



DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, MISSISSIPPI VALLEY DIVISION
1400 WALNUT STREET
VICKSBURG, MISSISSIPPI 39180-3262

CEMVD-PDC

13 May 2021

MEMORANDUM FOR COMMANDER, St. Louis District

SUBJECT: Approval of the Review Plan for the Rio Guanajibo Validation Study Review Plan

1. References:

- a. South Atlantic Division, CESAD-PD, Jacqueline Keiser email (Rio Guanajibo Review Plan - Submittal for SAD Approval), 3 March 2021
- b. South Atlantic Division, CESAJ-PD memorandum (Approval and Type I Independent External Peer Review Exclusion for Rio Guanajibo, Puerto Rico, Validation Report Review Plan), 3 November 2020 (Encl 2)
- c. EC 1165-2-217 (Review Policy for Civil Works), 20 February 2018

2. A Type I Independent External Peer Review exclusion was requested on 3 November 2020 and endorsed by the Risk Management Center (RMC) on 19 October 2020 (Encl 3).

3. The enclosed Review Plan (RP) for the Rio Guanajibo Validation Study (Encl 1) has been prepared in accordance with EC 1165-2-217 and has been coordinated with MVD staff and the RMC, who endorsed the RP.

4. We hereby approve this RP, which is subject to change as circumstances require, consistent with project development under the Project Delivery Business Process. Non-substantive changes to this RP do not require further approval. Substantive revisions to this RP or its execution will require new written approval from this office. The district should post the approved RP to its internal website, with sensitive information removed.

5. My point of contact for this action is ,



3 Encls

REVIEW PLAN

April 21, 2021

Project Name: Rio Guanajibo, Puerto Rico Project

P2 Number: MVS - Rio Guanajibo, PR - 477701

Decision Document Type: Validation Report

Project Type: Flood Risk Management

District: Jacksonville Division

District Contact: Planning Technical Lead

Major Subordinate Command (MSC): Mississippi Valley Division

MSC Contact:

Review Management Organization (RMO): Risk Management Center

RMO Contact:

Key Review Plan Dates

Date of RMO Endorsement of Review Plan: October 19, 2020

Date of MSC Approval of Review Plan: May 13, 2021

Date of IEPR Exclusion Approval: Pending

Has the Review Plan changed since RMO Endorsement: Yes, the MSC changed from SAD to MVD and the ATR reviewers have updated along with the dates of review schedule.

Date of Last Review Plan Revision: April 21, 2021

Date of Review Plan Web Posting: May 18, 2021

Date of Congressional Notifications: Pending

Milestone Schedule

	Scheduled (start)	Actual	Complete
Execute FCSA:	09 OCT 2018	09 OCT 18	Yes
Initiate District DQC	5 FEB 2021	5 FEB 2021	Underway
Initiate ATR:	7 JUN 2021	(enter date)	Pending
Initiate Policy and Legal Review	7 JUN 2021	(enter date)	Pending
Policy and Legal Review Backcheck	17 AUG 2021	(enter date)	Pending
Final Report Transmittal:	27 SEP 2021	(enter date)	Pending
Validation Report Approval	4 OCT 2021	(enter date)	Pending

Project Fact Sheet

April 21, 2021

Project Name:

Rio Guanajibo, Puerto Rico Project

Purpose:

This Review Plan (RP) for the Validation Report for the Rio Guanajibo Supplemental Project (P2# 477701) at Mayaguez, Hormigueros, and San German, will help ensure a quality review process is developed by the Corps of Engineers in accordance with EC 1165-2-217, "Review Policy for Civil Works". As part of the Project Management Plan this RP establishes an accountable, comprehensive, life-cycle review strategy for Civil Works products and lays out a value added process and describes the scope of review for the current phase of work. The EC outlines five general levels of review: District Quality Control/Quality Assurance (DQC), Agency Technical Review (ATR), Biddability, Constructability, Operability, Environmental, and Sustainability (BCOES) Review, Independent External Peer Review (IEPR), and Policy and Legal Compliance Review. This RP will be provided to the Project Delivery Team (PDT) and all applicable review teams. The validation review efforts addressed in this RP, DQC and ATR, are to augment and complement the policy review processes.

