



DEPARTMENT OF THE ARMY
CHIEF OF ENGINEERS
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WASHINGTON, D.C. 20310-2600

DAEN

May 24, 2022

Subject: Rio Guanajibo Flood Risk Management, Mayaguez, Hormigueros, and San German, Puerto Rico

THE SECRETARY OF THE ARMY

1. I submit for transmission to Congress my report on the feasibility of improvements for the purpose of flood risk management (FRM) in the cities of Mayaguez, Hormigueros, and San German, Puerto Rico. It is accompanied by the validation report of the St. Louis District Commander. The Water Resources Development Act of 1999 authorized the Rio Guanajibo Flood Risk Management Project in the cities of Mayaguez, Hormigueros, and San German. Due to inactivity, a Deauthorization Report was sent to Congress on February 26, 2016, and published in the Federal Register on March 25, 2016, in accordance with section 6001(d) of the Water Resources Reform and Development Act of 2014. The Bipartisan Budget Act of 2018 (Public Law 115-123), Title IV, Division B (BBA18) provides funding for "investigations related to the completion, or initiation and completion, of flood and storm damage reduction, including shore protection, studies which are currently authorized, or which are authorized after the date of enactment of the subdivision...". Under this authority the Jacksonville and St. Louis Districts reviewed the report of the Chief of Engineers dated February 27, 1996, on Guanajibo River, Puerto Rico, and other pertinent reports with a view to verify problems and the continued need for the project and to document whether the features identified in the 1996 Chief's Report were still valid. The verification report was approved by the Assistant Secretary of the Army (Civil Works) on July 29, 2019, which allowed for the development of the validation report and the start of pre-construction engineering and design (PED).

2. The reporting officers recommend the re-authorization of the National Economic Development (NED) plan for FRM with the refinements identified in the validation report for the cities of Mayaguez and Hormigueros and possible action in San German. For the San German area, the original authorization included approximately 0.9 miles of channel improvements and replacement of the Highway 119 (now Highway 122) bridge. Because the Puerto Rico Department of Transportation replaced the bridge in 2009, that measure has been removed from the recommended plan. While no significant flooding impacts occurred in the area from Hurricane Maria (an estimated 10 percent Annual Exceedance Probability (AEP) event), additional hydrology and hydraulics (H&H) modeling during the PED phase will be done to confirm the existing channel will accommodate the 10 percent AEP flood as originally authorized. If the H&H modeling indicates otherwise, modifications to the channel in San German may be desirable, and thus, such modifications have been included in the recommended plan. Based on Fiscal Year (FY) 2022 price levels, a 2.25 percent discount rate and a 50-year period of

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analysis, the estimated total project first cost of the recommended plan is \$170,730,000. Benefits from the original feasibility report in FY93 dollars, less the benefits from the San German region, result in total average annual benefits of \$5,190,000; total average annual costs in FY93 dollars are \$2,807,000; and total average annual net benefits are \$2,383,000. The benefit to cost ratio (BCR) is 1.8 for the FRM features. The principal features of the plan include:

- a) Near Mayaguez, construction of approximately one mile of levee with a 1:4 slope, a top levee elevation of approximately 18.4-ft, and an average height of approximately 10-ft for along the southeast and southwest borders of San Jose Estates tying into high ground to the east (Vista Del Oeste). A drainage ditch will also be constructed on the inside of the levee.
- b) Near Mayaguez, construction of approximately 0.5 miles of levee with a 1:4 slope and a top levee elevation of approximately 16.5-ft along the south and southeast boarder of Guanajibo Homes to the floodwall described below. A drainage ditch will also be constructed on the inside of the levee and discharge through the below floodwall.
- c) Near Mayaguez, construction of a floodwall on the northeast boundary of Guanajibo Homes, along the Cano Corazones. The average height will be similar to the levee section at approximately 16.5-ft.
- d) Construction of an approximately one-mile levee in the Lower Hormigueros area, to the west of Highway 114 and north of Highway 100 with an average height of about 8 feet, and a top elevation of about 26.2-feet NGVD.
- e) Construction of a detention pond of approximately 40 acres between the levee and Highway 100 in the Lower Hormigueros area.
- f) Construction of a small levee upstream of Highway 100 that runs from Highway 100 to Highway 309 in the Upper Hormigueros area.
- g) Removal of a railroad bridge east of Highway 114 in the Upper Hormigueros area.
- h) Approximately one mile of channel improvements, if needed based on further H&H modeling, to accommodate a 10 percent AEP in San German in the vicinity of the Puerto Rico Highway 122 Bridge.
- i) Up to 70 acres of mitigation for mangrove habitat.

3. The recommended plan could potentially result in induced flooding along the Rio Guanajibo from Upper Hormigueros to the coast. Additional analysis to be performed during PED will confirm if any induced flooding results in a taking of private property that will require compensation or design changes to reduce the flooding.

4. The non-federal sponsor is the Puerto Rico Department of Natural and Environmental Resources (DNER). Based on October 2021 price levels, the estimated total first cost of the recommended plan is \$170,730,000. The non-federal cost share of the project is 35 percent, which is estimated at \$59,755,500. However, in accordance with BBA18 which states "all repair, rehabilitation, study, design, and construction of

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Corps of Engineers projects in Puerto Rico... , using funds provided under this heading, shall be conducted at full Federal expense”, the construction of this project is not subject to cost-sharing if completed using BBA18 funds. The non-federal sponsor is required to provide all lands, easements, relocations, rights-of- way, and disposal areas (LERRDs) for the project, which are estimated at \$9,194,000. The non-federal sponsor would also be responsible for operation, maintenance, repair, replacement, and rehabilitation (OMRR&R) of the project at approximately \$260,000 per year, which would include mowing, control of vegetation and burrowing animals, routine inspections, cleaning woody debris and trash from the inlet, outlet and basin, and repair of berm erosion, outlet pipes, and riprap.

