to comply with the previous terms and conditions.

8. In the event of an incidental mortality or injury, the U.S. Fish and Wildlife Service located in Jacksonville, Florida (904-232-2580) must be notified within 24 hours of each event. The Florida Marine Patrol (1-800-DIAL-FMP) should be notified if other dead, injured, or sick endangered or threatened sea turtle specimens are collected or observed. Care should be taken in handling these individuals to ensure effective treatment and care of the injured and to preserve dead specimens in the best possible state for later analysis. The Corps or its authorized contractor has the responsibility to ensure that evidence intrinsic to the specimen is not unnecessarily disturbed.

Southeastern beach mouse

1. Prior to dune excavation, all proposed access points must be trap surveyed for beach mice, using one or more transects running perpendicular to the dunes for at

least three consecutive nights. Size of the access route will determine transect and trap numbers. A plant survey using the same transects must be conducted to determine diversity and density of vegetation. The site selected for access shall be the one which survey findings suggest will result in the minimal impact to beach mice and/or vegetation. Photographs of this site shall be taken to facilitate accurate restoration of the previous dune ecosystem to the maximum extent.

2. The excavation shall be restricted to the minimum length and width practical for providing access to vehicles and equipment. Excavated sand shall be temporarily stored between the back dunes and the boardwalk service road.

3. Foredune restoration will be accomplished by erecting snow fences and planting sea oats. Excavated sand may be used to physically re-create back dunes. The remainder of the excavated sand shall be integrated with adjacent back dunes in a manner which complements their usual physical appearance.

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize incidental take that might otherwise result from the proposed alternatives. Provided that these measures are implemented, the Service believes that any incidental take resulting in mortality of Atlantic salt marsh snake and southeastern beach mouse, and false crawls of nesting sea turtles will be considered as unavoidable. The Service, however, has determined that implementing the above measures should result in the death or injury of no more than one adult sea turtle from contact with vehicles or equipment, and the incidental taking of 100 sea turtle hatchlings. If, during the course of the action, this minimized level of incidental take is exceeded, such incidental take represents new information requiring review of the reasonable and prudent measures provided. The Federal agency must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

Reinitiation - Closing Statement

This concludes formal consultation on the actions outlined in the Fish and Wildlife Coordination Act Report for the Ponce de Leon Navigation Improvement Study. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

Coastal Barrier Resources Act

Background

The Coastal Barrier Resources Act (CBRA), first enacted in 1982 (16 U.S.C. 3502 et seq.), was reauthorized and amended by the Coastal Barrier Improvement Act (CIBA) of 1990 (16 U.S.C. 3501). Its purpose, as stated in section 2(b), is ".....to minimize the loss of human life, wasteful expenditure of Federal revenues, and the damage to fish, wildlife, and other natural resources associated with the coastal barriers....." CBRA established the Coastal Barrier Resources System, a mapped series of undeveloped coastal barriers on the Atlantic and Gulf coasts, including the Great Lakes Region, Virgin Islands, and Puerto Rico. Areas within the system are designated as either "units" or "otherwise protected areas" (OPA's). Section 5(a) prohibits all new federal expenditures and financial assistance within unit boundaries, with some exceptions as determined through a process of consultation.

Consultation

Section 6(a) of CBRA requires that the appropriate federal officer consult with the Secretary of the Interior (Secretary) prior to making commitments on Federal expenditures or financial assistance within CBRA units. The Secretary has delegated his consultation responsibility to the U.S. Fish and Wildlife Service (Service). The Service, therefore, offers the following comments on proposed improvements to navigation at Ponce de Leon Inlet, a designated CBRA unit, pursuant to Section 6.

Ponce de Leon Inlet is located on the Florida east central coast between the cities of Daytona Beach and New Smyrna Beach. The inlet and much of the adjacent coastal river wetlands east of Route 1 are grouped within the P08 unit (Figure 24). The 1993 Corps Reconnaissance Report proposed various measures to improve navigation within the inlet and adjacent portions of the Halifax and North Indian Rivers, and control erosion of the inlet's north spit. These measures include:

- extending the north and south jettys located at the inlet mouth,
- re-opening a portion of the north jetty weir,
- constructing a scour apron on the south side of the north jetty and rebuilding the damaged portions of the north jetty,
- building a groin field along the east shoreline of the north spit within the inlet throat,
- constructing a revetment from the toe end of the north jetty westward along one of three possible alignments, and
- creating a new Federal channel through the old bed of the Halifax River.

Since publication of the Reconnaissance Report, more than 60 additional acres of the north spit have eroded. As a result, the Corps re-reviewed the groin field alternative and determined that conditions on the north spit no longer matched the parameters under which this measure was to operate. The Corps, therefore, dropped this strategy from project consideration.

Habitats found within the Ponce Inlet unit include marine, estuarine, brackish riverine, salt marsh, mangrove swamp, tidal mud and sand flats, beaches, and coastal dunes. These habitats not only support diverse communities of both resident plants and animals, but are also important for migratory birds, including waterfowl and neotropical migrants. The extensive coastal wetlands support both shellfish and the adults and juveniles of many commercially valuable finfish. More specific information on these and other significant natural resources associated with Ponce Inlet may be found in the subsection on the description of the affected environment.

Section 6(a)(2) of CIBA provides an exception to Section 5, Limitations on Federal Expenditures Affecting the System, if the expenditure is for "the maintenance or construction of improvements of existing Federal navigation channels (including the Intracoastal Waterway) and related structures (such as jetties), including the disposal of dredge materials related to such maintenance or construction." The proposed jetty extensions, north jetty weir re-opening, and north jetty repair and scour apron are actions which qualify under this exception.

Subsections 6(a)(6A-F) of CBRA also provide exceptions to section 5, provided that the actions or projects are consistent with the purposes of CBRA as previously stated. The proposed new channel and rock revetment would greatly reduce or eliminate, respectively, the erosion potential of facilities within Lighthouse Point County Park, located on the north spit. These measures thus could be considered under subsection 6(F), which exempts expenditures and assistance for "the maintenance, replacement, reconstruction, or repair, but not the expansion, of publicly owned or publicly operated roads, structures, or facilities." Both actions are also consistent with the purposes of CBRA because

- they will contribute to increased inlet navigability, which should minimize the existing risk of loss of human life,
- current Federal expenditures for inlet renourishment and containment of inlet breaching will be eliminated and dredging for shoal removal will be greatly reduced, and
- the expected habitat loss from the actions is offset by the anticipated conservation of nearby habitat supporting similar fish, wildlife, and other natural resources within the unit that otherwise might be lost to uncontrolled erosion.

Based on the preceding review, the Service concludes that the proposed jetty extensions, north jetty weir re-opening, and north jetty repair and scour apron are exempted under Section 6(a)(2) and the engineered channel and rock revetment are exempted under Section 6(a)(6F).

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APPENDIX I

FIGURES

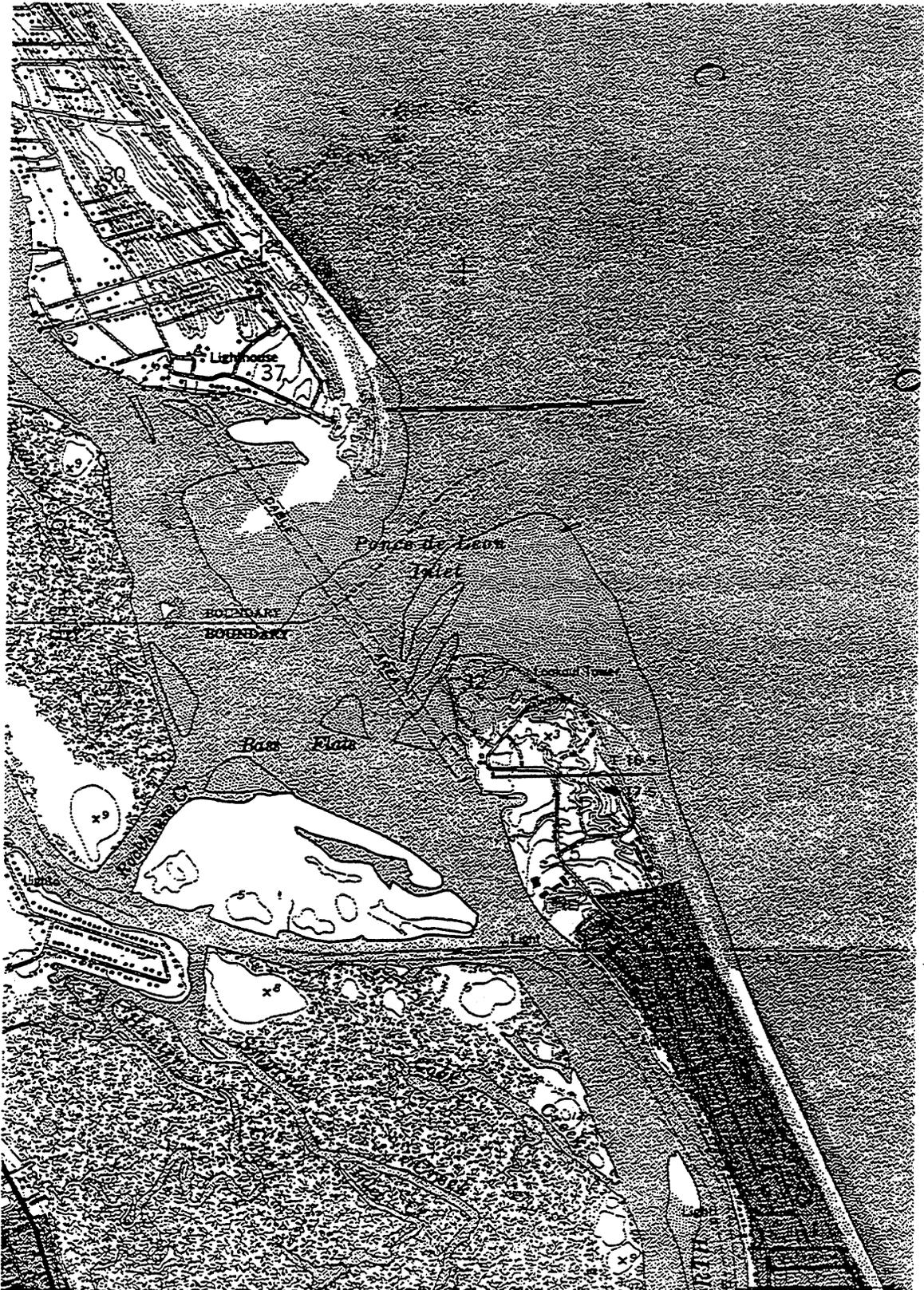


Figure 1. Ponce DeLeon Inlet New Smyrna Beach 7.5' Quadrangle 1993.

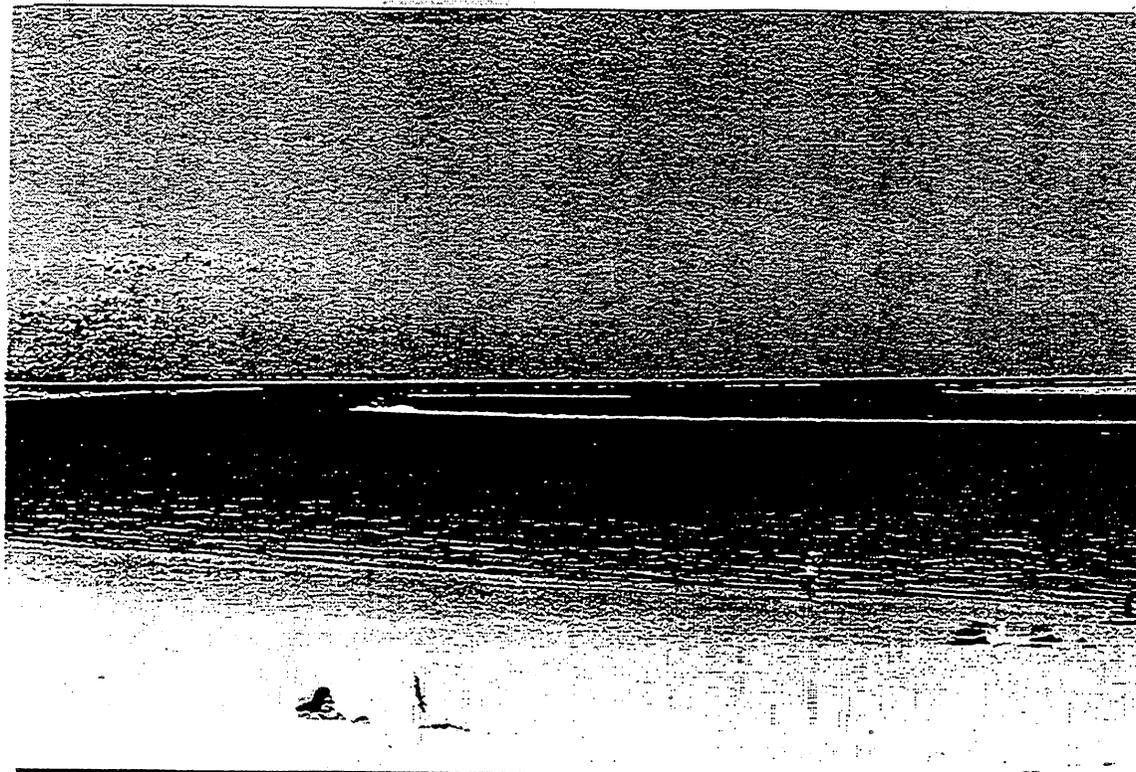


Figure 2. Atlantic Ocean at Ponce de Leon Inlet.



Figure 3. North Indian and Halifax Rivers.

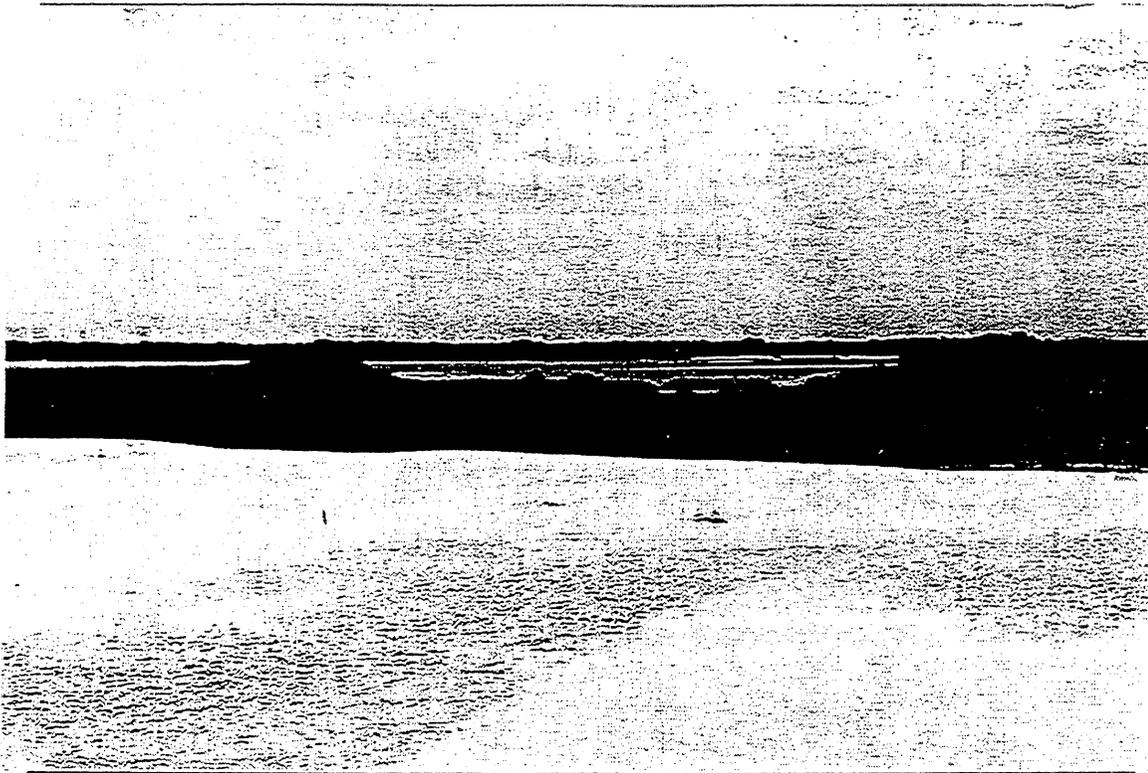


Figure 4. Old Halifax Riverbed

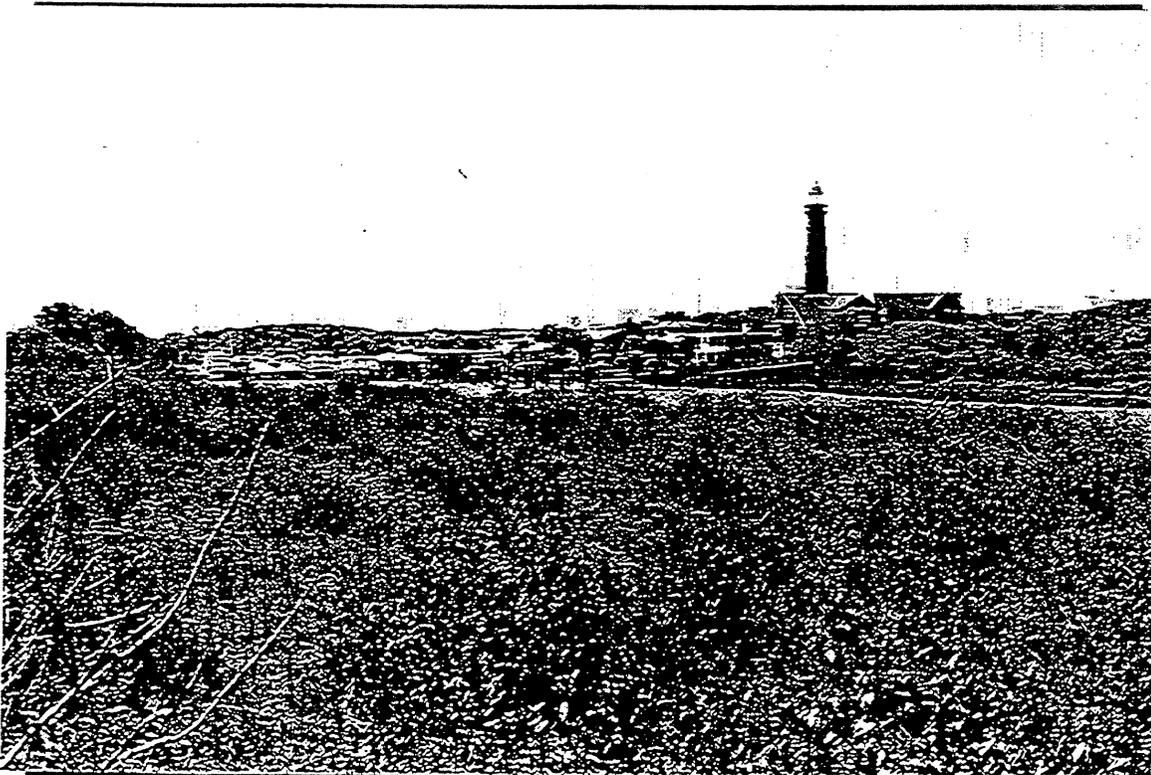


Figure 5. Boat Marina and Cove.

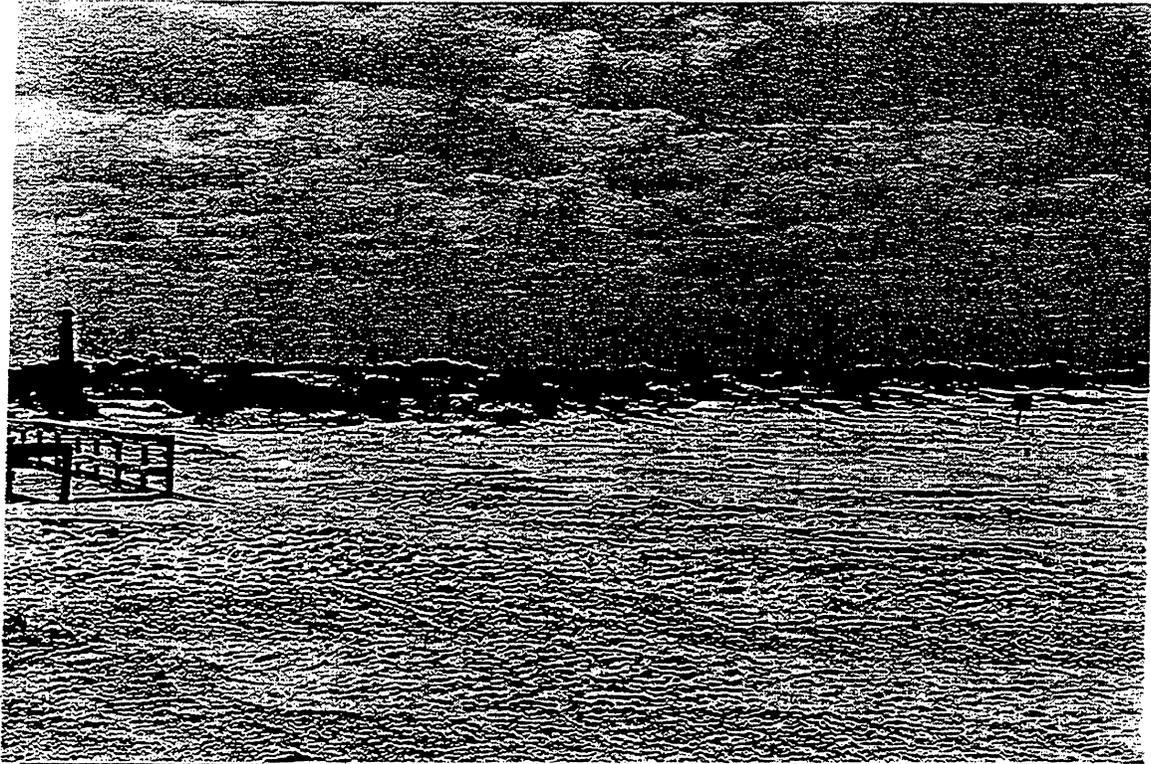


Figure 6. Beach and Dunes - North Jetty.

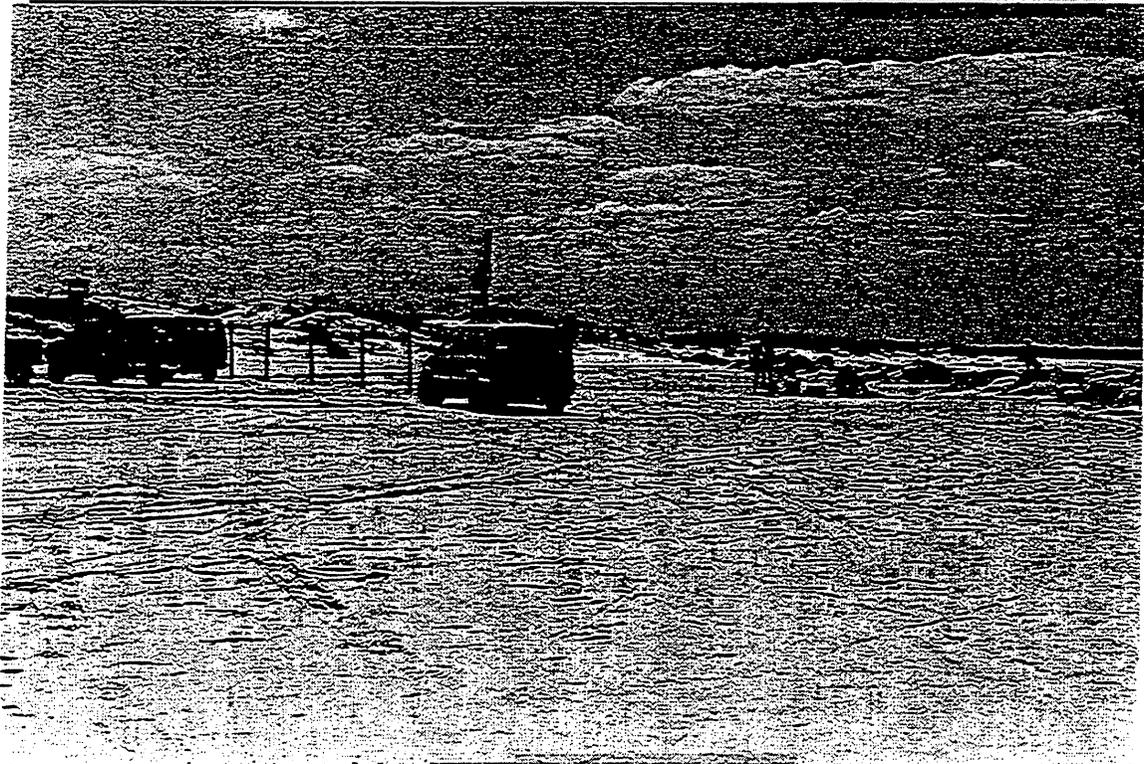


Figure 7. Beach and Dunes - South Jetty.



Figure 8. Beach Quality Sand Barrier - North Spit.

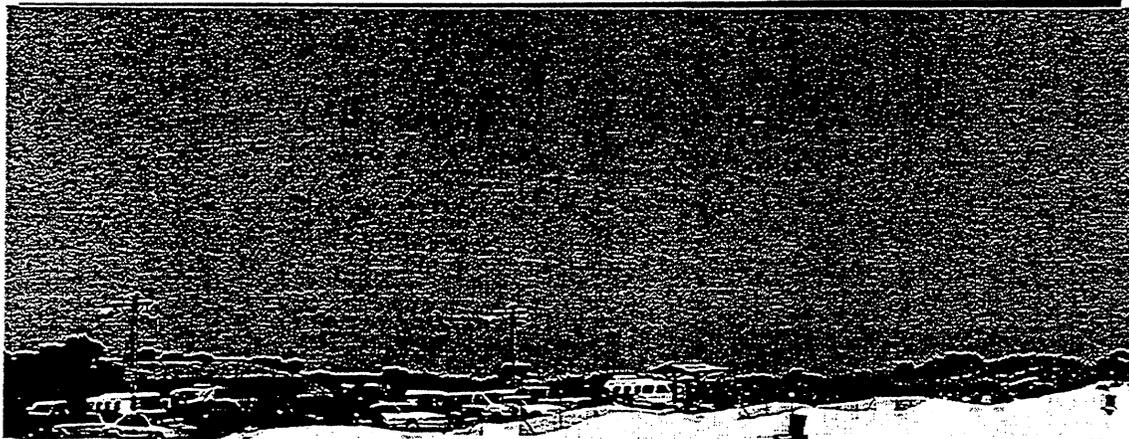


Figure 9. Beach Quality Sand Barrier - North Spit.

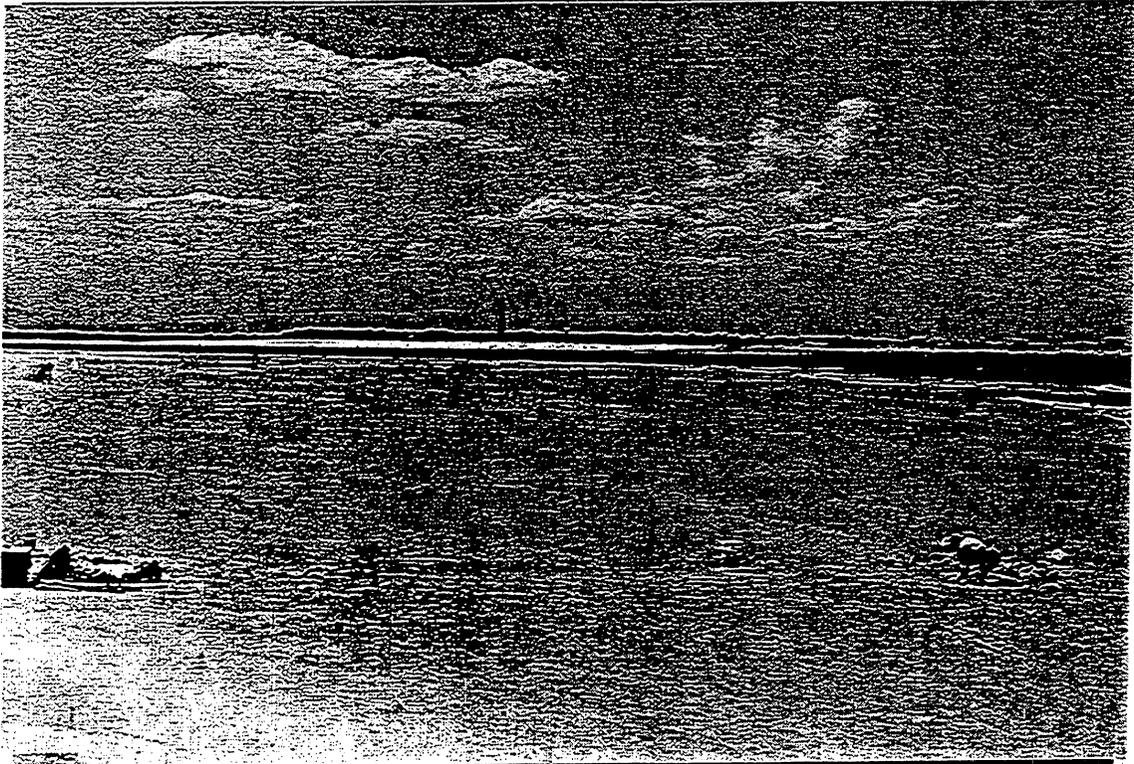


Figure 10. Sand Flat - South Spit.

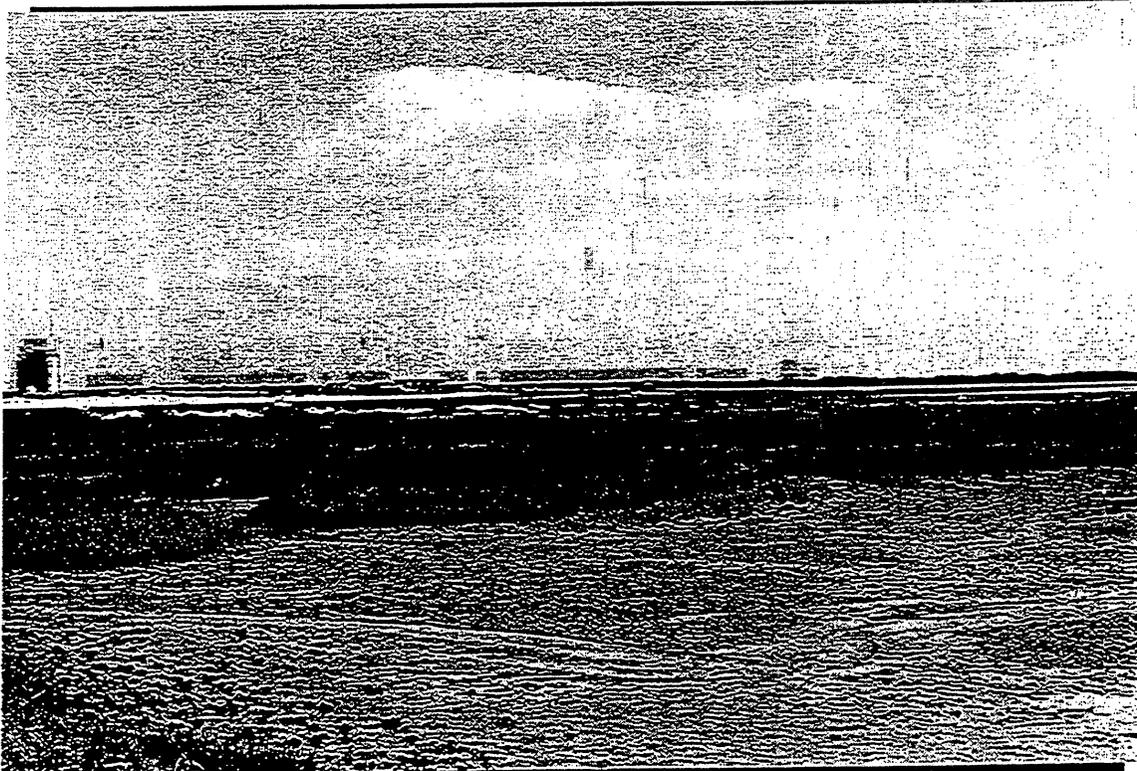


Figure 11. Mud Flat - North Spit.



Figure 12. Sand Dune - North Spit..

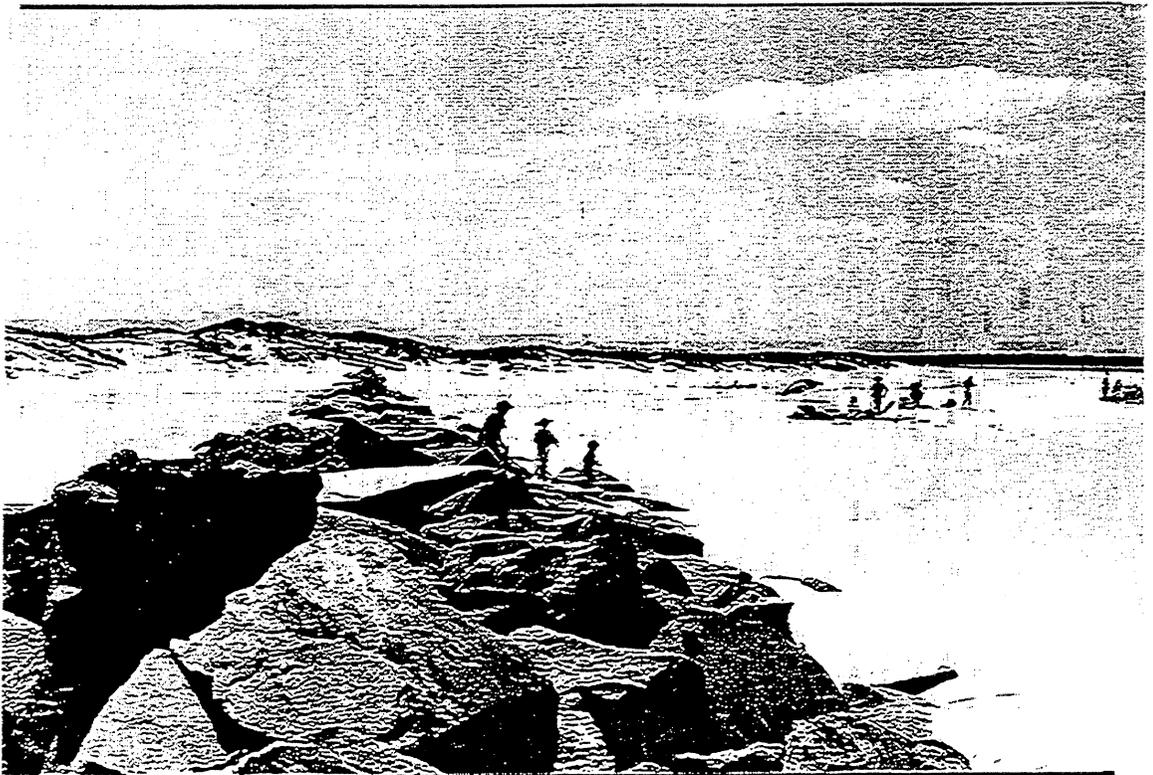


Figure 13. Sand Dune - South Spit.



Figure 14. Salt Marsh - North Spit.

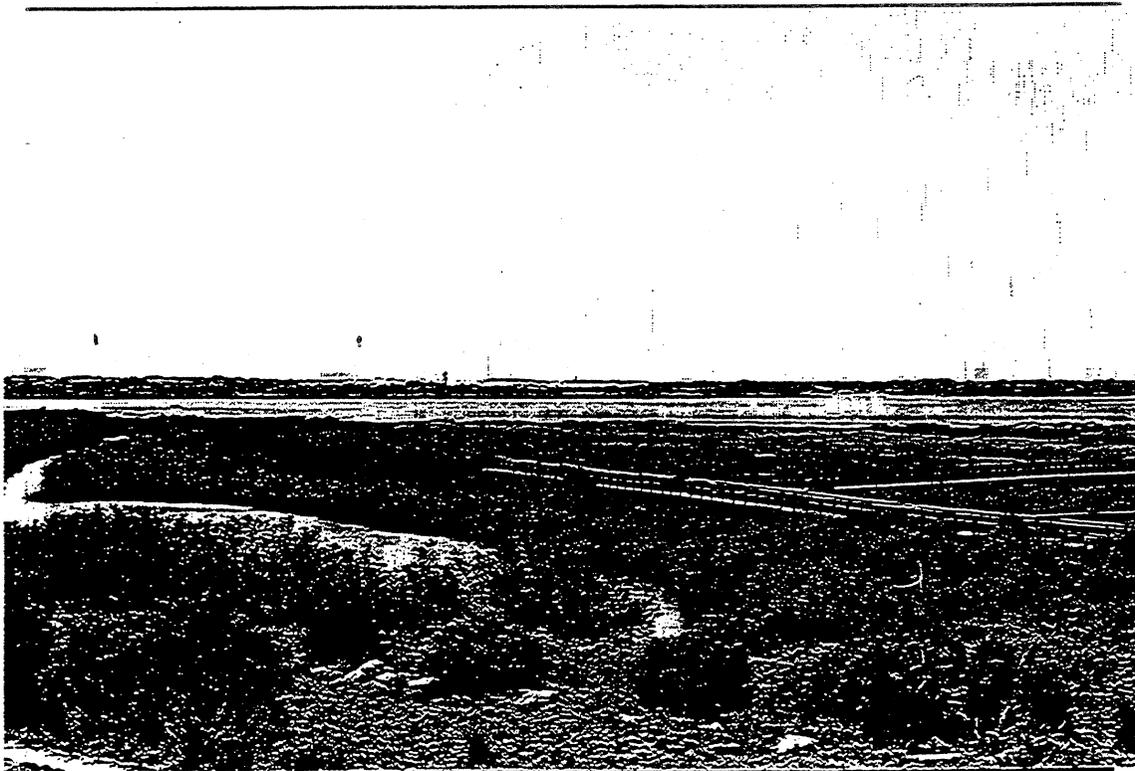


Figure 15. Salt Marsh Mangrove - South Spit.

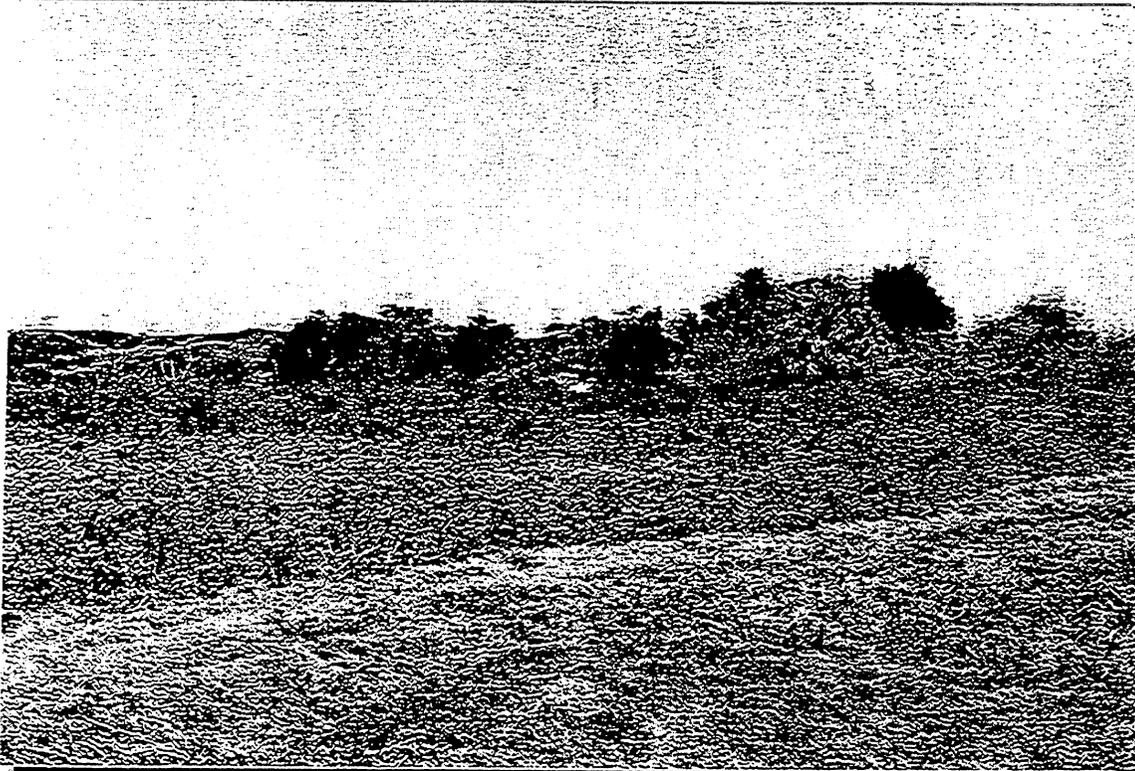


Figure 16. Mangrove - North Spit.



Figure 17. North Jetty.

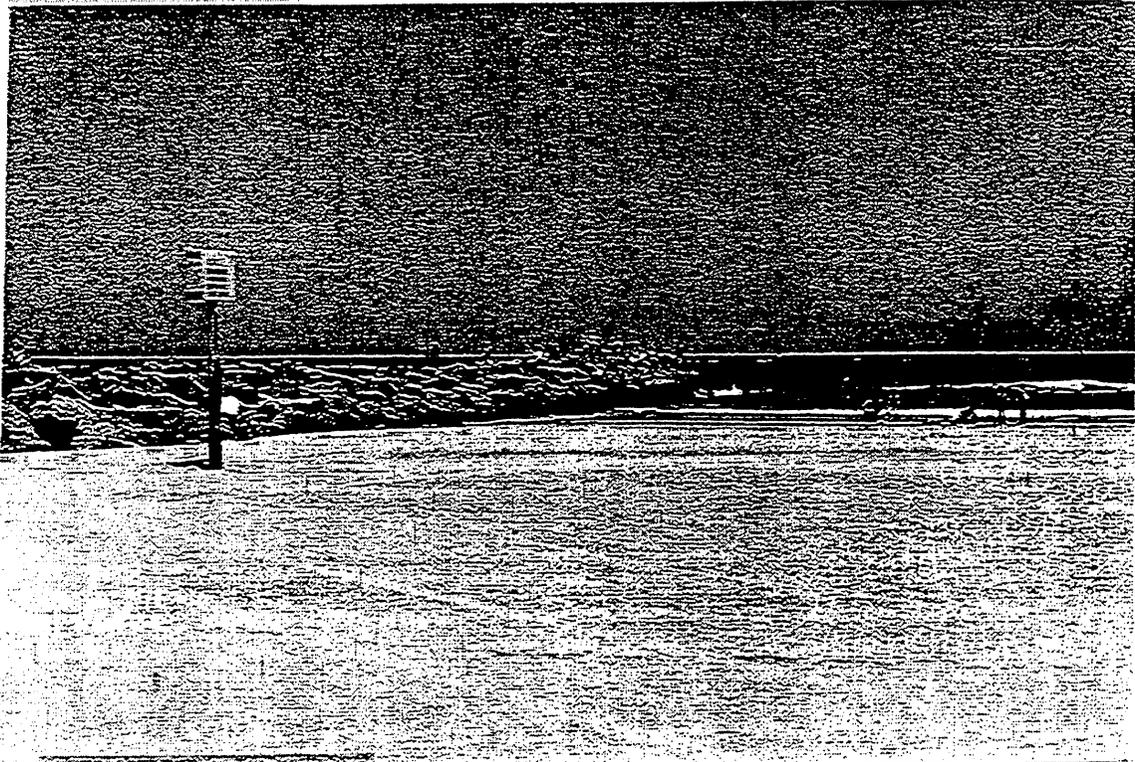


Figure 18. South Jetty.

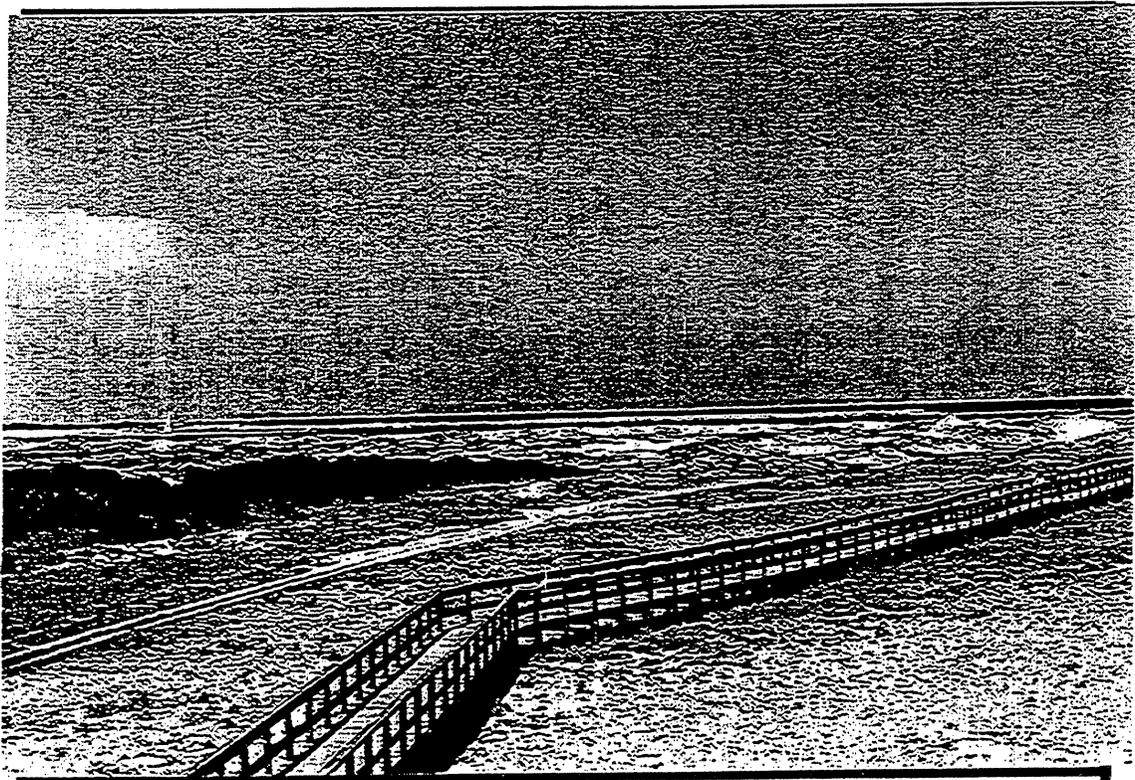


Figure 19. Spoil Area - South Spit.

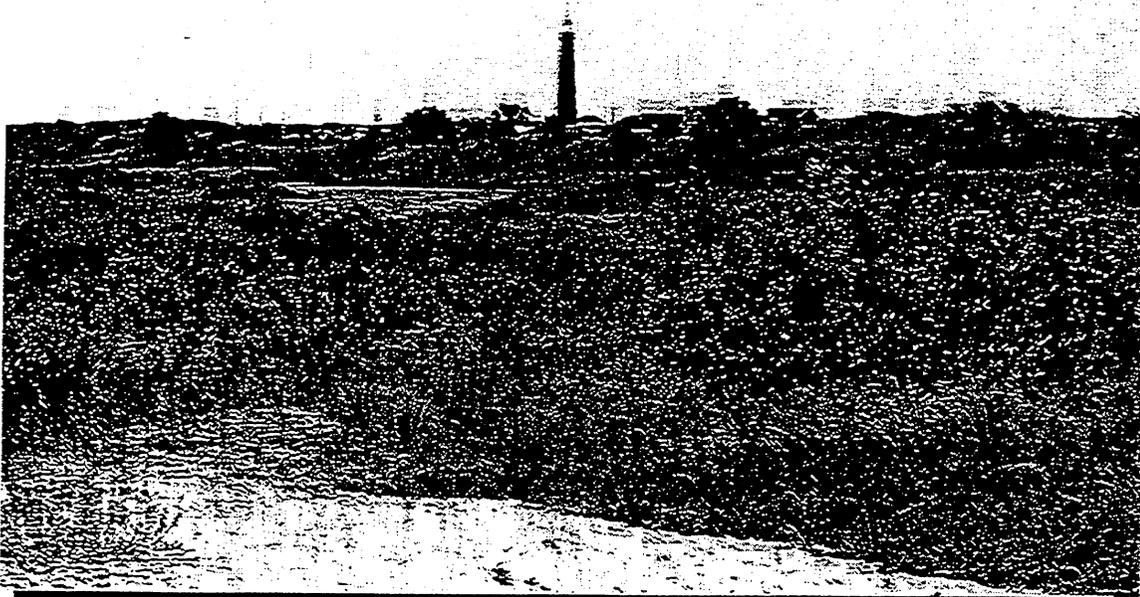


Figure 20. Spoil Peninsula (Background) - North Spit.



Figure 21. Spoil Peninsula and wetland Boundary - North Spit.

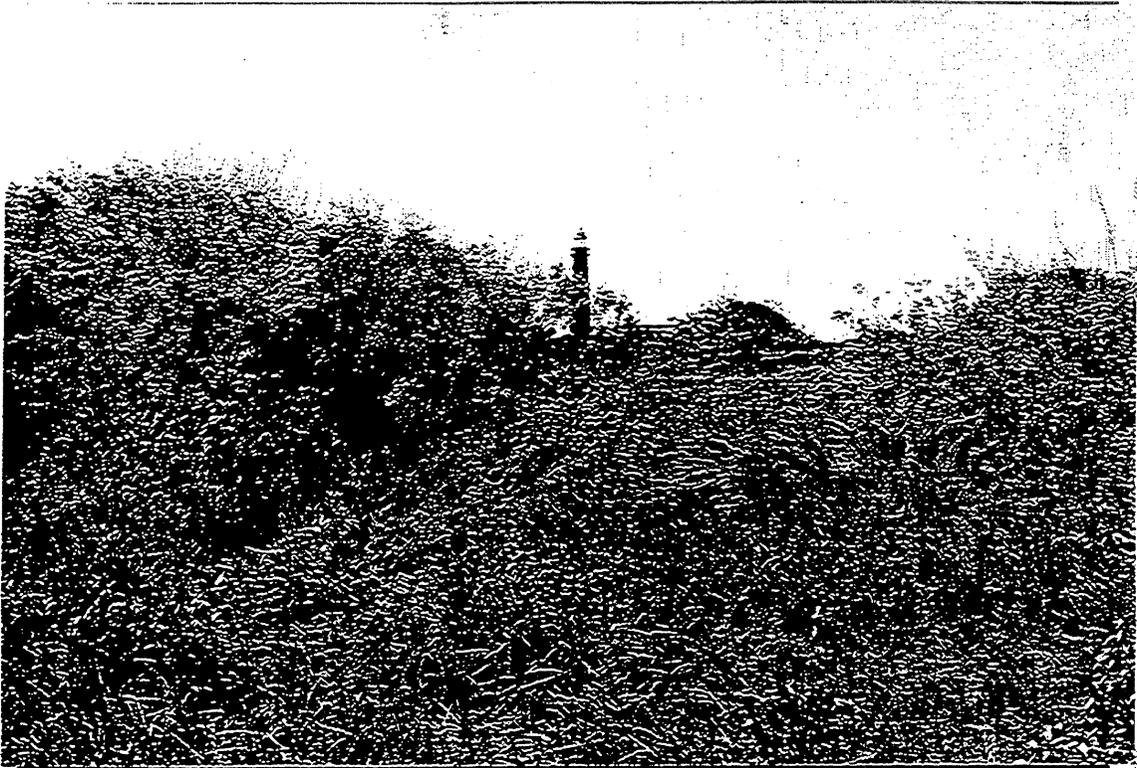


Figure 22. Lateral Salt Marsh Corridor - North Spit.

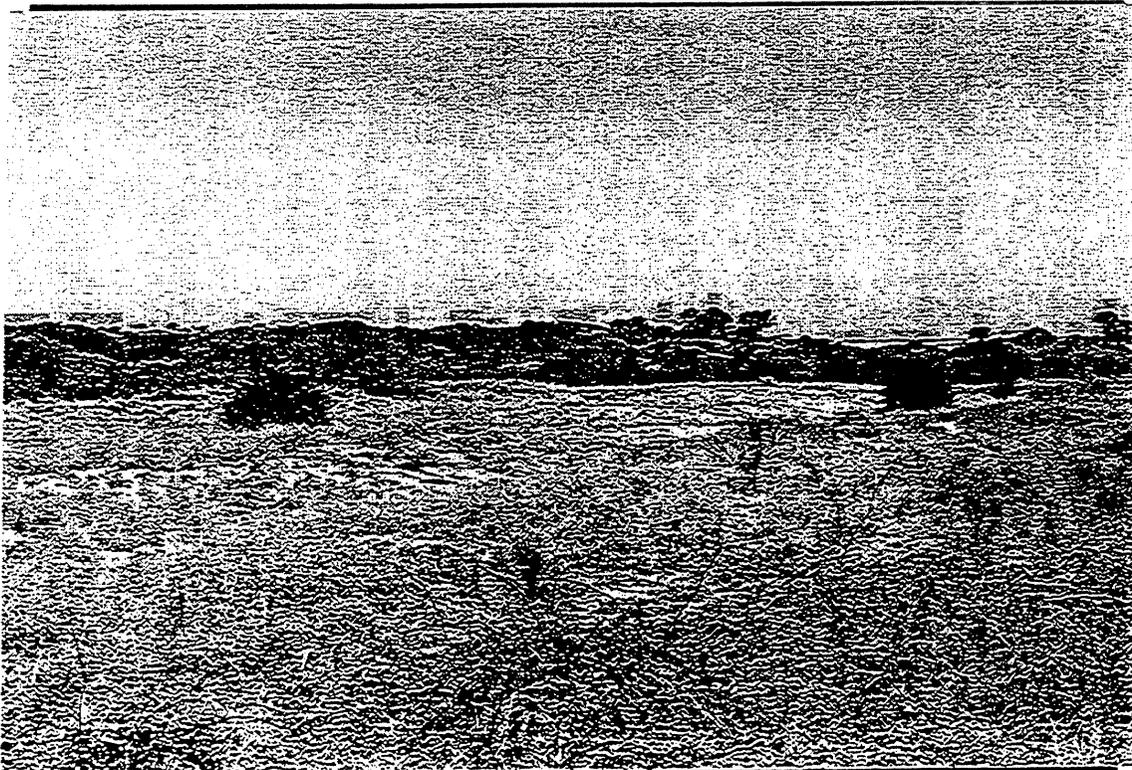


Figure 23. Spoil Field on Peninsula - North Spit.

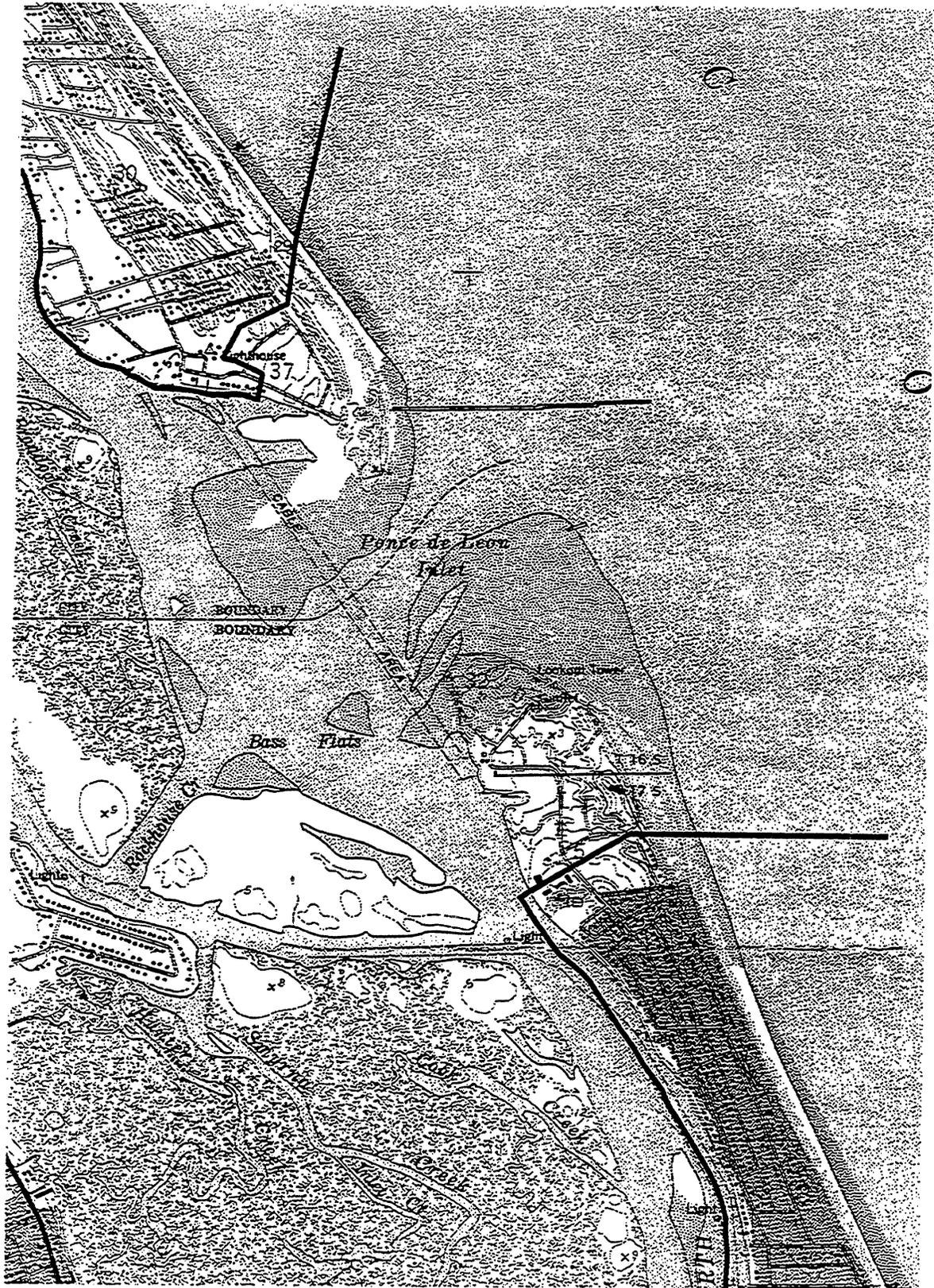


Figure 24. Portion of Ponce Inlet Coastal Barrier Resource System Unit (PO8).

APPENDIX II

OFFICIAL CORRESPONDENCE



DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P. O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

September 29, 1992

Planning Division
Environmental Branch

TO ADDRESSEES ON ATTACHED LIST:

The Jacksonville District, U.S. Army Corps of Engineers, is gathering information to define issues and concerns that will be addressed in a reconnaissance-level report on proposed inlet improvements at Ponce de Leon Inlet, Volusia County, Florida.

Alternatives under consideration include lengthening the south jetty approximately 1,000 feet, construction of a scour apron on the south side of the north jetty, rebuilding damaged areas of the north jetty, construction of a groin field along the sand spit inside the inlet adjacent to the north jetty and construction of a storm revetment to seal a potential breach along shoreline of the sand spit inside the inlet (enclosure 1).

The Corps welcomes your views, comments and information about resources, study objectives and important features within the described study area, as well as any suggested improvements. Letters of comment or inquiry should be addressed to the letterhead address to the attention of Planning Division, Environmental Studies Section and received by this office within thirty (30) days of the date of this letter.

Sincerely,

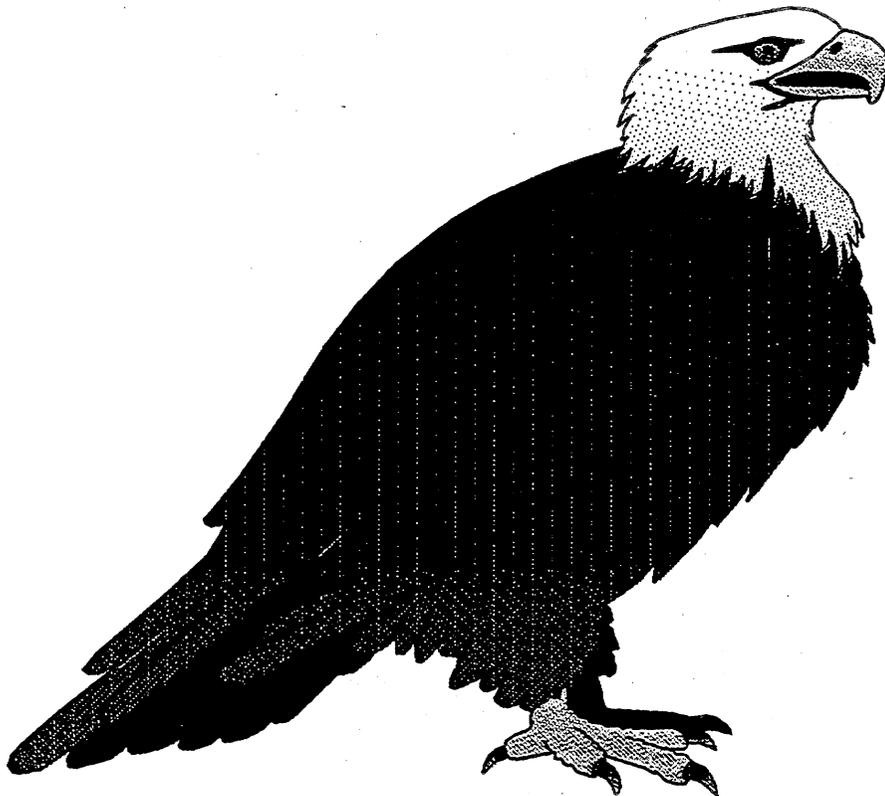
A. J. Salem
Chief, Planning Division

Enclosure

PROJECT MGR. - JACK POWELL (#1694)

(Also: RAY BOOTHBY 3453)

FISH & WILDLIFE COORDINATION ACT



**PONCE-DE-LEON INLET PROJECT
(ADDENDUM)
JULY 23, 1997**

**PONCE DE LEON INLET IMPROVEMENTS
(ADDENDUM)
VOLUSIA COUNTY, FLORIDA**

1.0 PURPOSE

On September 26, 1997, the Fish and Wildlife Service (Service) provided the Jacksonville District, Army Corps of Engineers (Corps) with the final Fish and Wildlife Coordination Act Report (CAR) for inclusion in the Feasibility Study of proposed navigation improvements to Ponce de Leon Inlet, Volusia County, Florida.

On May 5, 1997, the Jacksonville District requested the Service provide an addendum to the CAR as a result of a proposed modification to the originally described project. As a result of the modification, the Service has also modified the biological opinion, in accordance with section 7 of the Endangered Species Act of 1973, as amended and reaffirmed the Service's determination with reference to section 6 consultation, in accordance with the Coastal Barrier Resources Act of 1982, as amended.

2.0 MODIFIED PROJECT DESCRIPTION

In addition to the proposed action described in the September 26, 1997, CAR, the Jacksonville District proposes to realign the southern portion of the Ponce de Leon Inlet Federal channel in the Indian River to Cut-24 of the Intracoastal Waterway (IWW), and deepen the existing IWW channel from Cut-24 north to the site of the old Swoop Power Plant on the west side of the IWW north of Rockhouse Creek (16,000 linear feet) (figure 1). The channel would be deepened from the authorized depth of minus 12 feet to a depth of minus 16 feet; however, the bottom width of 125 feet will remain unchanged. The top width would increase from 200 feet to 225 feet. About 360,000 cubic yards of beach quality material will be removed from the channel and either placed on the beach south of Ponce de Leon Inlet, two upland disposal sites, or enlarge two shoaled areas just west of the inlet at the mouth of Rockhouse Creek.

Ancillary Development

The Corps has discussed with the local sponsor the feasibility of securing private funds to build a commercial marina and seafood processing facility at the Swoop Power Plant site. The proposed modification to the inlet project, the subject of this modified CAR, is to service the commercial facility.

The purpose of the commercial facility is to attract open-ocean commercial fishing vessels, ranging from 65-95 feet in length with a draft of 12-14 feet. The current depth of the IWW from Cut-24 to the power plant site is minus 12 feet, therefore, the IWW will not accommodate the larger vessels.

There is only one commercial marina in the New Smyrna Beach area, Fager's Marina, which is located several miles south of the inlet, across from Chicken Island. This marina is not able to accommodate the larger vessels. The purpose of this new marina will be to provide quicker access to the golden and red crab fisheries, and rock shrimp, which lie approximately 100 miles east of Ponce de Leon Inlet. Currently there are three commercial marinas suitable to accommodate these larger ocean going vessels: Fernandina, Cape Canaveral and Ft. Pierce. The facility at Cape Canaveral is closing because of competing interests from the cruise ship industry, leaving only two facilities, both located at significant distances away from the targeted commercial fisheries.

3.0 AFFECTED ENVIRONMENT

The proposed work will occur within the existing channel from Cut-24 to just north of the Swoop Power Plant. No dredging will be required from the inlet south where it intercepts with the IWW. The dredged material will either be deposited on the beach south of the inlet, two upland disposal sites between Rockhouse Creek or in shoaled areas between the inlet and Rockhouse Creek.

Much of the biological information with reference to the inlet and surrounding wetlands is presented in the CAR; therefore, will not be repeated in this addendum. For this addendum, the Service evaluated the new dredging and the new proposed disposal sites.

Natural Habitats

Intracoastal Waterway

The Federal navigation channel (IWW) currently has a bottom width of 125 feet and a depth of minus 12 deep at mean low water. The proposal is to deepen the channel to minus 16 feet; however, the bottom width of the channel will remain unchanged. The top width will increase from 200 feet to 225 feet.

All work will be conducted from the water using a cutter-head dredge. The material will be piped to the disposal site(s).

Core samples from the channel show a material that is suitable for beach disposal. Because of existing water depth and water clarity, there is no submerged aquatic vegetation in or adjacent to the channel that would be affected by the dredging. No blasting will be required to deepen the channel. For a detailed description of biotic resources that may be found within the water column, we refer the Corps to the CAR.

Figures 2-5 show typical sites along the IWW, including a photograph of the Swoop Power Plant site where the commercial marina is proposed to be constructed. The eastern shoreline is vegetated in a mixture of black mangrove (*Avicennia germinans*) and smooth cordgrass

Spartina alterniflora). Landward of this vegetation is Brazilian pepper (*Shinus terebinthifolius*) and wax myrtle (*Myrica cerifera*), intermixed with cabbage palm (*Sabal palmetto*), and red cedar (*Juniperus virginiana*). Within the project area, most of the western shoreline is developed with single-family residences and the shoreline is bulkheaded.

The following Federally listed threatened and endangered species may be found in the IWW: manatee (*Trichechus manatus latirostris*) and loggerhead (*Caretta caretta*), green (*Chelonia mydas*), and leatherback (*Dermochelys coriacea*) sea turtles. With reference to marine turtles, we recommend that the Corps coordinate with the National Marine Fisheries Service regarding potential impacts of this project on these species.

Upland Disposal Sites

The upland disposal sites are located on the north and south sides of Rockhouse Creek (figures 6 and 7). Both sites historically were used as disposal sites for the IWW.

The north site (MSA 434) is approximately 378 acres, and appears not to have been used as a disposal site for many years based on the growth of the vegetation throughout the area (figures 8-10). The predominant vegetation is wax myrtle, cabbage palm, red cedar, lantana (*Lantana* spp.), smilax (*Smilax* spp.), and sea oats (*Uniola paniculata*). During the cursory survey, four active gopher tortoise (*Gopherus polyphemus*) burrows were found, and one gopher tortoise was observed in a burrow (figure 11).

The south site (MSA 434C) is approximately 47 acres, and appears to have been used more recently than the north site (figures 12-14). There has been little recruitment of vegetation on the disposal site. The predominant vegetation is sea oats.

The Service believes the use of the south site would have less environmental impact than the north site because it lacks the plant or animal diversity observed on the north site.

Shoal Sites

The shoaled areas are located between the inlet and the mouth of Rockhouse Creek. As shown in figures 15-19, the shoals are unvegetated, except one small patch of smooth cordgrass found on the extreme south end of the south shoal. Between the shoals and the islands, there were exposed tidal flats. Several unidentified shore birds were feeding on invertebrates found on these flats.

Of the three proposed methods of disposal available to the Corps for this project, the Service ranks the shoaled sites as the least favorable. The shoaled areas do provide feeding sites for shore and wading birds

Beach Disposal Site

The proposed beach disposal site begins south of the south jetty and will continue south along the beach until 360,000 cubic yards of sand is disposed of. The Corps did not identify a termination point.

Sandy beaches are populated by small, short-lived infauna with high species density and substantial reproductive potential and recruitment, for example decapods crustaceans, bivalves, spionid worms, and burrowing haustoriid amphipods. These communities occur in relatively well-defined zones and depend to some extent on the nature of the substrate.

The southeastern beach mouse (*Peromyscus polionotus niveiventris*), a Federally listed threatened species, may be found in the dune system. The marine turtles identified above may nest on the intertidal beach and supralittoral zones.

The dredged material will be piped from the project site to the beach to be dispersed. Work will be confined to the intertidal beach and supralittoral beach zones; no work will be conducted in the dunes.

Other than the impacts and conditions discussed in the enclosed biological opinion, the Service believes the impacts of beach disposal will be temporary. The invertebrates will recolonize the intertidal and supralittoral beach zones shortly after disposal.

4.0 ENDANGERED SPECIES ACT

SECTION 7 CONSULTATION

Manatee

The Service has evaluated the proposed dredging of the IWW on the manatee, in accordance with section 7 of the Act, and have determined that this action is not likely to adversely affect this species. The Corps has stated that the standard manatee construction precautions will be included in the dredging contract. In the event blasting is required, the Corps should reinitiate section 7 consultation with the Jacksonville Field Office.

The Service has encouraged marina construction close to inlets in order to decrease vessel travel time in the IWW, thereby reducing the probability of a manatee-boat collision. At the present time, Fager's Marina, located several miles south of the inlet, is the only marina available for commercial fishing vessels in the area.

The proposed marina at the power plant will shorten travel time in the IWW by several thousand feet, providing some additional protection for manatees.

Southeastern Beach Mouse

The historic distribution of this species included the southeastern Florida coast from Hollywood Beach in Broward County north to Ponce de Leon Inlet in Volusia County. Local populations currently are distributed from Ft. Pierce Inlet Recreation Area in St. Lucie County to Canaveral National Seashore in Brevard County.

Principal habitat includes vegetated coastal foredunes; however, mice are also found within the grassy/shrub area of backdunes and the woody scrub area associated with stable dunes

The Service has evaluated the proposed beach disposal operation on the southeastern beach mouse and determined that this action is not likely to adversely affect this subspecies. The Corps has stated that no work will be conducted in the dune system, the habitat for this species. All work will be confined to the intertidal beach and supralittoral beach zones. We recommend that all equipment be restricted, including staging, from the dunes.

BIOLOGICAL OPINION

Loggerhead, Green and Leatherback Sea Turtles

Description of the proposed action

Refer to Section 1.0 of this report.

Status of the species

Please refer to the biological opinion prepared for the CAR.

Environmental baseline

Action Area

The action area, as defined for this opinion, is a two-mile reach of shoreline proposed for beach nourishment.

Status of the Species Within the Action Area

Along a two-mile reach of beach beginning from the south jetty, an average of 23 loggerhead sea turtles nests were recorded from 1992 through 1996. For the current nesting season (June 1997), 21 loggerhead turtle nests have been documented. No green or leatherback sea turtle nests have been observed within this two-mile segment.

Effect of the Action on the Listed Species

Please refer to the biological opinion prepared for the CAR.

Cumulative Effects

Cumulative effects include the effects of future State, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

The Service has considered cumulative effects and determined they do not apply to this project.

Conclusion

After reviewing the current status of the green, loggerhead and leatherback turtles, the environmental baseline for the action area, the effects of the proposed beach nourishment, and the cumulative effects, it is the Service's biological opinion that beach nourishment, as proposed, is not likely to jeopardize the continued existence of the loggerhead, leatherback, and green sea turtles and southeastern beach mouse. No critical habitat has been designated for these species; therefore, none will be affected.

INCIDENTAL TAKE STATEMENT

Sections 4(d) and 9 of the ESA, as amended, prohibit taking (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct) of listed species of fish or wildlife without a special exemption. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. Harass is defined as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is any take of listed animal species that results from, but is not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or the applicant. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered a prohibited taking provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are non-discretionary, and must be implemented by the agency so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, in order for the exemption in section 7(o)(2) to apply. The Corps has a continuing duty to regulate the activity covered by this incidental take statement. If the Corps (1) fails to require the applicant to adhere to the terms and conditions of the incidental take statement

through enforceable terms that are added to the permit or grant document, and/or (2) fails to obtain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

Amount or extent of incidental take

The Service has reviewed the biological information and other information relevant to this action. Based on our review, incidental take is anticipated for all sea turtle nests that may be constructed and eggs that may be deposited and missed by a nest survey and egg relocation program within the boundaries of the proposed project.

Effect of the take

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the species or destruction or adverse modification of critical habitat.

Reasonable and prudent measures

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize take of the loggerhead, green, and leatherback sea turtles.

1. Only beach quality sand suitable for sea turtle nesting, successful incubation, and hatchling emergence shall be used on the project site.
2. If the beach nourishment project will be conducted during the sea turtle nesting season, surveys for nesting sea turtles shall be conducted within the project area, and eggs from all nests laid within the project area shall be relocated.
3. Immediately after completion of the beach nourishment project and prior to the onset of the nesting season for three subsequent years, beach compaction shall be monitored, and tilling conducted as required to reduce the likelihood of impacting sea turtle nesting and hatching activities.
4. Immediately after completion of the beach nourishment project and prior to the onset of the nesting season for three subsequent years, monitoring shall be conducted to determine if escarpments are present, and escarpments shall be leveled as required to reduce the likelihood of impacting sea turtle nesting and hatching activities.
5. The applicant shall ensure that contractors doing the beach nourishment work fully understand the sea turtle protection measures detailed in this biological opinion.

6. During the sea turtle nesting season, no construction equipment shall be parked on the beach where it could hinder sea turtle nesting activities or hatching activities of relocated nests, and all construction pipes shall be located to minimize impacts to nesting sea turtles.

7. During the sea turtle nesting season, lighting associated with the project shall be minimized to reduce the possibility of disrupting and disorienting nesting and/or hatching sea turtles.

Terms and conditions

In order to be exempt from the prohibitions of section 9 of the ESA, the Corps must comply with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are non-discretionary.

1. All fill material placed shall be sand that is similar to that already existing on the site in both coloration and grain size. All such fill material shall be free of construction debris, rocks, clay, or other foreign matter and shall, in general, not contain greater than 5 percent fines (passing the #200 sieve) and be free of coarse gravel or cobbles.

2. A sea turtle nesting survey and conservation program is required if any portion of the beach nourishment activities occurs between April 15 through September 30. Nesting surveys shall begin 65 days prior to nourishment activities or by April 15, whichever is later. Nesting surveys shall continue through the end of the project or through September 30, whichever is earlier. Nests that may be affected by construction activities shall be relocated per the following requirements.

2a. Nest surveys and egg relocations shall only be conducted by personnel with prior experience and training in nest survey and egg relocation procedures. Surveyors shall have a valid Florida Department of Environmental Protection permit. Nest surveys shall be conducted daily between sunrise and 9 a.m. These surveys shall be performed in such a manner so as to ensure that daily movement of the construction activity does not extend into any unsurveyed area.

2b. Only those nests that may be affected by construction activities are required to be relocated. Any nests requiring relocation shall be moved between sunrise and 10 a.m. each day to a nearby self-release beach site in a secure setting where artificial lighting will not interfere with hatchling orientation. Nest relocations in association with construction activities shall not be performed if construction activities are not anticipated to be initiated within 65 days of the date of a nesting event. Nest relocations in association with construction activities shall cease when construction activities no longer threaten nests.

3. Immediately after completion of the beach nourishment project and prior to April 15 of the next three nesting seasons, beach compaction shall be monitored in the area of restoration in accordance with a protocol agreed to by the Service, the State regulatory agency, and the applicant. At a minimum, the protocol provided under 3a and 3b below shall be followed. If required, the area shall be tilled to a depth of 36 inches. All tilling activity must be completed prior to April 15. If the project is completed during the nesting season, tilling shall not be performed in areas where nests have been left in place or relocated. A report on the results of compaction monitoring shall be submitted to the Service prior to any tilling actions being taken. An annual summary of compaction and the actions taken shall be submitted to the Service.

This condition shall be evaluated annually and may be modified if necessary to address sand compaction problems identified during the previous year.

3a. Compaction sampling stations shall be located at 500-foot intervals along the project area. One station shall be at the seaward edge of the dune/bulkhead line (when material is placed in this area); one station shall be midway between the dune line and the high water line (normal wrack line); and one station shall be located just landward of the high water line.

At each station, the cone penetrometer shall be pushed to a depth of 6, 12, and 18 inches three times (three replicates). Material may be removed from the hole if necessary to ensure accurate readings of successive levels of sediment. The penetrometer may need to be reset between pushes, especially if sediment layering exists. Layers of highly compact material may lay over less compact layers. Replicates shall be located as close to each other as possible, without interacting with the previous hole and/or disturbed sediments. The three replicate compaction values for each depth are then averaged to produce final values for each depth at each station. Reports shall include all 27 values for each transect line, and the final 9 averaged compaction values.

3b. If the average value for any depth exceeds 500 psi for any two or more adjacent stations, then that area shall be tilled immediately prior to the sea turtle nesting season. If values exceeding 500 psi are distributed throughout the project area but in no case do those values exist at two adjacent stations at the same depth, then consultation with the Fish and Wildlife Service shall be required to determine if tilling is required. If a few values exceeding 500 psi are present randomly within the project area, tilling shall not be required.

4. Visual surveys for escarpments along the project area shall be made immediately after completion of the beach nourishment project and prior to April 15 of the 3 years following completion of the project. Results of the surveys shall be submitted to the Service prior to any action being taken. Escarpments that interfere with sea turtle nesting or that exceed 18 inches in height for a distance of 100 feet shall be mechanically leveled to the natural beach

contour by April 15. If the project is completed during the main part of the nesting season (May 1 through October 31), escarpments may be required to be leveled immediately, while protecting nests that have been relocated or left in place. An annual summary of escarpment surveys and actions taken shall be submitted to the Service.

5. The applicant shall arrange a meeting between representatives of the contractor, the Service, the Florida Department of Environmental Protection and the permitted person responsible for egg relocation at least 30 days prior to the commencement of work on this project. At least 10 days advance notice shall be provided prior to conducting this meeting. This will provide an opportunity for explanation and/or clarification of the sea turtle protection measures.

6. From April 15 through November 30, no construction equipment shall be parked on the beach where it could hinder sea turtle nesting and hatching activities. In addition, all construction pipes that are placed on the beach shall be located as far landward as possible without compromising the integrity of the existing or reconstructed dune system. Temporary storage of pipes shall be off of the beach to the maximum extent possible. Temporary storage of pipes on the beach shall be in such a manner so as to impact the least amount of nesting habitat and shall likewise not compromise the integrity of the dune systems (placement of pipes perpendicular to the shoreline is recommended as the method of storage).

7. From April 15 through November 30, all lighting associated with the project shall be limited to the immediate area of active construction only. Such lighting shall be the minimal lighting necessary to comply with U.S. Coast Guard and OSHA requirements and shall incorporate reduced wattage, downlights, special fixtures, and/or screens to minimize illumination of the nesting beach and nearshore waters. Lighting on offshore equipment shall be similarly minimized. Shielded low pressure sodium vapor lights are required for on-beach construction site illumination and recommended for all other lighting applications that cannot be eliminated.

8. A report describing the actions taken to implement the terms and conditions of this biological opinion shall be submitted to the Jacksonville Field Office within 60 days of completion of the proposed work for each year when the activity has occurred. This report will include the dates of actual construction activities, names and qualifications of personnel involved in nest surveys and relocation activities, descriptions and locations of hatcheries, nest survey and relocation results, and hatching success of nests.

9. In the event a sea turtle nest is excavated during construction activities, the permitted person responsible for egg relocation for the project should be notified so the eggs can be moved to a suitable relocation site.

10. Upon locating a dead, injured, or sick endangered or threatened sea turtle specimen, initial notification must be made to the nearest Fish and Wildlife Service Law Enforcement Office, 904-232-2580. Care should be taken in handling sick or injured specimens to ensure effective treatment and care and in handling dead specimens to preserve biological materials in the best possible state for later analysis of cause of death. In conjunction with the care of sick or injured endangered or threatened species or preservation of biological materials from a dead animal, the finder has the responsibility to ensure that evidence intrinsic to the specimen is not unnecessarily disturbed.

11. The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize incidental take that might otherwise result from the proposed action. With implementation of these measures, the Service believes that no more than those sea turtle nests and eggs that may be missed by a nest survey and egg relocation program will be incidentally taken. If, during the course of the action, this minimized level of incidental take is exceeded, such incidental take represents new information requiring review of the reasonable and prudent measures provided. The Federal agency must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and reatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

1. Construction activities for this project and similar future projects should be planned to take place outside the main part of the sea turtle nesting and hatching season.
2. Appropriate native salt-resistant dune vegetation should be established on the restored dunes. The Florida Department of Environmental Protection, Division of Beaches and Shores, can provide technical assistance on the specifications for design and implementation.
3. Surveys for nesting success of sea turtles should be continued for a minimum of 3 years following beach nourishment to determine whether sea turtle nesting success has been adversely impacted.
4. Educational signs should be placed where appropriate at beach access points explaining the importance of the area to sea turtles and/or the life history of sea turtle species that nest in the area.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

This concludes formal consultation. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

5.0 COASTAL BARRIER RESOURCES ACT

SECTION 6 CONSULTATION

The Coastal Barrier Resources Act (CBRA), first enacted in 1982 (16 U.S.C. 3502 *et seq.*), was reauthorized and amended by the Coastal Barrier Improvement Act (CIBA) of 1990 (16 U.S.C. 3501). Its purpose, as stated in section 2(b), is ".....to minimize the loss of human life, wasteful expenditure of Federal revenues, and the damage to fish, wildlife, and other natural resources associated with the coastal barriers....." CBRA established the Coastal Barrier Resources System, a mapped series of undeveloped coastal barriers on the Atlantic and Gulf coasts, including the Great Lakes Region, Virgin Islands, and Puerto Rico. Areas within the system are designated as either "units" or "otherwise protected areas" (OPA's). Section 5(a) prohibits all new Federal expenditures and financial assistance within unit boundaries, with some exceptions as determined through a process of consultation.

Consultation

Section 6(a) of CBRA requires that the appropriate federal officer consult with the Secretary of the Interior (Secretary) prior to making commitments on Federal expenditures or financial assistance within CBRA units. The Secretary has delegated his consultation responsibility to the U.S. Fish and Wildlife Service. The Service, therefore, offers the following comments on proposed improvements to navigation on the IWW, which is within a designated CBRA unit, pursuant to Section 6.

The project site is located adjacent to Ponce de Leon Inlet. The project site is found within CBRA unit P08 (figure).

Section 6(a)(2) of CBRA provides an exception to Section 5, Limitations on Federal expenditures Affecting the System, if the expenditure is for "the maintenance or construction of improvements of existing Federal navigation channels (including the Intracoastal Waterway) and related structures (such as jetties), including the disposal of dredge materials related to such maintenance or construction."

Based on the preceding review, the Service concludes that the proposed deepening of the IWW and disposal of the material either on the beach, existing spoil islands or shoaled areas are exempted under Section 6(a)(2).

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FIGURE 1. PROJECT SITE

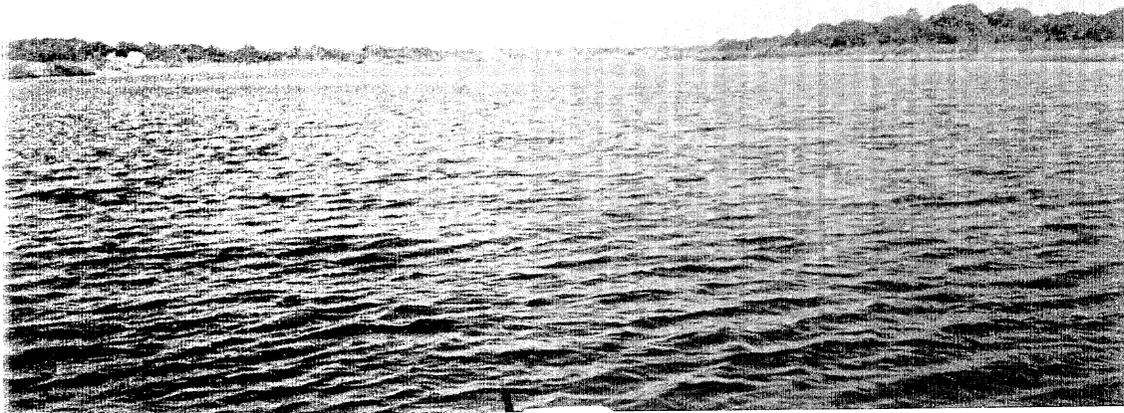


Figure 2. The IWW, in the project site, looking north.



Figure 3. The vegetated shoreline on the east side of the IWW within the project site.

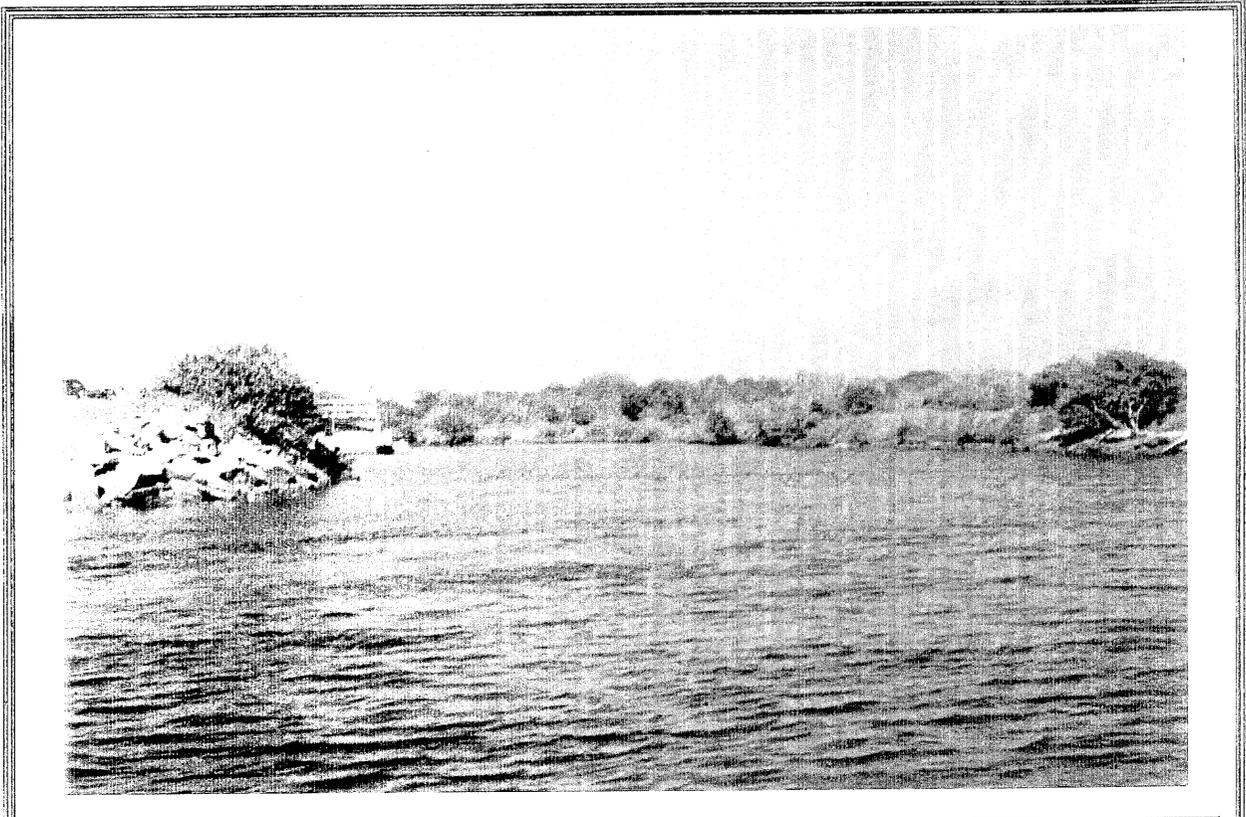


Figure 4. The proposed marina site at the Swoop Power Plant.

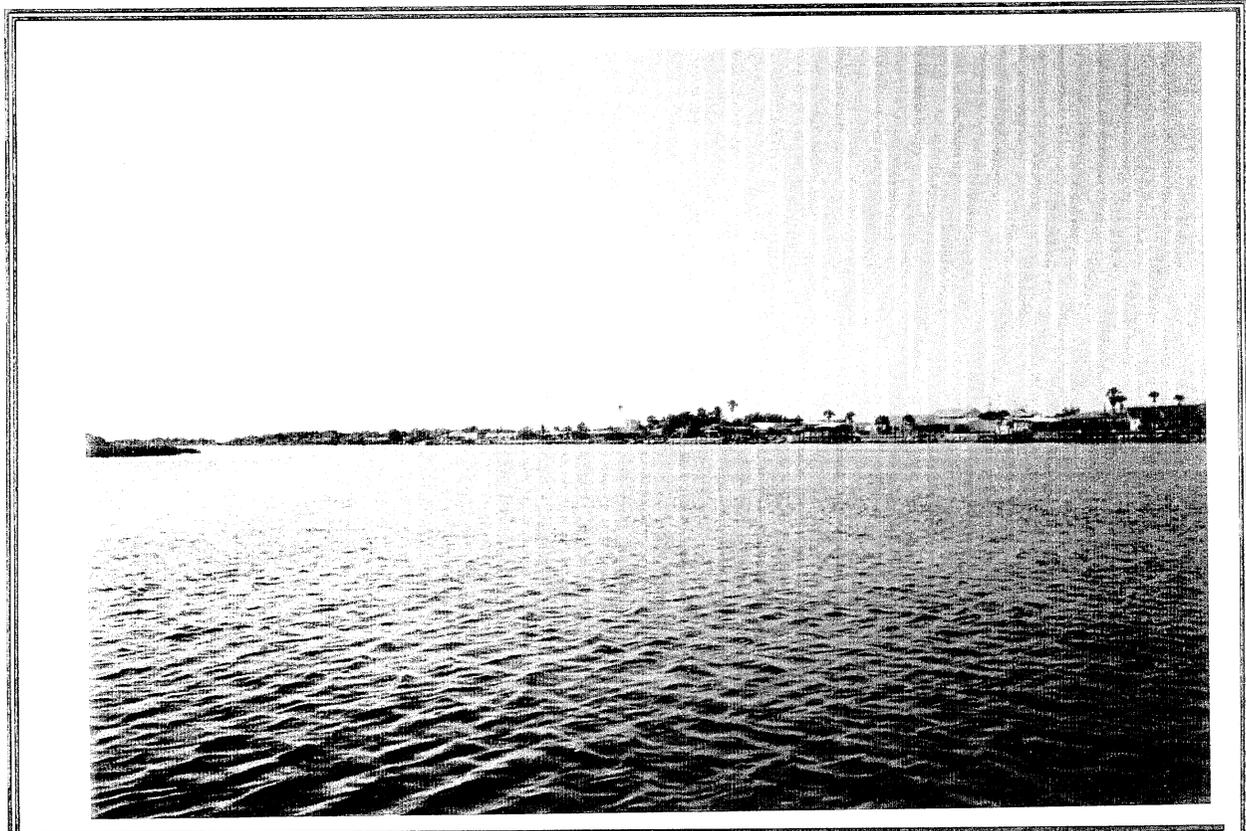


Figure 5. A view of the west side of the IWW within the project site.

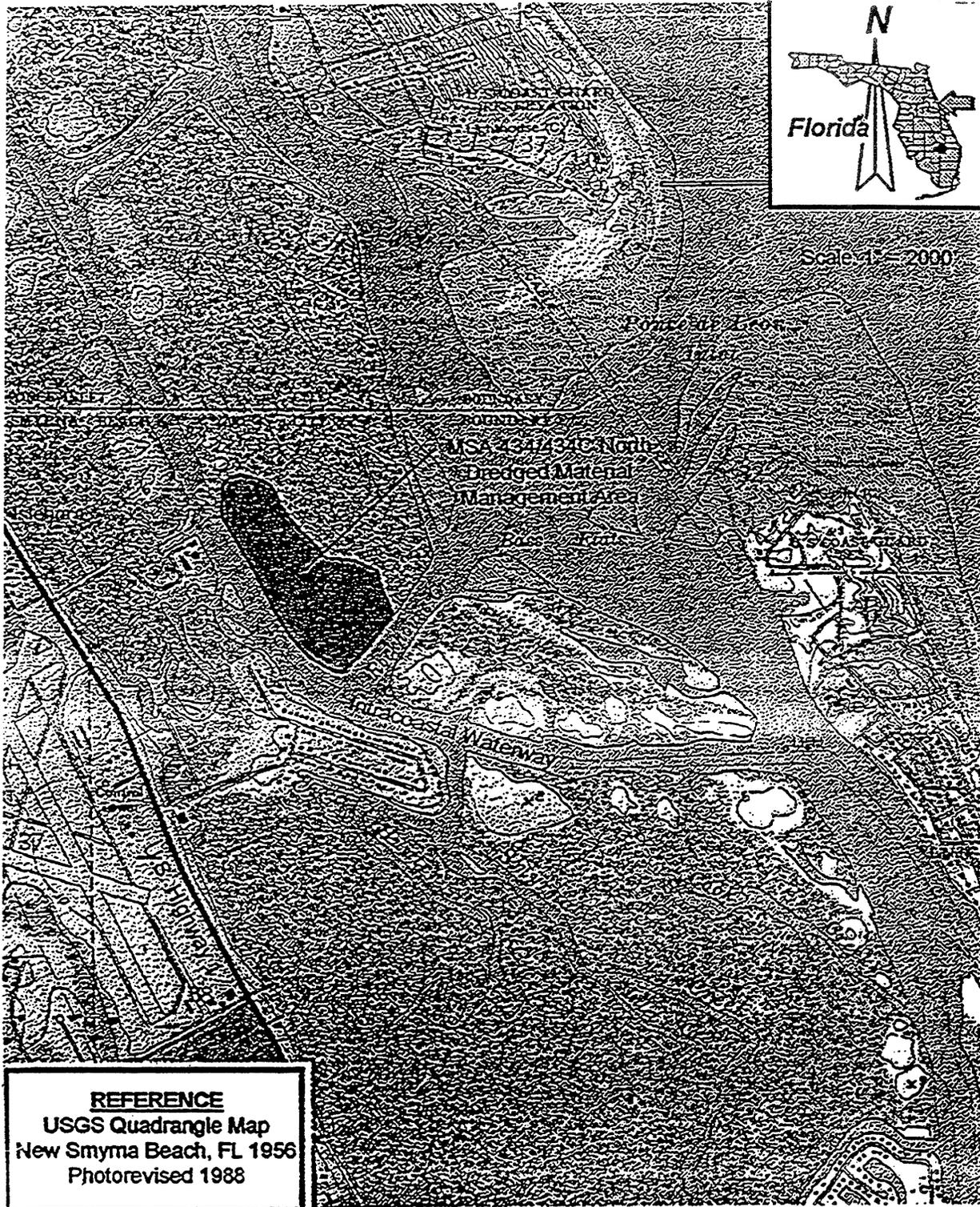


FIGURE 6. THE NORTH DISPOSAL SITE

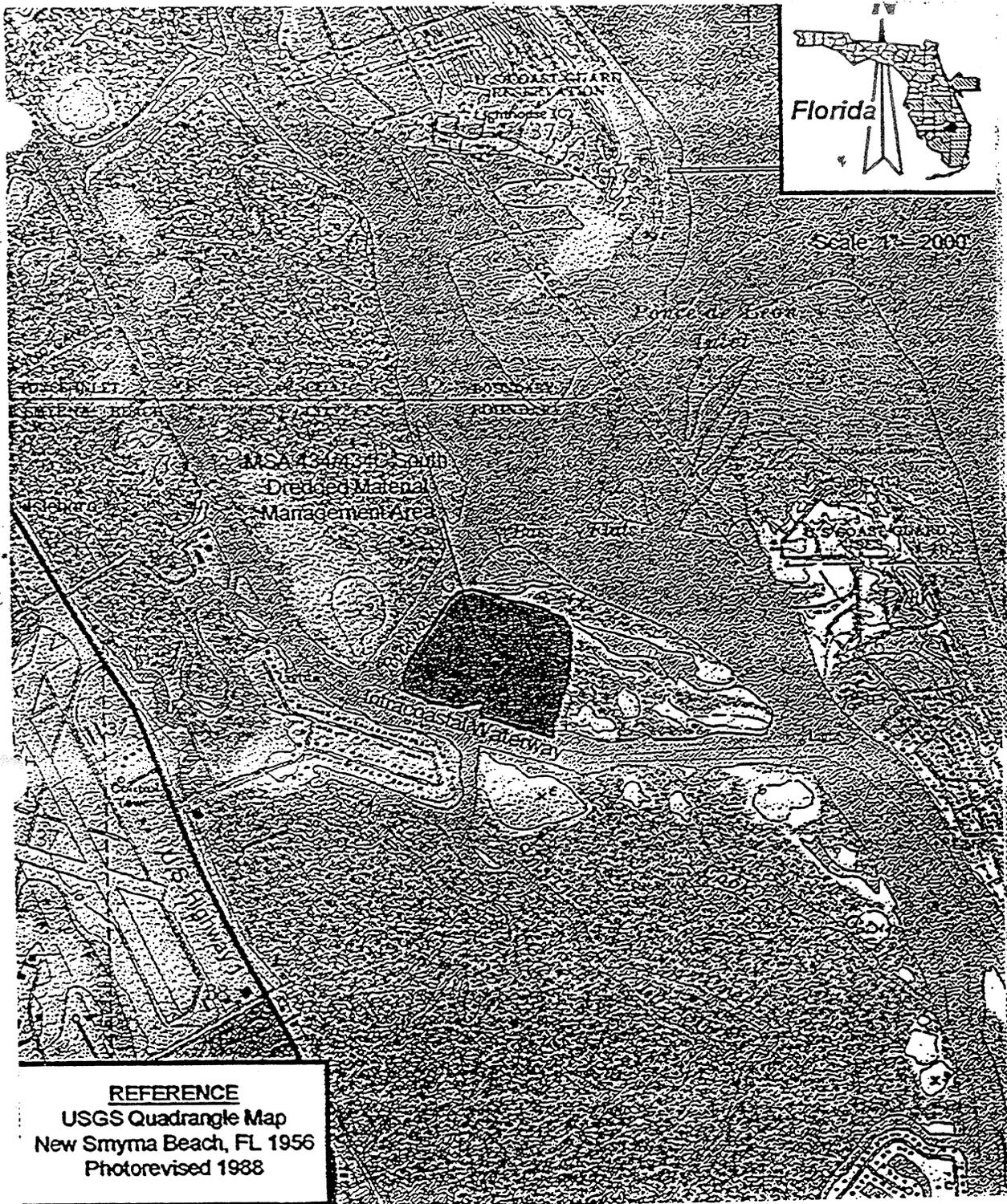


FIGURE 7. THE SOUTH DISPOSAL SITE

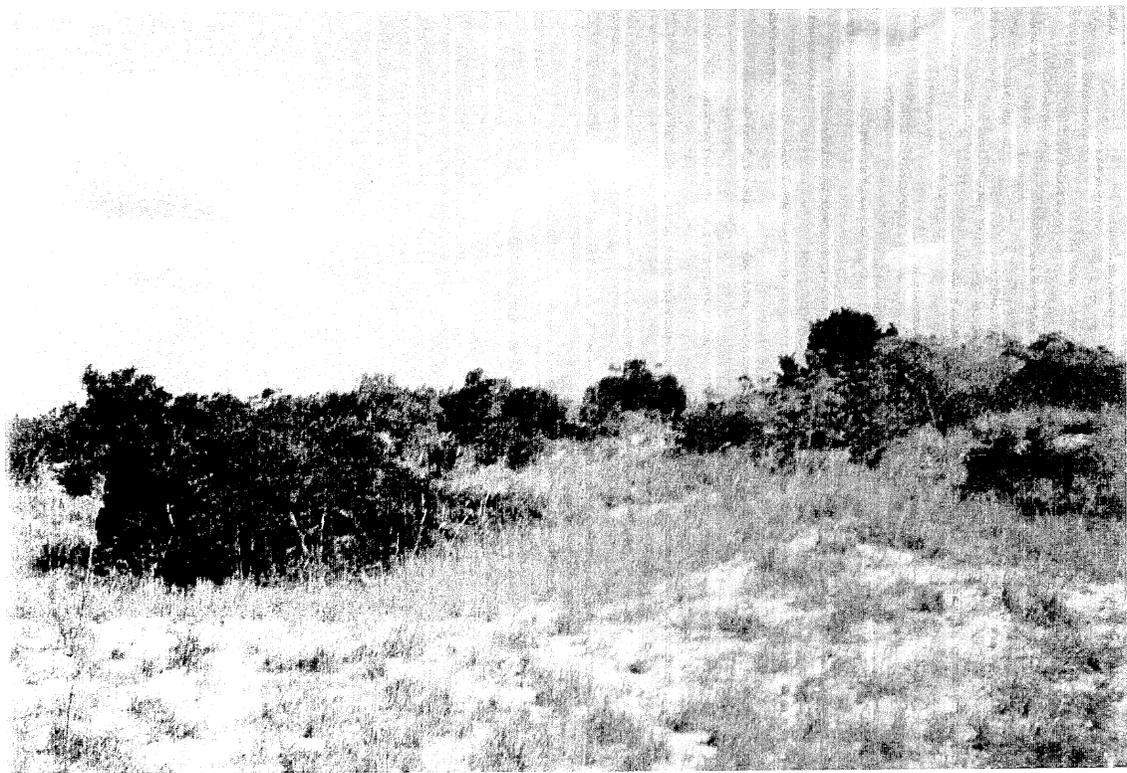


Figure 8. North disposal site.