The purpose of the validation report is to ensure the project as recommended in the 1996 Chief's Report is technically sound, environmentally and socially acceptable and economically justified. Although the Validation Report and Preconstruction Engineering and Design (PED) efforts are happening concurrently, this RP only covers the review process for the validation efforts. The Validation Report is a joint effort being prepared by the Jacksonville District (SAJ) and St. Louis District (MVS) and approved by MVD (see Attachment 5 - MOA for additional information). PED efforts are being conducted by St. Louis (MVS) and Memphis (MVM) Districts. A separate review plan and review process will occur for the PED efforts which is concurrent with the validation effort and is the responsibility of MVS. Since these efforts are happening concurrently the goal is to use the same reviewers where applicable for ATR for both the validation and design efforts. The Jacksonville District Levee Safety Officer (LSO) will be part of the district Quality Control team for both the Validation Report and PED. The Jacksonville District LSO and St. Louis District Chief of Engineering and Construction have assessed that the life safety risk of this project is significant; therefore, a Type II IEPR/Safety Assurance Review (SAR) will be required during PED. The Risk Management Center will be the RMO for both the Validation Report and PED RPs and review processes. This was decided during a joint call with the RMC, SAD, FRM-PCX, and SAJ. The RMC determined that since they were the RMO for the PED review efforts they would also be RMO for the validation review to ensure consistency since they were concurrent efforts.

References:

1. EC 1165-2-217, Review Policy For Civil Works, 20 February 2018
2. Memorandum for Commander, CESAJ, 12 October 2018, subject: Accelerated Verification of the Guanajibo River, Puerto Rico Project.
3. Chief's Report, CECW-PE, 27 February 1996, Subject: Guanajibo River, Puerto Rico

4. Memorandum for Record, CECW-P, 7 April 2019, Subject: Supplemental Scope Verification/ "3Es" Determination for Rio Grande de Loiza, Rio Guanajibo at Mayaguez, and Rio Nigua at Salinas.
5. Scope Verification Report for the Rio Guanajibo Puerto Rico Project dated, 12 June 2019
6. OASACW Comments on the Puerto Rico Scope Verification Reports dated 28 June 2019 with Corps Responses 8 July 2019.
7. Memorandum, DCW, 9 July 2019, subject: Additional Information for the Scope Verification Reports for Rio Grande de Loiza, Rio Guanajibo at Mayaguez, and Rio Nigua at Salinas.
8. Memorandum, ASA(CW), 29 July 2019, subject: Supplemental Scope Verification for Rio Grande de Loiza, Rio Guanajibo at Mayaguez, and Rio Nigua at Salinas, Puerto Rico.
9. Memorandum for Commander, 30 October 2019, subject: Supplemental Guidance - Deauthorized Project Validation Scope for Rio Grande de Loiza, Rio Guanajibo at Mayaguez, and Rio Nigua at Salinas, Puerto Rico
10. Memorandum for Major Subordinate Commands and District Commanders, subject: Interim Guidance on Streamlining Independent External Peer Review (IEPR) for Improved Civil Works Product Delivery, 5 April 2019.

Project Description and Location:

The Río Guanajibo basin is located in southwest Puerto Rico and includes portions of 6 municipalities with a total population over 225,000. The population at risk for the project area is approximately 88,500. Based on the 1995 Rio Guanajibo Feasibility Report there were 2,321 structures in the Mayaguez and Hormigueros area affected by the 100-year flood (1 percent chance of flooding in any given year) and 578 structures affected in the San German area. The catchment area is 140 square miles. Flooding is a serious threat to life and property in the towns of San German, Hormigueros and Mayaguez. The recommended project includes a channel planned to provide a 10-year level of protection at San German in the upper basin and a system of levees that will provide a 100-year level of protection for the urban areas at Hormigueros and Mayagüez in the lower basin. The recommended plan consists of 6.26 kilometers of floodwalls and levee system in the vicinity of the residential developments of Guanajibo Homes, San José Estates, Buenaventura, and Valle Hermoso. The plan also consists of channel improvements in San German located 12 kilometers upstream of the levee features. See Figures 1, 2, and 3. As of November of 2019, all listed features will be included in the design effort and will be verified in the validation report for being technically sound, environmentally and socially acceptable and economically justified.

Mayaguez

Both communities (Guanajibo Homes and San Jose) are densely populated primarily with residences and a few commercial and public properties. Their line of protection will consist of a levee or floodwall and protects the community from flooding from the west by the Rio Guanajibo and Caño Merle. Guanajibo Homes is a development along the PR-102 (Boulevard Guanajibo) where planned floodwall and levee features are to protect the community and two radio towers. There is a PRASA wastewater pump station near the northeast side levee alignment that will

also be within the line of protection. Most of the lands on the levee alignment are on the edge of forested and saturated/inundated mangrove wetlands. On the northeast side of the development, a floodwall will be constructed where there is little room for a levee footprint between structures and Caño Corazones. The line of protection will tie in to existing features at two locations. The northern tie-in will be to the Caño Corazones PR-102 Bridge left bank abutment and the southern tie-in will be on the coastline at PR-102, just south of the community. An interior drainage culvert will be located in alignment with the interior drainage ditch located between the pump and the radio stations. Near the south side tie-in, there is an existing 36” culvert that will accommodate additional interior drainage.

