



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

DAEN (1105-2-10a)

JAN 23 2015

SUBJECT: New Jersey Shore Protection, Hereford Inlet to Cape May Inlet, New Jersey

THE SECRETARY OF THE ARMY

1. I submit for transmission to Congress my report on the study of hurricane and storm damage reduction for coastal communities located between Hereford Inlet and Cape May Inlet, Cape May County, New Jersey. It is accompanied by the report of the district and division engineers. This report is an interim response to a resolution by the Committee on Transportation and Infrastructure of the United States House of Representatives, adopted December 1987 and by the Committee on Environment and Public Works of the United States Senate dated December 1987 and an interim response to PL 113-2, the Disaster Relief Appropriations Act. The resolutions requested the Secretary of the Army to review existing reports of the Chief of Engineers for the entire coast of New Jersey with a view to study, in cooperation with the State of New Jersey, its political subdivisions and agencies and instrumentalities thereof, the changing coastal processes along the coast of New Jersey. Preconstruction engineering and design activities for the Hereford Inlet to Cape May Inlet, New Jersey, project will continue under the study authority cited above. The Corps of Engineers intends to undertake initial construction of the project under the authority of, and using funds provided in, PL 113-2. I am recommending that the Congress authorize periodic nourishment and any initial construction of the project that will not be completed using PL 113-2 funds.

2. The reporting officers recommend authorization of the National Economic Development Plan that consists of a dune and berm construction using sand obtained from an onshore beach borrow source located at the southern end of Five Mile Island (the Wildwoods). The recommended plan extends approximately 4.5 miles from Hereford Inlet to Cape May Inlet and will encompass the towns of North Wildwood, Wildwood, Wildwood Crest and Lower Township. Dimensions of the project are a +16-foot North American Vertical Datum 1988 (NAVD88) dune, with a 25-foot wide dune crest on a 75-foot wide berm that is +6.5-foot NAVD88 in elevation within North Wildwood, Wildwood, Wildwood Crest and Lower Township. Side slopes for the dune will be 1V:5H and slopes for the berm will be 1V:30H. The plan includes approximately 64 acres of dune grass, 28,000 linear feet of sand fence, 44 extended crossovers, seven new pedestrian crossovers, seven extended handicap crossovers, six new handicap crossovers, eight existing vehicle crossover extensions and five new vehicular crossovers. The sand will be pumped from the southern borrow area using mobile back-passing technology to hydraulically pump sand from the Wildwood and Wildwood Crest borrow source to the placement area. Initial construction for the project will remove approximately 1,527,250 cubic yards (cy) of sand from the approved borrow zone, which includes a design quantity of 1,136,000 cy and advanced nourishment of 391,000 cy. Periodic nourishment is included in project design to maintain the integrity of the design beach template over the project period of analysis. Nourishment requirements were

DAEN

SUBJECT: New Jersey Shore Protection, Hereford Inlet to Cape May Inlet, New Jersey

determined by considering losses resulting from diffusion of the design beach fill planform and natural background erosion. Following the initial construction, approximately 391,000 cy of material will be back-passed every four years throughout the 50-year period of analysis for the periodic nourishment of the selected plan. Since the recommended plan would not have any significant adverse effects, no mitigation measures (beyond management practices and avoidance) or compensation measures would be required.

3. The New Jersey Department of Environmental Protection (NJDEP) is the non-federal cost sharing sponsor for all features. Based on a March 2014 price level, the estimated total nourishment cost is \$104,030,000, which includes the project first cost of initial construction of \$21,600,000 and a total of 12 periodic nourishments at a total cost of \$82,430,000. 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. Shore protection features are cost-shared at a rate of 65 percent federal and 35 percent non-federal for the initial construction. Thus the federal share of the project first cost is \$14,040,000 and the non-federal share is estimated at \$7,560,000 which includes the costs of land, easements, rights-of-way, relocations, and dredged or excavated material disposal areas (LERRD). LERRD costs are estimated at about \$1,270,000. The non-federal sponsor will receive credit for the costs of LERRD toward the non-federal share.

b. Periodic nourishment will be cost shared 50 percent federal and 50 percent non-federal. It is expected to have costs of \$5,950,000 for year 4 and 8, and \$6,190,000 every four years thereafter, except in year 24, which assumes major nourishment is required at a cost of \$7,920,000. In addition, nourishment activities include monitoring costs estimated to average about \$138,000 over the 50-year period for a total of \$6,900,000.

c. The NJDEP would be responsible for the operation, maintenance, repair, replacement, and rehabilitation (OMRR&R) of the project after construction, an average annual cost currently estimated at \$150,000 over the 50-year period of analysis.