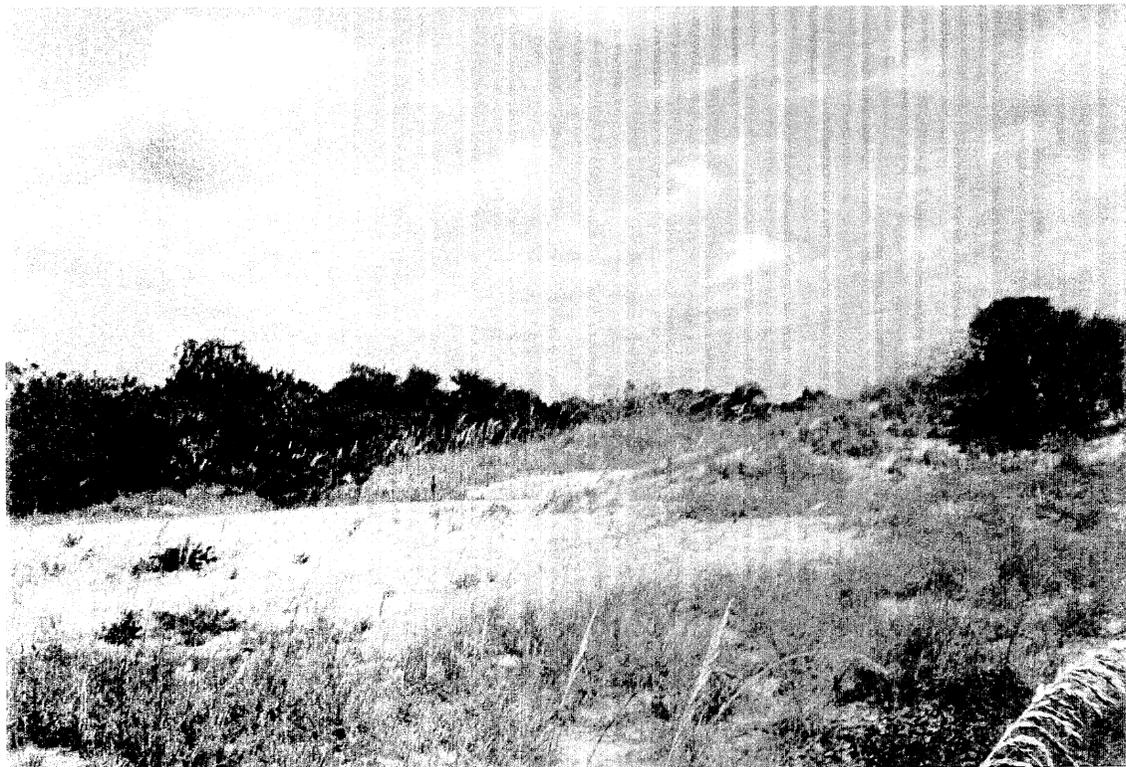


Figure 9. North disposal site.



Figure 10. North disposal site.



Figure 11. An active gopher tortoise burrow at the north disposal site.

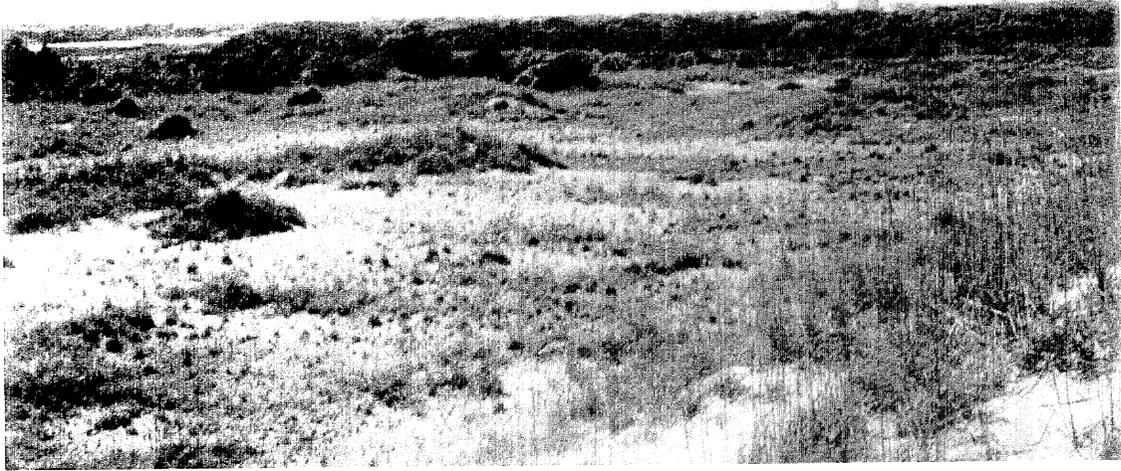


Figure 12. South disposal site.



Figure 13. South disposal site.

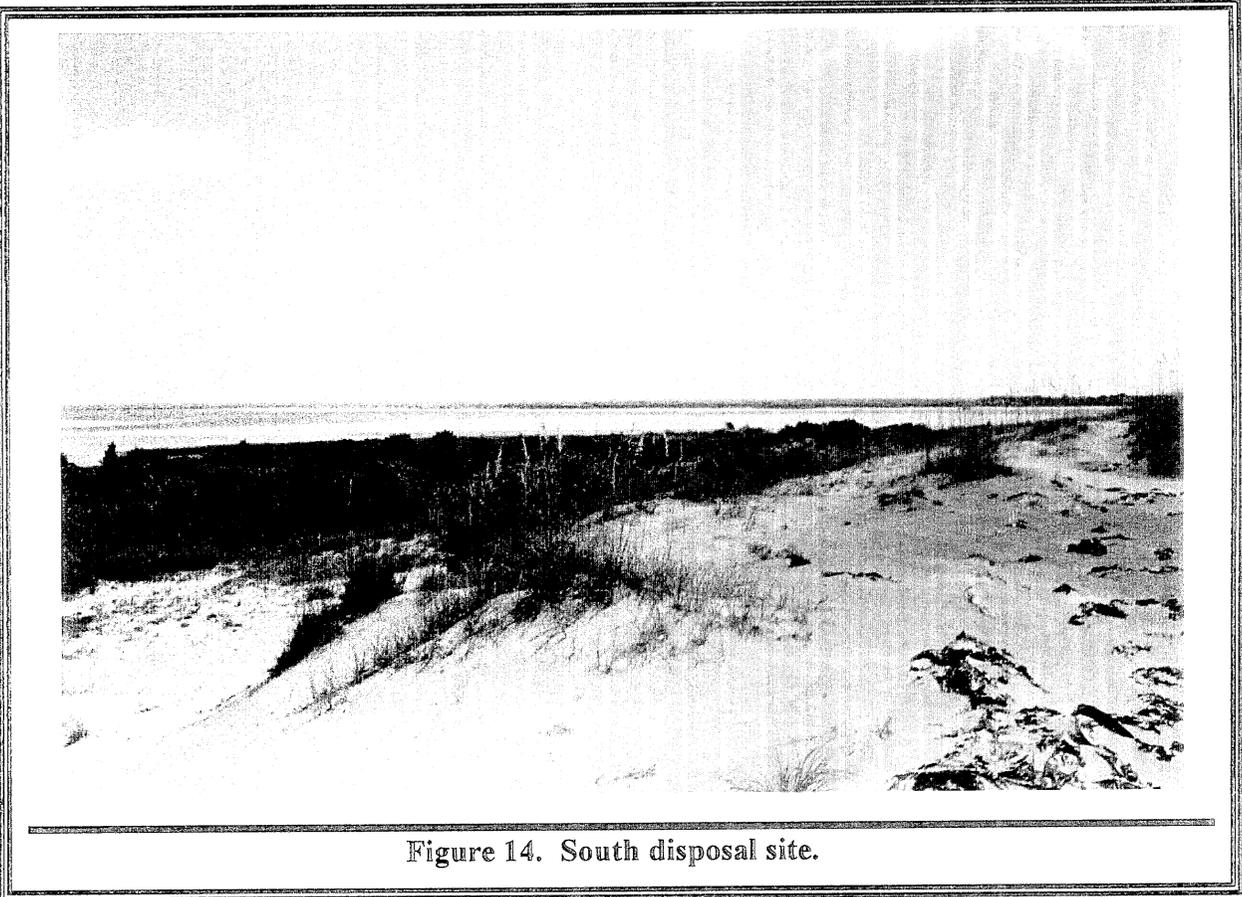


Figure 14. South disposal site.

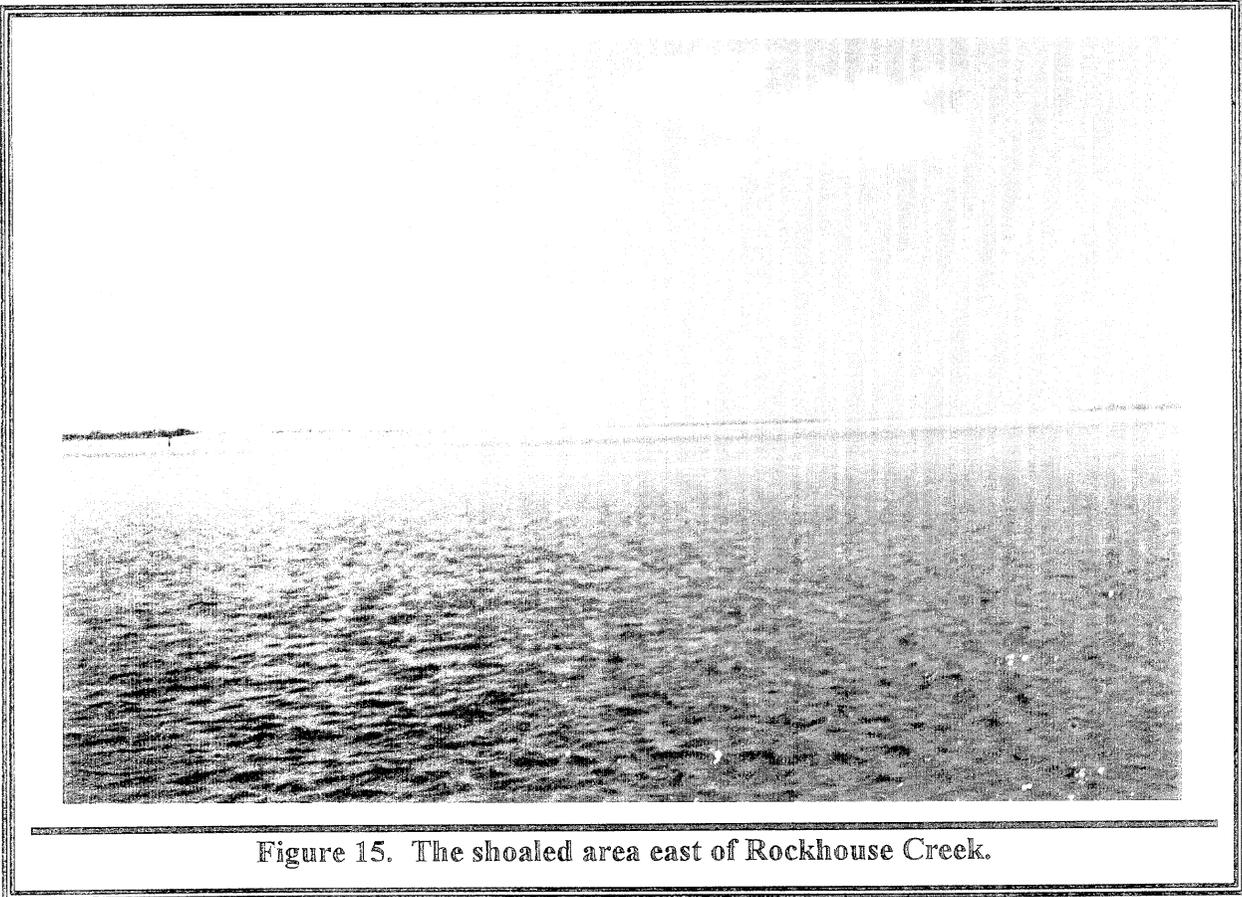


Figure 15. The shoaled area east of Rockhouse Creek.

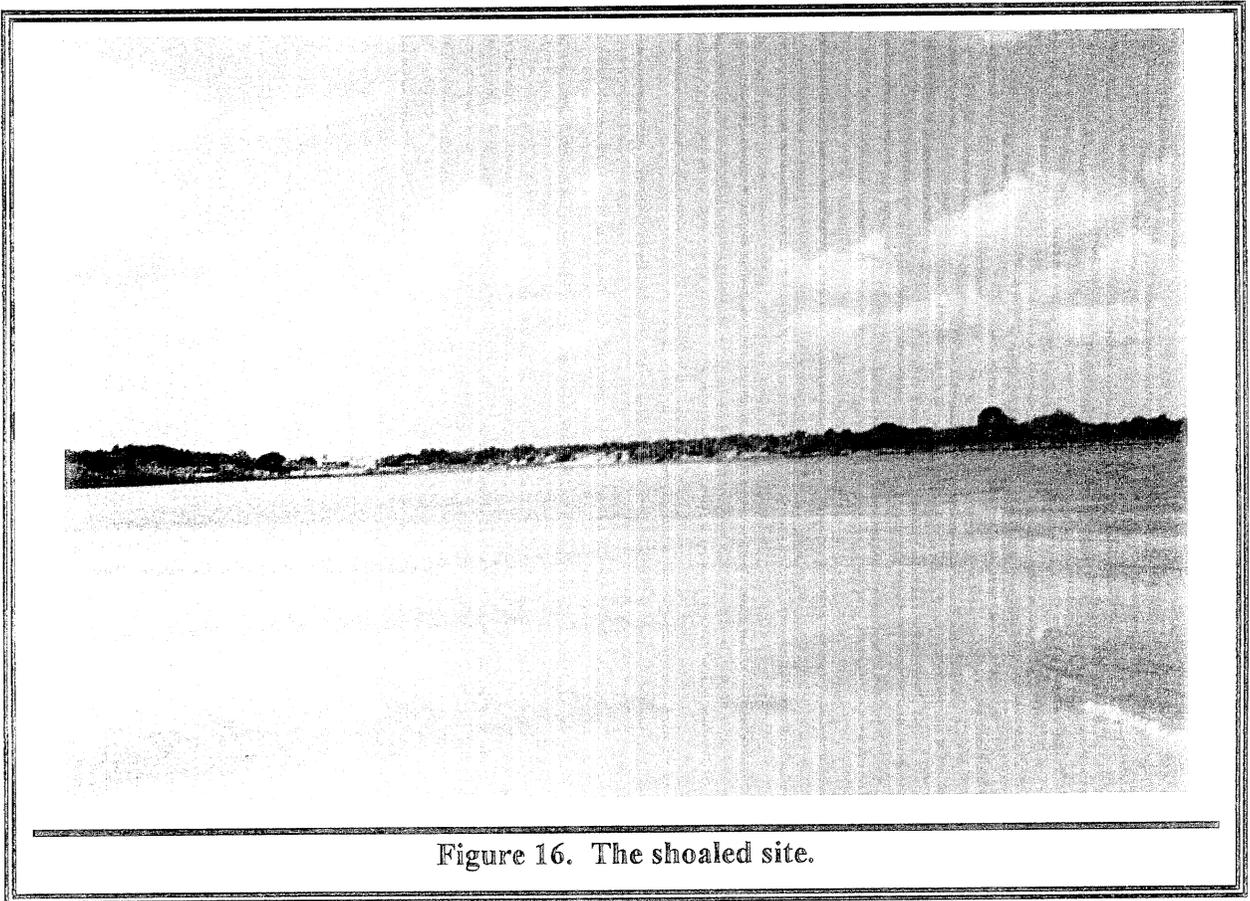


Figure 16. The shoaled site.

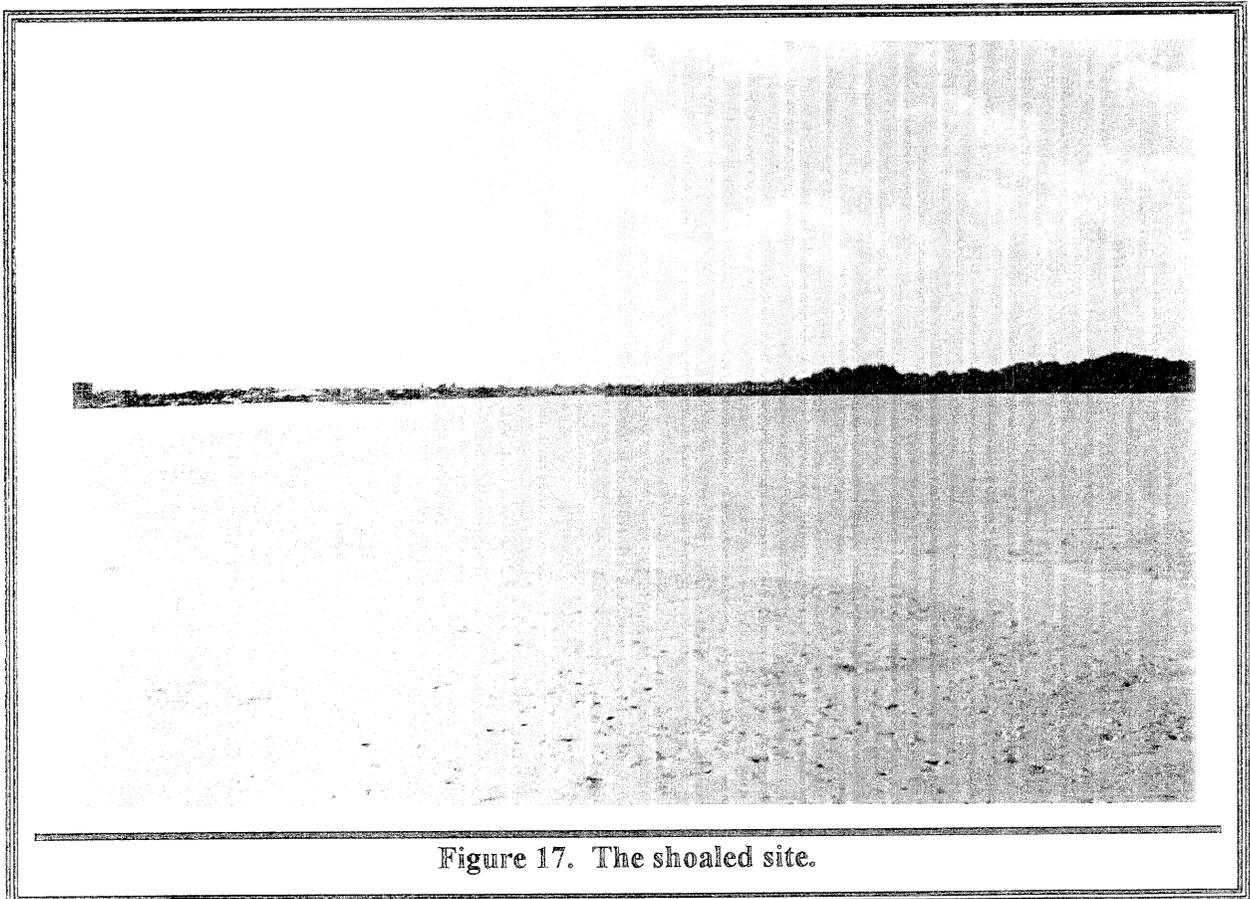


Figure 17. The shoaled site.

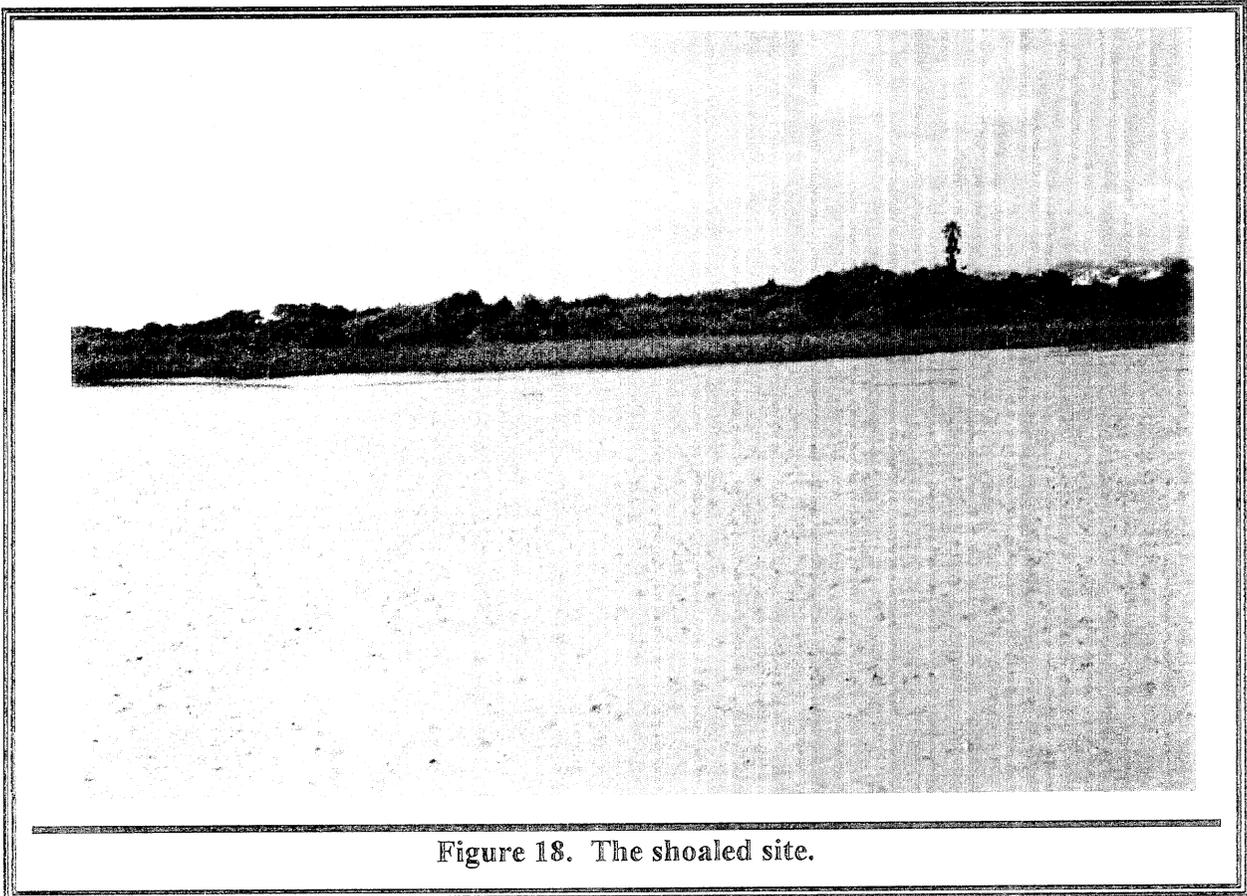


Figure 18. The shoaled site.

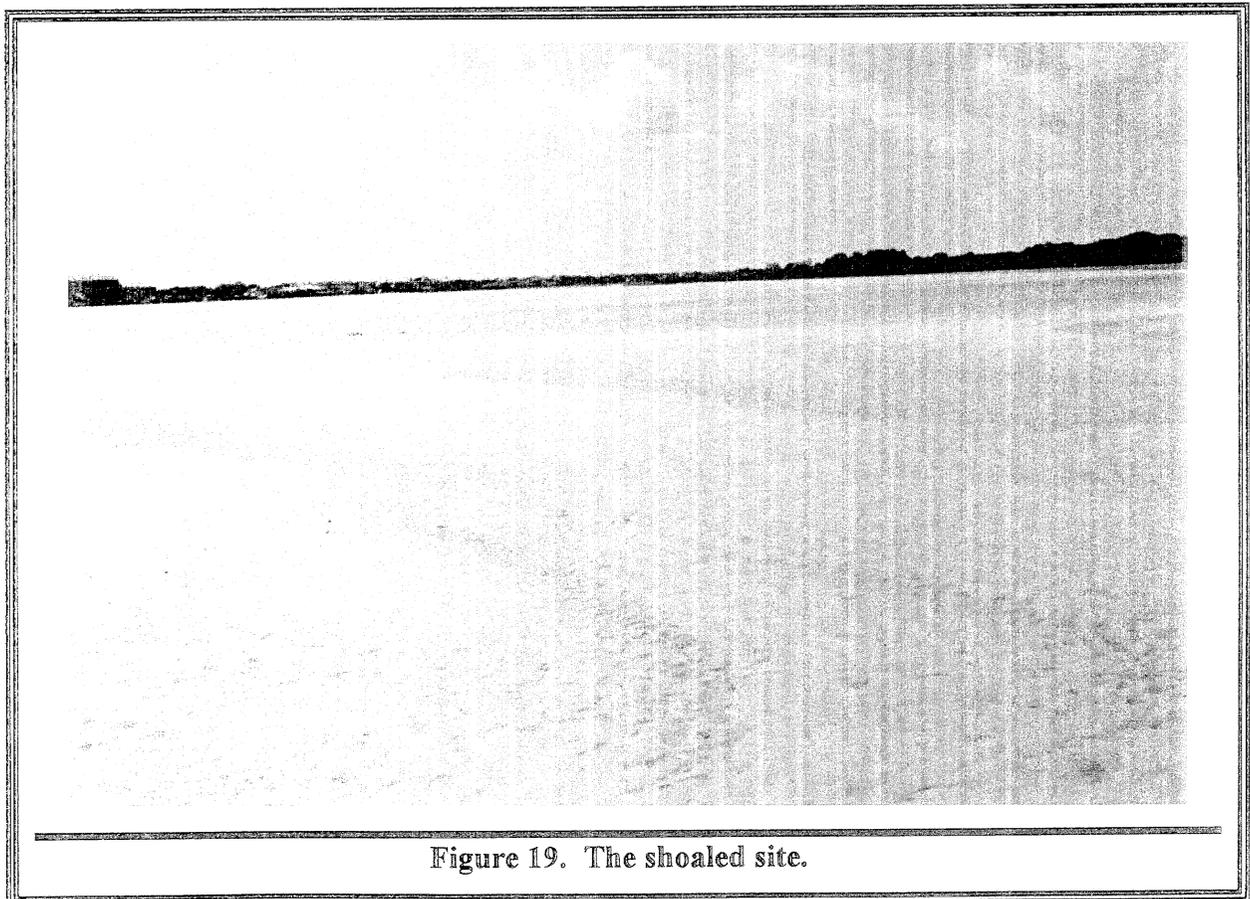


Figure 19. The shoaled site.

APPENDIX A
ENGINEERING

Ponce de Leon Inlet
Feasibility Study
Engineering Appendix

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ENGINEERING APPENDIX

INTRODUCTION

This appendix describes the procedures used to investigate alternative plans of improvement for the Ponce de Leon Inlet Feasibility Study. This appendix describes the physical and numerical modeling efforts, and contains sections on the detailed design of the recommended plan, geotechnical data, and final cost estimates. The selected plan consists of a 1000-foot seaward extension of the south jetty.

Construction of a 2340-foot revetment extending westward from the north jetty will be performed with Operations and Maintenance (O&M) funding beginning in FY1999, and will be assumed to be in place for the with and without project conditions. Due to its importance on the inlet system, discussions of the revetment design, location, and dimensions will also be presented in this appendix.

PHYSICAL AND NUMERICAL MODELS

GENERAL INFORMATION

Physical and numerical models were used to examine the effects of various proposed alternatives on the inlet hydrodynamics, with the ultimate goals of improving safety and reducing maintenance at Ponce de Leon Inlet. The physical modeling effort was conducted by the U.S. Army Corps of Engineers' Waterways Experiment Station, Coastal Hydraulics Laboratory (CHL), formerly the Coastal Engineering Research Center-CERC. The numerical modeling was conducted by Taylor Engineering, Inc, located in Jacksonville, Florida. Taylor Engineering, Inc. is the engineering consultant for the local sponsor, the Ponce de Leon Inlet Port Authority. This section will provide a brief summary of the physical and numerical modeling efforts. Detailed information on both modeling efforts is provided in the "Supplemental Report: Ponce de Leon Inlet Feasibility Study, Physical and Numerical Modeling Studies".

The modeling efforts conducted by CHL and Taylor Engineering, Inc. were very closely coordinated. Both models were created using the same hydrographic surveys and field data, which are described below. Information and data were continuously exchanged between CHL, Taylor Engineering, and the Jacksonville District during model development and production. Numerous meetings, site visits, and teleconferences were held throughout the duration of the studies to ensure that model setup, calibration, verification, and operations proceeded in a mutually compatible manner.

The same alternative plans of improvements were evaluated using both models. Specifically, these plans of improvement were:

1) Seaward extension of the south jetty - The purpose of extending the south jetty is to reduce the northward transport of sediment around the seaward end of the south jetty into the inlet, and to more evenly distribute tidal flow across the inlet. By reducing the transport of sediment into the inlet, the large shoal in the inlet throat would gradually erode, and the navigation channel would tend to migrate southward toward the center of the inlet. Two alignments were examined for the south jetty extension: straight (aligned 20 degrees north of east) and parallel to the north jetty (aligned due east). Extension lengths of 500, 800, and 1000 feet were examined for each alignment (500 and 1000-foot extensions were examined in the numerical model). The 1000-foot alternative would extend the south jetty tip to the same easterly limit as the north jetty tip. The jetty crest elevation was optimized at +7.0 feet mlw for the original design; this crest elevation would be maintained along the 1000-foot jetty extension.

2) Re-opening the weir in the north jetty - The purpose of re-opening the weir in the north jetty is to provide a second outlet for tidal flow through the inlet and to allow limited transport of sediment into the inlet. By allowing a portion of the tidal flow to pass through the weir, tidal current velocities and associated scour through the outer portion of the inlet throat would be reduced, providing safer conditions for boaters. Allowing limited sediment transport into the north side of the inlet could protect the foundation of the north jetty from the tidal current scouring which is currently threatening the landward portion of the jetty. Accumulation of sediment along the weir portion of the jetty would tend to displace the navigation channel southward, away from the north jetty and more toward the center of the inlet. Weir openings of 500, 1000, and 1500 feet were evaluated. The 1500-foot opening duplicated the original weir configuration, and the 500 and 1000-foot weirs each extended landward from the position of the eastern end of the original weir. All modeled weir crest elevations were 0.0 feet, mlw.

3) Engineered channel through sand spit - A channel would be constructed through the sand spit inside the inlet (south of the landward end of the north jetty) in order to relieve erosional pressure on the north jetty created by the high ebb flow velocities along the jetty. Construction of this channel would reduce the volume of flow through the dogleg portion of the channel, which is currently located south of the sand spit. Tidal flow would be more aligned with the axis of the channel, and would be more uniformly distributed across the inlet cross-section. A revetment is already planned for construction along the shoreline on the north side of the channel alignment in order to prevent further migration of the shoreline to the north, which could result in flanking of the north jetty and damage and disruption to several marinas located immediately north of the proposed channel. This revetment is to be constructed beginning in FY 1999 using Operation and Maintenance (O&M) funding.

The original scope of work required that each of the above alternatives be simulated in both models, in order to determine the effects of the proposed improvements relative to the existing conditions. Existing conditions included the construction of the revetment extending westward from the landward end of the north jetty. The shoreline inside the inlet was not allowed to recede northward past the revetment alignment.

The physical model was a 3-dimensional steady-state model which simulated either peak ebb or peak flood conditions, and could create a variety of storm wave events. This model was used to examine wave and current-driven sediment transport using gage measurements and dye and tracer studies. In this manner, numerous tidal current/storm wave interaction scenarios were modeled, and the effects of adding each of the proposed plans of improvements (or combinations of improvements) were studied.

The numerical hydrodynamic model examined the effects of the alternative plans of improvement on inlet tidal hydrodynamics. Patterns of erosion and shoaling for each alternative were inferred through the use of sediment transport analyses. The setup, operation, and results of each modeling effort will be discussed in the following sections. These sections present an overview only, and detailed information on all aspects of both modeling efforts are contained in the supplemental report "Supplemental Report: Ponce de Leon Inlet Feasibility Study, Physical and Numerical Modeling Studies".

DESCRIPTION OF PHYSICAL MODEL

Work performed by CHL consisted of field measurements and construction and operation of the physical model. The field data gathered by CHL included a 2-month record of water level measurements at four locations inside the inlet and two locations in the ocean, north and south of the inlet. Current velocities were measured along eight transects in the inlet throat and north and south access channels using a vessel-mounted current profiler. Non-synoptic current velocities were measured during a 13 hour period at each transect, in order to cover the peak ebb and flood velocities. Current velocities were also measured in the inlet throat and the north and south access channels using bottom-mounted current meters. These hydrodynamic data were used in conjunction with hydrographic surveys obtained by CHL (LIDAR surveys) and the Jacksonville District (conventional surveys) in July/August 1994 to construct and calibrate the physical model.

The physical model is an undistorted three-dimensional steady state model, which was constructed at a 1:100 scale in one of CHL's physical modeling facilities at the Waterways Experiment Station in Vicksburg, Mississippi. The model includes the inlet throat area, and extends approximately 1 mile north and south along the access channels, and into Rockhouse Creek. The model accurately reproduces offshore bathymetry to the 35-foot depth contour. The layout of the model is shown in figure 1. As shown in figure 1, two wave generators (plunger: non-directional and DSWG: directional) were used to create the north and south-directed wave fields used in this study. A water circulation system was used to generate and maintain the peak ebb and flood tidal flows in the model. Field data or numerical model data were used to determine the water surface

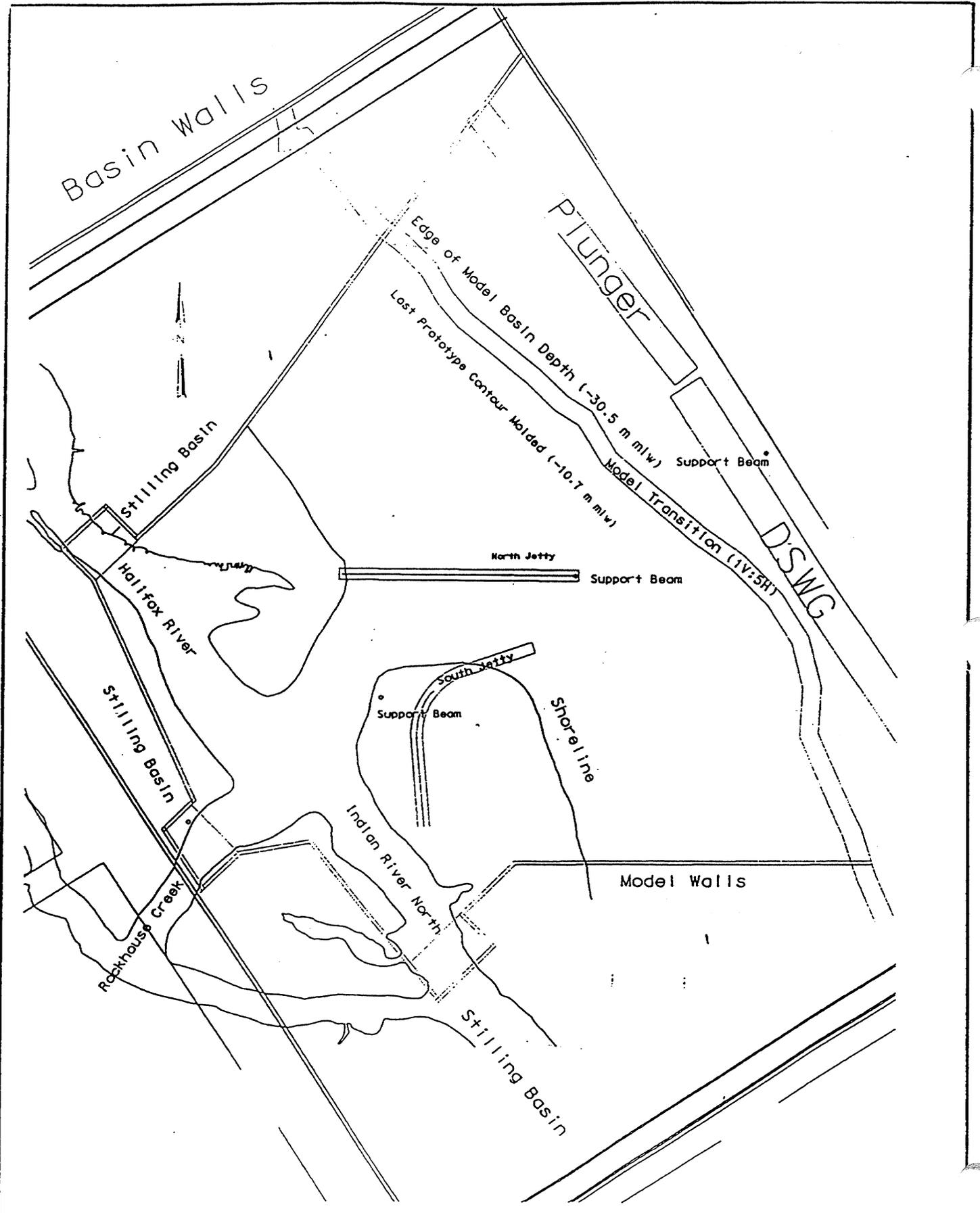


Figure 1. General physical model layout - Ponce de Leon Inlet Feasibility Study.

(Courtesy Waterways Experiment Station)

elevations corresponding to peak flow. These water surface elevations were then duplicated and held constant in the physical model for ebb and flood flow simulations.

The physical model was equipped with 13 wave gages and 5 velocity meters. These instruments were placed throughout the model to determine wave heights and current velocities under a given set of wave/tidal current/tidal elevation conditions, for comparison to similar measurements taken with alternative plans of improvement in place. Both wave generators, the water circulation system, and all gages were computer-controlled. All gage data were recorded on a personal computer, and were capable of being viewed in real-time. The physical model was validated by comparison of model water level and velocity measurements with the field data.

Wave conditions used in the physical model were derived from the 40-year Wave Information Study (WIS) hindcast records for WIS stations 21 and 22 (south and north of the inlet, respectively). Ten wave conditions were ultimately selected for use in the model. Four of these conditions were "safe" navigation conditions, as defined in the supplemental report as waves of less than 1.5 meter in height, which can be safely negotiated by boats 25 feet long or greater. The other 6 cases were storm waves which were capable of transporting the largest volumes of sediment into the inlet. These 6 storm wave cases were chosen to evaluate the effectiveness of the various south jetty extensions (waves from the south). Likewise, a different set of storm wave conditions was developed for investigation of the north jetty weir opening option (waves from the north). The "safe" navigation wave conditions referred to herein as "normal" waves developed for the south jetty extension were repeated for the weir opening alternatives.

Sea level rise has been determined using a variety of methods along central Florida's Atlantic coastline. From analyses performed in the St. Johns County General Reevaluation Report dated January 1998, changes in sea level were calculated along the St. Johns County shoreline, located about 50 miles north of Ponce de Leon Inlet. These rates of sea level rise are applicable to the Ponce de Leon Inlet study area. Using the National Research Council method, sea level rise rates of 0.85 ft, 1.34 m, and 1.87 ft were estimated by the year 2050 for the project area, based on the low, medium, and high coefficients of sea level change, respectively. The low rate corresponds closely with a calculated rise of 0.75 ft by the year 2050 using the EPA method. Using the shoreline recession method developed by Per Bruun, the calculated rise in sea level is 0.8 feet by the year 2050, corresponding to a shoreline recession of 0.8 feet per year. The 1% chance of exceedance estimate of sea level rise is 1.8 feet by 2050, corresponding to a shoreline recession of 1.7 feet per year. Using the shoreline erosion method, the most likely recession rate of 0.8 feet per year translates into a loss of 0.9 cubic yards per linear foot of shoreline per year.

DESCRIPTION OF NUMERICAL MODEL

The numerical hydrodynamic model used by Taylor Engineering, Inc was the TRANQUAL model, developed by Taylor and Dean in 1972, and updated and refined by

Taylor and Pagenkopf in 1981. TRANQUAL is a vertically integrated two-dimensional model which uses an implicit finite difference methodology to solve the equations for conservation of mass and fluid dynamics. The model simulates time varying water level elevations and ebb and flood tidal current velocities over selected tidal cycles. The model includes the effects of nonlinear propagation of long waves in shallow estuaries, and includes the effects of irregular basin geometry, flooding and drying of intertidal areas, bottom friction, wind shear, freshwater inflows, convective and Coriolis accelerations, gravity, lateral shear, and small-scale features such as flow constrictions and sills.

The same July/August 1994 survey of Ponce de Leon Inlet which was used to construct the physical model was used to set up the numerical model. The area of coverage for the numerical model is larger than the area covered by the physical model. The model boundaries are shown in figure 2, and cover an area of 2.7 by 4.3 miles. This area was gridded, with a grid size of 100 by 100 feet, arranged in a 140 by 225 matrix. A three-dimensional surface was generated using digital terrain modeling (DTM) software, and an elevation value was assigned to each grid cell using this surface.

The TRANQUAL model allows for four types of boundary conditions: zero flow (land, impermeable barriers, etc), time varying (tide) or constant water surface elevation, time varying or constant flow rate, and free surface profile radiation. The specific boundary conditions selected for the Ponce de Leon Inlet numerical modeling study area were: a specified ocean tide linearly interpolated between the two eastern corners of the model, a free surface profile radiation applied uniformly across all offshore grid cells along the northern and southern boundaries, a specified uniform tide (Fourier series representation) across the open water boundary cells in the Halifax River, a free surface profile radiation boundary condition uniformly applied across the boundary cells of the Indian River North, Spruce Creek, Redland Canal, and Smyrna Creek. No flow was permitted at all other boundary elements (which are dry land), no flow was permitted across the north or south jetties, and no freshwater inflow or wind effects were included. Data collected by CHL from July-August 1994 (as described above) were used to set up and calibrate the TRANQUAL model boundary conditions.

The model's wetting and drying algorithm which allowed the simulation of the flooding and drying of marsh and shoals was an important feature during model validation. The model was validated with comparisons between model generated water level and velocity conditions and the field data. The two tidal flow scenarios which were numerically modeled were the 21-22 July 1994 spring tidal cycles, and a 1-year storm tide superimposed on these cycles. A 30-day lunar month cycle was also examined.

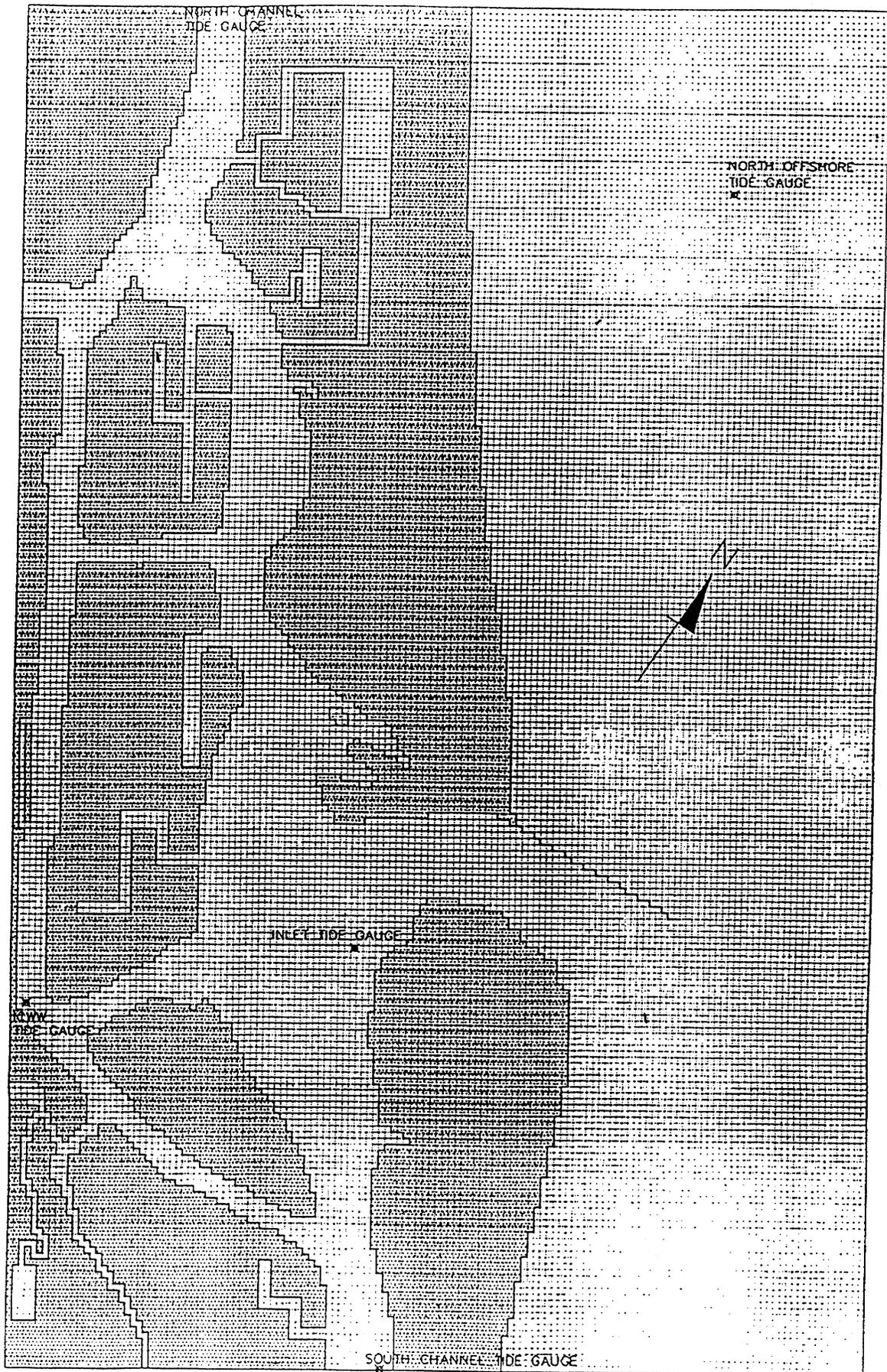


Figure 2. Numerical model grid scheme - Ponce de Leon Inlet Feasibility Study.

(Courtesy Taylor Engineering, Inc.)

VOLUMETRIC ANALYSIS

In addition to the numerical modeling effort, a volumetric analysis was conducted by Taylor Engineering, Inc. in order to quantify regions of erosion and accretion. Only the 1986, 1990, and 1994 surveys were used in this analysis since they are representative of the inlet in its present configuration, following closure of the north jetty weir in 1984. Three periods of analysis were examined: 1986-1990, 1990-1994, and 1986-1994.

The most dominant trends observed in the volumetric analysis were the erosion of the sand spit inside the inlet, and erosion along the landward end of the south side of the north jetty. The erosion of this spit is primarily due to the flood tidal flow impinging on the area, and the erosion along the north jetty is due to the ebb tidal flow impinging on the north jetty. Both erosional areas result from the deflection of tidal flow caused by the dogleg configuration of the channel around the sand spit. As the sand spit continues to erode, the dogleg becomes straighter and erosional pressures are expected to ease. The flood shoal area and the shoal in the inlet throat were generally accretionary during this period. Bathymetric change charts and a detailed discussion of volumetric changes in the inlet are presented in the supplemental report. Gross volumetric changes are 243,000 cy/yr between 1986-94. The net channel shoaling rate, based on dredging records, is 51,000 cy/year from 1952-96, and 46,000 cy/yr since closure of the north jetty weir in 1984.

PHYSICAL AND NUMERICAL MODELLING OF ALTERNATIVE PLANS

Extension of South Jetty. The first alternative plan of improvement to be physically and numerically modeled was the seaward extension of the south jetty. Previous studies had shown that construction of a south jetty extension would reduce the transport of sediment into the inlet, reducing shoaling in the inlet throat and improving navigation by allowing the channel to migrate southward toward the center of the inlet. Two alignments were examined using both models: a straight extension of the existing south jetty alignment (20 degrees north of east), and an alignment parallel to the north jetty (due east). The physical model examined both alignments with 500, 800 and 1000-foot extensions; the numerical model examined both alignments with 500 and 1000-foot extensions. Model results were used to select the optimum south jetty extension length and alignment.

Dye tests in the physical model quickly indicated that the shorter jetty extension lengths of 500 and 800 feet (for both alignments) were not effective in preventing the potential for bypassing of large volumes of sediment. Jetty extension lengths of 1000 feet were effective in preventing dye and tracer movement into the inlet for most wave/current scenarios, and only minimal dye movement into the inlet was observed using both alignments (at 1000-foot length) for the "worst case" storm condition. Likewise, the inferred sediment movement based on tidal current velocities in the numerical model indicates that the longer jetty length should allow less sediment to enter the inlet. The 1000-foot extension also produced more desirable hydraulic effects, i.e. a more even distribution of flow across the inlet cross-section. These model results verified the

intuitive assumption that the longer jetty length should be more effective in preventing sediment transport into the inlet.

Both models examined the effects of the two alternative jetty extension alignments. The physical model was inconclusive; dye response was similar for both alignments. The numerical model produced more definitive results. Both straight extensions (500' and 1000') produced generally undesirable hydraulic effects in the numerical model, such as reduced velocities in the middle of the entrance channel and increased velocities in the vicinity of the scour hole at the landward end of the north jetty. The alignment parallel to the north jetty provided a more even distribution of tidal flow across the inlet cross-section, pulling the channel away from the north jetty slightly. Due to the more desirable flow characteristics of the wider parallel alignment, the 1000-foot parallel extension of the south jetty was chosen as a recommended plan. The numerical model results indicated that this alternative only influenced hydrodynamic conditions east of the proposed location of the north jetty weir and had no influence on interior hydrodynamics or associated sedimentation.

Three nearshore gages were positioned in the physical model to determine the effects of the south jetty extension on wave heights at the popular surfing area immediately south of the south jetty. Gage data showed an average of 10 percent wave height increase during normal ebb flows, and no discernible wave height changes during flood flows. This data assumes no change in offshore bathymetry from the 1994 survey; extension of the jetty would probably cause significant accretion in this area, which could result in a southward and eastward (offshore) displacement of the present surfing area.

North Jetty Weir Opening. The next alternative to be evaluated in the physical and numerical models was the re-opening of the weir in the north jetty. The original weir was built during the initial construction of the north jetty in 1969, and was closed in 1984 due to excessive shoaling in the inlet due to the inflow of sediment from the north beaches through the weir. Re-opening the weir would allow a portion of the tidal flow to pass through the weir instead of between the jetties, reducing current velocities and associated scouring, and increasing boating safety at the offshore entrance to the inlet. Re-opening of various lengths of weir is also being investigated in order to allow limited volumes of sediment to enter the inlet. The limited inflow of sediment through the weir could alleviate the scouring problem at the landward end of the north jetty, and partially rebuild the shoal in this area, forcing the channel southward toward the center of the inlet.

Possible negative effects of re-opening the weir include re-establishing strong cross-currents across the weir, which presented a serious hazard to boaters when the original weir was in place. Increased wave energy through the weir (broadside) presented another hazard to boaters. Finally, tidal velocities were too strong to allow deposition in the former impoundment basin area. Sediment which was transported through the original weir into the impoundment basin was quickly transported to the sand spit, and ebb and flood shoal areas. Under the present inlet configuration, it was hoped that a limited weir opening might sufficiently reduce tidal flow through the inlet entrance

channel and allow enough sediment into the inlet to alleviate the scouring, without adversely impacting navigation.

The three weir lengths used in both models were 500, 1000, and 1500 feet. All three weirs would extend landward from the seaward end of the original weir. This point of origin was selected in order to keep the weir roughly centered on the outer portion of the littoral zone north of the jetty. The 1000 and 1500-foot options would each involve removal of a portion of the concrete fishing walkway, which was constructed by the local sponsor following weir closure. Due to the demonstrated positive effects of constructing the south jetty extension, both models assumed that the 1000-foot south jetty parallel extension was in place in combination with each of the weir openings.

The physical model used dye studies to trace the movement of peak tidal flows through the weir under a variety of scenarios of differing wave conditions, current velocities, and water levels. Results from the physical model showed that on the ebb flows most of the discharge flowed out through the inlet mouth (between the jetties) through the existing deepwater channel along the north jetty. Flow over the weir was minimal. During flood flows most of the water enters the inlet through the mouth, and flow through the weir is also minimal. Waves from the north tended to greatly increase the flow of water over the weir. Numerical modeling performed by Taylor Engineering, Inc verified that for the design sill elevation of 0.0 feet mhw, a very small percentage of tidal flow passes over the weir. More importantly, both models showed that regardless of the length of weir opening, the ebb flow velocities along the north jetty were minimally decreased, even at storm water levels. This suggests that the tidal scouring of the base of the north jetty would not be reduced by re-opening a weir in the north jetty. This also suggests that substantial accretion of sediment transported through the weir is unlikely, due to the excessive current velocities. Since the closure of the weir, depths in the vicinity of the original weir along the south side of the jetty have increased from 10 - 25 feet to 40 - 50 feet. This increased depth allows a high percentage of flow to avoid the weir influence and exit the inlet mouth.

Tracer (coal dust) was used to determine the relative transport rates of sediment through the various weir opening lengths in the physical model. A line of tracer was placed adjacent to each weir opening along the north side of the jetty and various storm wave scenarios were simulated. For each of the weir openings, material was transported through the weir and deposited in the scour hole area, but tidal currents tended to quickly transport the tracer material out of the scour hole. During normal peak ebb flows and navigable waves, almost no sediment was transported into the inlet. By increasing the wave heights and periods, some sediment was deposited in the scour hole for each weir opening. Under flood conditions and normal waves, more material was observed crossing the weir into the inlet, with roughly the same pattern of deposition in and around the scour hole. When storm waves were added however, virtually all tracer material was transported through the weir and into the inlet. For peak ebb normal flows tracer was deposited in the scour hole, but for peak flood normal flows tracer was deposited up to 400 feet south of the north jetty, and very little was deposited in the scour hole. These

physical model tracer studies indicated that re-establishment of an impoundment basin in this area is unlikely due to the strong tidal currents.

Numerical modeling by Taylor Engineering, Inc. verifies that re-opening the weir in the north jetty produces minimal positive impacts on the hydraulic processes of Ponce de Leon Inlet. Model simulations indicate that opening the weir will cause a slight decrease in inlet tidal velocities east of the weir, particularly during flood tides. This, in combination with increased inflow of sediment through the weir, would probably increase shoaling, resulting in higher channel maintenance. Model runs on the 1500-foot weir opening showed that increased tidal velocities through the weir could cause beach erosion north of the jetty. Finally, the numerical model shows that re-opening the weir would not provide the desired hydrodynamic and sedimentation modifications intended. Based on the results from the physical and numerical models, re-opening the weir is not recommended.

Constructed Channel Through the North Spit. The third alternative plan of improvement consists of excavating a channel through the sand spit. This alternative was proposed in order to straighten the landward portion of the entrance channel (removing the dogleg), reducing erosional pressure on the north jetty. Ebb tidal flow would no longer impinge on the north jetty, and tidal flow would be more evenly distributed across the entrance. A revetment would be constructed along an alignment approximating the north bank of the channel to prevent further northward recession of the shoreline. Construction of this revetment would be begin in FY 1999 using O&M funding.

As the physical and numerical modeling efforts evolved, it was decided by representatives from the Jacksonville District, CHL, and Taylor Engineering, Inc. that investigation of the engineered channel alternative would be dropped from the physical modeling effort and would be simulated using the numerical model only. This decision was reached based on limitations associated with the non-tidal capabilities and the proximity of the engineered channel to the northern boundary of the physical model. It was felt to be more beneficial to spend more time testing the south jetty extensions and north jetty weir openings. Preliminary numerical simulations indicated that the engineered channel alternative provided many adverse impacts to shoaling in the inlet. Also, natural erosion of the sand spit was proceeding at such a rate that the shoreline would be at or near the proposed channel alignment by the time channel construction could begin, thus making the channel excavation an unnecessary expense.

The numerical model simulations were run with the 1000-foot parallel south jetty extension in place, and no weir opening in the north jetty. The initial channel cut was 2500 feet long, extending through the sand spit in the location of the southernmost relic channel. This configuration would extend the entrance channel westward along the alignment of the north jetty. The channel was 12 feet deep (mlw), 200 feet wide along the bottom, and 400 feet wide along the top, with 1 vertical: 8 horizontal side slopes. Numerical model simulations were made for initial, intermediate, and long-range conditions. An interactive process was followed whereby sediment transport inferences,

using numerical hydrodynamic modeling results, were used to help schematize or project anticipated bathymetric response (sediment erosion and deposition) until a pseudo-equilibrium condition was reached for each of these modeling runs. A complete discussion of each model simulation is presented in the supplemental report; results are summarized in this section.

Long-term simulations suggest that extensive shoaling will occur south and west of the existing sand spit. The main navigation channel gradually shifts from the natural channel south of the spit to the engineered channel north of the spit. The engineered channel will gradually widen, and the existing natural channel (south of the spit) will eventually shoal. It is currently believed that the island created by cutting the channel would remain emergent, but the possibility remains that waves and tidal flow may eventually erode the island to elevations below mean low water. Both conditions were examined in the numerical model.

Analyses of recent surveys (1986, 1990, and 1994) and aerial photographs indicate the sand spit is retreating northward at a rate of 70 to 80 feet per year. Based on the continuation of this recession rate, the shoreline could reach the position of the north bank of the engineered channel by the year 2002 or 2003. In the meantime, the entrance channel continues to straighten as the spit erodes, and erosional pressures on the north jetty are reduced. Construction of the engineered channel is not recommended at this time, since the spit is eroding naturally, and since construction of the channel could provide adverse shoaling and navigational impacts on the area. Construction of a revetment along the alignment of the north bank of the channel is recommended in order to prevent the northward recession of the shoreline past this point.

GENESIS SHORELINE MODELING.

The numerical shoreline change model GENESIS was used by Taylor Engineering, Inc to simulate the effects of the recommended plan on the adjacent shorelines north and south of the inlet. Separate simulations were conducted for the north and south beaches to determine the long-range (10 year) shoreline responses in each study area. As with the physical model, wave hindcast data from WIS stations 21 and 22 were used to define the input wave time series used to run the GENESIS model. The wave-transformation model RCPWAVE was used to transform waves from the WIS station locations to the nearshore pre-breaking reference line for each study area. Corps of Engineers and Florida Department of Environmental Protection (FDEP) surveys were used to develop the relative shoreline positions for model calibration, verification, and simulations.

The length of simulated shoreline for the south beach was 5.4 miles, with the northern boundary of the model located at the south jetty. GENESIS results for the south beach indicated that all three jetty extension cases (500, 800, and 1000 feet) produce increasing amounts of shoreline advance with increasing jetty extension lengths. Ten-year model simulations indicate shoreline advances of 130, 165, and 180 feet

immediately south of the south jetty, as compared to the no-project simulation. In all cases, the shoreline advance along the northern mile of the south beach occurs rapidly at the beginning of the simulation period, and quickly stabilizes. All three jetty extension lengths produce slight accretion along a reach of shoreline beginning about 1.3 miles south of the inlet and extending southward.

GENESIS results for the north beach were inconsistent with observed shoreline responses. In an effort to resolve this problem, the RCPWAVE model was discarded for north beach simulations, in favor of the internal GENESIS wave transformation model. Results improved dramatically and the internal model was used for all north beach modeling. Ten-year simulations indicated accretion along the entire 4.9-mile length of the north beach GENESIS grid. The amount of shoreline advance decreases with distance from the north jetty. The effects of lengthening the south jetty on the north beach could not be modeled; these model results reflect only long-term behavior without the effects of any jetty extensions, weir openings, or beach fills.

PHYSICAL & NUMERICAL MODELING SUMMARY & CONCLUSIONS

The recommended plan of improvement at Ponce de Leon Inlet consists of a 1000-foot extension of the south jetty aligned parallel to the north jetty. A revetment extending landward from the western end of the north jetty would be constructed under separate O&M authority to halt the northward recession of the sand spit. The recommended plan is shown in figure 3. The south jetty extension was selected based on dye and tracer studies. The numerical model verified the improved flow characteristics of this alternative, and suggested that the parallel configuration would provide more favorable hydraulic responses in the inlet than the straight extension, primarily by providing less constriction of the tidal flow.

Re-opening the weir in the north jetty was not recommended. Flow through the weir was found to be minimal and insufficient to reduce scour along the north jetty. The increased depths along the north jetty allowed a high percentage of flow to bypass the weir influence and continue out through the mouth of the inlet. Current velocities remain excessive for sediment deposition with each of the three weir options in place, and construction of the proposed scour apron (described later in this appendix) will prevent future scour damage to the north jetty. Additionally, sediment passing through the weir would be transported throughout the inlet by strong ebb and flood currents, and increased channel shoaling would be very likely. Wave heights are also increased by re-opening the weir, as are cross-currents which would tend to pull boats through the weir. The increased channel shoaling and hazards to navigation outweigh any benefits to re-opening the weir.

Constructing the channel through the north spit was also not recommended. Extensive shoaling in the channels south and west of the spit would provide hazards to navigation. As the spit erodes naturally, the entrance channel will become more aligned with the axis of the inlet throat, tidal flow will become more evenly distributed across the



Place de Leon Inlet
Study

Figure 3

Deep Water Channel

Deep Water Channel

PONCE DE LEON INLET

Deep Water Channel

Tie into Existing Jetty

800-foot extension
(O&M work)

1540-foot revelment
(O&M work)

Revelment Alignment
Limits

Center Line of Existing North Jetty

Eastern Limit of Existing South Jetty

Center Line of South Jetty Extension
(Plan A - Selected Plan)

inlet cross-section, and erosion around the base of the north jetty will decrease. Construction of the engineered channel is therefore regarded as an unnecessary expense, and is not recommended. However, construction of a revetment along the alignment of the north side of the proposed channel is recommended and will be provided under the O&M program in order to stop the northward recession of the sand spit shoreline. Construction of this revetment will allow the entrance channel to realign along the axis of the inlet while protecting the north jetty from flanking during storms. The revetment will also protect the wetland habitat along the northern portion of the sand spit from erosion, and will deflect the strong tidal currents away from the marinas located to the northwest of the structure.

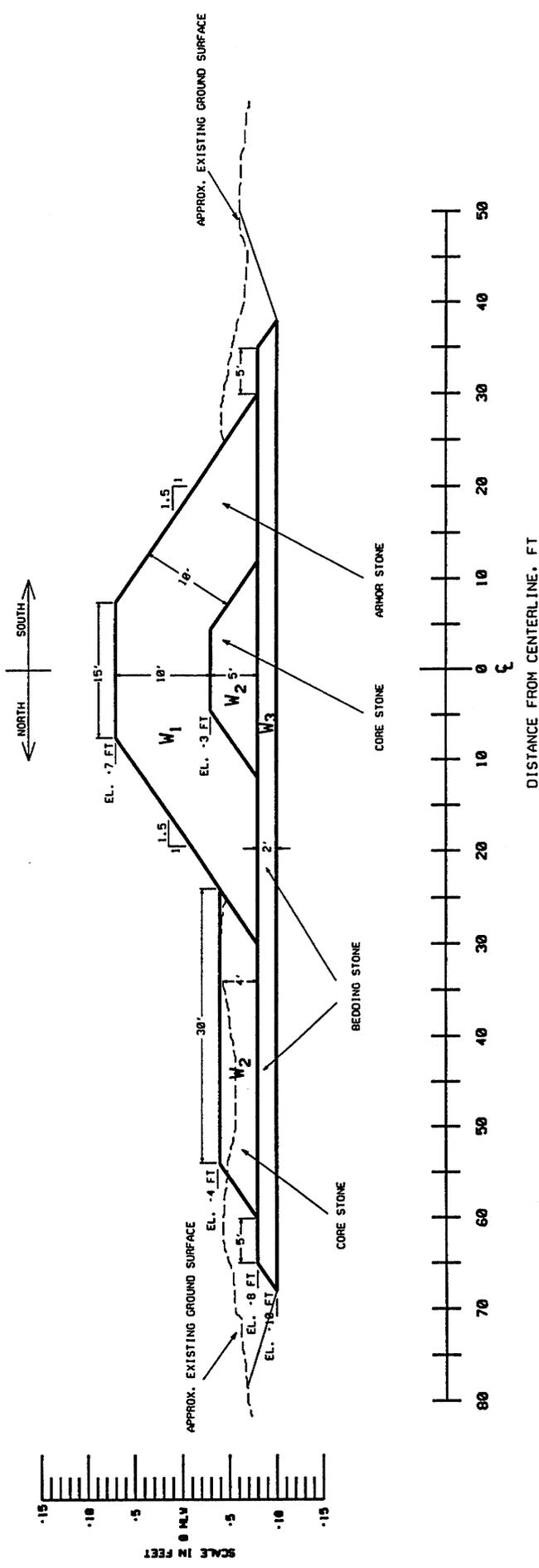
DETAILED DESIGN OF RECOMMENDED PLAN

DESIGN OF SOUTH JETTY EXTENSION

Construction of a 1000-foot seaward extension (parallel alignment) of the south jetty is recommended in order to reduce the northward transport of material into the inlet. Construction of the jetty extension will also distribute tidal currents more evenly across the inlet throat, causing a gradual deepening of the inlet throat and pulling the existing natural channel away from the north jetty, and more towards the center of the inlet. A plan view of the jetty extension is shown in figure 3; a cross-section is shown in figure 4.

The cross-section of the 1000-foot extension is similar to the cross-section used during the original jetty construction. The only modifications made were a steepening of the side slopes from 1:2 to 1:1.5, and the addition of a 30-foot scour apron on the inside (north side) of the jetty, to prevent damage to the jetty from the scouring which is expected upon completion of the extension. The crest elevation of the extension will match the elevation of the original jetty, but the crest width will increase from the jetty's 10 feet to 15 feet along the extension, in accordance with current design procedures which require a minimum of 3 stones across the width of the structure. A taper will be constructed to provide a smooth transition from the original jetty's 10-foot width to the extension's 15-foot width. Lower jetty crest elevations were examined as a cost-saving measure, but due to the relatively low crest elevation of the jetty extension (+7.0 feet mhw) coupled with the relatively high tide range (4.7 feet along the open coastline in South Daytona), excessive wave overtopping occurs for lower crest elevations during the higher tide levels. This in turn results in excessive wave heights inside the inlet, and the potential to transport excessive amounts of sediment over and through the jetty. It was therefore determined that +7 feet mhw was the minimum acceptable crest elevation for the jetty extension.

Armor stone size will range from 8 to 12 tons, with 50 percent of the stones weighing 10 tons or more. All armor stone will be 165 pcf. The armor layer will be 10 feet (2 stones) thick and the crest of the jetty will be 15 feet (3 stones) wide. The armor stone will overlie the intermediate and bedding layers as shown in figure 4. The intermediate layer is comprised of 500 to 2500 - lb stone, with 50 percent of the stones



PONCE DE LEON INLET
FEASIBILITY STUDY
1000-FT SOUTH JETTY EXTENSION
CROSS-SECTION VIEW **FIGURE 4**

- NOTES:**
1. STONE SIZES AS FOLLOWS:
 W₁ : MEDIAN STONE SIZE - 10 TONS
 W₂ : CORE STONE, 500 - 2500 LBS.
 W₃ : BEDDING STONE, 1 - 12".
 2. UNIT WEIGHT OF ARMOR AND CORE STONE TO BE NLT 165 PCF.
 UNIT WEIGHT OF BEDDING STONE TO BE NLT 140 PCF.
 3. MATERIAL REMOVED DURING EXCAVATION IS TO BE
 PLACED SOUTH OF CONSTRUCTION AREA.

weighing 1500 lbs or more. This stone will be used for construction of the core and scour apron, as shown in figure 4. The scour apron will be 4 feet thick, and the thickness of the core will vary according to depths along the jetty alignment. The 2-foot thick bedding layer will be constructed using standard Department of Transportation gradations for limerock. This stone has a unit weight of 140 pcf, and is available locally. Total quantities of materials required for construction of the 1000-foot south jetty extension are: 32,740 tons of 10-ton armor stone, 12,856 tons of 1500-lb core stone, 10,307 tons of bedding stone, 11,780 square yards of filter fabric, and 25,000 cubic yards of excavation.

The elevation of the foundation of the jetty will be at -10 feet mlw or on existing bottom, whichever is deeper. Any excavated material will be placed to the south of the jetty, outside of the footprint of construction. All excavated material is expected to be beach-quality sand.

MAINTENANCE OPERATIONS

General. Construction of the Ponce de Leon Inlet jetties began in 1968 and was completed in 1970. Since that time some areas of localized scouring and foundation settlement have occurred along portions of the north and south jetties. Two areas are of particular interest: a large scour hole which threatens to undermine a 400-foot length of the landward end of the north jetty, and low areas along the crest of the north jetty. Both of these areas will be repaired using Operations and Maintenance (O & M) funds, and are mentioned here in the interest of providing a complete description of all ongoing Federal work at Ponce de Leon Inlet. Construction of the landward extension of the north jetty will also be an O & M function, as described previously. The design of these O&M structures will be discussed briefly in this section.

North Jetty Scour Hole. Due to the dogleg configuration of the inlet throat created by the presence of the sand spit, the ebb tidal flow through the inlet impinges on the landward section of the north jetty. Prior to the closure of the weir in 1984, a large shoal created by the transport of sediment through the weir protected this portion of the north jetty from scour damage. Following closure of the weir, the shoal rapidly eroded and the tidal scouring began to undermine the south side of the north jetty along the landward portion of the structure. The most critical area is located along a 400-foot section of the structure between stations 45+50 and 49+50, or along the seaward 400 feet of the north jetty concrete walkway. Construction plans show that the existing bottom along the jetty alignments was generally less than 10 feet deep at the time of jetty construction. Soundings taken in June 1996 indicated depths in excess of 45 feet along most of the length of the scour hole.

In order to better determine the condition of the jetty's foundation, a diver survey was performed in June/July 1996. This survey provided cross-sections at 100-foot intervals along a 1400-foot length of the north jetty. This survey area was chosen because the previous inlet survey had indicated depths in excess of 30 feet along this portion of the structure. As a result of the diver survey, it was determined that the most

critical area lay along a 400-foot reach between stations 45+50 and 49+50. Areas seaward of station 45+50 are still adequately protected by the scour apron which was constructed in 1979. Areas landward of station 49+50 have not experienced severe scouring at this time; however the area will be protected against potential future damage by the placement of a 40-foot wide scour apron, which will tie into the proposed (westward jetty extension) revetment at station 58+00.

The proposed renovation of the north jetty due to scour damage consists of rebuilding the side slope along the affected 400-foot reach, and the addition of a scour apron extending from the landward limit of the 1979 scour apron at station 45+50 to the location of the revetment tie-in at station 58+00. Armor stone will be placed at a 1 vertical:1 horizontal slope along the 400-foot reach, in order to stabilize the jetty side slope. Armor stone will have a median stone size of 10 tons, and will match the stone used to construct the jetty. The scour apron will be 3 feet thick and 40 feet wide, measured from the toe of the armor stone. Scour apron stone will be graded from 500-2500 lbs. A 2-foot thick layer of bedding stone will be placed under the armor and scour protection stones. A total of 9240 tons of armor stone, 9380 tons of intermediate stone, and 5710 tons of bedding stone will be required.

The sand spit (located south of the north jetty) is currently eroding at an average rate of about 70 feet per year. As the sand spit continues to erode the dogleg in the channel will continue to straighten, and the erosional pressure on the north jetty should decrease. It is anticipated that the sand spit shoreline will erode northward to the position of the proposed revetment by the year 2002 or 2003. Based on the performance of the 1979 scour apron, the proposed north jetty rehabilitation/scour apron should provide adequate protection of the north jetty during this time.

Low Areas Along North Jetty Crest. A centerline survey conducted in 1996 indicated that the entire length of the north jetty seaward of the eastern end of the concrete walkway has settled and average of 2 to 3 feet. Two areas in particular have settled approximately 7 to 8 feet, and are currently at or below mlw. A gap approximately 50 feet wide is centered at station 35+60, and a gap approximately 25 feet wide is centered at station 31+60. Significant wave energy has been observed passing through these gaps during storms, creating a potential hazard to navigation and allowing excessive sediment to enter the inlet.

Repair of these low areas will consist of the replacement of 10-ton armor stones across the two gaps. No attempt will be made to rebuild the jetty to the original +7.0-foot mlw elevation at this time; stone placement will blend smoothly into the adjacent crest elevations and widths (typically +5 feet elevation, 8-10 feet wide). Repairs of these low areas could be performed under the same Operations and Maintenance contract as the construction of the scour apron described above, and the same size armor stone will be used in both areas.

Revetment Construction / Westward Extension of the North Jetty. The sand spit inside the inlet has eroded consistently since weir closure in 1984. The current erosion rate of this shoreline is approximately 70-80 feet per year, and at this rate by the year 2002 or 2003, the sand spit shoreline will have eroded northward to the north jetty alignment. The primary purpose of the revetment is to prevent erosion in the vicinity of the western end of the north jetty, which could eventually result in flanking and failure of the jetty. The revetment would also prevent the shoreline from eroding through the peninsula of land shown in figure 3. Erosion of this peninsula would result in direct impact of strong tidal currents on the marinas located directly northwest of the peninsula, and loss of valuable wetland habitat.

The proposed revetment alignment is shown in figure 3. As shown this figure, the revetment alignment is curved, extending first in a southwesterly direction (jutting into the inlet) from the landward end of the north jetty, then turning to more of a westerly direction which is more aligned with the axis of the inlet throat. This alignment was selected in order to protect existing structures in the adjacent public park, to follow the natural alignment of the shoreline of the peninsula (behind the spit) as shown in figure 3, to provide a maximum degree of protection to the adjacent marinas, and to protect a maximum amount of wetland habitat. Due to the varying exposure to ocean waves along the length of the structure, the revetment will be constructed using two cross-sections, and could be constructed in stages if necessary. The first section (revetment section #1) is 800 feet in length, and extends from the intersection of the north jetty southwestward to the point where the alignment bends to the west. The second section (revetment section #2) begins at this point, and extends an additional 1540 feet westward, along the southern shoreline of the peninsula shown in figure 3.

According to a recession analysis conducted by Taylor Engineering Inc. (contained in the physical and numerical modeling Supplemental Report), the present rate of northward recession of the sand spit shoreline is about 70 feet per year. At this rate, the widest portion of the sand spit should recede to the position of the revetment alignment by the year 2002 or 2003. Due to the more eroded condition of the shoreline along revetment section #1 and the more immediate concern of preventing flanking of the north jetty, revetment section #1 will be constructed first, in FY 1999. Revetment section #2 would be constructed 3-4 years later, based on the present rate of shoreline erosion along the revetment alignment.

A brief summary of the design of the revetment is presented in this section of the appendix (even though it will be constructed with O & M funding and is not a part of the plan recommended herein), because of the eventual impact of the revetment on the stability of the inlet once the sand spit shoreline recedes to the revetment alignment. Details of the design of each revetment section are presented below.

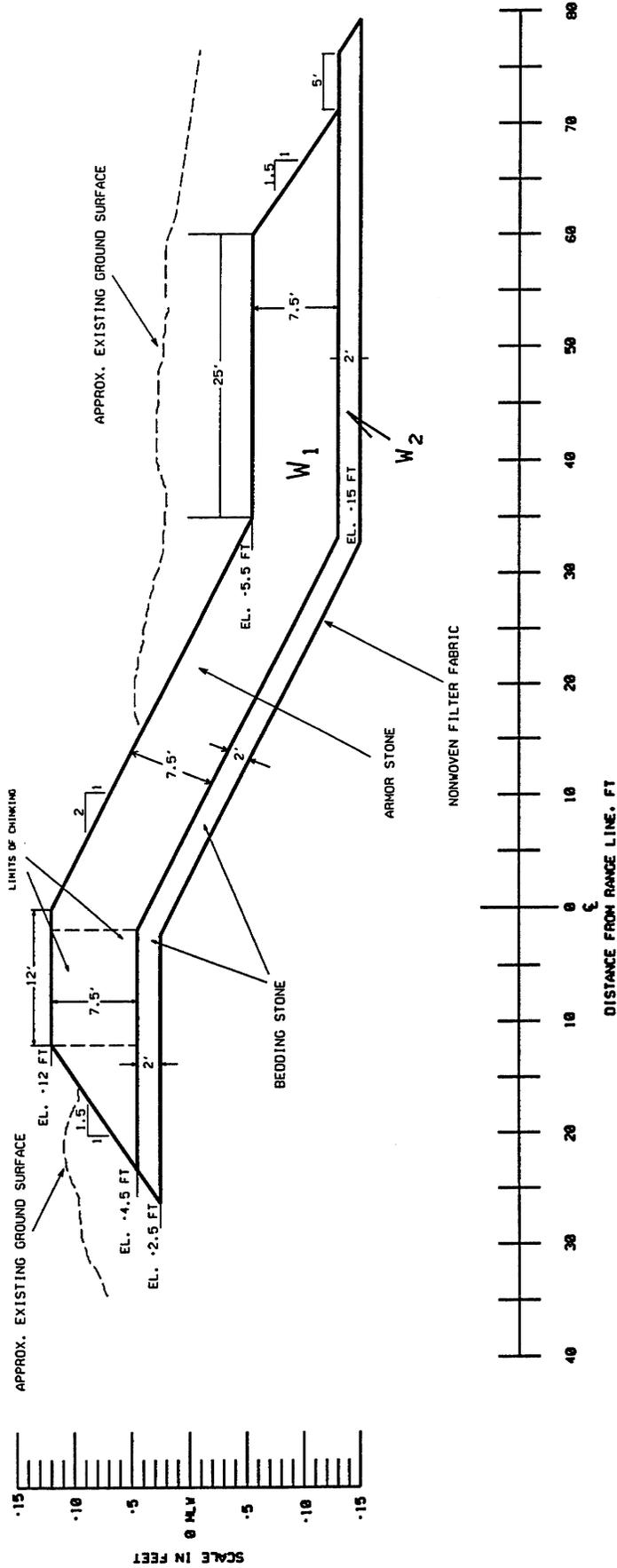
Design of Revetment Section #1. This landward extension of the north jetty is referred to as a revetment because the cross-section of the structure is in the form of a revetment, not the symmetrical cross-section of a jetty. Both terms "revetment" and

“landward extension of the north jetty” are used interchangeably throughout this design appendix.

Revetment section #1 will be more directly exposed to ocean waves than revetment section #2, and will be constructed of 8500-lb armor stone. This armor stone is designed to withstand 8-foot, 12-second waves. Under the present inlet configuration it is very unlikely that 8-foot waves could reach the revetment due to the shallow shoals through the inlet throat, but following construction of the south jetty extension, depths throughout the inlet throat are expected to gradually increase, and the design wave would then be able to reach the structure. The 8-foot design wave represents a maximum probable wave height which could impact directly on the side slope of the revetment. Assuming that deep water existed from the toe of the revetment to the open ocean (following erosion of the inlet shoals) the design wave could impact the first section of the structure when water depths at the toe of the revetment are 10.2 feet deep. The most critical wave breaking condition will occur over the scour apron (which is 5.5 feet deep), with the addition of the 2.7-foot spring high tide and a 2-foot storm surge.

A cross-section of this section of the revetment is shown in figure 5. The revetment ties into the existing north jetty at station 58+00. The revetment crest elevation is +12 feet, mlw, which matches the crest elevation of the north jetty and the existing topography behind this portion of the revetment alignment. A front slope of 1 vertical on 2 horizontal will be constructed, and a 25-foot scour apron will be constructed at the toe of the revetment to allow for future scouring to depths of 30 feet, which are currently observed in this region of the inlet. A 2-foot thick layer of bedding stone will be placed over nonwoven geotextile filter fabric as shown in figure 5. Bedding stone will be standard Department of Transportation graded Florida limerock, with a density of 140 pcf. Armor and intermediate stone will be 165 pcf. The crest of the revetment will be chinked with bedding stone from elevation +4.5 to +12, in order to decrease the permeability of the revetment and minimize loss of backbeach material through the structure. The approximate limits of chinking are shown in figure 5. Total quantities of materials required for the construction of revetment section #1 are: 35,692 tons of 8500-lb armor stone, 8,538 tons of bedding stone, 768 tons of chinking stone (same gradation as bedding stone), 9780 square yards of filter fabric, and 60,000 cubic yards of excavation.

Design of Revetment Section #2. The second revetment section is located further into the inlet, and is oriented almost parallel to the axis of the inlet throat. Ocean waves will impact this section of the revetment much more obliquely than section 1, and wave impact forces will be reduced accordingly. The 2500-lb stone size is adequate to withstand direct impacts from 5-foot, 12-second waves. Large ocean waves are rarely observed this far inside the inlet under the current inlet configuration, but boat wakes in excess of 2 to 3 feet are observed on a continuous basis.



NOTES:

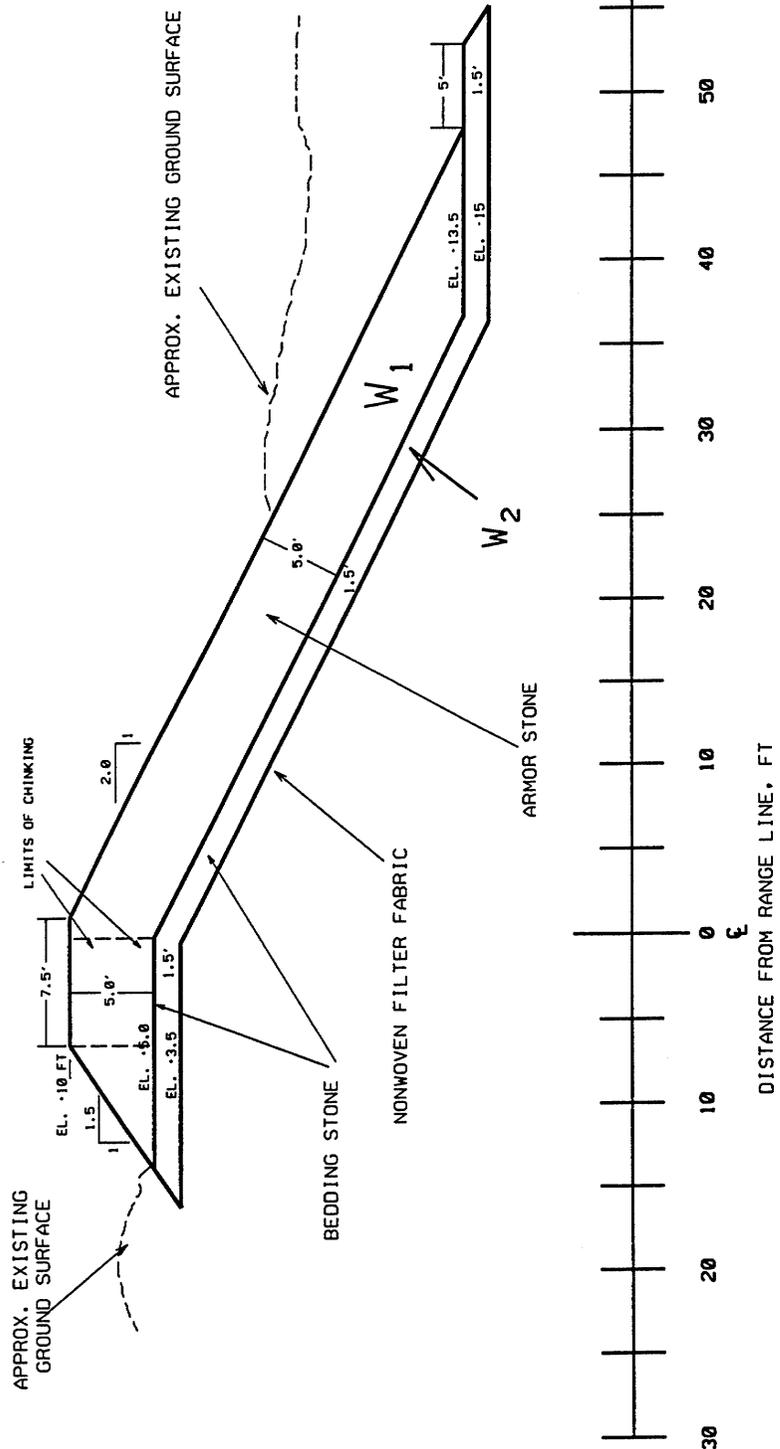
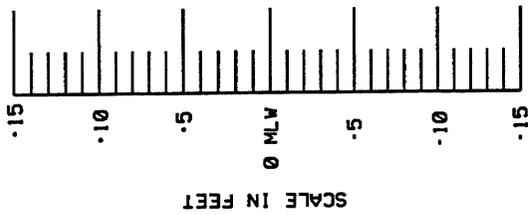
1. STONE SIZES AS FOLLOWS:
 W_1 : MEDIAN STONE SIZE - 8500 LBS.
 W_2 : BEDDING STONE: 2 - 90 LBS.
2. FILTER FABRIC (NONWOVEN) WILL BE PLACED UNDER BEDDING LAYER
3. UNIT WEIGHT OF ARMOR STONE TO BE NLT 165 PCF. UNIT WEIGHT OF BEDDING STONE TO BE NO LESS THAN 140 PCF.
4. MATERIAL REMOVED DURING EXCAVATION IS TO BE REPLACED OVER TOE OF REVETMENT, TO APPROXIMATE PRE-CONSTRUCTION GRADE. ANY ADDITIONAL MATERIAL WILL BE PLACED AS BACKFILL.

PONCE DE LEON INLET
FEASIBILITY STUDY
REVETMENT SECTION #1
TYPICAL CROSS SECTION
FIGURE 5

A cross-section of revetment section #2 is shown in figure 6. A lower crest elevation is used along section #2 due to lower wave heights and the lack of potential damage which would be caused by overtopping. The base of the structure extends down to elevation -15, mlw. A lower degree of scouring is expected in this region of the inlet, and no scour apron is provided. Other differences between revetment sections 1 and 2 include a 1-foot higher base elevation of the crest of the structure (+3.5 feet, mlw) in order to achieve the design crest elevation of +10 feet with a 2-stone thick armor layer. A 1.5-foot thick bedding layer will be required instead of the 2-foot layer used in section #1. The same nonwoven geotextile filter fabric and bedding stone gradations will be used along both sections of the revetment. The crest of section #2 will be chinked in the same manner described above for section #1.

All stone sizes and gradations for the revetment were calculated using the Automated Coastal Engineering System (ACES v.1.07 software developed by the Coastal Engineering Research Center. As per Shore Protection Manual criteria, the armor layer is at least 2 stones thick, and the crest of the structure is 3 stones wide. This results in an armor layer 7.5 feet thick and a crest 12 feet wide for section #1, and an armor layer 5.0 feet thick and crest 7.5 feet wide for revetment section #2. Table 1 provides the gradations of each armor and bedding layer. No intermediate layer is required due to the wide gradations specified for the armor and bedding layers. Incident waves with a 12-second period produce the maximum required stone sizes for both revetment sections. The 12-second wave period is not uncommon for this area and was therefore used for all designs. Other ACES input included a 1:50 nearshore slope, a 1:2 revetment front slope, 10-foot depth at toe of structure, armor stone unit weight of 165 pcf, permeability coefficient of 0.1, and damage level of 2%.

Armor and bedding stone may be transported to the site by truck or barge, at the contractor's discretion. Excavated material will be placed behind (north of) the revetment, and will be used primarily to transition from the revetment crest to existing natural grade. Excavated backfill will also be placed in front of the revetment for aesthetic purposes. Temporary stockpile areas will be provided immediately north of the revetment, and along the beach north and south of the landward end of the north jetty, seaward of the dunes. Total quantities of materials required for construction are: 30,056 tons of 2500-lb armor stone, 8,476 tons of bedding stone, 610 tons of chinking stone, 13,000 square yards of filter fabric, and 40,000 cubic yards of excavation.



NOTES:

1. STONE SIZES AS FOLLOWS:
 W₁ : MEDIUM STONE SIZE - 2500 LBS
 W₂ : BEDDING STONE - 1-25 LBS
2. NONWOVEN FILTER FABRIC WILL BE PLACED UNDER BEDDING LAYER
3. MATERIAL REMOVED DURING EXCAVATION IS TO BE REPLACED OVER TOE OF REVETMENT, TO APPROXIMATE PRE-CONSTRUCTION GRADE. ANY ADDITIONAL MATERIAL WILL BE PLACED AS BACKFILL.

PONCE DE LEON INLET
 FEASIBILITY STUDY

REVETMENT SECTION #2
 TYPICAL CROSS SECTION

FIGURE 6

**TABLE 1
STONE SIZE GRADATIONS
REVTMENT SECTION #1**

ARMOR STONE (165 pcf)		
% Less than by weight	Weight (lbs)	Dimension (ft)
0	1100	1.9
15	3500	2.8
50	8500	3.8
85	17000	4.7
100	34800	5.9

BEDDING STONE (140 pcf)		
% Passing		Sieve Size
100		12"
65-85		9"
25-45		3"
0-10		1"

**STONE SIZE GRADATIONS
REVTMENT SECTION #2**

ARMOR STONE (165 pcf)		
% Less than by weight	Weight (lbs)	Dimension (ft)
0	310	1.2
15	1000	1.8
50	2500	2.5
85	5000	3.1
100	10000	3.9

BEDDING STONE (140 pcf)		
Percent Passing		Sieve Size
100		12"
65-85		9"
25-45		3"
0-10		1"

GEOTECHNICAL INVESTIGATION

1. Geotechnical Investigations

The subsurface investigation for this project consist of drilling 3 core borings along the proposed channel excavation alignment, drilling 4 core borings for the proposed 1540-foot revetment on the north shore and drilling 2 core boring for the 1000 foot jetty extension. The core borings drilled for the channel excavation and north shoreline revetment was drilled to depths up to 30 feet deep. The two core borings drilled for the proposed jetty extension, CB-PDLJ-2 and CB-PDLJ-3 was drilled to depths of 36 and 55 feet respectfully. See figure 7 for core boring layout.

2. Material Encountered

The material encountered in the seven core borings drilled for the proposed channel excavation and shore line revetment consisted of medium to dense, slightly silty quartz sand with fine to Coarse grained shell fragments (SP AND SP-SM material).

The material encountered in the two core borings drilled for the proposed jetty extension consisted of 36 foot of medium to dense, poorly graded sand (SP) with some of shell fragments. Below the sand layer boring CB-PDJ-2, was a soft to medium dense layer of highly plastic clay. The 39 feet of medium to dense sands above this clay zone will be of sufficient to support the proposed structure.

3. Slope Stability

The channel excavated slopes were analysis for end of construction case. The analysis indicated that the excavated slope of 1 vertical on 2.5 horizon would be stability.

COST ESTIMATES

Cost estimates for the recommended plan are contained in enclosure 2, at the end of this appendix. Cost estimates are provided in MCASES format, and are referenced to October 1996 price levels.



