



REPLY TO  
ATTENTION OF

DAEN

Proposed Report <sup>1</sup>

## DEPARTMENT OF THE ARMY

CHIEF OF ENGINEERS  
2600 ARMY PENTAGON  
WASHINGTON, DC 20310-2600

SUBJECT: St. Johns County, Florida - South Ponte Vedra Beach, Vilano Beach, and Summer Haven Reaches - Coastal Storm Risk Management Project

### THE SECRETARY OF THE ARMY

1. I submit for transmission to Congress my report on coastal storm risk management at St. Johns County, Florida. It is accompanied by the report of the district and division engineers. This report is an interim response to House Resolution 2646 adopted June 21, 2000 by the Committee on Transportation and Infrastructure of the United States House of Representatives. The resolution requested the Secretary of the Army, acting through the Chief of Engineers, *“to survey the shores of St. Johns County, Florida, with particular reference to the advisability of providing beach erosion control works in the area north of St. Augustine Inlet, the shoreline in the vicinity of Matanzas Inlet, and adjacent shorelines, as may be necessary in the interest of hurricane protection, storm damage reduction, beach erosion control, and other related purposes.”* Pre-construction engineering and design activities for the project will continue under the authority cited above.

2. The reporting officers recommend a project that will contribute to economic efficiency for providing coastal storm risk management. Based on an evaluation of alternative plan costs and economic benefits the recommended plan is the National Economic Develop (NED) plan. The non-federal sponsor, St. Johns County, supports the NED plan.

a. The recommended plan includes beach and dune nourishment within the Vilano Beach reach and a small portion of the South Ponte Vedra Beach reach. The design includes construction of a 60- foot equilibrated berm extension from the +8.0 foot 1988 North Atlantic Vertical Datum (NAVD88) contour between the R monuments R103.5 and R116.5 along 2.6 miles of shoreline. The project template will include a dune feature that reflects the average 2015 dune position. Tapers of a maximum length of one thousand feet will extend from the northern and southern ends of the berm extension, connecting the extension to the existing shoreline. The addition of tapers results in sand placement from R102.5 to R117.5 along 3 miles of shoreline.

b. Initial construction will require approximately 1,310,000 cubic yards of sand, and each periodic nourishment event will require approximately 866,000 cubic yards. The periodic

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<sup>1</sup> This report contains the proposed recommendation of the Chief of Engineers. The recommendation is subject to change to reflect Washington level review and comments from federal and state agencies.

DAEN

SUBJECT: St. Johns County, Florida - South Ponte Vedra Beach, Vilano Beach, and Summer Haven Reaches - Coastal Storm Risk Management Project

nourishment interval is expected to be approximately 12 years, equaling an estimated 3 periodic nourishment events in addition to initial construction over the 50-year period of federal participation.

c. The sand source identified for the project is the St. Augustine Inlet system, located adjacent to the project area to the south. There is approximately 6.5 million cubic yards (my) of beach quality sand in the inlet system. This volume is more than adequate to meet the initial construction volume. The periodic nourishment volume is approximately 866,000 cubic yards every 12 years. The Florida Department of Environmental Protection's inlet management plan for St. Augustine Inlet states a bypassing objective of 278,000 cubic yards per year of which one third should go to beaches to the north. One third of the bypassing objective is 92,666 cubic yards per year. Over 12 years, 1.1 million cubic yards would be available to meet the 866,000 cubic yard need for a periodic nourishment event.

d. Native vegetation will be planted on areas of the existing dune disturbed by construction, as well as the newly constructed dune to stabilize the fill. It is assumed that dune planting will only be necessary for initial construction and that vegetation will naturally grow and spread to any areas that are nourished in the future.

e. A portion of the project is located in the Coastal Barrier Resource System (CBRS) unit P04A. In accordance with the Coastal Barrier Resources Act (CBRA), no federal funds will be expended for this portion of the project. The cost share for this area is a non-federal responsibility for both initial construction and periodic nourishment.

3. St. Johns County is the non-federal cost sharing sponsor for all features. Based on FY17 price levels, the estimated total nourishment cost of the NED Plan is \$78,417,000, which includes the project first cost of initial construction of \$24,834,000 and three periodic nourishments at a total cost of \$53,583,000. The three periodic nourishments are estimated to occur at 12-year intervals. Since the final nourishment is estimated to occur at year 36 following initial construction, the estimated cost of periodic nourishments accounts for approximately two years' worth of additional volume being placed during that final nourishment. Cost sharing is applied in accordance with the provisions of Section 103 of the Water Resources Development Act (WRDA) of 1986, as amended by Section 215 of WRDA 1999, as follows:

a. The federal share of the project first cost for initial construction would be approximately \$5,711,820 and the non-federal share would be approximately \$19,122,180, which equates to 23 percent federal and 77 percent non-federal (before LERRD is applied). The non-federal costs include the value of lands, easements, rights-of-way, relocations and dredged or excavated material disposal areas (LERRD) estimated to be \$943,000.

b. The federal share of future periodic nourishment is estimated to be \$9,484,000 and the non-federal share is estimated to be \$44,099,000 which equates to 17.7 percent federal and 82.3 percent non-federal.