4. Based on a 3.375-percent discount rate and a 50-year period of analysis, the total equivalent average annual costs of the project are estimated to be \$2,669,000, including monitoring and OMRR&R. All project costs are allocated to the authorized purpose of shoreline protection. The recommended plan has average annual benefits of \$6,252,000. The net national economic development (NED) benefits of the project are \$3,583,000 and the benefit to cost ratio (BCR) is 2.3. In addition to providing protection from coastal storms, the dunes and berm create habitat for bird nesting and coastal plant species. The 64 acres of Cape American Beach Grass has the potential to develop into a more diverse plant community in a stable dune system. This project should benefit the piping plover habitat in the North Wildwood by stabilizing the beaches through regular periodic nourishment and improve the overall quality of the beach habitat.

DAEN

SUBJECT: New Jersey Shore Protection, Hereford Inlet to Cape May Inlet, New Jersey

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 risk and uncertainty analysis that incorporated key economic, hydraulic and sea level change parameters was performed for the feasibility study. This risk and uncertainty plan was peer reviewed by the Jacksonville District of the Army Corps of Engineers and approved by North Atlantic Division. The project is not intended to, nor will it, reduce 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 NJDEP.

6. In accordance with the Corps of Engineering Circular (EC 1165-2-212) on sea level change, the study performed a sensitivity analysis to look at the effects that different rates of accelerated sea level rise could have on the recommended plan. The plan was formulated using a historical or low rate of sea level rise of 0.013 feet/year. The sensitivity analysis used additional accelerated rates, which includes what the EC defines as intermediate and high rates of 0.023 feet/year and 0.056 feet/year, respectively. The analysis found that the influence of current sea level rise on the project is relatively low as compared to other factors causing erosion (waves, currents, winds and storms). The magnitude of the short-term storm induced erosion during hurricane events have a much greater effect along the New Jersey coastline than those indicated by the natural long term shoreline trends. Adaptive management will be used including monitoring and adding additional volume of sand during periodic nourishments to compensate for significant accelerated sea level rise beyond the current observed rate should it become necessary.

7. In accordance with the Corps of Engineers Circular (EC 1165-2-214) on the review of decision documents, all technical, engineering and scientific work underwent an open, dynamic and rigorous review process to ensure technical quality. This includes a District Quality Control review, an Agency Technical Review (ATR), an Independent External Peer Review (IEPR) (Type 1), and a Corps Headquarters policy and legal review. The IEPR was completed by Battelle Memorial Institute. 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 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. During the State and Agency (S&A) review, comments were received from the U.S. Environmental Protection Agency (EPA) and the Department of the Interior (DOI). Other

DAEN

SUBJECT: New Jersey Shore Protection, Hereford Inlet to Cape May Inlet, New Jersey

agencies indicated they either had no comments or provided none. The EPA reiterated a comment on the draft report concerning the potential for erosion at dune cross over locations due to their alignment. The Corps responded that the final report had addressed the concern, and the seaward side of all of the vehicular and pedestrian crossovers would be constructed at an angle to the dune, not perpendicular, in order to enhance dune resiliency. The DOI commented on the consideration given to borrow from the inlet area and the potential listing of the Red Knot as a threatened species under the Endangered Species Act. The Corps responded that the recommended plan has no borrow from the Hereford Inlet. The Corps has been engaged in Endangered Species Act consultation with the U.S. Fish and Wildlife Service (FWS) regarding the red knot, which was listed as a threatened species following receipt of the DOI S&A comments. The district will coordinate any potential impacts related to this coastal project with the FWS and incorporate protection measures into the project plan as the design phase continues.