At the development of San Jose Estates, a levee and drainage ditch will be placed along the southwest and southeast perimeters. A mitigation area will be included to account for project features that encroach into the mangrove wetlands. A levee is planned to extend eastward from the end of the southeast floodwall and continue along the left bank of Sábalo Creek providing both flood protection and an evacuation route in case of tsunami or other emergency. This portion of the levee has a wastewater pipeline along a part of its length that may need to be relocated. The line of protection will tie in to existing features at two locations. The westernmost tie-in will be to the coastline at PR-102. The easternmost tie-in will be to high ground at the dead-end of Calle Tauro in the Villas del Oeste community.



Figure 1-1- Project Features for Guanajibo Homes, Mayaguez



Figure 1-2: Project Features for San Jose Homes, Mayaguez, Puerto Rico

Hormigueros

The line of protection at Hormigueros includes a levee and drainage ditch with up to eight penetrating culverts discharging interior waters to both Río Hondo and Río Guanajibo. The levee and drainage ditch begins to the northwest on high ground near PR-114, and follows the left bank of Río Hondo. The levee and drainage ditch then make a 90 degree left turn along the right bank of the Río Guanajibo. The levee will then tie-in to the elevated community just to the northwest of PR-100. The lands for this portion of levee reach are largely undeveloped.

The levee restarts/ties-in on the south side of PR-100, crossing PR-114 at a road ramp. A gravel/sand processing plant is located near the road ramp for PR-114. Alignment options to accommodate this plant will need to be further analyzed during design. The levee continues toward PR-2 along the south side of PR-309. The planned southeast levee embankment tie-in is located on the opposite side of the creek adjacent to Calle F, approximately half way between the PR-100 and the intersection of PR-309 and PR-2. At least two residences could possibly be affected by this alignment. As an alternative, the levee may be extended to the newly elevated PR-2 intersection and tie-in to high ground on the road ramp. This alignment would also provide additional benefits by protecting a commercial/industrial complex. With exception to the gravel/sand processing plant, the lands for this portion of levee are undeveloped and are either farmed or ranched.