DAEN

SUBJECT: St. Johns County, Florida - South Ponte Vedra Beach, Vilano Beach, and Summer Haven Reaches - Coastal Storm Risk Management Project

c. Operation, Maintenance, Repair, Rehabilitation, and Replacement (OMRR&R) costs are estimated to be \$35,000 annually. OMRR&R costs are a 100% non-federal responsibility.

4. Based on a 2.875 percent discount rate and a 50-year period of analysis, the total equivalent average annual costs of the project are estimated to be \$2,031,000. All project costs are allocated to the authorized purpose of coastal storm risk management. The selected plan would reduce average annual coastal storm damages by approximately \$1,961,000. The equivalent average annual benefits, inclusive of recreation benefits, are estimated to be \$2,653,000 with net average annual benefits of \$622,000. The benefit to cost ratio is approximately 1.3 to 1. The project would reduce coastal damages including reduction of damage to a hurricane evacuation route, State Road A1A. The project would also establish at least 3.2 acres of beach habitat that will provide suitable nesting habitat for federally threatened and endangered species such as loggerhead, green, Kemp's ridley, hawksbill, and leatherback sea turtles and piping plover and rufa red knot shorebirds along approximately 3 miles of shoreline.

5. Risk and uncertainty has been explicitly factored into the economic analysis of this project. Chapter 6 of ER 1105-2-100, entitled "Risk-Based Analysis for Evaluation of Hydrology/Hydraulics and Economics in Shore Protection Studies" specifies the analysis requirements for shore protection projects, the fundamental requirement being that all shore protection analyses adopt a life cycle approach. A statistical risk based model, Beach-fx, was used in this study to formulate and evaluate the project in a life-cycle approach. Beach-fx integrates the engineering and economic analyses and incorporates uncertainty in both physical parameters and environmental forcing, which enables quantification of risk with respect to project evolution and economic costs and benefits of project implementation. The application of Beach-fx in this study is to estimate future without project damages and quantify the damages prevented by various storm damage reduction alternatives for St. Johns County over the 50 year project life. The project is intended to address erosion and prevent damages to structures and infrastructure; it is not intended to, nor will it, reduce the risk to loss of life during major storm events. Loss of life can only be prevented by residents and visitors following the local evacuation plans that are already in place. These residual risks have been communicated to the residents of St. Johns County.

6. In accordance with the Corps Engineering Regulation (ER 1100-2-8162) on sea level change, the study performed a sensitivity analysis to evaluate the effects that different rates of sea level change could have on the recommended plan. The NED plan was formulated using the historical or low rate of sea level change. Beach-fx was used to model the performance of the NED plan for what the ER defines as intermediate and high rates of sea level rise. The benefits of the project increase significantly in the intermediate and high sea level rise scenarios, but the costs also increase. Thus, the project performance (in terms of the benefit-cost ratio) is relatively constant throughout the three scenarios. As both costs and benefits are increasing, the net benefits actually increase with increasing rates of sea-level rise. Overall, these results suggest that the NED plan is both effective and robust in all three simulated sea level rise scenarios. Adaptive management will be used including adjusting the timing of periodic nourishments and

DAEN

SUBJECT: St. Johns County, Florida - South Ponte Vedra Beach, Vilano Beach, and Summer Haven Reaches - Coastal Storm Risk Management Project

project volume requirements based on monitoring reports to compensate for any significant accelerated sea level rise beyond the historical or low rate should it become necessary.

7. In accordance with the Corps Engineering Circular (EC 1165-2-214) on review of decision documents, all technical, engineering and scientific work underwent an open, dynamic and rigorous review process to ensure technical quality. This included District Quality Control review, Agency Technical Review (ATR), Major Subordinate Command (MSC) review and a Corps Headquarters policy and legal review. All concerns of the ATR have been addressed and incorporated into the final report. The requirement to perform Independent External Peer Review (IEPR) was waived by HQUSACE since there was no Environmental Impact Statement (EIS) for the study, it had negligible adverse impacts to the environment and is not controversial. All comments from the above referenced reviews have been addressed and incorporated into the final documents. Overall, the reviews resulted in improvements to the technical quality of the report.

8. Washington level review indicates that the project recommended by the reporting officers is technically sound, environmentally and socially acceptable, and economically justified. The plan complies with all essential elements of the 1983 U.S. Water Resources Council's Economic and Environmental Principles and Guidelines for Water and Land Related Resources Implementation studies and complies with other administrative and legislative policies and guidelines. Also the views of interested parties, including federal, state and local agencies have been considered.