Revelment Section
PLT-6

Tie into E

0 500

Scale, feet

SO

**Engineering Appendix
Enclosure 1
Core Boring Logs**

Hole No. CB-PLI-1

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 2
1. PROJECT Ponce De Leon Inlet		10. SIZE AND TYPE OF BIT See Remarks	
2. LOCATION (Coordinates or Station) X=525,114 Y=1724,501		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) NGVD (FEET)	
3. DRILLING AGENCY Corps of Engineers		12. MANUFACTURER'S DESIGNATION OF DRILL CME 45	
4. HOLE NO. (As shown on drawing title and file number) CB-PLI-1		13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 17 undisturbed: 0	
5. NAME OF DRILLER L. Wooters		14. TOTAL NUMBER OF CORE BOXES 1	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		15. ELEVATION GROUND WATER	
7. THICKNESS OF BURDEN 0 Ft.		16. DATE HOLE STARTED COMPLETED 12/12/95 12/13/95	
8. DEPTH DRILLED INTO ROCK 0 Ft.		17. ELEVATION TOP OF HOLE 9.4 Ft.	
9. TOTAL DEPTH OF HOLE 25.5 Ft.		18. TOTAL CORE RECOVERY FOR BORING 59 %	
		19. SIGNATURE OF GEOLOGIST K. PITCHFORD	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit or Barrel	BLOWS/15'
9.4	.0					9.4	0
			SAND, fine grained quartz, trace fine grained shell, light gray. (SP)	60	1	SPLIT SPOON	1 3 4
						7.9	3
				80	2, 2d	SPLIT SPOON	4 10
						6.4	12
				60	3	SPLIT SPOON	18 23
						4.9	14
				53	4	SPLIT SPOON	24 25
						3.4	18
				53	5	SPLIT SPOON	25 28
						1.9	16
			gray	47	6	SPLIT SPOON	23 26
.4	9.0					.4	24
			silty SAND, fine grained quartz, trace fine grained shell, gray. (SP-SM)	47	7, 7d	SPLIT SPOON	13 17
			dark gray from -1.1 to -1.3			-1.1	10
				60	8	SPLIT SPOON	20 28
			dark gray from -2.6 to -2.85			-2.6	9
			little fine to medium grained shell, light gray	80	9	SPLIT SPOON	14 37
			trace fine grained shell			-4.1	16
				47	10	SPLIT SPOON	23 31
						-5.6	14
				53	11, 11d	SPLIT SPOON	15 22
						-7.1	15
				67	12	SPLIT SPOON	34 48
						-8.6	20
				67	13	SPLIT SPOON	31 47
						-10.1	20
				60	14, 14d	SPLIT SPOON	29 47
						-11.6	36
				60	15	SPLIT SPOON	32 62
						-13.1	22.5
-13.1	22.5					(continued)	

DRILLING LOG (Cont. Sheet)		ELEVATION TOP OF HOLE		PROJECT		INSTALLATION		REMARKS		SHEET 2 OF 2		
		9.4 Ft.		Ponce De Leon Inlet		Jacksonville District		Bit or Barrel				
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC #	SAMPLE NUMBER					BLOWS/ft.		
-13.1	22.5		silty SAND, fine grained quartz, trace fine grained shell, light gray. (SM)	60	16	-13.1				51	22.5	
		SPLIT SPOON						44				
					47	17, 17d	-14.6				75	
		SPLIT SPOON					10		20	25		
-16.1	25.5					-16.1				43		
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System.			140# Hammer with 30" drop used 2.0" split spoon (1 3/8" I.D. X 2" O. D.)					27.5	
											30	
											32.5	
											35	
											37.5	
											40	
											42.5	
											45	
											47.5	
											50	

Hole No. CB-PLI-2

SHEET 1
OF 2

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Jacksonville District
1. PROJECT Ponce De Leon Inlet	10. SIZE AND TYPE OF BIT See Remarks	
2. LOCATION (Coordinates or Station) X=524,542 Y=1724,259	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) NGVD (FEET)	
3. DRILLING AGENCY Corps of Engineers	12. MANUFACTURER'S DESIGNATION OF DRILL CME 45	
4. HOLE NO. (As shown on drawing title and file number) CB-PLI-2	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 16 undisturbed: 0	
5. NAME OF DRILLER L. Wooters	14. TOTAL NUMBER OF CORE BOXES 1	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED	15. ELEVATION GROUND WATER	
7. THICKNESS OF BURDEN 0 Ft.	16. DATE HOLE STARTED COMPLETED 12/14/95 12/14/95	
8. DEPTH DRILLED INTO ROCK 0 Ft.	17. ELEVATION TOP OF HOLE 3.6 Ft.	
9. TOTAL DEPTH OF HOLE 25.5 Ft.	18. TOTAL CORE RECOVERY FOR BORING 61 %	
	19. SIGNATURE OF GEOLOGIST K. PITCHFORD	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit or Barrel	BLOWS/5'
3.6	.0					3.6	0
		[Pattern]	SAND, fine grained quartz, trace fine grained shell, some plant debris, tan, (SP)	53	1	SPLIT SPOON	2
2.1	1.5					2.1	2
		[Pattern]	silty SAND, fine grained quartz, trace fine grained shell, little plant debris, tan, (SP-SM)	80	2d	SPLIT SPOON	2
.6	3.0					.6	3
		[Pattern]	SAND, fine grained quartz, light gray, (SP)	80	3	SPLIT SPOON	8
		[Pattern]	trace fine grained shell			-9	7
		[Pattern]		67	4	SPLIT SPOON	19
		[Pattern]				-2.4	21
		[Pattern]		67	5	SPLIT SPOON	17
		[Pattern]				-3.9	23
		[Pattern]		40	6	SPLIT SPOON	27
		[Pattern]				-5.4	5
		[Pattern]		20	7	SPLIT SPOON	13
		[Pattern]				-6.9	18
-6.9	10.5					-6.9	13
		[Pattern]	silty SAND, fine grained quartz, trace fine grained shell, light gray, (SP-SM)	53	8, 8d	SPLIT SPOON	18
		[Pattern]				-8.4	13
		[Pattern]		0		SPLIT SPOON	17
		[Pattern]				-9.9	10
		[Pattern]		67	9	SPLIT SPOON	12
		[Pattern]				-11.4	10
-11.4	15.0					-11.4	15
		[Pattern]	SAND, fine grained quartz, trace fine grained shell, light gray, (SP)	53	10	SPLIT SPOON	20
		[Pattern]				-12.9	22
		[Pattern]	little fine to coarse grained shell	60	11, 11d	SPLIT SPOON	7
		[Pattern]				-14.4	9
		[Pattern]	SAND, medium grained shell, some fine grained quartz, gray, (SP)	80	12	SPLIT SPOON	9
		[Pattern]				-15.9	4
		[Pattern]		67	13	SPLIT SPOON	6
		[Pattern]				-17.4	4
-15.2	18.8					-15.2	2
		[Pattern]				-17.4	2
		[Pattern]				-17.4	5
-17.4	21.0					-17.4	8
		[Pattern]	silty SAND, fine grained quartz, little fine to medium grained shell, gray, (SM)	73	14, 14d	SPLIT SPOON	8
		[Pattern]				-18.9	8
		[Pattern]				(continued)	11

DRILLING LOG (Cont. Sheet)			ELEVATION TOP OF HOLE 3.6 Ft.		SHEET 2 OF 2		
PROJECT Ponce De Leon Inlet			INSTALLATION Jacksonville District				
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit or Barrel	BLOWS/ 5'
-18.9	22.5					-18.9	22.5
				100	5	SPLIT SPOON	3 7 11
				73	16, 16d	SPLIT SPOON	14 15 22
-21.9	25.5					-21.9	25
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System.			140# Hammer with 30" drop used 2.0' split spoon (1 3/8" I.D. X 2" O. D.)	27.5 30 32.5 35 37.5 40 42.5 45 47.5 50

Hole No. CB-PLI-3

SHEET 1
OF 2

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Jacksonville District	
1. PROJECT Ponce De Leon Inlet		10. SIZE AND TYPE OF BIT See Remarks	
2. LOCATION (Coordinates or Station) X=524,023 Y=1724,159		11. DATUM FOR ELEVATION SHOWN (TBM or NSL) NGVD (FEET)	
3. DRILLING AGENCY Corps of Engineers		12. MANUFACTURER'S DESIGNATION OF DRILL CME 45	
4. HOLE NO. (As shown on drawing title and file number) CB-PLI-3		13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 24 undisturbed: 0	
5. NAME OF DRILLER L.C. Gregory		14. TOTAL NUMBER OF CORE BOXES 1	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		15. ELEVATION GROUND WATER -0.2 ft NGVD	
7. THICKNESS OF BURDEN 0 Ft.		16. DATE HOLE STARTED COMPLETED 12/18/95 12/19/95	
8. DEPTH DRILLED INTO ROCK 0 Ft.		17. ELEVATION TOP OF HOLE 9.8 Ft.	
9. TOTAL DEPTH OF HOLE 36.0 Ft.		18. TOTAL CORE RECOVERY FOR BORING 64 %	
		19. SIGNATURE OF GEOLOGIST K. PITCHFORD	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit or Barrel	BLOWS/ 5'		
9.8	.0					9.8	0		
		[Pattern: Sand]	SAND, fine grained quartz, trace fine grained shell, trace plant debris, tan, (SP)	73	1	SPLIT SPOON	1		
						8.3	3		
				67	2d	SPLIT SPOON	2	2.5	
						6.8	2		
5.3	4.5			73	3	SPLIT SPOON	3		
		[Pattern: Silty Sand]	silty SAND, fine grained quartz, trace fine grained shell, trace plant debris, tan, (SP-SM)			5.3	3		
						47	4	SPLIT SPOON	4
								3.8	5
						67	5	SPLIT SPOON	3
								2.3	4
						40	6	SPLIT SPOON	5
						.8	5		
.8	9.0						7.5		
		[Pattern: Sand]	SAND, fine grained quartz, trace fine grained shell, light gray, (SP)	27	7	SPLIT SPOON	4		
								-7	7
						87	8d	SPLIT SPOON	8
								-2.2	13
						47	9	SPLIT SPOON	12
						-3.7	14		
-3.7	13.5						12.5		
		[Pattern: Silty Sand]	silty SAND, fine grained quartz, trace fine grained shell, light gray, (SP-SM)	80	10	SPLIT SPOON	22		
								-5.2	23
-5.2	15.0						14		
		[Pattern: Sand]	SAND, fine grained quartz, trace fine grained shell, light gray, (SP)	60	11	SPLIT SPOON	24		
								-6.7	46
						67	12	SPLIT SPOON	33
								-8.2	37
-8.2	18.0						46		
		[Pattern: Silty Sand]	silty SAND, fine grained quartz, trace fine grained shell, light gray, (SP-SM)	60	13d	SPLIT SPOON	17		
								-9.7	36
						80	14	SPLIT SPOON	65
								-11.2	21
						100	15	SPLIT SPOON	40
						-12.7	60		
						(continued)	13		
							26		
							30		
							49		
							47		
							22.5		

DRILLING LOG (Cont. Sheet)		ELEVATION TOP OF HOLE		PROJECT		INSTALLATION		SHEET 2 OF 2			
		9.8 Ft.		Ponce De Leon Inlet		Jacksonville District					
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit or Barrel	BLOWS/ft				
-12.7	22.5	[Stippled pattern]	trace fine to medium grained shell some fine to medium grained shell shell layer from -20.2 to -20.4 shell layer from -20.65 to -20.75	60	16	SPLIT SPOON	18	22.5			
								32			
								47			
						53	17	SPLIT SPOON	20	25	
									27		
									34		
						40	18	SPLIT SPOON	13		
									27		
									33		
						67	19	SPLIT SPOON	10	27.5	
							16				
							21				
				67	20, 20d	SPLIT SPOON	14				
							12				
							18	30			
				80	21	SPLIT SPOON	6				
							9				
							13				
				47	22	SPLIT SPOON	7				
							9	32.5			
							7				
-23.2	33.0	[Stippled pattern]	silty SAND, fine grained quartz, some fine to medium grained shell, gray, (SM)	100	23	SPLIT SPOON	6				
								5			
								9			
				53	24	SPLIT SPOON	7	35			
							6				
							13				
-26.2	36.0	[Stippled pattern]	NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System.			140# Hammer with 30" drop used 2.0' split spoon (1 3/8" I.D. X 2" O. D.)		37.5			

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Jacksonville District
1. PROJECT Ponce De Leon Inlet	10. SIZE AND TYPE OF BIT See Remarks	
2. LOCATION (Coordinates or Station) X=523,608 Y=1724,185	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) NGVD (FEET)	
3. DRILLING AGENCY Corps of Engineers	12. MANUFACTURER'S DESIGNATION OF DRILL CME 45	
4. HOLE NO. (As shown on drawing title and file number) CB-PLI-4	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 17 undisturbed: 0	
5. NAME OF DRILLER L.C. Gregory	14. TOTAL NUMBER OF CORE BOXES 1	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED	15. ELEVATION GROUND WATER	
7. THICKNESS OF BURDEN 0 Ft.	16. DATE HOLE STARTED COMPLETED 12/20/95 12/20/95	
8. DEPTH DRILLED INTO ROCK 0 Ft.	17. ELEVATION TOP OF HOLE 3.1 Ft.	
9. TOTAL DEPTH OF HOLE 25.5 Ft.	18. TOTAL CORE RECOVERY FOR BORING 67 %	
19. SIGNATURE OF GEOLOGIST K. PITCHFORD		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit or Barrel	BLOWS/5'
3.1	.0					3.1	0
			SAND, fine grained quartz, tan, (SP)	87	1	SPLIT SPOON	2
1.6	1.5					1.6	3
			silty SAND, fine grained quartz, trace fine grained shell, gray, (SM)	60	2, 2d	SPLIT SPOON	3
						.1	1
							4
							9
-1.4	4.5					-1.4	15
			SAND, fine grained quartz, light gray, (SP)	60	4	SPLIT SPOON	20
			trace fine grained shell			-2.9	25
							28
						-4.4	9
							13
						-5.9	28
							5
						-7.4	12
							36
							12
						-7.4	23
							32
-7.4	10.5					-7.4	12
			silty SAND, fine grained quartz, trace fine grained shell, light gray, (SP-SM)	47	8	SPLIT SPOON	25
						-8.9	31
							18
						-10.4	25
							36
							12
						-11.9	25
							60
							12
						-13.4	17
							25
-13.4	16.5					-13.4	7
			SAND, fine grained quartz, trace fine to medium grained shell, light gray, (SP)	67	12	SPLIT SPOON	15
						-14.9	25
							10
						-16.4	28
			trace fine grained shell				35
							7
						-17.9	10
							22
							4
						-19.4	15
							23
						(continued)	22.5

DRILLING LOG (Cont. Sheet)		ELEVATION TOP OF HOLE		3.1 Ft.		SHEET 2 OF 2	
PROJECT			INSTALLATION				
Ponce De Leon Inlet			Jacksonville District				
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit or Barrel	BLOWS/5'
-19.4	22.5		trace fine to medium grained shell	67	16	SPLIT SPOON	4 5 26
-20.9	24.0		silty SAND, medium grained shell, some fine grained quartz, gray. (SM)	60	17, 17d	SPLIT SPOON	4 4 5
-22.4	25.5						
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System.	140# Hammer with 30" drop used 2.0' split spoon (1 3/8" I.D. X 2" O. D.)			

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Jacksonville District
1. PROJECT Ponce De Leon Inlet	10. SIZE AND TYPE OF BIT See Remarks	
2. LOCATION (Coordinates or Station) X=524,761 Y=1723,939	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) NGVD (FEET)	
3. DRILLING AGENCY Corps of Engineers	12. MANUFACTURER'S DESIGNATION OF DRILL CME 45	
4. HOLE NO. (As shown on drawing title and file number) CB-PLI-5	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 20 undisturbed: 0	
5. NAME OF DRILLER L. Wooters	14. TOTAL NUMBER OF CORE BOXES 1	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED	15. ELEVATION GROUND WATER -1.2 ft NGVD	
7. THICKNESS OF BURDEN 0 Ft.	16. DATE HOLE STARTED COMPLETED 12/13/95 12/13/95	
8. DEPTH DRILLED INTO ROCK 0 Ft.	17. ELEVATION TOP OF HOLE 11.2 Ft.	
9. TOTAL DEPTH OF HOLE 30.0 Ft.	18. TOTAL CORE RECOVERY FOR BORING 62 %	
	19. SIGNATURE OF GEOLOGIST K. PITCHFORD	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit or Barrel	BLOCKS / 5'
11.2	.0					11.2	0
			SAND, fine grained quartz, trace fine grained shell, light gray. (SP)	60	1	SPLIT SPOON	1
						9.7	2
							3
				87	2, 2d	SPLIT SPOON	5
						8.2	4
							4
				87	3	SPLIT SPOON	5
						6.7	11
6.7	4.5						13
			silty SAND, fine grained quartz, trace fine grained shell, light gray. (SP-SM)	80	4	SPLIT SPOON	21
						5.2	22
							17
				73	5	SPLIT SPOON	30
						3.7	30
							25
				53	6	SPLIT SPOON	23
						2.2	28
							24
			gray	60	7, 7d	SPLIT SPOON	17
						.7	17
							13
				53	8	SPLIT SPOON	25
						-0.8	23
							12
				67	9	SPLIT SPOON	16
						-2.3	18
-2.3	13.5						24
			silty SAND, fine grained quartz, trace fine grained shell, gray. (SM)	53	10	SPLIT SPOON	35
						-3.8	28
							11
				53	11, 11d	SPLIT SPOON	24
						-5.3	29
-5.3	16.5						10
			silty SAND, fine grained quartz, trace fine grained shell, light gray. (SP-SM)	53	12	SPLIT SPOON	18
			gray			-6.8	29
							26
				53	13	SPLIT SPOON	28
						-8.3	28
-8.3	19.5						10
			gravel sized rock fragment	0		SPLIT SPOON	12
			dark gray fat clay layer from -9.85 to -10.15			-9.8	11
							7
			clayey SAND, fine grained quartz, trace fine grained shell, dark gray. (SC)	67	14, 15	SPLIT SPOON	2
						-11.3	3

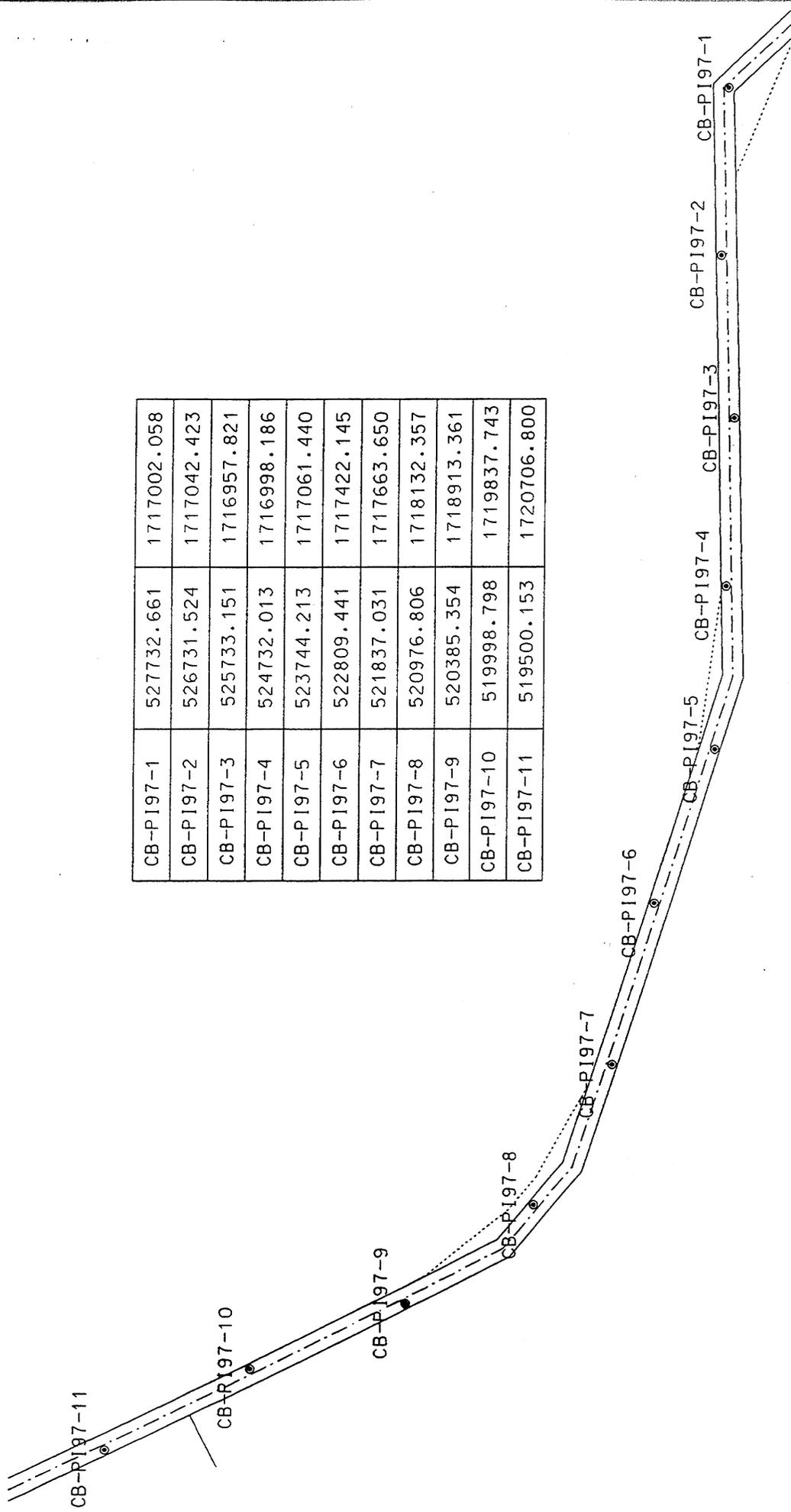
(continued)

DRILLING LOG (Cont. Sheet)		ELEVATION TOP OF HOLE		SHEET 2 OF 2			
PROJECT Ponce De Leon Inlet		INSTALLATION Jacksonville District					
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC #	SAMPLE NUMBER	REMARKS Bit or Barrel	BLOWS/ ft.
-11.3	22.5					-11.3	38
				93	16, 16d	SPLIT SPOON	24
						-12.6	10
				80	17	SPLIT SPOON	1
						-14.3	4
-14.3	25.5						18
							16
			silty SAND, fine grained quartz, trace fine grained shell, gray, (SM)	60	18	SPLIT SPOON	43
			little fine to medium grained shell			-15.8	35
				67	19, 19d	SPLIT SPOON	20
						-17.3	25
-17.3	28.5						30
			silty SAND, fine grained quartz, little fine to medium grained shell, gray, (SP-SM)	47	20	SPLIT SPOON	8
						-18.8	15
-18.8	30.0						13
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System.			140# Hammer with 30" drop used 2.0' split spoon (1 3/8" I.D. X 2" O. D.)	
							8
							30
							32.5
							35
							37.5
							40
							42.5
							45
							47.5
							50

Hole No. CB-PLI-6

DRILLING LOG (Cont. Sheet)		ELEVATION TOP OF HOLE		Ft.		SHEET 2 OF 2	
PROJECT			INSTALLATION				
Ponce De Leon Inlet			Jacksonville District				
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC X	SAMPLE NUMBER	REMARKS Bit or Barrel	BLOKS/ '6'
n/a	22.5						22.5
		[Stippled Legend]		27	16	SPLIT SPOON	8
							8
							12
							17
	25.5			33	17	SPLIT SPOON	28
							31
			NOTES: Soils are field visually classified in accordance with the Unified Soils Classification System.			140# Hammer with 30" drop used 2.0' split spoon (1 3/8" I.D. X 2" O. D.)	27.5
							30
							32.5
							35
							37.5
							40
							42.5
							45
							47.5
							50

CB-P197-1	527732.661	1717002.058
CB-P197-2	526731.524	1717042.423
CB-P197-3	525733.151	1716957.821
CB-P197-4	524732.013	1716998.186
CB-P197-5	523744.213	1717061.440
CB-P197-6	522809.441	1717422.145
CB-P197-7	521837.031	1717663.650
CB-P197-8	520976.806	1718132.357
CB-P197-9	520385.354	1718913.361
CB-P197-10	519998.798	1719837.743
CB-P197-11	519500.153	1720706.800



Hole No. CB-PI-1A

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 1
1. PROJECT Ponce de Leon Inlet		10. SIZE AND TYPE OF BIT See Remarks	
2. LOCATION (Coordinates or Station) X=527,197 Y=1717,079		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW	
3. DRILLING AGENCY Corps of Engineers		12. MANUFACTURER'S DESIGNATION OF DRILL Acker on WB-33	
4. HOLE NO. (As shown on drawing title and file number) CB-PI-1A		13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 6 undisturbed:	
5. NAME OF DRILLER L.C. Gregory		14. TOTAL NUMBER OF CORE BOXES 1	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		15. ELEVATION GROUND WATER Tidal	
7. THICKNESS OF BURDEN 0 Ft.		16. DATE HOLE STARTED COMPLETED 3/19/97 3/19/97	
8. DEPTH DRILLED INTO ROCK 0 Ft.		17. ELEVATION TOP OF HOLE -11.0 Ft.	
9. TOTAL DEPTH OF HOLE 9.0 Ft.		18. TOTAL CORE RECOVERY FOR BORING 63 %	
		19. SIGNATURE OF GEOLOGIST B. Ross	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit or Barrel	BLOWS/ 5'
-11.0	0		SAND, fine to medium grained quartz, gray (SP)	10	1	SPLIT SPOON	0
							SETTLED
							1
				50	2	SPLIT SPOON	4
							4
							2.5
							4
				66	3	SPLIT SPOON	7
							6
							SETTLED
							2
				90	4	SPLIT SPOON	2
							4
							5
							4
				100	5	SPLIT SPOON	7
							11
							7.5
							10
				6	6	SPLIT SPOON	10
							10
-20.0	9.0						
			Soils are field visually classified in accordance with the Unified Soils Classification System.			140# HAMMER WITH 30" DROP USED ON 2' SPLIT SPOON (1 3/8" ID X 2" OD)	10
			SAMPLE ELEVATION -12.5/-14.0 -15.5/-17.0				12.5
			LABORATORY CLASSIFICATION (SP)* (SP)*				15
			*NOTE: Visual classification based on grain size curves. No Atterberg Limits.				17.5
							20
							22.5

Hole No. CB-PI-2

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 1
1. PROJECT Ponce de Leon Inlet	10. SIZE AND TYPE OF BIT See Remarks		
2. LOCATION (Coordinates or Station) X=526,736 Y=1717,044	11. DATUM FOR ELEVATION SHOWN (TBM or NSL) MLW		
3. DRILLING AGENCY Corps of Engineers	12. MANUFACTURER'S DESIGNATION OF DRILL Acker on WB-33		
4. HOLE NO. (As shown on drawing title and file number) CB-PI-2	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 5 undisturbed:		
5. NAME OF DRILLER L.C. Gregory	14. TOTAL NUMBER OF CORE BOXES 1		
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED	15. ELEVATION GROUND WATER Tidal		
7. THICKNESS OF BURDEN 0 Ft.	16. DATE HOLE STARTED COMPLETED 3/12/97 3/12/97		
8. DEPTH DRILLED INTO ROCK 0 Ft.	17. ELEVATION TOP OF HOLE -12.5 Ft.		
9. TOTAL DEPTH OF HOLE 7.5 Ft.	18. TOTAL CORE RECOVERY FOR BORING 58 %		
	19. SIGNATURE OF GEOLOGIST B. Ross		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit or Barrel	BLOWS/ 5 ft.
-12.5	0						0
		↓	SETTLED				
-14.0	1.5		silty SAND, fine to medium grained quartz, dark brown (SM)	47	1	SPLIT SPOON	3
-15.5	3.0		SAND, fine to medium grained quartz, gray (SP-SM)	80	2	SPLIT SPOON	2
							2
							4
							7
							5
							8
							11
							7
-20.0	7.5			60	5	SPLIT SPOON	18
							31
			Soils are field visually classified in accordance with the Unified Soils Classification System.			140# HAMMER WITH 30" DROP USED ON 2' SPLIT SPOON (1 3/8" ID X 2" OD)	
							10
							12.5
							15
							17.5
							20
							22.5

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Jacksonville District		SHEET 1 OF 1		
1. PROJECT Ponce de Leon Inlet		10. SIZE AND TYPE OF BIT See Remarks					
2. LOCATION (Coordinates or Station) X=525,735 Y=1716,964		11. DATUM FOR ELEVATION SHOWN (TBM or NSL) MLW					
3. DRILLING AGENCY Corps of Engineers		12. MANUFACTURER'S DESIGNATION OF DRILL Acker on WB-33					
4. HOLE NO. (As shown on drawing title and file number) CB-PI-3		13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 4 undisturbed:					
5. NAME OF DRILLER L.C. Gregory		14. TOTAL NUMBER OF CORE BOXES 1					
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		15. ELEVATION GROUND WATER Tidal					
7. THICKNESS OF BURDEN 0 Ft.		16. DATE HOLE STARTED COMPLETED 3/11/97 3/11/97					
8. DEPTH DRILLED INTO ROCK 0 Ft.		17. ELEVATION TOP OF HOLE -14.6 Ft.					
9. TOTAL DEPTH OF HOLE 6.0 Ft.		18. TOTAL CORE RECOVERY FOR BORING 66 %					
		19. SIGNATURE OF GEOLOGIST B. Ross					
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit or Barrel	BLOWS/ ft.
-14.6	.0					-14.6	0
-16.1	1.5		silty SAND, fine to medium grained quartz, dark brown (SM)	33	1	SPLIT SPOON	SETTLE ↓ 2
-17.6	3.0		SAND, fine to medium grained quartz, gray (SP-SM)	66	2	SPLIT SPOON	1 3 5 2.5
			SAND, fine to medium grained quartz, light, gray (SP)	66	3	SPLIT SPOON	9 18 35
-20.6	6.0			100	4	SPLIT SPOON	9 15 5
			Soils are field visually classified in accordance with the Unified Soils Classification System.			140# HAMMER WITH 30" DROP USED ON 2' SPLIT SPOON (1 3/8" ID X 2" OD)	7.5
			SAMPLE ELEVATION : LABORATORY CLASSIFICATION (SP-SM)* -16.1/-17.6				10
			*NOTE: Visual classification based on grain size curves. No Atterberg Limits.				12.5
							15
							17.5
							20
							22.5

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 1
	1. PROJECT Ponce de Leon Inlet	10. SIZE AND TYPE OF BIT See Remarks	
2. LOCATION (Coordinates or Station) X=524,732 Y=1716,993	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW	12. MANUFACTURER'S DESIGNATION OF DRILL Acker on WB-33	
3. DRILLING AGENCY Corps of Engineers	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 4 undisturbed:	14. TOTAL NUMBER OF CORE BOXES 1	
4. HOLE NO. (As shown on drawing title and file number) CB-PI-4	15. ELEVATION GROUND WATER Tidal	16. DATE HOLE STARTED COMPLETED 3/11/97 3/11/97	
5. NAME OF DRILLER L.C. Gregory	17. ELEVATION TOP OF HOLE -14.5 Ft.	18. TOTAL CORE RECOVERY FOR BORING 37 %	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED	18. SIGNATURE OF GEOLOGIST B. Ross		
7. THICKNESS OF BURDEN 0 Ft.			
8. DEPTH DRILLED INTO ROCK 0 Ft.			
9. TOTAL DEPTH OF HOLE 6.0 Ft.			

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit or Barrel	BLOWS/5'
-14.5	.0					-14.5	0
			silty SAND, fine to medium grained quartz, dark brown (SM)	21	1	SPLIT SPOON	SETTLED
				14	2	SPLIT SPOON	SETTLED
-17.5	3.0		SAND, fine to medium grained quartz, gray (SP-SM)	66	3	SPLIT SPOON	SETTLED
-19.0	4.5		SHELL SAND, medium sand size to 1" whole and broken shell, gray (SP)	47	4	SPLIT SPOON	SETTLED
-20.5	6.0						2
			Soils are field visually classified in accordance with the Unified Soils Classification System.			140# HAMMER WITH 30" DROP USED ON 2' SPLIT SPOON (1 3/8" ID X 2" OD)	7.5
			SAMPLE ELEVATION -14.5/-16.0 LABORATORY CLASSIFICATION (SP-SM)*				10
			*NOTE: Visual classification based on grain size curves. No Atterberg Limits.				12.5
							15
							17.5
							20
							22.5

Hole No. CB-PDI-5

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 1
1. PROJECT Ponce de Leon Inlet	10. SIZE AND TYPE OF BIT See Remarks		
2. LOCATION (Coordinates or Station) X=523,744 Y=1717,060	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW		
3. DRILLING AGENCY Corps of Engineers	12. MANUFACTURER'S DESIGNATION OF DRILL Acker on WB-33		
4. HOLE NO. (As shown on drawing title and file number) CB-PDI-5	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 5 undisturbed:		
5. NAME OF DRILLER L.C. Gregory	14. TOTAL NUMBER OF CORE BOXES 1		
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED	15. ELEVATION GROUND WATER Tidal		
7. THICKNESS OF BURDEN 0 Ft.	16. DATE HOLE STARTED COMPLETED 3/12/97 3/12/97		
8. DEPTH DRILLED INTO ROCK 0 Ft.	17. ELEVATION TOP OF HOLE -13.0 Ft.		
9. TOTAL DEPTH OF HOLE 7.5 Ft.	18. TOTAL CORE RECOVERY FOR BORING 44 %		
	19. SIGNATURE OF GEOLOGIST B. Ross		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit or Barrel	BLOWS/16"
-13.0	.0					-13.0	0
			silty SAND, fine to medium grained quartz, dark brown (SM)	33	1	SPLIT SPOON	SETTLED
-14.5	1.5					-14.5	
			SAND, fine to medium grained quartz, gray (SP-SM)	33	2	SPLIT SPOON	SETTLED
						-16.0	2.5
				33	3	SPLIT SPOON	SETTLED
						-17.5	
				33	4	SPLIT SPOON	SETTLED
-19.0	6.0					-19.0	5
							4
							4
							10
-20.5	7.5					-20.5	7.5
				87	5	SPLIT SPOON	17
							22
			Soils are field visually classified in accordance with the Unified Soils Classification System.			140# HAMMER WITH 30" DROP USED ON 2" SPLIT SPOON (1 3/8" ID X 2" OD)	
							10
							12.5
							15
							17.5
							20
							22.5

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 1	
1. PROJECT Ponce de Leon Inlet		10. SIZE AND TYPE OF BIT See Remarks			
2. LOCATION (Coordinates or Station) X=522,808 Y=1717,429		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW			
3. DRILLING AGENCY Corps of Engineers		12. MANUFACTURER'S DESIGNATION OF DRILL Acker on WB-33			
4. HOLE NO. (As shown on drawing title and file number) CB-PI-6		13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 6 undisturbed:			
5. NAME OF DRILLER L.C. Gregory		14. TOTAL NUMBER OF CORE BOXES 1			
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		15. ELEVATION GROUND WATER Tidal			
7. THICKNESS OF BURDEN 0 Ft.		16. DATE HOLE STARTED COMPLETED 3/12/97 3/12/97			
8. DEPTH DRILLED INTO ROCK 0 Ft.		17. ELEVATION TOP OF HOLE -11.0 Ft.			
9. TOTAL DEPTH OF HOLE 9.0 Ft.		18. TOTAL CORE RECOVERY FOR BORING 62 %			
		19. SIGNATURE OF GEOLOGIST B. Ross			

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC x	SAMPLE NUMBER	REMARKS Bit or Barrel	BLOWS/ 5'
-11.0	.0					-11.0	0
			Silty SAND, some fine to medium grained quartz, brown (SM)	40	1	SPLIT SPOON	SETTLED
-12.5	1.5					-12.5	2
			SAND, fine to medium grained quartz, light gray (SP)	80	2	SPLIT SPOON	5
						-14.0	5
				53	3	SPLIT SPOON	2
						-15.5	3
				80	4	SPLIT SPOON	5
						-17.0	23
				60	5	SPLIT SPOON	7
						-18.5	8
				66	6	SPLIT SPOON	12
-20.0	9.0					-20.0	6
							17
							25
			Soils are field visually classified in accordance with the Unified Soils Classification System.			140# HAMMER WITH 30" DROP USED ON 2' SPLIT SPOON (1 3/8" ID X 2" OD)	10
			SAMPLE ELEVATION LABORATORY CLASSIFICATION				12.5
			*NOTE: Visual classification based on grain size curves. No Atterberg Limits.				15
							17.5
							20
							22.5

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 1
1. PROJECT Ponce de Leon Inlet		10. SIZE AND TYPE OF BIT See Remarks	
2. LOCATION (Coordinates or Station) X=521,837 Y=1717,666		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW	
3. DRILLING AGENCY Corps of Engineers		12. MANUFACTURER'S DESIGNATION OF DRILL Acker on WB-33	
4. HOLE NO. (As shown on drawing title and file number) CB-PI-7		13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 5 undisturbed:	
5. NAME OF DRILLER L.C. Gregory		14. TOTAL NUMBER OF CORE BOXES 1	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		15. ELEVATION GROUND WATER Tidal	
7. THICKNESS OF BURDEN 0 Ft.		16. DATE HOLE STARTED COMPLETED 3/13/97 3/13/97	
8. DEPTH DRILLED INTO ROCK 0 Ft.		17. ELEVATION TOP OF HOLE -12.9 Ft.	
9. TOTAL DEPTH OF HOLE 7.5 Ft.		18. TOTAL CORE RECOVERY FOR BORING 58 %	
		19. SIGNATURE OF GEOLOGIST B. Ross	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit or Barrel	BLOWS/16'
-12.9	.0					-12.9	0
			SAND, fine to medium grained quartz, gray (SP-SM)	28	1	SPLIT SPOON	SETTLED ↓
-14.4	1.5		SAND, fine to medium grained quartz, light gray (SP)	53	2	SPLIT SPOON	6 8
				80	3	SPLIT SPOON	11 9 17
				73	4	SPLIT SPOON	15 9 27
				66	5	SPLIT SPOON	32 9 24
-20.4	7.5					-20.4	48
			Soils are field visually classified in accordance with the Unified Soils Classification System.			140# HAMMER WITH 30" DROP USED ON 2' SPLIT SPOON (1 3/8" ID X 2" OD)	7.5 10 12.5 15 17.5 20 22.5

Hole No. CB-PI-9

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 1
1. PROJECT Ponce de Leon Inlet	10. SIZE AND TYPE OF BIT See Remarks		
2. LOCATION (Coordinates or Station) X=520,382 Y=1718,918	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW		
3. DRILLING AGENCY Corps of Engineers	12. MANUFACTURER'S DESIGNATION OF DRILL Acker on WB-33		
4. HOLE NO. (As shown on drawing title and file number) CB-PI-9	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 6 undisturbed:		
5. NAME OF DRILLER L.C. Gregory	14. TOTAL NUMBER OF CORE BOXES 1		
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED	15. ELEVATION GROUND WATER Tidal		
7. THICKNESS OF BURDEN 0 Ft.	16. DATE HOLE STARTED COMPLETED 3/19/97 3/19/97		
8. DEPTH DRILLED INTO ROCK 0 Ft.	17. ELEVATION TOP OF HOLE -11.0 Ft.		
9. TOTAL DEPTH OF HOLE 9.0 Ft.	18. TOTAL CORE RECOVERY FOR BORING 63 %		
	19. SIGNATURE OF GEOLOGIST B. Ross		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit or Barrel	BLOWS/ 5'	
-11.0	.0		SAND, fine to medium grained quartz, gray (SP)	10	1	-11.0 SPLIT SPOON	0 SETTLED ↓	
							4	
					50	2	-12.5 SPLIT SPOON	4 6
							-14.0	12
					86	3	-15.5 SPLIT SPOON	5 7
							-17.0	7 20
			brown from -18.6 to -20.1			-18.5	15 22	
					6	-20.0 SPLIT SPOON	23 4 5	
-20.0	9.0		Soils are field visually classified in accordance with the Unified Soils Classification System.			140# HAMMER WITH 30" DROP USED ON 2' SPLIT SPOON (1 3/8" ID X 2" OD)	2	
			SAMPLE ELEVATION -11.1/-12.6 -15.6/-17.1					
			LABORATORY CLASSIFICATION (SP)* (SP)*					
			*NOTE: Visual classification based on grain size curves. No Atterberg Limits.					

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 1
1. PROJECT Ponce de Leon Inlet		10. SIZE AND TYPE OF BIT See Remarks	
2. LOCATION (Coordinates or Station) X=519,998 Y=1719,838		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW	
3. DRILLING AGENCY Corps of Engineers		12. MANUFACTURER'S DESIGNATION OF DRILL Acker on WB-33	
4. HOLE NO. (As shown on drawing title and file number) CB-PI-10		13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 6 undisturbed:	
5. NAME OF DRILLER L.C. Gregory		14. TOTAL NUMBER OF CORE BOXES 1	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		15. ELEVATION GROUND WATER Tidal	
7. THICKNESS OF BURDEN 0 Ft.		16. DATE HOLE STARTED COMPLETED 3/18/97 3/18/97	
8. DEPTH DRILLED INTO ROCK 0 Ft.		17. ELEVATION TOP OF HOLE -11.0 Ft.	
9. TOTAL DEPTH OF HOLE 9.0 Ft.		18. TOTAL CORE RECOVERY FOR BORING 57 %	
		19. SIGNATURE OF GEOLOGIST B. Ross	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit or Barrel	BLOWS/ft	
-11.0	.0					-11.0	0	
		[Stippled pattern]	SAND, fine to medium grained quartz, gray (SP)	21	1	SPLIT SPOON	SETTLED 3	
							4	
					66	2	SPLIT SPOON	8
							11	2.5
					60	3	SPLIT SPOON	8
							13	
							5	
				70	4	SPLIT SPOON	9	
						15		
							4	
				70	5	SPLIT SPOON	10	
			brown from -18.6 to -20.1			-18.5	17	
							6	
				55	6	SPLIT SPOON	9	
						-20.0	12	
-20.0	9.0							
			Soils are field visually classified in accordance with the Unified Soils Classification System.			140# HAMMER WITH 30" DROP USED ON 2" SPLIT SPOON (1 3/8" ID X 2" OD)	10	
							12.5	
							15	
							17.5	
							20	
							22.5	

Hole No. CB-PI-11

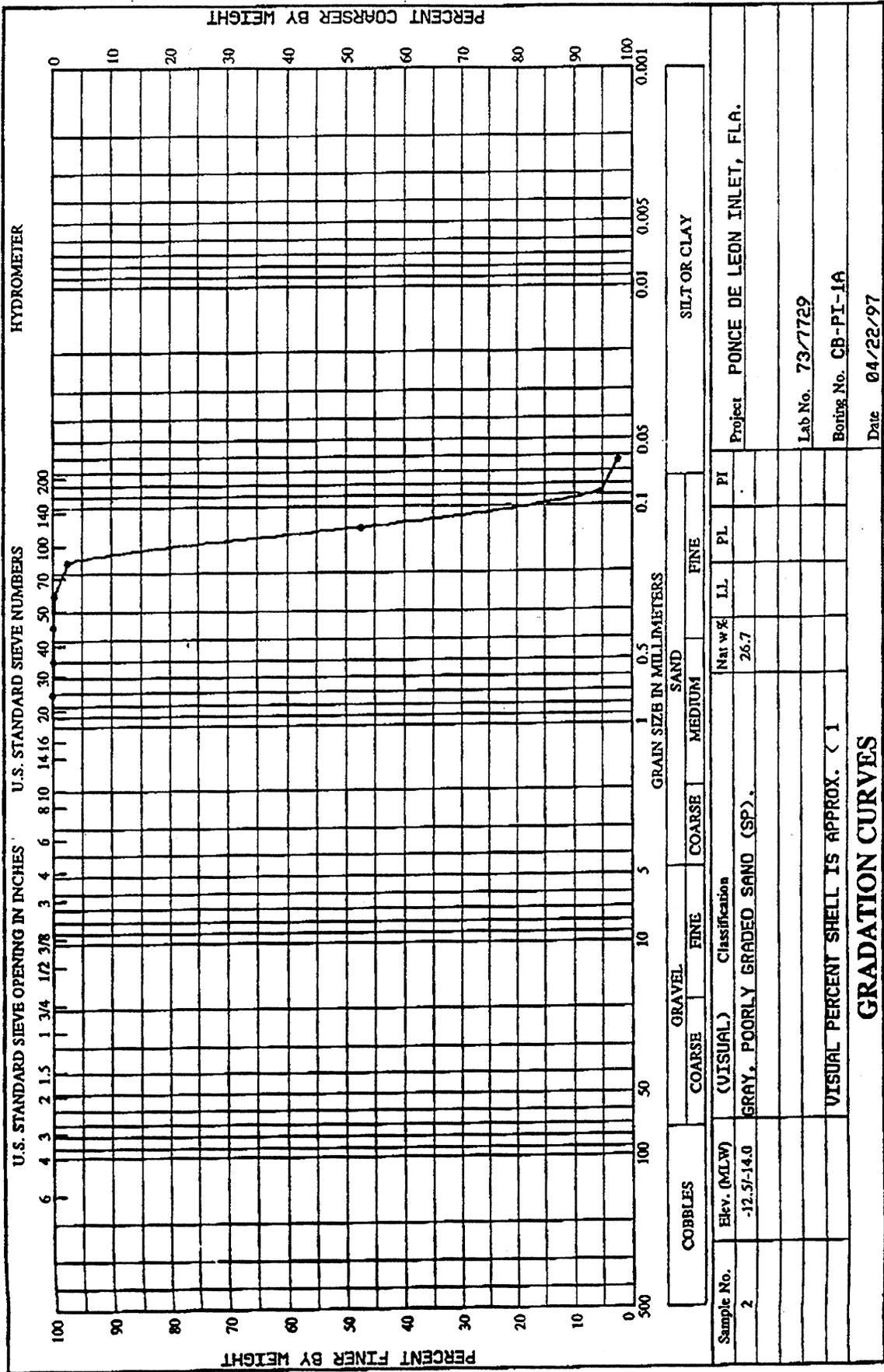
DRILLING LOG	DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 1
1. PROJECT Ponce de Leon Inlet		10. SIZE AND TYPE OF BIT See Remarks	
2. LOCATION (Coordinates or Station) X=519,503 Y=1720,706		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW	
3. DRILLING AGENCY Corps of Engineers		12. MANUFACTURER'S DESIGNATION OF DRILL Acker on WB-33	
4. HOLE NO. (As shown on drawing title and file number) CB-PI-11		13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 7 undisturbed:	
5. NAME OF DRILLER L.C. Gregory		14. TOTAL NUMBER OF CORE BOXES 1	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		15. ELEVATION GROUND WATER Tidal	
7. THICKNESS OF BURDEN 0 Ft.		16. DATE HOLE STARTED COMPLETED 3/19/97 3/19/97	
8. DEPTH DRILLED INTO ROCK 0 Ft.		17. ELEVATION TOP OF HOLE -11.6 Ft.	
9. TOTAL DEPTH OF HOLE 10.5 Ft.		18. TOTAL CORE RECOVERY FOR BORING 74 %	
		19. SIGNATURE OF GEOLOGIST B. Ross	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit or Barrel	BLOWS/ 5'
-11.6	.0					-11.6	0
		•••••	SAND, fine to medium grained quartz, gray (SP)	30	1	SPLIT SPOON	SETTLED 2
						-13.1	4
			brown from -14.9 to -8.6	100	2	SPLIT SPOON	8 7
						-14.6	2.5
				100	3	SPLIT SPOON	4 7
						-16.1	7
				60	4	SPLIT SPOON	1 3
						-17.6	5
			tan from -18.6 to -21.1	100	5	SPLIT SPOON	4 4
						-19.1	7.5
				60	6	SPLIT SPOON	1 2
						-20.6	4
				70	7	SPLIT SPOON	3 5
-22.1	10.5					-22.1	10
			Soils are field visually classified in accordance with the Unified Soils Classification System.			140# HAMMER WITH 30" DROP USED ON 2' SPLIT SPOON (1 3/8" ID X 2" OD)	12.5
			SAMPLE ELEVATION -11.6/-13.1 -14.6/-16.1			LABORATORY CLASSIFICATION (SP)* (SP)*	15
			*NOTE: Visual classification based on grain size curves. No Atterberg Limits.				17.5
							20
							22.5

DEPARTMENT OF THE ARMY, SOUTH ATLANTIC DIVISION LABORATORY
 CORPS OF ENGINEERS, 611 SOUTH COBB DRIVE, MARIETTA, GA. 30060

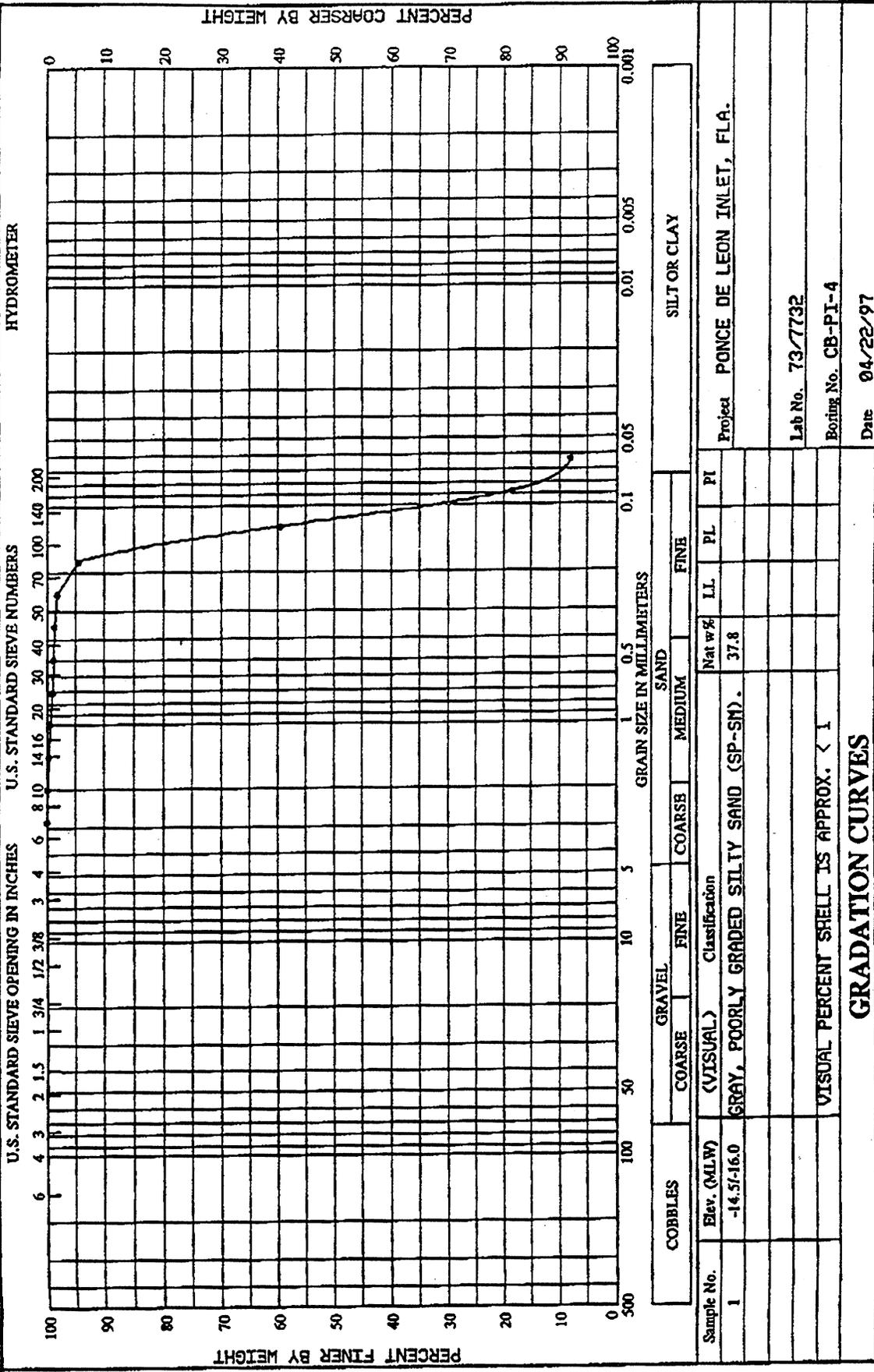
WORK ORDER: 8207

REQUISITION: W32CS570875212



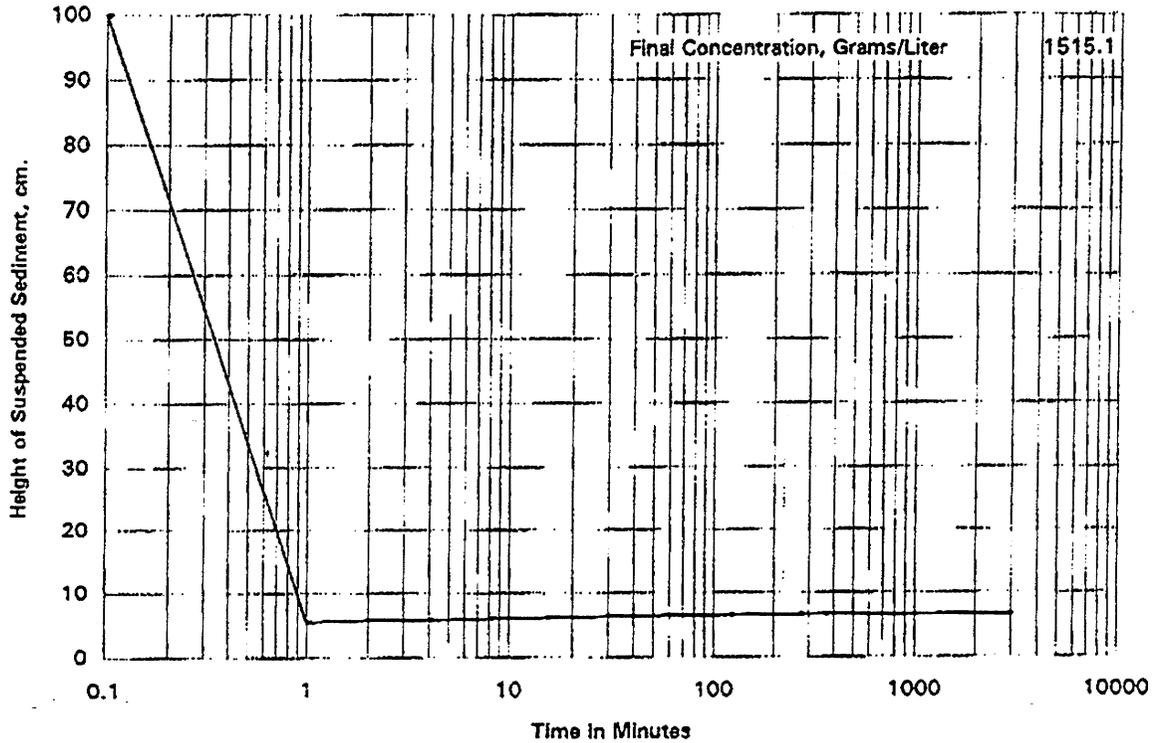
DEPARTMENT OF THE ARMY, SOUTH ATLANTIC DIVISION LABORATORY
 CORPS OF ENGINEERS, 611 SOUTH COBB DRIVE, MARIETTA, GA. 30060

WORK ORDER: 8207
 REQUISITION: W32CS570875212



U.S. ARMY CORPS OF ENGINEERS
SOUTH ATLANTIC DIVISION LABORATORY
MARIETTA, GEORGIA

SUSPENDED SEDIMENT-TIME CURVE

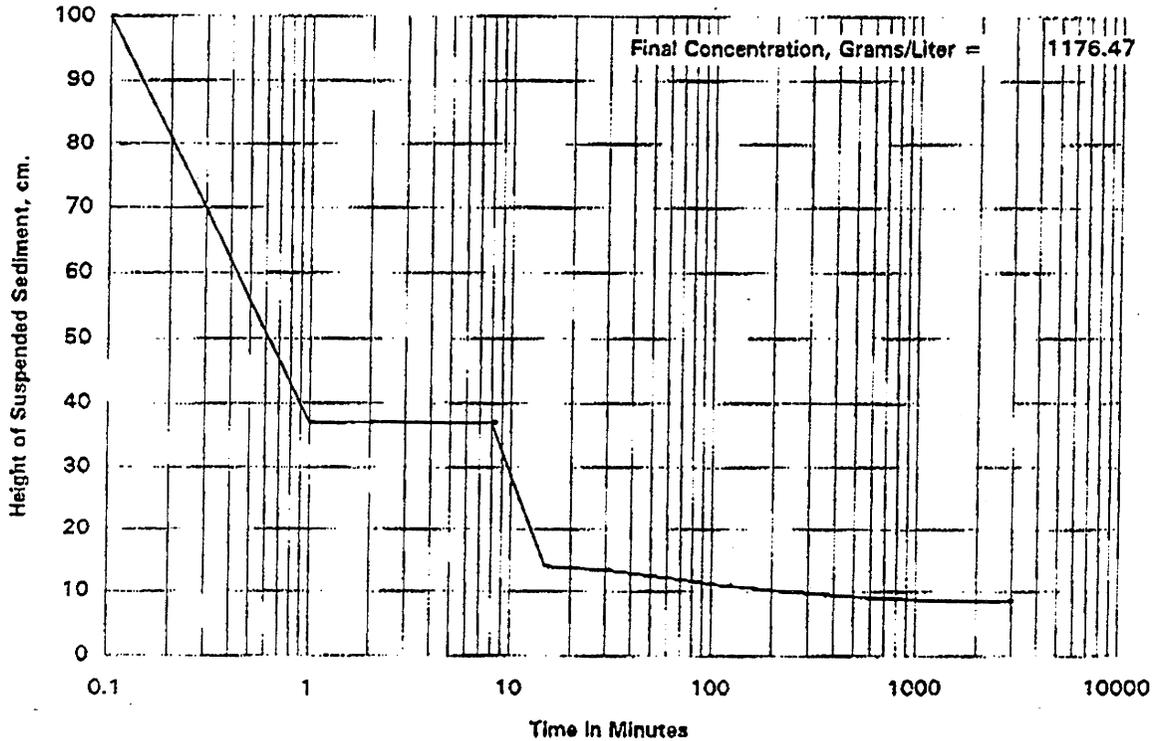


- NOTES:** 1. Test specimens (100 grams/ liter ,moist weight of specimen) suspended in sea water(salinity about 11 ppt) in 100 cm. long bottom withdrawal tubes.
2. Suspended sediment-time curves represent the contact surface between the sediment still in suspension and the "clear" water on top at the elapsed time indicated.
3. See grain-size data on enclosed gradation curve.
4. Percent Solids = 78.93

PROJECT	JACKSONVILLE DISTRICT	REQ'N NO.	8207
		W.O. NO.	W32CS570B75212
AREA	PONCE DE LEON INLET, FLA.	DATE RECEIVED	1 APRIL, 1997
		DATE REPORTED	22-Apr-97
BORING NO.	CB-PI-1A	ELEVATION	-12.5 / -14.0
SAMPLE NO.	2	LAB NO.	7317729

U.S. ARMY CORPS OF ENGINEERS
SOUTH ATLANTIC DIVISION LABORATORY
MARIETTA, GEORGIA

SUSPENDED SEDIMENT-TIME CURVE

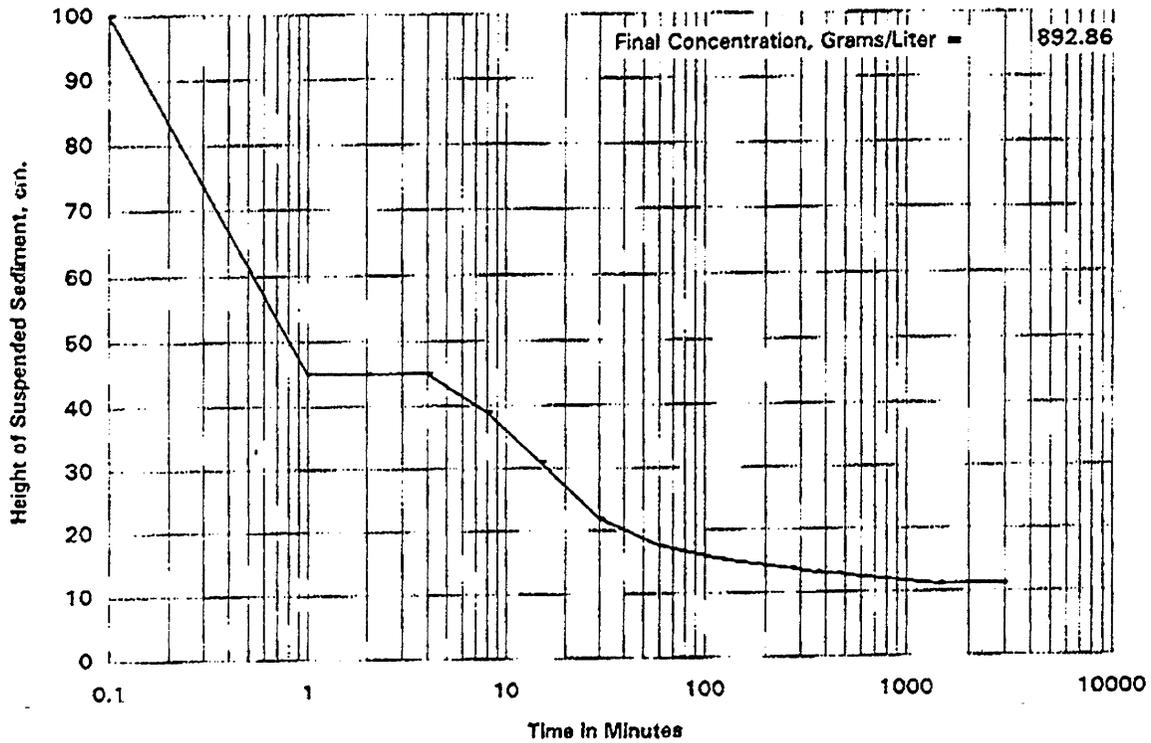


- NOTES:**
1. Test specimens (100 grams/ liter ,moist weight of specimen) suspended in sea water(salinity about 16 ppt) in 100 cm. long bottom withdrawal tubes.
 2. Suspended sediment-time curves represent the contact surface between the sediment still in suspension and the "clear" water on top at the elapsed time indicated.
 3. See grain-size data on enclosed gradation curve.
 4. Percent Solids = 78.80

PROJECT	JACKSONVILLE DISTRICT	REQ'N NO.	8207
		W.O. NO.	W32CS570875212
AREA	PONCE DE LEÓN INLET, FLA.	DATE RECEIVED	1 APRIL, 1997
		DATE REPORTED	22-Apr-97
BORING NO.	CB-PI-3	ELEVATION	-16.1 / -17.8
SAMPLE NO.	2	LAB NO.	73/7731

U.S. ARMY CORPS OF ENGINEERS
SOUTH ATLANTIC DIVISION LABORATORY
MARIETTA, GEORGIA

SUSPENDED SEDIMENT-TIME CURVE

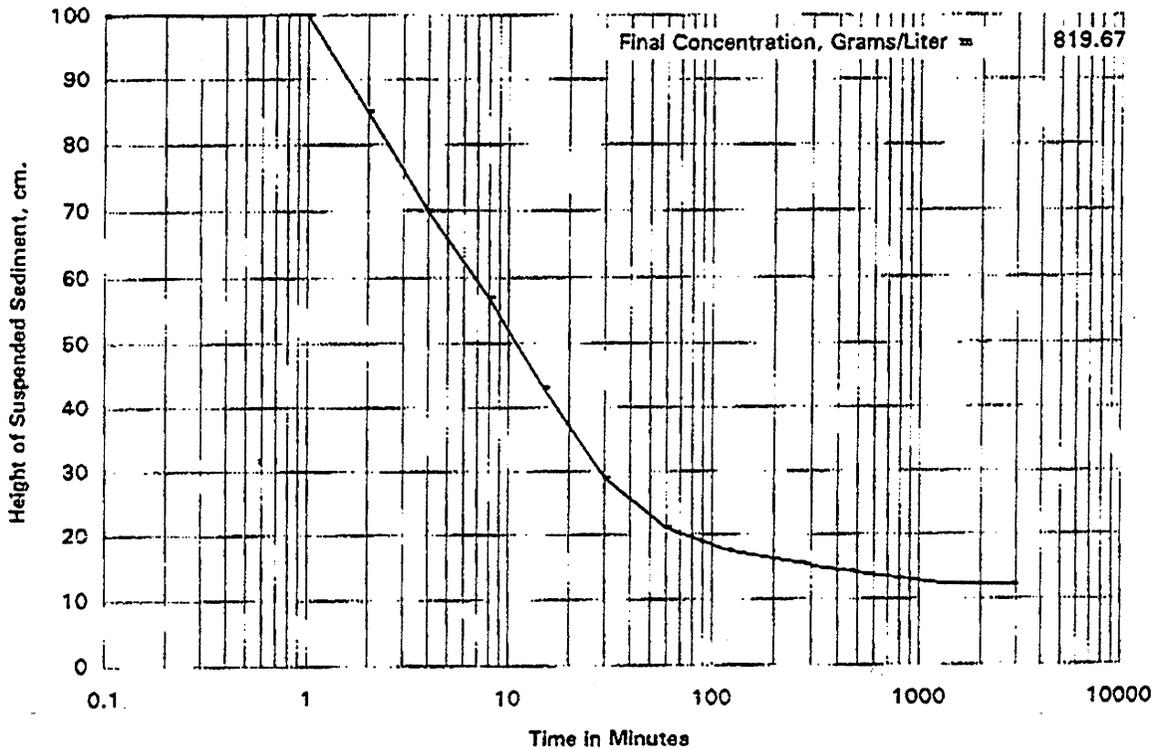


- NOTES: 1. Test specimens (100 grams/ liter ,moist weight of specimen) suspended in sea water(salinity about 16 ppt) in 100 cm. long bottom withdrawal tubes.
2. Suspended sediment-time curves represent the contact surface between the sediment still in suspension and the "clear" water on top at the elapsed time indicated.
3. See grain-size data on enclosed gradation curve.
4. Percent Solids = 72.57

PROJECT	JACKSONVILLE DISTRICT	REQ'N NO.	8207
		W.O. NO.	W32CS570875212
AREA	PONCE DE LEON INLET, FLA.	DATE RECEIVED	1 APRIL, 1997
		DATE REPORTED	22-Apr-97
BORING NO.	CB-PI-4	ELEVATION	-14.5 / -16.0
SAMPLE NO.	1	LAB NO.	73/7732

U.S. ARMY CORPS OF ENGINEERS
SOUTH ATLANTIC DIVISION LABORATORY
MARIETTA, GEORGIA

SUSPENDED SEDIMENT-TIME CURVE

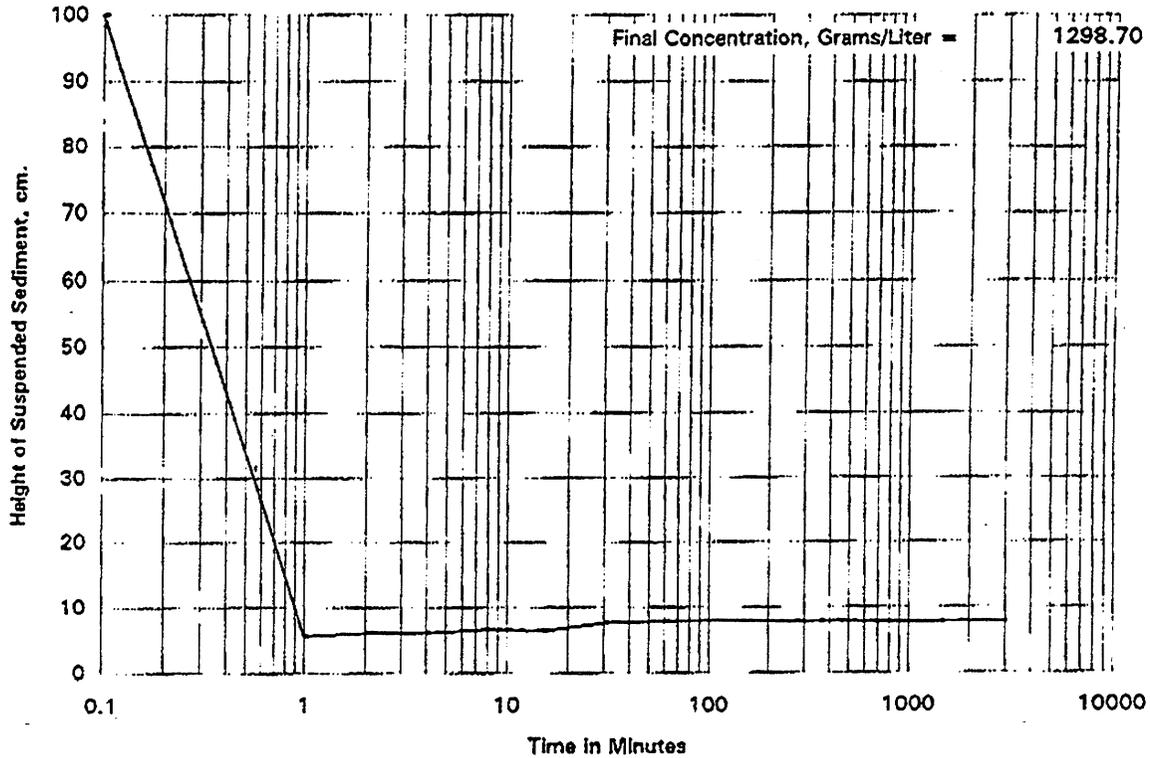


- NOTES:**
1. Test specimens (100 grams/ liter ,moist weight of specimen) suspended in sea water(salinity about 16 ppt) in 100 cm. long bottom withdrawal tubes.
 2. Suspended sediment-time curves represent the contact surface between the sediment still in suspension and the "clear" water on top at the elapsed time indicated.
 3. See grain-size data on enclosed gradation curve.
 4. Percent Solids = 68.45

PROJECT	JACKSONVILLE DISTRICT	REQ'N NO.	8207
		W.O. NO.	W32CS570875212
AREA	PONCE DE LEON INLET, FLA.	DATE RECEIVED	1 APRIL, 1997
		DATE REPORTED	22-Apr-97
BORING NO.	CB-PI-6	ELEVATION	-11.0 / -12.5
SAMPLE NO.	1	LAB NO.	73/7733

U.S. ARMY CORPS OF ENGINEERS
SOUTH ATLANTIC DIVISION LABORATORY
MARIETTA, GEORGIA

SUSPENDED SEDIMENT-TIME CURVE

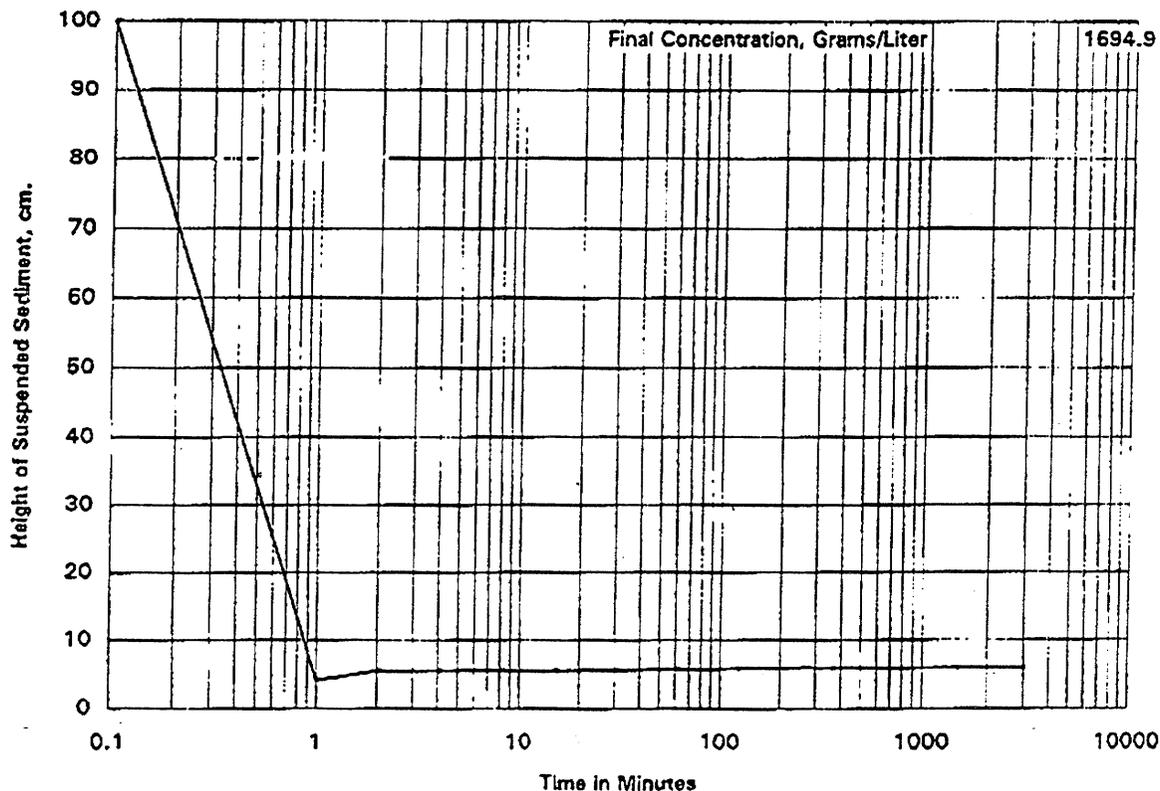


- NOTES:**
1. Test specimens (100 grams/ liter ,moist weight of specimen) suspended in sea water(salinity about 16 ppt) in 100 cm. long bottom withdrawal tubes.
 2. Suspended sediment-time curves represent the contact surface between the sediment still in suspension and the "clear" water on top at the elapsed time indicated.
 3. See grain-size data on enclosed gradation curve.
 4. Percent Solids = 78.99

PROJECT	JACKSONVILLE DISTRICT	REQ'N NO.	8207
		W.O. NO.	W32CS570875212
AREA	PONCE DE LEON INLET, FLA.	DATE RECEIVED	1 APRIL, 1997
		DATE REPORTED	22-Apr-97
BORING NO.	CB-PI-8	ELEVATION	-7.4 / -8.9
SAMPLE NO.	1	LAB NO.	73/7735

U.S. ARMY CORPS OF ENGINEERS
SOUTH ATLANTIC DIVISION LABORATORY
MARIETTA, GEORGIA

SUSPENDED SEDIMENT-TIME CURVE

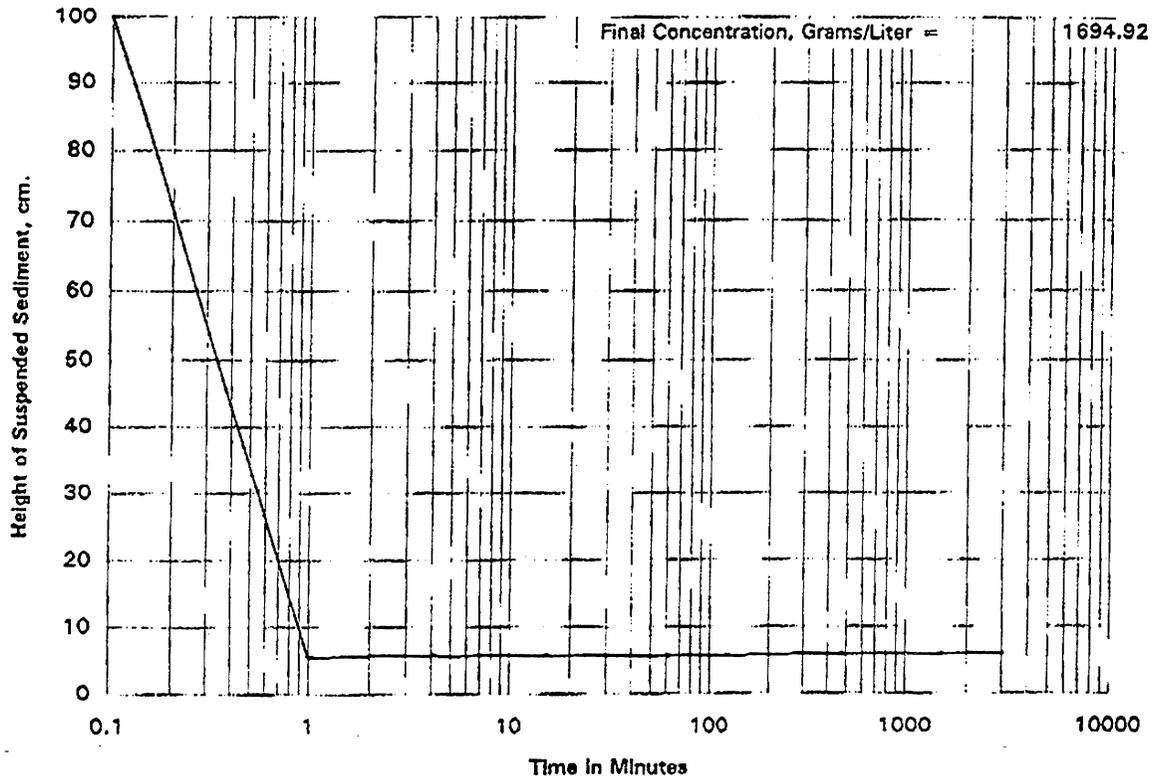


- NOTES:**
1. Test specimens (100 grams/liter, moist weight of specimen) suspended in sea water (salinity about 16 ppt) in 100 cm. long bottom withdrawal tubes.
 2. Suspended sediment-time curves represent the contact surface between the sediment still in suspension and the "clear" water on top at the elapsed time indicated.
 3. See grain-size data on enclosed gradation curve.
 4. Percent Solids = 80.45

PROJECT	JACKSONVILLE DISTRICT	REQ'N NO.	W32CS570875212
		W.O. NO.	8207
AREA	PONCE DE LEON INLET, FLA.	DATE RECEIVED	1 APRIL, 1997
		DATE REPORTED	17-Apr-97
BORING NO.	CB-PI-9	ELEVATION	-15.6 / -17.1
SAMPLE NO.	4	LAB NO.	73/7738

U.S. ARMY CORPS OF ENGINEERS
SOUTH ATLANTIC DIVISION LABORATORY
MARIETTA, GEORGIA

SUSPENDED SEDIMENT-TIME CURVE



- NOTES:**
1. Test specimens (100 grams/ liter ,moist weight of specimen) suspended in sea water(salinity about 16 ppt) in 100 cm. long bottom withdrawal tubes.
 2. Suspended sediment-time curves represent the contact surface between the sediment still in suspension and the "clear" water on top at the elapsed time indicated.
 3. See grain-size data on enclosed gradation curve.
 4. Percent Solids = 80.39

PROJECT	JACKSONVILLE DISTRICT	REQ'N NO.	8207
		W.O. NO.	W32CS570875212
AREA	PONCE DE LEON INLET, FLA.	DATE RECEIVED	1 APRIL, 1997
		DATE REPORTED	22-Apr-97
BORING NO.	CB-PI-11	ELEVATION	-11.6 / -13.1
SAMPLE NO.	1	LAB NO.	73/7739

Hole No. CB-PLI-7

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 3
1. PROJECT Ponce DeLeon Inlet	10. SIZE AND TYPE OF BIT See Remarks		
2. LOCATION (Coordinates or Station) X=523,595 Y=1723,916	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW		
3. DRILLING AGENCY Corps of Engineers	12. MANUFACTURER'S DESIGNATION OF DRILL ACKER on WB-33		
4. HOLE NO. (As shown on drawing title and file number) CB-PLI-7	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 1 undisturbed: 0		
5. NAME OF DRILLER L.C. Gregory	14. TOTAL NUMBER OF CORE BOXES 1		
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED	15. ELEVATION GROUND WATER N/A		
7. THICKNESS OF BURDEN 0 Ft.	16. DATE HOLE STARTED COMPLETED 01/31/86 02/01/86		
8. DEPTH DRILLED INTO ROCK 0 Ft.	17. ELEVATION TOP OF HOLE -5.0 Ft.		
9. TOTAL DEPTH OF HOLE 28.5 Ft.	18. TOTAL CORE RECOVERY FOR BORING 52 %		
	19. SIGNATURE OF GEOLOGIST M. Marty Goff		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC X	SAMPLE NUMBER	REMARKS	BLOWS/ ft.		
-5.0	.0					-5.0	0		
			SAND, little clay, fine grained quartz, dark gray, organic odor (SP-SC)				Settle		
								6	
								10	
								settle	
								settle	
								17	
								9	
								14	
								20	
								30	
						33	1	SPLIT SPOON	41
								-11.5	25
							51		
				N/R	2	SPLIT SPOON	31		
						-13.0	7.5		
							10		
-13.0	8.0		SAND, fine grained quartz, trace clay to -8.5, gray. (SP)	53	3	SPLIT SPOON	34		
			CLEAN, trace medium grain shell fragments			-14.5	32		
				47	4	SPLIT SPOON	37		
						-16.0	10		
				47	5	SPLIT SPOON	6		
						-17.5	9		
				80	6	SPLIT SPOON	18		
						-19.0	12.5		
				73	7	SPLIT SPOON	11		
						-20.5	9		
				N/R	8	SPLIT SPOON	17		
			Color change to greenish to gray.			-22.0	10		
				60	9	SPLIT SPOON	10		
						-23.5	7		
			Some coarse grain to gravel size shell fragments below -19.5. Trace shell fragments below -20.0.			-25.0	17.5		
				100	10	SPLIT SPOON	8		
						-26.5	16		
				53	11	SPLIT SPOON	17		
							19		
			Some sand to gravel size shell fragments.			-28.5	20		
				67	12	SPLIT SPOON	20		
							10		
							washed		
							15		
						(continued)	22.5		

Hole No. CB-PLI-7

DRILLING LOG (Cont. Sheet)		ELEVATION TOP OF HOLE		SHEET 2 OF 3			
PROJECT Ponce DeLeon Inlet		INSTALLATION Jacksonville District					
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC X	SAMPLE NUMBER	REMARKS	BLOKS/ 9'
-27.5	22.5						22.5
-28.0	23.0			67	12	-28.0 SPLIT SPOON	21
			SAND, composed, mainly of fine to coarse sized shell fragments with some fine grain quartz sand, gray. Trace gravel size shell fragments. (SP) 80% fine grain quartz with 20% coarse grain shell, trace silt. (SP)	47	13	-29.5 SPLIT SPOON	22 28 31
				53	14	-31.0 SPLIT SPOON	25
-31.5	26.5					-31.5	
				67	15	-33.0 SPLIT SPOON	27.5
-34.5	29.5		SAND, fine grain quartz with some coarse shell fragments, trace silt, (SP)	67	16	-34.5 SPLIT SPOON	
			NOTE: Soils are field visually classified in accordance with the Unified Soils Classification System.			140# Hammer with 30" drop Used on 2.0' Split Spoon. (1 3/8" I.D. X 2" O.D.)	30 32.5 35 37.5 40 42.5 45 47.5 50
(continued)							

Hole No. CB-PLI-7

DRILLING LOG (Cont. Sheet) ELEVATION TOP OF HOLE -5.0 Ft. SHEET 3 OF 3

PROJECT: Ponce DeLeon Inlet INSTALLATION: Jacksonville District

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC x	SAMPLE NUMBER	REMARKS	BLOWS/ 6'
-55.0	50.0						50
							52.5
							55
							57.5
							60
							62.5
							65
							67.5
							70
							72.5
							75
							77.5

Hole No. CB-PDLJ-2

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 3
1. PROJECT Ponce De Leon Inlet		10. SIZE AND TYPE OF BIT See Remarks	
2. LOCATION (Coordinates or Station) X=52885,818 Y=172297,567		11. DAY ON FOR ELEVATION SHOWN (TBN or HSL) Fishtail MLW	
3. DRILLING AGENCY Savannah District		12. MANUFACTURER'S DESIGNATION OF DRILL Failing 314	
4. HOLE NO. (As shown on drawing title and file number) CB-PDLJ-2		13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 33 undisturbed: 0	
5. NAME OF DRILLER C. Robbins		14. TOTAL NUMBER OF CORE BOXES 0	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		15. ELEVATION GROUND WATER	
7. THICKNESS OF BURDEN 55.3 Ft.		16. DATE HOLE STARTED COMPLETED 02/23/96 02/23/96	
8. DEPTH DRILLED INTO ROCK 0 Ft.		17. ELEVATION TOP OF HOLE -6.6 Ft.	
9. TOTAL DEPTH OF HOLE 55.3 Ft.		18. TOTAL CORE RECOVERY FOR BORING 80 %	
19. SIGNATURE OF GEOLOGIST J. AUTHOR, P.G.			

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit or Barrel	BLOWS/ '6"	
-6.6	.0					-6.6	0	
			LIGHT GRAY FINE, poorly graded quartz sand. (SP)	33	1	Split Spoon	10	
								8
								7
							12	
							13	
							21	
							13	
							15	
							15	
-11.1	4.5			Trace of small shell fragments.	73	4	Split Spoon	13
							13	
							17	
							19	
							17	
							15	
						14		
						13		
						12		
						23		
						27		
						17		
						20		
						20		
						10		
						12		
						22		
						16		
						20		
						18		
						10		
						24		
						30		
						7		
						13		
						22		
						10		
						17		
						24		
						12		
						22		
						24		
-27.6	21.0		GRAY, trace of small shell fragments.	80	15	Split Spoon	20	
						30		
						35		
						(continued)	22.5	

Hole No. CB-PDLJ-2

DRILLING LOG (Cont. Sheet)		ELEVATION TOP OF HOLE		SHEET 2				
		-6.6 Ft.		OF 3				
PROJECT			INSTALLATION					
Ponce De Leon Inlet			Jacksonville District					
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC X	SAMPLE NUMBER	REMARKS Bit or Barrel	BLOWS/10'	
-29.1	22.5			73	16	-29.1 Split Spoon	15 27	
							-30.6 30	
					73	17	-32.1 Split Spoon	22 28
							-33.6 27	48
					73	18	-35.1 Split Spoon	47
							-36.6 30	53
					85	19	-38.1 Split Spoon	47
							-39.6 39	50
					67	20	-41.1 Split Spoon	49
							-42.6 66	69
				GRAY FINE poorly grades quartz sand, trace so small shell fragments. (SP)	92	21	-44.1 Split Spoon	31
							-45.6 30	21
					80	22	-47.1 Split Spoon	15
				Trace of silt			-48.6 17	37
					87	23	-50.1 Split Spoon	39
							-51.6 25	25
					53	24	-53.1 Split Spoon	15
-42.6	36.0			GRAY FINE CLAYEY quartz sand, trace of small shell fragments (SC)	87	25	-54.6 Split Spoon	18 15
							-56.1 15	23
					47	26	-58.1 Split Spoon	14
-45.6	39.0			GRAY FAT CLAY, some fine quartz sand and small shell fragments.	40	27	-59.1 Split Spoon	7 2
							-60.1 0	0
-47.1	40.5			Trace of fine quartz sand and small shell fragments.	38	28	-61.1 Weight of Rods Drove splitspoon From 40.5' to 43.1'	0 0
							-62.1 Weight of Hammer Drove Splitspoon From, 44.6' to 47.0' and 47.0' to 48.6'	3 4
-49.7	43.1		No sand or shell fragments.	60	29	-63.1 Split Spoon	6 0	
						-64.1 0	0	
				71	30	-65.1 Split Spoon	0 0	
						-66.1 0	0	
				100	31	-67.1 Split Spoon	0 0	
						-68.1 0	0	
				80	32	-69.1 Split Spoon	9 9	
						-70.1 8	8	
-55.2	48.6		Trace of fine quartz sand and small shell fragments.	87	33	-71.1 Split Spoon	12 13	
						-72.1 13		
						(continued)		

DRILLING LOG (Cont. Sheet)		ELEVATION TOP OF HOLE -6.6 Ft.		SHEET 3 OF 3			
PROJECT Ponce De Leon Inlet			INSTALLATION Jacksonville District				
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC X	SAMPLE NUMBER	REMARKS Bit or Barrel	BLOWS/ 6'
-56.6	50.0						50
-58.2	51.6		GRAY AND LIGHT GRAY, some brown streaks, trace of fine to coarse calcareous sand.				
			WASH				52.5
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System.			140# Hammer with 30" drop used 2.0' split spoon (1 3/8" I.D. X 2" O. D.)	55
							57.5
							60
							62.5
							65
							67.5
							70
							72.5
							75
							77.5

Hole No. CB-PDLJ-3

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 2
1. PROJECT Ponce De Leon Inlet		10. SIZE AND TYPE OF BIT See Remarks	
2. LOCATION (Coordinates or Station) X=52835,373 Y=172296,608		11. DATUM FOR ELEVATION SHOWN (TBM or NSL) Fishtail MLW	
3. DRILLING AGENCY Savannah District		12. MANUFACTURER'S DESIGNATION OF DRILL Failing 314	
4. HOLE NO. (As shown on drawing title and file number) CB-PDLJ-3		13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 24 undisturbed: 0	
6. NAME OF DRILLER C. Robbins		14. TOTAL NUMBER OF CORE BOXES 0	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		15. ELEVATION GROUND WATER	
7. THICKNESS OF BURDEN 36.0 Ft.		16. DATE HOLE STARTED COMPLETED 02/22/86 02/22/86	
8. DEPTH DRILLED INTO ROCK 0 Ft.		17. ELEVATION TOP OF HOLE -7.5 Ft.	
9. TOTAL DEPTH OF HOLE 36.0 Ft.		18. TOTAL CORE RECOVERY FOR BORING 78 %	
		19. SIGNATURE OF GEOLOGIST J. AUTHOR, P.G.	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit or Barrel	BLOWS/ ft.
-7.5	.0					-7.5	0
		[Dotted Pattern]	Light gray fine poorly graded quartz sand (SP)	73	1	Split Spoon	31
				47	2	Split Spoon	49
				53	3	Split Spoon	15
							17
							14
							18
							15
							17
							14
							17
-12.0	4.5		Trace of small shell fragments	53	4	Split Spoon	11
					15	5	
					16		
-13.5	6.0		Some small shell fragments	60	5	Split Spoon	13
					16		
					17	7.5	
					10		
					17		
					18		
					16		
					20	10	
					25		
					14		
					23		
					30		
					17	12.5	
					29		
					39		
					17		
-21.0	13.5		Trace of small shell fragments	73	10	Split Spoon	30
					30		
					31	15	
					14		
					31		
					52		
					29		
					40	17.5	
					35		
-25.5	18.0		No shell fragments	73	13	Split Spoon	25
					41		
					28	20	
					41		
					45		
					24		
					29		
					28	22.5	
					28		
					(continued)		

Engineering Appendix
Enclosure 2
Cost Estimates

COST ESTIMATE

1,000-Foot South Jetty Extension

Ponce de Leon Inlet
Feasibility Report
Volusia County, Florida

Designed By: Jacksonville District Office
Estimated By: M Fascher

Prepared By: M Fascher

Preparation Date: 08/21/97
Effective Date of Pricing: 05/29/97

Sales Tax: 6.00%

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Release 5.30A

Descriptions of Project:

This Contract consists of construction of a 1,000 lf Seaward Extension of the South Jetty.

Detailed breakdowns were used for E&D and S&A. These were provided by the technical manager after coordination with the appropriate offices.

Contingencies:

20% Contingencies were used for Construction Costs in the Jetty estimate due to the unpredictable availability of Marine Equipment.

Fri 11 Sep 1998
Eff. Date 05/29/97
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U.S. Army Corps of Engineers
PROJECT PDL817: Ponce de Leon Inlet - Feasibility Report

TIME 10:53:55

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No Detailed Estimate...

No Backup Reports...

* * * END TABLE OF CONTENTS * * *

** PROJECT OWNER SUMMARY - UserDefi **

	QUANTITY	UOM	CONTRACT	CONTING	TOTAL COST	UNIT COST

01 South Jetty Extension						
01- A Construction Cost						
01- A/10 Breakwaters and Seawalls						
01- A/10.00 Breakwaters & Seawalls						
01- A/10.00.01 Mob, Demob & Preparatory Work						
01- A/10.00.01/01 Mob, Demob & Preparatory Work			33,338	6,668	40,006	
			-----	-----	-----	
TOTAL Mob, Demob & Preparatory Work			33,338	6,668	40,006	
01- A/10.00.46 Breakwaters						
01- A/10.00.46/J1 Armor Stone (10-ton)	32740.00	TNS	2,462,142	492,428	2,954,570	90.24
01- A/10.00.46/J2 Core & Scour Stone (500-2500#)	12856.00	TNS	932,713	186,543	1,119,256	87.06
01- A/10.00.46/J3 Bedding Stone	10307.00	TNS	654,308	130,862	785,170	76.18
01- A/10.00.46/J4 Filter Fabric	11780.00	SY	51,928	10,386	62,314	5.30
01- A/10.00.46/J5 Excavation	25000.00	CY	47,894	9,579	57,473	
			-----	-----	-----	
TOTAL Breakwaters			4,148,985	829,797	4,978,783	
			-----	-----	-----	
TOTAL Breakwaters & Seawalls			4,182,324	836,465	5,018,788	
			-----	-----	-----	
TOTAL Breakwaters and Seawalls			4,182,324	836,465	5,018,788	
			-----	-----	-----	
TOTAL Construction Cost			4,182,324	836,465	5,018,788	
01- B Non-Construction Cost						
01- B/01 Lands and Damages			20,000	5,000	25,000	
			-----	-----	-----	
TOTAL Lands and Damages			20,000	5,000	25,000	
01- B/20 Permanent Operating Equipment						
01- B/20.00 Permanent Operating Equipment						
01- B/20.00.99 Associated General Items						
01- B/20.00.99/01 Navigation Aids			11,667	2,333	14,000	
			-----	-----	-----	
TOTAL Associated General Items			11,667	2,333	14,000	
			-----	-----	-----	

** PROJECT OWNER SUMMARY - UserDefi **

	QUANTITY UOM	CONTRACT	CONTING	TOTAL COST	UNIT COST
TOTAL Permanent Operating Equipment		11,667	2,333	14,000	
TOTAL Permanent Operating Equipment		11,667	2,333	14,000	
01- B/30 Planning, Engineering and Design		122,917	24,583	147,500	
01- B/31 Construction Management (S&I)		206,792	41,358	248,150	
TOTAL Non-Construction Cost		361,376	73,275	434,651	
TOTAL South Jetty Extension		4,543,700	909,740	5,453,439	

Fri 11 Sep 1998

U.S. Army Corps of Engineers

TIME 10:53:55

Eff. Date 05/29/97

PROJECT PDL817: Ponce de Leon Inlet - Feasibility Report

ERROR PAGE 1

ERROR REPORT

No errors detected...

* * * END OF ERROR REPORT * * *

APPENDIX B

REAL ESTATE

6/96
rev 1/97
rev 7/97
rev 11/97
rev 5/98
rev 7/98
rev 1/99

**REAL ESTATE PLAN FOR PONCE DE LEON INLET, FLORIDA
VOLUSIA COUNTY, NAVIGATION STUDY
FEASIBILITY REPORT**

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**REAL ESTATE PLAN FOR PONCE DE LEON INLET, FLORIDA
VOLUSIA COUNTY, NAVIGATION STUDY
FEASIBILITY REPORT**

1. Statement of Purpose.

a. The purpose of the Ponce De Leon Feasibility Report is to evaluate the stability, maintenance and related navigation problems in the Ponce De Leon Inlet area and provide a solution for the continued inlet stability problems endangering uplands within project areas.

b. This Real Estate Plan is only for planning purposes and both the final real property acquisition lines and estimates of value are subject to change even after approval of this report.

2. Project Authorization.

a. A resolution from the Committee on Public Works and Transportation, United States House of Representatives, dated May 21, 1991, provides the study authority as follows.

"Resolved by the Committee on Public Works and Transportation of the United States House of Representatives, That the Board of Engineers for Rivers and Harbors, is requested to review the report of the Chief of Engineers on Ponce De Leon Inlet, Florida published as House Document 74, Eighty-ninth Congress, First Session, and other pertinent reports, to determine whether modifications of the recommendations contained therein are advisable at the present time, in the interest of navigation and other purposes."

b. Approval of the reconnaissance report in December 1993 and receipt of funds in April 1994 enabled the continuation of the study process to determine the feasibility of a Federal navigation improvement for that area.

3. Project Location.

Ponce De Leon Inlet is located on the east coast of Florida approximately 10 miles south of the city of Daytona Beach. The inlet is a natural harbor connecting the Halifax River to the Atlantic Ocean and the Indian River North. Fishing parties, commercial and recreational, bound for New Smyrna Beach or Daytona Beach use the inlet, as well as others entering for

anchorage. In the area of Ponce De Leon Inlet, the Intracoastal Waterway traverses the Halifax River to the north and the Indian River to the south except near the Ponce De Leon Inlet. At the inlet, the waterway follows a cut through the marshes about a mile to the west. The project area is bounded on the north and south by jetties, and is located in Township 16, Range 34 East. The northern limit of the project area is located within Lighthouse Point Park, a state owned spit of land which extends south of Ponce De Leon's north jetty. The southern project limit is the south jetty. See Exhibit "2" Vicinity Map.

4. Project Description.

a. Existing Project

The existing navigation project was authorized in the Rivers and Harbors Act of October 1965. That project consists of an entrance channel which provides access to a northwesterly channel along the Halifax River and a southeasterly channel along the Indian River. Both inner harbor channels connect with the Intracoastal Waterway. The authorized project includes:

1. An entrance channel 15' deep x 200' wide across the ocean bar.
2. A channel 12' deep by 200' wide in the inlet.
3. A channel 12' deep by 100' wide inside the inlet and southward in the Indian River to the Intracoastal Waterway.
4. A channel 7' deep by 100' wide northward in the Halifax River.
5. Ocean Jetties about 4,200' long and about 2,700' long on the north and south sides respectively.
6. A weir in the north jetty with an impoundment basin just to the south for accumulating littoral drift material for transport across the inlet to the south by use of a conventional pipeline dredge.

b. Recommended Plan

The recommended or selected plan was derived from the following alternatives:

1. Plan A - South Jetty Extension. This option calls for the extension of the south jetty 1000' parallel to the north jetty.

2. Plan B - North Jetty Weir Opening. This option calls for the reopening of the north jetty weir, looking at dimensions of 500' to 1500'.

3. Plan C - Channel Realignment. This plan calls for the realigning of the 12' deep by 200' wide engineered channel through the sand spit west of the north jetty. This plan also includes the revetment along the north shoreline of the proposed channel to tie back with the north jetty.

4. Plan D - Groin Field. This plan calls for the placement of a groin field along the north sand spit before it becomes completely eroded away.

5. Plan E - Landward north jetty extension (Maintenance). This option calls for the 800' landward extension of the north jetty.

6. Plan F - Revetment. This plan calls for the placement of a 1500' revetment along the north shore of the breakthrough area, tying into the landward extension of the north jetty extension as described above.

7. Plan G - This plan calls for an extension of the south portion of the Ponce De Leon Inlet Federal channel in the Indian River to about Cut-24 of the IWW. The proposal realigns this Indian River portion to existing deep water and considers deepening the Intercoastal Waterway extension from 12 feet to about 16 feet.

c. The selected plan and the Local Sponsor preferred plan is Plan A.

5. Government-Owned Land.

a. The Federal government has interest in a tentative staging upland site. The government owns the upland site, Smyrna Dunes Park, approximately 250 acres, which it leases to the sponsor. The sponsor has utilized this park for past maintenance to the Ponce De Leon Inlet. This site is located outside of the project construction limits.

b. The Federal government has a perpetual pipeline and stockpile area easement over approximately 240.80 acres. These lands have been previously used in the construction and maintenance of the Ponce De Leon Inlet and are located within the project construction limits.

c. The Federal government has a perpetual right-of-way easement over approximately 388.17 acres. These lands have been previously used in the construction and maintenance of the Ponce De Leon Inlet and are located within the project construction limits.

d. The Federal government has a perpetual pipeline easement over approximately 7.34 acres within the project construction limits. These lands have been previously used in the construction and maintenance of the Ponce De Leon Inlet.

e. The Federal government owns in fee approximately 2.79 acres located outside of the project construction limits. These lands have been previously used in the construction and maintenance of the Ponce De Leon Inlet.

6. Non-Federally-Owned Land.

a. The State of Florida owns Lighthouse Point Park where the revetment, north jetty landward extension and a tentative staging site will be located.

b. The sponsor, Ponce De Leon Inlet Port Authority, currently leases from the State of Florida approximately 60 acres of land located in Lighthouse Point Park. These leased lands comprise the areas where the construction of the revetment, north jetty landward extension and a tentative staging site will occur. The sponsor intends to modify its existing lease with the State to construct the project features affected by State ownership, while retaining sufficient rights to perform operation and maintenance for the life of the project.

c. The sponsor has interests in an additional upland site that may be used as a staging area. The tentative staging site is the former Swoope Power Plant, owned by The City of New Smyrna Beach, with approximately 1.5 acres leased to the sponsor. The sponsor has utilized this site in connection with its Artificial Reef Program.

7. Real Estate Requirements.

a. Lands required for this project include access areas, staging areas and stockpile areas. Access to any staging or stockpile areas will be via barge or public access. Three possible areas containing .25 acre each have been identified for staging and/or stockpile areas. Temporary work area easements are required for the areas not owned by the Federal government. A permit is required for the area owned by the Federal government.

b. Lands needed for the placement of revetment and the landward jetty extension will require a perpetual revetment easement for the area located landward of the mean high water line. For lands below the mean high water line, the government will exercise paramount jurisdiction through navigational servitude.

8. Non-Federal Operation/Maintenance Responsibilities.

The non-Federal sponsor is responsible for a portion of the operation, maintenance, repair, rehabilitation and replacement (OMRR&R) costs for the south jetty extension. The present worth of the non-Federal share of OMRR&R costs for the south jetty extension is estimated to be \$180,000. This amount will be put into an interest-bearing escrow account with funds in the account available for the non-Federal portion of OMRR&R costs associated with the south jetty extension.

9. Non-Federal Authority to Participate in the Project.

The Ponce De Leon Port Authority, a public body, was created by Chapter 65-2363 Laws of Florida, as amended by Chapter 69-1705. Chapter 315.03 empowered port authorities with the rights to acquire by purchase, grant, gift or lease or by the exercise of the right of eminent domain for or in connection with any port facility; to fix and collect rates, rentals, fees and other charges; to borrow money, to issue bonds or other obligations to finance all or any part of such acquisition or construction; to contract with the United States; etc.

10. Appraisal Information.

No appraisal was required based on the alternatives presented. All lands required for the project have been previously provided as an item of local cooperation for a Federal Project. Therefore, the sponsor will receive no credit for the value of the lands.

11. Minerals.

There are no known minerals of value in the proposed project area.

12. Hazardous and Toxic Wastes (HTW).

There are no known hazardous and toxic wastes in the project area.

13. Relocation Assistance Payments (Public Law 91-646).

No persons or businesses will require relocation.

14. Timber and Vegetative Cover.

There will be no timber or vegetative cover affected.

15. Recreation Lands.

There are no separable recreational lands identified for the project.

16. Relocations, Alterations, Vacations, and Abandonment's (Public Law 85-500).

No governmental structures or facilities that come within the purview of Section 111 of the Rivers and Harbors Act of 1958 (PL 85-500) approved 3 July 1958 will be affected by the project.

17. Cultural Resources.

There are no cultural resources identified for the project.

18. Acquisition/Administrative Costs.

a. The estimate of the Federal acquisition/administrative cost is \$10,000. This figure includes project real estate planning, review and monitoring costs.

b. The local sponsor will receive credit towards its share of administrative project costs incurred for providing the estates needed for the project. Non-Federal sponsor administrative costs are estimated to be \$10,000.

19. Summary of Real Estate Costs.

a.	Lands:	0
	Improvements:	0
	Severance Damages:	0
	Minerals:	0
	Total Lands and Damages	0
b.	Acquisition/Administrative	
	Federal	10,000
	Non-Federal	10,000
c.	Public Law 91-646	0
d.	25% Contingency	5,000
e.	Total Real Estate Cost	\$ 25,000

20. Real Estate Acquisition Schedule.

The non-Federal sponsor intends to modify its existing lease with the State of Florida as applicable, to construct the revetment, landward extension of the north jetty, and obtain rights for a tentative staging area as described in this report while retaining sufficient rights to perform operation and maintenance for the life of the project. Administrative time required to prepare and review land certifications is estimated at 180 days.

21. Estates to be Acquired. The following estate descriptions will be used and are as follows:

a. Temporary Work Area Easement.

A temporary easement and right-of-way in, on, over and across (the land described in Schedule A) (Tracts Nos. ___ and ___), for a period not to exceed twenty-four months, beginning with date possession of the land is granted to the Project Sponsor, for use by the Project Sponsor, its representatives, agents, and contractors as a work area, including the right to move, store and remove equipment and supplies, and erect and remove temporary structures on the land and to perform any other work necessary and incident to the construction of the Ponce De Leon Navigation Project, together with the right to trim, cut, fell and remove therefrom all trees, underbrush, obstructions, and any other vegetation, structures, or obstacles within the limits of the

right-of-way; reserving, however, to the landowners, their heirs and assigns, all such rights and privileges as may be used without interfering with or abridging the rights and easement hereby acquired; subject, however, to existing easements for public roads and highways, public utilities, railroads and pipelines.

b. Retement Easement.