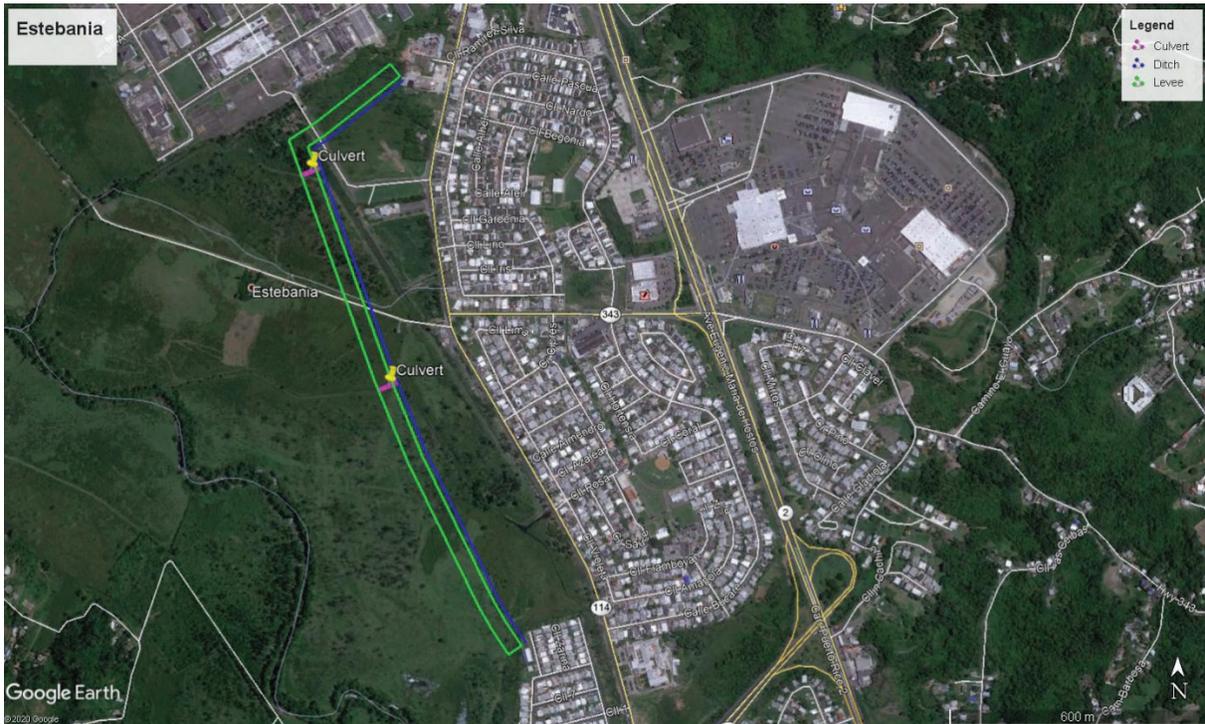
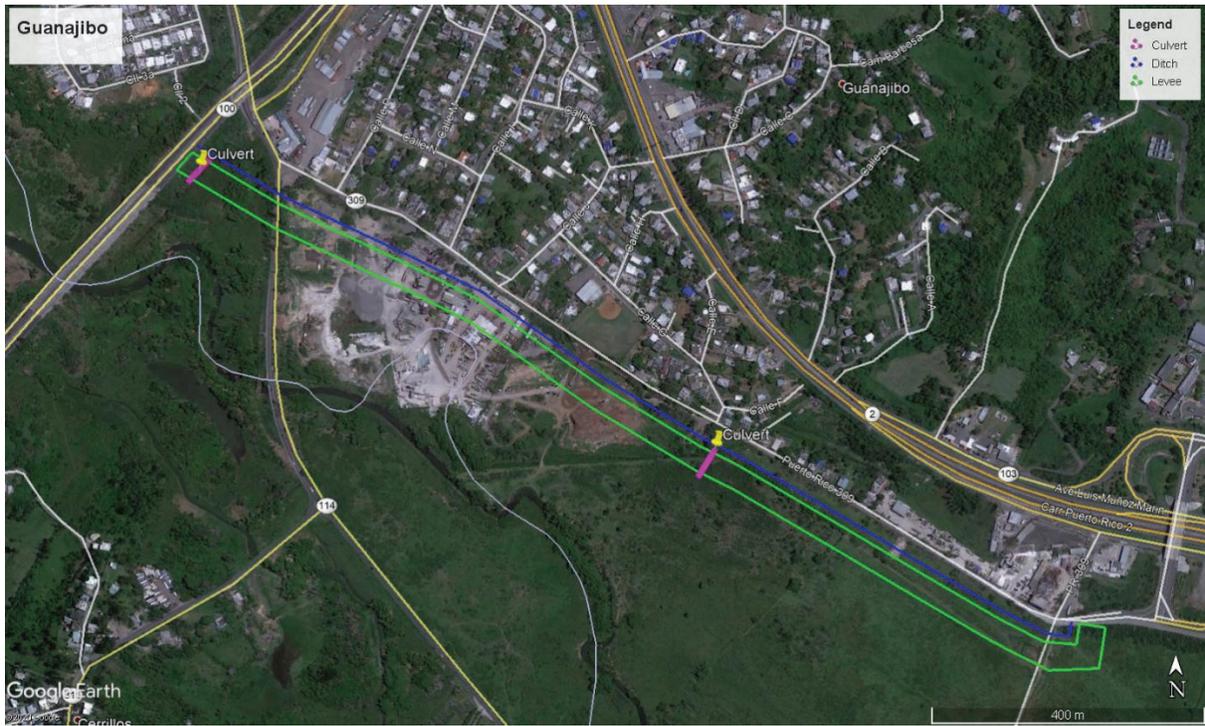


Figure 2- Contract Locations (Hormigueros)

San German

At San German channel improvements upstream of PR-122 to the confluence of Retiro Creek with Río Guanajibo and the left bank just downstream of PR-122 have been constructed utilizing gabion revetment. This work will be evaluated for condition and functionality during PED. The previously constructed confluence wall, as it appears shorter in length than presented in the plans, will also be evaluated during PED. The Puerto Rico Highway Authority has reinforced the channel under the PR-122 Bridge. Areas where the channel has not been improved are highly vegetated with areas showing active erosion, including vertical shear or slope failure. The channel just downstream of the PR-360 Bridge abutment has not been reinforced and the right bank is in a damaged or failing condition. These areas will be evaluated during PED. The proposed project ends in a transitional area downstream of the PR-360 Bridge.