5. While the recommended plan is expected to provide flood risk reduction to structures up to the one percent AEP in the Mayaguez neighborhoods of San Jose Estates and Guanajibo Homes and the Hormigueros area, some residual risk remains. Therefore, large, infrequent flood events or localized rain events occurring behind the levees may still cause flooding. Additionally, there is risk of failure of the levees and floodwalls. However, there is negligible life risk associated with these features as long as they are constructed to current engineering standards and design requirements. In addition, a Potential Failure Mode Analysis and risk assessment will be performed during PED, and a post implementation risk assessment will be completed after construction. The currently known residual risks have been communicated to the non-federal sponsor, who understands and agrees with the assessment of the plan.

6. An environmental impact statement was prepared in accordance with the National Environmental Policy Act for the 1995 report that lead to the 1996 Chief’s Report. A comparison of the summary of impacts from the 1995 report to the anticipated changes in impacts with the implementation of the currently recommended plan led to the conclusion that the proposed action is covered by the existing analysis, and the overall scope of the project has not substantially changed. In addition, no new circumstances or information related to the impacts of the recommended plan were identified. The recommended plan has been designed to avoid or minimize environmental impacts while maximizing safety and economic benefits to the community. It is anticipated that mitigation for up to 70 acres of mangroves, at an estimated cost of \$5,400,000, will be required to address the impacts of the project. However, the project will seek to further minimize impacts to wetland resources during PED, and any refinements to the mitigation plan will be coordinated with the resource agencies.

7. In accordance with U.S. Army Corps of Engineers guidance 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, and headquarters policy and legal compliance review. All concerns of the reviews have been addressed and incorporated into the final report. An exclusion from Independent External Peer Review was granted in November

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2020 by the Mississippi Valley Division Commander. A Safety Assurance Review will be conducted during PED.

8. Washington level review indicates that the project recommended by the reporting officers is technically sound, cost effective, environmentally 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. The recommended plan 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 flood risk to Mayaguez, Hormigueros, and San German, Puerto Rico along Rio Guanajibo be re-authorized in accordance with the reporting officers' recommended plan at an estimated project first cost of \$170,730,000 with such modifications as in the discretion of the Chief of Engineers may be advisable. My recommendation is subject to cost sharing and other applicable requirements of federal laws, regulations, and policies. Federal implementation of the project for structural flood risk management includes, but is not limited to, the following required items of local cooperation to be undertaken by the non-federal sponsor in accordance with applicable federal laws, regulations, and policies:

a. Provide a minimum of 35 percent, up to a maximum of 50 percent, of construction costs, as further specified below:

1. Provide, during design, 35 percent of design costs in accordance with the terms of a design agreement entered into prior to commencement of design work for the project;

2. Pay, during construction, a contribution of funds equal to 5 percent of construction costs;

3. Provide all lands, easements, rights-of-way, and placement areas and perform all relocations determined by the Federal government to be required for the project;

4. Provide, during construction, any additional contribution necessary to make its total contribution equal to at least 35 percent of construction costs;

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

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c. Inform affected interests, at least yearly, of the extent of risk reduction afforded by the flood risk management features; participate in and comply with applicable Federal floodplain management and flood insurance programs; prepare a floodplain management plan for the project to be implemented not later than one year after completion of construction of the project; 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;

d. Operate, maintain, repair, rehabilitate, and replace the project or functional portion thereof 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;

e. Give 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 project to inspect the project, and, if necessary, to undertake work necessary to the proper functioning of the project for its authorized purpose;

f. Hold and save the Federal government free from all damages arising from design, construction, operation, maintenance, repair, rehabilitation, and replacement of the project, except for damages due to the fault or negligence of the Federal government or its contractors;

g. Perform, or ensure performance of, any investigations for hazardous, toxic, and radioactive wastes (HTRW) that are determined necessary to identify the existence and extent of any HTRW regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. 9601-9675, and any other applicable law, that may exist in, on, or under real property interests that the Federal government determines to be necessary for construction, operation, and maintenance of the project;

h. Agree, as between the Federal government and the non-Federal sponsor, to be solely responsible for the performance and costs of cleanup and response of any HTRW regulated under applicable law that are located in, on, or under real property interests required for construction, operation, and maintenance of the project, including the costs of any studies and investigations necessary to determine an appropriate response to the contamination, without reimbursement or credit by the Federal government;

i. Agree, as between the Federal government and the non-Federal sponsor, that the non-Federal sponsor shall be considered the owner and operator of the project for the purpose of CERCLA liability or other applicable law, and to the maximum extent

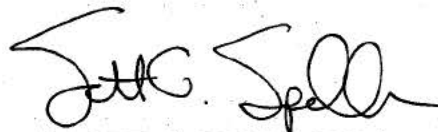
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practicable shall carry out its responsibilities in a manner that will not cause HTRW liability to arise under applicable law; and

j. Comply with the applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, as amended, (42 U.S.C. 4630 and 4655) and the Uniform Regulations contained in 49 C.F.R Part 24, in acquiring real property interests necessary for construction, operation, and maintenance of the project including those necessary for relocations, and placement area improvements; and inform all affected persons of applicable benefits, policies, and procedures in connection with said act.

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 Congress for authorization and/or implementation funding. However, prior to transmittal to the Congress, the non-federal sponsor, the Commonwealth of Puerto Rico, interested federal agencies and other parties will be advised of any modifications and will be afforded an opportunity to comment further.



SCOTT A. SPELLMON
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