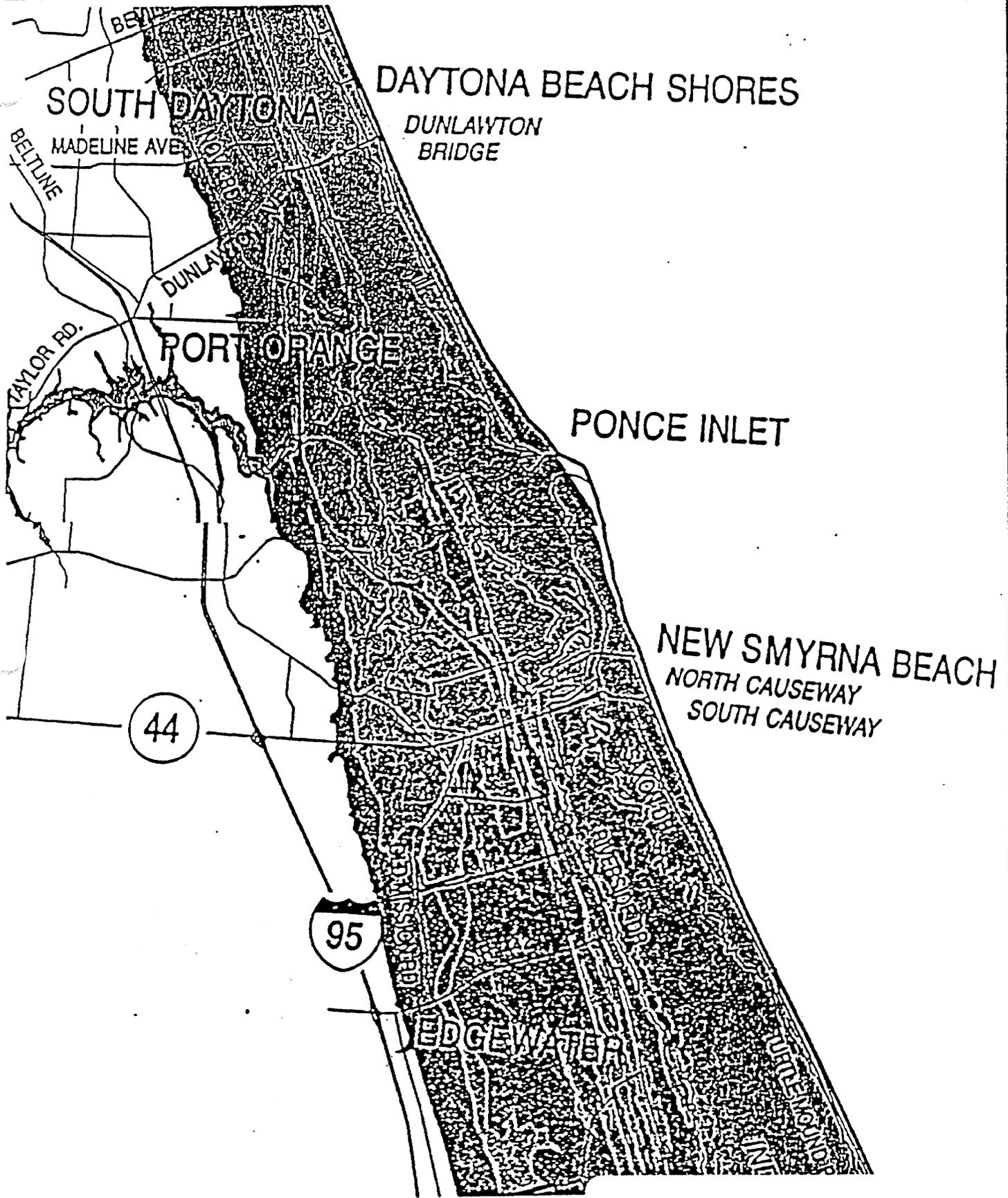
A perpetual and assignable right and easement in (the land described in Schedule A) (Tracts Nos. ____, ____ and ____) to construct, maintain, repair, operate, patrol and replace a revetment, including all appurtenances thereto; reserving, however, to the owners, their heirs and assigns, all such rights and privileges in the land as may be used without interfering with or abridging the rights and easement hereby acquired; subject, however, to existing easements for public roads and highways, public utilities, railroads and pipelines.

22. Maps.

A vicinity map of the proposed project area and a real estate GIS map are enclosed with this report as Exhibits Nos. 1 and 2 respectively.

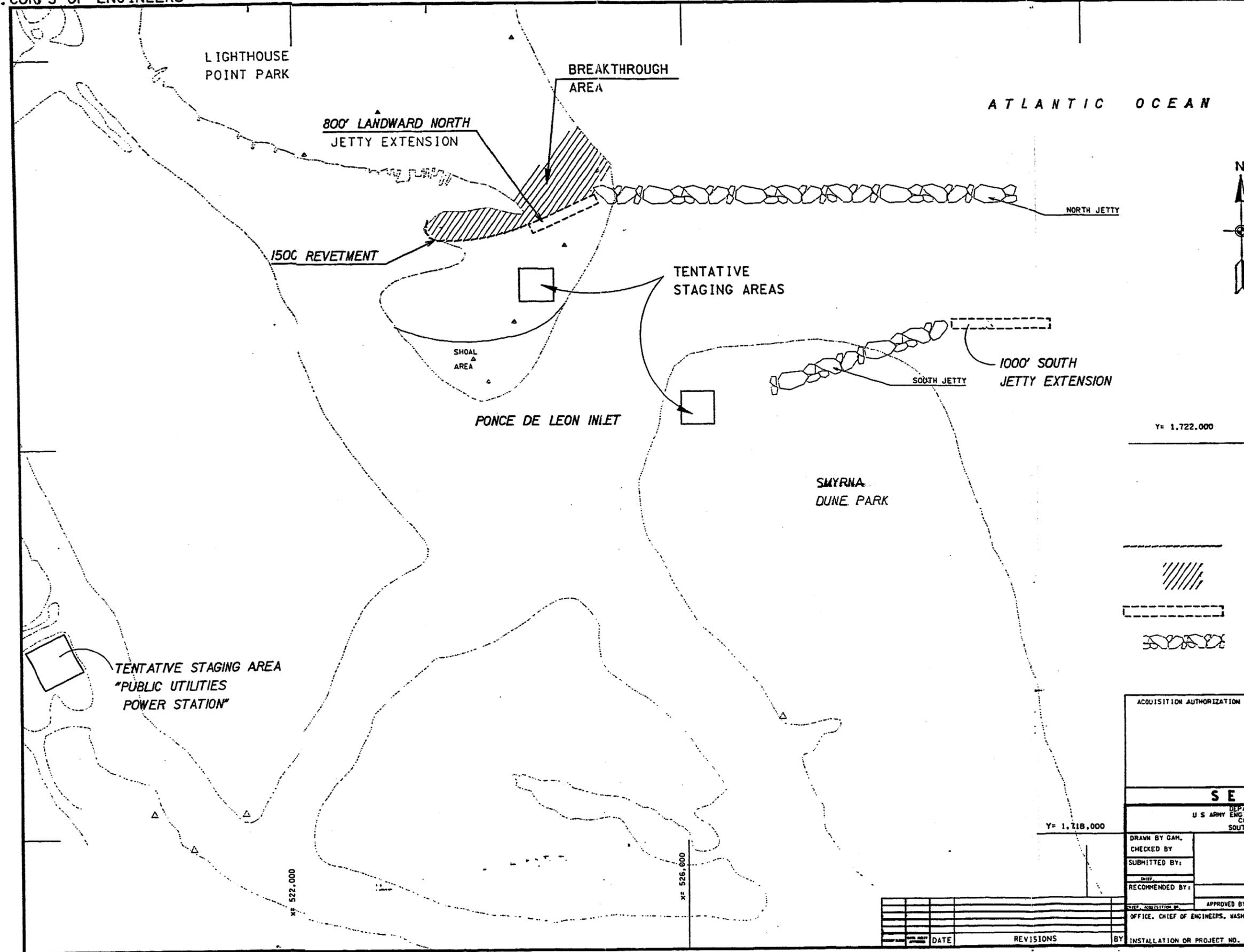
**REAL ESTATE CHART OF ACCOUNTS
PONCE DE LEON INLET**

01	LANDS AND DAMAGES		
01A00	PROJECT PLANNING (FEDERAL)	\$	6,000
01B--	ACQUISITIONS		
01B20	BY PROJECT SPONSOR (NON-FEDERAL)	\$	6,000
01B40	REVIEW OF PROJECT SPONSOR (FEDERAL)	\$	4,000
01E--	APPRAISALS		
01E30	BY PROJECT SPONSOR (NON-FEDERAL)	\$	0
01E50	REVIEW OF PROJECT SPONSOR (FEDERAL)	\$	0
01R--	REAL ESTATE PAYMENTS	\$	0
01R10	LAND PAYMENTS		
01R1B	BY PROJECT SPONSOR	\$	0
01M00	Project Related Administration	\$	4,000
TOTAL REAL ESTATE COSTS EXCLUDING CONTINGENCIES			<u>\$20,000</u>
	REAL ESTATE CONTINGENCIES (25%)	\$	5,000
TOTAL PROJECT REAL ESTATE COST (ROUNDED)		\$	<u>25,000</u>



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EXHIBIT "1"



PRELIMINARY PROJECT MAP

DEPT OF THE ARMY
USING SERVICE CORPS OF ENGINEERS

LOCATION OF PROJECT

STATE FLORIDA
COUNTY
DIVISION SOUTH ATLANTIC
DISTRICT JACKSONVILLE
ARMY AREA THIRD
MILES OF
MILES OF

TRANSPORTATION FACILITIES

RAILROADS SEABOARD COAST LINES
STATE ROADS
FEDERAL ROADS
AIR LINES

LEGEND

RESERVATION LINE
RESERVATION LINE (ACTUAL SURVEY)
TRACT BOUNDARY LINE
TRACT NUMBER
CONTOUR LINE
DISPOSAL
EXTENDED OWNERSHIP LINE

SEGMENT I

DEPARTMENT OF THE ARMY
ENGINEER DISTRICT JACKSONVILLE
CORPS OF ENGINEERS
SOUTH ATLANTIC DIVISION

NEV SMYRNA, FLORIDA
REAL ESTATE PLANNING MAP
PONCE DE LEON INLET

DRAWN BY GAM,
CHECKED BY
SUBMITTED BY
RECOMMENDED BY

APPROVED BY: DATE
OFFICE, CHIEF OF ENGINEERS, WASHINGTON D C

GRAPHIC SCALE
SHEET OF DRWG NO.

DATE	REVISIONS	BY	INSTALLATION OR PROJECT NO.

APPENDIX C

PERTINENT CORRESPONDENCE

APPENDIX C

PERTINENT CORRESPONDENCE

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APPENDIX C

PERTINENT CORRESPONDENCE

The study coordination effort was to keep the public informed and obtain feedback. The study participants are listed in this appendix along with the public views and comments obtained during the study.

STUDY PARTICIPANTS

Accomplishment of the study involved close coordination between the Corps of Engineers and the sponsor. The Corps of Engineers conducted the study, consolidated information from other agencies, formulated plans, and coordinated study findings at various points during the study. Coordination involved the following Federal and State agencies in addition to local interest and the sponsor, the Ponce DeLeon Port Authority of Volusia County.

FEDERAL

Fish and Wildlife Service
United States Coast Guard

STATE

Game and Fresh Water Fish Comm.
Dept. of Environmental Protect.
Dept. of Natural Resources
Office of the Governor
Department of Commerce
Department of State
Division of Historical Resources

WRITTEN COORDINATION AND RESPONSES

Coordination with local interests involved field visits and local interviews to obtain their views and provide information. A feasibility study Technical Review Conference occurred on July 12, 1995. A public meeting/workshop was held on July 24, 1997, sponsored by the Volusia County Council Port Authority Advisory Board. Coordination efforts to gather information and obtain comments and responses on various plans are in the letters following this page.



City of New Smyrna Beach

July 16, 1996

Mr. Richard Powell, CESAJ-PD-PN
U.S. Army Corps of Engineers
Jacksonville District
P.O. Box 4900
Jacksonville, Fl. 32232-0019

Dear Mr. Powell:

Thank you for the opportunity to discuss waterfront development options in the City of New Smyrna Beach. As requested I have enclosed a copy of a recent market study done for the City. This study has an emphasis toward recreational boating since improvements in facilities serving this market are among our short-term priorities. However, there is some market data on charter fishing, and, as we discussed, we are in the planning stages of the development of a facility on the North Causeway which would cater to this market. Implementation of a project of this type is not expected for three to five years depending on funding and permitting activities, but the study shows that such a facility could be economically viable.

The other prime water-related site is the power plant site located east of our airport. This site has been the topic of many proposals over the years, and continues to be investigated by prospects interested in waterfront industrial activity, gambling cruises and other types of water oriented commercial and industrial activity. The City has tried to maintain a flexible posture toward the use of this site, and we would be willing to consider modification of the current land use and zoning if required by a quality project. We do expect the ultimate development of this site to be some type of economic generator related to water activity.

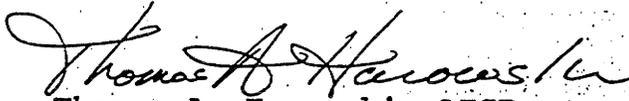
I do not have any information on the commercial fishing market that might be useful. With an improved inlet access additional commercial fishermen may desire to use local

Mr. Richard Powell
July 16, 1996
Page 2

facilities. If current facilities are inadequate, we would certainly consider the use of all or a portion of the power plant site for the development of supporting land-side operations that would serve the fishermen.

I hope this information has been helpful. If you need additional data or have other questions, please feel free to contact us.

Sincerely,


Thomas A. Harowski, AICP
Development Services Director

cc: F. Roberts
D. O'Brien

February 14, 1992

Mr. Marvin Bailey
Chief, Navigation Branch
Planning Division
Jacksonville District Corps of Engineers
P.O. Box 4970
Jacksonville, FL 32232

Re: Phase III Technical Addendum, Ponce DeLeon Inlet Management Program

Dear Mr. Bailey:

Enclosed is a copy of our completed report referenced above. This document summarizes the work performed by Taylor Engineering, Inc. during the past year as part of our ongoing technical evaluation of the performance of the Ponce DeLeon navigation project. As such the enclosed document has been designated as a technical addendum to our 1990 report referenced as follows:



Taylor, R. B., M.A. Yanez, T.J. Hull and W.F. McFetridge, "Engineering Evaluation of Ponce DeLeon Inlet, Final Phase II Report," Taylor Engineering, Inc., Jacksonville, FL, May, 1990

We hope that the information contained in this document will be of assistance to you in the performance of your ongoing reconnaissance study of Ponce DeLeon Inlet. I look forward to receiving your comments regarding our work. After you have reviewed the enclosed report, we would appreciate the opportunity to meet with you and your staff to discuss our findings and to answer any questions that you might have. Thank you for your interest and efforts.

Sincerely,

R. Bruce Taylor, Ph.D., P.E.
President

:blm

enclosure

cc: Dan O'Brien

Mid-Atlantic Technology

P. O. Box 4067
Wilmington, North Carolina 28406-1067
910 675-8270

4 July 1995

Janice Adams
Archeologist
Planning Division/CFSAJ-PD-ER
Jacksonville District Office
U.S. Army Corps of Engineers
P.O. Box 4970
Jacksonville, Florida 32232-0019

Re: Executive Summary – Professional Services to conduct Diver Investigations of Seven Potentially Significant Magnetic Anomalies in the Vicinity of Ponce de Leon Inlet, Volusia County, Florida.
Contract Number: DACW17-95-M-0980

Dear Ms. Adams:

Mid-Atlantic Technology conducted field investigations for the above-referenced project from 25 through 29 June 1995. The objectives of the investigations were to physically relocate, identify, and assess the archeological significance of the materials producing magnetic anomalies in Ponce de Leon Inlet. The seven targets, Ponce F through Ponce M, were originally identified in a remote sensing survey conducted by Mid-Atlantic Technology on 23 and 24 February 1995.

Mid-Atlantic Technology returned to the anomalies' coordinates with the aid of an onboard computer navigation system interfaced with a Differential Global Positioning System (DGPS) and a Geometrics 866 marine magnetometer. The DGPS consisted of a NavStar™ receiver system that operated with an UHF radio link and interfaced with a 486 PC computer system. The computer system was operated with HYPACK hydrographic survey software, which was used to return to target/anomaly coordinates. The magnetometer was used to relocate target/anomaly signatures.

As the magnetic anomalies were rediscovered, buoys were dropped as closely as possible to the target in order to triangulate the source of each target signature. Once the source had been marked by a buoy, the vessel was anchored nearby and divers were sent down a buoy line to identify the material producing the signature. If the material producing the target signature was not exposed on the bottom surface, the divers used probes to locate the target below the bottom surface. If the object was buried, a water-powered jet probe and induction dredge were used to excavate test holes down to the object.

All of the following seven target signatures were relocated and identified:

Target ID

State Plane Coordinates

Ponce F

X=528,578

Y=1,723,314

Target Ponce F was identified as an 18-inch dredge pipe, of undetermined length, and at least one dredge pipe coupler. The pipe was buried in 6 feet of loose sand. Divers exposed a 3-foot-long section of the pipe to confirm its identity. Once exposed, a jet was used to probe along its length until the coupler was located.

Ponce G

X=529,164

Y=1,723,444

Target Ponce G was identified as a steel anchor weight and cable. The object was buried 5 feet below the bottom surface in loose sand. It was identified by probing, to and around the anchor, with a 10-foot-long jet probe.

Ponce H

X=528,598

Y=1,723,155

Target Ponce H was identified as an 18-inch dredge pipe of undetermined length. The pipe was buried in 7 feet of loose sand. It was identified by probing, to and along the pipe, with a 10-foot-long jet probe.

Ponce I

X=529,020

Y=1,723,233

Target Ponce I was identified as an approximately 3-foot by 3-foot steel anchor weight with chain, of undetermined length. The object was buried 6 to 7 feet below the bottom surface in loose sand. It was identified by probing, to and around the anchor, with a 10-foot-long jet probe.

Ponce J

X=529,671

Y=1,723,490

Target Ponce J was identified as a large, steel anchor (possibly Navy type). The anchor was buried 5 feet below the bottom surface in loose sand. It was identified by excavating with a handheld dredge and probing, to and around the anchor, with a 10-foot-long jet probe.

Ponce K

X=528,675

Y=1,722,950

Target Ponce K was identified as an approximately 3-foot by 3-foot steel anchor, of undetermined length. The object was buried 8 feet below the bottom surface in loose sand. It was identified by probing, to and around the anchor, with a 10-foot-long jet probe.

Ponce M**X=528,998****Y=1,722,904**

Target Ponce M was identified as an approximately 3-foot by 3-foot steel anchor weight, of undetermined length, and other debris including chain and a small, steel plate, of undetermined size. The object was buried 7 feet below the bottom surface in loose sand. It was identified by probing, to and around the anchor, with a 10-foot-long jet probe.

None of the objects identified have any archeological significance, and, therefore, do not meet any criteria for nomination to the National Register of Historic Places. No further investigations are recommended.

If you have any questions or need further information please contact me.

Sincerely yours,



Wes Hall
Mid-Atlantic Technology



County of Volusia

Ponce DeLeon Port Authority
440 S. Beach Street • Daytona Beach, FL 32114-5004
(904) 254-4637 • (904) 423-3864

December 26, 1991

U.S. Army Corps of Engineers
Jacksonville District
Post Office Box 4970
Jacksonville, Florida 32232-0019

Attn: Richard B. Powell, Jr.

Dear Mr. Powell,

Please find enclosed the erosion information I discussed with you previously on Ponce De Leon Inlet.

1) Volusia County charter industry artificial reef use on a yearly basis.

Approximately ten (10) years ago we began constructing artificial reef from 6-12 mile offshore. We have approximately 12 reefs presently and will continue to construct artificial reefs. Our natural reefs are 25-30 miles offshore, so you can see why a new industry was created.

This document establishes through survey of 30 boats that tourists paid to the skippers of these vessels approximately \$1,000,000.00 per year for half trips to artificial reefs. We did this survey to show that the money we spend each year constructing artificial reefs (\$100,000.00 per year) is generating economic benefit to the area.

However, this survey can be used to establish the total charter business for a year. See if you don't agree with me.



Corps of Engineers
December 26, 1991
Page Two

Charter Boats

Total Trips Per Year			
1,310	1/2 Day	x \$325.00 Per Trip	\$ 425,750.00
1,966	Full Day	x \$450.00 Per Trip	\$ 884,700.00
Total Fee Paid to Skippers -			<u>\$1,310,450.00</u>

Head Boats

1/2 Day Trips - 20,592 Persons @ \$25.00 Each	\$ 514,800.00
Full Day Trip - 20,592 Persons @ \$40.00 Each	\$ 823,680.00
Total Fee Paid to Skippers -	<u>\$1,338,480.00</u>

TOTAL \$2,648,930.00

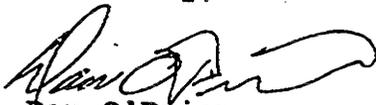
If you use the normal multiplier to establish economic benefit to community it would be much larger.

2) Memo dated 11/2/91 re: landing stats. reflects offshore commercial fishing trips.

I hope these figures assist you in your analysis. If you need further assistance please call me.

Happy New Year!

Sincerely,



Dan O'Brien
Coordinator
Port Authority

DO/dd
Enclosures

Department
Memorandum



RECEIVED

PONCE DE LEON
PORT AUTHORITY

TO: Dan O'Brien
Ponce Inlet Port Authority

FROM: Joe Nolin
Extension Agent-Marine/Sea Grant

SUBJECT: Land Stats

DATE: November 21, 1991

FILE:

REFERENCE:

The information requested by the Ponce Inlet Port Authority Advisory Board regarding commercial vessel passages through Ponce Inlet and the value of the commercial fishery in Volusia County Is as follows:

Based on 1990 FDNR landing Statistics:

1. There were 5,614 offshore commercial fishing trips recorded as landing in Volusia.*
2. The dockside (on the hoof) value of the offshore commercial fishery was \$ 2,183,839.70.**
3. Adjusted offshore commercial fishery value based on a multiplying factor of 1.85 is \$ 4,040,103.44

* This figure is based on a percentage of actual trips made and only reflects passages from seaward back through Ponce Inlet to land and sell product it does not account for passages out to sea to fish since accurate trip origination data is not available. Considering this the actual number of passages through Ponce Inlet by commercial fishing vessels may be much higher.

** These figures are only the dockside value. Using a multiplier factor that considers spinoff industries related to the landing, marketing, processing, and packaging, of the product this value becomes much higher. The average multiplying factor used in Florida commercial fisheries as of 1985 was 1.85.

UOLUSIA CHARTER INDUSTRY ARTIFICIAL REEF USE
GENERAL YEARLY TRIP STATISTICS

	<u>CHARTER BOATS</u>	<u>HEAD BOATS</u>
VESSELS SURVEYED.....	21	9
AVERAGE # OF TRIPS/WEEK.....	3	4
TOTAL TRIPS/YEAR.....	3,276	1,872
COMBINED TOTAL TRIPS.....		5,148 TRIPS/YEAR
TRIP PROFILE.....	73% FULL-DAY 27% HALF-DAY	50% FULL-DAY 50% HALF-DAY
AVERAGE COST/TRIP.....	\$450.00 FULL-DAY \$325.00 HALF-DAY	\$40.00 FULL-DAY \$25.00 HALF-DAY
AVERAGE # OF TRIPS TO AN ARTIFICIAL REEF/WEEK.....	1.2 (40% OF TRIPS)	2 (50% OF TRIPS)
TRIPS TO AN ARTIFICIAL REEF/YEAR.....	1310 TRIPS/YEAR	936 TRIPS/YEAR
COMBINED TOTAL OF TRIPS TO ARTIFICIAL REEFS/YEAR.....		2,246 TRIPS/YEAR

UOLUSIA CHARTER INDUSTRY ARTIFICIAL REEF USE
GENERAL CLIENTELE STATISTICS (YEARLY)

	<u>CHARTER BOATS</u>	<u>HEAD BOATS</u>
AVERAGE # CLIENTS/TRIP.....	5	22
CLIENTELE.....	67% TOURISTS 33% RESIDENTS	64% TOURISTS 36% RESIDENTS
TOTAL CLIENTS.....	16,380 PERSONS	41,184 PERSONS
COMBINED TOTAL.....		57,564 PERSONS
CLIENTS FISHING ARTIFICIAL REEFS/YEAR.....	6,550 PERSONS	20,592 PERSONS
TOTAL # OF PERSONS FISHING ARTIFICIAL REEFS ON CHARTER AND HEAD BOATS/YEAR.....		27,142 PERSONS
ARTIFICIAL REEF FISHERMAN PROFILE.....		17,778 TOURISTS 9,364 RESIDENTS

UOLUSIA CHARTER INDUSTRY ARTIFICIAL REEF USE
GENERAL TRIP AND FARE STATISTICS* (YEARLY)
CHARTER BOATS

TOTAL DOLLARS PAID FOR FISHING
TRIPS TO ARTIFICIAL REEFS
BASED ON HALF-DAY**
TRIP PRICING.....1,310 TRIPS @ \$325.00/TRIP

TOTAL DOLLARS SPENT ON
ARTIFICIAL REEF FISHING TRIPS.....\$425,750.00/YEAR

HEAD BOATS

TOTAL DOLLARS PAID FOR FISHING
TRIPS TO ARTIFICIAL REEFS
BASED ON HALF-DAY** TRIP
PRICING AND AVERAGE NUMBER
OF FISHERMEN/TRIP.....936 TRIPS X 22 FISHERMEN

TOTAL FISHERMEN.....20,592 PERSONS @ \$25.00ea.

TOTAL DOLLARS SPENT ON
ARTIFICIAL REEF FISHING TRIPS.....\$514,800.00/YEAR

ECONOMIC ACTIVITY OF CHARTER INDUSTRY IN UOLUSIA
THAT IS GENERATED BY FARES PAID TO FISH
UOLUSIA ARTIFICIAL REEFS

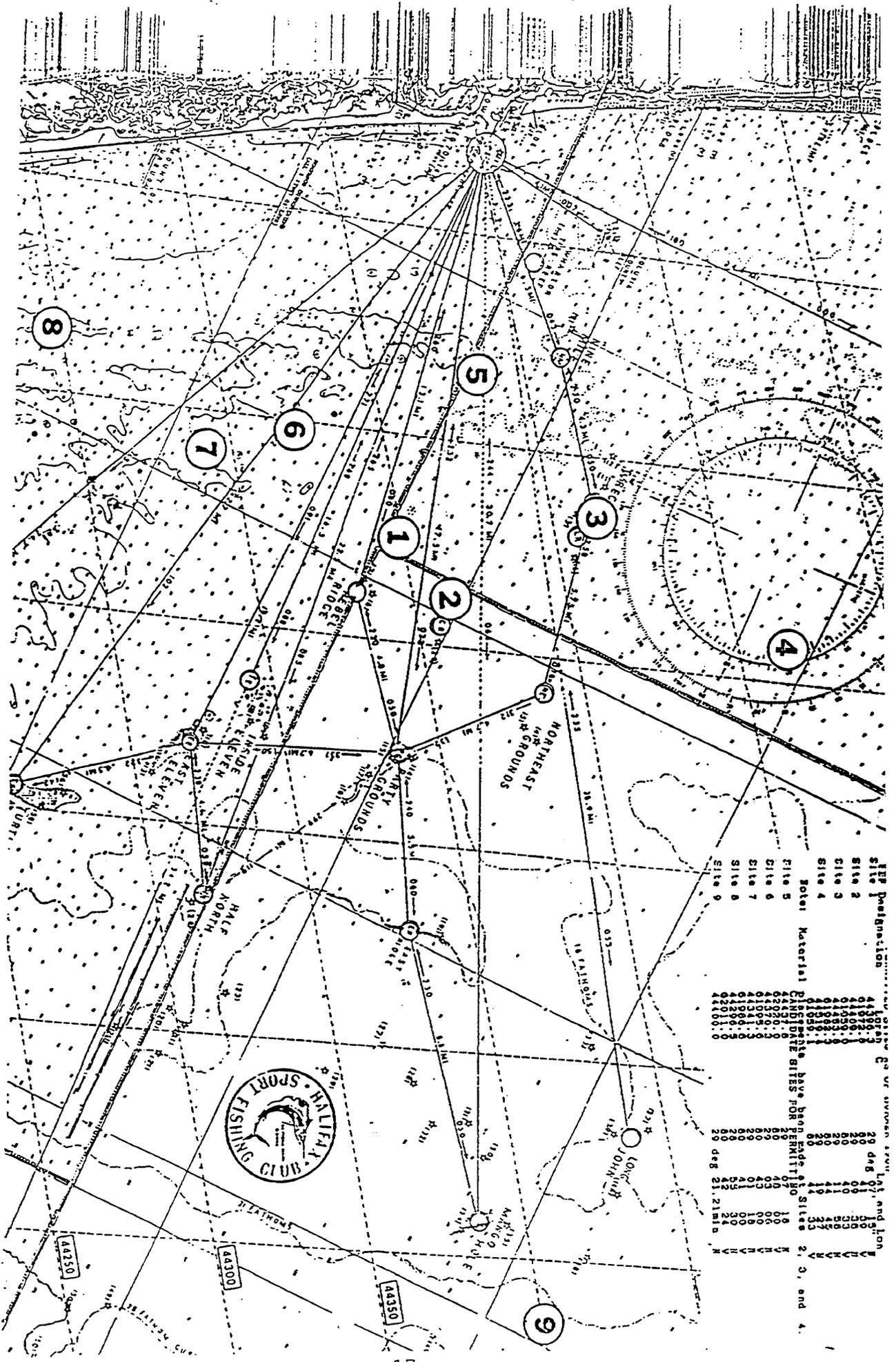
TOTAL DOLLARS PAID TO THE CHARTER
AND HEAD BOAT INDUSTRY TO FISH
UOLUSIA ARTIFICIAL REEFS.....\$940,550.00/YEAR***

* CHARTER AND HEAD BOAT FARE STATS ARE FIGURED DIFFERENTLY
BECAUSE CHARTER BOATS CHARGE ON A PER TRIP BASIS,
WHEREAS HEAD BOATS CHARGE ON A PER PERSON BASIS.

** BOTH CHARTER AND HEAD BOATS USE ARTIFICIAL REEFS PRIMARILY
ON HALF-DAY TRIPS.

*** THIS FIGURE ONLY INDICATES ECONOMIC ACTIVITY GENERATED BY
FEES PAID FOR CHARTER AND HEAD BOAT FISHING TRIPS. ACTUAL
TOTAL ECONOMIC ACTIVITY WOULD HAVE TO INCLUDE BAIT,
TACKLE, EMPLOYEE WAGES, HAULING FEES, FUEL COSTS, BOOKING
FEES, ADVERTISING, AND ALL OTHER COSTS ASSOCIATED WITH A
CHARTER FISHING BUSINESS.

Reprinted with permission of the Halifax Sport Fishing Club





County of Volusia

Ponce DeLeon Port Authority
440 S. Beach Street • Daytona Beach, FL 32114-5004
(904) 254-4637 • (904) 423-3864

February 6, 1992

U.S. Army Engineer District, Jacksonville
Post Office Box 4970
Jacksonville, Florida 32232-0019

Attn: Richard B. Powell, Jr.,
Civil Engineer
Planning Division

Dear Mr. Powell,

It has come to my attention that I have omitted an important segment of information regarding our Ponce Inlet Reconnaissance Report, that being the erosion of some very expensive land owned by the State of Florida on the north side of the channel.

In 1986 the State of Florida and the Port Authority obtained approximately 40 acres (Parcel B) of an 80 acre tract on the north side of Ponce Inlet (see attachment). The area is known as Lighthouse Point Park. The property was taken by eminent domain and the settlement price was \$1,800,000.00. The other 40 acres (Parcel C) is owned by the State. Since the weir on the North Jetty was closed, the channel has migrated to the north and the entire 40 acres purchased in 1986 no longer exists. The erosion is now eating away at the remaining 40 acres. If something is not done we will probably lose most or all of the remaining acreage.

The above erosion does not include erosion taking place within a 55 acre parcel known as Parcel A, Lighthouse Point Park. Parcel A is developed as a passive park. The erosion is so intrusive that the parking area and pavilion on the property is in danger of being lost and if erosion is allowed to continue it could cause the blockage of the only channel (private) allowing the ingress and egress to the Ponce Inlet Fishing Fleet to the Inlet.

Richard B. Powell, Jr.
February 6, 1992
Page Two

According to our Coastal Engineer, Taylor Engineering, Inc., Jacksonville, we are losing approximately 75 feet per year from the north side of our Inlet. So it won't be many more years before we could lose all of it.

If you need further information please call me.

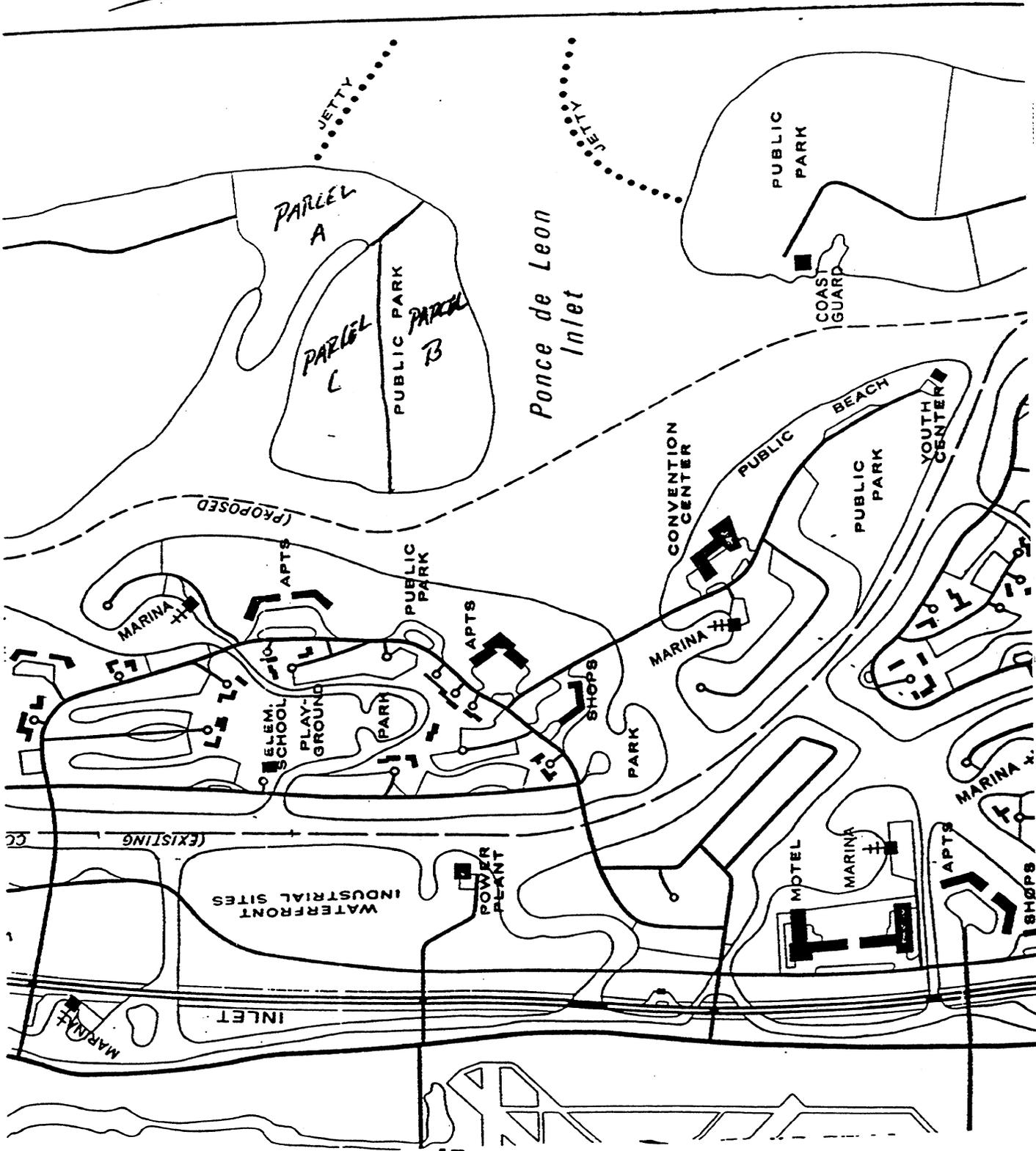
Sincerely,

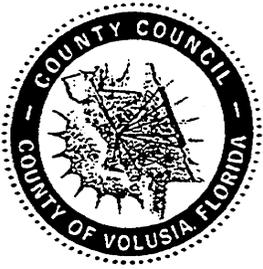


Dan O'Brien
Coordinator
Port Authority

DO/dd
Attachment

ATTACHMENT





County of Volusia

Ponce DeLeon Port Authority
440 S. Beach Street • Daytona Beach, FL 32114-5004
(904) 254-4637 • (904) 423-3864

November 11, 1992

U.S. Army Corps of Engineers
Jacksonville District
Post Office Box 4970
Jacksonville, Florida 32232

Attn: A.J. Salem, Chief,
Planning Section

Dear Mr. Salem,

Attached please find correspondence from the Florida Department of Natural Resources dated November 6th regarding USACE-SAJ Reconnaissance Report, Ponce De Leon Inlet. A copy of this letter was sent to you.

The letter states that no approved Inlet Management Plan is available. The letter is correct, however, we have a contract with Taylor Engineering, Inc. Jacksonville to complete a plan and forward it to D.N.R. for approval. The project is 75% complete and Taylor Engineering, Inc. has until February 1993 to complete it.

I am not sure how long the approval process takes once we submit the plan, but we will do all we can to expedite the project so they can comment.

Sincerely,

Dan O'Brien
Coordinator
Port Authority

DO/dd
Attachment





County of Volusia

COUNTY MANAGER

THOMAS C. KELLY ADMINISTRATION CENTER
123 West Indiana Avenue • DeLand, Florida 32720-4612
Telephone (904) 736-5920 • (904) 257-6011 • (904)423-3860
<http://volusia.org>

R. STANLEY ROSEVEAR
CHAIR
DISTRICT 4

March 2, 1998

~~FILED~~
3-3-98

PATRICIA NORTHEY
VICE-CHAIR
AT LARGE

PAT PATTERSON
DISTRICT 1

Mr. Richard Bonner, Deputy District Engineer
for Project Management
U. S. Army Corps of Engineers
Jacksonville District
P. O. Box 4970
Jacksonville, FL 32232

JAMES E. WARD
DISTRICT 2

FREDDYE MOORE
DISTRICT 3

Dear Mr. Bonner:

ANN MCFALL
DISTRICT 5

Please accept this letter as a request to amend the feasibility report for Ponce DeLeon Inlet known as "Ponce DeLeon Inlet, Florida, #14310."

ROBERT E. TUTTLE
AT LARGE

The Ponce DeLeon Port Authority, County of Volusia has developed a locally preferred plan. This plan would 1) remove the commercial fishing port, 2) construct the 1,000 foot extension of the south jetty as per the feasibility report on a cost share basis, 3) provide for north jetty improvements in two stages: (a) 800 foot revetment to section one as soon as possible, and (b) construct 1,540 foot revetment to section two as funding is available.

LAWRENCE W. ARRINGTON
COUNTY MANAGER

All of the work for both stages of north jetty improvements to be considered under the maintenance contract and be considered O & M work funded by the Corps of Engineers.

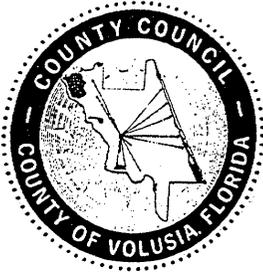
Should you have any questions, please call my office at (904) 736-5920.

Sincerely,

Lawrence W. Arrington
County Manager

LWA/DO/db





County of Volusia

Ponce DeLeon Port Authority

700 Catalina Drive, Suite 125 • Daytona Beach, Florida 32114
Telephone: (904) 248-8072 • Fax: (904) 248-8075

April 20, 1998

Mr. Tom Wright, President
Smyrna Surfari Club
340 North Causeway
New Smyrna Beach, Florida 32169

Dear Tom,

Thank you for the opportunity to speak before the Smyrna Surfari Club regarding the Ponce de Leon Port Authority and the U.S. Corps of Engineers plans for stabilization of Ponce de Leon Inlet. I very much appreciate the interests of the surfing community in Southeast Volusia that your group represents having myself grown up surfing and fishing on the beaches of New Smyrna.

As I promised you I have contacted the Corps since our meeting to address the questions you-all had about the planned South Jetty construction and this letter will serve as the response.

Regarding how the South Jetty extension work would be accomplished the complete answer has yet to be determined. It could however, have an overland component whereby granite jetty rocks and or equipment would be transported to the existing jetty by truck. This of course would involve construction of an adequate roadway out to the project on an existing COE easement alongside the old South Jetty. The Corps would prefer that this roadway easement remain accessible for their use to facilitate access to the channel works features for future maintenance but does not typically maintain these easements for public use. As far as becoming a permanent public roadway allowing surfers access to the South Jetty, that would naturally entail pre-construction discussion and agreement-making among a variety of agencies and groups that would have a stake in the project. Additionally, the final construction method is determined by the construction contractor and not necessarily the Corps. In other words, the Corps explains in their bid specs what they want done and it's up to the private contractor to determine how it will be accomplished, whether by trucks overland or by a barge and crane on the water.

Regarding when the project will begin, again there are some variables. The project must first be Authorized by the U.S. COE and by Congress through the Water Resources Development Act (WRDA). Efforts are being made at all levels to get the South Jetty project included in the WRDA-'98 Authorization Bill. This would allow the U.S. COE to move forward on the Plans, Specifications, and Design (PED) for the South Jetty work aiming towards Congressional Appropriation of funding for the project. The bottom line is that under the best circumstances, a start date of the year 2000 is possible. Bear in mind however, that the WRDA Act comes up for authorization every two years and if we miss WRDA-'98 we have to shoot for WRDA-2000 which could set us up for a one-year delay.

I also called back Mr. Jeff Clark with your organization after having discussed his project engineering ideas and concerns with a U.S. COE representative. I passed on to him the name and phone number of a Jacksonville District COE staff member who has since contacted Mr. Clark and discussed the South Jetty project engineering with him.

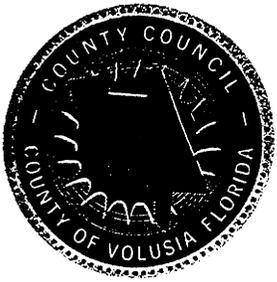
Tom, I hope this addresses your groups questions. Again, I greatly appreciate your interest in this project and please feel free to call me for any further information you may need.

Sincerely,

Joe Nolin
Ponce de Leon Port Authority

cc: Dan O'Brien, Director, Ponce de Leon Port Authority
Jamie Seaman, Director, VC-Economic Resources Service Center
Patrick Bowls, Congressional Aide--Representative John Mica
C.J. Drake, Congressional Aide--Representative John Mica
Tom Smith, U.S. COE--Jacksonville District Office
Mr. Tim Murphy, U.S. COE--Jacksonville District Office





County of Volusia

UF
Tim M
3

Ponce DeLeon Port Authority

700 Catalina Drive, Suite 126 ▪ Daytona Beach, Florida 32114
Telephone: (904) 248-8072 ▪ Fax: (904) 248-8075

Mr. Richard E. Bonner, P.E.
Deputy District Engineer for Project Management
Department of the Army
Jacksonville District Corps of Engineers
Programs and Project Management Division
Project Management Branch
P.O. Box 4970
Jacksonville, Florida 32232-0019

January 11, 1999

Dear Mr. Bonner,

Please accept this letter verifying the financial capability and commitment of the Ponce de Leon Port Authority as the "Local Sponsor" for the USACE Channel Works at Ponce de Leon Inlet.

The final feasibility study for Ponce de Leon Inlet calls for a 1,000-foot eastward extension of the south jetty. The initial cost for this new channel works feature is approximately \$ 5,500,000 with the project sponsor's share of these costs estimated to be \$ 2,500,000.

Additionally, the project sponsor's share of all future maintenance of this feature is \$ 180,000. These funds are to be forwarded to the USACE prior to the construction contract advertisement currently scheduled for March, 2000.

With understanding of the above, please accept this letter as verification that the Ponce de Leon Port Authority supports the USACE recommended plan, has the project construction and maintenance cost-share funds available, and will continue to be the "Local Sponsor" for this project.

We sincerely appreciate your continued efforts on behalf of the stabilization of Ponce de Leon Inlet. Please call for any further information or assistance you may need.

Sincerely,

Ms. Jamie Seaman, Director
Ponce de Leon Port Authority

cc: Mr. Tim Murphy, U.S.-COE Jacksonville District Project Manager
Ponce de Leon Inlet
Mr. Joe Nolin, Special Projects Manager
Ponce de Leon Port Authority





FLORIDA AUDUBON SOCIETY

March 17, 1995

A.J. Salem
Department of the Army
Jacksonville District Corps of Engineers
P.O. Box 4970
Jacksonville, Fl 32232-0019

Re: Ponce de Leon Inlet Improvements

Dear Mr. Salem:

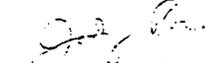
The Florida Audubon Society is pleased to review the proposed Ponce de Leon Inlet improvements, as requested by the Army Corps of Engineers. After reviewing the Reconnaissance Report dated January 1993 and the February 7, 1995 correspondence, it appears that a channel may be constructed in the potential breakthrough area. If this alternative is selected, the vegetation in the area of the channel should be relocated to another site at Lighthouse Point Park to aid in stabilization and habitat creation.

Since the sand spit area is included in the Lighthouse Point Park, public access should be provided to the spit if the channel severs the park. However, public access should not impact the wintering and breeding behavior of listed shorebirds, terns and gulls. To avoid disturbance during the breeding season, March 1 through July 31, public access should be restricted to areas that are at least 100 yards from the nesting colony. Florida Audubon Society concur with the recommendations of the Florida Game and Fresh Water Fish Commission in relation to the timing and location of construction during the shorebird nesting season.

Although the modeling has not been completed for the alternatives discussed in the Reconnaissance Report, I would like to recommend that the model analyze the long term consequences of the proposed alternatives on beach shoreline erosion. Since beach shoreline erosion negatively effects listed sea turtle populations and existing residential development, the results of the model should be reviewed closely.

Please continue to inform Florida Audubon Society on the projects associated with Ponce de Leon Inlet. Please address questions or comments concerning this letter to me at 407/260-8300.

Sincerely,


Jody Rosier
Permit Coordinator

The Voice of Conservation Since Nineteen Hundred

460 HWY. 436 • SUITE 200 • CASSELBERRY, FL 32707-4939 • (407) 260-8300 • FAX (407) 260-9652



LAWTON CHILES
GOVERNOR

STATE OF FLORIDA

Office of the Governor

THE CAPITOL
TALLAHASSEE, FLORIDA 32399-0001

November 18, 1992

Mr. A. J. Salem
Chief, Planning Division
Department of the Army
Jacksonville District Corps
of Engineers
Post Office Box 4970
Jacksonville, Florida 32232-0019

RE: Reconnaissance-Level Report on Proposed Inlet Improvements
at Ponce de Leon Inlet, Volusia County, Florida

SAI: FL9210021642C

Dear Mr. Salem:

The Florida State Clearinghouse, pursuant to Presidential Executive Order 12372, Gubernatorial Executive Order 83-150, the Coastal Zone Management Act Reauthorization Amendments of 1990 and the National Environmental Policy Act, has coordinated a review of the above referenced project.

Pursuant to Presidential Executive Order 12372, the project will be in accord with State plans, programs, procedures and objectives when consideration is given to and action taken on the enclosed comments and requirements of our reviewing agencies.

The Department of Environmental Regulation (DER) notes the following general concerns that should be addressed in the study and subsequent environmental documents: current status of the inlet that necessitates alteration of the environment; identification of resources at risk under each alternative; secondary and cumulative impacts resulting from each alternative; non-structural alternatives; and mitigation for unavoidable resource impacts. The DER recommends close coordination with the permitting staff in the DER Bureau of Wetland Resource Management to develop alternatives consistent with the provisions of Chapter 403, Florida Statutes. Please refer to the enclosed DER comments.

The Department of Natural Resources (DNR) indicates that the report must be coordinated closely with the inlet management plan, and should address the following concerns: expand alternatives to include the null alternative and channel realignment; beach renourishment should be considered separately or in combination with the proposed alternatives; justification for the inlet armoring must be fully substantiated by economic

Mr. A. J. Salem
Page Two

and navigation safety needs; environmental assessments should include consideration of marine turtle and manatee construction impacts, changes to physical and chemical characteristics of associated estuaries and the use of the inlet area by colonial seabirds. Please refer to the enclosed DNR comments.

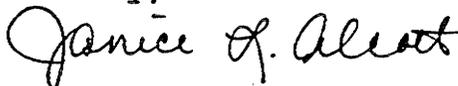
Please refer to the enclosed comments provided by the Department of State (DOS) noting that the proposed project is located in an area with a high potential for submerged cultural resources. The DOS indicates that although no historic properties are currently recorded within the proposed project area, a survey to locate possible submerged cultural resources may be required.

The Game and Fresh Water Fish Commission (GFWFC) indicates that construction activities in the vicinity of the sand spit adjacent to the north jetty should take place outside of the seasonal window from March 1 through July 31 or while maintaining a disturbance buffer of at least 100 yards from nests during the nesting season. Please refer to the enclosed GFWFC comments.

The State of Florida has completed a review of the consistency determination for this project and, based on the information available at this time, agrees that the project, at this stage, is consistent with the Florida Coastal Management Program. However, certain issues of concern have been identified by our reviewing agencies which will require resolution in federal consistency reviews conducted at subsequent decision points. Pursuant to 15 CFR 930.34 and .37, you should prepare a consistency determination at each major decision point for the State's review. Continued State agreement will be based, in part, on adequate reconciliation of previously identified concerns.

This letter reflects your compliance with Presidential Executive Order 12372.

Sincerely,



Janice L. Alcott, Director
State Clearinghouse

JLA/bl.

Enclosure(s)

cc: Department of Environmental Regulation
Department of Natural Resources
Department of State
Game and Fresh Water Fish Commission
St. Johns River Water Management District
Department of Commerce



Office of the Governor

THE CAPITOL

TALLAHASSEE, FLORIDA 32399-0001

LAWTON CHILES
GOVERNOR

Date: OCT-07 1992

Comment Due Date: OCT-21 1992

SAI# FL92100216420

STATE AGENCIES

<input checked="" type="checkbox"/>	Agriculture/Forestry
<input type="checkbox"/>	Board of Regents
<input checked="" type="checkbox"/>	Commerce
<input checked="" type="checkbox"/>	Community Affairs
<input type="checkbox"/>	Education
<input checked="" type="checkbox"/>	Environmental Regulation
<input checked="" type="checkbox"/>	Game & Fish Comm.
<input type="checkbox"/>	Health & Rehab. Services
<input type="checkbox"/>	Highway Safety
<input type="checkbox"/>	Labor & Employment
<input type="checkbox"/>	Law Enforcement

STATE AGENCIES

<input checked="" type="checkbox"/>	Marine Fisheries Commission
<input checked="" type="checkbox"/>	Natural Resources
<input checked="" type="checkbox"/>	State
<input checked="" type="checkbox"/>	Transportation
<input type="checkbox"/>	Trans. Disad. Comm.
<input type="checkbox"/>	Elder Affairs
<input type="checkbox"/>	

LOCAL/OTHER

<input type="checkbox"/>	RPR
<input checked="" type="checkbox"/>	WMD SJR
<input type="checkbox"/>	

OPB POLICY UNITS

<input type="checkbox"/>	Criminal Justice
<input type="checkbox"/>	Education
<input type="checkbox"/>	Environmental/C & ED
<input type="checkbox"/>	General Government
<input type="checkbox"/>	Health & Human Services
<input type="checkbox"/>	Revenue & Eco. Analysis
<input type="checkbox"/>	SCH
<input checked="" type="checkbox"/>	SCH/CON

The attached document requires a Coastal Zone Management Act/Florida Coastal Management Program consistency evaluation and is categorized as one of the following:

- Federal Assistance to State or Local Governments (15 CFR 930, Subpart F). State Agencies are required to evaluate the consistency of the activity.
- Direct Federal Activity (15 CFR 930, Subpart C). Federal agencies are required to furnish a consistency determination for the State's concurrence or objection.
- Outer Continental Shelf Exploration, Development or Production Activities (15 CFR 930, Subpart E). Operators are required to provide a consistency certification for state concurrence/objection.
- Federal Licensing or Permitting Activity (15 CFR 930, Subpart D). Such projects will only be evaluated for consistency when there is not an analogous state license or permit.

SEE REVERSE SIDE FOR INSTRUCTIONS.

To: State Clearinghouse
Executive Office of the Governor-OPB
Room 411, Carlton Building
Tallahassee, Florida 32399-0001
(904)485-8114 (Suncom 278-8114)

From: DNR

Division/Bureau Executive Office

Reviewer Fritz Wettstein

Date: 11/6/92

EO. 12372

No Comment

Comments Attached

Not Applicable

Federal Consistency

No Comment/Consistent

Consistent/Comments Attached

Inconsistent/Comments Attached



FLORIDA DEPARTMENT OF STATE

Jim Smith
Secretary of State

DIVISION OF HISTORICAL RESOURCES

R.A. Gray Building
500 South Bronough

Tallahassee, Florida 32399-0250

Director's Office

Telecopier Number (FAX)

(904) 488-1480

(904) 488-3353

PFN: 922968

October 27, 1992

In Reply Refer To:
Susan Hammersten
Compliance Review
Section, DHR
(904) 487-2333

Ms. Janice L. Alcott, Director
State Clearinghouse
Executive Office of the Governor, OPB
Room 411, Carlton Building
Tallahassee, Florida 32399-0001

RE: SAI# FL9210021642C
Improvements to the Ponce de Leon Inlet
Volusia County, Florida

RECEIVED
OCT 29 1992
STATE CLEARINGHOUSE

Dear Ms. Alcott:

In accordance with the provisions of Florida's Coastal Zone Management Act and Chapter 267, Florida Statutes, as well as the procedures contained in 36 C.F.R., Part 800 ("Protection of Historic Properties"), we have reviewed the above referenced project(s) for possible impact to historic properties listed, or eligible for listing, in the National Register of Historic Places.

It is the opinion of this office that all of the project alternatives under consideration by the Corps have the potential to adversely affect historic properties. The project is located in an area with a high potential for submerged cultural resources. Therefore, although no historic properties are currently recorded within the project area, a survey to locate such properties may be required.

We look forward to reviewing the final specifications for the project once they have been selected. If you have any questions concerning our comments, please do not hesitate to contact us. Your interest in protecting Florida's historic properties is appreciated.

Sincerely,

for 
George W. Percy, Director
Division of Historical Resources

and
State Historic Preservation Officer

GWP/Hsh

2-22



Office of the Governor

THE CAPITOL
TALLAHASSEE, FLORIDA 32399-0001

RECEIVED
10-12-92

Date: OCT-07 1992

Comment Due Date: OCT-21 1992

SAI# FL92100216420

LAWTON CHILES
GOVERNOR

OPB POLICY UNITS

STATE AGENCIES	
<input checked="" type="checkbox"/>	Agriculture/Forestry
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<input type="checkbox"/>	Health & Rehab. Services
<input type="checkbox"/>	Highway Safety
<input type="checkbox"/>	Labor & Employment
<input type="checkbox"/>	Law Enforcement

STATE AGENCIES	
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<input checked="" type="checkbox"/>	Natural Resources
<input checked="" type="checkbox"/>	State
<input checked="" type="checkbox"/>	Transportation
<input type="checkbox"/>	Trans. Disad. Comm.
<input type="checkbox"/>	Elder Affairs
<input type="checkbox"/>	

<input type="checkbox"/>	Criminal Justice
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<input type="checkbox"/>	Health & Human Services
<input type="checkbox"/>	Revenue & Eco. Analysis
<input type="checkbox"/>	SCH
<input checked="" type="checkbox"/>	SCH/CON

LOCAL/OTHER	
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<input checked="" type="checkbox"/>	WMD SJR
<input type="checkbox"/>	

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- Direct Federal Activity (15 CFR 930, Subpart C). Federal agencies are required to furnish a consistency determination for the State's concurrence or objection.
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- Federal Licensing or Permitting Activity (15 CFR 930, Subpart D). Such projects will only be evaluated for consistency when there is not an analogous state license or permit.

SEE REVERSE SIDE FOR INSTRUCTIONS.

To: State Clearinghouse
Executive Office of the Governor-OPB
Room 411, Carlton Building
Tallahassee, Florida 32399-0001
(904)486-2114 (Suncom 275-2114)

From: FLA DEPT OF COMM
Division/Bureau Econ Developm/BEA

Reviewer: R Peterson WW

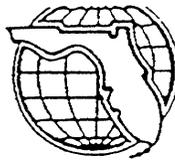
Date: OCT 12, 1992

EO. 12372

- No Comment
- Comments Attached
- Not Applicable

Federal Consistency

- No Comment/Consistent
- Consistent/Comments Attached
- Inconsistent/Comments Attached



STATE OF FLORIDA DEPARTMENT OF COMMERCE
Division of Economic Development

October 12, 1992

RECEIVED

OCT 23 1992

Ms. Janice L. Alcott, Director
State Clearinghouse
Office of Planning and Budgeting
Executive Office of the Governor
The Capitol
Tallahassee, Florida 32399-0001

STATE CLEARINGHOUSE

RE: SAI# FL 92 10 02 1642C (Ponce de Leon Inlet/Volusia County)

Dear Ms. Alcott:

We appreciate being asked to review this request for comments from the U. S. Army Corps of Engineers. Improvements are being planned at Ponce de Leon Inlet in Volusia County. Under consideration are lengthening a jetty, rebuilding damaged areas, and constructing a groin field and a storm revetment.

At the planning stage, pursuing this project is consistent with the economic criteria of those portions of the Coastal Zone Management Act of 1972 and the Florida Coastal Management Program for which the Department of Commerce has responsibility.

Very respectfully,

Wynneffe Wilson
Economist Supervisor
Bureau of Economic Analysis

WW/rdp

Director's
Office
904/488-6300

Business
Assistance
904/488-9357

Economic
Analysis
904/487-2568

Industry
Development
904/488-9360

Motion Picture
and Television
904/487-1100

International
Trade and
Development
904/488-6124

COLLINS BUILDING

TALLAHASSEE, FLORIDA 32399-2000

FAX 904/487-1407



**WATER
MANAGEMENT
DISTRICT**

Henry Dean, Executive
John R. Wehle, Assistant Executive

POST OFFICE BOX 1429 PALATKA, FLORIDA 32178
TELEPHONE 904/329-4500 SUNCOM 904/860-4500

FAX (EXECUTIVE/LEGAL) 329-4125 (PERMITTING) 329-4315 (ADMINISTRATION/FINANCE)

FIELD STATIONS

618 E. South Street Orlando, Florida 32801 407/894-6423	7775 Baymeadows Way Suite 102 Jacksonville, Florida 32254 904/730-8270	PERMITTING: 305 East Drive Melbourne, Florida 32904 407/984-4940	OPERATIONS: 2133 N. Wickham Pkwy Melbourne, Florida 32901 407/254-1762
---	---	---	---

November 16, 1992

State Clearinghouse
Executive Office of the Governor, OPB
Room 411, Carlton Building
Tallahassee, FL 32399-0001

Re: SAI #FL9210021642C; Ponce de Leon Inlet improvements.

Dear Sir or Madam:

The St. Johns River Water Management District is pleased to review proposed Ponce de Leon Inlet improvements, as requested by the State Clearinghouse. We believe this project would be consistent with District rules and policies on condition that the construction details conform with criteria to be defined by the Florida Department of Environmental Regulation (FDER).

Whereas it was difficult to fully assess the project from the description provided, we doubt the proposed work would be subject to regulation by the District. Under Section III. 2. (f) of the Operating Agreement between the District and the FDER, the District does not review dredge-and-fill issues for public works projects not requiring a Management and Storage of Surface Waters (MSSW) permit. Hence, the construction of jetties, groins, dolphins, breakwaters, boat ramps, seawalls, etc., in state waters shall be authorized exclusively by the FDER. (This agreement is effective after November 15, 1992.)

Should any aspect of the project change so as to require an MSSW, the District can meet with the Army Corps of Engineers to identify fully any subsequent permit requirements. Please direct any questions to Lee Kissick, Environmental Specialist, (407) 897-4337 (Suncom 342-4337).

Sincerely,

Lee Kissick, for

Lance D. Hart, Lead Environmental Specialist
Department of Resource Management

RECEIVED
NOV 17 1992
STATE CLEARINGHOUSE

LDH:db

cc: David Dewey
Pat Frost
Lee Kissick
Glenn Lowe

Post-It™ brand fax transmittal memo 7671 # of pages 1

To <i>State Clearinghouse</i>	From <i>Lance Hart</i>
Co.	Co. <i>SRWMD</i>
Dept.	Phone #
Fax # <i>904-922-6200</i>	Fax # <i>SunCom 342-4337</i>

Joe E. Hill, CHAIRMAN
LEESBURG
Terri C. Fore
OCALA

Joseph D. Collins, VICE CHAIRMAN
JACKSONVILLE
Ralph E. Simmons
FERNANDINA BEACH

Jesse J. Pattish, III, TREASURER
TITUSVILLE
Candra H. Gray
DE BARY

Lenore N. McCullagh, SECRETARY
ORANGE PARK
Patricia T. Hardon
James H. Williams

FLORIDA GAME AND FRESH WATER FISH COMMISSION

DON WRIGHT
Orlando

QUINTON L. HEDGEPEITH, DDS
Miami

MRS. GILBERT W. HUMPHREY
Micosukee

JOE MARLIN HILLIARD
-Clewiston

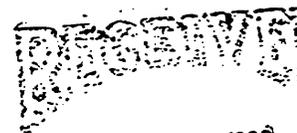
BEN ROY
-Gainesville

ROBERT M. BRANTLY, Executive Director
ALLAN L. EGBERT, Ph. D., Assistant Executive Director



FARRIS BRYANT BUILDING
620 South Meridian Street
Tallahassee, Florida 32399-1600
(904) 488-1960

October 29, 1992



Ms. Janice L. Alcott, Director
Florida State Clearinghouse
Executive Office of the Governor
Office of Planning and Budgeting
The Capitol
Tallahassee, Florida 32399-0001

STATE CLEARINGHOUSE

RE: SAI #FL9210021642C, Volusia
County, Inlet improvements at
Ponce de Leon Inlet

Dear Ms. Alcott:

The Office of Environmental Services of the Florida Game and Fresh Water Fish Commission (GFC) has reviewed the proposed project and offers the following comments.

The proposed project would take place at Ponce de Leon Inlet in Volusia County, Florida. Several inlet improvement alternatives are being considered by the U.S. Army Corps of Engineers. Construction improvements to the south jetty would be facilitated by driving over the jetty or from a barge, while improvements to the north jetty would be accomplished via a barge. Proposed construction improvements include: 1) a 1,000-foot extension of the south jetty, 2) a scour apron 30 feet wide and 3 feet thick along the north jetty, 3) rebuilding damaged portions of the north jetty with about 1,000 cubic yards of stone, 4) construction of a groin field along the sand spit adjacent to the north jetty, and 5) construction of a storm revetment to seal a potential breach along the sand spit adjacent to the north jetty.

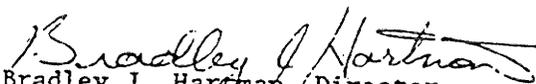
The sand spit adjacent to the north jetty is excellent habitat for both wintering and breeding species of shorebirds, terns, and gulls. Some of these species are listed by the GFC as endangered (E), threatened (T), or species of special concern (SSC).

During the non-nesting period, this habitat would provide resting and roosting opportunities for a host of bird species including brown pelican (SSC), American oystercatcher (SSC), and piping plover (T). During the spring nesting season, this area should be monitored for the presence of least terns

Ms. Janice L. Alcott
October 29, 1992
Page 2

(T) and American oystercatchers. These species can be expected to engage in breeding activities from March 1 through July 31. Because they are especially sensitive to disturbance during this time, construction activities in the vicinity of the sand spit adjacent to the north jetty should take place outside of this seasonal window or while maintaining a disturbance buffer of at least 100 yards from nests during the nesting season.

Sincerely,


Bradley J. Hartman, Director
Office of Environmental Services

BJH/BT/rs
ENV 1-3-2
ponce

cc: U.S. Army Corps of Engineers, Jacksonville



STATE OF FLORIDA
Office of the Governor

THE CAPITOL
TALLAHASSEE, FLORIDA 32399-0001

Date: OCT-07 1992

LAWTON CHILES
GOVERNOR

Comment Due Date: OCT-21 1992

SAIF# FL92100216420

STATE AGENCIES	STATE AGENCIES	OPS POLICY UNITS
<input checked="" type="checkbox"/> Agriculture/Forestry	<input checked="" type="checkbox"/> Marine Fisheries Commission	<input type="checkbox"/> Criminal Justice
<input type="checkbox"/> Board of Regents	<input checked="" type="checkbox"/> Natural Resources	<input type="checkbox"/> Education
<input checked="" type="checkbox"/> Commerce	<input checked="" type="checkbox"/> State	<input type="checkbox"/> Environmental/C & ED
<input checked="" type="checkbox"/> Community Affairs	<input checked="" type="checkbox"/> Transportation	<input type="checkbox"/> General Government
<input type="checkbox"/> Education	<input type="checkbox"/> Trans. Desc. Comm.	<input type="checkbox"/> Health & Human Services
<input checked="" type="checkbox"/> Environmental Reclamation	<input type="checkbox"/> Elder Affairs	<input type="checkbox"/> Revenue & Econ. Analysis
<input checked="" type="checkbox"/> Game & Fish Comm.	<input type="checkbox"/>	<input type="checkbox"/> SCS
<input type="checkbox"/> Health & Rehab. Services		<input checked="" type="checkbox"/> SCHCON
<input type="checkbox"/> Highway Safety		
<input type="checkbox"/> Labor & Employment		
<input type="checkbox"/> Law Enforcement		
	LOCAL/OTHER	
	<input type="checkbox"/> RDCP	
	<input checked="" type="checkbox"/> WMD SJR	
	<input type="checkbox"/>	

The attached document requires a Coastal Zone Management Act/Florida Coastal Management program consistency evaluation and is categorized as one of the following:

- Federal Assistance to State or Local Governments (15 CFR 930, Subpart F). State agencies are required to evaluate the consistency of the activity.
- Direct Federal Activity (15 CFR 930, Subpart C). Federal agencies are required to furnish a consistency determination for the State's concurrence or objection.
- Outer Continental Shelf Exploration, Development or Production Activities (15 CFR 930, Subpart E). Operators are required to provide a consistency certification for state concurrence/objection.
- Federal Licensing or Permitting Activity (15 CFR 930, Subpart D). Such projects will only be evaluated for consistency when there is not an analogous state license or permit.

SEE REVERSE SIDE FOR INSTRUCTIONS.

<p>To: State Clearinghouse Executive Office of the Governor-OPS Room 411, Carlton Building Tallahassee, Florida 32399-0001 (904)488-2114 (Suncom 278-2114)</p> <p>From: DHR.</p> <p>Division/Bureau <u>Executive Office</u></p> <p>Reviewer: <u>Fritz Klettstein</u></p> <p>Date: <u>11/6/92</u></p>	<p>EO. 12372</p> <p><input type="checkbox"/> No Comment</p> <p><input checked="" type="checkbox"/> Comments Attached</p> <p><input type="checkbox"/> Not Applicable</p>	<p>Federal Consistency</p> <p><input checked="" type="checkbox"/> No Comment/Consistent</p> <p><input type="checkbox"/> Consistent/Comments Attached</p> <p><input type="checkbox"/> Inconsistent/Comments Attached</p>
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FLORIDA DEPARTMENT OF NATURAL RESOURCES

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399

Lawton Chiles
Governor
Jim Smith
Secretary of State
Bob Butterworth
Attorney General
Gerald Lewis
State Comptroller
Tom Gallagher
State Treasurer
Bob Crawford
Commissioner of Agriculture
Betty Castor
Commissioner of Education

November 6, 1992



NOV 9 1992

Ms. Janice Alcott
State Clearinghouse
Office of Planning and Budget
Executive Office of the Governor
The Capitol
Tallahassee, Florida 32399-0001

STATE CLEARINGHOUSE

RE: USACE-SAJ Reconnaissance Report, Ponce de Leon Inlet

SAI: FL9210021642C

Dear Ms. Alcott:

The Department of Natural Resources has reviewed the above referenced document as requested. Due to insufficient information, and the fact that an approved inlet management plan is not available at this time, the Department will not comment on the federal consistency of the proposed alternatives. The report must be coordinated closely with the inlet management plan, and should address the following concerns.

Alternatives should be expanded to include the null alternative and channel realignment. In addition, currently the State is reviewing a proposal to place dredged material on the shoreline area in question. Beach nourishment should be considered separately or in combination with the proposed alternatives. Justification for the inlet armoring must be fully substantiated by economic and navigation safety needs. Environmental assessments should include consideration of marine turtle and manatee construction impacts, changes to physical and chemical characteristics of associated estuaries, and the use of the inlet area by colonial seabirds.

Thank you for your time and the opportunity to provide comments on this project. Please address questions or comments concerning this letter to me at 904/488-1555.

Sincerely,

John F. Wettstein
Senior Management Analyst

cc: Ed Conklin, DNR-DMR
Kirby Green, DNR-DBS
Dan O'Brien, Ponce de Leon Port Authority
A.J. Salem, USACE-SAJ-PD
Frank Votra, DNR-DSL



Florida Department of Environmental Regulation

Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400

Carol M. Browner, Secretary

Leonidas Chiles, Governor

PANAFAX TRANSMITTAL FORM

FAX # 904/487-4938

(SUNCOM) 277-4938

DATE: 17 NOV 92

TO: Barbara Leighty

ORGANIZATION: State Clearinghouse

FAX #: 488-9005

PHONE #: 488-8114

NUMBER OF PAGES (including cover sheet): 2

FROM: Susan Coogin

OFFICE: Intergovernmental Programs

PHONE #: 488-0784

IF ANY OF THE PAGES ARE NOT CLEARLY RECEIVED, PLEASE CALL THE PERSON LISTED ABOVE OR

_____ AT _____

COMMENTS: _____



Florida Department of Environmental Regulation

Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400

Lawton Chiles, Governor

16 November 1992

Carol M. Browner, Secretary

Janice L. Alcott
Director, State Clearinghouse
Office of Planning and Budgeting
Budget Management and Planning Policy Unit
Executive Office of the Governor
The Capitol
Tallahassee, Florida 32399-0001

RE: Reconnaissance Report, Ponce de Leon Inlet Proposed
Improvements, Volusia County
SAI: FL9210021642C

Dear Ms. Alcott,

The US Army Corps of Engineers (COE) is gathering information on issues and concerns regarding proposed improvements to Ponce de Leon Inlet. The brief notice issued by the COE does not provide sufficient information on the current situation at the inlet for our office to respond in detail to the proposed improvements.

Given this caveat, general concerns that should be addressed in detail in the study and subsequent environmental documents include: 1) the current status of the inlet that necessitates alteration of the environment; 2) identification of resources that will be at risk under each alternative; 3) the secondary and cumulative impacts that will result from each alternative; 4) non-structural alternatives; and 5) mitigation for unavoidable resource impacts.

We appreciate the opportunity to review the reconnaissance study when it is available. We recommend close coordination with the permitting staff in the Bureau of Wetland Resource Management (DER, Tallahassee) to develop alternatives consistent with the provisions of Chapter 403, Fla. Statutes. If you should have any questions concerning this letter, please call me at 904/488-0784.

Sincerely,

Susan Goggin
Environmental Specialist
Office of Intergovernmental Programs

SEG:LG:s

RECEIVED JUL 13 1994



FLORIDA DEPARTMENT OF STATE

Jim Smith

Secretary of State

DIVISION OF HISTORICAL RESOURCES

R.A. Gray Building

500 South Bronough

Tallahassee, Florida 32399-0250

Director's Office

Telecopier Number (FAX)

(904) 488-1480

(904) 488-3353

July 7, 1994

Mr. Bruce Piatek
Bruce Piatek & Associates
13 Marilyn Avenue
St. Augustine, FL 32084

In Reply Refer To:
Susan M. Herring
Historic Preservation
Planner
(904) 487-2333
Project File No. 942168

RE: *Archaeological and Historical Survey of Lighthouse Point
Park, Ponce Inlet, Volusia County, Florida (Bruce John
Piatek, November 1993)*

Dear Mr. Piatek:

In accordance with this agency's responsibilities under Section 267.061, Florida Statutes, we have reviewed the referenced survey report and find it complete and sufficient. We note that one new site, 8V05253, Hotel Inlet Terrace, was encountered. We concur with the archaeologist's determination that this site is not significant.

Thus, it is the opinion of this agency that park development activities will have no effect on any historic properties listed, or eligible for listing, in the National Register of Historic Places, or otherwise of historic or archaeological value, and may proceed.

If you have any questions concerning our comments, please do not hesitate to contact us. Your interest in protecting Florida's historic properties is appreciated.

Sincerely,

for *Laura R. Kammerer*
George W. Percy, Director
Division of Historical Resources

GWP/Hsh

Ci Ginny Kent



FLORIDA DEPARTMENT OF STATE

Sandra B. Mortham
Secretary of State

DIVISION OF HISTORICAL RESOURCES

R.A. Gray Building
500 South Bronough Street
Tallahassee, Florida 32399-0250

Director's Office
(904) 488-1480

Telecopier Number (FAX)
(904) 488-3353

September 20, 1995

Mr. A. J. Salem, Chief
Planning Division, Environmental Resources Brance
Jacksonville District Corps of Engineers
P.O. Box 4970
Jacksonville, Florida 32232-0019

In Reply Refer To:
Frank J. Keel
Historic Sites Specialist
(904) 487-2333
Project File No. 952959

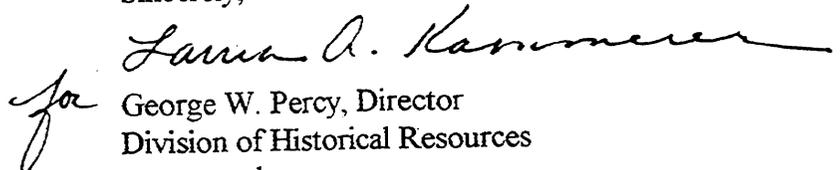
RE: Cultural Resource Assessment Review Request
*Diver Investigations of Seven Potentially Significant Magnetic Anomalies in the
Vicinity of Ponce de Leon Inlet, Volusia County, Florida.* By Mid-Atlantic
Technology, July 30, 1995

Dear Mr. Salem:

In accordance with the procedures contained in 36 C.F.R., Part 800 ("Protection of Historic Properties"), we have reviewed the results of the referenced investigations conducted by Mid-Atlantic Technology and find them to be complete and sufficient. The investigations concluded the previously identified magnetic anomalies as modern debris. Therefore, it is the opinion of this agency that the proposed undertaking will have no effect on any sites listed, or eligible for listing, in the *National Register of Historic Places*.

If you have any questions concerning our comments, please do not hesitate to contact us. Your interest in protecting Florida's historic properties is appreciated.

Sincerely,


George W. Percy, Director
Division of Historical Resources
and

State Historic Preservation Officer

GWP/Kfk



STATE OF FLORIDA
DEPARTMENT OF COMMUNITY AFFAIRS

2740 CENTERVIEW DRIVE • TALLAHASSEE, FLORIDA 32399-2100

LAWTON CHILES
Governor

LINDA LOOMIS SHELLEY
Secretary

April 7, 1995

Mr. A.J. Salem
Army Corps of Engineers
Jacksonville District
Post Office Box 4970
Jacksonville, FL 32232-0019

RE: Navigation Projects - Scoping Letter for Feasibility
Report - Ponce de Leon Inlet Improvements - Volusia
County, Florida
SAI: FL9210051642CR

Dear Mr. Salem:

The Florida State Clearinghouse, pursuant to Presidential Executive Order 12372, Governor's Executive Order 93-194, the Coastal Zone Management Act, 16 U.S.C. §§ 1451-1464, as amended, and the National Environmental Policy Act, 42 U.S.C. §§ 4321, 4331-4335, 4341-4347, as amended, has coordinated a review of the above-referenced project.

The Department of Environmental Protection (DEP) indicates that Alternative A may result in adverse impacts to marine turtle nesting habitat. Therefore, the Corps of Engineers (Corps) is advised to evaluate the potential shoreline response for Alternative A and to coordinate project planning with the DEP's Office of Protected Species. Please refer to the enclosed DEP comments.

The Department of State (DOS) indicates that the Corps is required to provide the results of the magnetometer survey to the DOS for review. The Corps is also required to consult with the DOS regarding avoidance or mitigation of any impacts to any historic site located in the project area. Please refer to the enclosed DOS comments.

Based on the available information and the enclosed comments provided by our reviewing agencies, the state has determined that, at this stage, the above-referenced project is consistent with the Florida Coastal Management Program (FCMP). All subsequent environmental documents prepared for this project

EMERGENCY MANAGEMENT • HOUSING AND COMMUNITY DEVELOPMENT • RESOURCE PLANNING AND MANAGEMENT

Mr. A.J. Salem

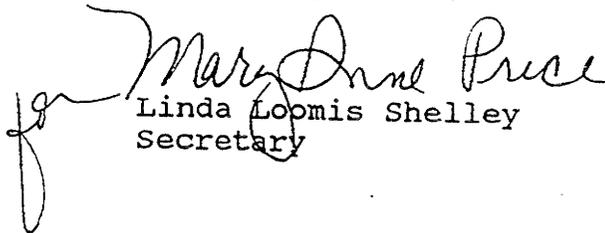
April 7, 1995

Page Two

must be reviewed to determine the project's continued consistency with the FCMP. All future documents prepared for this project must be submitted to the Florida State Clearinghouse for interagency review. The state's continued concurrence with the project will be based, in part, on the adequate resolution of issues identified during this and subsequent reviews.

In addition, the Department of Community Affairs (Department) notes that the area proposed for improvement is located within the federal Coastal Barrier Resources System Unit P08 which was designated under the Coastal Barrier Resources Act (CBRA). The Corps is advised to consult with Mr. James Pulliam, Jr., U.S. Department of Interior, Fish and Wildlife Service, Region 4, regarding the applicability of the CBRA requirements to this project. Please refer to the Department's enclosed comments.

Very truly yours,


Linda Loomis Shelley
Secretary

LLS/rk

Enclosures

cc: Carliane Johnson, Department of Environmental Protection
George Percy, Department of State



Department of Environmental Protection

Lawton Chiles
Governor

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

Virginia B. Wethere
Secretary

March 20, 1995

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MAR 22 1995

Suzanne Traub-Metlay
State Clearinghouse
Executive Office of the Governor
The Capitol
Tallahassee, Florida 32399-0001

Florida Coastal
Management Program

RE: COE/Navigation Study for Ponce de Leon Inlet, Volusia County
SAI: FL9210051642CR

Dear Ms. Traub-Metlay:

The Department has reviewed the referenced notice to conduct additional studies associated with the Ponce de Leon Inlet Feasibility Study, funded in part by the Department. Specifically, two additional alternatives will be investigated; A) the reopening of the weir on the north jetty, and B) the construction of a channel through the north interior spit.

REOPENING N. JETTY WEIR

The Office of Protected Species Management (OPSM) states that there would be very substantive concerns with Alternative A because such a weir may adversely impact marine turtle nesting habitat on the beach north of the inlet and from potential impacts associated with the additional maintenance dredging when the sand trap inside the inlet filled. The continued study of Alternative A should carefully consider the increased dredging requirements and perform computer assisted modeling of the shoreline in response to such an option. The OPSM has identified no marine turtle issues in association with the additional inlet stabilization as proposed with Alternative B.

SOUTH JETTY EXTENSION

Based on the information provided for this review, the study of the alternatives is consistent with our authorities in the Florida Coastal Management Program and with the recommendations of the Department's Ponce de Leon Inlet Management Plan.

For information regarding the Ponce de Leon Management Plan, the Corps should contact Phil Flood, Bureau of Beaches and Coastal Systems, at 904/487-1262. Questions concerning marine turtles may be directed to David Arnold, OPSM, at 904/922-4330.

Sincerely

Carliane D. Johnson
Environmental Specialist
Office of Intergovernmental Programs

/cdj

cc: Phil Flood
Ed Irby

"Protect, Conserve and Manage Florida's Environment and Natural Resources"

Printed on recycled paper.



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MAR 27 1995

Florida Coastal Management Program

FLORIDA DEPARTMENT OF STATE

Sandra B. Mortham
Secretary of State

DIVISION OF HISTORICAL RESOURCES

R.A. Gray Building
500 South Bronough Street
Tallahassee, Florida 32399-0250

Director's Office
(904) 488-1480

Telecopier Number (FAX)
(904) 488-3353

March 24, 1995

Ms. Suzanne Traub-Metlay
State Clearinghouse
Executive Office of the Governor
Room 1603, The Capitol
Tallahassee, Florida 32399-0001

In Reply Refer To:
Frank J. Keel
Historic Sites
Specialist
(904) 487-2333
Project File No. 950675

RE: Cultural Resource Assessment Request
SAI# FL9210051642CR
Improvements to the Ponce de Leon Inlet
Volusia County, Florida

Dear Ms. Traub-Metlay:

In accordance with the provisions of Florida's Coastal Zone Management Act and Chapter 267, Florida Statutes, as well as the procedures contained in 36 C.F.R., Part 800 ("Protection of Historic Properties"), we have reviewed the referenced project(s) for possible impact to historic properties listed, or eligible for listing, in the National Register of Historic Places, or otherwise of historical or architectural value.

We understand that the Corps of Engineers have recently completed a magnetometer survey for this project. When a report has been completed, the Corps of Engineers will coordinate with this office concerning potential effects to historic properties.

If you have any questions concerning our comments, please do not hesitate to contact us. Your interest in protecting Florida's historic properties is appreciated.

Sincerely,

George W. Percy
George W. Percy, Director
Division of Historical Resources
and

State Historic Preservation Officer

GWP/Kfk
XC: Jasmin Raffington, FCMP-DCA
Archaeological Research (904) 487-2299
Florida Folklife Programs (904) 397-2192

Historic Preservation
(904) 487-2333

Museum of Florida History
(904) 488-1484

COUNTY: VOLUSIA

DATE: 02/27/95

COMMENT DUE DATE: 03/14/95

SAI#: FL9210051642CR

OPB POLICY UNITS

STATE AGENCIES

<input checked="" type="checkbox"/>	Agriculture
<input type="checkbox"/>	Board of Regents
<input checked="" type="checkbox"/>	Commerce
<input checked="" type="checkbox"/>	Community Affairs
<input type="checkbox"/>	Education
<input checked="" type="checkbox"/>	Environmental Protection
<input checked="" type="checkbox"/>	Game & Fish Comm
<input type="checkbox"/>	Health & Rehab Srv
<input type="checkbox"/>	Highway Safety
<input type="checkbox"/>	Labor & Employmnt
<input type="checkbox"/>	Law Enforcement
<input checked="" type="checkbox"/>	Marine Fish Comm
<input type="checkbox"/>	State Library
<input checked="" type="checkbox"/>	State
<input checked="" type="checkbox"/>	Transportation
<input type="checkbox"/>	Trans Disad. Comm
<input type="checkbox"/>	DEP District

LOCAL/OTHER

<input type="checkbox"/>	NWFWMD
<input type="checkbox"/>	SFWMD
<input type="checkbox"/>	SWFWMD
<input checked="" type="checkbox"/>	SJRWMD
<input type="checkbox"/>	SRWMD

<input type="checkbox"/>	Public Safety
<input type="checkbox"/>	Education
<input type="checkbox"/>	Environment/C & ED
<input type="checkbox"/>	General Government
<input type="checkbox"/>	Health & Human Srv
<input type="checkbox"/>	Revenue & Eco. Ana
<input type="checkbox"/>	SCH
<input checked="" type="checkbox"/>	SCH/CON

The attached document requires a Coastal Zone Management Act/Florida Coastal Management Program consistency evaluation and is categorized as one of the following:

- Federal Assistance to State or Local Government (15 CFR 930, Subpart F). Agencies are required to evaluate the consistency of the activity.
- Direct Federal Activity (15 CFR 930, Subpart C). Federal Agencies are required to furnish a consistency determination for the State's concurrence or objection.
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- Federal Licensing or Permitting Activity (15 CFR 930, Subpart D). Such projects will only be evaluated for consistency when there is not an analogous state license or permit.



MAR 9 1995

Florida Coastal Management Program

FOR CONSISTENCY PROJECTS, SEE REVERSE SIDE FOR INSTRUCTIONS.

To: State Clearinghouse
 Executive Office of the Governor -OPB
 Room 1603, The Capitol
 Tallahassee, FL. 32399-0001
 (904) 488-8114 (SC 278-8114)

Florida Coastal Management Director
 Department of Community Affairs
 Suite 305, Rhyme Building
 Tallahassee, FL. 32399-2100
 (904) 922-5438 (SC 292-5438)

EO. 12372/NEPA

Federal Consistency

- No Comment
- Comments Attached
- Not Applicable

- No Comment/Consistent
- Consistent/Comments Attached
- Inconsistent/Comments Attached
- Not Applicable

From:

Division/Bureau: TRANSPORTATION

Reviewer: James D. Kimbler JAMES D. KIMBLER, DISTRICT DIRECTOR OF PLANNING

Date: 3/6/95 AND PUBLIC TRANSPORTATION

COUNTY: VOLUSIA

DATE: 02/27/95

COMMENT DUE DATE: 03/14/95

SAI#: FL9210051642CR

STATE AGENCIES

LOCAL/OTHER

OPB POLICY UNITS

- Agriculture
- Board of Regents
- Commerce
- Community Affairs
- Education
- Environmental Protection
- Game & Fish Comm
- Health & Rehab Srv
- Highway Safety
- Labor & Employmnt
- Law Enforcement
- Marine Fish Comm
- State Library
- State
- Transportation
- Trans Disad. Comm
- DEP District

- NFWFMD
- SFWMD
- SWFWMD
- SJRWMD
- SRWMD

- Public Safety
- Education
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- SCH
- SCH/CON

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FEB 28 1995

MARINE FISHERIES COMMISSION

The attached document requires a Coastal Zone Management Act/Florida Coastal Management Program consistency evaluation and is categorized as one of the following:

- Federal Assistance to State or Local Government (15 CFR 930, Subpart F). Agencies are required to evaluate the consistency of the activity.
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MAR 4 1995

Florida Coastal Management Program

FOR CONSISTENCY PROJECTS, SEE REVERSE SIDE FOR INSTRUCTIONS.

To: State Clearinghouse
 Executive Office of the Governor -OPB
 Room 1603, The Capitol
 Tallahassee, FL 32399-0001
 (904) 488-8114 (SC 278-8114)

Florida Coastal Management Director
 Department of Community Affairs
 Suite 305, Rhyne Building
 Tallahassee, FL 32399-2100
 (904) 922-5438 (SC 292-5438)

EO. 12372/NEPA

Federal Consistency

- No Comment
- Comments Attached
- Not Applicable

- No Comment/Consistent
- Consistent/Comments Attached
- Inconsistent/Comments Attached
- Not Applicable

From:

Division/Bureau: Marine Fisheries Comm

Reviewer: [Signature]

Date: 3-12-95

COUNTY: VOLUSIA

RECEIVED
2/28/95

DATE: 02/27/95
COMMENT DUE DATE: 03/14/95
SAI#: FL9210051642CR

STATE AGENCIES

- Agriculture
- Board of Regents
- Commerce
- Community Affairs
- Education
- Environmental Protection
- Game & Fish Comm
- Health & Rehab Srv
- Highway Safety
- Labor & Employmnt
- Law Enforcement
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- DEP District

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- SFWMD
- SWFWMD
- SJRWMD
- SRWMD

OPB POLICY UNITS

- Public Safety
- Education
- Environment/C & ED
- General Government
- Health & Human Srv
- Revenue & Eco. Ana
- SCH
- SCH/CON

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MAR 6 1995

Florida Coastal
Management Program

The attached document requires a Coastal Zone Management Act/Florida Coastal Management Program consistency evaluation and is categorized as one of the following:

- Federal Assistance to State or Local Government (15 CFR 930, Subpart F). Agencies are required to evaluate the consistency of the activity.
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- Federal Licensing or Permitting Activity (15 CFR 930, Subpart D). Such projects will only be evaluated for consistency when there is not an analogous state license or permit.

FOR CONSISTENCY PROJECTS, SEE REVERSE SIDE FOR INSTRUCTIONS.

To: State Clearinghouse
Executive Office of the Governor -OPB
Room 1603, The Capitol
Tallahassee, FL. 32399-0001
(904) 488-8114 (SC 278-8114)

Florida Coastal Management Director
Department of Community Affairs
Suite 305, Rhyne Building
Tallahassee, FL. 32399-2100
(904) 922-5438 (SC 292-5438)

EO. 12372/NEPA

Federal Consistency

- No Comment
- Comments Attached
- Not Applicable

- No Comment/Consistent
- Consistent/Comments Attached
- Inconsistent/Comments Attached
- Not Applicable

From:

Division/Bureau:

Reviewer: Vera A. Shearwood

Date: 3/2/95



STATE OF FLORIDA
DEPARTMENT OF COMMUNITY AFFAIRS

2740 CENTERVIEW DRIVE • TALLAHASSEE, FLORIDA 32399-2100

LAWTON CHILES
Governor

LINDA LOOMIS SHELLEY
Secretary

March 21, 1995

Ms. Janice L. Hatter
Director
State Clearinghouse
Executive Office of the Governor
Room 1603 - The Capitol
Tallahassee, Florida 32399-0001

RE: U.S. Army Corp of Engineers - Scoping Letter for
Feasibility Report - Ponce de Leon Inlet Improvements -
Volusia County, Florida
SAI# FL9210051642CR

Dear Ms. Hatter:

The Department of Community Affairs (Department), pursuant to its role as the state's land planning and emergency management agency, has reviewed the above-referenced project for consistency with our responsibilities under the Florida Coastal Management Program (FCMP). The Department has determined that the proposed feasibility report is consistent with our FCMP responsibilities.

Ponce de Leon Inlet, which is under consideration for the proposed improvements, is located within the federal Coastal Barrier Resources System (CBRS) Unit P08. Therefore, the Department has reviewed the requirements of the Coastal Barrier Resources Act (CBRA) for applicability to the above-referenced project. The CBRA limits the use of federal funds within CBRS units, with certain exceptions. The Corps of Engineers is advised to consult with the Mr. James W. Pulliam, Jr., U.S. Department of Interior, U.S. Fish and Wildlife Service, Region 4, 1875 Century Boulevard, Atlanta, Georgia, 30345, (404) 679-4000, to ensure compliance with the CBRA requirements.

EMERGENCY MANAGEMENT • HOUSING AND COMMUNITY DEVELOPMENT • RESOURCE PLANNING AND MANAGEMENT

Ms. Janice L. Hatter
March 21, 1995
Page Two

Thank you for the opportunity to comment on this proposed project. If you have any questions, please contact Rosalyn Kilcollins, Florida Coastal Management Program, at (904) 922-5438.

Very truly yours,

Mary Anne Price
for Linda Loomis Shelley
Secretary

LLS/rk

COMMITTEE ON PUBLIC WORKS AND TRANSPORTATION
U.S. HOUSE OF REPRESENTATIVES
WASHINGTON, D.C.

R E S O L U T I O N

Ponce De Leon Inlet, Volusia County, Florida
Docket 2361

Resolved by the Committee on Public Works and Transportation of the United States House of Representatives, That the Board of Engineers for Rivers and Harbors, is requested to review the report of the Chief of Engineers on Ponce De Leon Inlet, Florida published as House Document 74, Eighty-ninth Congress, First Session, and other pertinent reports, to determine whether modifications of the recommendations contained therein are advisable at the present time, in the interest of navigation and other purposes.

Adopted: May 21, 1901

ATTEST: 
ROBERT A. ROE, Chairman

(Requested by Representative Craig T. James)

John M.
FYI



DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P. O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

September 29, 1992

REPLY TO
ATTENTION OF

Planning Division
Environmental Branch

TO ADDRESSEES ON ATTACHED LIST:

The Jacksonville District, U.S. Army Corps of Engineers, is gathering information to define issues and concerns that will be addressed in a reconnaissance-level report on proposed inlet improvements at Ponce de Leon Inlet, Volusia County, Florida.

Alternatives under consideration include lengthening the south jetty approximately 1,000 feet, construction of a scour apron on the south side of the north jetty, rebuilding damaged areas of the north jetty, construction of a groin field along the sand spit inside the inlet adjacent to the north jetty and construction of a storm revetment to seal a potential breach along shoreline of the sand spit inside the inlet (enclosure 1).

The Corps welcomes your views, comments and information about resources, study objectives and important features within the described study area, as well as any suggested improvements. Letters of comment or inquiry should be addressed to the letterhead address to the attention of Planning Division, Environmental Studies Section and received by this office within thirty (30) days of the date of this letter.

Sincerely,

A handwritten signature in cursive script, reading "A. J. Salem", is positioned below the word "Sincerely,".

A. J. Salem
Chief, Planning Division

Enclosure

PONCE DE LEON INLET
MAILING LIST

Director
Office of Federal Activities (A-104)
Environmental Protection Agency
401 M Street SW
Washington, D.C. 20024-2610 (5 cys)

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Department of Commerce
NOAA/CS/EC/Room 6222
14 and Constitution Ave., NW
Washington, DC 20230 (4 cys)

Mr. Bruce Blanchard, Director
Office of Environmental Project
Review
Department of the Interior,
Room 4241
18th and C Streets, NW
Washington, D.C. 20240 (12 cys)

Executive Director
Advisory Council on Historic
Preservation
The Old Post Office Building
1100 Pennsylvania Avenue NW 809
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Isaak Walton League of America, Inc.
5314 Bay State Road
Palmetto, Florida 33561-9712

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Executive Office of the Governor
The Capitol
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Tallahassee, FL 32314-6870

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Gainesville, FL 32609

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Soil Conservation Service
U.S. Department of Agriculture
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Housing & Urban Development
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75 Spring St., SW
Atlanta, GA 30303-3309 (2 cys)

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Environmental Policy Section
EPA, Region Iv
345 Courtland Street, N.E.
Atlanta, GA 30365-2401 (5 cys)

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Coral Gables, FL 33416

State Director, ASCS
U.S. Department of Agriculture
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Gainesville, Florida 32602-0670

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Florida Chapter
Sierra Club
927 Delores Drive
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National Marine Fisheries Service
Environmental Assessment Branch
3500 Delwood Beach Road
Panama City, FL 32407-7499

National Marine Fisheries Service
Office of the Regional Director
9450 Koger Boulevard
St. Petersburg, FL 33702-2496

National Marine Fisheries Service
Chief, Protected Species Branch
9450 Koger Boulevard
St. Petersburg, FL 33702-2496

Mr. Steve Fitch
Forest Supervisor
U.S. Forest Service
227 N. Bronough Street
Suite 4061
Tallahassee, Florida 32301

St. Johns River Water
Management District
P.O. Box 1429
Palatka, Florida 32178-1428

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Lighthouse Boatyard
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Daytona Beach, Florida 32127

Mr. Charlie Schammel
Critter Fleet
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Mr. Bob Stone
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4950 S. Peninsula Dr.
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Mr. Tim Garrett
Critter Fleet
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United States Coast Guard
State Ponce DeLeon
P.O. Box 370
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Commander
Seventh Coast Guard District
United States Coast Guard
Brickell Plaza Federal Building
Miami, Florida 33131-3050

Mr. Daniel M. O'Brien
Port Authority Coordinator
Ponce DeLeon Port Authority
440 S. Beach Street
Daytona Beach, Florida 32114

PONCE DE LEON INLET
PROPOSED ALTERNATIVES

1. Five alternatives are currently under consideration and are described below:

a. Construct a 1,000-foot extension of the south jetty. The jetty would be constructed at a base elevation of -15 feet m.l.w. and extend to a crest elevation of +7.0 feet m.l.w.

b. Construct a scour apron along the south side of the north jetty. The apron would be 30 feet wide and 3 feet thick and would be placed along the landward 700 feet of the north jetty.

c. Rebuild the damaged portions of the north jetty with stone similar to that now in place. Portions of the north jetty have slumped up to 3 feet since initial construction because of scouring or storm displacement due to wave action. Approximately 1,000 cy of stone will be required for repairs.

d. Construct a groin field along the sand spit inside the inlet, adjacent to the north jetty. Four (4) rubble-mound groins are anticipated at this time.

e. Construct a storm revetment to seal a potential breach along the sand spit inside the inlet, adjacent to the north jetty.

2. Construction of all improvements to the north jetty will be from a barge. South jetty improvements may be constructed by driving over the jetty or from a barge.