9. I generally concur in the findings, conclusions, and recommendations of the reporting officers. Accordingly, I recommend that the periodic nourishment associated with the project to reduce hurricane and storm damages for Hereford Inlet to Cape May Inlet, New Jersey and any initial construction of the project that will not be completed with PL 113-2 funds be authorized in accordance with the reporting officers' recommended plan, with such modifications as in the discretion of the Chief of Engineers may be advisable. The estimated cost of the project is \$104,030,000, which includes an estimated total cost for periodic nourishment of \$82,430,000 for 12 cycles of periodic nourishment and an estimated total cost of \$21,600,000 for initial construction that would be reduced by any initial construction undertaken using PL 113-2 funds. My recommendation is subject to cost sharing, financing, and other applicable requirements of federal laws and policies, including Section 103 of the Water Resources Development Act (WRDA) of 1986, as amended by Section 215 of WRDA 1999. This recommendation is subject to the non-federal sponsor agreeing to comply with all applicable federal laws and policies, including that it will:

a. Provide a minimum of 35 percent of initial project costs assigned to coastal storm damage reduction, plus 100 percent of initial project costs assigned to protecting undeveloped private lands and other private shores which do not provide public benefits, and 50 percent of periodic nourishment costs assigned to coastal storm damage reduction, plus 100 percent of periodic nourishment costs assigned to protecting undeveloped private lands and other private shores which do provide public benefits, and as further defined below:

1) Provide all lands, easements, and rights-of-way, including suitable borrow areas, and perform or ensure performance of all relocations determined by the federal government to be necessary for the initial construction, periodic nourishment, operation, and maintenance of the project;

2) Provide during construction any additional amounts necessary to make its total contribution equal to 35 percent of initial project costs assigned to hurricane and storm

DAEN

SUBJECT: New Jersey Shore Protection, Hereford Inlet to Cape May Inlet, New Jersey

damage reduction plus 100 percent of initial project costs assigned to protecting undeveloped private lands and other private shores which do not provide public benefits;

b. Operate, maintain, repair, replace, and rehabilitate 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 and state laws and regulations and any specific directions prescribed by the federal government;

c. Give the federal government a right to enter, at reasonable times and in a reasonable manner, upon property that the non-federal sponsor, now or hereafter, owns or controls for access to the project for the purpose of inspection, and, if necessary, after failure, to perform by the non-federal sponsor, for the purpose of completing, operating, maintaining, repairing, replacing, or rehabilitating the project. No completion, operation, maintenance, repair, replacement, or rehabilitation by the federal government shall relieve the non-federal sponsor of responsibility to meet the non-federal sponsor's obligations, or to preclude the federal government from pursuing any other remedy at law or equity to ensure faithful performance;

d. 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 project, except for damages due to the fault or negligence of the United States or its contractors;

e. Perform, or cause to be performed, 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;

f. 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 initial construction, periodic nourishment, operation, or maintenance of the project;

DAEN

SUBJECT: New Jersey Shore Protection, Hereford Inlet to Cape May Inlet, New Jersey

g. Agree 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, repair, replace, and rehabilitate the project in a manner that will not cause liability to arise under CERCLA

h. Participate in and comply with applicable federal floodplain management and flood insurance programs.

i. 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 use of such funds for the project is authorized;

j. Prevent obstructions of or encroachment on the project (including prescribing and enforcing regulations to prevent such obstructions or encroachments) which might reduce the level of protection it affords, hinder operation and maintenance or future periodic nourishment, or interfere with its proper function, such as any new developments on project lands or the addition of facilities which would degrade the benefits of the project;

k. Not less than once each year, inform affected interests of the extent of protection afforded by the project;

l. Publicize floodplain information in the area concerned and provide this information to zoning and other regulatory agencies for their use in preventing unwise future development in the floodplain, and in adopting such regulations as may be necessary to prevent unwise future development and to ensure compatibility with protection levels provided by the project;

m. For so long as the project remains authorized, ensure continued conditions of public ownership and use of the shore upon which the amount of federal participation is based;

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

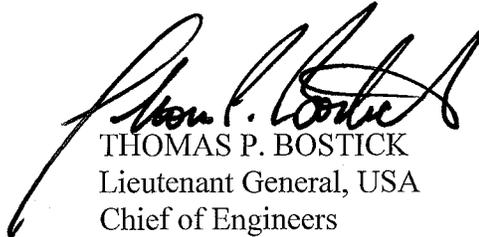
o. At least twice annually and after storm events, perform surveillance of the beach to determine losses of nourishment material from the project design section and provide the results of such surveillance to the federal government.

10. The recommendation contained herein reflects the information available at this time and current departmental policies governing the formulation of individual projects. It does not reflect program and budgeting priorities inherent in the formulation of a national civil works construction program or the perspective of higher review levels within the executive branch. Consequently, the recommendation may be modified before it is transmitted to Congress as a

DAEN

SUBJECT: New Jersey Shore Protection, Hereford Inlet to Cape May Inlet, New Jersey

proposal for authorization and implementation funding. However, prior to transmittal to Congress, the 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.



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