Downstream of the project boundary, gabions have been installed along the left bank by Department of Natural and Environmental Resources (DNER). The backside of houses on PR-347 were flooded by Maria when the river overtopped the gabions crest elevation by approximately 4 feet. Gabions were in fair condition with slight slumping in some areas.

The PDT continues to refine and optimize project features within the scope of the authorized project. The Real Estate Plan (REP) appendix to the validation report will continue to reflect the iterative changes as a living document up to the point of submission for DQC, estimated for February 5, 2021. The completed REP could still be updated with any adjustments needed a result of the DQC review, prior to submission for the Agency Technical Review (ATR) in June/July 2021.

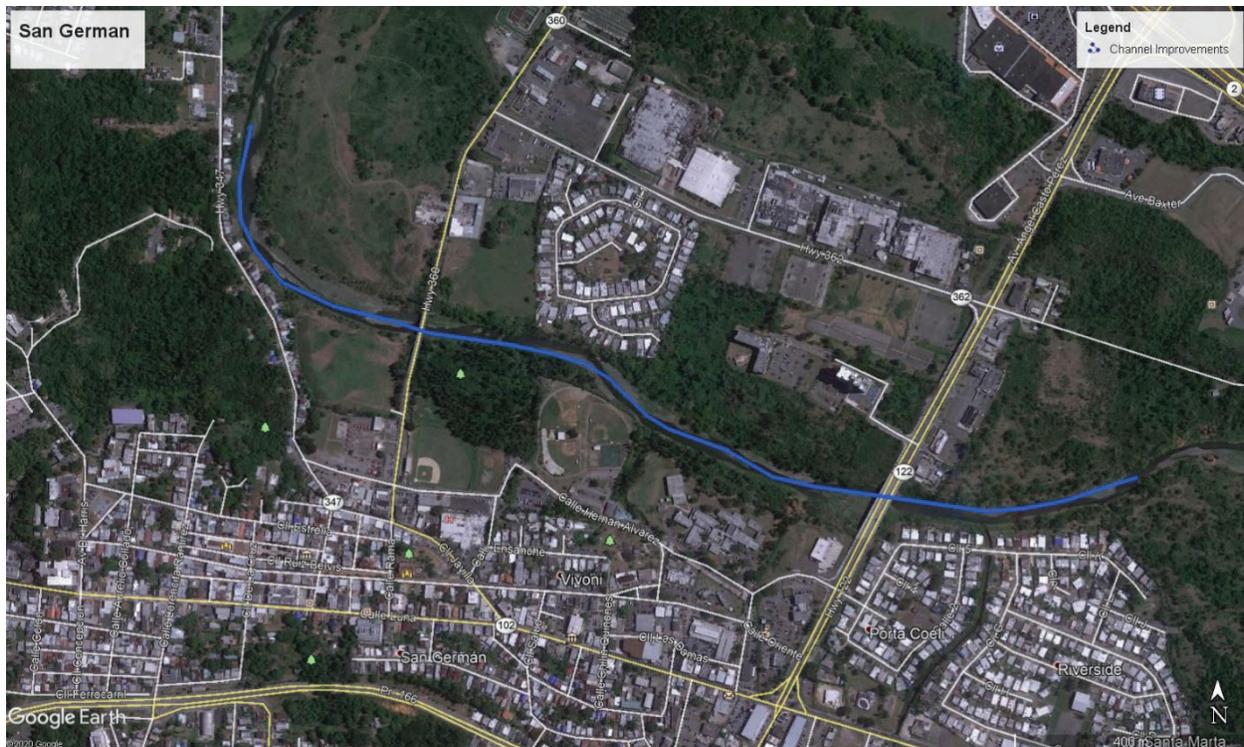


Figure 3- Contract Locations (San German)

Authority:

The project was originally authorized by Section 101(a)(27) of the Water Resources Development Act of 1999, Public Law 106-53.

The U.S. Army Corps of Engineers published a Final Deauthorization Report of water resources development projects identifying them for deauthorization in accordance with section 6001(d) of the Water Resources Reform and Development Act of 2014, Public Law 113-121, 128 STAT. 1346-1347 (WRRDA 2014). The Assistant Secretary of the Army for Civil Works transmitted the Final Deauthorization Report to Congress on February 26, 2016 which included Rio Guanajibo, Puerto Rico for deauthorization.