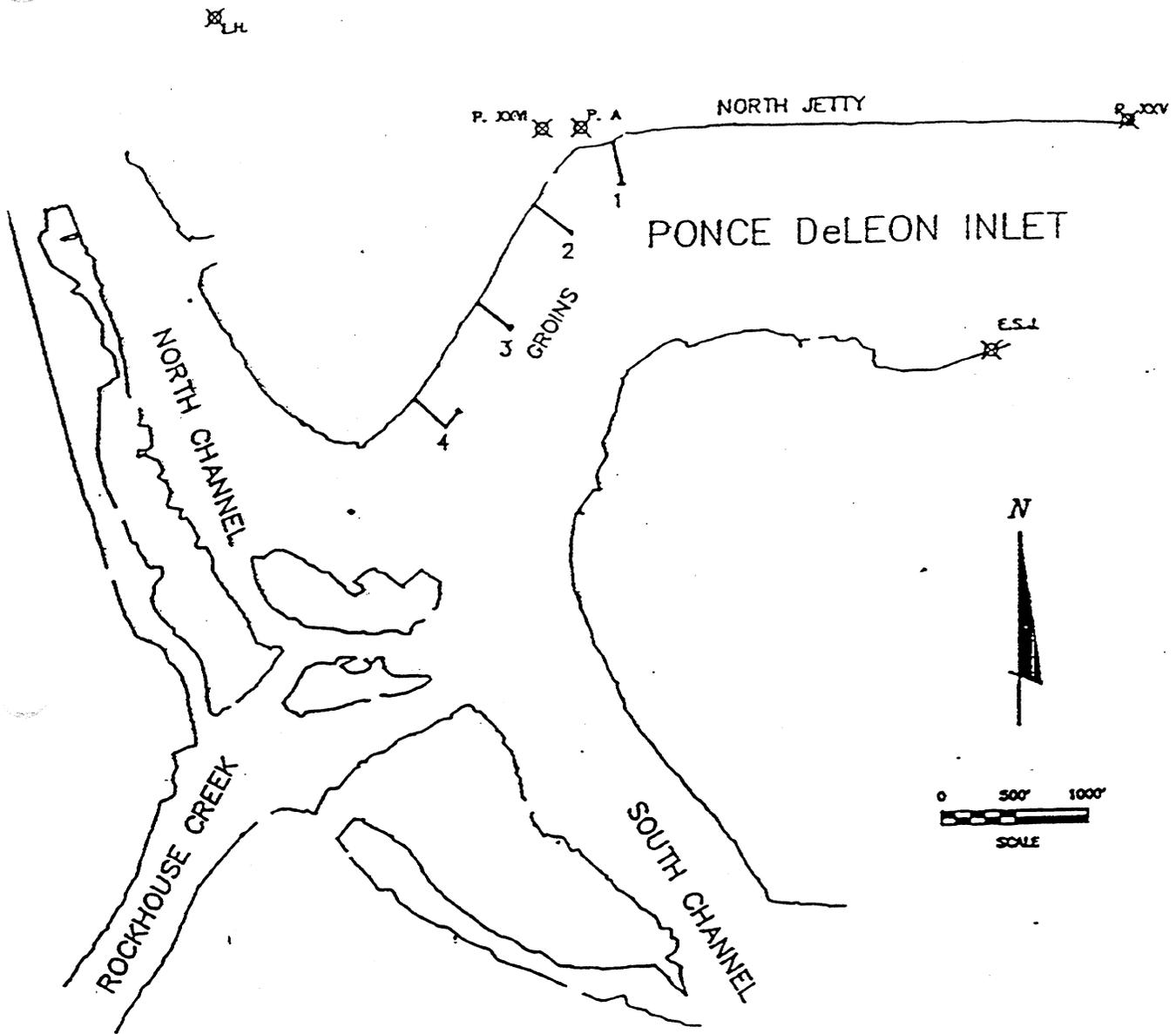
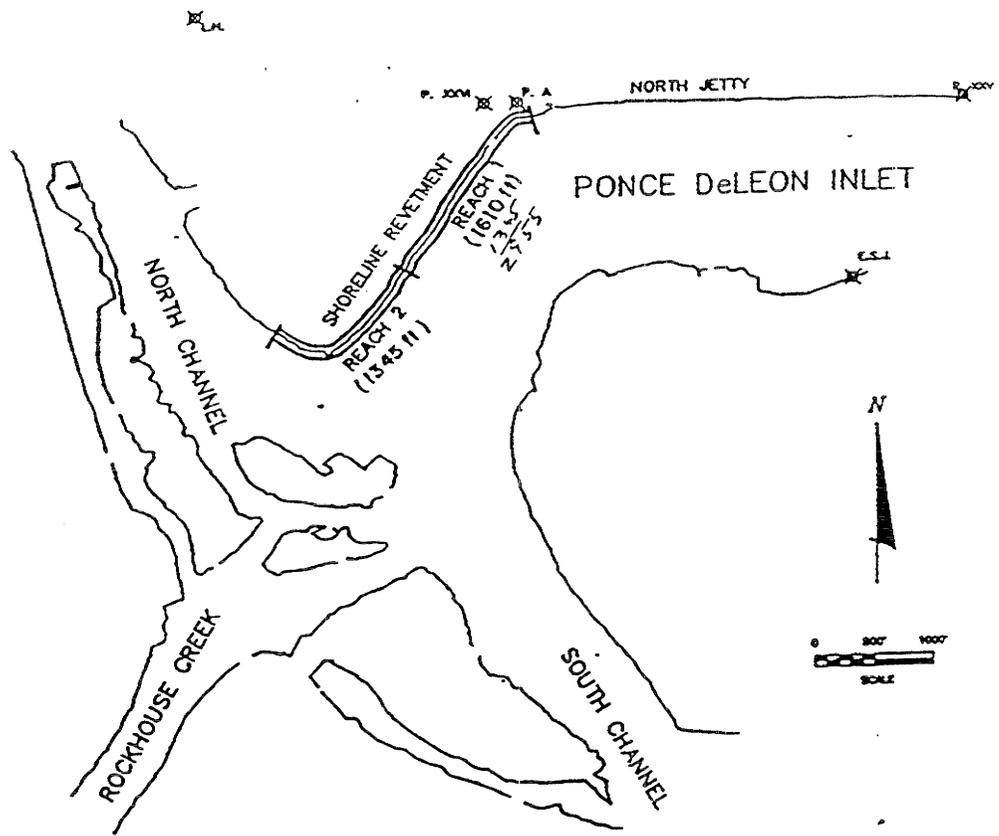
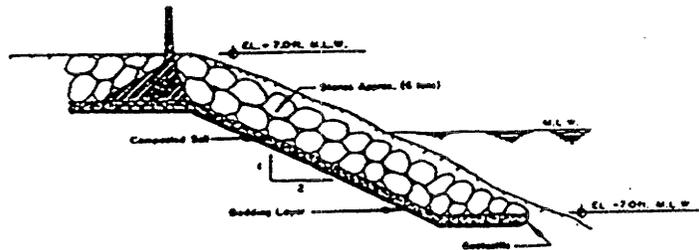


Figure 1 Four Groin System

0-95

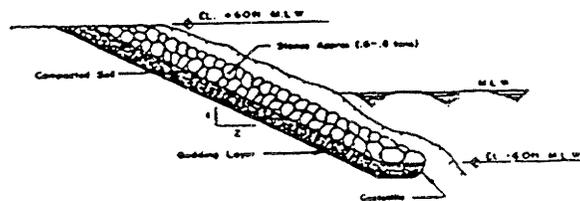


Reach 1 - Typical Cross-Section
N.T.S.



Conceptual Design Only

Reach 2 - Typical Cross-Section
N.T.S.



Conceptual Design Only

Figure 2 Conceptual Design, North Spit Shoreline Revetment



DEPARTMENT OF THE ARMY
 WATERWAYS EXPERIMENT STATION, CORPS OF ENGINEERS
 3909 HALLS FERRY ROAD
 VICKSBURG, MISSISSIPPI 39180-6199

REPLY TO
 ATTENTION OF

5 DECEMBER 1992

CEWES-CR-P (1110-1-8100c)

MEMORANDUM FOR Commander, U.S. Army Engineer Division, Jacksonville, ATTN:
 CESAJ-ED-HC (Mr. Joseph Gurule), P.O. Box 4970, Jacksonville,
 FL 32232

SUBJECT: Review of Previous Studies of Ponce De Leon Inlet, FL, and Proposal
 for Additional Work

1. At your request, a series of studies performed by Taylor Engineering Inc. at Ponce de Leon Inlet, FL, were reviewed. The review includes an assessment of the applicability of numerical models that were previously applied to the site to investigate the consequences of North Jetty failure and loss of land along the inlet throat just inside the North Jetty. Written review comments are included in the encl.
2. A scope of work also was prepared (included in the encl), that involves additional work needed to better understand the nature of erosion problems being experienced in the inlet, assess future changes in the inlet if nothing is done to stem the erosion, and evaluate the performance of possible solutions to the problem. The scope involves a combination of field data collection, numerical modeling, and laboratory scale-modeling and is designed to take advantage of the strengths of each. Time and cost to complete the entire study are estimated to be 28 months and \$702,000.
3. We understand that this study is under consideration for the US Army Engineer Waterways Experiment Station to perform during FY93 through FY95. In order for us to perform this study, we must be authorized the necessary Full Time Equivalent (FTE) spaces. To assist us in obtaining the necessary FTE allocation, it is requested that you take action to have this work entered into the Headquarters, US Army Corps of Engineers FORCON manpower accounting system. For this study to be conducted by the Program Division of Civil Works Directorate as justification for the necessary FTE authorization, it must be substantiated and validated by a submission from your office.
4. If you have any questions concerning this proposal, please contact Mr. Bruce A. Ebersole (601-634-3209) directly.

Encl


 ROBERT W. WHALIN, PhD, PE
 Director

D 27



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P. O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019



February 7, 1995

Planning Division
Environmental Branch

TO THE ADDRESSEES ON THE ENCLOSED LIST:

The Jacksonville District, U.S. Army Corps of Engineers (Corps), is gathering information to define issues and concerns that will be addressed in a feasibility-level report on proposed inlet improvements at Ponce de Leon Inlet, Volusia County, Florida.

In a letter dated September 29, 1992, the Corps presented a series of alternatives and requested views, comments, and information regarding those alternatives. Responses were incorporated into the environmental considerations for the Reconnaissance Report dated January 1993. That report is available from the Jacksonville District, upon request.

During the feasibility phase, two additional alternatives will receive consideration. (See enclosed map, figure 1.) One involves reopening the north jetty weir (A on enclosed map). The second consists of constructing a channel in the area of the potential breakthrough (B on enclosed map). A model study will evaluate those measures for stabilizing the inlet in combination with a 1000-foot extension of the south jetty. Extension of the south jetty may include reuse of existing stone from the landward end of the south jetty or from reopening the weir in the north jetty.

The Corps welcomes your views, comments, and information about resources, study objectives, and important features within the described study area, as well as any suggested improvements. Letters of comment or inquiry should be addressed to the letterhead address to the attention of Planning Division, Environmental Studies Section, and received by this office within 30 days of the date of this letter.

Sincerely,

A. J. Salem
Chief, Planning Division

Enclosure

PONCE DE LEON INLET

MAILING LIST

Director
Office of Federal Activities (A-104)
Environmental Protection Agency
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Washington, DC 30034-2610 (5 cys)

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Office of Environmental Project Review
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Seventh Coast guard District
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Brickell plaza Federal Building
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Ponce DeLeon Port Authority
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Captain Mike Nelson
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Captain Ernie Endicott
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Captain Steve Dresser
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Captain Dix Harper
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Captain Scott Frierson
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Captain Mike DeBloom
Adventure Yacht Harbor
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Ponce Inlet, FL 32127

Captain Bob Marsham
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Captain Jay Wilson
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Captain Bob McWhorter
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Captain Bill Fulton
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Captain Moors
Feger's Seafood
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New Smyrna Beach, FL 32170-0024

Captain Frank Martinez
Feger's Seafood
P.O. Box 24
New Smyrna Beach, FL 32170-0024

Captain David Baird
Path Finder
P.O. Box 818
Sharpes, FL 32959

Captain Robert Smith
The Charlie
P.O. Box 818
Sharpes, FL 32959

Captain R. Christiansen
Charter Boat, The Charlie
P.O. Box 818
Sharpes, FL 32959

Captain Tony Crane
Charter Boat, Lucky Strike
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Sharpes, FL 32959

Captain Timmons
Manager Sea Love Marina
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Ponce Inlet, FL 32127

Captain Joe Camp
Sea Love Marina
4884 Front Street
Ponce Inlet, FL 32127

Captain Lingo
Sea Love
4884 Front Street
Ponce Inlet, FL 32127

Captain David Stokes
Charter Boat, Sea Lover
4884 Front Street
Ponce Inlet, FL 32127

Captain David Thompson
Charter Boat, Square One
4884 Front Street
Ponce Inlet, FL 32127

Captain Scott Laney
Charter Boat, Rockin Robin
4884 Front Street
Ponce Inlet, FL 32127

Captain Chris Forman
Charter Boat, Taylor made
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Ponce Inlet, FL 32127

Mr. Sam Fernandez
Dockside Charters
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Ponce Inlet, FL 32127

Captain Danny Day
Charter Boat, Mommas Money II
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Ponce Inlet, FL 32127

Captain Bob Sorenson
Charter Boat, High Roller
4888 Front Street
Ponce Inlet, FL 32127

Captain Tom Wagner
Charter Boat, Sun Dancer
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Sea harvest
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New Smyrna Beach, FL 32168

Captain Johnny Lloyd
Charter Boat, Triple Header
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New Smyrna Beach, FL 32168

Captain Tom Harold
Charter Boat, Pier Three
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New Smyrna Beach, FL 32168

Mr. Richard Kirk
Ponce Deep Water Landing
133 Inlet Harbor Road
Ponce Inlet, FL 32127

Captain George Locke
Little Dolphin
133 Inlet Harbor Road
Ponce Inlet, FL 32127

Captain John Ellis
Charter Boat, Rainbow II
133 Inlet Harbor Road
Ponce Inlet, FL 32127

Captain Steve Ellis
Charter Boat, Rainbow III
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Ponce Inlet, FL 32127

Captain David Grubbs
Charter Boat, Heavy Hitter
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Halifax Harbor Marina
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Captain William Nixon
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Riverview Charlies Restaurant
North Causeway
New Smyrna Beach, FL 32169



STATE OF FLORIDA
DEPARTMENT OF COMMUNITY AFFAIRS

2740 CENTERVIEW DRIVE • TALLAHASSEE, FLORIDA 32399-2100

LAWTON CHILES
Governor

LINDA LOOMIS SHELLEY
Secretary

April 7, 1995

Mr. A.J. Salem
Army Corps of Engineers
Jacksonville District
Post Office Box 4970
Jacksonville, FL 32232-0019

RE: Navigation Projects - Scoping Letter for Feasibility
Report - Ponce de Leon Inlet Improvements - Volusia
County, Florida
SAI: FL9210051642CR

Dear Mr. Salem:

The Florida State Clearinghouse, pursuant to Presidential Executive Order 12372, Governor's Executive Order 93-194, the Coastal Zone Management Act, 16 U.S.C. §§ 1451-1464, as amended, and the National Environmental Policy Act, 42 U.S.C. §§ 4321, 4331-4335, 4341-4347, as amended, has coordinated a review of the above-referenced project.

The Department of Environmental Protection (DEP) indicates that Alternative A may result in adverse impacts to marine turtle nesting habitat. Therefore, the Corps of Engineers (Corps) is advised to evaluate the potential shoreline response for Alternative A and to coordinate project planning with the DEP's Office of Protected Species. Please refer to the enclosed DEP comments.

The Department of State (DOS) indicates that the Corps is required to provide the results of the magnetometer survey to the DOS for review. The Corps is also required to consult with the DOS regarding avoidance or mitigation of any impacts to any historic site located in the project area. Please refer to the enclosed DOS comments.

Based on the available information and the enclosed comments provided by our reviewing agencies, the state has determined that, at this stage, the above-referenced project is consistent with the Florida Coastal Management Program (FCMP). All subsequent environmental documents prepared for this project

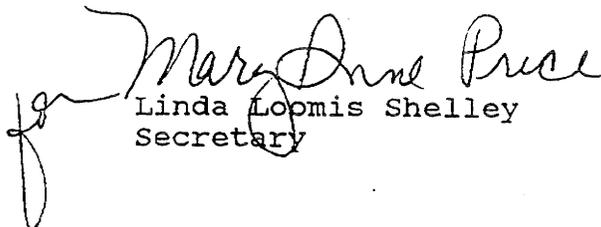
EMERGENCY MANAGEMENT • HOUSING AND COMMUNITY DEVELOPMENT • RESOURCE PLANNING AND MANAGEMENT

Mr. A.J. Salem
April 17, 1995
Page Two

must be reviewed to determine the project's continued consistency with the FCMP. All future documents prepared for this project must be submitted to the Florida State Clearinghouse for interagency review. The state's continued concurrence with the project will be based, in part, on the adequate resolution of issues identified during this and subsequent reviews.

In addition, the Department of Community Affairs (Department) notes that the area proposed for improvement is located within the federal Coastal Barrier Resources System Unit P08 which was designated under the Coastal Barrier Resources Act (CBRA). The Corps is advised to consult with Mr. James Pulliam, Jr., U.S. Department of Interior, Fish and Wildlife Service, Region 4, regarding the applicability of the CBRA requirements to this project. Please refer to the Department's enclosed comments.

Very truly yours,


Linda Loomis Shelley
Secretary

LLS/rk

Enclosures

cc: Carliane Johnson, Department of Environmental Protection
George Percy, Department of State



Department of Environmental Protection

Lawton Chiles
Governor

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

Virginia B. Wetherell
Secretary

March 20, 1995

RECEIVED

MAR 22 1995

Suzanne Traub-Metlay
State Clearinghouse
Executive Office of the Governor
The Capitol
Tallahassee, Florida 32399-0001

Florida Coastal
Management Program

RE: COE/Navigation Study for Ponce de Leon Inlet, Volusia County
SAI: FL9210051642CR

Dear Ms. Traub-Metlay:

The Department has reviewed the referenced notice to conduct additional studies associated with the Ponce de Leon Inlet Feasibility Study, funded in part by the Department. Specifically, two additional alternatives will be investigated; A) the reopening of the weir on the north jetty, and B) the construction of a channel through the north interior spit.

The Office of Protected Species Management (OPSM) states that there would be very substantive concerns with Alternative A because such a weir may adversely impact marine turtle nesting habitat on the beach north of the inlet and from potential impacts associated with the additional maintenance dredging when the sand trap inside the inlet filled. The continued study of Alternative A should carefully consider the increased dredging requirements and perform computer assisted modeling of the shoreline in response to such an option. The OPSM has identified no marine turtle issues in association with the additional inlet stabilization as proposed with Alternative B.

Based on the information provided for this review, the study of the alternatives is consistent with our authorities in the Florida Coastal Management Program and with the recommendations of the Department's Ponce de Leon Inlet Management Plan.

For information regarding the Ponce de Leon Management Plan, the Corps should contact Phil Flood, Bureau of Beaches and Coastal Systems, at 904/487-1262. Questions concerning marine turtles may be directed to David Arnold, OPSM, at 904/922-4330.

Sincerely

Carliane D. Johnson
Environmental Specialist
Office of Intergovernmental Programs

/cdj
cc: Phil Flood
Ed Irby

"Protect, Conserve and Manage Florida's Environment and Natural Resources"

Printed on recycled paper.



RECEIVED

MAR 27 1995

Florida Coastal
Management Program

FLORIDA DEPARTMENT OF STATE

Sandra B. Mortham
Secretary of State

DIVISION OF HISTORICAL RESOURCES

R.A. Gray Building
500 South Bronough Street
Tallahassee, Florida 32399-0250

Director's Office
(904) 488-1480

Telecopier Number (FAX)
(904) 488-3353

March 24, 1995

Ms. Suzanne Traub-Metlay
State Clearinghouse
Executive Office of the Governor
Room 1603, The Capitol
Tallahassee, Florida 32399-0001

In Reply Refer To:
Frank J. Keel
Historic Sites
Specialist
(904) 487-2333
Project File No. 950675

RE: Cultural Resource Assessment Request
SAI# FL9210051642CR
Improvements to the Ponce de Leon Inlet
Volusia County, Florida

Dear Ms. Traub-Metlay:

In accordance with the provisions of Florida's Coastal Zone Management Act and Chapter 267, Florida Statutes, as well as the procedures contained in 36 C.F.R., Part 800 ("Protection of Historic Properties"), we have reviewed the referenced project(s) for possible impact to historic properties listed, or eligible for listing, in the National Register of Historic Places, or otherwise of historical or architectural value.

We understand that the Corps of Engineers have recently completed a magnetometer survey for this project. When a report has been completed, the Corps of Engineers will coordinate with this office concerning potential effects to historic properties.

If you have any questions concerning our comments, please do not hesitate to contact us. Your interest in protecting Florida's historic properties is appreciated.

Sincerely,

George W. Percy
George W. Percy, Director
Division of Historical Resources
and

State Historic Preservation Officer

GWP/Kfk
xc: Jasmin Raffington, FCMP-DCA
Archaeological Research (904) 487-2299
Florida Folklife Programs (904) 397-2197

Historic Preservation
(904) 487-2333

Museum of Florida History
(904) 488-1484

COUNTY: VOLUSIA

DATE: 02/27/95

COMMENT DUE DATE: 03/14/95

SAI#: FL9210051642CR

STATE AGENCIES

LOCAL/OTHER

OPB POLICY UNITS

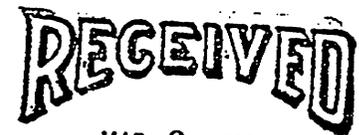
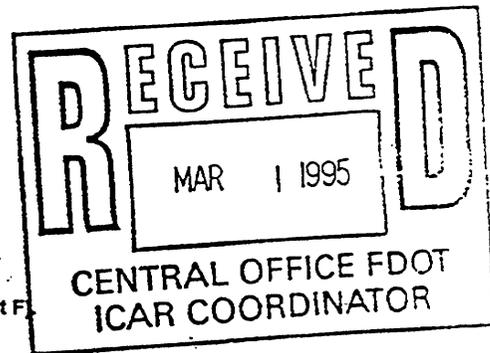
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<input type="checkbox"/>	Board of Regents
<input checked="" type="checkbox"/>	Commerce
<input checked="" type="checkbox"/>	Community Affairs
<input type="checkbox"/>	Education
<input checked="" type="checkbox"/>	Environmental Protection
<input checked="" type="checkbox"/>	Game & Fish Comm
<input type="checkbox"/>	Health & Rehab Srv
<input type="checkbox"/>	Highway Safety
<input type="checkbox"/>	Labor & Employmnt
<input type="checkbox"/>	Law Enforcement
<input checked="" type="checkbox"/>	Marine Fish Comm
<input type="checkbox"/>	State Library
<input checked="" type="checkbox"/>	State
<input checked="" type="checkbox"/>	Transportation
<input type="checkbox"/>	Trans Disad. Comm
<input type="checkbox"/>	DEP District
<input type="checkbox"/>	
<input type="checkbox"/>	

<input type="checkbox"/>	NWFWMD
<input type="checkbox"/>	SFWMD
<input type="checkbox"/>	SWFWMD
<input checked="" type="checkbox"/>	SJRWMD
<input type="checkbox"/>	SRWMD
<input type="checkbox"/>	
<input type="checkbox"/>	

<input type="checkbox"/>	Public Safety
<input type="checkbox"/>	Education
<input type="checkbox"/>	Environment/C & ED
<input type="checkbox"/>	General Government
<input type="checkbox"/>	Health & Human Srv
<input type="checkbox"/>	Revenue & Eco. Ana
<input type="checkbox"/>	SCH
<input checked="" type="checkbox"/>	SCH/CON

The attached document requires a Coastal Zone Management Act/Florida Coastal Management Program consistency evaluation and is categorized as one of the following:

- Federal Assistance to State or Local Government (15 CFR 930, Subpart F). Agencies are required to evaluate the consistency of the activity.
- Direct Federal Activity (15 CFR 930, Subpart C). Federal Agencies are required to furnish a consistency determination for the State's concurrence or objection.
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MAR 9 1995

Florida Coastal Management Program

FOR CONSISTENCY PROJECTS, SEE REVERSE SIDE FOR INSTRUCTIONS.

To: State Clearinghouse
 Executive Office of the Governor -OPB
 Room 1603, The Capitol
 Tallahassee, FL. 32399-0001
 (904) 488-8114 (SC 278-8114)

Florida Coastal Management Director
 Department of Community Affairs
 Suite 305, Rhyne Building
 Tallahassee, FL. 32399-2100
 (904) 922-5438 (SC 292-5438)

EO. 12372/NEPA

Federal Consistency

- No Comment
- Comments Attached
- Not Applicable

- No Comment/Consistent
- Consistent/Comments Attached
- Inconsistent/Comments Attached
- Not Applicable

From:

Division/Bureau: TRANSPORTATION

Reviewer: James D. Kimbler JAMES D. KIMBLER, DISTRICT DIRECTOR OF PLANNING AND PUBLIC TRANSPORTATION

Date: 3/6/95

COUNTY: VOLUSIA

DATE: 02/27/95

COMMENT DUE DATE: 03/14/95

SAI#: FL9210051642CR

STATE AGENCIES

- Agriculture
- Board of Regents
- Commerce
- Community Affairs
- Education
- Environmental Protection
- Game & Fish Comm
- Health & Rehab Srv
- Highway Safety
- Labor & Employmnt
- Law Enforcement
- Marine Fish Comm
- State Library
- State
- Transportation
- Trans Disad. Comm
- DEP District

LOCAL/OTHER

- NWFWM
- SFWMD
- SWFWMD
- SJRWMD
- SRWMD

OPB POLICY UNITS

- Public Safety
- Education
- Environment/C & ED
- General Government
- Health & Human Srv
- Revenue & Eco. Ana
- SCH
- SCH/CON

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FEB 28 1995

MARINE FISHERIES COMMISSION

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Florida Coastal Management Program

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EO. 12372/NEPA

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- Comments Attached
- Not Applicable

Federal Consistency

- No Comment/Consistent
- Consistent/Comments Attached
- Inconsistent/Comments Attached
- Not Applicable

From:

Division/Bureau: Marine Fisheries Comm

Reviewer: [Signature]

Date: 3-12-95

VGT

RECEIVED
2/23/95

DATE: 02/27/95

COMMENT DUE DATE: 03/14/95

SAI #: FL9210051642CR

COUNTY: VOLUSIA

STATE AGENCIES

- Agriculture
- Board of Regents
- Commerce
- Community Affairs
- Education
- Environmental Protection
- Game & Fish Comm
- Health & Rehab Srv
- Highway Safety
- Labor & Employmnt
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- Marine Fish Comm
- State Library
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- DEP District

LOCAL/OTHER

- NFWWMD
- SFWMD
- SWFWMD
- SJRWMD
- SRWMD

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- Education
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- SCH
- SCH/CON

RECEIVED

MAR 6 1995

Florida Coastal Management Program

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- Not Applicable

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- Consistent/Comments Attached
- Inconsistent/Comments Attached
- Not Applicable

From:

Division/Bureau: _____

Reviewer: W. A. Shearwood

Date: 3/2/95



STATE OF FLORIDA
DEPARTMENT OF COMMUNITY AFFAIRS

2740 CENTERVIEW DRIVE • TALLAHASSEE, FLORIDA 32399-2100

LAWTON CHILES
Governor

LINDA LOOMIS SHELLEY
Secretary

March 21, 1995

Ms. Janice L. Hatter
Director
State Clearinghouse
Executive Office of the Governor
Room 1603 - The Capitol
Tallahassee, Florida 32399-0001

RE: U.S. Army Corp of Engineers - Scoping Letter for
Feasibility Report - Ponce de Leon Inlet Improvements -
Volusia County, Florida
SAI# FL9210051642CR

Dear Ms. Hatter:

The Department of Community Affairs (Department), pursuant to its role as the state's land planning and emergency management agency, has reviewed the above-referenced project for consistency with our responsibilities under the Florida Coastal Management Program (FCMP). The Department has determined that the proposed feasibility report is consistent with our FCMP responsibilities.

Ponce de Leon Inlet, which is under consideration for the proposed improvements, is located within the federal Coastal Barrier Resources System (CBRS) Unit P08. Therefore, the Department has reviewed the requirements of the Coastal Barrier Resources Act (CBRA) for applicability to the above-referenced project. The CBRA limits the use of federal funds within CBRS units, with certain exceptions. The Corps of Engineers is advised to consult with the Mr. James W. Pulliam, Jr., U.S. Department of Interior, U.S. Fish and Wildlife Service, Region 4, 1875 Century Boulevard, Atlanta, Georgia, 30345, (404) 679-4000, to ensure compliance with the CBRA requirements. 2

EMERGENCY MANAGEMENT • HOUSING AND COMMUNITY DEVELOPMENT • RESOURCE PLANNING AND MANAGEMENT

Handwritten notes and signatures:
FWS
R. J. [unclear]
ALL

Ms. Janice L. Hatter
March 21, 1995
Page Two

Thank you for the opportunity to comment on this proposed project. If you have any questions, please contact Rosalyn Kilcollins, Florida Coastal Management Program, at (904) 922-5438.

Very truly yours,

Mary Anne Price
for Linda Loomis Shelley
Secretary

LLS/rk



DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P. O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019



March 18, 1997

REPLY TO
ATTENTION OF

Planning Division
Environmental Branch

TO WHOM IT MAY CONCERN:

U.S. Army Corps of Engineers (Corps), Jacksonville District, is continuing to gather information to define issues and concerns that will be addressed in a feasibility-level report on proposed navigation improvements at Ponce DeLeon Inlet, Volusia County, Florida.

In letters dated September 29, 1992, and February 7, 1995, the Corps presented a series of alternatives for navigation improvements and requested views, comments and information regarding those alternatives. Responses were incorporated into the Reconnaissance Report and further comments will be considered in the Feasibility Report.

Subsequent to completion of the draft Feasibility Report, local interests proposed a new commercial marina and seafood processing facility to be constructed on county property adjacent to the Intracoastal Waterway in the vicinity of Rockhouse Creek. The local sponsor has requested that the Corps study the feasibility of expanding the Federal project to accommodate these facilities (see attached sheet for description).

The Corps welcomes your views, comments and any pertinent information about resources, study objectives and important features within the described study area, as well as any suggested improvements. Letters of comment or inquiry should be addressed to the letterhead address to the attention of Planning Division, Environmental Studies Section and received by this office within 30 days of the date of this letter.

Sincerely,

Hanley K. Smith
Acting Chief, Planning Division

Enclosure

**PONCE DELEON INLET
VOLUSIA COUNTY, FLORIDA
DESCRIPTION OF ADDITIONAL PROJECT FEATURES**

1.0 Proposed New Project Features. The Corps has been requested to consider additional project features for the Ponce DeLeon Inlet Navigation Improvements study. The proposal is to realign the southern portion of the Ponce DeLeon Inlet Federal channel in the Indian River to Cut-24 of the IWW and to deepen the existing IWW channel from Cut-24 north to an the site of the old Swoope Power Plant site on the west side of the IWW north of Rockhouse Creek (Figure 1). The channel would be deepened from an authorized depth of 12 feet to 16 feet with a width of 125 feet for a distance of approximately 16,00 feet from Cut-24. About 360,000 cubic yards of beach quality material will be removed from the channel and placed on the beach south of Ponce DeLeon Inlet.

2.0 Proposed Docking and Marina Facilities. Local interests are proposing construction of commercial marina and seafood processing facilities on county property adjacent to the IWW to support part of the regional shrimp and fish fleet harvesting operations in nearby Atlantic Ocean waters (Figure 1). Docking facilities will be constructed to support berthing areas which are needed for offloading the catch and provisioning of the fleet. Additional landside facilities will include buildings or facilities to house and facilitate operation of seafood processing machinery, mainly for handling the catch from regional shrimp fisheries and the evolving fisheries for red and golden crabs. Anticipated requirements are for the construction of both docks and processing facilities to accommodate a fleet of both homeport and transient vessels with a combined total of 100 to 120 vessels of which 25 to 40 are expected to be in port at any given time. Facilities are being designed to accommodate about 35 vessels at one time. Therefore, total dockage requirements vary from a minimum of 700 feet to a more probable maximum of nearly 1100 feet. Of this total, approximately 500 to 550 feet of dockage will be built along the south side of an existing service canal on the north side of the site while the remaining footage will be built on the east side of the site along the IWW.

2.1 Docks will be constructed using one of two methods or a combination of both. One type will be of sheet pile construction with a concrete cap and solid backfill/underfill to provide a solid dock and bulkhead. The second type will be a concrete piling and cap constructed above and adjacent to (or in front of) riprap or armour stone. Landside facilities for commercial fishery operations will require one or two buildings or similar facilities each of approximately 25,000 to 35,000 square feet depending upon equipment requirements or configuration and refrigerated storage space. The width of these facilities will be about 130 feet.

2.2 In addition to the primary specifications of the processing buildings and dockage, there will likely be requirements on-site for the handling or storage of fishing equipment such as rigging or traps, ice production facilities for packing landside and aboard vessels and storage of fuel for vessel operations. Handling and/or shipment of marine food products by heavy trucks will probably require paving of the primary access road leading to the site as well as paving of wheeled vehicle access and marshaling areas on-site.



STATE OF FLORIDA
DEPARTMENT OF COMMUNITY AFFAIRS
EMERGENCY MANAGEMENT • HOUSING AND COMMUNITY DEVELOPMENT • RESOURCE PLANNING AND MANAGEMENT

LAWTON CHILES
Governor

May 13, 1997

JAMES F. MURLEY
Secretary

Mr. Hanley K. Smith
U.S. Army Corps of Engineers
Jacksonville District Corps of Engineers
Post Office Box 4970
Jacksonville, Florida 32232-0019

RE: U.S. Army Corps of Engineers - Proposed Navigation
Improvements and Commercial Facilities - Ponce de Leon
Inlet, Volusia County, Florida
SAI: FL9210021642CR

Dear Mr. Smith:

The Florida State Clearinghouse, pursuant to Presidential Executive Order 12372, Gubernatorial Executive Order 95-359, the Coastal Zone Management Act, 16 U.S.C. §§ 1451-1464, as amended, and the National Environmental Policy Act, 42 U.S.C. §§ 4321, 4331-4335, 4341-4347, as amended, has coordinated a review of the above-referenced project.

The Department of Environmental Protection (DEP) offers general comments regarding dredging, dock expansion and the protection of manatees, sea turtles, and right whales. The DEP and the St. Johns River Water Management District (SJRWMD) indicate that permits will be required for both the dredging and the proposed dock expansion prior to the start of construction. A Joint Coastal Permit issued by DEP's Bureau of Beaches and Coastal Systems will be required for the realignment and deepening of the navigation channels and the placement of dredged material seaward of the Coastal Construction Control Line. Early coordination with the DEP may help to eliminate problems in the permitting process. Please refer to the enclosed DEP and SJRWMD comments.

2555 SHUMARD OAK BOULEVARD • TALLAHASSEE, FLORIDA 32399-2100

FLORIDA KEYS AREA OF CRITICAL STATE CONCERN	SOUTH FLORIDA RECOVERY OFFICE	GREEN SWAMP AREA OF CRITICAL STATE CONCERN
FIELD OFFICE	P.O. Box 4022	FIELD OFFICE
2796 Overseas Highway, Suite 212	8600 N.W. 36th Street	155 East Summerlin
Marathon, Florida 33050-2227	Miami, Florida 33159-4022	Bartow, Florida 33830-4641

Mr. Hanley K. Smith
May 13, 1997
Page Two

Based on the information contained in the notification of intent and the enclosed comments provided by our reviewing agencies, the state has determined that the above-referenced project is consistent with the Florida Coastal Management Program.

Thank you for the opportunity to review this project. If you have any questions regarding this letter, please contact Ms. Keri Akers, Clearinghouse Coordinator, at (904) 922-5438.

Sincerely,

A handwritten signature in cursive script, appearing to read "Ralph Cantral".

Ralph Cantral, Executive Director
Florida Coastal Management Program

RC/cc

Enclosures

cc: Dan Pennington, Department of Environmental Protection
Margaret Spontak, St. Johns River Water Management District



Department of Environmental Protection

Lawton Chiles
Governor

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

Virginia B. Wetherell
Secretary

May 6, 1997

Ms. Keri Akers, Coordinator
Department of Community Affairs
Suite 305
2740 Centerview Drive
Tallahassee, Florida 32399-2100

Re: SAI # FL9210021642CR - U.S. Army Corps of Engineers - Proposed Navigation Improvements and Commercial Facilities - Ponce de Leon Inlet, Volusia County

Dear Ms. Akers:

The department has reviewed the proposed navigation improvements and offers the following comments.

Protected Species

Manatees, sea turtles and right whales may all be impacted by the construction or operation phases of this proposal. As requested by the USCOE we offer these comments/questions concerning this proposal:

1. In the areas proposed for channel deepening, will there be any impacts to existing submerged and/or emergent vegetation?
2. Regarding the proposed fishing fleet, what will be the expected increase in vessel traffic and expected traffic pattern, in the vicinity of the inlet, due to the proposed commercial marina?
3. How was it established that the 360,000 cubic yards of material removed from the channel is of beach quality? Where will the material that is not beach quality be placed?

We will be able to address impacts related to manatees, sea turtles and right whales after we have evaluated the answers to the above questions and during the permitting process.

Dredging

Review of the project indicates that dredging is being proposed to increase the navigability of the channels in Ponce de Leon Inlet. It appears that the majority of the dredging proposed will occur in areas which have been previously dredged, but which will be re-dredged to increase depth. In these areas, unless the channel width increases substantially as a result of the dredging, there should be few expected impacts.

Post-It* Fax Note	7671	Date	# of pages	2
To	Keri Akers	From	Dan Penniston	
Co./Dept.		Co.		
Phone #		Phone #	487-2231	
Fax #		Fax #		

irces"

Mention was made to realigning the southern portion of Ponce de Leon Federal Channel in the Indian River to Cut- 24 of Intracoastal Water Way. No details were provided regarding this realignment proposal, nor were details provided regarding the existing resources in this area. New dredging may have substantial impact to resources such grass beds.

No details were provided regarding the dock expansion, so the impacts of the proposed work are impossible to appraise. If the dock expansion is to occur in undisturbed areas, then there could be potential for resource impact.

A DEP, Environmental Resource Permit (ERP) will be required for both the dredging and the proposed dock expansion. Evaluation of impacts, as well as stormwater management concerns are within the jurisdiction of the ERP process. The process also determines the status of the proposed project with respect to State Water Quality Certification, required to obtain a Army Corps of Engineers permit. In addition, construction of the portion of project involving realignment and deepening of the navigation channels and placement of dredged material seaward of the Coastal Construction Control Line (CCCL) would require issuance of a Joint Coastal Permit (JCP) by the DEP Bureau of Beaches and Coastal Systems, pursuant to Chapters 161, 373, and 253, F.S. Sediment geotechnical information will be required to determine whether the material dredged from the navigation channels is suitable for placement on the beach disposal area. A portion of the dredged material that is not beach quality (over 10% fines), may be determined to be suitable for placement in the nearshore disposal area. An alternative disposal site should also be established for dredged material determined to be unsuitable for placement at either of these sites.

If you have any questions please call me at (904) 487-2231.

Cordially,



Dan Pennington

Office of Intergovernmental Programs

DP

cc: Ruth McLemore-Price, Central District DEP - Orlando
Lauran Milligan, Beaches and Coastal System
Carol Knox, Office of Protected Species Management
Fritz Wettstein, Division of Marine Resources
Terry Zable, Central District DEP - Orlando

JNTY: VOLUSIA

DATE: 03/25/97
COMMENTS DUE - 2 WKS: 04/08/97
CLEARANCE DUE DATE: 05/09/97
SAI#: FL9210021642CR

sage:

STATE AGENCIES

WATER MANAGEMENT DISTRICTS

OPB POLICY UNITS

Community Affairs
Environmental Protection
Game and Fresh Water Fish Comm
Marine Fisheries Commission
OTED
State
Transportation

St. Johns River WMD

Environmental Policy/C & ED

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State of Florida Clearinghouse

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MAR 27 1997

MARINE FISHERIES
COMMISSION

attached document requires a Coastal Zone Management Act/Florida
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Project Description:

U.S. Army Corps of Engineers - Proposed
Navigation Improvements and Commercial
Facilities - Ponce de Leon Inlet, Volusia County,
Florida

To: Florida State Clearinghouse
Department of Community Affairs
2555 Shumard Oak Boulevard
Tallahassee, FL 32399-2100
(904) 922-5438 (SC 292-5438)
(904) 414-0479 (FAX)

EO. 12372/NEPA

- No Comment
- Comments Attached
- Not Applicable

Federal Consistency

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- Consistent/Comments Attached
- Inconsistent/Comments Attached
- Not Applicable

From:

Division/Bureau:

Reviewer:

Date:

MARINE FISHERIES COMMISSION
2540 EXECUTIVE CENTER CIRCLE WEST
SUITE 106
TALLAHASSEE, FLORIDA 32301

[Handwritten signature]
[Handwritten date: 3-27-97]

INTY: VOLUSIA

DATE: 03/25/97
COMMENTS DUE-2 WKS: 04/08/97
CLEARANCE DUE DATE: 05/09/97
SAI#: FL9210021642CR

sage:

STATE AGENCIES

WATER MANAGEMENT DISTRICTS

OPB POLICY UNITS

Community Affairs
Environmental Protection
Game and Fresh Water Fish Comm
Marine Fisheries Commission
OTED
State
Transportation

St. Johns River WMD

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State of Florida Clearinghouse

Environmental Policy/C & ED

VOLUSIA
SAI-CORPS

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XRef: 963207 clem

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2555 Shumard Oak Boulevard
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EO. 12372/NEPA

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- Not Applicable

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- Not Applicable

RECEIVED

MAR 27 1997

From:

Division/Bureau: DIVISION OF HISTORICAL RESOURCES

Reviewer: [Signature] Laura A. Kammeyer

Date: 4/10/97 4-11-97

COMPLIANCE & REVIEW SECTION

COUNTY: VOLUSIA

DATE: 03/25/97
COMMENTS: E-2 WKS: 04/08/97
CLEARANCE DUE DATE: 05/09/97
SAI#: FL9210021642CR

Project Name:

STATE AGENCIES	WATER MANAGEMENT DISTRICTS	OPB POLICY UNITS
Community Affairs Environmental Protection Game and Fresh Water Fish Comm Marine Fisheries Commission OTED State Transportation	St. Johns River WMD	Environmental Policy/C & ED

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U.S. Army Corps of Engineers - Proposed Navigation Improvements and Commercial Facilities - Ponce de Leon Inlet, Volusia County, Florida

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Department of Community Affairs
2555 Shumard Oak Boulevard
Tallahassee, FL 32399-2100
(904) 922-5438 (SC 292-5438)
(904) 414-0479 (FAX)

EO. 12372/NEPA

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- Comments Attached
- Not Applicable

Federal Consistency

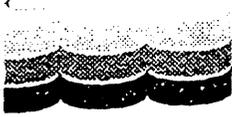
- No Comment/Consistent
- Consistent/Comments Attached
- Inconsistent/Comments Attached
- Not Applicable

FROM: Florida Department of Transportation


Jim Hayden, Systems Planning Supervisor

DATE: 4/2/97

ST. JOHNS RIVER



**WATER
MANAGEMENT
DISTRICT**

POST OFFICE BOX 1429

PALATKA, FLORIDA 32178-1429

TELEPHONE 504-325-4500
TDD 504-329-4450

SUNCOM 904-860-4500
TDD SUNCOM 860-4450

FAX (EXECUTIVE/LEGAL) 329-4125

(PERMITTING) 329-4315

(ADMINISTRATION/FINANCE) 329-4508

SERVICE CENTERS

618 E. South Street
Orlando, Florida 32801
407-897-4300
TDD 407-897-5960

7775 Baymeadows Way
Suite 102
Jacksonville, Florida 32256
904-730-6270
TDD 904-448-7900

PERMITTING:
305 East Drive
Melbourne, Florida 32904
407-984-4940
TDD 407-722-5368

OPERATIONS:
2133 N. Wickham Road
Melbourne, Florida 32935-8109
407-254-1782
TDD 407-253-1203

April 16, 1997

Ms. Keri Akers
Florida State Clearinghouse
Department of Community Affairs
2555 Shumard Oak Blvd.
Tallahassee, FL 32399-2100

RECEIVED
APR 24 1997

State of Florida Clearinghouse

Re: SAI #: FL9210021642CR
Name of Project: USACE - Proposed Navigation Improvements and Commercial Facilities - Ponce de Leon Inlet, Volusia County, Florida.

Dear Ms. Akers:

The staff of the St. Johns River Water Management District (SJRWMD) has reviewed the above referenced project and offers the following comments regarding the District's areas of responsibility which include water quality, water supply, flood protection, and natural systems.

Staff believes that the proposed project would be consistent with SJRWMD's goals and objectives as long as all projects conform to SJRWMD design and construction criteria defined in Chapter 40C-4, F.A.C. A particular project may be considered "consistent" with SJRWMD rules when a District permit is issued or the project is exempted from our permitting requirements.

In this project, any individual Environmental Resource Permit (ERP) that may be required owing to the project's size or probable wetland impacts would be reviewed by the Department of Environmental Protection (DEP). DEP assumes ERP responsibilities for projects involving large commercial marinas, navigational dredging, and work seaward of the coastal construction control line according to the August 1994 Operating Agreement between the District and DEP. Staff believes the project could be designed and constructed to avoid unacceptable, adverse impacts to adjacent properties and natural resources.

For additional information on the permitting process, the applicant can contact SJRWMD's Orlando Service Center at (407) 897-4300.

This letter does not constitute or substitute for a permit review. Permit reviews require more specific information.

William M. Segal, CHAIRMAN
MAITLAND

Dan Roach, VICE CHAIRMAN
FERNANDINA BEACH

James T. Swann, TREASURER
COCOA

Otis Mason, SECRETARY
ST. AUGUSTINE

Lathy Chinoy
JACKSONVILLE

Griffin A. Greene
VERO BEACH

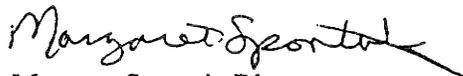
James H. Williams
OCALA

Patricia T. Harden
SANFORD

Reid Hughes
DAYTONA BEACH

If you have any questions about our comments, please contact me at (904) 329-4374.

Sincerely,

A handwritten signature in cursive script that reads "Margaret Spontak". The signature is written in black ink and is positioned above the typed name.

Margaret Spontak, Director
Division of Policy and Planning

EJ/REG/ls

INTY: VOLUSIA

sage:

DATE: 03/25/97
 COMMENTS DUE-2 WKS: 04/08/97
 CLEARANCE DUE DATE: 05/09/97
 SAI#: FL9210021642CR

STATE AGENCIES	WATER MANAGEMENT DISTRICTS	OPB POLICY UNITS
Community Affairs Environmental Protection Game and Fresh Water Fish Comm Marine Fisheries Commission OTED State Transportation	X St. Johns River WMD	Environmental Policy/C & ED

Attached document requires a Coastal Zone Management Act/Florida
 tal Management Program consistency evaluation and is categorized
 e of the following:

- Federal Assistance to State or Local Government (15 CFR 930, Subpart F). Agencies are required to evaluate the consistency of the activity.
- Direct Federal Activity (15 CFR 930, Subpart C). Federal Agencies are required to furnish a consistency determination for the State's concurrence or objection.
- Outer Continental Shelf Exploration, Development or Production Activities (15 CFR 930, Subpart E). Operators are required to provide a consistency certification for state concurrence/objection.
- Federal Licensing or Permitting Activity (15 CFR 930, Subpart D). Such projects will only be evaluated for consistency when there is not an analogous state license or permit.

Project Description:

U.S. Army Corps of Engineers - Proposed
 Navigation Improvements and Commercial
 Facilities - Ponce de Leon Inlet, Volusia County,
 Florida

o: Florida State Clearinghouse
 Department of Community Affairs
 2555 Shumard Oak Boulevard
 Tallahassee, FL 32399-2100
 (904) 922-5438 (SC 292-5438)
 (904) 414-0479 (FAX)

EO. 12372/NEPA

- No Comment
- Comments Attached
- Not Applicable

Federal Consistency

- No Comment/Consistent
- Consistent/Comments Attached
- Inconsistent/Comments Attached
- Not Applicable

rom:

Division/Bureau: Policy & Planning

Reviewer: Margaret H. Spontak

Date: 4-16-97

INTY: VOLUSIA

sage:

Mary

DATE: 03/25/97
 COMMENTS: JE-2 WKS: 04/08/97
 CLEARANCE DUE DATE: 05/09/97
 SAI#: FL9210021642CF

STATE AGENCIES

Community Affairs
 Environmental Protection
 Game and Fresh Water Fish Comm
 Marine Fisheries Commission
 OTED
 State
 Transportation

WATER MANAGEMENT DISTRICTS

St. Johns River WMD

RECEIVED
 MAY 2 1997

State of Florida Clearinghouse

OPB POLICY UNITS

X Environmental Policy/C & ED

RECEIVED
 MAR 26 1997

OFFICE OF PLANNING
 & BUDGETING
 ENVIRONMENTAL POLICY UNIT

Attached document requires a Coastal Zone Management Act/Florida
 al Management Program consistency evaluation and is categorized
 e of the following:

Federal Assistance to State or Local Government (15 CFR 930, Subpart F).
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 consistency certification for state concurrence/objection.

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 analogous state license or permit.

Project Description:

U.S. Army Corps of Engineers - Proposed
 Navigation Improvements and Commercial
 Facilities - Ponce de Leon Inlet, Volusia County,
 Florida

o: Florida State Clearinghouse
 Department of Community Affairs
 2555 Shumard Oak Boulevard
 Tallahassee, FL 32399-2100
 (904) 922-5438 (SC 292-5438)
 (904) 414-0479 (FAX)

EO. 12372/NEPA

- No Comment
- Comments Attached
- Not Applicable

Federal Consistency

- No Comment/Consistent
- Consistent/Comments Attached
- Inconsistent/Comments Attached
- Not Applicable

om:
 Division/Bureau: EOG-OPB Env. Policy
 Reviewer: M. Tenner
 Date: 4/30/97

VISIONS OF FLORIDA DEPARTMENT OF STATE
Office of the Secretary
Office of International Relations
Office of Administrative Services
Division of Corporations
Division of Cultural Affairs
Division of Elections
Division of Historical Resources
Division of Library and Information Services
Division of Licensing



J. Powell

MEMBER OF THE FLORIDA CABINET
Historic Florida Keys Preservation Board
Historic Palm Beach County Preservation Board
Historic Pensacola Preservation Board
Historic St. Augustine Preservation Board
Historic Tallahassee Preservation Board
Historic Tampa/Hillsborough County
Preservation Board
Ringling Museum of Art

FLORIDA DEPARTMENT OF STATE
Sandra B. Mortham
Secretary of State
DIVISION OF HISTORICAL RESOURCES

June 30, 1997

Mr. Hanley K. Smith
Planning Division
Environmental Branch
Department of the Army
Jacksonville District Corps of Engineers
P. O. Box 4970
Jacksonville, Florida 32232-0019

In Reply Refer To:
Robin D. Jackson
Historic Sites Specialist
Project File No. 972133

RE: Cultural Resource Assessment Request
U. S. Army Corps of Engineers - Realign Southern Portion of federal Navigation Channel
in Indian River to Cut-24 of Intercoastal Waterway (IWW) and Deepen IWW Channel
from Cut-24 North to the Vicinity of Former Swoope Power Plant

Dear Mr. Smith:

In accordance with the procedures contained in 36 C.F.R., Part 800 ("Protection of Historic Properties"), we have reviewed the referenced project(s) for possible impact to historic properties listed, or eligible for listing, in the National Register of Historic Places. The authority for this procedure is the National Historic Preservation Act of 1966 (Public Law 89-665), as amended.

A review of the Florida Site File indicates that no significant archaeological or historical sites are recorded for or likely to be present within the project area. Furthermore, because of the project location and/or nature it is unlikely that any such sites will be affected. Therefore, it is the opinion of this office that the proposed project will have no effect on historic properties listed, or eligible for listing, in the National Register of Historic Places.

If you have any questions concerning our comments, please do not hesitate to contact us. Your interest in protecting Florida's historic properties is appreciated.

Sincerely,

Laura R. Kanner

for

George W. Percy, Director
Division of Historical Resources
and
State Historic Preservation Officer

GWP/Jrj

DIRECTOR'S OFFICE

R.A. Gray Building • 500 South Bronough Street • Tallahassee, Florida 32399-0250 • (904) 488-1480
FAX: (904) 488-3353 • WWW Address <http://www.dos.state.fl.us>

ARCHAEOLOGICAL RESEARCH
(904) 487-2299 • FAX: 414-2207

HISTORIC PRESERVATION
(904) 487-2333 • FAX: 922-0496

HISTORICAL MUSEUMS
(904) 488-1484 • FAX: 921-2503

FLORIDA DEPARTMENT OF STATE
Office of the Secretary
Office of International Relations
Division of Administrative Services
Division of Corporations
Division of Cultural Affairs



MEMBER OF THE FLORIDA CABINET
Division of Library & Information Services
Division of Historical Resources
Ringling Museum of Art
Division of Licensing
Division of Elections

FLORIDA DEPARTMENT OF STATE
Sandra B. Mortham
Secretary of State
DIVISION OF HISTORICAL RESOURCES

August 27, 1997

Mr. Dennis R. Duke
Planning Division, Environmental Branch
Jacksonville District, Corps of Engineers
P.O. Box 4970
Jacksonville, Florida 32232-0019

In Reply Refer To:
Scott B. Edwards
Historic Sites Specialist
Project File No. 973791

RE: Cultural Resource Assessment Request
Florida Inland Navigation District (FIND)
Two Proposed Dredged Material Management Area (DMMA)
MSA 434/434C North and MSA 434/434C South
Volusia County, Florida

Dear Mr. Duke:

In accordance with the procedures contained in 36 C.F.R., Part 800 ("Protection of Historic Properties"), we have reviewed the referenced projects for possible impact to historic properties listed, or eligible for listing, in the *National Register of Historic Places*. The authority for this procedure is the National Historic Preservation Act of 1966 (Public Law 89-665), as amended.

A review of the Florida Master Site File indicates that no significant archaeological or historical sites are recorded for or likely to be present within the project area. Furthermore, because of the project location and/or nature it is unlikely that any such sites will be affected. Therefore, it is the opinion of this office that the proposed project will have no effect on historic properties listed, or eligible for listing, in the *National Register of Historic Places*.

If you have any questions concerning our comments, please do not hesitate to contact us. Your interest in protecting Florida's historic properties is appreciated.

Sincerely,

George W. Percy, Director
Division of Historical Resources
and
State Historic Preservation Officer

GWP/Ese

DIRECTOR'S OFFICE

R.A. Gray Building • 500 South Bronough Street • Tallahassee, Florida 32399-0250 • (850) 488-1480
FAX: (850) 488-3353 • WWW Address <http://www.dos.state.fl.us>

ARCHAEOLOGICAL RESEARCH

HISTORIC PRESERVATION

HISTORICAL MUSEUMS

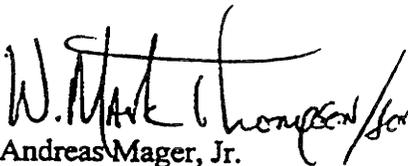
In view of the above, the NMFS recommends that in its study the COE should address the following:

- 1). The alternatives to the proposed action;
- 2) The aquatic habitats within the Inlet and the potential direct (e.g. dredging) and indirect (e.g. modified salinity) alterations that may occur to various habitats;
- 3) The affect of habitat alterations from the proposed action on commercial and recreational fisheries in the area as well as the effect on ecologically important (i.e. food chain) species; and,
- 4) The alternatives available to compensate for the loss or alteration of aquatic habitats.

Also, it is our understanding that the proposed marina facility, which has prompted this study, has not received all necessary authorizations to be constructed including a Department of the Army permit pursuant to Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act. The NMFS has provided comments and recommendations to previous marina permit applications including recommendations to deny Department of the Army authorization of a marina at the Swoope Power Plant site. The need for the proposed action should be clearly identified prior to committing irretrievable resources to this project that would adversely affect living marine resources.

If we can be of further assistance, please advise. Related comments, questions or correspondence should be directed to Mr. David N. Dale of our Panama City Branch Office in St. Petersburg, Florida. He may be contacted at 813/570-5317 or at the letterhead address above.

Sincerely,



Andreas Mager, Jr.
Assistant Regional Director
Habitat Conservation Division

cc:
EPA,ATL
DEP,TALL
GFWFC,TALL
FWS,JACKSONVILLE
F/SEO2
F/SEO23-ST PETE

June 9, 1997

Planning Division
Environmental

Mr. David Hankla
Field Supervisor
U. S. Fish and Wildlife Service
Suite 310
6620 Southpoint Drive, South
Jacksonville, Florida 32217

Dear Mr. Hankla:

The U.S. Army Corps of Engineers (Corps), Jacksonville District, is initiating consultation under Section 6(a)(2) of the Coastal Barrier Resources Act (CBRA) for Unit P08 of the Coastal Barrier Resources System, Ponce De Leon Inlet, Florida. Section 6(a)(2) of the Act states that " In General - Notwithstanding Section 5, the appropriate Federal officer, after consultation with the Secretary, may make Federal expenditures and may make financial assistance available within the System for the following: (2) The maintenance or construction of improvements of existing Federal navigation channels (including the Intracoastal Waterway) and related structures (such as jetties), including the disposal of dredge materials related to such maintenance or construction."

Based on the Exceptions listed in Section 6(a)(2) above, the Corps believes that the proposed expansion of the Ponce De Leon Inlet Navigation project to include dredging of the Intracoastal Waterway is exempt from the Coastal Barrier Resources Act and requests your concurrence in this matter. If you have further questions, please feel free to contact this office.

Sincerely,

Hanley K. Smith
Acting, Chief, Planning Division

Boothby/CESAJ-PD-ER/3/5/12/12
Dugger/CESAJ-PD-ER
Smith/CESAJ-PD-E
Murphy/CESAJ-PD-PN
Strain/CESAJ-PD-P
Smith/CESAJ-PD-E/CESAJ-PD

w/boothby/pdicbra

FEGER SEAFOOD, INC.
P.O BOX 24
244 N. CAUSEWAY
NEW SMYRNA BEACH, FL 32170-0024

March 28, 1997

Mr. Hanley K. Smith
Acting Chief, Planning Division
Environmental Studies Section
Department of The Army
Jacksonville District Corps of Engineers
P.O. Box 4970
Jacksonville, Florida 32232-0019

Reference: Proposed navigation improvements at Ponce DeLeon Inlet, Volusia County, Florida

Dear Mr. Smith:

As per your document dated March 18, 1997 soliciting views and comments concerning the above reference, we wish to submit the following:

1. Being established in 1938, Feger Sea Food, Inc. is the oldest retail/wholesale business in New Smyrna Beach. Our Manager, Steve Feger is the third generation relying on our commercial activity for his livelihood and his son Joshua will be the fourth (4th) generation.

2. We strongly protest the development of a new facility as proposed for seafood processing. This new facility will impact on the private business of Feger Sea Food, Inc. Being in business for all these years, it should be obvious that we are not opposed to any business coming into the area, however we are opposed to the use of our public tax dollars for assisting a business that will be in competition with and that would so greatly impact the future of the business and the livelihood of the family and all our employees.

3. We have repeatedly requested a minimal dredging of the Inlet to assist in the safety of navigation of the fleet that we serve, only to be denied by the CORPS. The proposed project seems to be a double standard and "smacks" of discrimination to us to deny the oldest business of New Smyrna while at the same time considering the expenditure of hundreds of thousands of dollars at the expense of our livelihood at Feger Seafood, Inc.

4. It is our belief (view) that there is more than ample dockage and supporting facilities that currently exist that could be expanded and/or improved that would have minimal economic and environmental impact, compared to the proposed project.

5. We at Feger Seafood, Inc. have a long history of concern for the environment and consider ourselves and insist that our employees exhibit stewardship of the environment and nature in general. The proposed projects dredging of 360,00 cubic

yards and the subsequent building of 25-35,000 square feet of buildings can only adversely affect an already fragile ecosystem.

6. It does not take a rocket scientist to realize that since seafood harvest quotas have already been drastically reduced for all species, there must be a diminishing supply of same. Shrimp harvesting is seasonal; six months per year (winter season of October, November, December and summer season of June, July and August). Your document of a yearly average number of vessels is misleading. It would seem that common sense has fallen by the wayside or there are those that insist upon ignoring common sense in proposing a project that would future reduced an already limited supply of seafood. With a proposed homeport/transient 100-120 vessel fleet, where are the shrimp and other seafood for this size fleet? Is it not short sighted to add a greater harvest that would expedite the over harvest of an already fragile population of seafood? Bigger is not always better and we feel that the "proposed project is a "paper tiger" that is misleading to say the least and serves a few developers at the cost of those of us established businesses.

7. We are not opposed to the correction of the shifting channels of Ponce DeLeon Inlet as evidenced by our requests to the CORPS and support the removal of the Inlet as the 7th worst in the United States. However, our support and concern is not driven by monetary motives as one would have to think the developers of the proposed project are. During our long tenure, Feger Seafood, Inc. has lost six (6) shrimp boats and the life of one of our crew. Even those these tragedies were not Inlet related, as a serendipity, we realize the devastating effects of 109 capsized boats on the economy of those in business. More importantly, the 20 seamen that have lost their lives should be the driving force in the Inlet project, not the driving force of development.

8. As previously stated, "bigger is not always better", we can also state without fear of contradiction that development and growth does not pay for itself. It is obvious to us that read between the lines of the proposed project that the developers that are the driving force does not want the public to know that the channelization and associated improvements will be only the "tip of the iceberg". With no area ice production facilities for packing, fuel storage, proper roads needed for the increased traffic (adding to an already significant problem), associated support services, etc, our current natural beauty and environmental integrity of the area and Inlet will be in jeopardy. All of us that live in this area, along with the tourist will have a reduced quality of life. Some things are best left as they are in order to protect us, the human species, along with all the endangered and threatened wildlife.

9. It is worthy of note that though we support expenditure of our public tax dollars to assure safe navigation of vessels through the Inlet, we will strongly contest and will fight for our right to refuse to allow the use of governmental tax dollars to assist the development of facilities, (not only in direct competition of Feger Seafood, Inc. and many of our friends that own marinas) by a hand full of developers tottering on the side of greed.

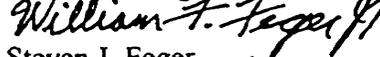
Joshua Feger, our fourth (4th) generation is too young to fight his fight to preserve his heritage but rest assured that we will fight the fight for him.

If common sense should not prevail and the powers beyond our influence and/or control decided that an expanded seafood processing business is a must, then we wish to go on record that Feger Seafood, Inc. has all the dockage and associated services necessary and are open to negotiating the sale of our business in lieu of losing the same after a one-half century of back breaking work. Joshua will not understand, but then neither will we. However, we intend to not only remain as the oldest business in New Smyrna Beach but remain as a viable enterprise for not only the Fegers, but for all our employees and their families.

To assist us in the fairness of the "fight", we hereby request, under the 1973 United States Freedom of Information Act, copies of ALL correspondence concerning the proposed project, current and in the future. This request includes ALL document and ALL names of parties associated with the request(s) of the proposed project, whether they be private, public and/or governmental. The request for ALL documents includes telephone logs, letters, memos, minutes of meetings and any other documents. The information should be sent in a timely manner, as mandated by law, to the address on the letterhead.

Respectfully yours,

William F. Feger, Jr.



Steven J. Feger



C: Legal Council

Environmental Consultant, Bayliss Prater, Certified Environmental Professional
File

Aug. 18, 1997

MMD
Standing
with
NRAS

Memo to Corps of Engineers: (Mr. Murphy) (Jerry Scarborough??)

From: Lawrence E. Decker, concerned citizen

1. Information for your files on the Ponce Inlet commercial Port project by Dan O'Brien, Volusia County Port Authority
2. A lot of the local people and some govt. officials feel it is illogical to waste scarce federal and County tax dollars on a feasibility study re: a commercial fishing port at Ponce Inlet.
3. They feel things are too uncertain on the local level to even start thinking about such a study. Please hold off on the study until ownership of the Swoope's Electric Power Plant issue is decided by NSB and Volusia County. Right now NSB doesn't want to sell.
4. If this fishing port is finally built, local people believe it will be a subsidized "white Elephant", costing taxpayers millions initially and millions in the future to keep it going. Thank you---



Lawrence E. Decker
5906 John Anderson Hiway
Flagler Beach, Fla. 32136

904-672-7867

Enclosures:



County of Volusia

Ponce DeLeon Port Authority

700 Catalina Drive, Suite 125 • Daytona Beach, Florida 32114
Telephone: (904) 248-8072 • Fax: (904) 248-8075

TO: Hal Buckland, Director
Economic Resource Service Center

FROM: Dan O'Brien, Director
Port Authority Service Group

DATE: August 6, 1997

RE: F.I.N.D. Reimbursement Grant to Analyze Deepening the Inlet - \$50,000

Please find enclosed (2) two letters:

- (1) Feger Seafood
- (2) City of New Smyrna Beach

These letters were used by Mr. Lawrence Decker a long time anti-port person to challenge the F.I.N.D. staff recommendation to fund our grant, thus killing the grant for this year.

The County Council entered an agreement with the Corps to evaluate the deepening of the inlet to allow the more modern and larger fishing fleets to use our proposed facility at the Swoope power plant. The Port Authority has sent \$100,000.00 and executed this agreement months ago to initiate the project. This department applied for a \$50,000.00 F.I.N.D. reimbursement grant. Mr. Decker did not curtail the project. He just cost the taxpayers of Volusia County \$50,000.00 and accomplished nothing.

What bothers me are the letters. Mr. Feger has always been a proponent of re-stabilizing the inlet. He has his property up for sale. He has talked to me about moving to the proposed facility. I don't know where he is coming from unless he is scared of possible competition.

The City of New Smyrna Beach letter is the one that really concerns me. After two meetings with the City Manager and the Mayor discussing the issue, i.e., we discussed buying the Feger property that they need for their Riverside Re-Development plan and swapping the Feger parcel for the Swoope Plant, I was authorized by the City to proceed with negotiation with Mr. Feger. Based on an MAI appraisal I offered Mr. Feger verbally \$600,000.00 for his property, subject to the city swapping the power plant site. Mr. Feger talked with his wife and contacted me and



asked if we could increase the offer a little and I told him I would get back to him. I informed the city of the offer, no one said anything. I have kept you apprised of what was going on. In fact you attended one of the meetings with the Mayor and Manager. When County Councilperson Northey brought up the issue of a workshop, you told me not to proceed any further until after the workshop, which I have done.

This city letter flies in the face of reality and also cost the citizens of the district and New Smyrna Beach \$50,000.00 for no reason.

In my opinion the restabilization of this inlet is paramount for the safety of boaters and the economic well being of our Marine and Tourist Industry.

It is of the utmost importance to meet with the city regarding these issues.

Please keep me advised.

C: Lawrence Arrington, County Manager
City of New Smyrna Beach
Bill Feger

1



City of New Smyrna Beach

Office of the Mayor & City Commissioners

July 30, 1997

Mr. Art Wilde, Executive Director
FIND
1314 Marcinski Road
Jupiter, Florida 33477

Re: Ponce Inlet

Dear Mr. Wilde:

I learned today that Volusia County has applied for a grant for a Ponce Inlet project. The project, as I understand it, would only happen if the City agreed to allow the County to use our Swoope power site. I would like to inform you that the City has no agreement with the County and the possibility exists that no such agreement will occur for the Swoope site.

Thanks for your time, and I hope this information is helpful to you.

Sincerely,

James L. Vandergriff
Mayor



City of New Smyrna Beach

Office of the Mayor & City Commissioners

July 29, 1997

Mr. Edward Aftuck
Inlet Shores Homeowners Association
32 Cunningham Drive
New Smyrna Beach, FL 32168

Dear Mr. Aftuck,

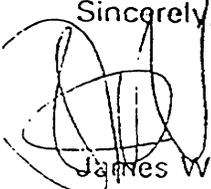
I am in receipt of your recent letter and express like sentiments regarding the Swoope Power Plant site.

As one Commissioner, I personally do not feel use of the site as a commercial fish processing plant would be a beneficial venture for the community as a whole. I will express my feelings in that regard during any discussion that entertains that proposal.

There are other possibilities and I am sure they will be carefully reviewed by the Commission prior to making any decision regarding the use of that site.

Thank you for expressing your concern regarding use of the Swoope site.

Sincerely,


James W. Hathaway
Commissioner, Zone 3

JWH/rjh

2

Edward Aftuck
Inlet Shores Homeowners Association
32 Cunningham Dr.
New Smyrna Beach, FL 32168

City of New Smyrna Beach
100 Sams Ave.
New Smyrna Beach, FL 32168

To the City of New Smyrna Beach City Commissioners and Planning Board Members;

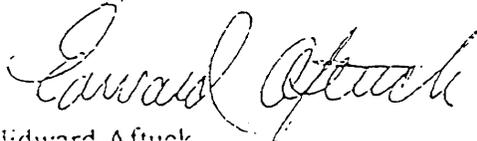
I am writing to request that the City of New Smyrna Beach look into other alternatives for the use of the Swoop Power Plant before selling the property to the county to be used as a commercial fish processing plant. Please take into consideration the tax payers of Inlet Shores as well as adjoining property owners in a two mile radius of Swoop Power Plant.

A fish processing plant would adversely impact the value of the properties in the north section of New Smyrna Beach. I lived in Fernandina Beach, FL, and the smell coming from the fish processing plant there was terrible. I can't imagine trying to sell a home with that aroma in the air.

It is my understanding that according to the deed for the Swoop plant property (copy attached), that the property is to be used for public purposes only, and that the city can not sell or lease the property to any private person, firm or corporation.

Surely, there must be a better usage for this property; one that would not have a negative effect on the existing taxpayers the area.

Sincerely,



Edward Aftuck
Pres. Inlet Shores Homeowners Association

Feger Seafood Inc.

PO BOX 24
NEW SMYRNA BEACH, FL 32170
FAX (904) 427-5716
PHONE (904) 428-4441

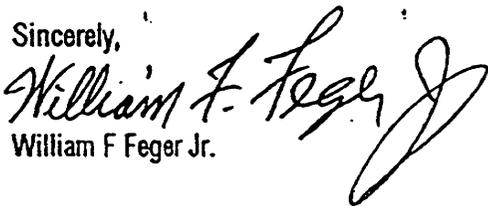
July 31, 1997

Dear Volusia County Commissioners,

During our meeting in Deland some of the untruths that were stated were that we had plenty of fishing grounds here, which is untrue. I have four boats ("Bold Challenge", "Big Eric", "2nd Stage", and "Miss Emma") leaving now for the west coast due to the rules, regulations, and permits involved here. The shark season was open three weeks and then closed. You have to catch 20,000 pounds of snapper per year to qualify for that permit, and only a couple of boats have been able to do that in the last several years. Right now there are already too many boats for the size of our fishing grounds off Ponce Inlet and for the amount of fish we are allowed to catch.

If you would like to know the truth about the catches off the east coast of Florida you can contact Claudia Dennis at 904-427-6562. She is the National Marine Fisheries Service Biologist whose office is in New Smyrna Beach.

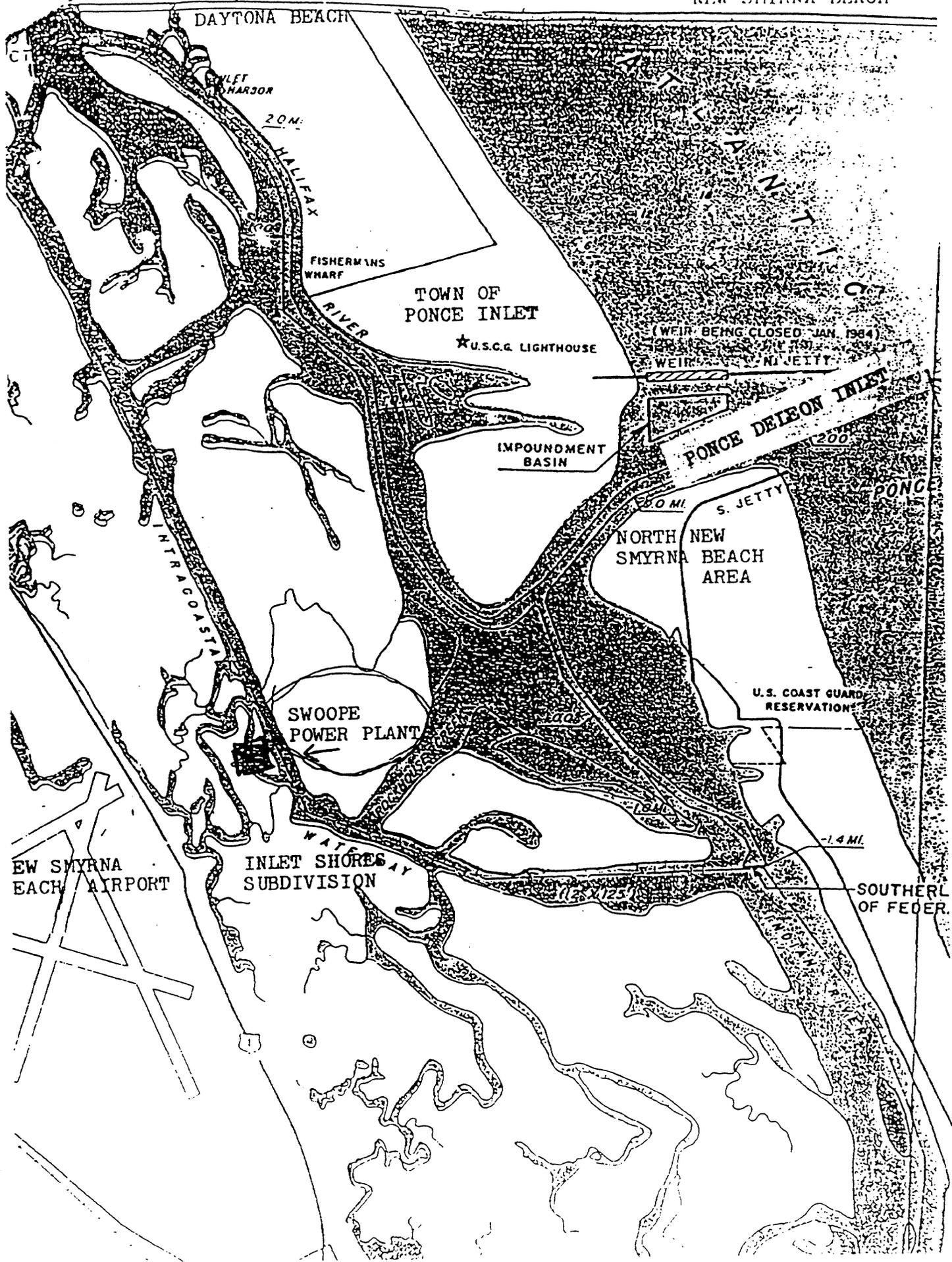
Sincerely,


William F Feger Jr.

Copy to: Army Corps of Engineers, Jacksonville, Fla.
Fla. Inland Navigation District, Jupiter, Florida
City of New Smyrna Beach, Fla.
Claudia Dennis, Biologist, National Marine Fisheries Service
at New Smyrna Beach, Fla.

PONCE DELEON INLET

DAYTONA BEACH AND
NEW SMYRNA BEACH





Department of Environmental Protection

Orig to P D-E
CF: DP-I (Murphy)
CO

Lawton Chiles
Governor

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

Virginia B. Wetherell
Secretary

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

May 21, 1997

Mr. Richard E. Bonner, P.E.
Jacksonville District
U. S. Army Corps of Engineers
Post Office Box 4970
Jacksonville, Florida 32232-0019

Dear Mr. Bonner:

Permit No. 64-286420-9, Volusia County
U. S. Army Corps of Engineers, Jacksonville District
Ponce De Leon Inlet Scour Apron

Your request to modify this permit has been received and reviewed by Department staff. The proposed modification is to authorize a landward extension of the authorized scour apron to be constructed along the inlet side of the north jetty of Ponce De Leon Inlet. The scour apron is to be extended approximately 900 feet landward from station 51+00 to station 60+05. The extension will require an additional 5,000 tons of bedding stone and 13, 800 tons of rip-rap.

The above changes are not expected to adversely affect water quality and will be clearly in the public interest provided the Project Description is amended to the permit as issued:

The activity is to construct a scour apron approximately ~~1600~~ 2500 feet in length along the inlet side of the north jetty of Ponce De Leon Inlet in 25 to 45 feet of water between stations 35+00 and ~~51+00~~ 60+05. A two-foot thick bedding layer will be placed, extending from the toe of the jetty outward approximately 50 feet. A four-foot layer of granite rip-rap will then be placed on top of the bedding layer and will extend approximately 10 feet up the slope of the jetty, as shown on the approved drawings. The median size of the rip-rap will be 300 lbs. Total stone quantities are estimated to be ~~8900~~ 13,900 tons of bedding stone and ~~24,500~~ 38,300 tons of rip-rap.

Since the proposed modification is not expected to result in any water quality degradation or environmental resource impacts, the permit is hereby modified as requested. By copy of this letter and the attached drawings, we are notifying all necessary parties of the modification.

"Protect, Conserve and Manage Florida's Environment and Natural Resources"

Printed on recycled paper.

This letter of approval does not alter the October 28, 2001 expiration date, other Specific or General Conditions, or monitoring requirements of the permit. This letter and the accompanying drawings must be attached to the original permit.

A person whose substantial interests are affected by the Department's action may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Tallahassee, Florida 32399-3000. Petitions filed by the permittee and the parties listed below must be filed within 14 days of receipt of this letter. Petitioner shall mail a copy of the petition to the permittee at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

The Petition shall contain the following information:

- (a) The name, address, and telephone number of each petitioner, the permittee's name and address, the Department Permit File Number and the county in which the project is proposed;
- (b) A statement of how and when each petitioner received notice of the Department's action or proposed action;
- (c) A statement of how each petitioner's substantial interests are affected by the Department's action; or proposed action;
- (d) A statement of the material facts disputed by petitioner, if any;
- (e) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or proposed action;
- (f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and
- (g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this letter. Persons whose substantial interests will be affected by any decision of the Department with regard to the permit have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of receipt of this notice in the Office of General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person

has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

This Notice constitutes final agency action unless a petition is filed in accordance with the above paragraphs or unless a request for extension of time in which to file a petition is filed within the time specified for filing a petition and conforms to Rule 62-103.070, F.A.C. Upon timely filing of a petition or a request for an extension of time this Notice will not be effective until further Order of the Department.

Any party to this letter has the right to seek judicial review of the Order pursuant to Section 120.68, Florida Statutes, by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Office of General Counsel, 3900 Commonwealth Boulevard, Tallahassee, Florida 32399-3000; and by filing a copy with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 days from the date the Notice of Permit Modification is filed with the Clerk of the Department.

Sincerely,



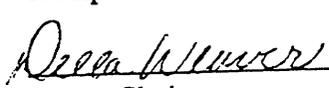
Robert M. Brantly, Jr., P.E.
Professional Engineering Administrator
Bureau of Beaches and Coastal Systems

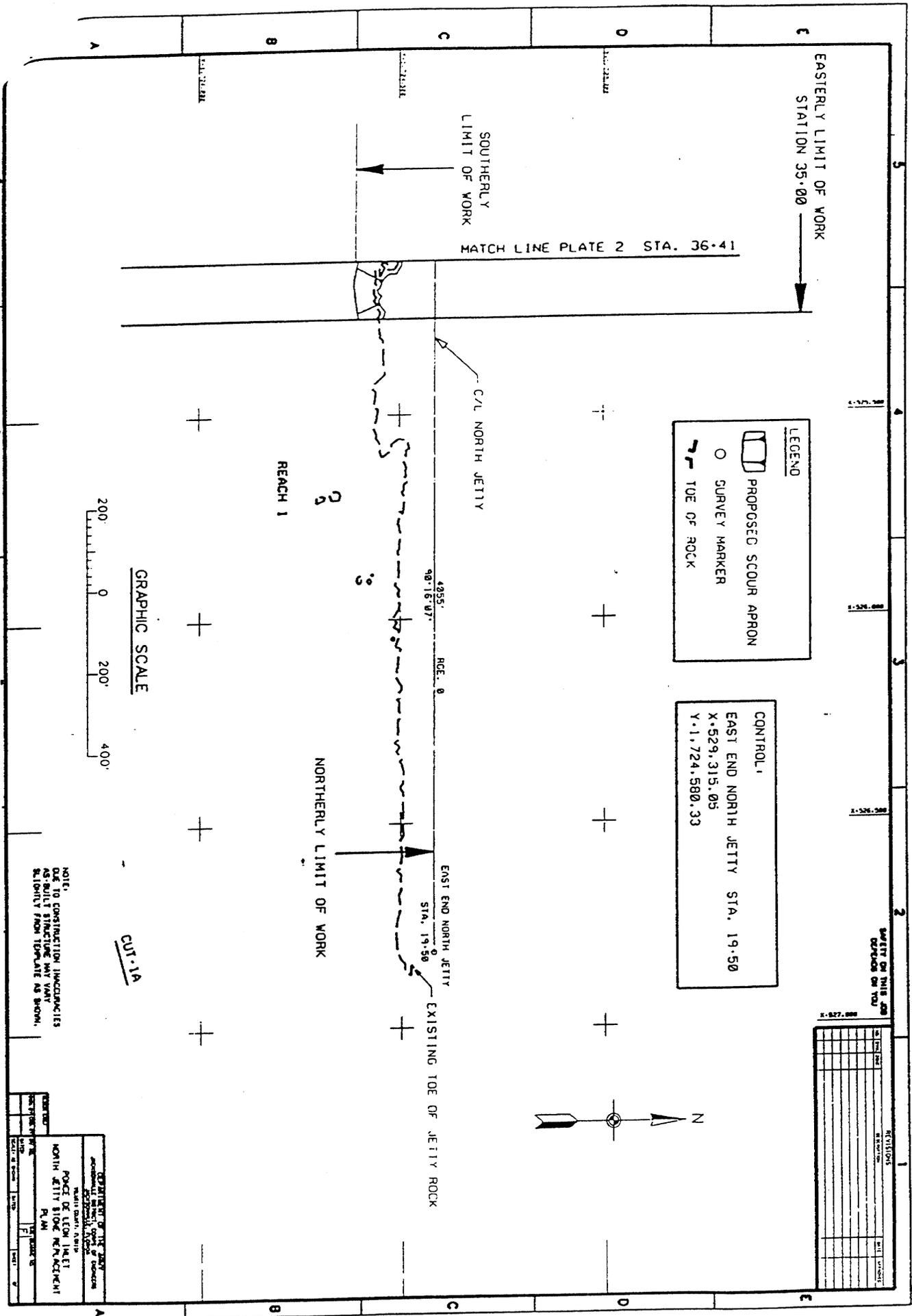
RMB/rvl

cc: DEP, Central District
DEP, Office of General Counsel
Bradley Hartman, Florida Game and Fresh Water Fish Commission
DEP, Division of State Lands

FILING AND ACKNOWLEDGMENT

FILED, on this date, pursuant to Section 120.52, Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

 5/23/97
Clerk Date



LEGEND

- PROPOSED SCOUR APRON
- SURVEY MARKER
- TOE OF ROCK

CONTROL:

EAST END NORTH JETTY STA. 19+50
 X=529,315.05
 Y=1,724,580.33



NOTE:
 DUE TO CONSTRUCTION INCONVENIENCES
 AS-BUILT STRUCTURE MAY VARY
 SLIGHTLY FROM TEMPLATE AS SHOWN.

REVISIONS

NO.	DATE	DESCRIPTION	BY	CHECKED

DEPARTMENT OF THE ARMY WASHINGTON, D. C. 20315 DISTRICT OF COLUMBIA WATERWAYS EXPERIMENT STATION WASHINGTON, D. C. 20542	PROJECT OF LION INLET NORTH JETTY SLOPE REINFORCEMENT PLAN
--	--

U.S. Department
of Transportation

United States
Coast Guard



Commander
Seventh Coast Guard District

909 S.E. 1st Avenue
Miami, FL 33130-3050
Staff Symbol: (oan)
Phone: (305) 536-5621
FAX: (305) 530-7655

16500
JBE 05-97

DEC - 1 1997

Mr. Dennis R. Duke
Acting Chief, Planning Division
Jacksonville District Corps of Engineers
P.O. Box 4970
Jacksonville, FL 32232-0019

Dear Mr. Duke:

Thank you for your letter of August 14, 1997 regarding the proposed extension of the Ponce DeLeon Inlet south channel. After review of the documentation enclosed in your letter, it does not appear that any change in the aid to navigation system will be necessary.

If you have any questions regarding this matter, please do not hesitate to call me at (305) 536-5621.

A handwritten signature in black ink, appearing to read "J. B. Embres".

J. B. EMBRES

Chief, Planning and Marine Information Section
Aids to Navigation and
Waterways Management Branch
Seventh Coast Guard District
By direction of the District Commander



United States Department of the Interior

FISH AND WILDLIFE SERVICE
6620 Southpoint Drive, South
Suite 310
Jacksonville, Florida 32216-0912

IN REPLY REFER TO:

SEP 26 1996

Mr. A.J. Salem
Chief, Planning Division
U.S. Army Corps of Engineers
P.O. Box 4970
Jacksonville, Florida 32232-0019

ATTN: Rae Boothby

Dear Mr. Salem:

The U.S. Fish and Wildlife Service (Service), in accordance with an FY 1996 funding agreement with the U.S. Army Corps (Corps) of Engineers' Jacksonville District, is submitting the attached final Fish and Wildlife Coordination Act Report (CAR) for inclusion in the Feasibility Study of proposed navigation improvements to Ponce de Leon Inlet, Volusia County, Florida. The Service provided a Planning Aid Letter to the Corps on December 11, 1992, with reference to this project. This information is needed to enable the Corps to evaluate the proposed project alternatives to insure that they conform to current environmental needs and criteria. The report includes an analysis of expected wetland impacts and recommendations to lessen these impacts. There are also sections on endangered species and coastal barrier resources. The Service has determined that the alternatives proposed for improving navigation at Ponce Inlet are not likely to adversely impact the continued existence of any federally listed species within the action area. We also determined that the proposed alternatives are exempt from federal funding restrictions designated under the Coastal Barrier Resources Act of 1982, as amended.

The attached document constitutes the final report of the Secretary of the Interior as required by Section 2(b) of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), and completes the consultation requirements pursuant to Section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.) and Section 6 of the Coastal Barrier Resources Act of 1982, as amended (16 U.S.C. 3501 et seq.). This report represents the views of the Department of the Interior.

Sincerely yours,

Michael M. Bentzien
Assistant Field Supervisor

Attachment:

DIVISIONS OF FLORIDA DEPARTMENT OF STATE
Office of the Secretary
Office of International Relations
Division of Administrative Services
Division of Corporations
Division of Cultural Affairs
Division of Elections
Division of Historical Resources
Division of Library and Information Services
Division of Licensing



MEMBER OF THE FLORIDA CABINET
Historic Florida Keys Preservation Board
Historic Palm Beach County Preservation Board
Historic Pensacola Preservation Board
Historic St. Augustine Preservation Board
Historic Tallahassee Preservation Board
Historic Tampa/Hillsborough County
Preservation Board
Ringling Museum of Art

FLORIDA DEPARTMENT OF STATE
Sandra B. Mortham
Secretary of State
DIVISION OF HISTORICAL RESOURCES

September 11, 1996

Mr. A. J. Salem, Chief
Planning Division, Environmental Resources Branch
Jacksonville District Corps of Engineers
P.O. Box 4970
Jacksonville, Florida 32232-0019

In Reply Refer To:
Robin D. Jackson
Historic Sites Specialist
(904) 487-2333
Project File No. 962505

RE: Cultural Resource Assessment Request
Proposed Construction of Improvements to Ponce de Leon Inlet
Extension of South Jetty/Reopening Weir in North Jetty/Construct Channel through Sand
Spit West of North Jetty with Revetment along North Shore/Groin Field to Protect North
Spit from Erosion/Construction of Revetment along North Shore of Breakthrough Area
Volusia County, Florida

Dear Mr. Salem:

In accordance with the procedures contained in 36 C.F.R., Part 800 ("Protection of Historic Properties"), we have reviewed the referenced project(s) for possible impact to archaeological and historical sites or properties listed, or eligible for listing, in the *National Register of Historic Places*. The authority for this procedure is the National Historic Preservation Act of 1966 (Public Law 89-665), as amended.

The mentioned U.S. Army Corps of Engineers Planning Division project has been reviewed by this agency. We note that several cultural resource surveys (terrestrial and underwater) have been conducted in the project areas. We concur with the conclusions in your letter that none of the proposed alternatives will effect significant historic properties. It is the opinion of this agency that because of the project locations and/or nature the proposed projects will have no effect on any sites listed, or eligible for listing, in the *National Register*

DIRECTOR'S OFFICE

R.A. Gray Building • 500 South Bronough Street • Tallahassee, Florida 32399-0250 • (904) 488-1466
FAX: (904) 488-3353 • WWW Address <http://www.dos.state.fl.us>

ARCHAEOLOGICAL RESEARCH
(904) 487-2299 • FAX: 414-2207

HISTORIC PRESERVATION
(904) 487-2333 • FAX: 922-0496

HISTORICAL MUSEUMS
(904) 488-1484 • FAX: 921-2503

Mr. Salem
September 11, 1996
Page 2

If you have any questions concerning our comments, please do not hesitate to contact us. Your interest in protecting Florida's historic properties is appreciated.

Sincerely,

for 
George W. Percy, Director
Division of Historical Resources
and

GWP/Jrj



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southeast Regional Office
9721 Executive Center Drive N.
St. Petersburg, FL 33702

SEP 10 1996

F/SEO13:JEB

Mr. A. J. Salem
Chief, Planning Division
Jacksonville District
U. S. Army Corps of Engineers
P. O. Box 4970
Jacksonville, FL 32232-0019

Dear Mr. Salem:

This responds to your request for consultation on the Ponce De Leon Navigation Improvement Study located south of Daytona Beach, Volusia County, Florida. The project may involve various improvements of Ponce De Leon Inlet including lengthening the south jetty approximately 1000 feet, rebuilding damaged portions of the north jetty, reopening the weir in the north jetty, construction of a scour apron on the south side of the north jetty, construction of a groin field along the sand spit inside the inlet adjacent to the north jetty, construction of a storm revetment to seal a potential breach along the sand spit, or constructing of a channel at the site of the potential breakthrough. All construction activities associated with the jetties would be conducted from a barge or the jetties. A Biological Assessment (BA) was submitted pursuant to Section 7 of the Endangered Species Act of 1973 (ESA).

We have reviewed the BA and concur with your determination that populations of endangered or threatened species under our purview would not be adversely affected by the proposed project. This concurrence is based, in part, upon the protective measures called for in the BA. Any dredging involved in this project is subject to the August 25, 1995, biological opinion on dredging in the Southeastern United States.

This concludes consultation responsibilities under Section 7 of the ESA. However, consultation should be reinitiated if new information reveals impacts of the identified activity that may affect listed species or their critical habitat, a new species is listed, the identified activity is subsequently modified, or critical habitat is determined that may be affected by the proposed activity.



If you have any questions please contact Jeffrey Brown, Fishery Biologist, at (813) 570-5312.

Sincerely,

A handwritten signature in black ink, appearing to read "Andrew J. Kemmerer" with a stylized flourish at the end.

Andrew J. Kemmerer
Regional Administrator

cc: F/PR8
F/SEO2

U.S. Department
of Transportation
United States
Coast Guard



Officer In Charge
U.S. Coast Guard
Aids to Navigation Team
Ponce De Leon Inlet

P.O. Box 370
New Smyrna Beach, FL
32070-0370
(904)428-0985

16500
14 Oct 1992

From: Officer In Charge, USCG ANT Ponce De Leon Inlet, FL
To: Commander, Seventh Coast Guard District (oan)
Via: Commander, Coast Guard Group Mayport, FL

Subj: RECOMMENDED ATON CHANGE PONCE DE LEON INLET AND SOUTH CHANNEL

Ref: (a) PHONCON between BML Farr ANT Ponce and Mr Embres CGD
SEVEN 10 Sep 92
(b) My ltr 16500 of 08 Jun 92
(c) My 252045Z Sep 92

1. Following reference (a), information has been gathered concerning water depth and proper placement of aids to navigation in Ponce De Leon Inlet and South Channel. Recommend the following changes to mark best route of water in this location.

a. Discontinue Ponce De Leon Inlet Buoy 6 (LLNR 8770) PA 29-04-39.2N, 080-54-53.0W. Shoal as charted no longer exist. The buoy located close to the jetty creates a safety problem. This area is a local fishing hot spot and several boats have anchored between the jetty and Buoy 6 and have ended up on the jetty rocks caused by heavy seas or an inconsiderate boat wake. With the buoy removed, sport fishing boats will no longer be able to assume they are safely anchored outside the channel.

b. Change Ponce De Leon Inlet LB 7 (LLNR 8775) from a flashing green 4 second to a quick flash green to better indicate the turn in the channel and to contrast the other lighted aids in the area. When coming in the inlet from offshore, the New Smyrna Beach Airport's rotating area makes identifying LB 7 difficult with the existing characteristic.

c. Discontinue Ponce De Leon Inlet Temp Bouy 7A (LLNR 0000) PA 29-04-00N, 080-55-28.1W, due to shoaling no longer exist. As per reference (c), this bouy was found adrift on 25 Sep 92 and not reset.

d. Discontinue Ponce De Leon Inlet Temp Bouy 7B (LLNR 0000) PA 29-04-20N, 080-55-15.8W due to shoaling no longer exist.

e. Discontinue Ponce De Leon Inlet Temp Bouy 10 (LLNR 0000) PA 29-04-10.9N, 080-55-18.2W.

f. Establish Ponce De Leon Inlet DBN 10 (LLNR to be assigned) in PA 29-04-10.4N, 080-55-18W as a SPW to properly mark the end of shoal exceeding channelward.

D-11

165000
14 Oct 92

Subj: RECOMMENDED ATON CHANGE PONCE DE LEON INLET AND SOUTH CHANNEL

- g. Discontinue Ponce De Leon Inlet Temp Buoy 10A (LLNR 0000) PA 29-04-06.3N, 080-55-17.7W due to shoal no longer exceeds into the channel.
 - h. Discontinue Ponce De Leon Inlet South Chan Buoy 2 (LLNR 8860) PA 29-04-02.5N, 080-55-15.7W due to shoal no longer exceeds into the channel.
 - i. Discontinue Ponce De Leon Inlet South Chan Buoy 3 (LLNR 8865) PA 29-04-07.1n, 080-55-14.4W due to shoaling no longer exist.
 - j. Discontinue Ponce De Leon Inlet South Chan Buoy 4 (LLNR 8870) PA 29-03-53.9N, 080-55-07.5W due to shoal no longer exceeds into the channel.
 - k. Discontinue Ponce De Leon Inlet South Chan Buoy 6 (LLNR 8875) PA 29-03-46.7N, 080-55-02.3W due to shoal no longer exceeds into the channel.
 - l. Change Ponce De Leon Inlet South Channel Lifeboat Station Light (LLNR 8885) from a fixed green light to Ponce De Leon Inlet LT 11 (LLNR to be assigned) PA 29-03-50.2N, 080-54-58.7W showing a quick flash characteristic and elevate from approximately 6 ft to 12 ft.
 - m. Discontinue Ponce De Leon Inlet South Chan Buoy 8 (LLNR 8880) PA 29-03-35.4N, 080-54-54.7W.
 - n. Establish Ponce De Leon Inlet LT 12 (LLNR to be assigned) in PA 29-03-35.4N, 080-54-54.7W as a SPW showing a flashing 2,5 red characteristic.
2. These changes would benefit the mariner as well as the Coast Guard. Numbering continuing from the inlet through to the beginning of the ICW would be less confusing for the boating public. Changing Ponce De Leon Inlet LB 7 (LLNR 8775) to a quick flash would indicate the turn in the channel and changing Ponce De Leon Inlet Lifeboat Station Light (LLNR 8885) to LT 11, elevating to twelve feet and installing 3sg dayboards would make the end of the concrete pilings more visible and continue the lateral marking of the channel. Discontinuing one 3NR and nine trubs and constructing one daybeacon and one light would reduce maintenance cost tremendously and have a less obstructed but still properly marked waterway.

16500
14 Oct 92

Subj: RECOMMENDED ATON CHANGE PONCE DE LEON INLET AND SOUTH
CHANNEL

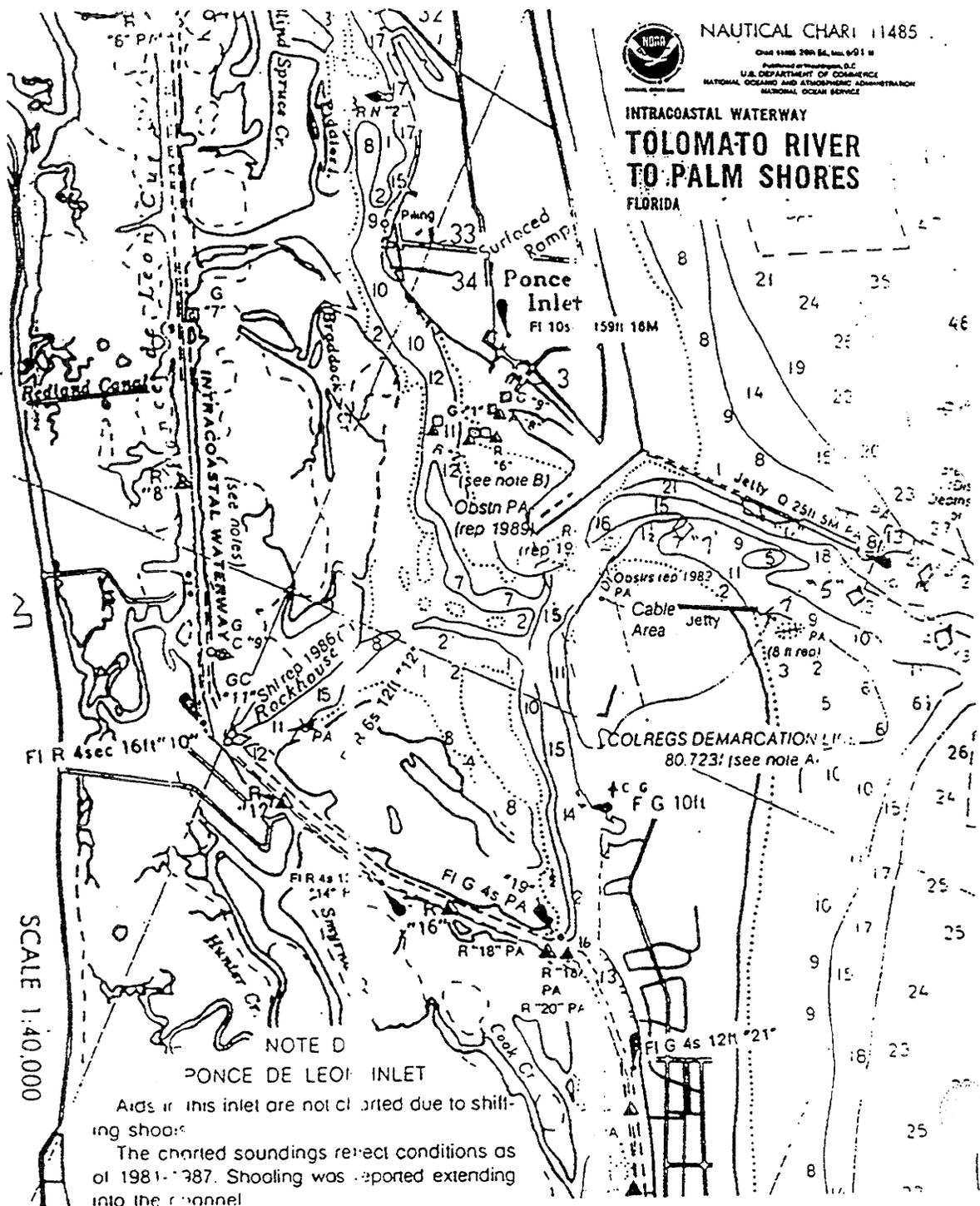
3. Enclosed is a sounding diagram with approximate positions of buoys and channel water depths, an enlarged photo copy of the charted area, and a rough diagram of what the area will look like with the proposed changes.