9. I concur in the findings, conclusions and recommendations of the reporting officers. Accordingly, I recommend that the plan to reduce hurricane and storm damages for St. Johns County, Florida is authorized in accordance with the reporting officers' recommended plan at an estimated project first cost of \$78,417,000 with such modifications as in the discretion of the Chief of Engineers may be advisable. My recommendation is subject to cost sharing, financing and other applicable requirements of federal and state laws and policies, including Section 103 of the Water Resources Development Act (WRDA) of 1986, as amended by Section 215 of WRDA 1999. The non-federal sponsor would provide the non-federal cost share and all LERRD. Further, the non-federal sponsor would be responsible for all OMRR&R. This recommendation is subject to the non-federal sponsor agreeing to comply with all applicable federal laws and policies.

a. Provide 35% of design and initial construction costs assigned to coastal storm risk management plus 100% of costs assigned to protecting areas within the CBRS when such costs are not excepted from the CBRA's limitation on federal expenditures and 100% of the costs assigned to protecting undeveloped private lands and other private shores which do not provide public benefits; and 50% of periodic nourishment costs assigned to hurricane and storm damage reduction, plus 100% of periodic nourishment costs assigned to protecting areas within the CBRS when such costs are not excepted from the CBRA's limitation on federal expenditures and 100% of costs assigned to protecting undeveloped private lands and other private shores which do not provide public benefits and as further specified below:

DAEN

SUBJECT: St. Johns County, Florida - South Ponte Vedra Beach, Vilano Beach, and Summer Haven Reaches - Coastal Storm Risk Management Project

- 1) Provide, during design, 35 percent of design costs;
  - 2) Provide all lands, easements, and rights-of-way, perform or ensure the performance of any relocations, and provide all relocation assistance determined by the federal government to be necessary for the initial construction, periodic nourishment, and operation and maintenance of the project, all in compliance with applicable provisions of the Uniform Relocation and Assistance and Real Property Acquisition Policies Act of 1970, as amended (42 U.S.C. 4601-4655) and the regulations contained in 49 CFR Part 24.;
  - 3) Pay, during construction, any additional amounts necessary to make its contribution equal to 35% of initial project costs assigned to hurricane and storm damage reduction, plus 100% of initial project costs assigned to protecting undeveloped private lands and other private shores which do not provide public benefits; and 50% of periodic nourishment costs assigned to hurricane and storm damage reduction, plus 100% of periodic nourishment costs assigned to protecting undeveloped private lands and other private shores which do not provide public benefits;
- b. Operate, maintain, and repair the completed project, or functional portion of the project, at no cost to the federal government, in a manner compatible with the project's authorized purposes and in accordance with applicable federal laws and regulations, and any specific directions prescribed by the federal government;
  - c. Hold and save the United States free from all damages arising from the initial construction, periodic nourishment, operation, maintenance, repair, replacement, and rehabilitation of the projects, except for damages due to the fault or negligence of the United States or its contractors;
  - d. Perform, or ensure performance of, any investigations for hazardous substances that are determined necessary to identify the existence and extent of any hazardous substances regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Public Law 96-510, as amended, 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 required for the initial construction, periodic nourishment, operation, and maintenance of the project. However, for lands that the federal government determines to be subject to the navigation servitude, only the federal government shall perform such investigations 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;
  - e. Assume, as between the federal government and the non-federal sponsor, complete financial responsibility 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 initial construction, periodic nourishment, operation, or maintenance of the project;

DAEN

SUBJECT: St. Johns County, Florida - South Ponte Vedra Beach, Vilano Beach, and Summer Haven Reaches - Coastal Storm Risk Management Project

f. Agree, as between the federal government and the non-federal sponsor, that the non-federal sponsor shall be considered the operator of the project for the purpose of CERCLA liability, and to the maximum extent practicable, operate, maintain, and repair the project in a manner that will not cause liability to arise under CERCLA;

g. Prevent obstructions or encroachments on the project (including prescribing and enforcing regulations to prevent such obstructions or encroachments) that might reduce the level of protection the project affords, hinder operation and maintenance of the project, or interfere with the project's proper function;

h. Inform affected interests, at least annually, of the extent of risk reduction afforded by the project; participate in and comply with applicable federal floodplain management and flood insurance programs; comply with Section 402 of the Water Resources Development Act of 1986, as amended (33 U.S.C. 701b-12); and publicize floodplain information in the area concerned and provide this information to zoning and other regulatory agencies for their use in adopting regulations, or taking other actions, to prevent unwise future development and to ensure compatibility with the project;

i. For shores, other than federal shores, protected using federal funds, ensure continued conditions of public use of such shores compatible with the authorized purpose of the project;

j. Provide and maintain necessary access roads, parking areas, and other public use facilities, open and available to all on equal terms; and

k. At least annually, and after storm events, perform surveillance of the project, at no cost to the government, to determine losses of material and provide the results of such surveillance to the federal government.

10. The recommendations contained herein reflect the information available at this time and current departmental policies governing formulation of individual projects. These recommendations do not reflect program and budgeting priorities inherent in the formulation of 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 Congress as proposals for authorization and implementation funding. However, prior to transmittal to the Congress, the non-federal sponsor, the state, interested Federal agencies and other parties will be advised of any significant modifications and will be afforded an opportunity to comment further.

TODD T. SEMONITE  
Lieutenant General, USA  
Chief of Engineers