4. Please contact me with your many questions, BM1 Farr
(904)427-3227.


H. A. FARR

Encl: (1) Sounding diagram with existing aids
(2) Enlargement of charted area
(3) Diagram of proposed changes

Copy: CGC SMILAX
CGC HAMMER
CG STA Ponce De Leon Inlet
Jacksonville District Corps of Engineers



NAUTICAL CHART 11485

Chart 11485 2000 Ed., Nov. 6/91 M
 Published at Washington, D.C.
 U.S. DEPARTMENT OF COMMERCE
 NATIONAL OCEANOIC AND ATMOSPHERIC ADMINISTRATION
 NATIONAL OCEAN SERVICE

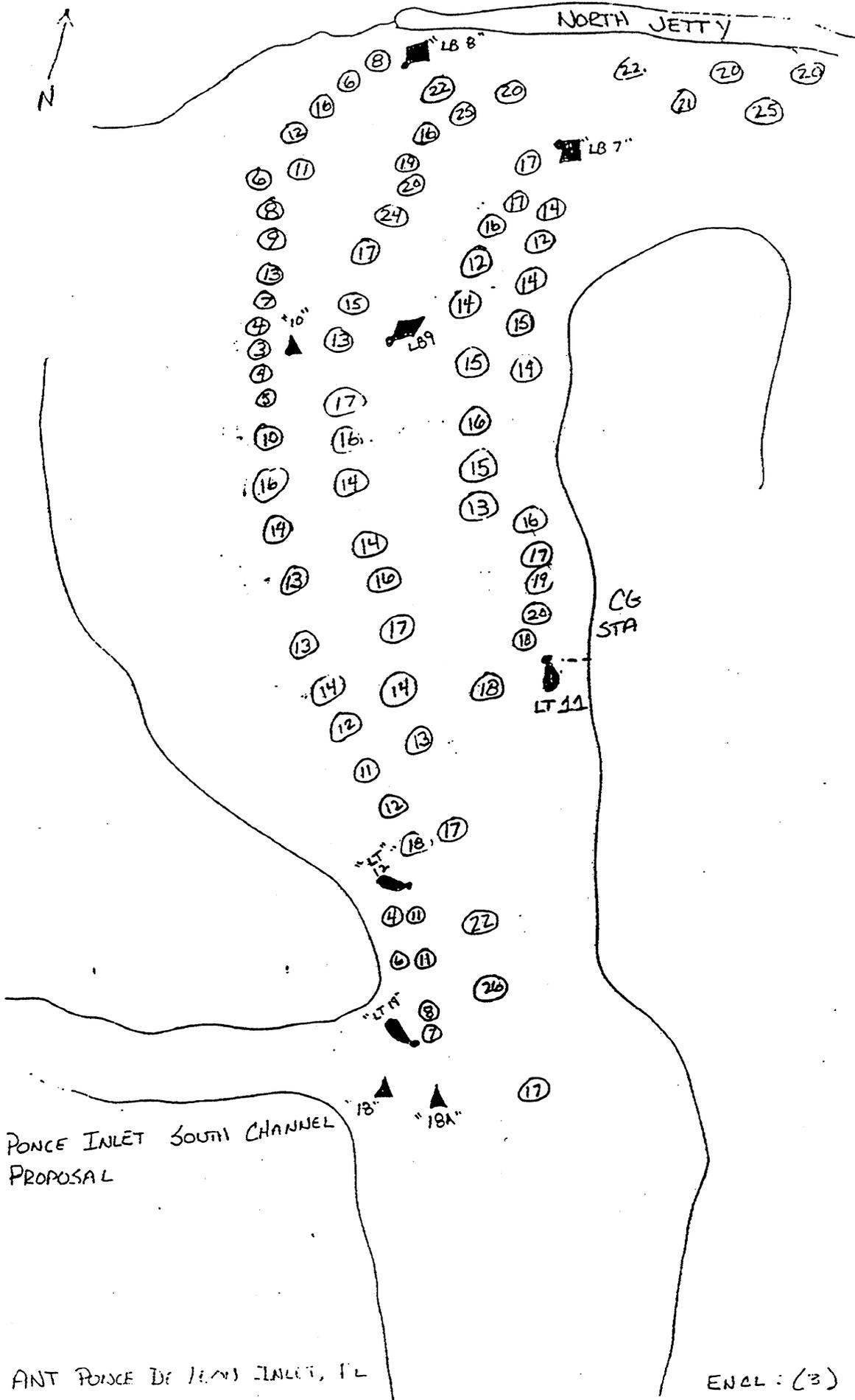
INTRACOASTAL WATERWAY
**TOLOMATO RIVER
 TO PALM SHORES**
 FLORIDA

SCALE 1:40,000

NOTE D
PONCE DE LEON INLET

Aids in this inlet are not charted due to shifting shoals.
 The charted soundings reflect conditions as of 1981-1987. Shoaling was reported extending into the channel.

ENCL: (2)



U.S. Department
of Transportation

United States
Coast Guard



Commandant
U.S. Coast Guard

2100 Second Street S.W.
Washington, DC 20593-0001
Staff Symbol: G-NRS
Phone: 202-267-1089

16100
December 16, 1992

Mr. Richard Powell
U.S. Army Corps of Engineers
Jacksonville District
P.O. 4970
Jacksonville, FL 32232-0019

Dear Mr. Powell,

This is in response to your facsimile request for data from the Search and Rescue database. Enclosed are the density plots you requested for Ponce de Leon Inlet for fiscal years 1981 - 1991. Please note that the latitude and longitude grid spacing for the vessel aground plot has been increased to two minute blocks in order to clarify the location of the cases.

We hope this information will be helpful. Please let us know if we can be of any further assistance.

Sincerely,

A handwritten signature in dark ink, appearing to read "S. R. Osmer".

S. R. OSMER
Commander, U.S. Coast Guard
Chief, Program Branch
Search and Rescue Division
By direction of the Commandant

Enclosure: 1) SAR Density Plots



Commander
Seventh Coast Guard
District

Brickell Plaza Federal Bldg
909 S.E. First Avenue
Miami, Fl 33131
Staff Symbol: (oan)
Ph: (305)536-5621

16500
Serial: 0488

Mr. A. J. Salem
Chief, Planning Division
Navigation Section
Department of the Army
Jacksonville District
Corps of Engineers
PO Box 4970
Jacksonville, FL 32232-0019

AUG -9 1996

Dear Mr. Salem:

This is to confirm previous conversation per your letter of May 22, 1996 regarding aids to navigation improvements in conjunction with your extension of the south breakwater at Ponce de Leon Inlet.

Similar to the process used for marking the extension of the south jetty at Port Canaveral; the Coast Guard will supply a 10' steel section tower for installation by your contractor. A Coast Guard Aids to Navigation Team will install the signalling equipment.

The Coast Guard point of contact for details/specification is the Aids to Navigation Officer at Group Mayport, who can be reached at (904) 247-7354.

Initial cost for equipment is approximately \$4,000 and annual maintenance is approximately \$250.

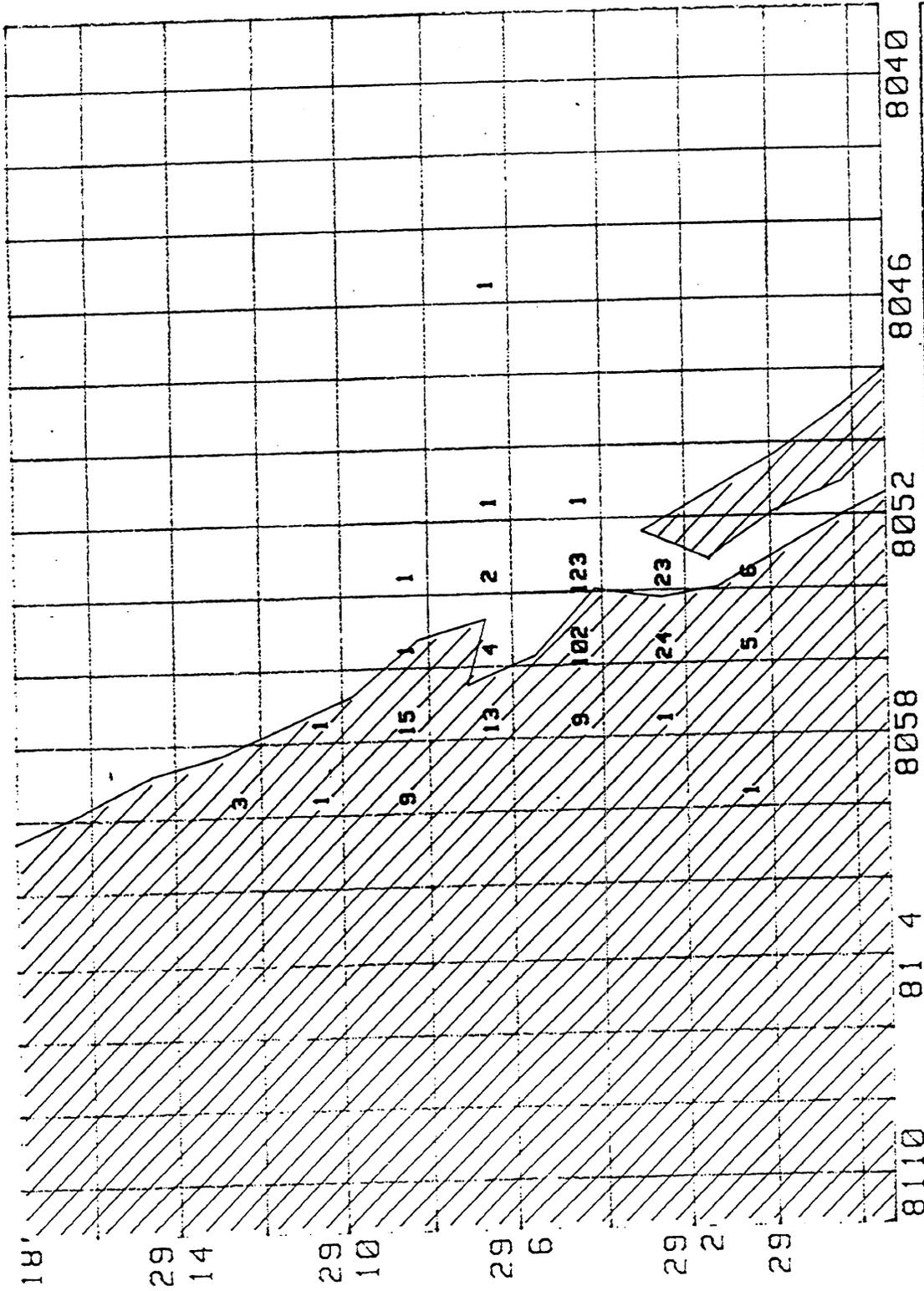
If you have any additional questions, please contact Mr. Joseph B. Embres at (305) 536-5621.

Sincerely,

B. W. HADLER
Captain, U.S. Coast Guard
Chief, Aids to Navigation and
Waterways Management Branch
Seventh Coast Guard District
By direction of the District Commander

Copy: CG Group Mayport

hct. 0




 FY - 81-91 CABES
 AGROUND VESSELS
 411 GULF of MEXICO Zoom Size 38 Scale 1:50000 161652R Dec 92
 V.S. 8
 UNCS
 MALDON



United States Department of the Interior



FISH AND WILDLIFE SERVICE

3100 University Blvd. South
Suite 120
Jacksonville, Florida 32216

December 11, 1992

Mr. A. J. Salem
Chief, Planning Division
U.S. Army Corps of Engineers
P.O. Box 4970
Jacksonville, Florida 32232-0019

Dear Mr. Salem:

The U. S. Fish and Wildlife Service has received your request for information concerning issues and concerns pertinent to proposed inlet improvements at Ponce de Leon Inlet, Volusia County, Florida.

The Corps has described various alternatives which would result in improvements to navigation in this area. These descriptions portray activities which may significantly impact threatened and endangered species known to occur in this area.

The following listed species are known to occur within the project area:

West Indian manatee	<i>Trichechus manatus</i>
Loggerhead sea turtle	<i>Caretta caretta</i>
Green sea turtle	<i>Chelonia midas</i>
Leatherback sea turtle	<i>Dermochelys coriacea</i>
Kemp's ridley sea turtle	<i>Lepidochelys kempii</i>
Hawksbill turtle	<i>Eretmochelys imbricata</i>
Piping plover	<i>Charadrius melodus</i>
Bald eagle	<i>Haliaeetus leucocephalus</i>
Wood stork	<i>Mycteria americana</i>

The Service is concerned with possible impacts to these listed species and is available to assist the Corps, pursuant to the Fish and Wildlife Coordination Act, in developing required reports through transfer fund agreements.

Lighthouse Point State Park, Smyrna Dunes State Park, and Spruce Creek Aquatic Preserve, administered by the Florida Department of Natural Resources, are located within the project area. Federal sites in proximity to the site include Canaveral National Seashore and the Ponce Inlet Coast Guard Station. These offices should be contacted to ensure that their needs and concerns are appropriately addressed.

We are forward to working with the Corps on this project. Should you have any questions, please contact Jim Valade in this office.

Sincerely,

Michael M. Bentzien

Michael M. Bentzien
Assistant Field Supervisor



IN REPLY REFER TO:

United States Department of the Interior

FISH AND WILDLIFE SERVICE

6620 Southpoint Drive, South

Suite 310

Jacksonville, Florida 32216-0912

JUN 20 1996

Mr. A.J. Salem
Chief, Planning Division
U.S. Army Corps of Engineers
P.O. Box 4970
Jacksonville, Florida 32232-0019

ATTN: Rae Boothby

Dear Mr. Salem:

The U.S. Fish and Wildlife Service (Service), in accordance with an FY 1996 funding agreement with the U.S. Army Corps of Engineers' Jacksonville District, is submitting the attached Draft Fish and Wildlife Coordination Act Report (CAR) for your review. The report is part of the Corps' Feasibility Study of proposed navigation and other improvements to Ponce de Leon Inlet in Volusia County, Florida.

The Service has determined that the proposed project is likely to have some adverse impacts on threatened and endangered species, and is preparing a Biological Opinion in accordance with Section 7(a)(2) of the Endangered Species Act of 1973, as amended. This opinion, together with our written findings of the project under the Section 6 consultation requirements of the Coastal Barrier Resources Act of 1982, as amended, will be provided in the final CAR.

We look forward to your comments and providing you with a fully integrated, final document. Please contact John Milio at (904) 232-2580 for further coordination.

Sincerely yours,

Don Palmer
for Michael M. Bentzien
Assistant Field Supervisor

Attachment:

PONCE DE LEON INLET IMPROVEMENTS

VOLUSIA COUNTY, FLORIDA

Project Description

The proposed project is located on land and adjacent coastal waters of the Atlantic ocean in the vicinity of Ponce de Leon Inlet, at S33, T16S, R34E (Figure 1). The 1993 Army Corps of Engineers Reconnaissance Report considered various alternatives intended to: stabilize the navigation channel near the center of the inlet's mouth and throat, stop the erosion of the inlet's north spit and prevent shoaling resulting from a possible breakthrough of the old bed of the Halifax River with either the inlet or Atlantic Ocean, and eliminate the undermining and settling of the north jetty. The alternatives proposed for consideration include:

- extending the north and south jettys (Figure 2),
- re-opening a portion of the north jetty weir (Figure 3),
- constructing a scour apron on the south side of the north jetty and rebuilding the damaged portions of the north jetty,
- building a groin field along the east shoreline of the north spit within the inlet throat (Figure 4),
- constructing a revetment from the toe end of the north jetty westward along one of three possible alignments (Figure 5), and
- creating a new federal channel through the old Halifax riverbed.

Description of the Affected Environment

The environment in and around Ponce de Leon Inlet is comprised of both natural and artificial (man-made) habitats. The naturally-occurring systems include open water (sub-littoral zone) and benthos associated with the Atlantic Ocean, inlet mouth and throat, the Indian and Halifax Rivers, and north spit coves; sand beach and tidal flats (littoral zone); coastal sand dunes; and tidal marshes. Artificial habitats include spoil uplands on both north and south spits and on estuarine marsh islands; two rock jettys; a beach-quality, sand barrier on the north spit; and various boardwalks, buildings, parking lots, and docks associated with two county parks, a U.S. Coast Guard Station, and commercial fishing facility and boat yard.

Natural Habitats

Open Water

The Atlantic Ocean in and around Ponce Inlet is characterized by a north/south longshore current and gradually sloping bottom within 1000 yards of the shore and out to the 24-foot depth contour. Currents at the inlet mouth have velocities from 1.0 to 2.5 feet per second

(fps) and depths between about 6 to 26 feet that tend to increase from the South to the North Jetty. Both depths and speed of current are highly variable within the inlet throat, varying between less than a foot to over forty feet, and between 0.5 and 4.5 fps, respectively. Water depth in the North Indian River is greater (18 versus 14 feet) and more uniformly distributed between shorelines, than the Halifax River. The distribution of water currents in both rivers is similar, although the Halifax River has greater velocities (3.0 versus 2.0 fps) which change rapidly near shorelines (Reference). Water depth and velocities at their confluence varies, depending upon location. Average water depths within the north spit coves, including the man-made channels, are estimated at five feet.

Net Phytoplankton (>20 microns) which may occur in the project area include diatoms of the genera *Skeletonema*, *Thalassiosira*, *Chaetoceros*, *Prorocentrum*, *Nitzschia*, and *Bacillaria*. Other prevalent genera which have been found in the lower St. Johns River Basin include *Rhizosolenia*, *Melosira*, *Coscinodiscus*, *Thalassionema*, *Thalassiotrix*, and *Gyrosigma* (SJRWMD 1994). Nanophytoplankton (<20 microns) in one study (Mahoney and Gibson 1983b) accounted for 99% of cell numbers and 91% of the biomass. Mahoney and Gibson (1983a) identified 232 species of diatoms and 20 species of dinoflagellates at one site in the Indian River Lagoon near Vero Beach. Abundance can vary seasonally and diversity is dependent upon salinity and the type and availability of nutrients. Water temperature, light penetration, and nutrient load are the principle factors which affect phytoplankton productivity. The nutrient input from New Smyrna Beach and its proximity to the project area may have an impact on phytoplankton within the vicinity of Ponce Inlet.

Copepods of various sizes typically dominate the zooplankton (References). Other significant components include the larvae of benthic invertebrates such as Arrowworm (*Sagitta* sp.), cirripids, tintinnids, coelenterates, immature stages of crab and shrimp, and various fish eggs. The larval stages of local fish species, known as ichthyoplankton, also may significantly contribute to the zooplankton biomass. Zooplankton density and diversity may vary year to year, though their seasonal abundance is usually greatest in spring, and summer or autumn, depending on location (inside or outside the Inlet). Their abundance around Ponce Inlet may be related to levels of nutrients and phytoplankton (references).

Ocean access, marshes, creeks, varying water depth and bottom contours, and rock jettys are all likely to contribute to the diversity of fish which could occur within the project area. Some of these fish include pinfish, mosquito fish (*Gambusia affinis*), silver perch (*Bairdella chrysura*), mullet (*Mugil* spp.), Atlantic croaker (*Micropogonias undulatus*), menhaden (*Brevoortia* spp.), sea robins (*Priono tribulus*), lizardfish (*Synodus foetens*), ladyfish (*Elops saurus*), sheepshead (*Archosargus probatocephalus*), flatfishes (Bothidae), mackeral (*Scomboromorus* spp.), juvenile snapper and grouper, sea bass (Lutjanidae and Serranidae), bluefish (*Pomatomus saltatrix*), seatrout and weakfish (*Cynoscion* spp.), common snook (*Centropomus undecimalis*), red and black drum (Sciaenidae), cobia (*Rachycentron canadum*), and various sharks.

Other animals inhabiting open water within the Ponce Inlet project area include the federally-endangered West Indian manatee, *Trichechus manatus latirostris*, four federally-listed sea turtles: the endangered green (*Chelonia mydas*), Kemp Ridley's (*Lepidochelys kempi*), and leatherback (*Dermochelys coriacea*) turtles and the threatened loggerhead (*Caretta caretta*) turtle (Reference), and the diamondback terrapin (*Malaclemys terrapin*).

Benthos

A site inspection of spoil material from previous dredgings revealed bottom sediments from the nearshore ocean, Ponce Inlet mouth and throat, and river confluence to be mainly unconsolidated sands or sand-shell combinations. Erosion and runoff from adjacent marshes and uplands contribute organic material to the bottom sediment of both rivers and the north spit coves. The rate of accumulation of this material in coves is usually greater due to input from surrounding areas exceeding removal due to the smaller influence of tides and wind on water currents. The result is a buildup of a "muck layer" in the coves which often is more than a foot deep.

The benthic community includes those organisms living on the surface of and within bottom sediments. Sediment composition and stability, salinity, light, temperature, oxygen and other chemical concentrations, and nutrient levels are factors which influence species abundance and diversity. Organisms associated with Ponce Inlet are, for the most part, continually exposed to full ocean salinities that likely fluctuate very little. In general, abundance and density are expected to be greatest during winter and spring and lowest towards the end of summer. Some of the benthic organisms expected in and around Ponce Inlet include polychaete worms in the genera *Polycirrus*, *Pectinaria*, *Polychaete*, and *Nereis*; bivalves including oysters (*Crassostrea virginica*), various clams, and mussels (*Mytilus* spp.); various gastropods (snails); crustacea (shrimps, crabs, amphipods, ostracods, and tanaids); echinoderms (starfish and sand dollars); and sea grasses in the genera *Halophila* and *Zostera*.

Beach

The beach around Ponce Inlet consists primarily of unconsolidated sand with some shell material extending from mean low water landward to where there is a marked change in material or physiographic form, or to the line of permanent vegetation. Areas of beach exist north and south of the North Jetty and completely around the inlet's south spit to the Coast Guard station on the north Indian River. Under natural conditions, the combined action of wind, waves, and current produce frequent changes in the size, shape, slope, and location of inlet beaches. Since completion of the Ponce Inlet jetty system in the early 1970's, sand accretion on the south spit has extended the beach area northward both east and west of the spit. While the beach north of the North Jetty has widened somewhat in the vicinity of the jetty, nearly all the natural beach south and west of the jetty is gone. A narrow, artificial beach has been maintained near the toe end of the jetty by the addition of beach-quality sand deposited in 1993, as a barrier between the inlet and a county parking lot. Beach driving is currently permitted on the ocean-side of each spit up to the jettys.

Animals associated with the beach community include birds, crustaceans, molluscs, sea turtles and beach mice. Specific birds which may occur at Ponce Inlet include gulls (*Larus* spp.); the black skimmer (*Rynchops niger*); American oystercatcher (*Haematopus palliatus*); terns (*Sterna* spp.); plovers in the genera *Pluvialis* and *Charadrius*, including the federally-threatened piping plover (*C. melodus*); sandpipers in the genera *Tringa*, *Calidris*, and *Actitis*, marbled godwit (*Limosa fedoa*), willet (*Catotrophorus semipalmatus*), and ruddy turnstone (*Arenaria interpres*) (Reference). The pallid beach mouse, *Peromyscus polionotus decoloratus*, which once occurred from north Ponce Inlet to the Matanzas Inlet, is now considered extinct. South Ponce Inlet is the northern limit of the southeastern beach mouse, *Peromyscus polionotus niveiventris*, a federally-threatened species (Reference). Bivalves, specifically clams of various species appear to be the most abundant mollusc at Ponce Inlet beaches. Most insects found at beach habitats are transients. Crustaceans inhabiting the littoral zone include sand fleas (), hermit crabs (*Pagurus longicarpus* and *Clibanarius vittatus*), and ghost crabs (*Ocypode quadrata*).

Tidal Flats

Sand flats are normally submerged, sand-bottomed areas which are completely exposed during mean low water, and may be separated from marsh or beach by continuously submerged bottom. A series of large and small sand flats exist within the project area, principally north and south of Rockhouse Creek on the west side of the Halifax and North Indian Rivers. A review of an 1851 U.S. Coast Survey map of Mosquito Inlet (Ponce Inlet) revealed a similar pattern of flats, though flats south of Rockhouse Creek today appear longer and wider. A flat may have existed at one time within the inlet throat adjacent to the south pit beach, but further sand accretion appears to have filled in the submerged area and produced a northward extension of that beach.

Mud flats are also tidally-exposed areas whose bottom substrate has an upper layer rich in silt and organic material. These flats typically occur along the edges of creeks, coves, rivers, and similar places where the rate of deposition of silt and organic material from adjacent marshes, swamps, and uplands exceeds their removal. Mud flats are present within the marina cove and the old bed of the Halifax River.

Animals expected to occur on Ponce Inlet sand flats during low water include benthic invertebrates such as some bivalves, crustacea, echinoderms, and polychaete worms, and vertebrates including birds and transient terrestrial species such as raccoons (*Procyon lotor*). Besides most of the previously mentioned birds, others which may be found on sand flats include the Double-crested cormorant (*Phalacrocorax auritus*), American avocet (*Recurvirostra americana*) and Short-billed dowitcher (*Limnodromus griseus*). Higher plants were not observed on the sand flats, though it is likely that various species of algae could and do occur there. Mud flats are likely to support a similar group of animals, though species composition will likely be different and total diversity may be higher due to the substrate's greater organic component.

Coastal Sand Dunes

The location and extent of sand dunes at Ponce Inlet prior to human intervention depended entirely on the interactions among wind, waves, changes in sea level, and specially-adapted vegetation. Today, in addition to these factors, dunes are strongly influenced by human activities such as construction of buildings, boardwalks, roads, parking lots, and jettys; beach driving and pedestrian foot traffic; and artificial deposition of sand for beach re-nourishment and other dredged spoil disposal. No natural dunes currently exist on the north spit south and west of the north jetty. An area of foredune and partially impacted backdunes and stable dunes exist approximately one mile north and a half mile west of the north jetty. A foredune encompasses the entire south spit, extending from the U.S. Coast Guard Station on the North Indian River through the southeastern boundary of Smyrna Dunes County Park. Backdunes and stable dunes in this area are naturally limited by marsh along the northwestern border and human impacts elsewhere, particularly a large spoil disposal field which includes a substantial portion of the center of the county park. Dunes formed by sand accreted since completion of the south jetty in 1969 have now partially or wholly buried more than 90% of the south jetty.

Coastal sand dunes are the primary habitat for beach mice. The southern spit at Ponce Inlet represents the northern limit of the range of the federally threatened, southeastern beach mouse, *Peromyscus polionotus niveiventris*. Although the area has not been trapped in recent times, the belief (Reference) is that, due to habitat loss and other impacts, the mouse no longer occupies the remaining habitat. A cursory examination of the back side of the existing foredunes revealed scattered burrows. Without a significant trapping effort, it is not clear whether these burrows are indicative of the presence of beach mice or represent the excavations of other rodents and/or ghost crabs. Other rodents which may be found in the area are the cotton rat (*Sigmodon hispidus*), cotton mouse (*Peromyscus gossypinus*), and house mouse (*Mus musculus*). Other animals observed or likely to occur within the dune ecosystem include feral cats (*Felis felis*), red fox (*Vulpes vulpes*), resident and neotropical migrant birds such as sparrows and warblers (Emberizidae), gopher tortoise (*Gopherus polyphemus*), various other herptiles (snakes and lizards), and numerous invertebrates.

Vegetation observed along the foredunes included sea oats (*Uniola paniculata*), sea rocket (*Cakile edentula*), seaside spurge (*Chamaesyce* spp.), coastal dropseed (*Sporobolus virginicus*), railroad-vine (*Ipomea pes-caprae*), and panic grass (*Panicum* spp.). Due to the generally disturbed nature of the interior portions of the south spit, the vegetative difference between transitional or backdunes and stable dunes was not always clear. Species observed were characteristic of both saw palmetto, wax myrtle and oak scrub zones and included saw palmetto (*Serenoa repens*), broomsedge (*Andropogon* spp.), partridge-pea (*Cassia* spp.), prickly-pear (*Opuntia* sp.), yaupon (*Ilex vomitoria*), dune greenbrier (*Smilax auriculata*), pennywort (*Hydrocotyle* spp.), cabbage palm (*Sabal palmetto*), groundsel tree (*Baccharis halimifolia*), Southern red cedar (*Juniperus silicicola*), wax myrtle (*Myrica cerifera*), and myrtle oak (*Quercus myrtifolia*).

Tidal Marsh

A review of aerial photographs of Ponce Inlet between 1967 and 1973, revealed that the pre-jetty tidal marsh was limited to portions of the north spit perimeter on the Halifax River and the southern section of the old riverbed cove, either side of the northernmost riverbed cove, and some interior portions of the north spit which were inundated from the southern cove through a then existing tidal creek. Following jetty construction, the area of tidal inundation apparently increased and, along with advanced sediment deposition, converted most of the sand spit into a tidal marsh. Today more than half the marsh and almost all the narrow, inlet-facing beach has been lost to erosion. Less than 20 acres of low salt marsh and mangrove swamp remain in and around the north spit.

Tidal marsh on the south spit is limited to a triangular area less than 10 acres on the spit's west side and mostly north of the Coast Guard Station. A small, open-water, brackish pond has formed at the landward marsh end near a boardwalk. Marsh formation occurred sometime after construction of the south jetty, probably from the conversion and convergence of two open-water coves from sediment buildup due to sand accretion at their juncture with the North Indian River.

Vegetation found within the low salt marsh included smooth cordgrass (*Spartina alterniflora*), glasswort (*Salicornia* spp.) and sea purslane (*Sesuvium portulacastrum*). High marsh plants observed included saltwort (*Batis maritima*), salt grass (*Distichlis spicata*), salt meadow cordgrass (*Spartina patens*), sand cordgrass (*Spartina bakerii*), salt marsh fimbriatylis (*Fimbristylis castanea*), sea oxeye (*Borrchia frutescens*), groundsel bush (*Baccharis halimifolia*), marsh elder (*Iva frutescens*), wax myrtle (*Myrica cerifera*), Southern red cedar (*Juniperus silicicola*), and the exotic Brazilian pepper (*Schinus terebinthifolius*). The overwash mangrove swamp on the north spit is occupied by all three species of mangroves: red (*Rhizophora mangle*), black (*Avicennia germinans*), and white (*Laguncularia racemosa*). Black and white mangroves predominate on the south spit marsh.

Invertebrate animals observed or expected to occur within these tidal marshes include fiddler crabs (*Uca* spp.), portunid crabs (*Callinectes* spp.), the palaemonid shrimp (*Palaemonetes intermedius*), penaeid shrimp (*Penaeus* spp.), other crustacea, bivalve (clams, oysters) and gastropod (snails) molluscs, polychaete worms, and a variety of aquatic, semi-aquatic and arboreal insects. Many of the previously mentioned fish species may be found within marsh habitat either as transient adults or during their immature stages. Other resident fish may include sailfin molly (*Poecilia latipina*), sheepshead minnow (*Cyprinodon variegatus*), marsh and gulf killifish (*Fundulus confluentus* and *F. grandis*), tidewater silverside (*Menidia beryllina*), fat sleeper (*Dormitator maculatus*), and rivulus (*Rivulus marmoratus*). Bird groups and species likely to occur in and around tidal marshes and their mud flats include bitterns, herons, and egrets (Ardeidae), ibis (Threskiornithidae), the federally endangered wood stork (*Mycteria americana*), rails (Rallidae), the marsh wren (*Cistothorus palustris*), boat-tailed grackle (*Quiscalus major*), red-winged blackbird (*Agelaius phoeniceus*), certain sparrows (*Ammodramus*, *Passerculus*, and *Melospiza* spp.), and many other shorebirds also associated with beaches and sand flats. Other

terrestrial vertebrates include the cotton mouse, cotton rat, and other rodents; shrews (*Soricidae*); marsh rabbit (*Sylvilagus palustris*); opossum (*Didelphis virginiana*); raccoon; fox; and various herpetiles; including the federally endangered Atlantic salt marsh snake (*Nerodia clarkii taeniata*).

Artificial Habitats

Rock Jetty

The existing rock jettys, built between 1968 and 1971, were approximately 4200 feet long and 47.5 feet wide on the north spit and 2700 feet long and 60 feet wide on the south spit. They consisted of very large (8 to 12 ton) stones over two layers of smaller stones in the shape of a truncated pyramid, that extended about 7.5 feet above and 5.0 feet below mean low water. The original north jetty included an 1800-foot weir and an impoundment basin just to the south for accumulating littoral drift material, which was to be transported across the inlet to the south by use of a conventional pipeline dredge. The weir was closed with armor stone in 1984 due to high cost of removing shoal material from the sediment basin. A concrete walkway was built on top of the jetty sometime thereafter and partially extended over the blockaded weir. Scouring due to channel migration within the inlet has undermined the jetty foundation and caused subsidence and overwash in two locations. Nealy 80 per cent of the north jetty is contiguous with open water on both sides. Heavy sand accretion has occurred on both sides along most of the entire length of the south spit jetty. As a result, only the oceanward tip of this jetty is directly exposed to water on both sides.

Jetty rock provides a hard, irregular, and multi-dimensional substrate with numerous spaces that support many living organisms. All four types of marine algae, blue-green (*Cyanophyta*), green (*Chlorophyta*), brown (*Phaeophyta*) and red (*Rhodophyta*), collectively known as seaweeds, may occur on these jettys. Bivalves, particularly mussels (pelecypods) anchor themselves to the rock surface and crevices. Various crustacea, including amphipods, ostracods, and decapods, may be found on the jetty both above and below the water's surface. Some shorebirds use jettys for loafing as well as feeding. Their landward end may also support plants as well as resident and transient vertebrate and invertebrate animals.

Spoil Uplands

Dredging of waterways has occurred in and around Ponce Inlet for over fifty years. Site visits and a review of aerial photographs and United States Geologic Survey 7.5 minute topographic map (New Smyrna Beach Quadrangle) revealed locations where disposal of dredged sediments (spoil) occurred on land. Spoil disposal sites occur on the mangrove islands bordering the rivers and ICW, as well as on both Ponce Inlet spits. The site on the south spit is circular and covers approximately 55 acres in the middle of Smyrna Dunes County Park. Vegetation in this area is generally very sparse, and includes prickly pear (*Opuntia*), broomsedge (*Andropogon*), and the occasional sea oat (*Uniola paniculata*). Two depressional wetlands have formed near the middle of the spoil field and support a more robust vegetative community, similar to that

associated with the wet, interdunal swales of backdune and stable dune areas. These areas are also likely to contain a greater diversity of animal life than the surrounding spoil upland.

A spoil deposit noted on the north spit is located on land between the two coves which form the old bed of the Halifax River. The site is roughly cylindrical, covers approximately 4.5 acres, and its average height above the marsh on the south side is about six feet. Salt marsh and mangrove swamp border the area and in two to three corridors which run transversely through the spoil uplands and total less than three acres. No wading bird rookeries were observed at this site. The spoil material visually resembled that found on the south spit. Grasses, shrubs, and small trees grew robustly along the perimeter of the spoil site while the more interior portion alternated among patches of bare sand, grass-dominated patches, and woody trees and shrubs. Specific vegetation observed included pennywort, broomedge, coastal dropseed, foxtail (*Setaria* spp.), goldenrod (*Solidago* spp.), various composites (Asteraceae), greenbriar, nightshade (*Solanum* spp.), prickly pear, wild grape (*Vitis* spp.), saw palmetto, cabbage palm, southern red cedar, and brazilian pepper. Animals inhabiting this area are expected to be similar to those occupying high and low salt marsh, mangrove swamp, and both transitional and stable backdunes. There was no evidence of past or present occupation by gopher tortoises.

Project Alternatives: Impacts to Fish and Wildlife Resources

No Action Alternative

According to the Army Corps of Engineers' 1993 Reconnaissance Report, the no action alternative at Ponce Inlet would likely result in the following conditions: 1) continued erosion of the southern and western portions of the north spit leading to an eventual breakthrough to the old bed of the Halifax River, 2) continued shoaling of the Halifax River and new shoaling around the north channel and nearby cove in the vicinity of the expected breakthrough, and 3) increasing instability and slumping along the entire stretch of the north jetty due to new and continued undermining from water velocities associated with the current northerly position of the deepwater channel within the inlet's throat. Another condition likely to result from the no action alternative is further beach expansion along the north shore of the south spit due to sand accretion adjacent to the inlet throat. Continued erosion around the toe of the north jetty will narrow the gap of land between the inlet and the Atlantic Ocean and predispose the area to a breach during a catastrophic northeast storm. Under this scenario, the jetty would be isolated and unable to protect land areas north and west of it from flooding and erosion.

The most significant direct impact to natural resources from the no action alternative would be the projected loss of the remaining salt marsh and mangrove swamp habitat, and all the associated biomass, from continued advanced erosion of the north spit south of the old riverbed. The accompanying movement of sediment and nutrients into the water column is also likely to affect organisms within the benthic and sub-littoral zones. These effects, especially for the open-

water fauna and flora, likely will be transitory due to the speed and range of shifting physical conditions typical of most inlets. The presence of an extensive marsh and mangrove system both north and south of the inlet would also tend to lessen the overall impacts of wetland loss. Additional shoaling in the Halifax River resulting from a breakthrough would impact the local benthos at that site. Shoaling may also reduce exchange of water and sediment from the boat basin cove, creating conditions favorable for expansion of the adjacent salt marsh and mangrove swamp. Degredation of the north jetty would expose more rock to the littoral and sub-littoral zone and provide additional shelter for fish and some crustacea as well as living surface for various algae and molluscs. Further expansion of the littoral zone adjacent to the inlet side of the south spit would likely benefit some benthic organisms, shorebirds, and nesting sea turtles. A breach behind the north jetty would remove some beach and foredune habitat and encroach on the transitional dune area. Fish, sub-littoral benthic organisms, and other tidal rock inhabitants would have new habitats to exploit.

Jetty Extension Alternative

Both the physical and numerical models of Ponce Inlet indicate that a 1000-foot extension of the south jetty would be the best of the extension proposals for improving the inlet's navigation characteristics, particularly within the entrance reach of the channel. The expected changes leading to a more centered channel include more uniform ebb and flood flow distributions at the entrance reach plus flood flow distributions just south of the seaward end of the south jetty. These changes would reduce littoral drift and sand deposition within the inlet, particularly along the north side of the south spit. Construction of the south jetty extension could be accomplished from land or water. One source of jetty stone under consideration is existing material within 2000 feet of the toe end of the original south jetty. This entire area is land-locked and much of it is at least partially buried beneath shallow sands which accreted rapidly following jetty construction in 1969.

Pre-construction Impacts

Activities preceding construction of the south jetty extension include boring to collect core samples of bottom sediments within the proposed extension area, and possible excavation of sand-imbedded stone from somewhere between the toe end of the south jetty out approximately 2000 feet along the middle of its footprint. The core sampling is done by a self-propelled drilling platform whose coring procedures, including drilling and platform stabilization, are expected to have limited and short-term impacts on the area's benthic organisms. Other possible impacts to manatees and sea turtles will be addressed in the section on threatened and endangered species.

The potential excavation of rock from the toe end of the south jetty would impact both plants and animals that have colonized the overlying sand, and possibly wetlands. Portions of the western side of the jetty come within a few feet of high marsh and mangrove swamp. The jetty's eastern side is bounded by a sand road that is used by county park personnel and other authorized

vehicles. Plant impacts to the site are expected to be complete but relatively short term due to the re-colonization potential from adjacent transitional and stable dunes and jetty dune areas left intact due to their close proximity to wetlands. The potential for re-colonization may be enhanced by using the excavated sand to re-create, as closely as possible, the previously existing topography. Another expected impact involves the gopher tortoise, *Gopherus polyphemus*. Table 1 provides the results of a survey in which over 2000-feet of jetty footprint, starting at the fenced property boundary of the Coast Guard Station, was surveyed in its entirety for active, inactive, and abandoned gopher tortoise burrows. Burrows were considered active if they had sign of recent tortoise activity. These included visual sightings, fresh tracks leading into the burrow, loose sand on the slide of the burrow, or other visual evidence of recent use. Burrows were classified as inactive if they showed no signs of recent tortoise use, but still maintained the characteristic shape of a tortoise shell (flat on the bottom, round on top). Burrows were classified as abandoned if they had lost the shape of a tortoise shell. Due to the confirmed presence of a small gopher tortoise colony on this site, a permit authorizing their disposition must be obtained from the Florida Game and Fresh Water Fish Commission (GFC). A permit application should be submitted in accordance with GFC guidelines at least 30 days prior to commencement of the proposed work. Contact with Smyrna Dunes County Park should be made first to coordinate this effort and determine if there are additional county requirements.

Construction and Post-construction Impacts

Impacts from increased boat and barge traffic expected during construction of the jetty extension include temporary displacement of fish, plankton, and some loafing and feeding shorebirds, permanent loss of some sand-bottomed, benthic habitat within the jetty footprint, and possible impacts to manatees and sea turtles. Land-based operations will impact beaches and possibly sand dunes if the heavy equipment must cross dunes in order to reach the jetty. Under these conditions, beach and dune animals and plants, including the federally listed piping plover and southeastern beach mouse, may be affected. Direct habitat impacts expected or predicted during the post-construction period include the addition of more dry and tidally-influenced, hard rock substrate; sand accretion to varying degrees along the beach upwards of a mile south of the new jetty; and loss of some shoals and extended beach along the north side of the south spit. The sand accretion predicted for the south beach will directly benefit shorebirds, benthic species found within the littoral and sub-littoral zones, nesting sea turtles, and other upper beach fauna and flora. The dune habitat in this area and its associated biotic community will also benefit from the increased availability of sand necessary for the maintenance and growth of this habitat type. These benefits will more than offset the predicted loss of some littoral and sublittoral habitat adjacent to the south side of the inlet throat.

North Jetty Weir Re-opening Alternative

An 1800-foot weir constructed in the north jetty and an accompanying impoundment basin were designed to collect littoral drift across the jetty for transport across the inlet by a pipeline dredge. The weir was closed in 1984 to stop the high cost of maintenance removal of shoal material

believed to be crossing the weir. Following weir closure, erosion rates throughout the north spit increased dramatically between 1985-1990 over pre-closure erosion rates. Reopening of the weir was considered in the early phases of the Reconnaissance Report as a way to reduce erosion velocities and add drift material which would hopefully accrete along a portion of the north spit as well as accumulate in the impoundment basin for later use in beach renourishment. Further testing of this alternative using a scale physical model revealed that re-opening various weir lengths would no longer have the desired effect of reducing erosional forces impinging on the north spit. The alternative had called for the removal of up to 1000 feet of armor stone from the seaward end of the original weir and dredging to re-establish a limited impoundment basin. The work would be accomplished by either land or water-based, heavy equipment.

Pre-construction Impacts

Core sampling of bottom sediments within the impoundment basin are expected to have limited and short-term impacts on the area's benthic organisms. Other possible impacts to manatees and sea turtles will be addressed in the biological pinion.

Construction and Post-construction Impacts

Re-opening of 1000 feet of weir would require removal of 255 feet of concrete walkway atop the jetty and approximately 17,000 tons of armor stone. If walkway demolition and rock removal is a land-based operation, the work would involve transporting equipment over the beach, then filling in jetty voids with stone to create a smooth, drivable surface for the heavy equipment. Part of the beach may be used as a staging area for materials. Some transient impacts to upper beach fauna and flora may occur, as well as temporary displacement of feeding and loafing shorebirds. A water-based operation may temporarily effect shorebirds, fish, plankton, and the sub-littoral benthos. Removal of the submerged rock would reduce the total amount of hard substrate available to algae and aquatic and semi-aquatic marine invertebrates. Dredging of the impoundment basin would have short-term, open water and benthic impacts. Dredged spoil used for beach renourishment may impact nesting sea turtles, crustacea and other littoral benthos, while careful deposition in already existing and permitted spoil disposal sites is likely to have only minor impacts on an already disturbed plant and animal community.

The major change expected from the weir re-opening is movement of additional sediment into the inlet from renewed littoral drift across the north jetty. Some of this sediment is expected to be deposited in the adjacent impoundment, where it may be piped or dredged to re-nourish south jetty beaches. Other sediment may be carried further into the inlet, where it will likely be involved in formation and maintenance of shoals, sand flats, and possibly accretion of remaining interior sand beaches bordering the north and south spits. The beach and dunes adjacent to the north jetty may become narrower due to transport of sediment formerly available to re-nourish these habitats. With the exception of the dredging and artificial beach re-nourishment, the major expected change would potentially add new plant and animal habitat to the inlet. Since the greatest possible change to the north beach and dune system is likely to occur in the immediate

vicinity of the north jetty, the overall impact to fauna and flora is not expected to be significant.

North Jetty Repair and Scour Apron Extension Alternative

Rebuilding portions of the north jetty crest and extending the scour apron along the south side of the north jetty are considered separate maintenance projects from the main Ponce Inlet Navigation Improvement Project. These projects were included as alternatives because of their expected contribution to improving the overall inlet stability. The north jetty repair project involves placing approximately 610 tons of armor stone in three places where the jetty crest has slumped to raise their level to the original crest height. The scour apron would consist of placing filter cloth, foundation and armor stone over an approximately one-half acre submerged area at the jetty's base in the vicinity of the scour apron. Barges and other boats would likely be used to handle manpower, equipment, and materials for both projects.

Impacts

The habitat and fish and wildlife resource impacts from these projects are expected to be about the same as those of the water-based operations for the south jetty extension alternative.

Groin Field Alternative

The construction of a set of three groins along the sand spit inside the inlet adjacent to the north jetty was originally considered to preserve the remaining shoreline and prevent breaching of the spit by deflecting flood tidal currents away from the spit. Since this alternative was considered in the Reconnaissance Report, more than 60 acres of remaining sand spit and marsh have been lost to erosion. As a result of these physical changes to the north spit since publication of the Reconnaissance Report, the Corps has re-reviewed this alternative and determined that the current conditions no longer matched the parameters under which the groin field was to operate. The Corps therefore decided to delete this alternative from project consideration.

Revetment Alternatives

Alignment One

The Reconnaissance Report considered the use of a hardened barrier as a permanent alternative which would provide direct protection of upland property adjacent to the north spit by preventing the further landward migration of its shoreline. The report discussed three alignments, all of which would originate from the toe end of the north jetty and offer varying degrees of protection. The first alignment would extend 4800 feet and offer maximum protection from shoreline erosion, inlet breaching, and ocean flanking of the jetty by completely encircling the north spit. Most of the footprint for the first alignment, however, has been lost due to shoreline erosion of

the north spit over the last four years. Based on the estimated rate of continued erosion, the remaining marsh south and west of the old Halifax River bed will be gone before any action on a revised alignment one can be initiated. The Corps has therefore dropped this alignment from consideration as a viable alternative and an evaluation of its impacts on natural resources is no longer necessary.

Alignment Two

The second alignment would extend approximately 2800 feet to the tip of a mixed marsh and spoil upland peninsula along its southern and western borders. The peninsula is located between the marina cove and the old bed of the Halifax River. This alignment is expected to protect against jetty flanking and potential erosion of the marsh/spoil peninsula, although it offers no protection against inlet breaching. The revetment footprint would total approximately 7.12 acres. Another 1.72 acres of an herbaceous spoil field within the middle of the peninsula is projected as a site to stockpile material and possibly equipment. The entire operation will be land-based. A review of the expected impacts from this alignment are described below.

Pre-construction Impacts

A tracked vehicle was used to transport a survey crew to delineate the midpoint of the revetment and collect soil core samples. The vehicle traversed spoil upland, mangrove swamp and high salt marsh. The wetland area covered by the vehicle was within the footprint of the proposed revetment. No permanent effects from the tracks were noted in the upland areas. Mangroves and salt marsh vegetation within the track path had not recovered two months following the survey. Some fiddler crab burrows were noted in the track path, though they were less than in the surrounding, non-impacted wetland. The area within the footprint would have to be cleared of all vegetation, creating a potential erosion condition into the old riverbed.

Construction and Post-construction Impacts

The first section of this alignment, a landward extension of the north jetty, would impact approximately 2.85 acres and traverse a portion of the existing sand barrier as well as some backdune habitat. The few plants which colonized the sand barrier were found adjacent to the backdunes and marsh. Animal use of this sand deposit is likely to be transitory rather than permanent. The permanent loss of the backdune habitat within this section will not be significant since the adjacent Lighthouse Point County Park consists primarily of this type of habitat.

The second section would directly impact a total of approximately 4.27 acres, including between two and three acres of tidal mud flat, low and high salt marsh, and mangrove swamp. Impacts to tidal mud flats would be temporary, since sedimentation and backfill would be expected to cover at least that portion of the revetment where the impacts occur below mean low water. In-kind mitigation would be required for the loss of the vegetated wetlands. This habitat is also within the range of the federally endangered, Atlantic salt marsh snake. Impacts to the additional 1.72

acres of open spoil field is not likely to be significant since this sparsely vegetated habitat appears to provide minimum wildlife function and value. The loss of the mixed herbaceous and woody transitional area also will not be significant because similar habitat on the peninsula still exists as well as more extensive habitat on the north side of the marina cove.

An indirect impact of the revetment is the possible mortality of some mangroves adjacent to the revetment due to the blocking of tidal flow between the old riverbed and the peninsula's wetlands. Depending upon rainfall and tidal influence, these areas may convert into a more herbaceous, high marsh, or become a salt barren. Any indirect loss of mangrove swamp must be added to the mitigation required for the direct impacts.

Few upland or transitional plants and terrestrial animals are likely to use the dry portions of the revetment. Estuarine organisms may use those sections of the revetment that are under regular and irregular tidal influence. In the event the remaining north spit marsh erodes and inlet breakthrough occurs, a portion of the entire southwest side of the revetment is predicted to be under littoral and sublittoral influence. The pattern of floral and faunal use of this area is then expected to be more like that of the north and south jettys.

Alignment Three

The third revetment alignment would extend 1600 feet from the north jetty towards the marina along open water, wetlands, and dense transitional uplands which form the northwest boundary of the marina cove. The revetment footprint would total about 4.86 acres and would only protect against ocean flanking of the north jetty.

Pre-construction Impacts

A paved road is adjacent and parallel to the alignment's footprint. This road and the lack of unpaved roads through the transitional area eliminates the need and potential habitat impacts from collecting soil core samples with a tracked vehicle. The area within the footprint would have to be cleared of all vegetation, creating a potential erosion condition into the marina cove.

Construction and Post-construction Impacts

This alignment would directly impact 4.86 acres, 2.85 acres of which traverse a portion of the existing sand barrier as well as some backdune habitat. These sites are the same as those described for section one of the revetment two alignment, with similar expected impacts. The remaining two acres are predominantly transitional uplands plus some tidal mud flat, salt marsh, and mangrove swamp. The impact to tidal mud flats would be temporary, since sedimentation and backfill would be expected to cover at least that portion of the revetment where the impact occurs below mean low water. In-kind mitigation would be required for the loss of the vegetated wetlands. The loss of the mostly woody transitional area would be significant since the only other habitat within the north spit area is on the spoil peninsula, where there are concerns about

erosion following a breakthrough produced by a catastrophic weather event.

Channel Dredging Alternative

This alternative consists of engineering a channel through the old riverbed to provide a more northern link between Ponce Inlet and the north channel of the Halifax River. The dredged channel would be approximately 2500 feet long, 100-200 feet wide, with an operating depth of 12 feet. Creation of a controlled channel would not protect the remaining north spit marsh or toe end of the north jetty from erosion, nor would it necessarily by itself protect the north jetty from flanking. The benefit would be to protect the spoil peninsula from erosion and maintain navigability by reducing shoaling potential at the mouth of the marina cove and the adjacent Halifax River. The dredging would likely require both land and water-based operations.

Pre-construction Impacts

Samplings of submerged sediment within the proposed dredge area by barge and small boat are expected to have only temporary effects on the benthos. Impacts similar to what occurred with revetment alignment two may be expected if soil sampling of the two to three acres of salt marsh and mangrove swamp within the channel footprint is done using a tracked vehicle.

Construction and Post-construction Impacts

The dredging in open water will remove the existing benthic community within the excavated area. Turbidity, especially within the old riverbed, will likely have a temporary, though possibly significant impact, on plankton and fish. Water-based operations may temporarily increase the risk of impacts to manatees and sea turtles. Land-based operations will remove some terrestrial plants and temporarily displace or kill some animals, possibly including the Atlantic salt marsh snake. Up to three acres of mixed salt marsh, mangrove swamp, and sand beach will be lost due to their location within the footprint of the channel. In-kind mitigation would be required for the loss of the vegetated wetlands. Dredging would generate approximately one million cubic yards of spoil. Beach-quality material may be used in re-nourishment projects, subject to further review by state and federal agencies. Other spoil should be deposited within permitted and active disposal sites to minimize potential impacts to fish and wildlife resources. Permitted but inactive sites and new sites without wetlands under consideration for disposal should first be assessed for occurrence of and potential impacts to federally-listed species. New potential sites with possible wetland impacts would first require a review of all fish and wildlife resources for possible impacts.

Some recolonization of dredged areas within the vicinity of the inlet and Halifax River should occur, and produce a benthic structure similar to the existing community. Significant changes in depth, current, salinity, and bottom sediments are expected within the old riverbed following dredging. These changes are expected to favor a biotic community which will more closely

resemble that occurring within the inlet and Halifax River. If this alternative produces greatly reduced water velocities on the flood tide in the vicinity of the spoil disposal peninsula, some accretion and low and high marsh formation may occur on the peninsula's southwest shore. If landward water velocities are not significantly diminished over current conditions, some erosion, possibly significant, may occur along the same shoreline. This would likely have short-term impacts on the open water and benthic communities.

Alternatives and Mitigation Recommendations

Alternatives Analysis

Table lists the navigation improvement alternatives with a subjective ranking based on the impacts and benefits, both likely and projected, to fish and wildlife resources. Rankings are given for alternatives alone, without mitigation, and combined with the south jetty extension alternative and mitigation. The no action alternative is included for comparative purposes only. The table indicates that the combinations of south jetty extension with north jetty repair and scour apron extension, and the second revetment alignment, offer the best opportunities to minimize project impacts to and/or enhance conditions for fish and wildlife resources.

Mitigation

South Jetty Extension

Habitat impacts for which mitigation is recommended include high salt marsh and mangrove wetlands and coastal dunes. Avoidance of direct impact to the wetlands is recommended for the toe-end portion of the south jetty discussed previously as under consideration as a source of jetty rock. Primary mitigation would include maintaining a buffer zone from 25 to 50 feet between the excavation and the delineated wetland border. All equipment and storage of material should remain outside this border and within the remaining jetty footprint and the adjacent sand road. Depressions created by the excavations and other small dunes impacted by this operation must at least be restored to the original size, shape, and orientation, using similar surface material. The preferred route for transport of the rock and other equipment is through the nearest beach road access approximately 1.5 miles south of the south jetty. In the event this beach access is not wide enough for passage of trucks and heavy equipment, passage through fore and back dunes may be considered. Should this option become necessary, the dune opening must be no longer or wider than is necessary for the most direct and single lane route of travel to the south jetty beach. Upon completion of the project, the backdunes will be restored to their pre-existing size, shape, and orientation using the original dune material. Revegetation may occur naturally from the adjacent dunes, but planting may be necessary. Fore dune recovery may be aided by reconstructing the back slope of the fore dune and using snow fences to capture aeolian drift for a more natural buildup of its front edge. Revegetation is expected to occur naturally from adjacent fore dunes.

North Jetty Repair and Scour Apron Extension

No mitigation for wetlands or is anticipated for this alternative since a water-based operation is the the only reasonable approach to accomplishing this work.

Revetment Alignment Number Two

Impacts requiring mitigation include loss of between two and tree acres of vegetated wetlands within and at the edge of the spoil disposal peninsula. The recommended mitigation plan is to create suitable habitat from the adjacent mangrove swamp by scraping down the upland portions of the peninsula north and east of the revetment to an elevation equal to or no more than two inches below the adjacent swamp elevation, and planting mangroves and transitional wetland species. The specific upland areas considered for this mitigation work include the herbaceous field and the western upland area at the tip of the peninsula.

For salt marsh and additional mangrove swamp mitigation, the recommended plan is to use some of the spoil remaining from the mangrove mitigation plan to create wetlands at the eastern end of the marina cove. Enough spoil would be deposited over the tidal flat and open water to bring that area up to the elevation required to promote and support natural growth of low salt marsh vegetation. This area also could be artificially planted, if necessary.



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Southeast Regional Office
9450 Koger Boulevard
St. Petersburg, Florida 33702

October 29, 1992

Colonel Terrence C. Salt
District Engineer, Jacksonville District
Department of the Army, Corps of Engineers
P.O. Box 4970
Jacksonville, FL 32232-0019

Dear Colonel Salt:

This is in response to your request, dated September 29, 1992, for comments regarding proposed improvements at Ponce de Leon Inlet, Volusia County, Florida.

A member of our staff visited the site on October 28, 1992. Based upon the information provided for the five alternatives under consideration the NMFS recommends alternative (c). This alternative, rebuilding damaged portions of the north jetty, would have minimal impacts upon marine and anadromous fishery resources for which we are responsible.

If we can be of further assistance, please contact Mr. David N. Dale of our Panama City Branch Office at 904/234-5061.

Sincerely,

✓
Andreas Mager, Jr.
Assistant Regional Director
Habitat Conservation Division

cc: F/SE02



APPENDIX D

BENEFITS

**Navigation Benefit Analyses
for
Ponce DeLeon Inlet, Florida**

Benefit analyses for Ponce DeLeon Inlet have undergone considerable revision since the inception of detailed feasibility studies in response to efforts to achieve justification based on commercial use in addition to evolution and refinement of engineering assumptions derived from the ongoing process of detailed studies. Engineering efforts have included basic engineering assessment(s) combined with considerable efforts for both physical and numerical modeling of physical inlet processes. In turn, evolving or resulting engineering assumptions concerning expectations for future channel conditions have had profound influence on refinement or determination of economic assumptions and related assessment of economic benefits. Generally, the overall process of project feature assessment has undergone four phases:

- Ia. Reconnaissance-level studies; limited to placement of a seaward extension of the south jetty (approximately 1,000 feet in length).
- Ib. The Initial phase of detailed studies which resulted in the determination that a seaward extension of the south jetty (approximately 1,000 feet in length) combined with placement of a landward extension of the north jetty (of approximately 800 to 900 feet) in turn connecting to a revetment extending generally further landward along the northern periphery of the interior of the inlet (for a distance of approximately 1,500 to 1,600 feet).
- II. The second phase of detailed studies which involved placement of north and south jetty extensions, the interior inlet revetment, and waterway improvements (notably channel deepening) in addition to placement of commercial fishing park facilities in an effort to strengthen justification through intensified commercial use of the inlet.
- III. The third and present phase of detailed studies limits efforts for economic justification to only seaward extension of the south jetty (approximately 1,000 feet in length) with a refined alignment derived from modeling studies¹.

¹ This revision to plan assessment is based on the determination that the north jetty extension and connecting revetment would be constructed in the future when required under requirements for operation and maintenance (O&M) of the existing Federally-sponsored project (and would therefor constitute sunk costs or costs common to both with and without-improvement conditions). In addition, requirements specific to placement of commercial fishing facilities also would not be implemented under this plan as it was ultimately decided the placement and operation of such facilities was unacceptable to the local constituency, and analyses revealed placement of such facilities with locally-mandated restrictions would not sufficiently

The remainder of the economic appendix is written to describe the general assumptions and related economic benefits according to the three latter phases described for detailed studies. Reconnaissance-level studies (phase Ia preceding; completed in January of 1993) are described in a separate document prepared before initiation of detailed studies which are currently in-process.

Description of Economic Analyses as Completed for Economic Justification of the South Jetty Extension, North Jetty Extension, Revetment, and Placement of Commercial Fishing Park Facilities (phases Ib and II preceding; completed in January of 1997; detailed study phases 1 and 2)

Proposed waterway improvements to Ponce DeLeon Inlet involve two measures. These include extending the south jetty approximately 1,000 feet in an alignment parallel to the existing north jetty combined with provision of 1,540 feet of revetment extending landward from the existing north jetty. The purpose of the revetment is to armour and stabilize the north side of the inlet shore bordering the section of the inlet leading to the Halifax River. It is anticipated these improvements will increase stability of the inlet system with a resulting shift of the present entrance channel away from the north jetty, and cessation or control of erosion within interior reaches of the inlet further northward than the alignment of the revetment.

Analyses for proposed improvements are based on the general assumption that proposed improvements will allow provision of unrestricted access to a clear or unoccluded waterway in accordance with design specifications for depth and width in the entrance channel, inlet throat, and tributary access or waterways leading to the Atlantic Intracoastal Waterway (AIWW) excepting uncontrollable restrictions imposed due to inclement weather and other unique or similar conditions. It should be noted that while economic analyses as described herein generally follow or adhere to the techniques and categories for benefits analyzed in reconnaissance studies, assumptions for future with-project and without-project conditions as applied for economic analyses have been revised considerably since release of reconnaissance findings in the latter part of 1993 (reference reconnaissance report for navigation improvements to Ponce de Leon Inlet dated January 1993).

Revisions to assumptions concerning future waterway

strengthen economic justification to offset total considered improvement costs with commercial benefits.

conditions are primarily as a result of additional information and data derived from physical and numerical modeling undertaken in 1995 and 1996 for detailed engineering and economic analysis of the inlet system. Consequently, a basic description of current or revised assumptions and primary differences from reconnaissance studies are provided in succeeding text.

Reconnaissance studies released in January of 1993 relied significantly on benefits derived from prevention of a catastrophic breakthrough or washout of the spit integral to the north shoreline extending from along the northern periphery of the inlet throat to the southern reaches of the branch waterway known as the Halifax River, which in turn ultimately leads to reaches of the Atlantic Intracoastal Waterway (AIWW) extending north of the subject inlet. It was estimated that such a breakthrough would be induced by a severe climatic event such as a hurricane or storm (i.e., level of occurrence approximately equal to a ten-year event), and that the resulting dispersal of sediment within the general physical confines of the inlet system would result in waterway conditions which by historical precedent, were found to be unnavigable for many commercial vessels which routinely use the inlet. The second category or source of project economic benefits were derived from estimated efficiencies in maintenance for the inlet system, particularly prevention or minimization of damages to the existing or without-project jetty system expected with migration of the channel northward which was anticipated would scour and eventually undermine the foundation material of the jetty itself.

As a consequence of the assumptions and work efforts within the time and scope of reconnaissance-level efforts the structure of average annual equivalent (AAEQ) economic benefits for justification of improvements was as follows:

I. Vessel Operations

- Avoidance of Lost Commercial Operating Income During Catastrophic Breakthrough (of the Spit) --> \$49,200
- Commercial Vessel Fuel Savings with Avoidance of Catastrophic Breakthrough Condition(s) --> \$29,500
- Reductions in Physical Damages to Commercial Vessels Associated with Catastrophic Breakthrough and Expected Long-Term Without-Improvement Conditions to Commercial Vessels --> \$89,000
- Reductions in Physical Damages to Recreational Craft Associated with Catastrophic Breakthrough and Expected Long-Term Without-Improvement Conditions to Commercial Vessels --> \$356,000

II. Project Maintenance and Operations (O&M)

- Reductions in Repair or Maintenance to the North Jetty --> \$271,000
- Reductions or Elimination of Project\Waterway Repair

Costs Associated with Catastrophic Breakthrough of the Spit --> \$357,000

As a result of detailed engineering studies coupled with physical and numerical modeling efforts, it has been determined that the best course for long-term management for operation and maintenance (O&M) of the inlet system with and without improvements would be to let the north spit area erode slowly over time (excluding a catastrophic event) as the branch waterway leading northward to the AIWW migrates northward until the shoreline is generally aligned parallel or coincident with the jetty extension and proposed revetment system. As long as a catastrophic event does not occur and cause significant dispersal of sediment within the inlet system between the base year of project economic life (currently 2001) and the year projected for required placement of the extension and revetment (currently 2002), current findings from modeling efforts indicate there will probably be little or no significant difficulty for navigability. In addition, this regime for inlet management also is complementary to current policies and decision criteria to take advantage of natural depths wherever advantageous as opposed to the rigid maintenance of a fixed waterway alignment at prohibitive costs. Given the relatively short period of time between the project base year and the year for placement of the jetty extension under without-project conditions, the propensity for benefits associated with a catastrophic breach have been virtually eliminated and no longer render a significant benefit for project justification². Therefore benefit analyses have been revised to reflect the propensity(ies) for damage and realization of efficiencies associated with project implementation excluding considerations for a breach of the north spit.

In general, economic analysis of proposed improvements involved two basic components for derivation of project benefits. These included:

- a.) Potential cost efficiencies or savings for both commercial and recreational vessel usage of the inlet and;
- b.) Savings in maintenance costs resulting from an analysis of historical and foreseeable repairs to the existing jetty system, and reductions in maintenance costs for removal of sediment or shoaling expected with a

² If a catastrophic breach of the spit area were to occur before its gradual erosion projected in 2001 to 2002, then such costs and efforts to clear or correct the waterway would be incurred prior to the beginning of project economic life and would be considered either common to both with and without-improvement conditions (i.e., effectively sunk) and/or would be accommodated under applicable measures for operation and maintenance (O&M).

relatively less stable inlet expected under without-project conditions.

The content of this section of the report addresses efforts to determine project economic benefits for vessel operations. Estimates for maintenance efficiencies from proposed improvements to existing navigation works are described elsewhere either in technical appendices or the main section of the comprehensive project report.

Cost efficiencies for commercial vessel operations entailed analysis of probable reductions in operations costs expected with proposed improvements and associated betterments in waterway conditions for vessel transit. Related efficiencies for commercial vessel operations include:

- a.) reduction in expenses for vessel maintenance or physical damages (i.e., due to groundings, etc.),
- b.) reductions in waterborne and landside transportation costs for commercial operations established or realigned under with-project conditions.

Analysis of Vessel Usage

Interviews were conducted with commercial fishermen and charter vessel operators to assess the nature of commercial operations and related costs associated with waterborne activities of the inlet. Interviews were also conducted with boatyard and vessel repair facility operators in the study region to assemble information on costs for maintenance or repairs which were deemed to be a result of unstable conditions within the inlet. Considerable assistance in gathering information on commercial vessel activities was also provided by the local project sponsor (the municipal government of Volusia County).

Information gathered during the course of interviews, review of available information for vessel registration, and inquiries by local government indicates that the existing commercial fleet for Ponce DeLeon Inlet consists of approximately 80 to 85 vessels that are either based in the area of the inlet or use the inlet on a seasonal or transient basis. Of the total of approximately 85 to 90 vessels identified, a total of 59 vessels have been identified as home port vessels and 24 to 27 were determined to be transient commercial harvest and charter fishing vessels which use the inlet consistently, but on a seasonal or transient basis from year to year. Of the homeport vessels, approximately 37 percent are commercial fishing boats, 58 percent are charter fishing operations, and the remainder, approximately 5 percent, are commercial passenger vessels or "head boats" employed for

party sportfishing or sightseeing excursions, or diving instruction and excursions. The 59 home port vessels identified were distributed between marinas, commercial fish or seafood processors situated along regional waterways, and boat yards located both north and south of the Inlet.

Historical and existing conditions of Ponce DeLeon Inlet have imposed considerable expenses for maintenance or repair of vessel damages. This has been attributable to physical migration of the channel system within the inlet and deposition of sediment in selected areas of the waterway system which sometimes precludes unencumbered passage by various vessels. Under current assumptions for without-project conditions it is anticipated that migration of waterways within the inlet system will continue with seasonal variation and that vessel damages will be incurred during such periods when channel location is relatively unstable.

Based on information assembled from interviews with vessel operators and available information for assessment of future channel conditions, it is estimated that the most significant period for such conditions will be in the late fall and winter of each year. Based on previous experience combined with review of U.S. Coast Guard (USCG) records for recreational vessel groundings, it is anticipated that difficulties with clearance for navigation will persist in areas between the north and south jetty, the throat of the inlet and tributary waterways, notably the Halifax River to the north and to a lesser extent, access via the Indian River to the south during the specified period of the year. Data gathered from various vessel facilities in the inlet area reveals that the most common repairs undertaken are refurbishment or replacement of propellers and shafts, with some repairs required for components of steering gear or fixed hull fittings.

Description of Commercial Benefits by Vessel Use

Investigations completed for detailed studies reveals that benefits will primarily be derived for established charter vessel operations and commercial fishing vessels expected to realign or establish operations at Ponce DeLeon inlet as a consequence of improvements and possible or proposed establishment of a commercial fishing park. Establishment of the proposed commercial fishing park is a consequence of efforts to increase or intensify commercial usage of the inlet and derive sufficient commercial benefits to (ideally) offset applicable project costs. Alternatively, with regard to existing vessel operations inquiries with local vessel operators reveals most commercial fishing vessels (such those employed for long-line fishing operations) would incur little or no difficulty due to familiarity with the inlet and considerable flexibility regarding scheduling of departure and arrival via the inlet system. Given

such findings, potential benefits for such vessels were not investigated given the expected magnitude of such benefits (i.e., minimal) relative to time and budgetary constraints for studies.

Commercial Charter Operations

Generally, one of the first requirements to assess the value of commercial vessel operations or marginal changes thereto for project analysis is to assemble or tabulate costs of operations and associated income. Presented in **Table D-1a** is a summary for annual costs, revenues and income for the aggregate charter vessel configuration applied for analysis. Costs as contained in Table D-1a were assembled via interviews with several vessel owners or operators based in the study area in addition to the application of data derived from past experience with other studies where subject data was not readily available for Ponce DeLeon Inlet. As portrayed, the average commercial charter vessel is approximately 43 feet in length overall with average annual revenues and net operating income of approximately \$155,000 and \$34,000 respectively³. From the cost and revenue structure portrayed in Table D-1a variable operating costs and returns to capital and labor per unit of time or occurrence employed can be measured to assess the benefits of reductions in time or costs of operation.

Investigations reveal that most or nearly all charter vessels experience some difficulty with present or without-project conditions in terms of minor groundings and excessive maintenance due to suspended sediments. Typically such costs involve bent propellers or minor damages to hull or control surfaces resulting from occasional contact with bottom areas which are sometimes less than ideally predictable due to migratory conditions of the channel bed. Other forms of damage or excessive maintenance costs include replacement of impellers and similar mechanisms due to significant sediment transport. While such damages are often minor enough to allow postponement or deferral of repairs, vessel downtime and repair requirements resulting in lost charters often present typical or average incidents and related repair costs when the vessel inventory is viewed as a whole. In addition to direct costs of repairs and lost business, additional costs are incurred as a result of labor time required to secure repairs. Values of marginal labor time or returns to labor are based on the per-unit-of-time returns derived from income and revenue summary (Table D-1a) adjusted for opportunity costs of time assessed at approximately one-third the

³ It should be noted that some operators are part-time business participants and may earn less while full-time operators typically earn considerably more.

pre-tax wage.

Examination of costs per occurrence per vessel per year reveal costs average approximately \$2,800 per year, and as stated previously, is derived from repair charges, loss of revenue or earnings, and the value of time or returns to labor. It should be noted that cost estimates reflect the occurrence almost every year of very minor costs combined with more significant costs or damages incidents which may occur once over a period of years. In addition, occasionally a charter vessel also incurs a significant or severe grounding incident which results in greater repair costs and greater downtime and loss of income⁴. Historically, available information indicates such occurrences number less than one per year on average over the period of time for available historical information (obtained from both local users and the U.S. Coast Guard).

Combined with damages, it is also estimated that many vessels lose between one and two charters per year due to conditions of the inlet when weather would still allow deployment at the insistence of clientele either for fishing or sightseeing. Review of Table D-1b reveals that the average annual equivalent (AAEQ) value of such costs that it is believed can be eliminated or reduced with proposed improvements totals a commercial vessel operations benefit of approximately \$259,000. The number of vessels applied for computations is based on the known homeport fleet combined with full-time equivalent (FTE) conversion of seasonal or transient vessels, which results in an applied base of 49 vessels for common or frequent damages and excessive maintenance, and lost returns from canceled or lost charters⁵.

A second category of commercial benefit uniquely attributable to inlet stabilization is the reduction in repair and personnel costs for open water trials for a local vessel manufacturer. Due to the changing or migratory conditions of channel bed areas in the inlet, the manufacturer must typically place an extra technician onboard to advise clientele unfamiliar with the inlet where and when (particularly on the south side of the inlet throat) a given vessel can safely pass. Nonetheless, it is estimated that 3 to 5 occurrences of vessel grounding (and related damages and downtime) occur per year resulting in

⁴ Care must be taken to avoid double counting of potential project benefits when more than one category of benefit is being assessed for a particular event or circumstance. With regard to quantification of damages, even though labor time is alternatively use for repairs or efforts to return a given vessel to service, the value for lost income already includes allowances for opportunity costs of time and marginal expenses for vessel operations that would otherwise have taken place (without subject damages or downtime), therefore the estimate of damage cost is a net adjustment to base income with further cost adjustment for associated time and expense of repairs.

⁵ Full-time equivalent (FTE) conversion of costs for aggregated analysis of the vessel inventory is based on employment of approximately 1,900 hours per year over a period of approximately 160 to nearly 220 days per year depending upon the vessel operator or nature of individual operations.

excessive direct costs and costs for value of time to company technicians and clientele. **Table 2** presents a summary or overview of costs based on grounding or damage occurrences which involve cost of retrieval of the vessel and passengers, direct costs of repairs, redeployment for completion of trials, and value of labor time for downtime (less adjustment for opportunity costs)⁶. Totaling such costs for reductions in escort personnel and damage occurrences which can be eliminated with improvements (i.e., 3 to 3.5 out of an average of 4.5 incidents per year) renders an average annual equivalent (AAEQ) value of \$32,000 per year.

Placement of Proposed Commercial Fishing Park Facilities

Investigations undertaken during the course of the initial draft report for Ponce DeLeon Inlet reveal that many commercial vessel operators would relocate or seasonally call at Ponce DeLeon inlet if sufficient support facilities were available, notably dockage, availability of provisions, and access to a seafood wholesaler in a singular location. With the provision of a commercial fishing park in the proximity of Ponce DeLeon Inlet, it was learned that various business entities were interested in establishing seafood processing facilities, notably for shrimp and shellfish (notably crab and/or scallops). Tentatively, the most promising of these activities is the handling of rock shrimp and golden crab. Interviews with affiliated interests who operate supporting commercial vessels indicate waterway improvements and landside facilities may render efficiencies that could be derived from reduced open water transit time for some deployments in the northern reaches of the rock shrimp fishery while also helping to support the possible opening of a new harvest area for golden crab in the northern zone of the overall golden crab fishery.

As with commercial charter vessels, information on costs and revenues was compiled via interviews for typical vessel configurations expected to harvest rock shrimp and/or golden crab in the foreseeable future. These relationships were used to assemble aggregate vessel operational characteristics from which in turn marginal costs or benefits based on reduced variable costs or value of labor time were derived⁷.

⁶ Additional detail is not provided at the request of the vessel manufacturer as such information is considered proprietary or confidential in nature.

⁷ Currently, few rock shrimp vessels consistently call at commercial facilities located in the vicinity of Ponce DeLeon Inlet but available information indicates that a total regional vessel inventory of approximately forty (40) to forty-five (45) regional vessels which harvest rock shrimp either on a part-time basis or as a primary catch would benefit from availability of a port of call at the location tentatively proposed for seafood processing facilities. Of these, it is estimated that approximately one third would make one to two calls per year while approximately one-half to two thirds of the remaining vessels would

Table series D-3a through D-3c presents costs and revenues for rock shrimp transportation operations. Summary relationships for vessel operation (operating costs and revenues) are listed in Table D-3a followed by Table D-3b which provides the estimated number of vessel trips or transits (and associated changes in variable costs for vessel assets and labor time) which could be efficiently diverted each year or season with establishment of commercial fishing park facilities and relative time to\from harvest grounds versus alternative facilities⁸. Table D-3c presents changes for landside transportation and distribution of whole-weight and processed product based on location of seafood processing facilities proposed for the establishment of the commercial fishing park. As revealed by Table D-3b, reductions in open water transit costs with facilities at Ponce DeLeon Inlet total approximately \$30,490 per year, while cost efficiencies for landside transport of landings total approximately \$128,230 as listed in Table D-3d. It should be noted that Table D-3d provides efficiencies (due to fishing park location versus alternative processing sites) for transport of catch from alternative docks in mid or southern Florida to fulfill the balance of required processing facility throughput (totaling a minimum of 1,375,000 pounds; whole weight) which cannot be achieved with the estimated number of cost-effective diversions of vessel transits (and average landings per vessel trip). Also presented in Table D-3c is the estimated cost efficiency for distribution of processed product to distributors for furthering to buyers for end-use or consumption throughout the Southeastern United States from a processing facility located north of existing facilities presently located at Port Canaveral or further south such as Miami or Fort Pierce⁹. Combining estimated values for estimated transport cost reductions renders a total benefit for rock shrimp operations of \$158,720 per year.

Undertaking the same basic analysis for golden crab as for rock shrimp results in the cost and revenue relationships for golden crab operations as portrayed in Table Series D-4a through D-4d. It should be noted that little information was available regarding a precise vessel configuration for harvest of golden

call at the realigned location once per year or season. Analyses according to aggregate classes are described later in this economic appendix. It should be noted that class delineations were not disaggregated or analyzed specifically according to draft or length for drafts less than 10 to 10.7 feet as plan formulation was not based on known or predictable changes in reference depths compared to without-project conditions, but measures for stabilization of the existing project. Based on estimates of the regional vessel inventory, it is estimated that commercial facilities will need to be sized to accommodate a minimum of 27 to 28 vessels but no more than approximately 35 vessels at one time (depending on size, etc.) including support facilities for Golden or Red Crab and vessel repair facilities, both of which are later discussed in this appendix.

⁸ Associated costs for proposed fishing park facilities are described in the main section of the overall project report.

⁹ Benefits include the comparative costs of landside transport necessary for whole versus processed weight of shrimp based on establishment of proposed facilities.

crab and supporting operations that would be based at Ponce DeLeon Inlet¹⁰. Existing vessels in the fishery employed in south Florida were not necessarily considered representative as the emerging northern zone fishery is believed to be a relatively large-vessel fishery due to rigging and equipment required to efficiently work grounds which are at greater depths and subject to more significant currents (in the northern zone). Therefore, the basic configuration for the 92.4-foot rock shrimp vessel was employed for analysis with adjustments for trip duration, catch, and revenue per pound. Based on described analytical efforts and subject to compliance with applicable fishery management plans, benefits and costs described by Table series D-4a through D-4c total approximately \$116,130 per year for waterborne and landside transportation cost efficiencies.

Provision of Commercial Marine Railway or Minor Maintenance Facility(ies)

As stated previously, investigations undertaken during the course of the initial draft report for Ponce DeLeon Inlet reveal that many commercial vessel operators would relocate or seasonally call at Ponce DeLeon inlet if sufficient support facilities were available, notably dockage, availability of provisions, and access to a seafood wholesaler in a singular location. An integral part of such facilities is the provision of a marine railway or minor vessel maintenance facility to serve commercial vessels which would serve seafood processing operations of the proposed park, or other commercial vessels in the local area. The advantage of such a facility is that many commercial operators indicated a need to often travel a considerable distance to find service facilities due to price, unique requirements, or lack of yard or facility capacity at peak periods during the year. Typically, the use of more distant

¹⁰ Available information for the golden crab fishery indicates that existing operators primarily harvest resource from the southern and to some extent the middle zones, with little or no harvest operations in the northern zone located to the west and north of Ponce DeLeon Inlet. Review of fishery management plans for Golden Crab indicate that yields from the northern reaches of the middle and northern zones could probably support two to five vessels depending on productivity and intensity of employment, and capitalization. Due to uncertainty of some parameters for related fishing operations, benefit analyses are based on employment of three vessels generally configured in size and respective costs for vessels of sufficient class to harvest traps from the deeper waters of the northern zone. The applied allocation of vessels based or homeported at proposed facilities for crab harvests includes one vessel approximately 60 to 65 feet in length overall with two other vessels 90 to 95 feet in length overall (LOA). Of these, it is estimated each vessel derived logistical efficiencies for 14 to 17 deployments per year with a efficiencies for a minor number of potential transient and/or part-time participants. Alternatives for land-based facilities include locations in the Miami area, Marathon Key (Florida Keys), and Port Canaveral to the south, and facilities in Jacksonville (Florida) or further northward. Analyses according to aggregate vessel classes are described later in this economic appendix. It should be noted that class delineations were not disaggregated or analyzed specifically according to draft or length for drafts less than 10 to 10.7 feet as plan formulation was not based on known or predictable changes in reference depths compared to without-project conditions, but measures for stabilization of the existing project. Based on estimates of the regional vessel inventory, it is estimated that commercial facilities will need to be sized to accommodate a minimum of 27 to 28 vessels but no more than approximately 35 vessels (depending on size) at one time including support facilities for Rock shrimp and vessel repair facilities, both of which are discussed elsewhere in this appendix.

repair facilities requires the dispatch and retrieval of the vessel, and transport of the crew to and from the vessel via landside transport. The operation of both the vessel and landside vehicle impose a direct cost of securing vessel repairs while time required of labor imposes a value of time cost either for downtime from productive activities to support the fishery or other activities.

Table D-5 summarizes estimated direct costs for vessel and vehicle operation for marginal transit, and time saved in addition to value of time saved for labor (adjusted for opportunity costs). Unit costs as presented were derived from weighted cost and revenue relationships derived from operation of vessels employed for harvest of rock shrimp and golden crab previously described. A composite was used for vessels projected to serve or call at the commercial fishing park given limited availability of information regarding what vessels would actually use the maintenance facility. As stated previously, the cost of repairs for commercial vessels involves both labor time and direct costs for operations. Such costs as described in Table D-5 include dispatch or transit of the vessel to the repair facility in addition to costs of landside transport to retrieve the crew or personnel after arrival at a given service facility. Upon completion of repairs, costs for landside transport and labor time must also be expended to retrieve the vessel and return it to productive service.

Based on a general assumption that costs of repairs would be comparable to alternative facilities combined with expected operation ten months of the year (at three vessels per month) a total of thirty vessels would be serviced per year resulting in a cost efficiency for minimized or marginal travel of approximately \$1,570 per vessel or \$47,100 per year. Given an assumption of no increase in growth over the planning horizon, the stated annual value equates to an average annual equivalent (AAEQ) value for project analyses¹¹.

Recreational Vessel Benefits

The analysis of recreational vessel benefits for Ponce DeLeon Inlet is based on general recreation analysis procedures authorized for USACE-sponsored studies of small harbor projects.

¹¹ The assumption of no growth for occurrences is based on the assumption of no growth for the regional commercial fishing fleet associated with the assumption of no significant increase in landings or exploitation of commercial marine resources related to intensity of employment. Distances for vessel and landside vehicle transit are based primarily on usage of alternative facilities in the area of Port Everglades to the south, or Jacksonville (Florida), Savannah (Georgia), and St. Augustine to the north with occasional use of facilities as distant as North and South Carolina depending on the timing of need for repairs and demand for facilities during respective fishing and tourist seasons. Associated costs for placement of repair facilities are covered in the main section or the overall project report.

Little information was readily available quantifying the frequency and nature or extent of use of the inlet by private recreational craft. cursory interviews were conducted with local marina operators and resulting information was combined with experience derived from other small inlet studies for Florida and available information for estimates of recreational craft based in the region to determine estimates of the nature or frequency of waterway use. Vessel operating characteristics of the inlet were generally assessed and related estimates of usership (based were applied to determine the value of recreational use based on variances in unit day values¹². In addition to analyses for application of unit day values, related estimates for frequency of operations were also applied to available information on vessel operating parameters to determine costs or expenses (i.e., such as damages) considered to be associated with inlet conditions and which could be eliminated or minimized with waterway improvements.

Particular to costs or expenses which could be minimized or eliminated, it was determined from interviews that most vessel damage costs or expenses attributable to unfavorable migratory conditions of the inlet encompassed three general categories. Subject categories include¹³:

- a.) Reductions in damages for severe or significant vessel groundings;
 - b.) Reductions in damages for vessel capsizings;
- and
- c.) Reductions in damages for common or unreported incidents (i.e., moderate or minimal damages)

The three aforementioned categories of vessel damages or costs primarily differ with magnitude of average costs and expected or relative frequency. In addition, estimates for frequency and location for severe vessel groundings and capsizings were obtained from data compiled for the Search and Rescue (SAR) reporting system maintained by the United States Coast Guard (USCG). Such events are considered severe or significant given that the Coast Guard is generally directed to respond to such incidents only when lives are in peril or at risk. Unreported incidents pertain to typical or common damages

¹² Source(s): Florida State Comprehensive Outdoor Recreation Plan (SCORP); 1994.

¹³ Benefits for groundings and capsizings are subject to change based on revised or more detailed information to be provided by the United States Coast Guard (USCG) regarding probable cause and location of historical vessel mishaps or incidents for which the USCG has responded or intervened.

attributable to dynamically changing conditions of the inlet which result in movement or unpredictability of the inlet channel system, and vessels in transit feeling the bottom or side slope of the channel. Such incidents are classed as unreported given that formal reporting of incidents is not undertaken by any formal entity (such as for severe groundings and capsizings by the USCG), and many resulting repairs are performed by either the vessel owner or small local marine repair facilities.

All three categories of vessel damages or costs include assessment of costs for vessel machinery or equipment, and repairs or maintenance for hull surfaces ranging from minimal (such as repitching and recupping a bent propeller) to catastrophic losses or severe vessel damages which occur infrequently. Repairs for damages to hull surfaces include structural repairs to hulls to repair breaches or cracked and punctured hull forms in addition to reglazing and painting of hull surfaces. Damages to machinery or equipment primarily entail damages to propulsion and steering gear equipment such as propellers, rudders, shafts and struts, lower units for outboards or stern drives, and other underfittings such as protective plates or shoes. Catastrophic damages, are generally related to severe groundings or vessel incidents which often require salvage efforts to recover the vessel and/or extensive repairs to both hull surfaces and structural members, and machinery¹⁴.

Information obtained from local marina owners and specialized marine repair vendors (such as for propeller repair or reconditioning) included estimates of vessel damages based largely on general familiarity with historical or past experience. Investigations with both representatives of marinas and vessel operators indicate that adverse or less than ideal conditions for Ponce DeLeon Inlet prevail generally throughout the year with the most notable adverse conditions occurring after severe weather or storm events and during the late fall or winter months spanning a time period of from four to five months, to as long six months. Applicable seasonal duration of conditions which impose operational limitations depends on the variability in prevailing weather conditions from day to day, and on the suitability of a given vessel for such conditions based on physical specifications (i.e., relative to maximum draft, length, freeboard, stability, etc.).

Damage valuations were assessed from general estimates according to recent record(s) or local knowledge as available,

¹⁴ Efforts to estimate catastrophic vessel damages proved difficult for Ponce DeLeon Inlet within the scope of studies as such occurrences are much less frequent than for typical or common damages as described, and are based on few instances in recent years. Similar to common damages for many craft, the imposition of catastrophic damages typically occurs to many vessel operators who are transient from outside the region and/or not intimately familiar with limitations of the waterway under adverse or sub-optimal conditions. However, based on available information, applied estimates of related damages were cursorily formulated based on general estimates of costs for severe groundings and near loss of vessels in recent years.

notably the past two to three years, with adjustment to current cost levels. Costs or expenses per occurrence include an assessment of both direct or explicit costs, and costs for the value of time saved with reduction or elimination of related damage incidents.

Costs for the value of time saved to the operator or vessel owner were derived from the avoidance of needing to expend labor time to secure assistance and/or facilitate repairs¹⁵. As a basis for values, general estimates of labor time potentially saved were assembled from cursory interviews combined with experience based on prior small harbor or inlet studies given limited availability of information for Ponce DeLeon Inlet¹⁶.

Based on experience with other small inlet studies, most common or typical damages require the expenditure of from as little as one or two to nearly twelve man-hours for most vessel owners for repairs performed by others (for pay), with a range of from less than one to three man-days (assuming eight man-hours per day) or more for significant repairs carried out by the owner or operator. Little information is available for Ponce DeLeon Inlet users concerning a precise estimate of employment of professional repair services (i.e., services for hire) versus repairs undertaken by vessel owners/operators themselves. cursory inquiries indicate that the majority of vessel owners in the region employ professional services for most, but not all, significant vessel service or repair requirements.

Costs or expenses *per occurrence* as reported for vessels damaged while transiting at Ponce DeLeon Inlet, for the purposes of analysis, are assumed to remain constant or invariable from year to year of project economic life. This assumption was based on limited availability or the absence of information concerning any detailed explicit relationship(s) between the incurrence of damages relative to intensity of waterway use needed for variable projection(s). *Growth* in the *frequency* of occurrence(s) was

¹⁵ Specified value per hour is derived from the estimates for recommended values for time as contained in Institute of Water Resources Report (IWR) 91-R-12 titled Value of Time saved for use in Corps Planning Studies: A Review of the Literature and Recommendations (October 1991). Values per unit of time derived from Table 2; page 23 respective to value of time saved for based on median income as averaged for occurrence and adjusted to projected price levels for calendar 1996. The average of values was selected given that detailed information was not available as to the true disposition of expended time and related opportunity costs (i.e., though time expended for repair for a recreation craft may generally constitute an expenditure for recreational activities, whether the time used actually constitutes marginal social or recreation as opposed to time away from income-earning activities such as work and earnings foregone could not be determined from information at the time of preparation). Therefore, combined with the general limited range of all values for time savings, aggregate values were applied for the purposes of studies.

¹⁶ The amount of time expended to facilitate vessel repairs ranges considerably depending upon the extent of work required and the willingness and skills of individuals to either perform repair work themselves or to diligently seek information and pricing before selection of a particular repair facility. As an example, some individuals may choose to use a preferred facility with which they have an established relationship and therefore may expend as little as one to two man-hours to secure and pay for vessel repair. At the other extreme, severe vessel damages may necessitate the pursuit of competitive bid estimates and significant time for discretion in selection of a repair facility and affiliated professional services.

estimated based on projections for saltwater fishing (by vessel) and saltwater vessel ramp use in the general region as contained in the *Florida State Comprehensive Outdoor Recreation Plan (SCORP)*¹⁷.

Based on the preceding general description, damages for severe or significant groundings of recreational vessels (as responded to by the USCG) which use Ponce DeLeon Inlet total an average for all vessels of approximately \$5,030 per occurrence per year based on values for direct costs and value of time totaling \$4,810 and \$220, respectively. Applying an average of approximately 17.1 vessel occurrences in the base period of projections, 1997 renders a total of approximately \$85,760 when adjusted for growth to the base year of project economic life, 2001. Average annual equivalent (AAEQ) tabulations for specified vessel class delineations in addition to overall average estimations are presented in **Table D-6a**, and total approximately \$111,640 given growth in vessel use derived from the SCORP, a fifty (50) project economic life, and annual interest or discount rate of 7 1/8 (.07125) percent.

While this number may appear relatively low compared to the total number of recreational vessel groundings as reported by the USCG, it should be noted USCG statistics were reviewed to exclude groundings or incidents attributable to causes which would in likelihood not be uniquely rectified or eliminated with stabilization of the inlet system. It should also be noted that interviews with users or operators of local marinas reveal that many individuals who reside in the area and frequently use the inlet are aware of the inlet's limitations due to seasonal conditions, and they employ such knowledge to, where possible, safely navigate the inlet. Hence, indications are that the majority of common or typical vessel damage costs are attributable to unfamiliarity with seasonal or changing conditions of the inlet stemming from infrequent use by some area vessel operators, and transient use by vessel operators from outside the study region.

The second category of project recreation benefits, reductions in direct costs and value of time expended for damages from vessel capsizings were also assessed in similar form to severe groundings based on a review of USCG statistics and interviews or available information concerning typical expenses or needed repairs for such occurrences. Correspondingly, examination of **Table D-6b** reveals an average occurrence of 4.5 incidents per year for 1997 at a total average cost of approximately \$8,780 for direct costs (\$8,030) and value of time (\$750). Average annual equivalent (AAEQ) benefits total approximately \$51,370 given the specified project economic life,

¹⁷ Source(s): Florida State Comprehensive Outdoor Recreation Plan (SCORP); 1994.

interest or discount rate, a project base year of 2001, and growth in inlet use as derived from the SCORP document.

The benefit category of reductions in damages and costs for unreported damage incidents is presented in **Table D-6c** and totals an average annual equivalent (AAEQ) value of approximately \$144,830. This value is based on estimates of occurrence and expenses derived from cursory interviews with local interests and operators of repair facilities and is derived from approximately 114 to 115 vessel occurrences per year at a total cost of \$980 per occurrence for 1997. Similar to estimates for groundings and capsizings, growth in occurrences were escalated by growth in recreational vessel use as derived from the SCORP document.

In addition to reductions in vessel operating costs, the remainder of recreational benefits are based on variances for unit\user day values (UDVs) assessed for waterway conditions unique to Ponce DeLeon Inlet¹⁸. Unit day values were assessed for Inlet conditions expected to prevail for recreational craft with and without implementation of proposed improvements. Any net increase or decrease in value per user day or occurrence associated with implementation of proposed improvements is deemed either a net benefit or cost, respectively. The derived unit day value differential ranged from approximately \$.75 to \$.83 per user-day or occurrence derived from current point monetary values authorized for studies during fiscal year (FY) 1997 and are presented in **Table D-6d**. Point estimates for general hunting and fishing were applied to the average number of vessel occupants or boaters estimated to transit or use waters of the inlet and the adjacent shoreline area. The average increase in unit\user day value was applied to vessel activity or use based on expectations of improved conditions expected with proposed stabilization measures. Based on general estimates of the frequency of use and average vessel occupancy as provided in Table D-6e combined with general prevalence or number of applicable vessels in the study area thought to be routinely employed for open water or near-shore activities, the estimated annual benefit for unit day values totals approximately \$107,530 for 1997 and is also provided in Table D-6e. Applying growth projections derived from the SCORP document in similar form to projections for damages previously described, renders average annual equivalent (AAEQ) values totaling \$158,330 in Table D-6e for the applied period of project economic life and interest or discount rate.

Combining all benefits as described for recreational vessel operations as described results in a summary total average annual equivalent (AAEQ) value of **\$466,170**. **Table D-6g** provides a

¹⁸ Unit day values assessed in accordance with engineering regulation (ER) 1105-2-100; section 6-113 and Economic Guidance Memorandum (EGM) 95-4 dated 18 January 1995; values for general fishing and hunting values.

summary listing of all recreational vessel benefits according to category and general vessel class.

Summary of Economic Benefits

Combining commercial and recreation benefits results in an estimate of total economic benefits for project justification. A summary of both commercial and recreation benefits as presented in **Table 7** provides average annual equivalent (AAEQ) values for benefits for proposed stabilization measures both with and without placement of commercial fishing park facilities totaling \$1,079,100 and \$757,150, respectively.

Summary Table for Average Annual Equivalent (AAE) Benefits by Aggregate Vessel Class
Estimated Economic Benefits for Reductions in Vessel Damages and Lost Charters for Commercial Charter Fishing Vessels

Year	Economic Life: 50 years	Applied Interest/Discount Rate: 7.125%	Period Coefficient	Projected Growth (%)	General Vessel Damages (Maintenance Avoided)			Charter Losses (Lost of Foreigners Avoided)			Severe Damages/Catastrophic Losses Avoided			Summary Total(s), All Benefit Categories			
					Direct Cost(s)	Value(s) by Year	Total Value(s)	Direct Cost(s)	Value(s) by Year	Total Value(s)	Direct Cost(s)	Value(s) by Year	Total Value(s)	Direct Cost(s)	Value(s) by Year	Total Value(s)	
2001	1.00000	13.65%	0	1.00000	\$131,900	\$25,619	\$157,608	\$157,610	\$37,310	\$7,156	\$1,282	\$3,438	\$8,440	\$163,094	\$40,266	\$203,360	\$203,360
2002	0.93349	2.14%	1	0.93349	\$134,610	\$26,165	\$160,775	\$159,270	\$35,980	\$7,309	\$1,309	\$3,618	\$8,050	\$166,579	\$41,126	\$207,705	\$193,890
2003	0.87140	2.07%	2	0.87140	\$137,802	\$26,707	\$164,510	\$156,310	\$36,901	\$7,460	\$1,337	\$3,707	\$8,079	\$170,029	\$41,978	\$212,007	\$184,740
2004	0.81344	2.01%	3	0.81344	\$140,368	\$27,244	\$167,613	\$153,340	\$37,820	\$7,610	\$1,363	\$3,804	\$8,149	\$173,447	\$42,822	\$216,269	\$175,920
2005	0.75934	1.95%	4	0.75934	\$143,110	\$27,776	\$170,887	\$150,760	\$38,663	\$7,759	\$1,390	\$3,900	\$8,249	\$176,835	\$43,658	\$220,493	\$167,430
2006	0.70984	1.90%	5	0.70984	\$145,830	\$28,304	\$174,135	\$148,330	\$39,489	\$7,906	\$1,416	\$3,993	\$8,398	\$180,106	\$44,488	\$224,594	\$159,260
2007	0.66189	1.85%	6	0.66189	\$148,530	\$28,828	\$177,358	\$146,380	\$40,320	\$8,053	\$1,443	\$4,085	\$8,495	\$183,532	\$45,312	\$228,844	\$151,420
2008	0.61768	1.81%	7	0.61768	\$151,212	\$29,349	\$180,560	\$144,590	\$41,162	\$8,199	\$1,469	\$4,178	\$8,600	\$186,845	\$46,130	\$232,975	\$143,900
2009	0.57860	1.76%	8	0.57860	\$153,877	\$29,866	\$183,743	\$143,000	\$41,995	\$8,346	\$1,495	\$4,267	\$8,707	\$190,139	\$46,943	\$237,082	\$136,700
2010	0.54325	1.72%	9	0.54325	\$156,528	\$30,381	\$186,909	\$141,600	\$42,820	\$8,496	\$1,520	\$4,354	\$8,811	\$193,414	\$47,752	\$241,166	\$129,810
2011	0.51245	1.69%	10	0.51245	\$159,167	\$30,893	\$190,063	\$140,290	\$43,653	\$8,641	\$1,546	\$4,443	\$8,917	\$196,675	\$48,557	\$245,232	\$123,220
2012	0.48603	1.65%	11	0.48603	\$161,795	\$31,403	\$193,198	\$138,920	\$44,489	\$8,792	\$1,571	\$4,531	\$9,024	\$199,922	\$49,359	\$249,281	\$116,920
2013	0.46373	1.62%	12	0.46373	\$164,414	\$31,911	\$196,326	\$137,650	\$45,320	\$8,934	\$1,597	\$4,619	\$9,131	\$203,159	\$50,158	\$253,317	\$110,910
2014	0.44571	1.59%	13	0.44571	\$167,027	\$32,418	\$199,445	\$136,380	\$46,151	\$9,077	\$1,622	\$4,707	\$9,236	\$206,388	\$50,955	\$257,342	\$105,160
2015	0.43153	1.56%	14	0.43153	\$169,634	\$32,924	\$202,559	\$135,210	\$46,982	\$9,219	\$1,648	\$4,795	\$9,344	\$209,610	\$51,750	\$261,360	\$99,720
2016	0.42051	1.54%	15	0.42051	\$172,239	\$33,430	\$205,668	\$134,080	\$47,813	\$9,361	\$1,673	\$4,883	\$9,451	\$212,827	\$52,545	\$265,372	\$94,510
2017	0.41247	1.51%	16	0.41247	\$174,841	\$33,935	\$208,776	\$132,950	\$48,644	\$9,479	\$1,698	\$4,971	\$9,559	\$216,043	\$53,338	\$269,381	\$89,560
2018	0.40635	1.49%	17	0.40635	\$177,443	\$34,440	\$211,883	\$131,820	\$49,475	\$9,600	\$1,723	\$5,059	\$9,667	\$219,258	\$54,132	\$273,391	\$84,850
2019	0.40204	1.47%	18	0.40204	\$180,047	\$34,945	\$214,992	\$130,690	\$50,306	\$9,721	\$1,749	\$5,147	\$9,775	\$222,476	\$54,927	\$277,402	\$80,370
2020	0.40000	1.45%	19	0.40000	\$182,653	\$35,451	\$218,105	\$129,560	\$51,137	\$9,842	\$1,774	\$5,235	\$9,883	\$225,697	\$55,722	\$281,418	\$76,110
2021	0.40000	1.43%	20	0.40000	\$185,265	\$35,956	\$221,223	\$128,430	\$51,970	\$9,957	\$1,799	\$5,322	\$9,991	\$228,923	\$56,518	\$285,441	\$72,060
2022	0.40000	1.41%	21	0.40000	\$187,881	\$36,462	\$224,343	\$127,300	\$52,801	\$10,072	\$1,825	\$5,409	\$10,099	\$232,157	\$57,317	\$289,474	\$68,220
2023	0.40000	1.40%	22	0.40000	\$190,500	\$36,967	\$227,461	\$126,170	\$53,632	\$10,186	\$1,850	\$5,496	\$10,217	\$235,399	\$58,111	\$292,510	\$64,570
2024	0.40000	1.38%	23	0.40000	\$193,120	\$37,472	\$230,580	\$125,040	\$54,463	\$10,291	\$1,876	\$5,583	\$10,337	\$238,641	\$58,902	\$295,543	\$61,110
2025	0.40000	1.37%	24	0.40000	\$195,741	\$37,977	\$233,700	\$123,910	\$55,294	\$10,396	\$1,901	\$5,670	\$10,458	\$241,883	\$59,694	\$300,573	\$57,820
2026	0.40000	1.36%	25	0.40000	\$198,362	\$38,482	\$236,820	\$122,780	\$56,125	\$10,500	\$1,926	\$5,757	\$10,579	\$245,127	\$60,486	\$305,613	\$54,710
2027	0.40000	1.34%	26	0.40000	\$201,000	\$38,987	\$240,000	\$121,650	\$56,956	\$10,604	\$1,951	\$5,844	\$10,700	\$248,370	\$61,279	\$310,649	\$51,600
2028	0.40000	1.32%	27	0.40000	\$203,640	\$39,492	\$243,180	\$120,520	\$57,787	\$10,708	\$1,976	\$5,931	\$10,821	\$251,611	\$62,072	\$315,683	\$48,490
2029	0.40000	1.31%	28	0.40000	\$206,280	\$40,000	\$246,360	\$119,390	\$58,618	\$10,811	\$1,999	\$6,018	\$10,942	\$254,852	\$62,865	\$320,717	\$45,380
2030	0.40000	1.30%	29	0.40000	\$208,920	\$40,505	\$249,540	\$118,260	\$59,449	\$10,914	\$2,024	\$6,105	\$11,063	\$258,093	\$63,658	\$325,751	\$42,270
2031	0.40000	1.30%	30	0.40000	\$211,560	\$41,010	\$252,720	\$117,130	\$60,280	\$11,017	\$2,049	\$6,191	\$11,184	\$261,334	\$64,451	\$330,785	\$39,160
2032	0.40000	1.29%	31	0.40000	\$214,200	\$41,515	\$255,900	\$116,000	\$61,111	\$11,120	\$2,074	\$6,278	\$11,305	\$264,575	\$65,244	\$335,819	\$36,050
2033	0.40000	1.28%	32	0.40000	\$216,840	\$42,020	\$259,080	\$114,870	\$61,942	\$11,225	\$2,099	\$6,365	\$11,426	\$267,816	\$66,037	\$340,853	\$32,940
2034	0.40000	1.26%	33	0.40000	\$219,480	\$42,525	\$262,260	\$113,740	\$62,773	\$11,329	\$2,124	\$6,452	\$11,547	\$271,057	\$66,828	\$345,885	\$29,830
2035	0.40000	1.27%	34	0.40000	\$222,120	\$43,030	\$265,440	\$112,610	\$63,604	\$11,432	\$2,149	\$6,539	\$11,668	\$274,298	\$67,619	\$350,917	\$26,720
2036	0.40000	1.27%	35	0.40000	\$224,760	\$43,535	\$268,620	\$111,480	\$64,435	\$11,535	\$2,174	\$6,626	\$11,789	\$277,539	\$68,410	\$355,951	\$23,610
2037	0.40000	1.26%	36	0.40000	\$227,400	\$44,040	\$271,800	\$110,350	\$65,266	\$11,638	\$2,199	\$6,713	\$11,910	\$280,780	\$69,201	\$360,984	\$20,500
2038	0.40000	1.26%	37	0.40000	\$230,040	\$44,545	\$274,980	\$109,220	\$66,097	\$11,741	\$2,224	\$6,799	\$12,031	\$284,021	\$70,000	\$366,016	\$17,390
2039	0.40000	1.25%	38	0.40000	\$232,680	\$45,050	\$278,160	\$108,090	\$66,928	\$11,844	\$2,249	\$6,886	\$12,152	\$287,262	\$70,791	\$371,043	\$14,280
2040	0.40000	1.25%	39	0.40000	\$235,320	\$45,555	\$281,340	\$106,960	\$67,759	\$11,947	\$2,274	\$6,973	\$12,273	\$290,503	\$71,582	\$376,075	\$11,170
2041	0.40000	1.24%	40	0.40000	\$237,960	\$46,060	\$284,520	\$105,830	\$68,590	\$12,050	\$2,299	\$7,059	\$12,394	\$293,744	\$72,373	\$381,116	\$8,060
2042	0.40000	1.24%	41	0.40000	\$240,600	\$46,565	\$287,700	\$104,700	\$69,421	\$12,153	\$2,324	\$7,146	\$12,515	\$296,985	\$73,164	\$386,149	\$4,950
2043	0.40000	1.23%	42	0.40000	\$243,240	\$47,070	\$290,880	\$103,570	\$70,252	\$12,256	\$2,349	\$7,232	\$12,636	\$300,226	\$73,955	\$391,181	\$1,840
2044	0.40000	1.23%	43	0.40000	\$245,880	\$47,575	\$294,060	\$102,440	\$71,083	\$12,357	\$2,374	\$7,319	\$12,757	\$303,467	\$74,746	\$396,213	\$70,070
2045	0.40000	1.22%	44	0.40000	\$248,520	\$48,080	\$297,240	\$101,310	\$71,914	\$12,458	\$2,399	\$7,406	\$12,878	\$306,708	\$75,537	\$401,245	\$59,160
2046	0.40000	1.22%	45	0.40000	\$251,160	\$48,585	\$300,420	\$100,180	\$72,745	\$12,559	\$2,424	\$7,493	\$12,999	\$309,949	\$76,328	\$406,277	\$48,250
2047	0.40000	1.22%	46	0.40000	\$253,800	\$49,090	\$303,600	\$99,050	\$73,576	\$12,660	\$2,449	\$7,580	\$13,120	\$313,190	\$77,119	\$411,309	\$37,340
2048	0.40000	1.22%	47	0.40000	\$256,440	\$49,595	\$306,780	\$97,920	\$74,407	\$12,761	\$2,474	\$7,667	\$13,241	\$316,431	\$77,910	\$416,342	\$26,430
2049	0.40000	1.22%	48	0.40000	\$259,080	\$50,100	\$309,960	\$96,790	\$75,238	\$12,862	\$2,499	\$7,754	\$13,362	\$319,672	\$78,701	\$421,375	\$15,520
2050	0.40000	1.21%	49	0.40000	\$261,720	\$50,605	\$313,140	\$95,660	\$76,069	\$12,963	\$2,524	\$7,841	\$13,483	\$322,913	\$79,492	\$426,407	\$4,610
2051	0.40000	1.21%	50	0.40000	\$264,360	\$51,110	\$316,320	\$94,530	\$76,900	\$13,064	\$2,549	\$7,928	\$13,604	\$326,154	\$80,283	\$431,437	\$1,500
2052	0.40000	1.21%	51	0.40000	\$267,000	\$51,615	\$319,500	\$93,400	\$77,731	\$13,165	\$2,574	\$8,015	\$13,725	\$329,395	\$81,074	\$436,469	\$3,390
2053	0.40000	1.21%	52	0.40000	\$269,640	\$52,120	\$322,680	\$92,270	\$78,562	\$13,266	\$2,599	\$8,102	\$13,846	\$332,636	\$81,865	\$441,501	\$2,280
2054	0.40000	1.21%	53	0.40000	\$272,280	\$52,625	\$325,860	\$91,140	\$79,393	\$13,367	\$2,624	\$8,189	\$13,967	\$335,877	\$82,656	\$446,533	\$1,170
2055	0.40000	1.21%	54	0.40000	\$274,920	\$53,130	\$329,040	\$90,010	\$80,224	\$13,468	\$2,649						

Table 2
Ponce DeLeon Inlet, Florida
*Estimated Benefits for Sea Trials Undertaken Via Ponce DeLeon Inlet
Reduced Labor and Damage Costs for Sea Trials **

	Without- Project	With- Project
Total Estimated Number of Vessel Deployments Per Year for Open Water Trials (average):	58.5	58.5
<i>Deployments With No Significant Difficulties Attributable to Inlet Dynamics Unique to Without-Project Conditions:</i>		
Average Deployment of Vessels Per Year	54.0	57.5
Technicians Involved (average per trip)	2.5	1.5
Customers\Observers Involved (average per trip)	3	3
Total Estimated Labor Costs	\$94,720	\$82,530
<i>Estimated Costs Due to Grounding or Damages Attributable to Dynamic or Migratory Inlet Conditions:</i>		
Estimated Number of Damage Occurrences (per Year)	4.5	1.0
Technicians Involved (average per occurrence)	2.5	1.5
Customers\Observers Involved (average per occurrence)	3.0	3.0
Retrieval Crewman Involved (per occurrence)	1.5	1.5
Repair Technicians Involved (per occurrence)	1.5	1.5
Total Estimated Labor Costs	\$14,170	\$2,710
Total Direct Costs of Repairs	\$1,880	\$420
Subtotal(s)	\$16,050	\$3,130
<i>Requirements for Resumption\Completion of Sea Trials:</i>		
Number of Vessel Redeployments	4.5	1.0
Technicians Involved (average per occurrence)	2.5	1.5
Customers\Observers Involved (average per occurrence)	3.0	3.0
Total Estimated Labor Costs (average per occurrence)	\$1,510	\$1,130
Marginal Customer Travel\Accommodation Costs (per occurrence)	\$350	\$350
Subtotal(s)	\$8,370	\$1,480
Total Applied Cost(s)	\$119,140	\$87,140
<i>Reduction or Differential (i.e., project benefit)</i>		\$32,000

* Detail of labor and operating costs not presented as associated information is considered proprietary by vessel manufacturer.

*Table D-1a
Ponce DeLeon Inlet, Florida
Commercial Charter Fishing Vessels
Summary Table for Example of Aggregate Average Annual Costs, Revenues, and Income*

Vessel Aggregate Class Statistics	
Average Vessel Length (Overall; in feet)	42.6
Average Vessel Length at Waterline (or between perpendiculars; in feet)	39.9
Average Vessel Breadth or Beam (extreme; in feet)	14.6
Average Vessel Draft (loaded; in feet)	5.1
Operating Costs	
Fixed Operational Costs	
– Interest and Amortization (Hull\Superstructure)	\$32,160
– Hull & Superstructure	\$310
– Propulsion\Power Plant(s)	\$470
– Rigging	\$490
– Support Facility\Berthing Expenses	\$4,340
– Insurance	\$3,650
– Administration\Accounting\Legal\Permits\Licensure	\$4,160
Subtotal	\$45,580
Variable Maintenance Costs	
– Hull & Superstructure\Rigging	\$5,750
– Propulsion\Power Plant(s)	\$6,810
Subtotal	\$12,560
Variable Operational Cost(s)	
– Fuel	\$34,220
– Oil\Lubrication	\$2,200
– Bait\Tackle	\$2,760
– Ice	\$2,060
– Consumables\Subsistence	\$1,900
– Advertising\Booking & Schedule Administration	\$7,080
– Hired Crew Compensation	\$12,490
Subtotal	\$62,710
Average Total Cost(s)	
Fixed Operational Cost(s)	\$45,580
Variable Maintenance Cost(s)	\$12,560
Variable Operating Cost(s)	\$62,710
Subtotal	\$120,850
Average Annual Revenue	\$154,820
Net Average Operating Income	\$33,970
Average Number of Days Employed Per Year	163
Average Number of Trips per Year	172
Average Duration of Trip (hours)	10.2
Average Hours Employed Per Year	1,756
Average Wage Per Hour for Hired Crewman	\$7.11
Average Wage\Return Per Hour for Captain	\$16.88

*Table D-3a
Ponce DeLeon Inlet, Florida
Commercial Fishing Vessels (Rock Shrimp)
Summary Table for Example of Aggregate Average Annual Costs, Revenues, and Income*

Vessel Aggregate Class Statistics			
Average Vessel Length (Overall; in feet)		69.7	92.4
Average Vessel Length at Waterline (or between perpendiculars; in feet)		63.2	85.5
Average Vessel Breadth or Beam (extreme; in feet)		18.3	21.9
Average Vessel Draft (loaded; in feet)		10.7	12.3
Operating Costs			
Fixed Operational Costs			
– Interest and Amortization (Hull\Superstructure)		\$34,960	\$54,500
– Hull & Superstructure		\$560	\$740
– Propulsion\Power Plant(s)		\$840	\$1,120
– Rigging		\$880	\$1,160
– Support Facility\Berthing Expenses		n/a	n/a
– Insurance		\$5,540	\$5,830
– Administration\Accounting\Legal\Permits\Licensure		\$6,370	\$6,290
	Subtotal	\$49,150	\$69,640
Variable Maintenance Costs			
– Hull & Superstructure\Rigging		\$14,100	\$21,800
– Propulsion\Power Plant(s)		\$12,710	\$17,570
	Subtotal	\$26,810	\$39,370
Variable Operational Cost(s)			
– Fuel		\$31,300	\$39,720
– Oil\Lubrication		\$4,880	\$7,390
– Consumables\Subsistence		\$2,980	\$2,480
– Hired Crew Compensation		\$49,280	\$82,100
	Subtotal	\$88,440	\$131,690
Average Total Cost(s)			
Fixed Operational Cost(s)		\$49,150	\$69,640
Variable Maintenance Cost(s)		\$26,810	\$39,370
Variable Operating Cost(s)		\$88,440	\$131,690
	Subtotal	\$164,400	\$240,700
Average Annual Revenue			
Net Average Operating Income		\$239,980	\$365,460
		\$75,580	\$124,760
Average Number of Days Employed Per Year			
Average Number of Trips per Year		126	105
Average Duration of Trip (Days)		11.5	5.3
Average Hours Employed Per Year		11.0	20.0
		1,575	1,313
Average Wage Per Hour for Hired Crewman(men);			
	2 in number	\$8.97	\$17.93
Average Wage\Return Per Hour for Captain;			
	1 in number	\$13.35	\$26.70

*Table D-3b
Ponce DeLeon Inlet, Florida
Commercial Fishing Vessels (Rock Shrimp)
Summary Table for Reductions in Variable Vessel Costs
With
Placement or Location of Commercial Fishing Park*

General Vessel Class [1.]		
Average Vessel Length (Overall; in feet)	69.7	92.4
Average Vessel Draft (loaded; in feet)	10.7	12.3
Average Number of Trips Per Year for Which Shorter Transit Time is Applicable:	37.2	1.7
Average Number of Hours Trip Transit Time is Reduced Per Transit Leg:	8.5	8.5
Applicable Number of Transit Legs Per Trip for Reduced Time: [2.]	1.5	1.5
Average Variable Cost(s):		
- Vessel Operating Costs	\$38.55	\$63.63
- Value of Labor Time (net of opportunity costs)	\$20.86	\$41.70
Subtotal(s)	\$59.41	\$105.33
Estimated Reduced Costs by Class per Year:	\$28,200	\$2,290
Estimated Total Reduced Waterborne Logistical Costs (i.e., benefit):		\$30,490
Total Poundage Carried Via Realigned Vessel Operations:		
- Average per Trip (whole or live weight)	19,410	53,200
- Total Poundage (whole or live weight)	722,580	90,770
Total Poundage (whole or live weight)		813,350

[1.] *Aggregate classes represent a total fleet of approximately 40 to 45 individual vessels of which approximately sixty-five to seventy percent approximate the 60.7-foot class and the remainder approximate or are aggregated for the 92.4-foot class.*

[2.] *An average of 1.5 trip legs or transits is applied given that some proportion of the time, either for the inbound or outbound leg, a given vessel will be closer to equidistant from another land-based facility depending on the geographical location of the vessel upon completion of the final deployment of harvest gear (or "drag" of netting equipment) while fishing in a northward or southward direction. Such physical placement does not constitute a marginal logistical betterment for location of the proposed fishing park and associated facilities. In the absence of specific information concerning vessel geographical placement, a proportion of .5 or fifty percent was applied to one leg or transit for a each trip.*

Table D-3c
Ponce DeLeon Inlet, Florida
Commercial Fishing Vessels (Rock Shrimp)
Summary Table for Reductions in Landside Transportation Costs
With
Placement or Location of Commercial Fishing Park

Estimated Landside Transport Cost Reductions:

Estimated Minimum Annual Poundage Throughput of On-Site Processing Facility (whole or live weight)	1,375,000
Poundage Originating from Realigned Vessel Operations (whole or live weight)	813,350
Poundage Transported Landside from Alternative Dockage Facilities for Processing (whole or live weight)	561,650
Estimated Cost(s) for Landside Shipment Per Pound Per Hundred Miles	
- Per pound; Whole or Live Weight	\$0.077
- Per pound; Processed Weight	\$0.108
Estimated Dockage Cost Per Pound from Alternative Facility (whole or live weight)	\$0.055
Approximate Conversion Factor (for whole-to-processed weight)	1.670

Landside Transport Costs Without Commercial Park:

Transport of Whole or Live-Weight Poundage to Processing Facility(ies)	
- Applied Pre-Processed Poundage	1,375,000
- Associated Dockage or Facility Offloading and Handling Charges [1.]	\$75,630
- Average Minimum Landside Transport Distance (miles)	90.0
- Associated Landside Transport Charges	\$95,290
Transport of Processed Poundage for Further Distribution:	
- Applied Processed Poundage	823,350
- Applied Marginal Distance Without Proposed Commercial Fishing Park (miles)	20.0
- Associated Landside Transport Charges	\$17,700

Summary Total Cost(s): **\$188,620**

Landside Transport Costs With Commercial Park:

Transport of Whole or Live-Weight Poundage	
- Applied Pre-Processed Poundage	813,350
- Associated Dockage Handling Charges [1.]	\$44,730
- Average Landside Transport Distance (miles)	25.0
- Associated Landside Transport Charges	\$15,660

Summary Total Cost(s): **\$60,390**

Net Reduction in Transportation Costs (i.e. benefit): **128,230**

[1.] Illustrates only the marginal cost of a second facility initially offloading and handling landings before transport to processor located at alternative without-project facilities. Marginal costs for placement of the proposed facility are netted or accounted for in the cost analysis section of the main project report.

Table D-4a
Ponce DeLeon Inlet, Florida
Commercial Fishing Vessels (Golden & Red Crab)
Summary Table for Example of Aggregate Average Annual Costs, Revenues, and Income

Vessel Aggregate Class Statistics		
Average Vessel Length (Overall; in feet)	69.7	92.4
Average Vessel Length at Waterline (or between perpendiculars; in feet)	63.2	85.5
Average Vessel Breadth or Beam (extreme; in feet)	18.3	21.9
Average Vessel Draft (loaded; in feet)	10.7	12.3
Operating Costs		
Fixed Operational Costs		
- Interest and Amortization (Hull\Superstructure)	\$34,960	\$54,500
- Hull & Superstructure	\$560	\$740
- Propulsion\Power Plant(s)	\$840	\$1,120
- Rigging	\$880	\$1,160
- Support Facility\Berthing Expenses	n/a	n/a
- Insurance	\$5,540	\$5,830
- Administration\Accounting\Legal\Permits\Licensure	\$6,370	\$6,290
Subtotal	\$49,150	\$69,640
Variable Maintenance Costs		
- Hull & Superstructure\Rigging	\$14,100	\$21,800
- Propulsion\Power Plant(s)	\$12,710	\$17,570
Subtotal	\$26,810	\$39,370
Variable Operational Cost(s)		
- Fuel	\$36,530	\$47,090
- Oil\Lubrication	\$4,880	\$7,390
- Consumables\Subsistence	\$2,980	\$2,480
- Hired Crew Compensation	\$23,580	\$43,200
Subtotal	\$67,970	\$100,160
Average Total Cost(s)		
Fixed Operational Cost(s)	\$49,150	\$69,640
Variable Maintenance Cost(s)	\$26,810	\$39,370
Variable Operating Cost(s)	\$67,970	\$100,160
Subtotal	\$143,930	\$209,170
Average Annual Revenue		
Average Annual Revenue	\$182,520	\$277,950
Net Average Operating Income		
Net Average Operating Income	\$38,590	\$68,780
Average Number of Days Employed Per Year		
Average Number of Days Employed Per Year	126	105
Average Number of Trips per Year		
Average Number of Trips per Year	25.2	17.5
Average Duration of Trip (Days)		
Average Duration of Trip (Days)	5.0	6.0
Average Hours Employed Per Year		
Average Hours Employed Per Year	1,575	1,313
Average Wage Per Hour for Hired Crewman(men);		
Average Wage Per Hour for Hired Crewman(men);	2 in number	\$4.29
Average Wage\Return Per Hour for Captain;		
Average Wage\Return Per Hour for Captain;	1 in number	\$6.39
		\$9.43
		\$14.05

*Table D-4b
Ponce DeLeon Inlet, Florida
Commercial Fishing Vessels (Golden & Red Crab)
Summary Table for Reductions in Variable Vessel Costs
With
Placement or Location of Commercial Fishing Park*

General Vessel Class [1.]		
Average Vessel Length (Overall; in feet)	69.7	92.4
Average Vessel Draft (loaded; in feet)	10.7	12.3
Average Number of Trips Per Year for Which Shorter Transit Time is Applicable:	16.4	34.1
Average Number of Hours Trip Transit Time is Reduced Per Transit Leg:	8.5	8.5
Applicable Number of Transit Legs Per Trip for Reduced Time: [2.]	1.5	1.5
Average Variable Cost(s):		
- Vessel Operating Costs	\$38.55	\$63.63
- Value of Labor Time (net of opportunity costs)	\$9.98	\$21.94
Subtotal(s)	\$48.53	\$85.57
Estimated Reduced Costs by Class per Year:	\$10,140	\$37,230
Estimated Total Reduced Waterborne Logistical Costs (i.e., benefit):		\$47,370
Total Poundage Carried Via Realigned Vessel Operations:		
- Average per Trip (whole or live weight)	6,340	7,610
- Total Poundage (whole or live weight)	103,850	259,690
Total Poundage (whole or live weight)		363,540

[1.] *Aggregate classes represent a total fleet of approximately 3 to 4 individual vessels of which one vessel approximates the 60.7-foot class and the remainder approximate or are aggregated for the 92.4-foot class.*

[2.] *An average of 1.5 trip legs or transits is applied given that some proportion of the time, either for the inbound or outbound leg, a given vessel will be closer to equidistant from another land-based facility depending on the geographical location of the vessel upon completion of the final deployment of harvest gear (or "drag" of netting equipment) while fishing in a northward or southward direction. Such physical placement does not constitute a marginal logistical betterment for location of the proposed fishing park and associated facilities. In the absence of specific information concerning vessel geographical placement, a proportion of .5 or fifty percent was applied to one leg or transit for a each trip.*

*Table D-4c
Ponce DeLeon Inlet, Florida
Commercial Fishing Vessels (Golden & Red Crab)
Summary Table for Reductions in Landside Transportation Costs
With
Placement or Location of Commercial Fishing Park*

Estimated Landside Transport Cost Reductions:

Estimated Minimum Annual Poundage Throughput of On-Site Processing Facility (whole or live weight)	596,300
Poundage Originating from Realigned Vessel Operations (whole or live weight)	363,540
Poundage Transported Landside from Alternative Dockage Facilities for Processing (whole or live weight)	232,760
Estimated Cost(s) for Landside Shipment Per Pound Per Hundred Miles	
- Per pound; Whole or Live Weight	\$0.073
- Per pound; Processed Weight	\$0.108
Estimated Dockage Cost Per Pound from Alternative Facility (whole or live weight)	\$0.055
Approximate Conversion Factor (for whole-to-processed weight)	1.000

Landside Transport Costs Without Commercial Park:

Transport of Whole or Live-Weight Poundage to Processing Facility(ies)	
- Applied Pre-Processed Poundage	596,300
- Associated Dockage or Facility Offloading and Handling Charges [1.]	\$32,800
- Average Minimum Landside Transport Distance (miles)	115.0
- Associated Landside Transport Charges	\$49,720
Transport of Processed Poundage for Further Distribution:	
- Applied Processed Poundage	596,300
- Applied Marginal Distance Without Proposed Commercial Fishing Park (miles)	20.0
- Associated Landside Transport Charges	\$12,820

Summary Total Cost(s): **\$95,340**

Landside Transport Costs With Commercial Park:

Transport of Whole or Live-Weight Poundage	
- Applied Pre-Processed Poundage	363,540
- Associated Dockage Handling Charges [1.]	\$19,990
- Average Landside Transport Distance (miles)	25.0
- Associated Landside Transport Charges	\$6,590

Summary Total Cost(s): **\$26,580**

Net Reduction in Transportation Costs (i.e. benefit): **68,760**

[1.] *Illustrates only the marginal cost of a second facility initially offloading and handling landings before transport to processor located at alternative without-project facilities. Marginal costs for placement of the proposed facility are netted or accounted for in the cost analysis section of the main project report.*

Table D-5
Ponce DeLeon Inlet, Florida
Commercial Fishing Vessel Maintenance and Repair Costs
Summary Table for Reductions in Landside Transportation Costs
Placement or Location of Marine Railway with Commercial Fishing Park

Total Vessel Dispatch and Return Transit Time Without Proposed Facilities:

- Without Proposed Facilities	19.50	hours
- With Proposed Facilities	2.75	hours
Differential or Reduction	16.75	hours

Applied Aggregate Values per Hour for Vessel Transit Time:

- Variable Vessel Operating Costs	\$47.78	per hour
- Value or Cost of Time for Labor	\$28.80	per hour

Estimated Reductions In Operations Costs for Vessel Dispatch and Return Time:

- Variable Vessel Operating Costs	\$800
- Value or Cost of Time for Labor	\$482
Subtotal:	\$1,283
Rounded:	\$1,280

Associated Costs for Vehicle(s) and Labor Required for Landside Transport (in the interim between vessel dispatch and return) *

Approximate Vessel Dispatch Radius:

Average Vessel Speed: 8.5 knots

Approximate Distance (nautical miles) Given Speed of Vessel and Transit Time:

71.2 naut. miles

Applied Approximate Landside Statute Miles

82.0 stat. miles

Applied Total Cost of Vehicle Per Statute Mile:

\$0.31

Total Landside Driving Distance:

328 stat. miles

Total Landside Driving Time:

6.6 hours

Applied Landside Transportation Cost(s)

- Vehicle	\$102
- Cost of Labor	\$190
Subtotal:	\$292
Rounded:	\$290

Summary of Total Applied Costs for Vessel, Landside Vehicle, and Associated Labor Time:

- Vessel	\$800
- Landside Vehicle	\$102
- Costs or value of Labor:	\$672

Subtotal: \$1,574
Rounded: \$1,570

or;

- Vessel Dispatch and Return Costs (including labor)	\$1,280
- Landside Transportation Costs (including labor)	\$290

Subtotal: \$1,570

Approximate Number of Months Per Year Repair Facility Will Be Operational:

10

Approximate Number of Repairs Per Month:

3

Total Estimated Cost Efficiencies Per Year With Marine Repair Facilities:

\$47,100

* Applied distance(s) and time(s) for vehicle travel allow for travel to and from facility with vessel dispatch, and to and from facility for retrieval of vessel after repairs are complete

**Ponce DeLeon Inlet, Florida
Recreation Navigation Benefits for Inlet Stabilization
(Based on Recreation Vessel Grounding Statistics as Reported by the United States Coast Guard (USCG))**

Year	Economic Life: Applied Interest/Discount Rate: 7.125%	50 years General Vessel Class ---> Number of Vessels/Observations ---> Percentage of Occurrences Considered: Preventable With Improved Conditions: Adjusted Number of Vessels or Occurrences: Physical Damages Avoided ---> Value of Time Saved ---> Total --->	Vessel Class 1 < 20.0 Feet Length Overall (LOA) 7.9 Vessels 59.5% 4.7 Vessels				Vessel Class 2 >= 20.0 < 25.0 Feet Length Overall (LOA) 10.0 Vessels 60.0% 6.0 Vessels				Vessel Class 3 >= 25.0 Feet Length Overall (LOA) 10.7 Vessels 58.8% 6.4 Vessels				Summary Total Nominal and Discounted Values							
			Nominal Value(s) by Year		Discounted Total(s) by Year		Nominal Value(s) by Year		Discounted Total(s) by Year		Nominal Value(s) by Year		Discounted Total(s) by Year		Nominal Value(s) by Year		Discounted Total(s) by Year					
			Direct Cost(s)	Time Value	Total	Total	Direct Cost(s)	Time Value	Total	Total	Direct Cost(s)	Time Value	Total	Total	Direct Cost(s)	Time Value	Total	Total				
2001	1.00000	13.10%	\$18,668	\$1,010	\$19,678	\$10,656	\$31,215	\$1,259	\$22,504	\$2,604	\$23,804	\$2,210	\$1,375	\$33,585	\$33,585	\$32,093	\$3,674	\$35,757	\$35,757	\$85,757	\$85,757	
2002	1	0.93349	2.61%	\$19,161	\$1,038	\$20,200	\$16,074	\$32,091	\$35,418	\$31,163	\$35,114	\$1,414	\$34,928	\$32,232	\$84,386	\$3,777	\$88,163	\$88,163	\$85,299	\$3,528	\$88,299	\$88,299
2003	2	0.87140	2.69%	\$20,204	\$1,066	\$21,270	\$16,993	\$33,854	\$39,315	\$34,316	\$39,002	\$4,004	\$1,452	\$38,456	\$36,655	\$3,878	\$42,334	\$42,334	\$40,540	\$1,794	\$42,334	\$42,334
2004	3	0.81344	2.58%	\$20,703	\$1,093	\$21,797	\$17,324	\$35,803	\$43,199	\$38,632	\$43,680	\$4,048	\$1,488	\$40,168	\$38,288	\$4,120	\$44,408	\$44,408	\$42,512	\$1,896	\$44,408	\$44,408
2005	4	0.75934	2.47%	\$21,193	\$1,120	\$22,313	\$17,671	\$37,856	\$47,183	\$42,527	\$48,161	\$4,136	\$1,528	\$43,689	\$41,601	\$4,268	\$47,947	\$47,947	\$45,852	\$2,095	\$47,947	\$47,947
2006	5	0.70884	2.37%	\$21,678	\$1,146	\$22,824	\$18,035	\$40,000	\$50,820	\$45,260	\$50,741	\$4,224	\$1,568	\$45,260	\$43,000	\$4,416	\$49,416	\$49,416	\$47,216	\$2,200	\$49,416	\$49,416
2007	6	0.66169	2.27%	\$22,144	\$1,172	\$23,316	\$18,311	\$42,000	\$54,556	\$48,000	\$53,611	\$4,311	\$1,608	\$48,000	\$45,611	\$4,611	\$53,222	\$53,222	\$50,711	\$2,511	\$53,222	\$53,222
2008	7	0.61768	2.17%	\$22,605	\$1,200	\$23,805	\$18,539	\$44,000	\$58,300	\$50,000	\$55,244	\$4,400	\$1,648	\$50,000	\$47,539	\$4,911	\$57,450	\$57,450	\$54,711	\$2,739	\$57,450	\$57,450
2009	8	0.57660	2.08%	\$23,066	\$1,228	\$24,294	\$18,721	\$46,000	\$62,000	\$52,000	\$58,999	\$4,488	\$1,688	\$52,000	\$49,421	\$5,111	\$60,532	\$60,532	\$57,511	\$3,021	\$60,532	\$60,532
2010	9	0.53923	1.99%	\$23,527	\$1,256	\$24,783	\$18,864	\$48,000	\$65,800	\$54,000	\$62,697	\$4,576	\$1,728	\$54,000	\$51,264	\$5,311	\$62,875	\$62,875	\$59,611	\$3,264	\$62,875	\$62,875
2011	10	0.50245	1.91%	\$23,988	\$1,284	\$25,272	\$19,000	\$50,000	\$69,600	\$56,000	\$66,396	\$4,664	\$1,768	\$56,000	\$53,400	\$5,511	\$65,056	\$65,056	\$61,711	\$3,515	\$65,056	\$65,056
2012	11	0.46803	1.83%	\$24,449	\$1,312	\$25,761	\$19,143	\$52,000	\$73,400	\$58,000	\$69,895	\$4,752	\$1,808	\$58,000	\$55,488	\$5,651	\$66,707	\$66,707	\$63,511	\$3,796	\$66,707	\$66,707
2013	12	0.43783	1.75%	\$24,910	\$1,340	\$26,250	\$19,286	\$54,000	\$77,200	\$60,000	\$73,094	\$4,840	\$1,848	\$60,000	\$57,480	\$5,791	\$68,318	\$68,318	\$65,211	\$4,072	\$68,318	\$68,318
2014	13	0.40871	1.65%	\$25,371	\$1,368	\$26,739	\$19,429	\$56,000	\$81,000	\$62,000	\$76,293	\$4,928	\$1,888	\$62,000	\$59,472	\$5,931	\$70,033	\$70,033	\$66,911	\$4,352	\$70,033	\$70,033
2015	14	0.38153	1.61%	\$25,832	\$1,396	\$27,228	\$19,572	\$58,000	\$84,800	\$64,000	\$79,492	\$5,016	\$1,928	\$64,000	\$61,464	\$6,071	\$71,767	\$71,767	\$68,611	\$4,632	\$71,767	\$71,767
2016	15	0.35615	1.54%	\$26,293	\$1,424	\$27,717	\$19,715	\$60,000	\$88,600	\$66,000	\$82,691	\$5,104	\$1,968	\$66,000	\$63,456	\$6,211	\$73,501	\$73,501	\$70,311	\$4,912	\$73,501	\$73,501
2017	16	0.33247	1.48%	\$26,754	\$1,452	\$28,203	\$19,858	\$62,000	\$92,400	\$68,000	\$85,890	\$5,192	\$2,008	\$68,000	\$65,448	\$6,351	\$75,235	\$75,235	\$72,011	\$5,192	\$75,235	\$75,235
2018	17	0.31035	1.42%	\$27,215	\$1,480	\$28,694	\$20,000	\$64,000	\$96,200	\$70,000	\$89,089	\$5,280	\$2,048	\$70,000	\$67,440	\$6,491	\$76,969	\$76,969	\$73,711	\$5,472	\$76,969	\$76,969
2019	18	0.28971	1.36%	\$27,676	\$1,508	\$29,184	\$20,143	\$66,000	\$100,000	\$72,000	\$92,288	\$5,368	\$2,088	\$72,000	\$69,384	\$6,631	\$78,703	\$78,703	\$75,411	\$5,752	\$78,703	\$78,703
2020	19	0.27044	1.30%	\$28,137	\$1,536	\$29,673	\$20,286	\$68,000	\$104,000	\$74,000	\$95,487	\$5,456	\$2,128	\$74,000	\$71,320	\$6,771	\$80,437	\$80,437	\$77,111	\$6,032	\$80,437	\$80,437
2021	20	0.25245	1.25%	\$28,598	\$1,564	\$30,162	\$20,429	\$70,000	\$108,000	\$76,000	\$98,686	\$5,544	\$2,168	\$76,000	\$73,264	\$6,911	\$82,181	\$82,181	\$78,811	\$6,312	\$82,181	\$82,181
2022	21	0.23566	1.19%	\$29,059	\$1,592	\$30,651	\$20,572	\$72,000	\$112,000	\$78,000	\$101,885	\$5,632	\$2,208	\$78,000	\$75,208	\$7,051	\$83,925	\$83,925	\$80,511	\$6,592	\$83,925	\$83,925
2023	22	0.21999	1.14%	\$29,520	\$1,620	\$31,140	\$20,715	\$74,000	\$116,000	\$80,000	\$105,084	\$5,720	\$2,248	\$80,000	\$77,152	\$7,191	\$85,669	\$85,669	\$82,211	\$6,872	\$85,669	\$85,669
2024	23	0.20536	1.10%	\$30,000	\$1,648	\$31,628	\$20,858	\$76,000	\$120,000	\$82,000	\$108,283	\$5,808	\$2,288	\$82,000	\$79,104	\$7,331	\$87,413	\$87,413	\$83,911	\$7,152	\$87,413	\$87,413
2025	24	0.19170	1.05%	\$30,480	\$1,676	\$32,116	\$21,000	\$78,000	\$124,000	\$84,000	\$111,482	\$5,896	\$2,328	\$84,000	\$81,048	\$7,471	\$89,157	\$89,157	\$85,611	\$7,432	\$89,157	\$89,157
2026	25	0.17905	1.01%	\$30,960	\$1,704	\$32,604	\$21,143	\$80,000	\$128,000	\$86,000	\$114,681	\$5,984	\$2,368	\$86,000	\$83,000	\$7,611	\$90,901	\$90,901	\$87,311	\$7,712	\$90,901	\$90,901
2027	26	0.16705	0.97%	\$31,440	\$1,732	\$33,092	\$21,286	\$82,000	\$132,000	\$88,000	\$117,880	\$6,072	\$2,408	\$88,000	\$85,008	\$7,751	\$92,645	\$92,645	\$89,011	\$7,992	\$92,645	\$92,645
2028	27	0.15594	0.92%	\$31,920	\$1,760	\$33,580	\$21,429	\$84,000	\$136,000	\$90,000	\$121,079	\$6,160	\$2,448	\$90,000	\$87,016	\$7,891	\$94,389	\$94,389	\$90,711	\$8,272	\$94,389	\$94,389
2029	28	0.14556	0.88%	\$32,400	\$1,788	\$34,068	\$21,572	\$86,000	\$140,000	\$92,000	\$124,278	\$6,248	\$2,488	\$92,000	\$89,064	\$8,031	\$96,133	\$96,133	\$92,411	\$8,552	\$96,133	\$96,133
2030	29	0.13568	0.85%	\$32,880	\$1,816	\$34,556	\$21,715	\$88,000	\$144,000	\$94,000	\$127,477	\$6,336	\$2,528	\$94,000	\$91,112	\$8,171	\$97,877	\$97,877	\$94,111	\$8,832	\$97,877	\$97,877
2031	30	0.12655	0.81%	\$33,360	\$1,844	\$35,044	\$21,858	\$90,000	\$148,000	\$96,000	\$130,676	\$6,424	\$2,568	\$96,000	\$93,160	\$8,311	\$99,621	\$99,621	\$95,811	\$9,112	\$99,621	\$99,621
2032	31	0.11841	0.78%	\$33,840	\$1,872	\$35,532	\$22,000	\$92,000	\$152,000	\$98,000	\$133,875	\$6,512	\$2,608	\$98,000	\$95,208	\$8,451	\$101,365	\$101,365	\$97,511	\$9,392	\$101,365	\$101,365
2033	32	0.11053	0.75%	\$34,320	\$1,900	\$36,020	\$22,143	\$94,000	\$156,000	\$100,000	\$137,074	\$6,600	\$2,648	\$100,000	\$97,252	\$8,591	\$103,109	\$103,109	\$99,211	\$9,672	\$103,109	\$103,109
2034	33	0.10318	0.72%	\$34,800	\$1,928	\$36,508	\$22,286	\$96,000	\$160,000	\$102,000	\$140,273	\$6,688	\$2,688	\$102,000	\$99,296	\$8,731	\$104,853	\$104,853	\$100,911	\$9,952	\$104,853	\$104,853
2035	34	0.09632	0.69%	\$35,280	\$1,956	\$36,996	\$22,429	\$98,000	\$164,000	\$104,000	\$143,472	\$6,776	\$2,728	\$104,000	\$101,340	\$8,871	\$106,597	\$106,597	\$102,611	\$10,232	\$106,597	\$106,597
2036	35	0.08991	0.66%	\$35,760	\$1,984	\$37,484	\$22,572	\$100,000	\$168,000	\$106,000	\$146,671	\$6,864	\$2,768	\$106,000	\$103,384	\$9,011	\$108,341	\$108,341	\$104,311	\$10,512	\$108,341	\$108,341
2037	36	0.08393	0.63%	\$36,240	\$2,012	\$37,972	\$22,715	\$102,000	\$172,000	\$108,000	\$149,870	\$6,952	\$2,808	\$108,000	\$105,428	\$9,151	\$110,085	\$110,085	\$106,011	\$10,792	\$110,085	\$110,085
2038	37	0.07835	0.60%	\$36,720	\$2,040	\$38,460	\$22,858	\$104,000	\$176,000	\$110,000	\$153,069	\$7,040	\$2,848	\$110,000	\$107,472	\$9,291	\$111,829	\$111,829	\$107,711	\$11,072	\$111,829	\$111,829
2039	38	0.07314	0.58%	\$37,200	\$2,068	\$38,948	\$23,000	\$106,000	\$180,000	\$112,000	\$156,268	\$7,128	\$2,888	\$112,000	\$109,516	\$9,431	\$113,573	\$113,573	\$109,411	\$11,352	\$113,573	\$113,573
2040	39	0.06827	0.55%	\$37,680	\$2,096	\$39,436	\$23,143	\$108,000	\$184,000	\$114,000	\$159,467	\$7,216	\$2,928	\$114,000	\$111,560	\$9,571	\$115,317	\$115,317	\$111,111	\$11,632	\$115,317	\$115,317
2041	40	0.06373	0.53%	\$38,160	\$2,124	\$39,924	\$23,286	\$110,000	\$188,000	\$116,000	\$162,666	\$7,304	\$2,968	\$116,000	\$113,608	\$9,711	\$117,061	\$117,061	\$112,811	\$11,912	\$117,061	\$117,061
2042	41	0.05954	0.51%	\$38,640	\$2,152	\$40,412	\$23,429	\$112,000	\$192,000	\$118,000	\$165,865	\$7,392	\$3,008	\$118,000	\$115,652	\$9,851	\$118,805	\$118,805	\$114,511	\$12,192	\$118,805	\$118,805
2043	42	0.05554	0.49%	\$39,120	\$2,180	\$40,900	\$23,572	\$114,000	\$196,000	\$120,000	\$169,064	\$7,480	\$3,048	\$120,000	\$117,696	\$9,991	\$120,549	\$120,549	\$116,211	\$12,472	\$120,549	\$120,549
2044	43	0.05184	0.47%	\$39,600	\$2,208	\$41,388	\$23,715	\$116,000	\$200,000	\$122,000	\$172,263	\$7,568	\$3,088	\$122,000	\$119,740	\$10,131	\$122,293	\$122,293	\$117,911	\$12,752	\$122,293	\$122,293
2045	44	0.04840	0.45%	\$40,080	\$2,236	\$41,876	\$23,858	\$118,000	\$204,000	\$124,000	\$175,462	\$7,656	\$3,128	\$124,000	\$121,784	\$10,271	\$124,033	\$124,033	\$119,611	\$13,032	\$124,033	\$124,033
2046	45	0.04518	0.43%	\$40,560	\$2,264	\$42,364	\$24,000	\$120,000	\$208,000	\$126,000	\$178,661	\$7,744	\$3,168	\$126,000	\$123,828	\$10,411	\$125,777	\$125,777	\$121,311	\$13,312	\$125,777	\$125,777
2047	46	0.04217	0.41%	\$41,040	\$2,292	\$42,852	\$24,143	\$122,000	\$212,000	\$128,000	\$181,860	\$7,832	\$3,208	\$128,000	\$125,87							

Ponce DeLeon Inlet, Florida
Recreation Navigation Benefits for Inlet Stabilization
Unreported Damage Incidents

Economic Life: Applied Interest/Discount Rate: 7.125%	General Vessel Class ---> Number of Vessels/Observations ---> Percentage of Occurrences Considered Preventable With Improved Conditions: Adjusted Number of Vessels or Occurrences: Physical Damages Avoided ---> Value of Time Saved ---> Total --->	Vessel Class 1 < 20.0 Feet Length Overall (LOA) 104 Vessels			Vessel Class 2 >= 20.0 < 25.0 Feet Length Overall (LOA) 63.2 Vessels			Vessel Class 3 >= 25.0 Feet Length Overall (LOA) 20.8 Vessels			Summary Total Nominal and Discounted Values				
		55.0% Vessels \$610 per occurrence (average) \$120 per occurrence (average) \$730 per occurrence (average)			55.0% Vessels \$840 per occurrence (average) \$170 per occurrence (average) \$1,010 per occurrence (average)			55.0% Vessels \$750 per occurrence (average) \$150 per occurrence (average) \$900 per occurrence (average)			114.5 Vessels \$810 per occurrence (average) \$170 per occurrence (average) \$980 per occurrence (average)				
		Year	Period	Discount Coefficient	Projected Growth	Nominal Value of Direct Costs	Value of Time	Total	Discounted Total	Nominal Value of Direct Costs	Value of Time	Total	Discounted Total	Nominal Value of Direct Costs	Value of Time
2001	0	1.00000	13.10%	\$39,482	\$7,783	\$47,225	\$47,225	\$39,482	\$7,783	\$47,225	\$47,225	\$39,482	\$7,783	\$47,225	\$47,225
2002	1	0.93349	2.81%	\$40,666	\$7,981	\$48,556	\$45,821	\$40,666	\$7,981	\$48,556	\$45,821	\$40,666	\$7,981	\$48,556	\$45,821
2003	2	0.87140	2.69%	\$41,060	\$8,196	\$49,556	\$43,445	\$41,060	\$8,196	\$49,556	\$43,445	\$41,060	\$8,196	\$49,556	\$43,445
2004	3	0.81344	2.58%	\$42,733	\$8,407	\$51,140	\$41,000	\$42,733	\$8,407	\$51,140	\$41,000	\$42,733	\$8,407	\$51,140	\$41,000
2005	4	0.75934	2.47%	\$43,768	\$8,615	\$52,403	\$39,782	\$43,768	\$8,615	\$52,403	\$39,782	\$43,768	\$8,615	\$52,403	\$39,782
2006	5	0.70884	2.37%	\$44,924	\$8,819	\$53,843	\$38,024	\$44,924	\$8,819	\$53,843	\$38,024	\$44,924	\$8,819	\$53,843	\$38,024
2007	6	0.66169	2.27%	\$46,340	\$9,019	\$55,459	\$36,300	\$46,340	\$9,019	\$55,459	\$36,300	\$46,340	\$9,019	\$55,459	\$36,300
2008	7	0.61768	2.17%	\$47,911	\$9,215	\$57,251	\$34,622	\$47,911	\$9,215	\$57,251	\$34,622	\$47,911	\$9,215	\$57,251	\$34,622
2009	8	0.57660	2.08%	\$49,636	\$9,407	\$59,239	\$32,992	\$49,636	\$9,407	\$59,239	\$32,992	\$49,636	\$9,407	\$59,239	\$32,992
2010	9	0.53825	1.99%	\$47,764	\$9,595	\$58,359	\$31,412	\$47,764	\$9,595	\$58,359	\$31,412	\$47,764	\$9,595	\$58,359	\$31,412
2011	10	0.50245	1.91%	\$49,696	\$9,778	\$59,474	\$29,863	\$49,696	\$9,778	\$59,474	\$29,863	\$49,696	\$9,778	\$59,474	\$29,863
2012	11	0.46903	1.83%	\$50,606	\$9,957	\$60,563	\$28,406	\$50,606	\$9,957	\$60,563	\$28,406	\$50,606	\$9,957	\$60,563	\$28,406
2013	12	0.43763	1.75%	\$51,494	\$10,132	\$61,626	\$26,962	\$51,494	\$10,132	\$61,626	\$26,962	\$51,494	\$10,132	\$61,626	\$26,962
2014	13	0.40871	1.65%	\$52,360	\$10,302	\$62,662	\$25,611	\$52,360	\$10,302	\$62,662	\$25,611	\$52,360	\$10,302	\$62,662	\$25,611
2015	14	0.38153	1.61%	\$53,203	\$10,466	\$63,671	\$24,262	\$53,203	\$10,466	\$63,671	\$24,262	\$53,203	\$10,466	\$63,671	\$24,262
2016	15	0.35615	1.54%	\$54,024	\$10,630	\$64,654	\$22,927	\$54,024	\$10,630	\$64,654	\$22,927	\$54,024	\$10,630	\$64,654	\$22,927
2017	16	0.33247	1.48%	\$54,823	\$10,787	\$65,610	\$21,613	\$54,823	\$10,787	\$65,610	\$21,613	\$54,823	\$10,787	\$65,610	\$21,613
2018	17	0.31035	1.42%	\$55,600	\$10,940	\$66,540	\$20,321	\$55,600	\$10,940	\$66,540	\$20,321	\$55,600	\$10,940	\$66,540	\$20,321
2019	18	0.28971	1.38%	\$56,355	\$11,089	\$67,444	\$19,059	\$56,355	\$11,089	\$67,444	\$19,059	\$56,355	\$11,089	\$67,444	\$19,059
2020	19	0.27044	1.30%	\$57,088	\$11,233	\$68,321	\$17,817	\$57,088	\$11,233	\$68,321	\$17,817	\$57,088	\$11,233	\$68,321	\$17,817
2021	20	0.25245	1.25%	\$57,800	\$11,373	\$69,173	\$16,594	\$57,800	\$11,373	\$69,173	\$16,594	\$57,800	\$11,373	\$69,173	\$16,594
2022	21	0.23566	1.19%	\$58,491	\$11,509	\$70,000	\$15,486	\$58,491	\$11,509	\$70,000	\$15,486	\$58,491	\$11,509	\$70,000	\$15,486
2023	22	0.21999	1.14%	\$59,161	\$11,641	\$70,802	\$14,397	\$59,161	\$11,641	\$70,802	\$14,397	\$59,161	\$11,641	\$70,802	\$14,397
2024	23	0.20536	1.10%	\$59,810	\$11,769	\$71,578	\$13,333	\$59,810	\$11,769	\$71,578	\$13,333	\$59,810	\$11,769	\$71,578	\$13,333
2025	24	0.19170	1.05%	\$60,439	\$11,893	\$72,332	\$12,291	\$60,439	\$11,893	\$72,332	\$12,291	\$60,439	\$11,893	\$72,332	\$12,291
2026	25	0.17895	1.01%	\$61,048	\$12,013	\$73,061	\$11,270	\$61,048	\$12,013	\$73,061	\$11,270	\$61,048	\$12,013	\$73,061	\$11,270
2027	26	0.16705	0.97%	\$61,637	\$12,129	\$73,768	\$10,272	\$61,637	\$12,129	\$73,768	\$10,272	\$61,637	\$12,129	\$73,768	\$10,272
2028	27	0.15594	0.92%	\$62,207	\$12,241	\$74,448	\$9,293	\$62,207	\$12,241	\$74,448	\$9,293	\$62,207	\$12,241	\$74,448	\$9,293
2029	28	0.14558	0.89%	\$62,756	\$12,349	\$75,107	\$8,331	\$62,756	\$12,349	\$75,107	\$8,331	\$62,756	\$12,349	\$75,107	\$8,331
2030	29	0.13588	0.85%	\$63,291	\$12,454	\$75,745	\$7,384	\$63,291	\$12,454	\$75,745	\$7,384	\$63,291	\$12,454	\$75,745	\$7,384
2031	30	0.12685	0.81%	\$63,806	\$12,555	\$76,361	\$6,451	\$63,806	\$12,555	\$76,361	\$6,451	\$63,806	\$12,555	\$76,361	\$6,451
2032	31	0.11841	0.78%	\$64,304	\$12,653	\$76,957	\$5,532	\$64,304	\$12,653	\$76,957	\$5,532	\$64,304	\$12,653	\$76,957	\$5,532
2033	32	0.11053	0.75%	\$64,784	\$12,748	\$77,532	\$4,627	\$64,784	\$12,748	\$77,532	\$4,627	\$64,784	\$12,748	\$77,532	\$4,627
2034	33	0.10316	0.72%	\$65,248	\$12,839	\$78,087	\$3,734	\$65,248	\$12,839	\$78,087	\$3,734	\$65,248	\$12,839	\$78,087	\$3,734
2035	34	0.09632	0.69%	\$65,696	\$12,927	\$78,623	\$2,851	\$65,696	\$12,927	\$78,623	\$2,851	\$65,696	\$12,927	\$78,623	\$2,851
2036	35	0.08991	0.66%	\$66,128	\$13,012	\$79,140	\$1,976	\$66,128	\$13,012	\$79,140	\$1,976	\$66,128	\$13,012	\$79,140	\$1,976
2037	36	0.08393	0.63%	\$66,545	\$13,173	\$79,639	\$1,119	\$66,545	\$13,173	\$79,639	\$1,119	\$66,545	\$13,173	\$79,639	\$1,119
2038	37	0.07835	0.60%	\$66,947	\$13,322	\$80,120	\$627	\$66,947	\$13,322	\$80,120	\$627	\$66,947	\$13,322	\$80,120	\$627
2039	38	0.07314	0.58%	\$67,334	\$13,449	\$80,583	\$584	\$67,334	\$13,449	\$80,583	\$584	\$67,334	\$13,449	\$80,583	\$584
2040	39	0.06827	0.55%	\$67,707	\$13,562	\$81,028	\$542	\$67,707	\$13,562	\$81,028	\$542	\$67,707	\$13,562	\$81,028	\$542
2041	40	0.06373	0.53%	\$68,067	\$13,663	\$81,460	\$502	\$68,067	\$13,663	\$81,460	\$502	\$68,067	\$13,663	\$81,460	\$502
2042	41	0.05949	0.51%	\$68,413	\$13,751	\$81,874	\$464	\$68,413	\$13,751	\$81,874	\$464	\$68,413	\$13,751	\$81,874	\$464
2043	42	0.05554	0.49%	\$68,747	\$13,827	\$82,274	\$428	\$68,747	\$13,827	\$82,274	\$428	\$68,747	\$13,827	\$82,274	\$428
2044	43	0.05184	0.47%	\$69,068	\$13,900	\$82,658	\$394	\$69,068	\$13,900	\$82,658	\$394	\$69,068	\$13,900	\$82,658	\$394
2045	44	0.04840	0.45%	\$69,377	\$13,961	\$83,028	\$361	\$69,377	\$13,961	\$83,028	\$361	\$69,377	\$13,961	\$83,028	\$361
2046	45	0.04517	0.43%	\$69,675	\$14,019	\$83,385	\$329	\$69,675	\$14,019	\$83,385	\$329	\$69,675	\$14,019	\$83,385	\$329
2047	46	0.04213	0.41%	\$69,961	\$14,066	\$83,727	\$297	\$69,961	\$14,066	\$83,727	\$297	\$69,961	\$14,066	\$83,727	\$297
2048	47	0.03937	0.39%	\$70,237	\$14,102	\$84,054	\$266	\$70,237	\$14,102	\$84,054	\$266	\$70,237	\$14,102	\$84,054	\$266
2049	48	0.03685	0.36%	\$70,502	\$14,127	\$84,374	\$235	\$70,502	\$14,127	\$84,374	\$235	\$70,502	\$14,127	\$84,374	\$235
2050	49	0.03430	0.36%	\$70,757	\$14,152	\$84,679	\$205	\$70,757	\$14,152	\$84,679	\$205	\$70,757	\$14,152	\$84,679	\$205
2051	50	0.03202	0.35%	\$71,002	\$14,176	\$84,972	\$176	\$71,002	\$14,176	\$84,972	\$176	\$71,002	\$14,176	\$84,972	\$176

Summary of Present Worth: \$635,269
 Average Annual Equivalent (AAE) Value(s): \$61,480
 Summary Total Average Annual Equivalent (AAE) Benefits: \$144,530
 [1.] Florida State Comprehensive Outdoor Recreation Plan (SCORP); base year percentage from growth subsequent to 1997.

Table D-6d

*Estimation of Unit\User-Day Values (UDV) for Recreational Boating
According to General Vessel Class for With and Without Project Conditions*

Ponce DeLeon Inlet, Florida

		<i>Without- Project (1.)</i>	<i>With- Project (1.)</i>	<i>Estimated Differentials (1.)</i>
For Vessel Classes Less Than 20.0 Feet in Length Overall (LOA)				
Recreation Experience	0 to 30 points	10.42	15.13	
Availability of Opportunity	0 to 18 points	7.21	10.52	
Carrying Capacity	0 to 14 points	7.25	9.75	
Accessibility	0 to 18 points	10.21	12.10	
Environmental	0 to 20 points	11.17	11.58	
	Subtotal(s)	46.25	59.08	12.83
Nature of Recreation: General Hunting and Fishing Values				
	Lower Bound UDV Point Value(s):	40	50	
	Lower Bound UDV Monetary Value(s):	\$5.35	\$5.83	
	Upper Bound UDV Point Value(s):	50	60	
	Upper Bound UDV Monetary Value(s):	\$5.83	\$6.46	
	Interpolated\Applied Value(s):	\$5.65	\$6.40	\$0.75
For Vessel Classes Greater Than 20.0 Feet Length Overall (LOA), But Less Than 25.0 Feet in Length Overall (LOA)				
Recreation Experience	0 to 30 points	11.46	17.11	
Availability of Opportunity	0 to 18 points	7.39	11.48	
Carrying Capacity	0 to 14 points	7.14	10.21	
Accessibility	0 to 18 points	9.71	12.26	
Environmental	0 to 20 points	11.29	12.14	
	Subtotal(s)	47.00	63.21	16.21
Nature of Recreation: General Hunting and Fishing Values				
	Lower Bound UDV Point Value(s):	40	60	
	Lower Bound UDV Monetary Value(s):	\$5.35	\$6.46	
	Upper Bound UDV Point Value(s):	50	70	
	Upper Bound UDV Monetary Value(s):	\$5.83	\$6.77	
	Interpolated\Applied Value(s):	\$5.69	\$6.56	\$0.87
For Vessel Classes Greater Than 25.0 Feet in Length Overall (LOA)				
Recreation Experience	0 to 30 points	11.42	17.04	
Availability of Opportunity	0 to 18 points	7.79	11.60	
Carrying Capacity	0 to 14 points	7.17	10.00	
Accessibility	0 to 18 points	9.71	12.42	
Environmental	0 to 20 points	11.42	11.58	
	Subtotal(s)	47.50	62.65	15.15
Nature of Recreation: General Hunting and Fishing Values				
	Lower Bound UDV Point Value(s):	40	60	
	Lower Bound UDV Monetary Value(s):	\$5.35	\$6.46	
	Lower Bound UDV Monetary Value(s):	50	70	
	Upper Bound UDV Point Value(s):	\$5.83	\$6.77	
	Upper Bound UDV Monetary Value(s):	\$5.71	\$6.54	\$0.83

(1.) *Number of decimal places does not necessarily denote precision; values are calculated as averages based on individual UDV point value assessments.*

Table D-6e

*Estimation of Present Annual Inlet Use and Benefit for Recreational Boating
According to General Vessel Class and Unit\|User Day Valuations
for
With-Project Conditions *
Ponce DeLeon Inlet, Florida*

Potential Average Number of Vessel Transits Per Day Per Year:	155			
Less Adjustment for Cancelled Trips per Year:	17.5%			
Applied Average Number of Vessel Transits Per Day Per Year:	128.0			
General Recreational Vessel Class (According to Length Overall [LOA] in Feet)	< 20	> 20; < 25	>= 25	Total(s) All Classes
Estimated Used	27.5%	35.0%	37.5%	100.0%
Applied Number of Vessel Transits Per Day According to Vessel Class	35.2	44.8	48.0	128.0
Average Estimate of Vessel Compliment or Users per Vessel Transit	2.8	2.8	2.8	2.8
Average Estimate of Vessel User Occassions per Day	98.6	125.4	134.4	121.4
Average Marginal Benefit Per User—Occasion Derived from Changes in Unit\ User Day Valuations for With Versus Without Project Conditions	\$0.75	\$0.87	\$0.83	\$0.82
Average Estimated Benefit Per Day by Vessel Class	\$73.92	\$109.13	\$111.55	\$100.36
Total Estimated Benefits Per Day				\$294.60
Applied Number of Days Per Year				365
Total Estimated Benefit per Year by Vessel Class for Unit\ User Day Valuations for Recreational Vessel Use	\$26,981	\$39,833	\$40,716	\$107,531
	Rounded:			\$107,530

* *Estimated benefit(s) are estimated for calendar year 1997 and do not include allowances for projected growth derived from the Florida State Comprehensive Outdoor recreation Plan (SCORP; 1994) for the study region. With-project conditions includes efforts to improve in stabilization, but excludes consideration of limited deepening also proposed for intensified commercial usage of the inlet.*

Table B
Ponce DeLeon Inlet, Florida
Recreation Navigation Benefits for Inlet Stabilization
Unit/User Day Variations (UDV)

Year	Period	Discount Coefficient	Projected Growth	Vessel Class 1				Vessel Class 2				Vessel Class 3				Summary Total Nominal and Discounted Values			
				Estimated Occasions Per Year	User/Unit Day Value Per Year	Discounted Totals by Year	Estimated Occasions Per Year	User/Unit Day Value Per Year	Discounted Totals by Year	Estimated Occasions Per Year	User/Unit Day Value Per Year	Discounted Totals by Year	Estimated Occasions Per Year	User/Unit Day Value Per Year	Discounted Totals by Year	Estimated Occasions Per Year	User/Unit Day Value Per Year	Discounted Totals by Year	
2001	0	1.00000	13.10%	14,531	40,686	\$30,515	\$30,515	18,484	51,782	\$45,051	\$45,051	19,815	55,481	\$48,049	\$48,049	52,839	147,950	\$121,615	\$121,615
2002	1	0.93349	2.81%	14,938	41,628	\$31,371	\$29,284	19,013	53,235	\$46,315	\$43,234	20,371	57,030	\$47,341	\$44,192	54,322	152,100	\$125,026	\$116,711
2003	2	0.87140	2.69%	15,340	42,952	\$32,214	\$28,071	18,524	54,668	\$47,560	\$41,444	20,918	58,571	\$48,614	\$42,362	55,782	156,189	\$128,387	\$111,877
2004	3	0.81344	2.58%	15,735	44,058	\$33,044	\$26,870	20,027	56,074	\$48,765	\$39,884	21,457	60,080	\$49,866	\$40,563	57,219	160,213	\$131,695	\$107,126
2005	4	0.75934	2.47%	16,124	45,148	\$33,859	\$25,711	20,521	57,458	\$49,969	\$38,659	21,987	61,583	\$51,097	\$39,000	58,631	164,167	\$134,945	\$108,472
2006	5	0.70884	2.37%	16,505	46,214	\$34,660	\$24,568	21,068	58,818	\$51,171	\$37,272	22,507	63,019	\$52,306	\$37,076	60,148	168,050	\$138,137	\$97,917
2007	6	0.66168	2.27%	16,879	47,261	\$35,446	\$23,454	21,482	60,151	\$52,331	\$36,027	23,017	64,447	\$53,491	\$35,995	61,378	171,859	\$141,268	\$99,476
2008	7	0.61768	2.17%	17,246	48,288	\$36,216	\$22,370	21,849	61,457	\$53,487	\$34,892	23,517	65,847	\$54,653	\$34,758	62,711	175,591	\$144,336	\$98,153
2009	8	0.57660	2.08%	17,604	49,292	\$36,989	\$21,318	22,408	62,738	\$54,560	\$33,740	24,006	67,217	\$55,780	\$33,528	64,016	179,245	\$147,339	\$84,956
2010	9	0.53825	1.99%	17,955	50,275	\$37,708	\$20,285	22,852	63,967	\$55,623	\$32,583	24,485	68,557	\$56,902	\$32,302	65,293	182,819	\$150,277	\$80,887
2011	10	0.50245	1.91%	18,299	51,238	\$38,427	\$19,308	23,289	65,209	\$56,732	\$31,433	24,953	69,867	\$58,000	\$31,087	66,540	186,312	\$153,149	\$78,949
2012	11	0.46903	1.83%	18,634	52,174	\$39,130	\$18,353	23,715	66,403	\$57,771	\$30,283	25,408	71,168	\$59,051	\$29,937	67,798	189,724	\$155,953	\$77,147
2013	12	0.43763	1.75%	18,960	53,089	\$39,817	\$17,433	24,132	67,568	\$58,784	\$29,137	25,855	72,395	\$60,087	\$28,781	69,047	193,052	\$158,689	\$65,479
2014	13	0.40871	1.66%	19,278	53,982	\$40,486	\$16,547	24,537	68,704	\$59,773	\$28,031	26,280	73,612	\$61,088	\$27,671	70,168	196,288	\$161,357	\$63,949
2015	14	0.38153	1.61%	19,590	54,851	\$41,139	\$15,696	24,932	69,811	\$60,735	\$26,973	26,713	74,797	\$62,042	\$26,568	71,335	199,466	\$163,856	\$62,554
2016	15	0.35615	1.54%	19,892	55,698	\$41,774	\$14,878	25,317	70,888	\$61,673	\$25,862	27,128	75,952	\$62,904	\$25,458	72,505	202,538	\$166,487	\$61,295
2017	16	0.33247	1.48%	20,188	56,522	\$42,391	\$14,094	25,692	71,937	\$62,585	\$24,767	27,517	77,075	\$63,763	\$24,359	73,405	205,534	\$168,949	\$60,045
2018	17	0.31035	1.42%	20,472	57,323	\$42,982	\$13,343	26,058	72,957	\$63,434	\$23,669	27,907	78,168	\$64,579	\$23,269	74,445	208,447	\$171,344	\$58,177
2019	18	0.28971	1.36%	20,751	58,101	\$43,556	\$12,624	26,410	73,947	\$64,161	\$22,591	28,286	79,228	\$65,340	\$22,195	75,458	211,278	\$173,671	\$56,101
2020	19	0.27044	1.30%	21,021	58,858	\$44,143	\$11,938	26,753	74,910	\$64,771	\$21,525	28,664	80,280	\$66,076	\$21,016	76,438	214,027	\$175,931	\$54,750
2021	20	0.25245	1.25%	21,283	59,591	\$44,694	\$11,283	27,087	75,844	\$65,322	\$20,481	29,022	81,261	\$66,747	\$20,002	77,392	216,686	\$178,124	\$53,479
2022	21	0.23566	1.19%	21,537	60,304	\$45,226	\$10,659	27,411	76,750	\$65,772	\$19,455	29,369	82,133	\$67,407	\$19,005	78,316	219,288	\$180,253	\$52,217
2023	22	0.21998	1.14%	21,784	60,994	\$45,745	\$10,064	27,725	77,629	\$66,217	\$18,451	29,705	83,003	\$68,004	\$18,000	79,173	221,798	\$182,317	\$51,008
2024	23	0.20538	1.10%	22,023	61,663	\$46,247	\$9,497	28,029	78,489	\$66,576	\$17,481	30,031	83,808	\$68,781	\$17,000	80,002	224,230	\$184,317	\$49,751
2025	24	0.19170	1.05%	22,254	62,311	\$46,734	\$8,959	28,323	79,305	\$66,956	\$16,529	30,346	84,600	\$69,594	\$16,000	80,824	226,587	\$186,254	\$48,500
2026	25	0.17895	1.01%	22,478	62,939	\$47,204	\$8,447	28,609	80,104	\$67,334	\$15,594	30,648	85,428	\$70,435	\$15,000	81,739	228,869	\$188,131	\$47,300
2027	26	0.16705	0.97%	22,695	63,547	\$47,660	\$7,961	28,885	80,878	\$67,703	\$14,644	30,948	86,264	\$71,283	\$14,000	82,528	231,079	\$189,947	\$46,100
2028	27	0.15594	0.92%	22,905	64,134	\$48,101	\$7,501	29,152	81,626	\$68,064	\$13,704	31,244	87,109	\$72,137	\$13,000	83,291	233,216	\$191,704	\$44,900
2029	28	0.14558	0.88%	23,108	64,703	\$48,527	\$7,064	29,410	82,349	\$68,381	\$12,784	31,511	87,944	\$73,000	\$12,000	84,030	235,283	\$193,403	\$43,700
2030	29	0.13588	0.85%	23,304	65,252	\$48,939	\$6,650	29,660	83,048	\$68,692	\$11,844	31,778	88,780	\$73,854	\$11,000	84,833	237,281	\$195,045	\$42,500
2031	30	0.12685	0.81%	23,494	65,783	\$49,336	\$6,258	29,902	83,724	\$69,000	\$10,900	32,037	89,600	\$74,700	\$10,000	85,633	239,212	\$196,632	\$41,300
2032	31	0.11841	0.75%	23,677	66,298	\$49,722	\$5,885	30,135	84,377	\$69,295	\$9,954	32,287	90,404	\$75,535	\$9,000	86,409	241,077	\$198,166	\$40,100
2033	32	0.11053	0.70%	23,854	66,792	\$50,094	\$5,537	30,360	85,008	\$69,576	\$8,999	32,528	91,192	\$76,367	\$8,000	87,164	242,879	\$199,646	\$38,900
2034	33	0.10318	0.72%	24,025	67,270	\$50,452	\$5,206	30,577	85,616	\$69,844	\$8,000	32,768	91,970	\$77,224	\$7,000	87,904	244,618	\$201,076	\$37,700
2035	34	0.09632	0.69%	24,190	67,731	\$50,799	\$4,893	30,785	86,204	\$70,107	\$7,000	33,003	92,744	\$78,088	\$6,000	88,633	246,298	\$202,455	\$36,500
2036	35	0.08991	0.66%	24,349	68,177	\$51,133	\$4,597	31,185	86,787	\$70,373	\$6,000	33,232	93,511	\$78,854	\$5,000	89,351	247,915	\$203,785	\$35,300
2037	36	0.08393	0.63%	24,502	68,608	\$51,455	\$4,319	31,373	87,354	\$70,636	\$5,000	33,461	94,278	\$79,611	\$4,000	90,099	249,477	\$205,070	\$34,100
2038	37	0.07835	0.60%	24,650	69,020	\$51,765	\$4,056	31,554	87,904	\$70,888	\$4,000	33,684	95,044	\$80,366	\$3,000	90,855	250,983	\$206,308	\$32,900
2039	38	0.07314	0.58%	24,793	69,420	\$52,065	\$3,800	31,729	88,442	\$71,133	\$3,000	33,908	95,811	\$81,111	\$2,000	91,611	252,435	\$207,501	\$31,700
2040	39	0.06827	0.55%	24,930	69,804	\$52,353	\$3,554	31,898	88,974	\$71,366	\$2,000	34,126	96,583	\$81,854	\$1,000	92,366	253,834	\$208,651	\$30,500
2041	40	0.06373	0.53%	25,063	70,175	\$52,631	\$3,314	32,060	89,500	\$71,594	\$1,000	34,340	97,356	\$82,588	\$0,000	93,111	255,188	\$209,760	\$29,300
2042	41	0.05949	0.51%	25,191	70,532	\$52,899	\$3,077	32,218	90,028	\$71,818	\$0,000	34,550	98,149	\$83,311	\$0,000	93,855	256,481	\$210,827	\$28,100
2043	42	0.05554	0.48%	25,313	70,878	\$53,157	\$2,842	32,367	90,527	\$72,038	\$0,000	34,758	98,944	\$84,033	\$0,000	94,599	257,731	\$211,855	\$26,900
2044	43	0.05194	0.47%	25,434	71,207	\$53,405	\$2,608	32,509	91,027	\$72,244	\$0,000	34,964	99,744	\$84,788	\$0,000	95,333	258,938	\$212,845	\$25,700
2045	44	0.04850	0.45%	25,545	71,526	\$53,645	\$2,376	32,651	91,533	\$72,444	\$0,000	35,168	100,554	\$85,533	\$0,000	96,066	260,099	\$213,811	\$24,500
2046	45	0.04510	0.43%	25,655	71,833	\$53,875	\$2,144	32,786	92,044	\$72,633	\$0,000	35,368	101,374	\$86,288	\$0,000	96,799	261,211	\$214,715	\$23,300
2047	46	0.04217	0.41%	25,764	72,128	\$54,098	\$1,912	32,915	92,554	\$72,818	\$0,000	35,564	102,199	\$87,055	\$0,000	97,533	262,285	\$215,596	\$22,100
2048	47	0.03937	0.39%	25,869	72,412	\$54,309	\$1,680	33,039	93,064	\$73,000	\$0,000	35,758	103,028	\$87,833	\$0,000	98,266	263,318	\$216,447	\$20,900
2049	48	0.03675	0.36%	25,969	72,688	\$54,514	\$1,453	33,158	93,574	\$73,177	\$0,000	35,950	103,859	\$88,611	\$0,000	98,999	264,312	\$217,264	\$19,700
2050	49	0.03430	0.36%	26,053	72,949	\$54,712	\$1,227	33,273	94,084	\$73,344	\$0,000	36,140	104,684						

Table D-6g

Summary of Average Annual Equivalent (AAEQ) Values for Recreational Vessels
According to General Vessel Class and Category of Benefit *

Ponce DeLeon Inlet, Florida

General Recreational Vessel Class (According to Length Overall [LOA] in Feet)	< 20	> 20; < 25	>= 25	Total(s)
Reductions in Damages Attributed to Severe or Significant Vessel Groundings:	\$25,600	\$42,320	\$43,720	\$111,640
Reductions in Damages Attributed to Vessel Capsizings:	\$20,830	\$22,710	\$7,830	\$51,370
Reductions in Damages Attributed to Unreported Vessel Damage Incidents:	\$61,480	\$68,110	\$15,240	\$144,830
Benefits derived from Changes in Unit\User Day Valuation(s) [UDV]:	\$39,730	\$58,650	\$59,950	\$158,330
Summary Total(s):	\$147,640	\$191,790	\$126,740	\$466,170

* Average annual equivalent (AAEQ) valuations based on a project economic life of fifty (50) years and an interest or discount rate of 7 1/8 (.07125) percent as authorized for assessment of water resources development projects for fiscal year (FY) 1998.

Table D-7

Ponce DeLeon Inlet, Florida

Summary of Average Annual Equivalent (AAEQ) Benefits With Proposed Improvements:

	Without Commercial Fishing Park	With Commercial Fishing Park
Commercial Benefits		
Charter Fishing Vessels	\$258,980	\$258,980
Efficiencies for Open Water Vessel Trials	\$32,000	\$32,000
Commercial Fishing Vessels		
- Rock Shrimp Fishery		
* Vessel Transit Efficiencies	n/a	\$30,490
* Landside Transportation Efficiencies	n/a	\$128,230
- Golden & Red Crab Fishery		
* Vessel Transit Efficiencies	n/a	\$47,370
* Landside Transportation Efficiencies	n/a	\$68,760
Placement of Marine Railway or Repair Facility	n/a	\$47,100
Total(s); Commercial Benefits	\$290,980	\$612,930
Recreational Benefits		
Private Recreational Vessels		
- Reductions in Damages for Severe Vessel Groundings	\$111,640	\$111,640
- Reductions in Damages for Vessel Capsizings	\$51,370	\$51,370
- Reductions in Damages for Unreported Damage Incidents	\$144,830	\$144,830
- Enhancement of Unit Day value(s)	\$158,330	\$158,330
Total(s); Recreation Benefits	\$466,170	\$466,170
Benefit Summary		
Commercial Benefits	\$290,980	\$612,930
Recreational Benefits	\$466,170	\$466,170
Summary Total(s); All Benefits	\$757,150	\$1,079,100

13 W

Description of Economic Analyses as Completed for Economic Justification of the South Jetty Extension (phase III as described preceding; completed in July of 1998; detailed study phases 3)

Subsequent to completion of the economic assessment of the north and south jetty extensions, revetment and fishing park, after further evaluation by the local constituency it was determined that the placement and operation of commercial seafood processing facilities was an unacceptable specification of the overall proposed project. Therefore, such landside features have been eliminated from further consideration for construction or placement. In addition, it was determined by the Jacksonville District with HQUSACE review that placement of the proposed revetment could be achieved or justified under requirements for future operation and maintenance (O&M) for the existing Federally-sponsored project. This represented a change in general position approximately four to five years earlier that any significant augmentation of the existing project would have to be economically justified as new work.

In an effort to explore the minimization of costs that would have to be economically justified (as new work), discussion(s) with Construction-Operations Division of the Jacksonville District subsequent to the determination that significant features would have to be primarily justified as new work did result in the allowance of the first 800 to 900 feet of a total landward extension of the north jetty (totaling 2,400 to 2,500) feet as a without-project condition requirement to protect integrity of the north jetty. The remainder of the landward extension therefore has been termed a revetment to clarify the difference between construction allowances that until recently would be Federally-sponsored under without-project conditions (an extension) compared to total and/or marginal allowances of the north jetty system that would be described for new work justification (a revetment). Given that the recent determination allows both the north jetty extension and connecting revetment to be placed under assumptions concerning requirements for future operation & maintenance, the only remaining costs to be analyzed for justification pertain to the south jetty extension. To determine related economic benefits, the separable or incremental effects of described features would have to be reasonably determined for economic studies. Previously it was presumed from an engineering and economic position that all waterway features as originally proposed were non-seperable and required together or in combination to achieve acceptable stabilization of the inlet system. To assess effects specific to the south Jetty, the location of sedimentation within the inlet system that may be prevented by the south jetty extension had to be assessed. Historical maintenance requirements were reviewed combined with further numerically-based sediment modeling to arrive at basic determination as to where sedimentation would occur and possibly

influence vessel operations. Related efforts resulted in findings that indicate the vast majority of sediment that would be precluded from entering the inlet system by the south jetty extension would otherwise fall within reaches of the Intracoastal Waterway (IWW) extending from reaches to the north of the Halifax river to the south past the confluence with the inlet waterway. As such it was determined that beneficial effects of the jetty extension regarding sediment transport would largely pertain to savings in maintenance for the IWW as opposed to reductions in vessel damages, especially for commercial vessels. Correspondingly, benefit estimates have been revised to reflect current assumptions. Revised estimates for benefits to commercial vessels total an average annual equivalent (AAEQ) value of \$48,000, while benefits to recreational craft total \$262,600.

- b.) savings in operations costs associated with marginal waterborne transit time due to occluded access waterways resulting from seasonal dynamics of the inlet system,

and;
- c.) lost operating revenue and income due to unnavigable conditions for commercial operators. Cost efficiencies or economic benefits for recreational craft were limited primarily to reductions in physical vessel damages, and applicable reductions in costs for reduced transit time (where applicable).

The estimated costs for such repairs for commercial vessels typically ranges from a low of about \$220 to a high of over \$2,300 with an average of approximately \$860 per occurrence. In addition, to benefits associated with direct costs of repairs or maintenance, benefits were also assessed for the operations expenses of delays or transit diversion due to inlet conditions unique to without-project conditions (i.e., such addition fuel or oil expended, etc.) and the value of time required for repairs or downtime, lost business or additional transit time and delays based on either computations for opportunity costs derived from vessel operations data, or in reference to general procedures as outlined in the IWR publication *The Value of Time Saved for Use in Corps Planning Studies - A Review of the Literature and Recommendations* (IWR publication 91-R-12; dated October 1991). As a result, average annual benefit valuations for commercial and recreational vessels is as follows:

- Reductions in Physical Damages to All Commercial Vessels (commercial fishing and charter sportfishing) -- > **\$91,640**
- Opportunity Costs Saved in Association with Reduction(s) in Physical Damages (Charter Operations) -- > **\$29,250**
- Operations Costs for Diversion and Delays for Commercial Fishing Vessels Due to Inlet Conditions --> **\$17,910**
- Harvest Yield Foregone for Commercial Vessels (longline and shrimp harvest operations) --> **\$11,290**
- Net Income Associated with Business Lost or Foregone for Charter Operations --> **\$27,650**
- Operations Costs for Diversion and Delays for Charter Fishing Vessels Due to Inlet Conditions --> **\$4,640**
- Opportunity Costs Saved in Association with Reduction(s) in Physical Damages (Longline\Commercial Fishing -- > **\$11,180**
- Operations Costs for Diversion and Delays for Transient or Seasonal Commercial Fishing Vessels Due to Inlet Conditions --> **\$29,660**

- Opportunity Costs Saved in Association with Reduction(s) in Physical Damages -- > \$15,720

Described benefits total \$238,940 for the existing vessel base which routinely uses the inlet system.

inflicting damages to propellers and hull surfaces which often do not required immediate pulling of the vessel for inspection and repair.

Therefore, based a preceding information, a weighted average of approximately 7.5 man-hours was utilized for incidence of labor time require for repairs. The aggregate applied value per unit of time for reduction of expenses associated with damages and related repairs or maintenance area is approximately \$11.48 per hour based on the value of 7.5 man-hours per occurrence for damage repairs deemed attributable to correctable conditions of the inlet

Reductions in Damages to Vessels. A density plot of a USCG search and rescue data base, figure __, indicates a total of 347 vessels aground during the FY-81 to FY-91 period. Almost all of the groundings shown are between the north and south jetties of the inlet, the Halifax River channel to the north, the Indian River channel to the south, or the throat of the inlet at the junction of Rock House Creek with those two channels. Discussions with USCG personnel at their Ponce De Leon Inlet Station, indicate that if a vessel runs aground and is not in immediate danger no USCG response is required. Grounded vessels not in immediate danger must rely on others such as salvage boat operators to assist them. The numbers shown represent only those vessels that went aground and required a USCG response.

An interview with a boat yard owner located on the north side of the inlet, reveals that he keeps his radio on constantly to assist boats passing along the Halifax River channel since it is not marked by the USCG. Many vessels run aground trying to reach his boat yard or the entrance channel but do not make it there for fear of running aground again. As a result those boaters go around the unmarked Halifax River channel by way of the AIWW.

Interviews with commercial vessel operators and boat yard owners in the area indicate an average of 35 to nearly 50 minutes one way as the additional time required to use the AIWW and the Indian River as an alternative access to the entrance channel when the Halifax River channel was shoaled-in during the prior breakthrough. During that breakthrough commercial charter boat and head boat operators as well as a boat yard located behind the north spit were shoaled in until the breakthrough was stopped and the shoals in their access channels and the Federal channel in the Halifax River were removed. All boat traffic along the Halifax River channel had to use the Intracoastal Waterway and

the Indian River channels as an alternative means of getting out of the inlet.

As a result of the continued migration of the entrance channel up against the north jetty and spit, unscheduled maintenance is estimated to start during the end of FY-93. The current plan involves placing maintenance material from the AIWW near Rock House Creek on the north spit in way of the potential breakthrough area. Other projected maintenance within the next three to six years involves placement of a scour apron along the landward end of the north jetty and placement of rock to fill in slumped areas. Estimates for the scour apron and additional rock to fill in slumped areas of the north jetty total \$1,444,000 and \$126,000 respectively (See Engineering Analysis Appendix B Plans C and D for details). Interviews with personnel from four marinas or boat yards and one propeller and shaft repair facility owner indicate an average of 3 propeller and shaft jobs per week over the course of a year. All of the Marinas or boat yards involved in the interview were located north of the inlet and were capable of hauling out boats for removal of propellers and shafts. The average cost of repairs was \$782. The total yearly cost for repairs to propellers and shafts from those four repair facilities is \$488,124.

With improvements to the inlet resulting in a more stable north channel which the USCG would agree to mark, it is estimated that 90 percent of the propeller and shaft repairs could be eliminated resulting in a savings of \$439,312 per year. Of that amount approximately 10 percent (\$43,391) is estimated to represent commercial vessels and 90 percent (\$395,380) recreational vessels.

If generally described improvements are not implemented improvements are not made, it is assumed that the following without improvement conditions will result.

Information assembled to-date indicates that an average minimum of 40 to 45 occurrences are expected each year which require vessel operators or owners to secure or perform repair services resulting in minimum value of time saved totaling approximately \$3,660 annually. Based on preceding values, the value for reductions in damages and associated labor time total approximately \$57,100 per year.

The values total or average on an annual basis approximately \$7,000 to \$9,000 dollars for hull or structural damages and approximately \$8,500 to \$12,000 for mechanical or machinery damages such as damaged propellers and steering gear. Allowing for application of averages of approximately \$15,500 and \$21,000 for hull and machinery damages respectively, annual estimated damages for catastrophic loss or severe damage incidents total an

expected minimum average of \$15,500 per year.

only during months of the year previously described when waterway conditions were deemed less than ideal.

Estimated costs for such repairs for commercial vessels typically ranges from a low of about \$220 to a high of over \$2,300 with an average of approximately \$860 per occurrence. In addition, to benefits associated with direct costs of repairs or maintenance, benefits were also assessed for the operations expenses of delays or transit diversion due to inlet conditions unique to without-project conditions (i.e., such addition fuel or oil expended, etc.) and the value of time required for repairs or downtime, lost business or additional transit time and delays based on either computations for opportunity costs derived from vessel operations data, or in reference to general procedures as outlined in the IWR publication *The Value of Time Saved for Use in Corps Planning Studies - A Review of the Literature and Recommendations* (IWR publication 91-R-12; dated October 1991). As a result, average annual benefit valuations for commercial and recreational vessels is as follows:

Described benefits total **\$238,940** for the existing vessel base which routinely uses the inlet system. In addition, recent information indicates that a new fishery will soon be open for the harvest of golden and red crab and it is projected the opening of this fishery will bring approximately 11 vessels to the inlet area for operations. Based on applicable procedures for analysis of net income, it is estimated that improved conditions will enable each vessel to increase its intensity of employment and harvest yield by approximately 4 to 5 percent or enable approximately two to three additional trips per year. Net income for exvessel compensation of harvests ranges from a probable minimum of approximately \$4,000 per trip to in excess of \$8,200 per trip. Applying an average of 2.5 trips per year per vessel and an average net increase in income \$5,290 per trip renders a benefit of approximately \$145,480 per year. Estimated benefits for these vessels for savings in time and operations expenses under with-project conditions total an additional 53,540 per year for a total commercial project economic benefit of **\$437,960** per year. Corresponding benefits for reduction in damages to recreational craft and value of time saved for inlet users equals approximately **\$248,210** and **\$24,290** respectively. These values provide a summary total of **\$710,460** of average annual equivalent benefits.

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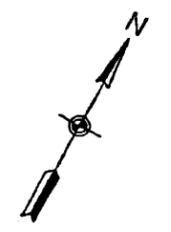
REVISIONS			
NO.	SYMBOL	DESCRIPTION	DATE APPROVED



LEGEND:
 G = APPROXIMATE VESSEL GROUNDING AREA
 B = ESTIMATE BUOY LOCATION AS OF 28 SEPT 95



SHEET INDEX



NOTES:
 1. REFER TO SURVEY NO. 94-325
 2. SEE SHEET NO. 1 FOR SURVEY NOTES
 3. VESSEL GROUNDINGS LOCATED BASED ON
 28 SEPT 95 MEETING WITH PONCE DE LEON
 INLET U.S. COAST GUARD AIDS TO NAVIGATION
 TEAM AND LIGHTHOUSE BOATYARD
 REPRESENTATIVES.

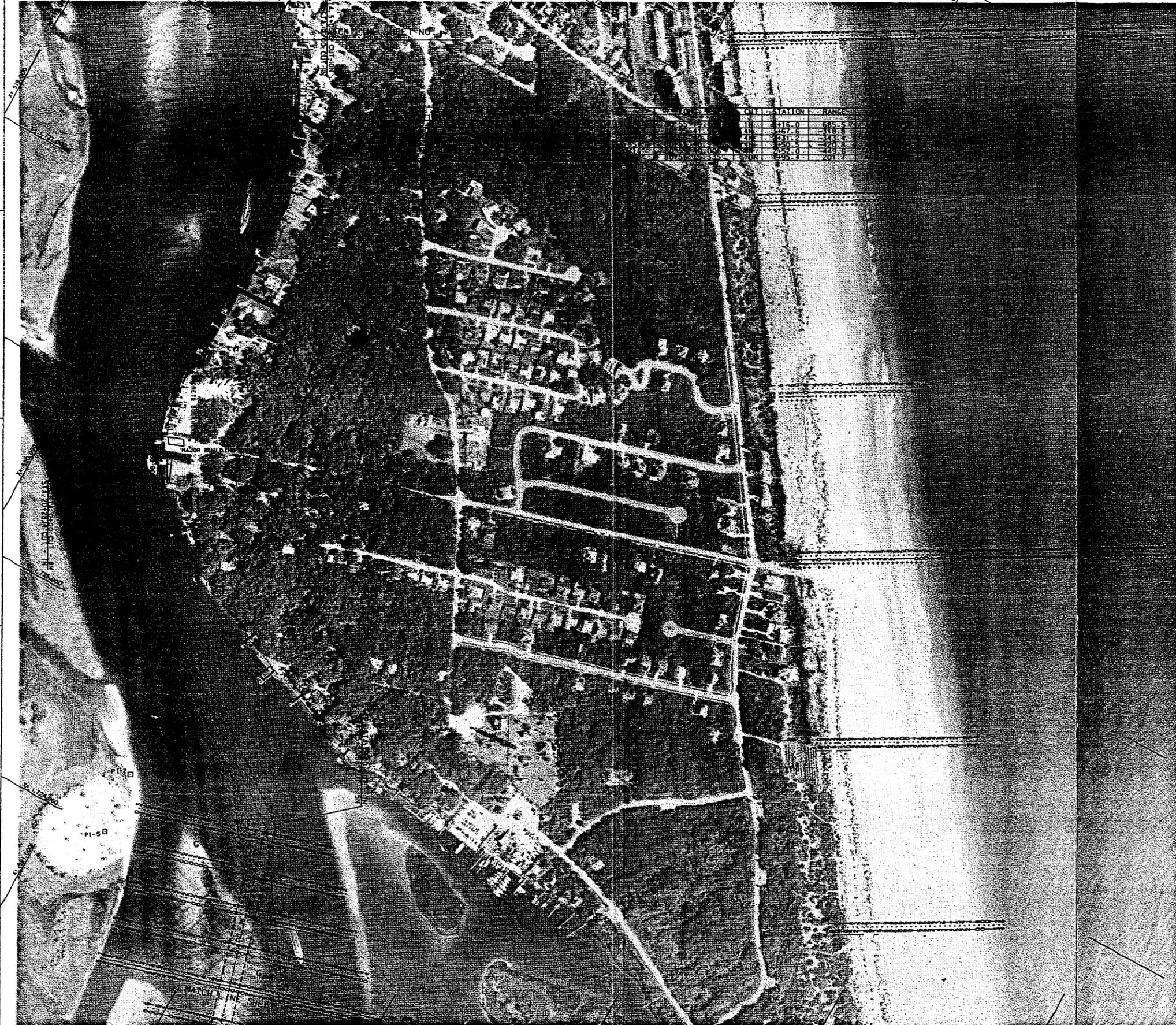


PONCE DE LEON INLET
 FEASIBILITY STUDY
 VESSEL GROUNDINGS

DATE:	SCALE: AS SHOWN	DATE: JUNE 1998	SHEET: 7 OF 8
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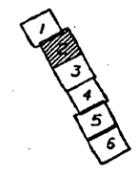
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REVISIONS			
NO.	SYMBOL	DESCRIPTION	DATE APPROVED

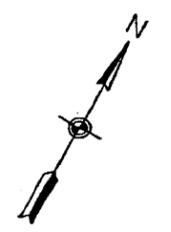


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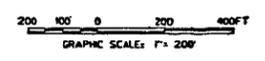
LEGEND:
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SHEET INDEX



NOTES:
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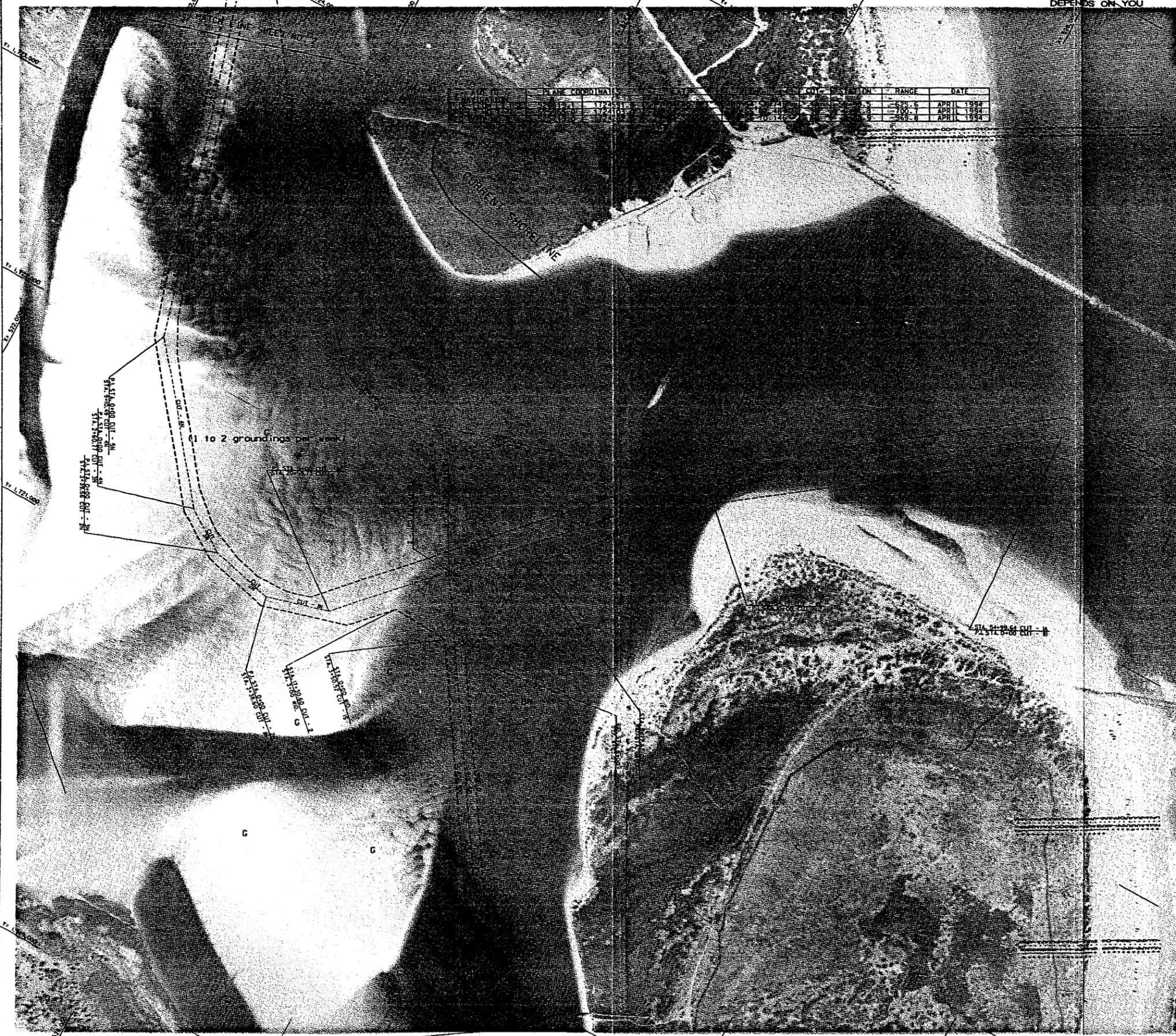


PONCE DE LEON INLET
FEASIBILITY STUDY
VESSEL GROUNDINGS

DRAWN BY: [] CHECKED BY: []
DATE: [] SCALE: AS SHOWN DATE: JUNE 1996 SHEET 2 OF 6

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REVISIONS			
NO.	SYMBOL	DESCRIPTION	DATE APPROVED



NO.	SYMBOL	DESCRIPTION	DATE
1			
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3			
4			
5			

LEGEND:
 1 - APPROXIMATE VESSEL GROUNDING AREA
 2 - ESTIMATED DRAFT LOCATION AS OF 28 SEPT 95



SHEET INDEX

NOTES:
 1. REFER TO SURVEY NO. 94-325
 2. SEE SHEET NO. 1 FOR SURVEY NOTES
 3. VESSEL GROUNDINGS LOCATED BASED ON
 4. ON SEPT 95 MEETING WITH PONCE DE LEON
 INLET U.S. COAST GUARD AIDS TO NAVIGATION
 TEAM AND LIGHTHOUSE BOATYARD
 REPRESENTATIVES.

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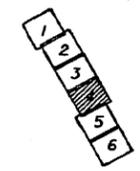
PONCE DE LEON INLET
 FEASIBILITY STUDY
 VESSEL GROUNDINGS

DATE: AS SHOWN DATE: JUNE 1996 SHEET 3 OF 6

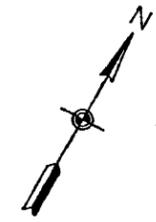
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REVISIONS		
NO.	SYM.ZONE	DESCRIPTION

LEGEND:
C = APPROXIMATE VESSEL GROUNDING AREA
B = ESTIMATED BUOY LOCATION AS OF 28 SEPT 95



SHEET INDEX

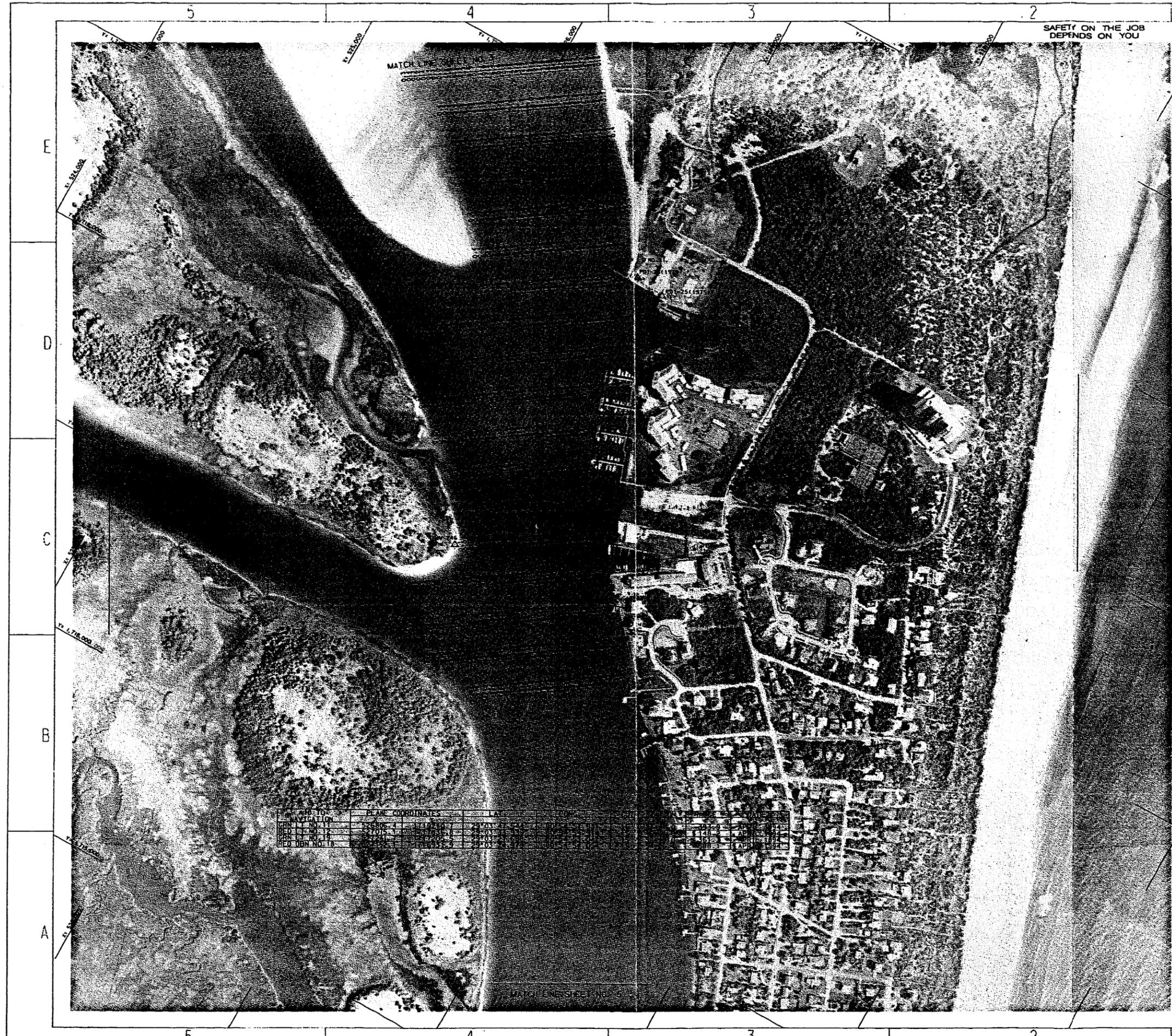


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PONCE DE LEON INLET
FEASIBILITY STUDY
VESSEL GROUNDINGS

DATE:	DATE PLOTTED:	DATE:	DATE PLOTTED:

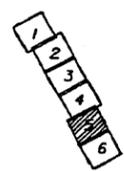


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6	526805.4	221015.3	22.05
7	526805.4	221015.3	22.05
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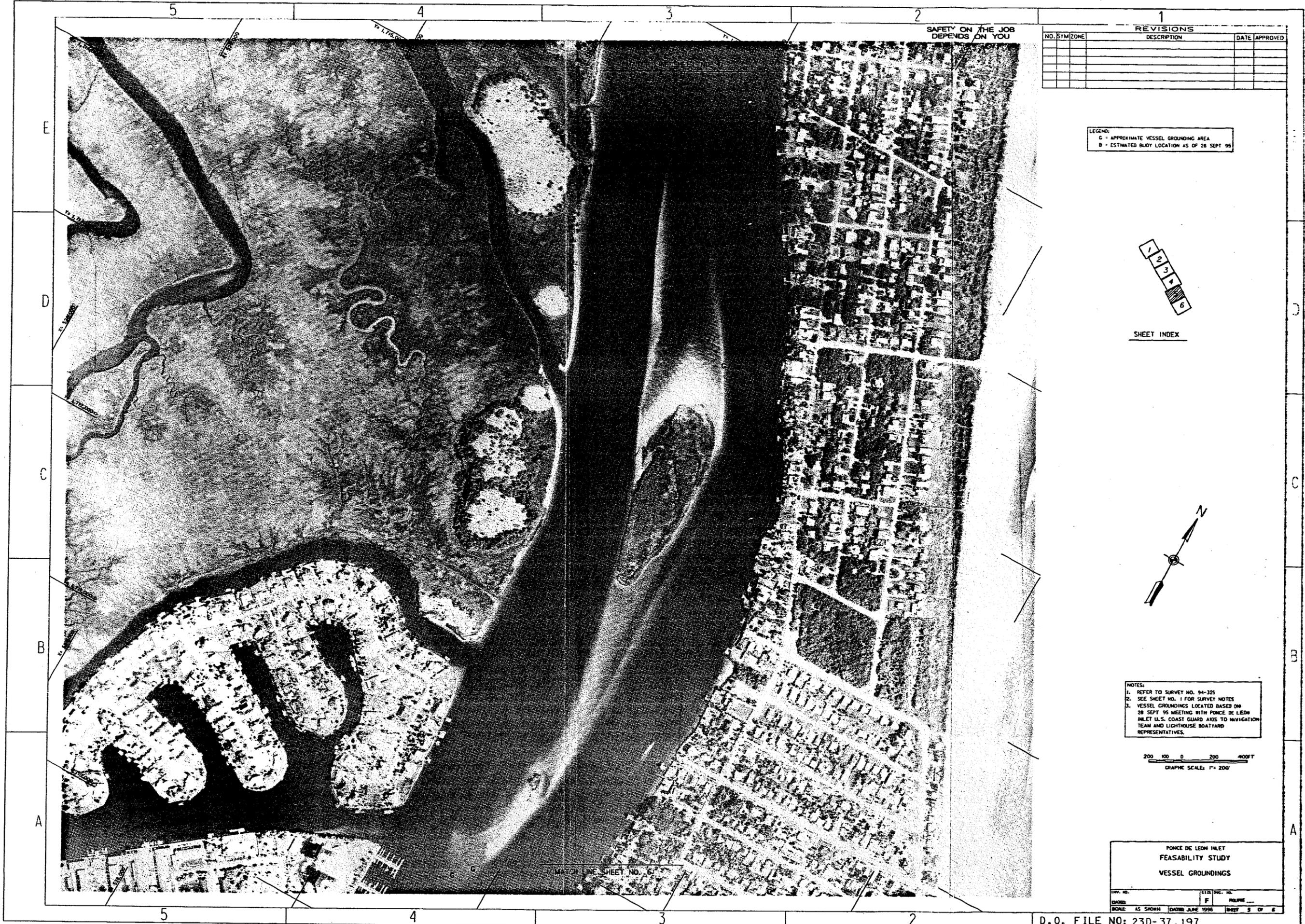


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 GRAPHIC SCALE: 1" = 200'

PONCE DE LEON INLET
 FEASIBILITY STUDY
 VESSEL GROUNDINGS

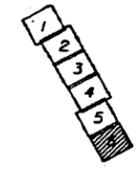
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 SCALE: AS SHOWN DATE: JUNE 1996 SHEET 5 OF 6



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REVISIONS					
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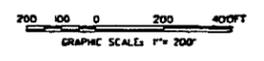
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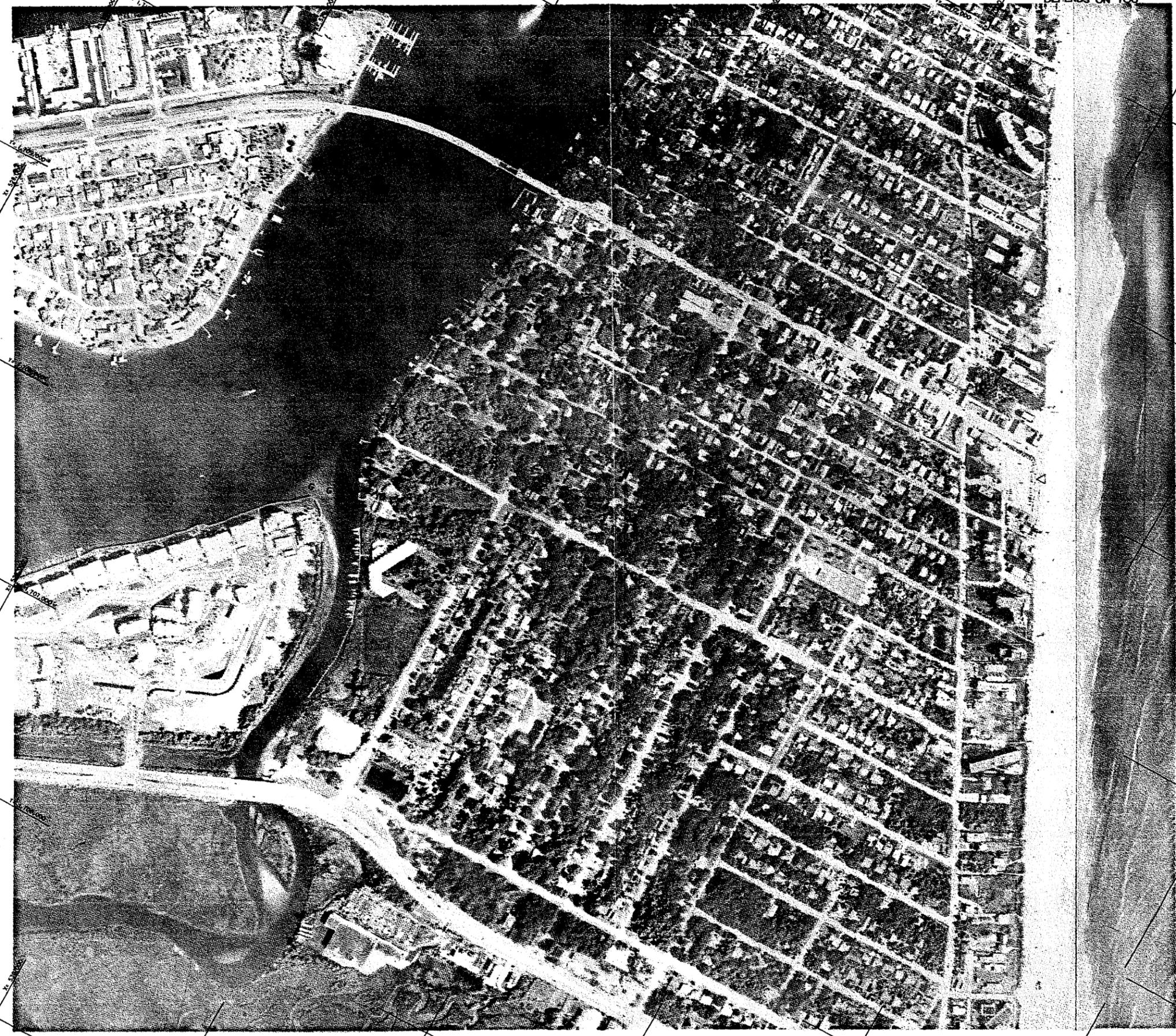


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PONCE DE LEON INLET
 FEASIBILITY STUDY
 VESSEL GROUNDINGS

DATE: AS SHOWN DATE: JUNE 1996 SHEET 6 OF 8



MAINTENANCE SAVINGS

Project Economic Life:
50 Years

Average Annual Equivalent (AAEQ) or
Capital Recovery Factor(S):

Interest Rate:	7.125%	7.125%	----->	0.073607
Calculated Rate:	9.125%	9.125%	----->	0.092424
OMB Rate:	10.000%	10.000%	----->	0.100859

Total Present Valuation(s),
Excluding Base Period:

Average Annual Equivalent
Valuations:

7.125%	----->	\$1,203,313	7.125%	----->	\$88,572
9.125%	----->	\$924,568	9.125%	----->	\$85,452
10.000%	----->	\$831,708	10.000%	----->	\$83,885

Applied Discount Factors

Year	Period	7.125%	9.125%	10.000%	Stream Values	7.125%	9.125%	10.000%
2001	0	1.00000	1.00000	1.00000	\$7,500	\$7,500	\$7,500	\$7,500
2002	1	0.93349	0.91638	0.90909	\$7,500	\$7,001	\$6,873	\$6,818
2003	2	0.87140	0.83975	0.82645	\$7,500	\$6,536	\$6,298	\$6,198
2004	3	0.81344	0.76953	0.75131	\$7,500	\$6,101	\$5,771	\$5,635
2005	4	0.75934	0.70518	0.68301	\$7,500	\$5,695	\$5,289	\$5,123
2006	5	0.70884	0.64622	0.62092	\$7,500	\$5,316	\$4,847	\$4,657
2007	6	0.66169	0.59218	0.56447	\$7,500	\$4,963	\$4,441	\$4,234
2008	7	0.61768	0.54266	0.51316	\$7,500	\$4,633	\$4,070	\$3,849
2009	8	0.57660	0.49729	0.46651	\$7,500	\$4,324	\$3,730	\$3,499
2010	9	0.53825	0.45570	0.42410	\$1,347,500	\$725,289	\$614,060	\$571,472
2011	10	0.50245	0.41760	0.38554	\$7,500	\$3,768	\$3,132	\$2,892
2012	11	0.46903	0.38268	0.35049	\$7,500	\$3,518	\$2,870	\$2,629
2013	12	0.43783	0.35068	0.31863	\$7,500	\$3,284	\$2,630	\$2,390
2014	13	0.40871	0.32135	0.28966	\$7,500	\$3,065	\$2,410	\$2,172
2015	14	0.38153	0.29448	0.26333	\$7,500	\$2,861	\$2,209	\$1,975
2016	15	0.35615	0.26986	0.23939	\$7,500	\$2,671	\$2,024	\$1,795
2017	16	0.33247	0.24729	0.21763	\$7,500	\$2,493	\$1,855	\$1,632
2018	17	0.31035	0.22661	0.19784	\$7,500	\$2,328	\$1,700	\$1,484
2019	18	0.28971	0.20767	0.17986	\$7,500	\$2,173	\$1,557	\$1,349
2020	19	0.27044	0.19030	0.16351	\$7,500	\$2,028	\$1,427	\$1,226
2021	20	0.25245	0.17439	0.14864	\$7,500	\$1,893	\$1,308	\$1,115
2022	21	0.23566	0.15981	0.13513	\$7,500	\$1,767	\$1,199	\$1,013
2023	22	0.21999	0.14644	0.12285	\$7,500	\$1,650	\$1,098	\$921
2024	23	0.20536	0.13420	0.11168	\$1,347,500	\$276,719	\$180,830	\$150,486
2025	24	0.19170	0.12298	0.10153	\$7,500	\$1,438	\$922	\$761
2026	25	0.17895	0.11269	0.09230	\$7,500	\$1,342	\$845	\$692
2027	26	0.16705	0.10327	0.08391	\$7,500	\$1,253	\$775	\$629
2028	27	0.15594	0.09463	0.07628	\$7,500	\$1,170	\$710	\$572
2029	28	0.14556	0.08672	0.06934	\$7,500	\$1,092	\$650	\$520
2030	29	0.13588	0.07947	0.06304	\$7,500	\$1,019	\$596	\$473
2031	30	0.12685	0.07282	0.05731	\$7,500	\$951	\$546	\$430
2032	31	0.11841	0.06673	0.05210	\$7,500	\$888	\$501	\$391
2033	32	0.11053	0.06115	0.04736	\$7,500	\$829	\$459	\$355
2034	33	0.10318	0.05604	0.04306	\$7,500	\$774	\$420	\$323
2035	34	0.09632	0.05135	0.03914	\$7,500	\$722	\$385	\$294
2036	35	0.08991	0.04706	0.03558	\$7,500	\$674	\$353	\$267
2037	36	0.08393	0.04312	0.03235	\$7,500	\$629	\$323	\$243
2038	37	0.07835	0.03952	0.02941	\$1,347,500	\$105,577	\$53,251	\$39,628
2039	38	0.07314	0.03621	0.02673	\$7,500	\$549	\$272	\$201
2040	39	0.06827	0.03319	0.02430	\$7,500	\$512	\$249	\$182
2041	40	0.06373	0.03041	0.02209	\$7,500	\$478	\$228	\$166
2042	41	0.05949	0.02787	0.02009	\$7,500	\$446	\$209	\$151
2043	42	0.05554	0.02554	0.01826	\$7,500	\$417	\$192	\$137
2044	43	0.05184	0.02340	0.01660	\$7,500	\$389	\$176	\$125
2045	44	0.04840	0.02145	0.01509	\$7,500	\$363	\$161	\$113
2046	45	0.04518	0.01965	0.01372	\$7,500	\$339	\$147	\$103
2047	46	0.04217	0.01801	0.01247	\$7,500	\$316	\$135	\$94
2048	47	0.03937	0.01650	0.01134	\$7,500	\$295	\$124	\$85
2049	48	0.03675	0.01512	0.01031	\$7,500	\$276	\$113	\$77
2050	49	0.03430	0.01386	0.00937	\$7,500	\$257	\$104	\$70
2051	50	0.03202	0.01270	0.00852	\$7,500	\$240	\$95	\$64

Project Economic Life:		Average Annual Equivalent (AAEQ) or Capital Recovery Factor(S):		
50 Years				
Current Rate:	7.125%	7.125%	----->	0.073607
Escalated Rate:	9.125%	9.125%	----->	0.092424
OMB Rate:	10.000%	10.000%	----->	0.100859

Total Present Valuation(s), Excluding Base Period:		Average Annual Equivalent Valuations:				
	7.125%	----->	\$306,680	7.125%	----->	\$22,574
	9.125%	----->	\$204,488	9.125%	----->	\$18,900
	10.000%	----->	\$172,074	10.000%	----->	\$17,355

Year	Period	Applied Discount Factors			Stream Values	Average Annual Equivalent Valuations:		
		7.125%	9.125%	10.000%		7.125%	9.125%	10.000%
2001	0	1.00000	1.00000	1.00000	\$7,500	\$7,500	\$7,500	\$7,500
2002	1	0.93349	0.91638	0.90909	\$0	\$0	\$0	\$0
2003	2	0.87140	0.83975	0.82645	\$0	\$0	\$0	\$0
2004	3	0.81344	0.76953	0.75131	\$7,500	\$6,101	\$5,771	\$5,635
2005	4	0.75934	0.70518	0.68301	\$0	\$0	\$0	\$0
2006	5	0.70884	0.64622	0.62092	\$0	\$0	\$0	\$0
2007	6	0.66169	0.59218	0.56447	\$7,500	\$4,963	\$4,441	\$4,234
2008	7	0.61768	0.54266	0.51316	\$0	\$0	\$0	\$0
2009	8	0.57660	0.49729	0.46651	\$0	\$0	\$0	\$0
2010	9	0.53825	0.45570	0.42410	\$7,500	\$4,037	\$3,418	\$3,181
2011	10	0.50245	0.41760	0.38554	\$0	\$0	\$0	\$0
2012	11	0.46903	0.38268	0.35049	\$0	\$0	\$0	\$0
2013	12	0.43783	0.35068	0.31863	\$7,500	\$3,284	\$2,630	\$2,390
2014	13	0.40871	0.32135	0.28966	\$0	\$0	\$0	\$0
2015	14	0.38153	0.29448	0.26333	\$0	\$0	\$0	\$0
2016	15	0.35615	0.26986	0.23939	\$7,500	\$2,671	\$2,024	\$1,795
2017	16	0.33247	0.24729	0.21763	\$0	\$0	\$0	\$0
2018	17	0.31035	0.22661	0.19784	\$0	\$0	\$0	\$0
2019	18	0.28971	0.20767	0.17986	\$7,500	\$2,173	\$1,557	\$1,349
2020	19	0.27044	0.19030	0.16351	\$0	\$0	\$0	\$0
2021	20	0.25245	0.17439	0.14864	\$0	\$0	\$0	\$0
2022	21	0.23566	0.15981	0.13513	\$7,500	\$1,767	\$1,199	\$1,013
2023	22	0.21999	0.14644	0.12285	\$0	\$0	\$0	\$0
2024	23	0.20536	0.13420	0.11168	\$1,340,000	\$275,179	\$179,824	\$149,649
2025	24	0.19170	0.12298	0.10153	\$7,500	\$1,438	\$922	\$761
2026	25	0.17895	0.11269	0.09230	\$0	\$0	\$0	\$0
2027	26	0.16705	0.10327	0.08391	\$0	\$0	\$0	\$0
2028	27	0.15594	0.09463	0.07628	\$7,500	\$1,170	\$710	\$572
2029	28	0.14556	0.08672	0.06934	\$0	\$0	\$0	\$0
2030	29	0.13588	0.07947	0.06304	\$0	\$0	\$0	\$0
2031	30	0.12685	0.07282	0.05731	\$7,500	\$951	\$546	\$430
2032	31	0.11841	0.06673	0.05210	\$0	\$0	\$0	\$0
2033	32	0.11053	0.06115	0.04736	\$0	\$0	\$0	\$0
2034	33	0.10318	0.05604	0.04306	\$7,500	\$774	\$420	\$323
2035	34	0.09632	0.05135	0.03914	\$0	\$0	\$0	\$0
2036	35	0.08991	0.04706	0.03558	\$0	\$0	\$0	\$0
2037	36	0.08393	0.04312	0.03235	\$7,500	\$629	\$323	\$243
2038	37	0.07835	0.03952	0.02941	\$0	\$0	\$0	\$0
2039	38	0.07314	0.03621	0.02673	\$0	\$0	\$0	\$0
2040	39	0.06827	0.03319	0.02430	\$7,500	\$512	\$249	\$182
2041	40	0.06373	0.03041	0.02209	\$0	\$0	\$0	\$0
2042	41	0.05949	0.02787	0.02009	\$0	\$0	\$0	\$0
2043	42	0.05554	0.02554	0.01826	\$7,500	\$417	\$192	\$137
2044	43	0.05184	0.02340	0.01660	\$0	\$0	\$0	\$0
2045	44	0.04840	0.02145	0.01509	\$0	\$0	\$0	\$0
2046	45	0.04518	0.01965	0.01372	\$7,500	\$339	\$147	\$103
2047	46	0.04217	0.01801	0.01247	\$0	\$0	\$0	\$0
2048	47	0.03937	0.01650	0.01134	\$0	\$0	\$0	\$0
2049	48	0.03675	0.01512	0.01031	\$7,500	\$276	\$113	\$77
2050	49	0.03430	0.01386	0.00937	\$0	\$0	\$0	\$0
2051	50	0.03202	0.01270	0.00852	\$0	\$0	\$0	\$0

Project Economic Life:
50 Years

Average Annual Equivalent (AAEQ) or
Capital Recovery Factor(S):

Interest Rate:	7.125%	7.125% ---->	0.073607
Rated Rate:	9.125%	9.125% ---->	0.092424
Base Rate:	10.000%	10.000% ---->	0.100859

Total Present Valuation(s),
Excluding Base Period:

Average Annual Equivalent
Valuations:

7.125% ---->	\$213,049	7.125% ---->	\$15,682
9.125% ---->	\$139,767	9.125% ---->	\$12,918
10.000% ---->	\$116,667	10.000% ---->	\$11,757

Applied Discount Factors

Year	Period	Applied Discount Factors			Stream Values	7.125% 9.125% 10.000%		
		7.125%	9.125%	10.000%		7.125%	9.125%	10.000%
2001	0	1.00000	1.00000	1.00000	\$1,000	\$1,000	\$1,000	\$1,000
2002	1	0.93349	0.91638	0.90909	\$0	\$0	\$0	\$0
2003	2	0.87140	0.83975	0.82645	\$0	\$0	\$0	\$0
2004	3	0.81344	0.76953	0.75131	\$1,000	\$813	\$770	\$751
2005	4	0.75934	0.70518	0.68301	\$0	\$0	\$0	\$0
2006	5	0.70884	0.64622	0.62092	\$0	\$0	\$0	\$0
2007	6	0.66169	0.59218	0.56447	\$1,000	\$662	\$592	\$564
2008	7	0.61768	0.54266	0.51316	\$0	\$0	\$0	\$0
2009	8	0.57660	0.49729	0.46651	\$0	\$0	\$0	\$0
2010	9	0.53825	0.45670	0.42410	\$1,000	\$538	\$456	\$424
2011	10	0.50245	0.41760	0.38554	\$0	\$0	\$0	\$0
2012	11	0.46903	0.38268	0.35049	\$0	\$0	\$0	\$0
2013	12	0.43783	0.35068	0.31863	\$1,000	\$438	\$351	\$318
2014	13	0.40871	0.32135	0.28966	\$0	\$0	\$0	\$0
2015	14	0.38153	0.29448	0.26333	\$0	\$0	\$0	\$0
2016	15	0.35615	0.26986	0.23939	\$1,000	\$356	\$270	\$239
2017	16	0.33247	0.24729	0.21763	\$0	\$0	\$0	\$0
2018	17	0.31035	0.22661	0.19784	\$0	\$0	\$0	\$0
2019	18	0.28971	0.20767	0.17986	\$1,000	\$290	\$208	\$180
2020	19	0.27044	0.19030	0.16351	\$0	\$0	\$0	\$0
2021	20	0.25245	0.17439	0.14864	\$0	\$0	\$0	\$0
2022	21	0.23566	0.15981	0.13513	\$1,000	\$236	\$160	\$135
2023	22	0.21999	0.14644	0.12285	\$0	\$0	\$0	\$0
2024	23	0.20536	0.13420	0.11168	\$1,017,000	\$208,849	\$136,478	\$113,577
2025	24	0.19170	0.12298	0.10153	\$1,000	\$192	\$123	\$102
2026	25	0.17895	0.11269	0.09230	\$0	\$0	\$0	\$0
2027	26	0.16705	0.10327	0.08391	\$0	\$0	\$0	\$0
2028	27	0.15594	0.09463	0.07628	\$1,000	\$156	\$95	\$76
2029	28	0.14556	0.08672	0.06934	\$0	\$0	\$0	\$0
2030	29	0.13588	0.07947	0.06304	\$0	\$0	\$0	\$0
2031	30	0.12685	0.07282	0.05731	\$1,000	\$127	\$73	\$57
2032	31	0.11841	0.06673	0.05210	\$0	\$0	\$0	\$0
2033	32	0.11053	0.06115	0.04736	\$0	\$0	\$0	\$0
2034	33	0.10318	0.05604	0.04306	\$1,000	\$103	\$56	\$43
2035	34	0.09632	0.05135	0.03914	\$0	\$0	\$0	\$0
2036	35	0.08991	0.04706	0.03558	\$0	\$0	\$0	\$0
2037	36	0.08393	0.04312	0.03235	\$1,000	\$84	\$43	\$32
2038	37	0.07835	0.03952	0.02941	\$0	\$0	\$0	\$0
2039	38	0.07314	0.03621	0.02673	\$0	\$0	\$0	\$0
2040	39	0.06827	0.03319	0.02430	\$1,000	\$68	\$33	\$24
2041	40	0.06373	0.03041	0.02209	\$0	\$0	\$0	\$0
2042	41	0.05949	0.02787	0.02009	\$0	\$0	\$0	\$0
2043	42	0.05554	0.02554	0.01826	\$1,000	\$56	\$26	\$18
2044	43	0.05184	0.02340	0.01660	\$0	\$0	\$0	\$0
2045	44	0.04840	0.02145	0.01509	\$0	\$0	\$0	\$0
2046	45	0.04518	0.01965	0.01372	\$1,000	\$45	\$20	\$14
2047	46	0.04217	0.01801	0.01247	\$0	\$0	\$0	\$0
2048	47	0.03937	0.01650	0.01134	\$0	\$0	\$0	\$0
2049	48	0.03675	0.01512	0.01031	\$1,000	\$37	\$15	\$10
2050	49	0.03430	0.01386	0.00937	\$0	\$0	\$0	\$0
2051	50	0.03202	0.01270	0.00852	\$0	\$0	\$0	\$0

Year	Period	Applied Discount Factors			Average Annual Equivalent (AAEQ) or Capital Recovery Factor (CRF)			Average Annual Equivalent (AAEQ) or Capital Recovery Factor (CRF)			Average Annual Equivalent (AAEQ) or Capital Recovery Factor (CRF)			Average Annual Equivalent (AAEQ) or Capital Recovery Factor (CRF)		
		7.125%	7.000%	10.000%	7.125%	7.000%	10.000%	7.125%	7.000%	10.000%	7.125%	7.000%	10.000%	7.125%	7.000%	10.000%
2002	0	1.00000	1.00000	1.00000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2003	1	0.97140	0.97140	0.97140	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2004	2	0.94380	0.94380	0.94380	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2005	3	0.91620	0.91620	0.91620	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2006	4	0.88860	0.88860	0.88860	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2007	5	0.86100	0.86100	0.86100	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2008	6	0.83340	0.83340	0.83340	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2009	7	0.80580	0.80580	0.80580	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2010	8	0.77820	0.77820	0.77820	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2011	9	0.75060	0.75060	0.75060	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2012	10	0.72300	0.72300	0.72300	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2013	11	0.69540	0.69540	0.69540	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2014	12	0.66780	0.66780	0.66780	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2015	13	0.64020	0.64020	0.64020	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2016	14	0.61260	0.61260	0.61260	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2017	15	0.58500	0.58500	0.58500	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2018	16	0.55740	0.55740	0.55740	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2019	17	0.52980	0.52980	0.52980	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2020	18	0.50220	0.50220	0.50220	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2021	19	0.47460	0.47460	0.47460	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2022	20	0.44700	0.44700	0.44700	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2023	21	0.41940	0.41940	0.41940	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2024	22	0.39180	0.39180	0.39180	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2025	23	0.36420	0.36420	0.36420	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2026	24	0.33660	0.33660	0.33660	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2027	25	0.30900	0.30900	0.30900	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2028	26	0.28140	0.28140	0.28140	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2029	27	0.25380	0.25380	0.25380	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2030	28	0.22620	0.22620	0.22620	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2031	29	0.19860	0.19860	0.19860	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2032	30	0.17100	0.17100	0.17100	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2033	31	0.14340	0.14340	0.14340	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2034	32	0.11580	0.11580	0.11580	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2035	33	0.08820	0.08820	0.08820	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2036	34	0.06060	0.06060	0.06060	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2037	35	0.03300	0.03300	0.03300	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2038	36	0.00540	0.00540	0.00540	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2039	37	0.00000	0.00000	0.00000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2040	38	0.00000	0.00000	0.00000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2041	39	0.00000	0.00000	0.00000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2042	40	0.00000	0.00000	0.00000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2043	41	0.00000	0.00000	0.00000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2044	42	0.00000	0.00000	0.00000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2045	43	0.00000	0.00000	0.00000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2046	44	0.00000	0.00000	0.00000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2047	45	0.00000	0.00000	0.00000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2048	46	0.00000	0.00000	0.00000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2049	47	0.00000	0.00000	0.00000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2050	48	0.00000	0.00000	0.00000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2051	49	0.00000	0.00000	0.00000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2051	50	0.03202	0.03395	0.00852	\$40,337	\$50,182	\$12,328	\$1,083,118	\$34,044	\$36,050	\$9,058	\$0	\$0	\$0	\$0	\$0

Beach/DIA
 Upland/DIA then pump to beach

Price Decline Method: N/A (N/A)
 Project Economic Life: 50 Years
 Current Rate: 7.125%
 Base Rate: 7.000%
 OMS Rate: 10.000%

FINANCE WITHOUT PROJECT BEACH/DIA

Form 3.15

Average Annual Equivalent (AAEQ) or
 Capital Recovery Factor(S):
 7.125%> 0.072607
 7.000%> 0.072460
 10.000%> 0.100859

Total Present Valuation,
 Excluding Base Period:
 7.125%> \$3,998,721
 7.000%> \$3,971,159
 10.000%> \$2,876,192

Average Annual Equivalent
 Valuation:
 7.125%> \$294,334
 7.000%> \$287,910
 10.000%> \$205,514

Average Annual Equivalent (AAEQ) or
 Capital Recovery Factor(S):
 7.125%> 0.072607
 7.000%> 0.072460
 10.000%> 0.100859

Total Present Valuation,
 Excluding Base Period:
 7.125%> \$3,085,312
 7.000%> \$3,057,650
 10.000%> \$1,951,479

Average Annual Equivalent
 Valuation:
 7.125%> \$225,202
 7.000%> \$227,039
 10.000%> \$186,825

Average Annual Equivalent (AAEQ) or
 Capital Recovery Factor(S):
 7.125%> 0.072607
 7.000%> 0.072460
 10.000%> 0.100859

Total Present Valuation,
 Excluding Base Period:
 7.125%> \$3,085,312
 7.000%> \$3,057,650
 10.000%> \$1,951,479

Year	Applied Discount Factors			0 FEET ADVANCED MAINTENANCE			1 FOOT ADVANCED MAINTENANCE			2 FEET ADVANCED MAINTENANCE			3 FEET ADVANCED MAINTENANCE			4 FEET ADVANCED MAINTENANCE			
	Period	7.125%	7.000%	10.000%	7.125%	7.000%	10.000%	7.125%	7.000%	10.000%	7.125%	7.000%	10.000%	7.125%	7.000%	10.000%	7.125%	7.000%	10.000%
2001	0	1.00000	1.00000	1.00000	\$2,562,645	\$2,562,645	\$2,562,645	\$2,806,313	\$2,806,313	\$2,806,313	\$3,136,877	\$3,136,877	\$3,136,877	\$3,136,877	\$3,136,877	\$3,136,877	\$3,136,877	\$3,136,877	\$3,136,877
2002	1	0.92463	0.92463	0.92463	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2003	2	0.85140	0.85140	0.85140	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2004	3	0.78134	0.78134	0.78134	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2005	4	0.71344	0.71344	0.71344	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2006	5	0.64759	0.64759	0.64759	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2007	6	0.58364	0.58364	0.58364	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2008	7	0.52156	0.52156	0.52156	\$2,562,645	\$1,983,094	\$1,315,206	\$2,806,313	\$1,510,433	\$1,550,436	\$1,190,110	\$3,136,877	\$1,576,118	\$1,584,029	\$1,209,402	\$3,136,877	\$1,626,277	\$3,136,877	\$1,626,277
2009	8	0.46125	0.46125	0.46125	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2010	9	0.40245	0.40245	0.40245	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2011	10	0.34503	0.34503	0.34503	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2012	11	0.28993	0.28993	0.28993	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2013	12	0.23703	0.23703	0.23703	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2014	13	0.18613	0.18613	0.18613	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2015	14	0.13713	0.13713	0.13713	\$2,562,645	\$977,647	\$974,909	\$2,806,313	\$813,020	\$890,287	\$594,749	\$3,136,877	\$791,319	\$810,628	\$466,277	\$3,136,877	\$846,277	\$3,136,877	\$846,277
2016	15	0.09003	0.09003	0.09003	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2017	16	0.04493	0.04493	0.04493	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2018	17	0.00183	0.00183	0.00183	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2019	18	0.26971	0.26971	0.26971	\$2,562,645	\$1,983,094	\$1,315,206	\$2,806,313	\$1,510,433	\$1,550,436	\$1,190,110	\$3,136,877	\$1,576,118	\$1,584,029	\$1,209,402	\$3,136,877	\$1,626,277	\$3,136,877	\$1,626,277
2020	19	0.27044	0.27044	0.27044	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2021	20	0.25245	0.25245	0.25245	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2022	21	0.23596	0.23596	0.23596	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2023	22	0.22096	0.22096	0.22096	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2024	23	0.20738	0.20738	0.20738	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2025	24	0.19515	0.19515	0.19515	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2026	25	0.18425	0.18425	0.18425	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2027	26	0.17459	0.17459	0.17459	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2028	27	0.16603	0.16603	0.16603	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2029	28	0.15856	0.15856	0.15856	\$2,562,645	\$1,983,094	\$1,315,206	\$2,806,313	\$1,510,433	\$1,550,436	\$1,190,110	\$3,136,877	\$1,576,118	\$1,584,029	\$1,209,402	\$3,136,877	\$1,626,277	\$3,136,877	\$1,626,277
2030	29	0.15218	0.15218	0.15218	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2031	30	0.14685	0.14685	0.14685	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2032	31	0.14253	0.14253	0.14253	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2033	32	0.13918	0.13918	0.13918	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2034	33	0.13674	0.13674	0.13674	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2035	34	0.13514	0.13514	0.13514	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2036	35	0.13425	0.13425	0.13425	\$2,562,645	\$1,983,094	\$1,315,206	\$2,806,313	\$1,510,433	\$1,550,436	\$1,190,110	\$3,136,877	\$1,576,118	\$1,584,029	\$1,209,402	\$3,136,877	\$1,626,277	\$3,136,877	\$1,626,277
2037	36	0.13396	0.13396	0.13396	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2038	37	0.13425	0.13425	0.13425	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2039	38	0.13514	0.13514	0.13514	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2040	39	0.13674	0.13674	0.13674	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2041	40	0.13918	0.13918	0.13918	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2042	41	0.14253	0.14253	0.14253	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2043	42	0.14685	0.14685	0.14685	\$2,562,645	\$1,983,094	\$1,315,206	\$2,806,313	\$1,510,433	\$1,550,436	\$1,190,110	\$3,136,877	\$1,576,118	\$1,584,029	\$1,209,402	\$3,136,877	\$1,626,277	\$3,136,877	\$1,626,277
2044	43	0.15184	0.15184	0.15184	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2045	44	0.15856	0.15856	0.15856	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2046	45	0.16603	0.16603	0.16603	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2047	46	0.17459	0.17459	0.17459	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2048	47	0.18425	0.18425	0.18425	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2049	48	0.19515	0.19515	0.19515	\$2,562,645	\$1,983,094	\$1,315,206	\$2,806,313	\$1,510,433	\$1,550,436	\$1,190,110	\$3,136,877	\$1,576,118	\$1,584,029	\$1,209,402	\$3,136,877	\$1,626,277	\$3,136,877	\$1,626,277
2050	49	0.20738	0.20738	0.20738	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2051	50	0.22096	0.22096	0.22096	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Beach/DIA

Beach/DIA

Beach/DIA

Beach/DIA

Beach/DIA

Beach/DIA

Beach/DIA

Project Economic Life: 50 Years
 Current Rate: 7.125%
 OMS Rate: 7.000%
 OMS Rate: 10.000%

ASSUMPTIONS:
 Applied Discount Factors: 7.125% 7.000% 10.000%

Year	Period	7.125%	7.000%	10.000%	Average Annual Equivalent (AAEQ) or Capital Recovery Factor(S)	Average Annual Equivalent (AAEQ) or Capital Recovery Factor(S)	Average Annual Equivalent (AAEQ) or Capital Recovery Factor(S)	Total Present Value(Initial, Excluding Base Period)	Total Present Value(Initial, Excluding Base Period)	Total Present Value(Initial, Excluding Base Period)	Average Annual Equivalent Value(S)	Stream Value	Left Bank Intermoney	10.000%	7.125%	7.000%	10.000%
2001	0	1.00000	1.00000	1.00000	\$1,656,437	\$1,656,437	\$1,656,437	\$1,656,437	\$1,656,437	\$1,656,437	\$1,656,437	\$1,656,437	\$1,656,437	\$1,656,437	\$1,656,437	\$1,656,437	\$1,656,437
2001	1	0.93249	0.93249	0.93249	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	2	0.87140	0.87140	0.87140	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	3	0.81640	0.81640	0.81640	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	4	0.76734	0.76734	0.76734	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	5	0.72460	0.72460	0.72460	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	6	0.68784	0.68784	0.68784	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	7	0.65656	0.65656	0.65656	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	8	0.63016	0.63016	0.63016	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	9	0.60816	0.60816	0.60816	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	10	0.59024	0.59024	0.59024	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	11	0.57592	0.57592	0.57592	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	12	0.56368	0.56368	0.56368	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	13	0.55304	0.55304	0.55304	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	14	0.54384	0.54384	0.54384	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	15	0.53504	0.53504	0.53504	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	16	0.52664	0.52664	0.52664	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	17	0.51864	0.51864	0.51864	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	18	0.51104	0.51104	0.51104	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	19	0.50384	0.50384	0.50384	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	20	0.49704	0.49704	0.49704	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	21	0.49064	0.49064	0.49064	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	22	0.48464	0.48464	0.48464	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	23	0.47904	0.47904	0.47904	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	24	0.47384	0.47384	0.47384	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	25	0.46904	0.46904	0.46904	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	26	0.46464	0.46464	0.46464	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	27	0.46064	0.46064	0.46064	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	28	0.45704	0.45704	0.45704	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	29	0.45384	0.45384	0.45384	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	30	0.45104	0.45104	0.45104	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	31	0.44864	0.44864	0.44864	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	32	0.44664	0.44664	0.44664	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	33	0.44504	0.44504	0.44504	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	34	0.44384	0.44384	0.44384	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	35	0.44304	0.44304	0.44304	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	36	0.44264	0.44264	0.44264	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	37	0.44244	0.44244	0.44244	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	38	0.44244	0.44244	0.44244	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	39	0.44264	0.44264	0.44264	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	40	0.44304	0.44304	0.44304	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	41	0.44364	0.44364	0.44364	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	42	0.44444	0.44444	0.44444	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	43	0.44544	0.44544	0.44544	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	44	0.44664	0.44664	0.44664	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	45	0.44804	0.44804	0.44804	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	46	0.44964	0.44964	0.44964	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	47	0.45144	0.45144	0.45144	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	48	0.45344	0.45344	0.45344	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	49	0.45564	0.45564	0.45564	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	50	0.45804	0.45804	0.45804	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

COST ESTIMATE

Maintenance Efficiencies

Mon 27 Jul 1998
Eff. Date 07/15/98

U.S. Army Corps of Engineers
PROJECT PDL820: Ponce de Leon Inlet - Feasibility Report

TIME 09:40:42

TITLE PAGE 1

Ponce de Leon Inlet
Feasibility Report
Volusia County, Florida

Designed By: Jacksonville District Office
Estimated By: M Fascher

Prepared By: M Fascher

Preparation Date: 07/15/98
Effective Date of Pricing: 07/15/98

Sales Tax: 6.00%

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Composer GOLD Software Copyright (c) 1985-1994
by Building Systems Design, Inc.
Release 5.30A

LABOR ID: NAT94A EQUIP ID: RG0395

Currency in DOLLARS

CREW ID: NAT95B UPB ID: NAT92A

Mon 27 Jul 1998

U.S. Army Corps of Engineers

TIME 09:40:42

Eff. Date 07/15/98

PROJECT PDL820: Ponce de Leon Inlet - Feasibility Report

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SUMMARY PAGE

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No Detailed Estimate...

No Backup Reports...

* * * END TABLE OF CONTENTS * * *

Descriptions of Project:

These are a series of comparison estimates to be used for determining benefits of the selected plan.

Contingencies:

20% Contingencies were used for Construction Costs in the estimate due to the unpredictable availability of Marine Equipment.

** PROJECT OWNER SUMMARY - Contract **

	QUANTITY	UOM	CONTRACT	CONTING	TOTAL COST	UNIT COST	
01	IWW - Without Project - Bch D/A	322000.00	CY	2,135,804	427,161	2,562,965	7.96
02	IWW - Without Project - Bch D/A	397000.00	CY	2,338,594	467,719	2,806,313	7.07
03	IWW - Without Project - Bch D/A	471000.00	CY	2,614,064	522,813	3,136,877	6.66
04	IWW - Without Project - Up D/A	322000.00	CY	1,380,364	276,073	1,656,437	5.14
05	IWW - Without Project - Up D/A	397000.00	CY	1,491,864	298,373	1,790,237	4.51
06	IWW - Without Project - Up D/A	471000.00	CY	1,653,044	330,609	1,983,653	4.21
07	IWW - With Project - Bch D/A	92000.00	CY	1,231,852	246,370	1,478,222	16.07
08	IWW - With Project - Up D/A	92000.00	CY	885,932	177,186	1,063,118	11.56
09	Upland D/A to Bch D/A Meth 1	515000.00	CY	3,261,108	652,222	3,913,329	7.60
10	Upland D/A to Bch D/A Meth 2	515000.00	CY	4,032,578	806,516	4,839,093	9.40
11	PDL - Without Project - Up D/A	200000.00	CY	1,306,241	261,248	1,567,489	7.84
12	PDL - Without Project - Bch D/A	200000.00	CY	1,805,065	361,013	2,166,078	10.83
13	PDL - With Project - Up D/A	68000.00	CY	724,980	144,996	869,976	12.79
14	PDL - With Project - Bch D/A	68000.00	CY	976,633	195,327	1,171,960	17.23
15	Rgn4 - Without Project - Bch D/A	180000.00	CY	4,654,000	930,800	5,584,800	31.03
16	Rgn4 - Without Project - Bch D/A	310000.00	CY	5,088,900	1,017,780	6,106,680	19.70
17	Rgn4 - Without Project - Bch D/A	440000.00	CY	5,373,600	1,074,720	6,448,320	14.66
18	Rgn4 - Without Project - Bch D/A	570000.00	CY	5,708,200	1,141,640	6,849,840	12.02
19	Rgn4 - Without Project - Bch D/A	700000.00	CY	6,320,000	1,264,000	7,584,000	10.83
20	Rgn4 - Without Project - Up D/A	180000.00	CY	2,529,319	505,864	3,035,183	16.86
21	Rgn4 - Without Project - Up D/A	310000.00	CY	2,777,600	555,520	3,333,120	10.75
22	Rgn4 - Without Project - Up D/A	440000.00	CY	2,933,800	586,760	3,520,560	8.00
23	Rgn4 - Without Project - Up D/A	570000.00	CY	3,120,500	624,100	3,744,600	6.57
24	Rgn4 - Without Project - Up D/A	700000.00	CY	3,453,000	690,600	4,143,600	5.92
25	Rgn4 - With Project - Up D/A	232000.00	CY	1,731,080	346,216	2,077,296	8.95
26	Rgn4 - With Project - Bch D/A	232000.00	CY	2,723,760	544,752	3,268,512	14.09

** PROJECT OWNER SUMMARY - UserDefi **

		QUANTITY UOM	CONTRACT	CONTING	TOTAL COST	UNIT COST

01	IWW - Without Project - Bch D/A					
01-	A Construction Cost					
01-	A/12 Navigation Ports & Harbors					
01-	A/12.02 Harbors					
01-	A/12.02.01 Mob, Demob & Preparatory Work					
01-	A/12.02.01/ 1 Mob, Demob & Preparatory Work		532,244	106,449	638,693	
	TOTAL Mob, Demob & Preparatory Work		532,244	106,449	638,693	
01-	A/12.02.16 Pipeline Dredging					
01-	A/12.02.16/ 2 Channel	322000.00 CY	1,603,560	320,712	1,924,272	5.98
	TOTAL Pipeline Dredging		1,603,560	320,712	1,924,272	
	TOTAL Harbors		2,135,804	427,161	2,562,965	
	TOTAL Navigation Ports & Harbors		2,135,804	427,161	2,562,965	
	TOTAL Construction Cost		2,135,804	427,161	2,562,965	
01-	B Non-Construction Cost					
01-	B/31 Construction Management (S&I)					
	TOTAL IWW - Without Project - Bch D/A	322000.00 CY	2,135,804	427,161	2,562,965	7.96
02	IWW - Without Project - Bch D/A					
02-	A Construction Cost					
02-	A/12 Navigation Ports & Harbors					
02-	A/12.02 Harbors					
02-	A/12.02.01 Mob, Demob & Preparatory Work					
02-	A/12.02.01/ 1 Mob, Demob & Preparatory Work		532,244	106,449	638,693	
	TOTAL Mob, Demob & Preparatory Work		532,244	106,449	638,693	

** PROJECT OWNER SUMMARY - UserDefi **

	QUANTITY	UOM	CONTRACT	CONTING	TOTAL COST	UNIT COST

02- A/12.02.16 Pipeline Dredging						
02- A/12.02.16/ 2 Channel	397000.00	CY	1,806,350	361,270	2,167,620	5.46
TOTAL Pipeline Dredging			1,806,350	361,270	2,167,620	
TOTAL Harbors			2,338,594	467,719	2,806,313	
TOTAL Navigation Ports & Harbors			2,338,594	467,719	2,806,313	
TOTAL Construction Cost			2,338,594	467,719	2,806,313	

02- B Non-Construction Cost						
02- B/31 Construction Management (S&I)						
TOTAL IWW - Without Project - Bch D/A	397000.00	CY	2,338,594	467,719	2,806,313	7.07

03 IWW - Without Project - Bch D/A						
03- A Construction Cost						
03- A/12 Navigation Ports & Harbors						
03- A/12.02 Harbors						
03- A/12.02.01 Mob, Demob & Preparatory Work						
03- A/12.02.01/ 1 Mob, Demob & Preparatory Work			532,244	106,449	638,693	
TOTAL Mob, Demob & Preparatory Work			532,244	106,449	638,693	

03- A/12.02.16 Pipeline Dredging						
03- A/12.02.16/ 2 Channel	471000.00	CY	2,081,820	416,364	2,498,184	5.30
TOTAL Pipeline Dredging			2,081,820	416,364	2,498,184	
TOTAL Harbors			2,614,064	522,813	3,136,877	
TOTAL Navigation Ports & Harbors			2,614,064	522,813	3,136,877	
TOTAL Construction Cost			2,614,064	522,813	3,136,877	

03- B Non-Construction Cost						

** PROJECT OWNER SUMMARY - UserDefi **

	QUANTITY	UOM	CONTRACT	CONTING	TOTAL COST	UNIT COST

03- B/31 Construction Management (S&I)						
TOTAL IWW - Without Project - Bch D/A	471000.00	CY	2,614,064	522,813	3,136,877	6.66
04 IWW - Without Project - Up D/A						
04- A Construction Cost						
04- A/12 Navigation Ports & Harbors						
04- A/12.02 Harbors						
04- A/12.02.01 Mob, Demob & Preparatory Work						
04- A/12.02.01/ 1 Mob, Demob & Preparatory Work			475,544	95,109	570,653	
TOTAL Mob, Demob & Preparatory Work			475,544	95,109	570,653	
04- A/12.02.16 Pipeline Dredging						
04- A/12.02.16/ 2 Channel	322000.00	CY	904,820	180,964	1,085,784	
TOTAL Pipeline Dredging			904,820	180,964	1,085,784	
TOTAL Harbors			1,380,364	276,073	1,656,437	
TOTAL Navigation Ports & Harbors			1,380,364	276,073	1,656,437	
TOTAL Construction Cost			1,380,364	276,073	1,656,437	
04- B Non-Construction Cost						
04- B/31 Construction Management (S&I)						
TOTAL IWW - Without Project - Up D/A	322000.00	CY	1,380,364	276,073	1,656,437	5.14
05 IWW - Without Project - Up D/A						
05- A Construction Cost						
05- A/12 Navigation Ports & Harbors						
05- A/12.02 Harbors						
05- A/12.02.01 Mob, Demob & Preparatory Work						

** PROJECT OWNER SUMMARY - UserDefi **

	QUANTITY	UOM	CONTRACT	CONTING	TOTAL COST	UNIT COST
05- A/12.02.01/ 1 Mob, Demob & Preparatory Work			475,544	95,109	570,653	
TOTAL Mob, Demob & Preparatory Work			475,544	95,109	570,653	
05- A/12.02.16 Pipeline Dredging						
05- A/12.02.16/ 2 Channel	397000.00	CY	1,016,320	203,264	1,219,584	3.07
TOTAL Pipeline Dredging			1,016,320	203,264	1,219,584	
TOTAL Harbors			1,491,864	298,373	1,790,237	
TOTAL Navigation Ports & Harbors			1,491,864	298,373	1,790,237	
TOTAL Construction Cost			1,491,864	298,373	1,790,237	
05- B Non-Construction Cost						
05- B/31 Construction Management (S&I)						
TOTAL IWW - Without Project - Up D/A	397000.00	CY	1,491,864	298,373	1,790,237	4.51
06 - IWW - Without Project - Up D/A						
06- A Construction Cost						
06- A/12 Navigation Ports & Harbors						
06- A/12.02 Harbors						
06- A/12.02.01 Mob, Demob & Preparatory Work						
06- A/12.02.01/ 1 Mob, Demob & Preparatory Work			475,544	95,109	570,653	
TOTAL Mob, Demob & Preparatory Work			475,544	95,109	570,653	
06- A/12.02.16 Pipeline Dredging						
06- A/12.02.16/ 2 Channel	471000.00	CY	1,177,500	235,500	1,413,000	3.00
TOTAL Pipeline Dredging			1,177,500	235,500	1,413,000	
TOTAL Harbors			1,653,044	330,609	1,983,653	
TOTAL Navigation Ports & Harbors			1,653,044	330,609	1,983,653	
TOTAL Construction Cost			1,653,044	330,609	1,983,653	

** PROJECT OWNER SUMMARY - UserDefi **

	QUANTITY UOM	CONTRACT	CONTING	TOTAL COST	UNIT CO.

06- B Non-Construction Cost					
06- B/31 Construction Management (S&I)					
TOTAL IWW - Without Project - Up D/A	471000.00 CY	1,653,044	330,609	1,983,653	4.21

07 IWW - With Project - Bch D/A					
07- A Construction Cost					
07- A/12 Navigation Ports & Harbors					
07- A/12.02 Harbors					
07- A/12.02.01 Mob, Demob & Preparatory Work					
07- A/12.02.01/ 1 Mob, Demob & Preparatory Work		476,532	95,306	571,838	
TOTAL Mob, Demob & Preparatory Work		476,532	95,306	571,838	

07- A/12.02.16 Pipeline Dredging					
07- A/12.02.16/ 2 Channel	92000.00 CY	755,320	151,064	906,384	9.85
TOTAL Pipeline Dredging		755,320	151,064	906,384	

TOTAL Harbors		1,231,852	246,370	1,478,222	

TOTAL Navigation Ports & Harbors		1,231,852	246,370	1,478,222	

TOTAL Construction Cost		1,231,852	246,370	1,478,222	

07- B Non-Construction Cost					
07- B/31 Construction Management (S&I)					
TOTAL IWW - With Project - Bch D/A	92000.00 CY	1,231,852	246,370	1,478,222	16.07

08 IWW - With Project - Up D/A					
08- A Construction Cost					
08- A/12 Navigation Ports & Harbors					
08- A/12.02 Harbors					
08- A/12.02.01 Mob, Demob & Preparatory Work					

** PROJECT OWNER SUMMARY - UserDefi **

	QUANTITY	UOM	CONTRACT	CONTING	TOTAL COST	UNIT COST
08- A/12.02.01/ 1 Mob, Demob & Preparatory Work			476,532	95,306	571,838	
TOTAL Mob, Demob & Preparatory Work			476,532	95,306	571,838	
08- A/12.02.16 Pipeline Dredging						
08- A/12.02.16/ 2 Channel	92000.00	CY	409,400	81,880	491,280	5.34
TOTAL Pipeline Dredging			409,400	81,880	491,280	
TOTAL Harbors			885,932	177,186	1,063,118	
TOTAL Navigation Ports & Harbors			885,932	177,186	1,063,118	
TOTAL Construction Cost			885,932	177,186	1,063,118	
08- B Non-Construction Cost						
08- B/31 Construction Management (S&I)						
TOTAL IWW - With Project - Up D/A	92000.00	CY	885,932	177,186	1,063,118	11.56
09 Upland D/A to Bch D/A Meth 1						
09- A Construction Cost						
09- A/12 Navigation Ports & Harbors						
09- A/12.02 Harbors						
09- A/12.02.01 Mob, Demob & Preparatory Work						
09- A/12.02.01/ 1 Mob, Demob & Preparatory Work			463,789	92,758	556,547	
TOTAL Mob, Demob & Preparatory Work			463,789	92,758	556,547	
09- A/12.02.16 Pipeline Dredging						
09- A/12.02.16/ 2 Channel	515000.00	CY	1,488,350	297,670	1,786,020	3.47
TOTAL Pipeline Dredging			1,488,350	297,670	1,786,020	
09- A/12.02.20 Disposal Areas						
09- A/12.02.20/01 Transport to Staging Area	515000.00	CY	1,308,969	261,794	1,570,762	3.05

** PROJECT OWNER SUMMARY - UserDefi **

	QUANTITY UOM	CONTRACT	CONTING	TOTAL COST	UNIT C
TOTAL Disposal Areas		1,308,969	261,794	1,570,762	
TOTAL Harbors		3,261,108	652,222	3,913,329	
TOTAL Navigation Ports & Harbors		3,261,108	652,222	3,913,329	
TOTAL Construction Cost		3,261,108	652,222	3,913,329	
09- B Non-Construction Cost					
09- B/31 Construction Management (S&I)					
TOTAL Upland D/A to Bch D/A Meth 1	515000.00 CY	3,261,108	652,222	3,913,329	7.60
10 Upland D/A to Bch D/A Meth 2					
10- A Construction Cost					
10- A/12 Navigation Ports & Harbors					
10- A/12.02 Harbors					
10- A/12.02.01 Mob, Demob & Preparatory Work					
10- A/12.02.01/ 1 Mob, Demob & Preparatory Work		500,000	100,000	600,000	
TOTAL Mob, Demob & Preparatory Work		500,000	100,000	600,000	
10- A/12.02.15 Mechanical Dredging					
10- A/12.02.15/01 Mechanical Dredging	515000.00 CY	2,223,609	444,722	2,668,331	5.18
TOTAL Mechanical Dredging		2,223,609	444,722	2,668,331	
10- A/12.02.20 Disposal Areas					
10- A/12.02.20/01 Transport to Staging Area	515000.00 CY	1,308,969	261,794	1,570,762	3.05
TOTAL Disposal Areas		1,308,969	261,794	1,570,762	
TOTAL Harbors		4,032,578	806,516	4,839,093	
TOTAL Navigation Ports & Harbors		4,032,578	806,516	4,839,093	
TOTAL Construction Cost		4,032,578	806,516	4,839,093	

** PROJECT OWNER SUMMARY - UserDefi **

	QUANTITY	UOM	CONTRACT	CONTING	TOTAL COST	UNIT COST

10- B Non-Construction Cost						
10- B/31 Construction Management (S&I)						
TOTAL Upland D/A to Bch D/A Meth 2	515000.00	CY	4,032,578	806,516	4,839,093	9.40

11 PDL - Without Project - Up D/A						
11- A Construction Cost						
11- A/12 Navigation Ports & Harbors						
11- A/12.02 Harbors						
11- A/12.02.01 Mob, Demob & Preparatory Work						
11- A/12.02.01/ 1 Mob, Demob & Preparatory Work			442,241	88,448	530,689	
TOTAL Mob, Demob & Preparatory Work			442,241	88,448	530,689	

11- A/12.02.16 Pipeline Dredging						
11- A/12.02.16/ 2 Channel	200000.00	CY	864,000	172,800	1,036,800	5.18
TOTAL Pipeline Dredging			864,000	172,800	1,036,800	
TOTAL Harbors			1,306,241	261,248	1,567,489	
TOTAL Navigation Ports & Harbors			1,306,241	261,248	1,567,489	
TOTAL Construction Cost			1,306,241	261,248	1,567,489	

11- B Non-Construction Cost						
11- B/31 Construction Management (S&I)						
TOTAL PDL - Without Project - Up D/A	200000.00	CY	1,306,241	261,248	1,567,489	7.84

12 PDL - Without Project - Bch D/A						
12- A Construction Cost						
12- A/12 Navigation Ports & Harbors						
12- A/12.02 Harbors						
12- A/12.02.01 Mob, Demob & Preparatory Work						

** PROJECT OWNER SUMMARY - UserDefi **

		QUANTITY UOM	CONTRACT	CONTING	TOTAL COST	UNIT CO
12- A/12.02.01/ 1	Mob, Demob & Preparatory Work		469,065	93,813	562,878	
TOTAL Mob, Demob & Preparatory Work			469,065	93,813	562,878	
12- A/12.02.16	Pipeline Dredging					
12- A/12.02.16/ 2	Channel	200000.00 CY	1,336,000	267,200	1,603,200	8.02
TOTAL Pipeline Dredging			1,336,000	267,200	1,603,200	
TOTAL Harbors			1,805,065	361,013	2,166,078	
TOTAL Navigation Ports & Harbors			1,805,065	361,013	2,166,078	
TOTAL Construction Cost			1,805,065	361,013	2,166,078	
12- B	Non-Construction Cost					
12- B/31	Construction Management (S&I)					
TOTAL PDL - Without Project - Bch D/A		200000.00 CY	1,805,065	361,013	2,166,078	10
13	PDL - With Project - Up D/A					
13- A	Construction Cost					
13- A/12	Navigation Ports & Harbors					
13- A/12.02	Harbors					
13- A/12.02.01	Mob, Demob & Preparatory Work					
13- A/12.02.01/ 1	Mob, Demob & Preparatory Work		429,180	85,836	515,016	
TOTAL Mob, Demob & Preparatory Work			429,180	85,836	515,016	
13- A/12.02.16	Pipeline Dredging					
13- A/12.02.16/ 2	Channel	68000.00 CY	295,800	59,160	354,960	5.22
TOTAL Pipeline Dredging			295,800	59,160	354,960	
TOTAL Harbors			724,980	144,996	869,976	
TOTAL Navigation Ports & Harbors			724,980	144,996	869,976	
TOTAL Construction Cost			724,980	144,996	869,976	

** PROJECT OWNER SUMMARY - UserDefi **

	QUANTITY	UOM	CONTRACT	CONTING	TOTAL COST	UNIT COST

13- B Non-Construction Cost						
13- B/31 Construction Management (S&I)						
TOTAL PDL - With Project - Up D/A	68000.00	CY	724,980	144,996	869,976	12.79

14 PDL - With Project - Bch D/A						
14- A Construction Cost						
14- A/12 Navigation Ports & Harbors						
14- A/12.02 Harbors						
14- A/12.02.01 Mob, Demob & Preparatory Work						
14- A/12.02.01/ 1 Mob, Demob & Preparatory Work			471,393	94,279	565,672	
TOTAL Mob, Demob & Preparatory Work			471,393	94,279	565,672	

14- A/12.02.16 Pipeline Dredging						
14- A/12.02.16/ 2 Channel	68000.00	CY	505,240	101,048	606,288	8.92
TOTAL Pipeline Dredging			505,240	101,048	606,288	
TOTAL Harbors			976,633	195,327	1,171,960	
TOTAL Navigation Ports & Harbors			976,633	195,327	1,171,960	
TOTAL Construction Cost			976,633	195,327	1,171,960	

14- B Non-Construction Cost						
14- B/31 Construction Management (S&I)						
TOTAL PDL - With Project - Bch D/A	68000.00	CY	976,633	195,327	1,171,960	17.23

15 Rgn4 - Without Project - Bch D/A						
15- A Construction Cost						
15- A/12 Navigation Ports & Harbors						
15- A/12.02 Harbors						
15- A/12.02.01 Mob, Demob & Preparatory Work						

** PROJECT OWNER SUMMARY - UserDefi **

		QUANTITY UOM	CONTRACT	CONTING	TOTAL COST	UNIT COST
15- A/12.02.01/ 1	Mob, Demob & Preparatory Work		1,000,000	200,000	1,200,000	
TOTAL Mob, Demob & Preparatory Work			1,000,000	200,000	1,200,000	
15- A/12.02.16	Pipeline Dredging					
15- A/12.02.16/ 2	Channel	180000.00 CY	3,654,000	730,800	4,384,800	24.36
TOTAL Pipeline Dredging			3,654,000	730,800	4,384,800	
TOTAL Harbors			4,654,000	930,800	5,584,800	
TOTAL Navigation Ports & Harbors			4,654,000	930,800	5,584,800	
TOTAL Construction Cost			4,654,000	930,800	5,584,800	
15- B	Non-Construction Cost					
15- B/31	Construction Management (S&I)					
TOTAL Rgn4 - Without Project - Bch D/A		180000.00 CY	4,654,000	930,800	5,584,800	31
16	Rgn4 - Without Project - Bch D/A					
16- A	Construction Cost					
16- A/12	Navigation Ports & Harbors					
16- A/12.02	Harbors					
16- A/12.02.01	Mob, Demob & Preparatory Work					
16- A/12.02.01/ 1	Mob, Demob & Preparatory Work		1,000,000	200,000	1,200,000	
TOTAL Mob, Demob & Preparatory Work			1,000,000	200,000	1,200,000	
16- A/12.02.16	Pipeline Dredging					
16- A/12.02.16/ 2	Channel	310000.00 CY	4,088,900	817,780	4,906,680	15.83
TOTAL Pipeline Dredging			4,088,900	817,780	4,906,680	
TOTAL Harbors			5,088,900	1,017,780	6,106,680	
TOTAL Navigation Ports & Harbors			5,088,900	1,017,780	6,106,680	
TOTAL Construction Cost			5,088,900	1,017,780	6,106,680	

** PROJECT OWNER SUMMARY - UserDefi **

	QUANTITY	UOM	CONTRACT	CONTING	TOTAL COST	UNIT COST

16- B Non-Construction Cost						
16- B/31 Construction Management (S&I)						
TOTAL Rgn4 - Without Project - Bch D/A	310000.00	CY	5,088,900	1,017,780	6,106,680	19.70

17 Rgn4 - Without Project - Bch D/A						
17- A Construction Cost						
17- A/12 Navigation Ports & Harbors						
17- A/12.02 Harbors						
17- A/12.02.01 Mob, Demob & Preparatory Work						
17- A/12.02.01/ 1 Mob, Demob & Preparatory Work			1,000,000	200,000	1,200,000	
TOTAL Mob, Demob & Preparatory Work			1,000,000	200,000	1,200,000	

17- A/12.02.16 Pipeline Dredging						
17- A/12.02.16/ 2 Channel	440000.00	CY	4,373,600	874,720	5,248,320	11.93
TOTAL Pipeline Dredging			4,373,600	874,720	5,248,320	
TOTAL Harbors			5,373,600	1,074,720	6,448,320	
TOTAL Navigation Ports & Harbors			5,373,600	1,074,720	6,448,320	
TOTAL Construction Cost			5,373,600	1,074,720	6,448,320	

17- B Non-Construction Cost						
17- B/31 Construction Management (S&I)						
TOTAL Rgn4 - Without Project - Bch D/A	440000.00	CY	5,373,600	1,074,720	6,448,320	14.66

18 Rgn4 - Without Project - Bch D/A						
18- A Construction Cost						
18- A/12 Navigation Ports & Harbors						
18- A/12.02 Harbors						
18- A/12.02.01 Mob, Demob & Preparatory Work						

** PROJECT OWNER SUMMARY - UserDefi **

		QUANTITY UOM	CONTRACT	CONTING	TOTAL COST	UNIT COS.
18- A/12.02.01/ 1	Mob, Demob & Preparatory Work		1,000,000	200,000	1,200,000	
TOTAL Mob, Demob & Preparatory Work			1,000,000	200,000	1,200,000	
18- A/12.02.16	Pipeline Dredging					
18- A/12.02.16/ 2	Channel	570000.00 CY	4,708,200	941,640	5,649,840	9.91
TOTAL Pipeline Dredging			4,708,200	941,640	5,649,840	
TOTAL Harbors			5,708,200	1,141,640	6,849,840	
TOTAL Navigation Ports & Harbors			5,708,200	1,141,640	6,849,840	
TOTAL Construction Cost			5,708,200	1,141,640	6,849,840	
18- B	Non-Construction Cost					
18- B/31	Construction Management (S&I)					
TOTAL Rgn4 - Without Project - Bch D/A		570000.00 CY	5,708,200	1,141,640	6,849,840	12
19	Rgn4 - Without Project - Bch D/A					
19- A	Construction Cost					
19- A/12	Navigation Ports & Harbors					
19- A/12.02	Harbors					
19- A/12.02.01	Mob, Demob & Preparatory Work					
19- A/12.02.01/ 1	Mob, Demob & Preparatory Work		1,000,000	200,000	1,200,000	
TOTAL Mob, Demob & Preparatory Work			1,000,000	200,000	1,200,000	
19- A/12.02.16	Pipeline Dredging					
19- A/12.02.16/ 2	Channel	700000.00 CY	5,320,000	1,064,000	6,384,000	9.12
TOTAL Pipeline Dredging			5,320,000	1,064,000	6,384,000	
TOTAL Harbors			6,320,000	1,264,000	7,584,000	
TOTAL Navigation Ports & Harbors			6,320,000	1,264,000	7,584,000	
TOTAL Construction Cost			6,320,000	1,264,000	7,584,000	

** PROJECT OWNER SUMMARY - UserDefi **

	QUANTITY	UOM	CONTRACT	CONTING	TOTAL COST	UNIT COST

19- B Non-Construction Cost						
19- B/31 Construction Management (S&I)						
TOTAL Rgn4 - Without Project - Bch D/A	700000.00	CY	6,320,000	1,264,000	7,584,000	10.83

20 Rgn4 - Without Project - Up D/A						
20- A Construction Cost						
20- A/12 Navigation Ports & Harbors						
20- A/12.02 Harbors						
20- A/12.02.01 Mob, Demob & Preparatory Work						
20- A/12.02.01/ 1 Mob, Demob & Preparatory Work			527,719	105,544	633,263	
TOTAL Mob, Demob & Preparatory Work			527,719	105,544	633,263	

20- A/12.02.16 Pipeline Dredging						
20- A/12.02.16/ 2 Channel	180000.00	CY	2,001,600	400,320	2,401,920	13.34
TOTAL Pipeline Dredging			2,001,600	400,320	2,401,920	
TOTAL Harbors			2,529,319	505,864	3,035,183	
TOTAL Navigation Ports & Harbors			2,529,319	505,864	3,035,183	
TOTAL Construction Cost			2,529,319	505,864	3,035,183	

20- B Non-Construction Cost						
20- B/31 Construction Management (S&I)						
TOTAL Rgn4 - Without Project - Up D/A	180000.00	CY	2,529,319	505,864	3,035,183	16.86

21 Rgn4 - Without Project - Up D/A						
21- A Construction Cost						
21- A/12 Navigation Ports & Harbors						
21- A/12.02 Harbors						
21- A/12.02.01 Mob, Demob & Preparatory Work						

** PROJECT OWNER SUMMARY - UserDefi **

		QUANTITY UOM	CONTRACT	CONTING	TOTAL COST	UNIT COST	
21-	A/12.02.01/ 1		527,000	105,400	632,400		
	Mob, Demob & Preparatory Work						
	TOTAL Mob, Demob & Preparatory Work		527,000	105,400	632,400		
21-	A/12.02.16						
	Pipeline Dredging						
21-	A/12.02.16/ 2	Channel	310000.00 CY	2,250,600	450,120	2,700,720	8.71
	TOTAL Pipeline Dredging		2,250,600	450,120	2,700,720		
	TOTAL Harbors		2,777,600	555,520	3,333,120		
	TOTAL Navigation Ports & Harbors		2,777,600	555,520	3,333,120		
	TOTAL Construction Cost		2,777,600	555,520	3,333,120		
21-	B	Non-Construction Cost					
21-	B/31	Construction Management (S&I)					
	TOTAL Rgn4 - Without Project - Up D/A	310000.00 CY	2,777,600	555,520	3,333,120	10	
22	Rgn4 - Without Project - Up D/A						
22-	A	Construction Cost					
22-	A/12	Navigation Ports & Harbors					
22-	A/12.02	Harbors					
22-	A/12.02.01	Mob, Demob & Preparatory Work					
22-	A/12.02.01/ 1	Mob, Demob & Preparatory Work	527,000	105,400	632,400		
	TOTAL Mob, Demob & Preparatory Work		527,000	105,400	632,400		
22-	A/12.02.16	Pipeline Dredging					
22-	A/12.02.16/ 2	Channel	440000.00 CY	2,406,800	481,360	2,888,160	6.56
	TOTAL Pipeline Dredging		2,406,800	481,360	2,888,160		
	TOTAL Harbors		2,933,800	586,760	3,520,560		
	TOTAL Navigation Ports & Harbors		2,933,800	586,760	3,520,560		
	TOTAL Construction Cost		2,933,800	586,760	3,520,560		

** PROJECT OWNER SUMMARY - UserDefi **

	QUANTITY UOM	CONTRACT	CONTING	TOTAL COST	UNIT COST

22- B Non-Construction Cost					
22- B/31 Construction Management (S&I)					
TOTAL Rgn4 - Without Project - Up D/A	440000.00 CY	2,933,800	586,760	3,520,560	8.00

23 Rgn4 - Without Project - Up D/A					
23- A Construction Cost					
23- A/12 Navigation Ports & Harbors					
23- A/12.02 Harbors					
23- A/12.02.01 Mob, Demob & Preparatory Work					
23- A/12.02.01/ 1 Mob, Demob & Preparatory Work		527,000	105,400	632,400	
TOTAL Mob, Demob & Preparatory Work		527,000	105,400	632,400	

23- A/12.02.16 Pipeline Dredging					
23- A/12.02.16/ 2 Channel	570000.00 CY	2,593,500	518,700	3,112,200	5.46
TOTAL Pipeline Dredging		2,593,500	518,700	3,112,200	
TOTAL Harbors		3,120,500	624,100	3,744,600	
TOTAL Navigation Ports & Harbors		3,120,500	624,100	3,744,600	
TOTAL Construction Cost		3,120,500	624,100	3,744,600	

23- B Non-Construction Cost					
23- B/31 Construction Management (S&I)					
TOTAL Rgn4 - Without Project - Up D/A	570000.00 CY	3,120,500	624,100	3,744,600	6.57

24 Rgn4 - Without Project - Up D/A					
24- A Construction Cost					
24- A/12 Navigation Ports & Harbors					
24- A/12.02 Harbors					
24- A/12.02.01 Mob, Demob & Preparatory Work					

** PROJECT OWNER SUMMARY - UserDefi **

		QUANTITY UOM	CONTRACT	CONTING	TOTAL COST	UNIT C.	
24-	A/12.02.01/ 1		527,000	105,400	632,400		
	Mob, Demob & Preparatory Work						
	TOTAL Mob, Demob & Preparatory Work		527,000	105,400	632,400		
24-	A/12.02.16						
	Pipeline Dredging						
24-	A/12.02.16/ 2	Channel	700000.00 CY	2,926,000	585,200	3,511,200	5.02
	TOTAL Pipeline Dredging		2,926,000	585,200	3,511,200		
	TOTAL Harbors		3,453,000	690,600	4,143,600		
	TOTAL Navigation Ports & Harbors		3,453,000	690,600	4,143,600		
	TOTAL Construction Cost		3,453,000	690,600	4,143,600		
24-	B	Non-Construction Cost					
24-	B/31	Construction Management (S&I)					
	TOTAL Rgn4 - Without Project - Up D/A	700000.00 CY	3,453,000	690,600	4,143,600		
25-	Rgn4 - With Project - Up D/A						
25-	A	Construction Cost					
25-	A/12	Navigation Ports & Harbors					
25-	A/12.02	Harbors					
25-	A/12.02.01	Mob, Demob & Preparatory Work					
25-	A/12.02.01/ 1	Mob, Demob & Preparatory Work	527,000	105,400	632,400		
	TOTAL Mob, Demob & Preparatory Work		527,000	105,400	632,400		
25-	A/12.02.16	Pipeline Dredging					
25-	A/12.02.16/ 2	Channel	232000.00 CY	1,204,080	240,816	1,444,896	6.23
	TOTAL Pipeline Dredging		1,204,080	240,816	1,444,896		
	TOTAL Harbors		1,731,080	346,216	2,077,296		
	TOTAL Navigation Ports & Harbors		1,731,080	346,216	2,077,296		
	TOTAL Construction Cost		1,731,080	346,216	2,077,296		

** PROJECT OWNER SUMMARY - UserDefi **

	QUANTITY	UOM	CONTRACT	CONTING	TOTAL COST	UNIT COST

25- B Non-Construction Cost						
25- B/31 Construction Management (S&I)						
TOTAL Rgn4 - With Project - Up D/A	232000.00	CY	1,731,080	346,216	2,077,296	8.95

26 Rgn4 - With Project - Bch D/A						
26- A Construction Cost						
26- A/12 Navigation Ports & Harbors						
26- A/12.02 Harbors						
26- A/12.02.01 Mob, Demob & Preparatory Work						
26- A/12.02.01/ 1 Mob, Demob & Preparatory Work			1,000,000	200,000	1,200,000	
TOTAL Mob, Demob & Preparatory Work			1,000,000	200,000	1,200,000	

26- A/12.02.16 Pipeline Dredging						
26- A/12.02.16/ 2 Channel	232000.00	CY	1,723,760	344,752	2,068,512	8.92
TOTAL Pipeline Dredging			1,723,760	344,752	2,068,512	
TOTAL Harbors			2,723,760	544,752	3,268,512	
TOTAL Navigation Ports & Harbors			2,723,760	544,752	3,268,512	
TOTAL Construction Cost			2,723,760	544,752	3,268,512	

26- B Non-Construction Cost						
26- B/31 Construction Management (S&I)						
TOTAL Rgn4 - With Project - Bch D/A	232000.00	CY	2,723,760	544,752	3,268,512	14.09

Mon 27 Jul 1998
Eff. Date 07/15/98
ERROR REPORT

U.S. Army Corps of Engineers
PROJECT PDL820: Ponce de Leon Inlet - Feasibility Report

TIME 09:40:42

ERROR PAGE 1

No errors detected...

* * * END OF ERROR REPORT * * *

APPENDIX E

LIST OF PHOTOGRAPHS

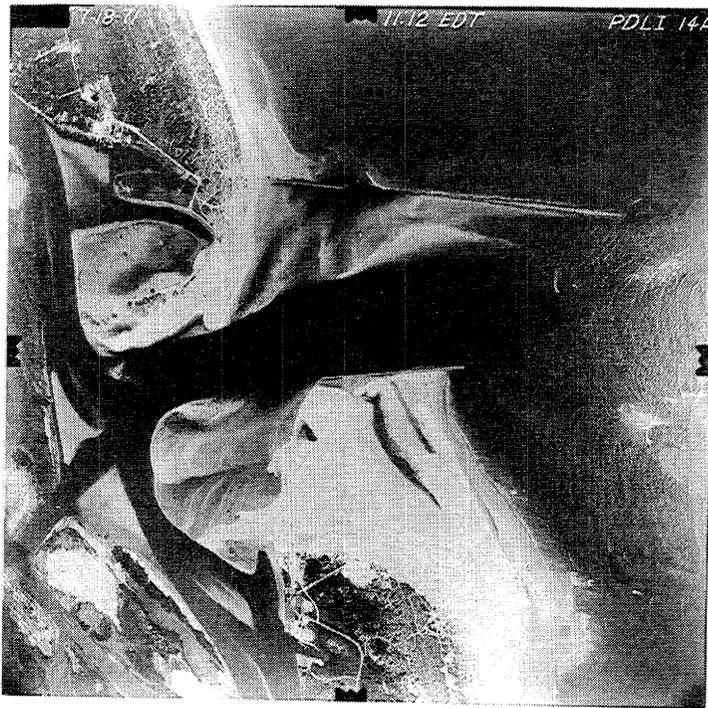
1.	Ponce de Leon Inlet	April 4, 1967	1
2.	Ponce de Leon Inlet	August 1969	1
3.	Ponce de Leon Inlet	July 18, 1971	2
4.	Ponce de Leon Inlet	December 13, 1971	2
5.	Ponce de Leon Inlet	June 27, 1972	3
6.	Ponce de Leon Inlet	October 30, 1972	3
7.	Ponce de Leon Inlet	January 31, 1973	4
8.	Ponce de Leon Inlet	February 28, 1973	4
9.	Ponce de Leon Inlet	May 11, 1973	5
10.	Ponce de Leon Inlet	July 23, 1973	5
11.	Ponce de Leon Inlet	May, 1961	6
12.	Ponce de Leon Inlet	July 8, 1992	7
13.	Ponce de Leon Inlet	July 8, 1992	7
14.	Ponce de Leon Inlet	September 22, 1992	8
15.	Ponce de Leon Inlet	September 22, 1992	8
16.	Ponce de Leon Inlet	September 9, 1992	9
17.	Ponce de Leon Inlet	September 9, 1992	9
18.	Ponce de Leon Inlet	September 9, 1992	10
19.	Ponce de Leon Inlet	September 9, 1992	10
20.	Ponce de Leon Inlet	September 9, 1992	11
21.	Ponce de Leon Inlet	September 9, 1992	11
22.	Ponce de Leon Inlet	September 9, 1992	12
23.	Ponce de Leon Inlet	September 9, 1992	12
24.	Ponce de Leon inlet	September 9, 1992	13



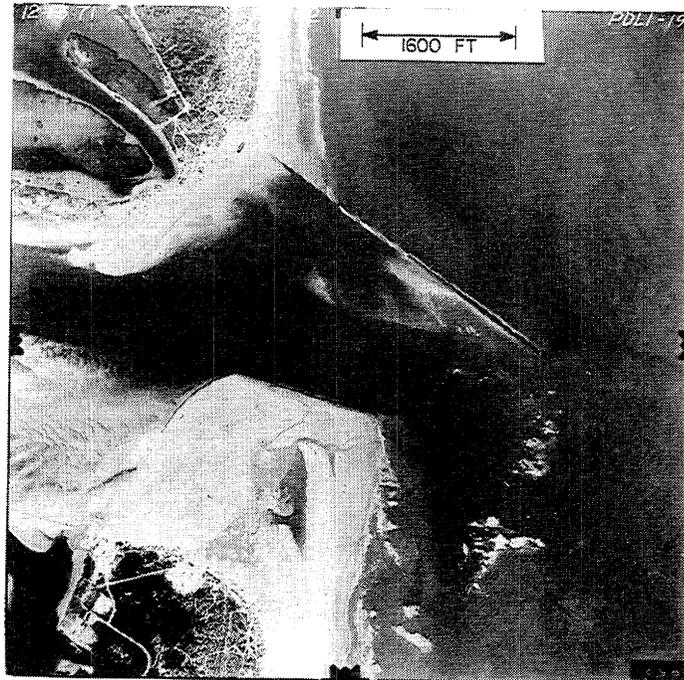
Photograph 1. Ponce de Leon Inlet - 4 April 1967



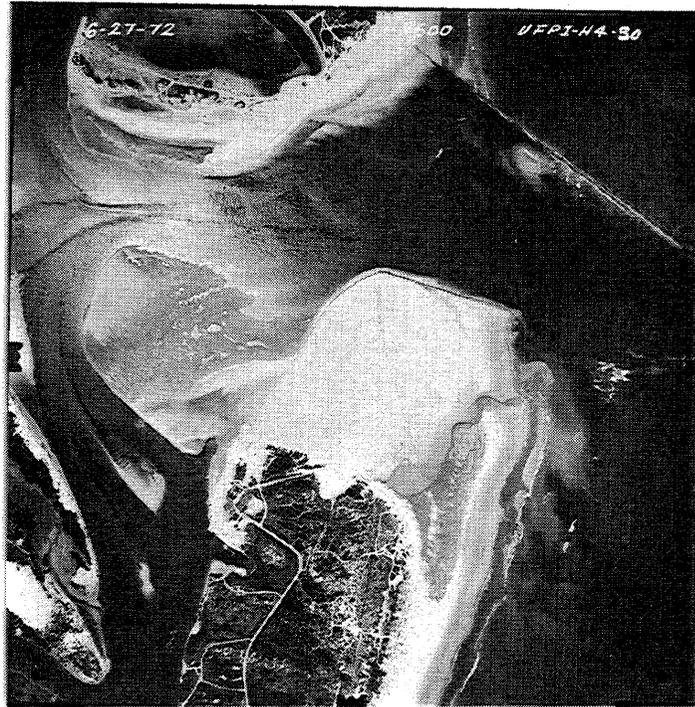
Photograph 2. Ponce de Leon Inlet - August 1969



Photograph 3. Ponce de Leon Inlet - 18 July 1971



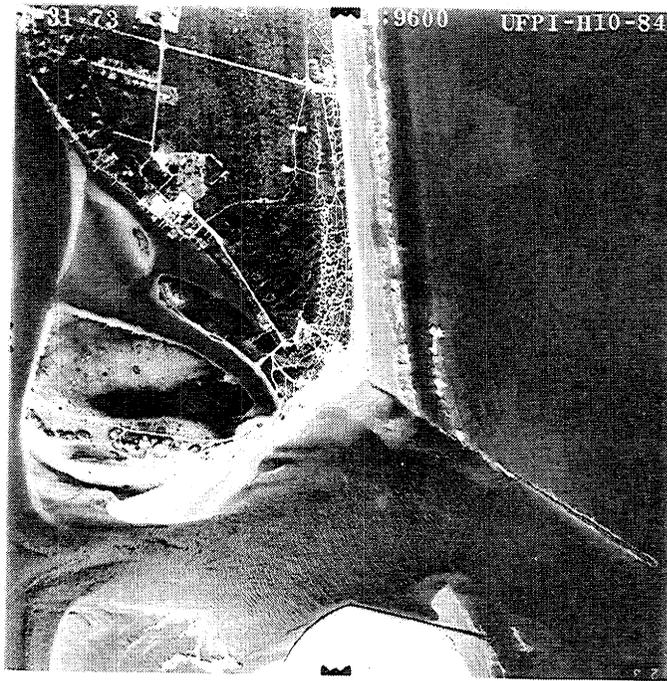
Photograph 4. Ponce de Leon Inlet - 13 December 1971



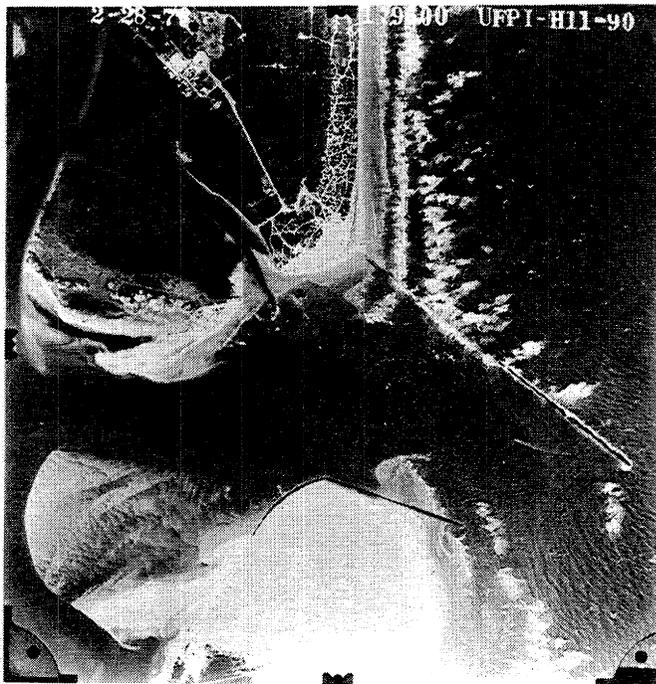
Photograph 5. Ponce de Leon Inlet - 27 June 1972



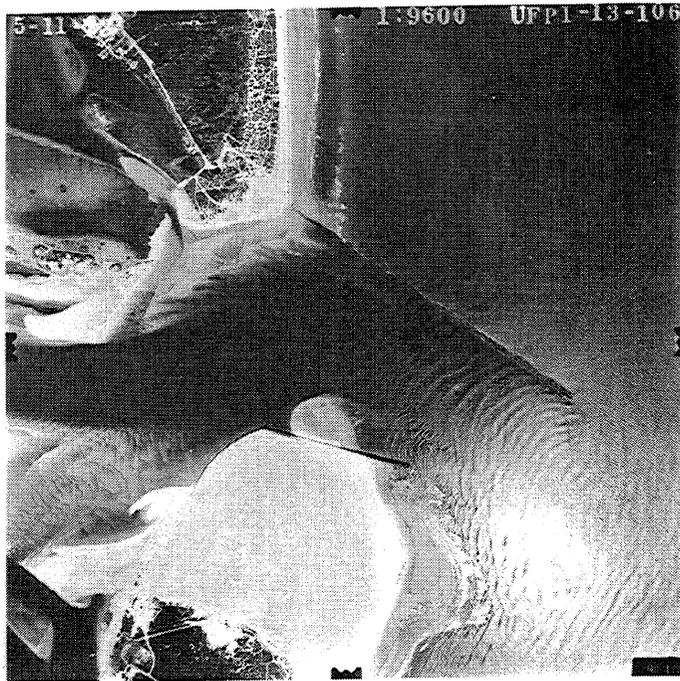
Photograph 6. Ponce de Leon Inlet - 30 October 1972



Photograph 7. Ponce de Leon Inlet - 31 January 1973



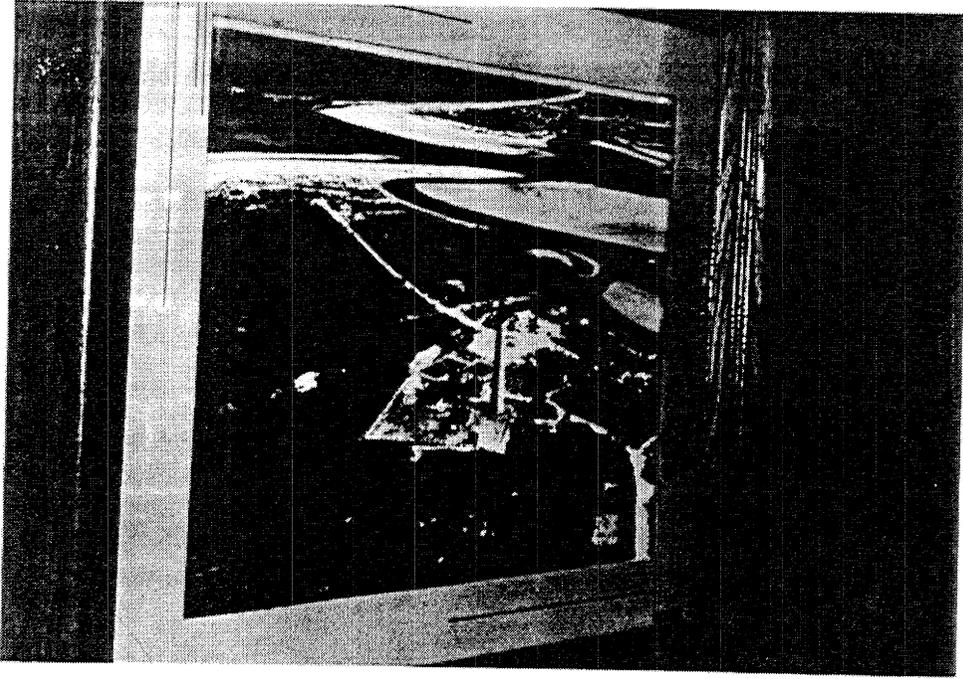
Photograph 8. Ponce de Leon Inlet - 28 February 1973



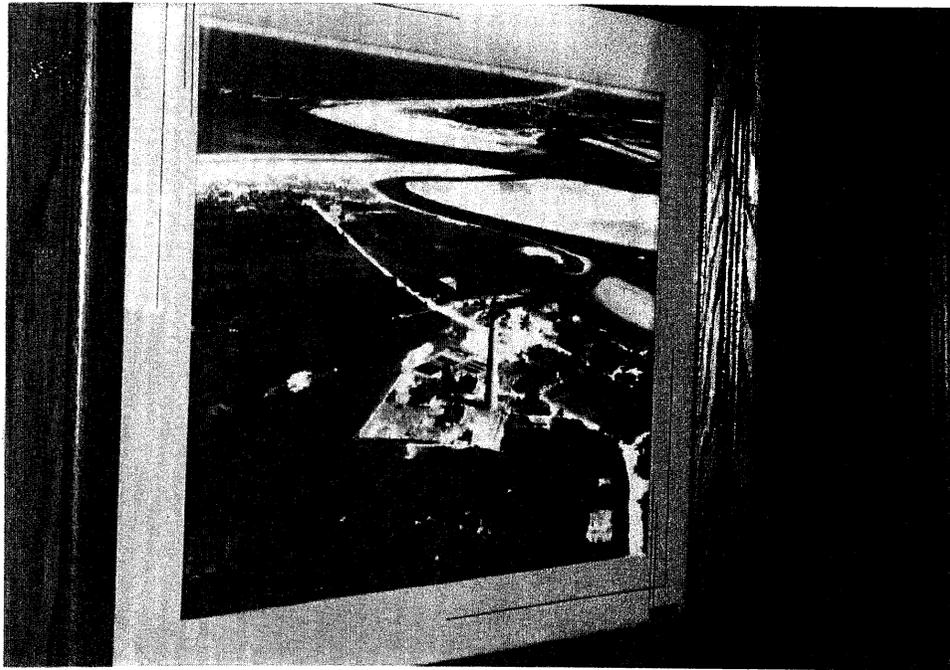
Photograph 9. Ponce de Leon Inlet - 11 May 1973



Photograph 10. Ponce de Leon Inlet - 23 July 1973

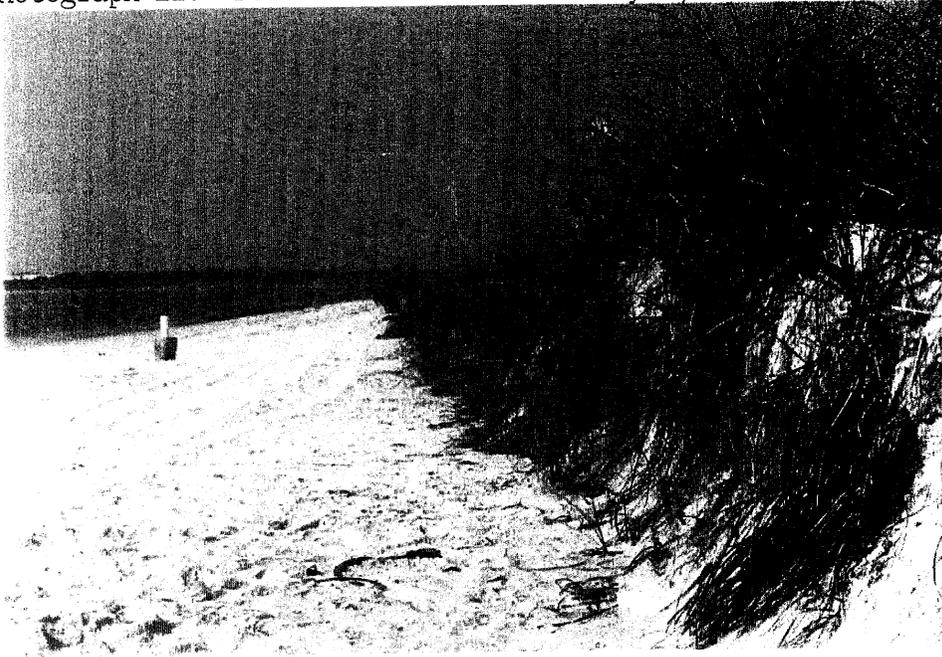


Photograph 11. Ponce de Leon Inlet - May, 1961



Photograph 11. Ponce de Leon Inlet - May, 1961

Photograph 12. Ponce de Leon Inlet - July 8, 1992



Scarp along shoreline inside the north jetty. Scarp is about 1.5 - 2 feet. In areas with no dune along this shoreline, evidence of overtopping was noted.



Photograph 13.
Ponce de Leon Inlet - July 8, 1992
Corps survey monument placed behind vegetation/dune line in 1991. Monument was completely undermined, and was about 15 feet seaward of vegetation/dune line, about 100 feet northeast of the "point" observed in photo #5.



Photograph 14. Ponce de Leon Inlet - September 22, 1992



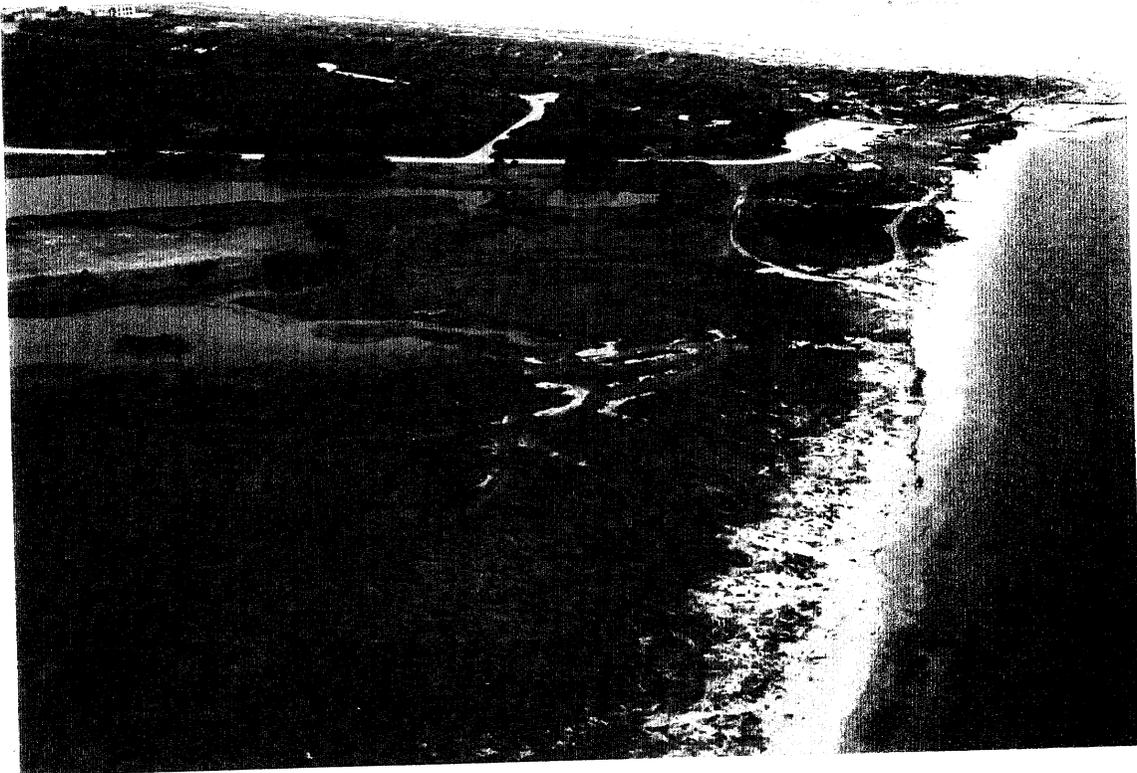
Photograph 15. Ponce de Leon Inlet - September 22, 1992



Photograph 16. Ponce de Leon Inlet - September 9, 1992



Photograph 17. Ponce de Leon Inlet - September 9, 1992



Photograph 18. Ponce de Leon Inlet - September 9, 1992



Photograph 19. Ponce de Leon Inlet - September 9, 1992



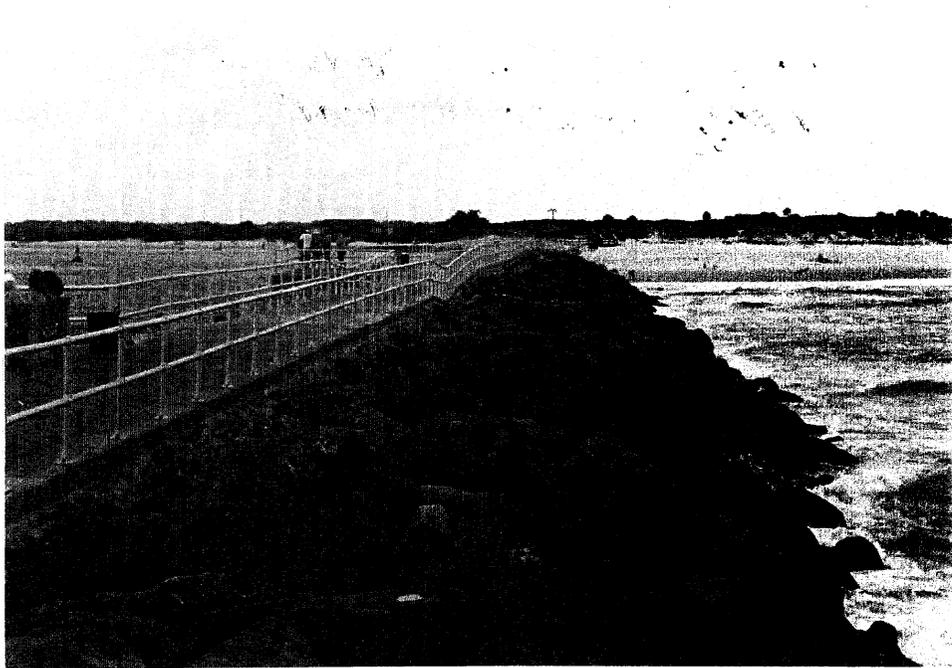
Photograph 20. Ponce de Leon Inlet - September 9, 1992



Photograph 21. Ponce de Leon Inlet - September 9, 1992



Photograph 22. Ponce de Leon Inlet - September 9, 1992



Photograph 23. Ponce de Leon Inlet - September 9, 1992

Photograph 24. Ponce de Leon Inlet - September 9, 1992