Pursuant to the Supplemental Bi-Partisan Budget Act (BBA) of 2018, PL 115-123, the Jacksonville District (SAJ) has performed a BBA "Investigation" account funded accelerated verification memorandum (Reference 2) of the Rio Guanajibo, Puerto Rico Project, for flood damage reduction. This verification effort assesses the engineering technical feasibility, environmental acceptability, and economic justification of the originally authorized project as described in the February 27, 1996 Chief's report (Reference 3) to determine if BBA allocated Construction appropriations should be made available for a subsequent Validation, PED and construction effort. The OASA(CW) concluded that engineering technical feasibility, environmental acceptability, and economic justification could not be determined based on the December 2018 memorandum (Reference 2) which was prepared in accordance with paragraph 4.d.(4) of Memorandum ASA(CW), 09 August 2018, Subject: Policy Guidance on Implementation of Supplemental Appropriations in the Bipartisan Budget Act of 2018. Headquarters directed that additional information be provided and formalized this direction in a memorandum for record dated 7 April 2019 (Reference 4).

As requested, the additional information was provided in a Verification Report dated 12 June 2019 (Reference 5) that was approved by ASA-CW on 29 July 2019 (Reference 8) to continue with concurrent validation and PED efforts. The Rio Guanajibo, Puerto Rico Validation Report is being prepared pursuant to this approval memorandum from ASA-CW (Reference 8).

Sponsor:

The non-federal sponsor for this project is the Puerto Rico Department of Natural and Environmental Resources (DNER).

Type of Study:

BBA 2018 Emergency Supplemental Validation Report

SMART Planning Status:

This effort is an Emergency Supplemental Validation Report to document the information required to support a decision using supplemental appropriations to proceed with project construction as previously approved as part of authorized flood control projects. Currently the Rio Guanajibo, Puerto Rico project has been approved for concurrent efforts which consist of the development of a Validation Report and PED. The supplemental NEPA for the approved EIS will be conducted during the PED efforts which will have a separate review plan and review process. This review plan only covers the review process for the Rio Guanajibo, Puerto Rico Validation Report.

Problem Statement:

Flooding is a serious threat to life and property in the towns of San German, Hormigueros, and Mayaguez and was most significantly observed in 1975 during Hurricane Eloise, when

according to historical newspaper reports presented in the 1994 Feasibility study, 8 people lost their lives and over 1,200 people lost their homes. Subsequently, minor to moderate flooding has occurred as recently as during Hurricane Maria.

Federal Interest:

This project is an authorized Federal Flood Risk Management (FRM) Project that established the Federal interest. The area's problems of flood risk still persist today. There is continued Federal interest to complete the authorized project to reduce flood risk within the basin.

Risk Identification:

Implementation Risk

The PDT has determined the project is NEPA compliant based on the existing NEPA document. A supplemental NEPA document is not expected for the validation or PED efforts. However, as the PDT refines the project concurrently during PED, the PDT will continue to consider the sufficiency of the existing NEPA documentation and will supplement as necessary. If a supplement is needed, it is anticipated to be an Environmental Assessment and not a full EIS, but that would be based on what the changes require. Project personnel have initiated informal coordination with resource agency personnel to help clarify the scope of potential environmental concerns. Impacts are anticipated to be in the same order of magnitude as those covered by the original NEPA document but increased somewhat due to potential footprint changes/expansions. Mitigation requirements from the original feasibility study/EIS were estimated to be 27.6 acres. Based on early footprint/alignment change assumptions, the mitigation requirement is now estimated to be 77 acres. Initial conversations with U.S. Fish and Wildlife Service personnel regarding potential changes in wetland impacts due to alignment/footprint changes were favorable. Service personnel indicated that, assuming mitigation commitments are adequate, there are no serious concerns with the proposed alignment changes to date. Further informal coordination will occur with resource agency personnel regarding potential threatened and endangered species impacts.

During PED a wetland delineation/vegetation survey will be conducted to clarify the scale of potential wetland impacts. A habitat model has been identified and approved by the ECO-PCX in compliance with current USACE planning requirements. The Uniform Mitigation Assessment Method (UMAM) has also been approved for regional use in Puerto Rico. Mitigation requirements will be finalized subsequent to wetland delineations, habitat model results, determination of final levee and floodwall footprints, and agency coordination. Coordination with resource agency personnel will continue as levee/floodwall alignments and habitat impact/mitigation quantities are refined. If determined necessary, a supplemental NEPA document will be released for public review if additional information during PED shows project impacts that are not currently disclosed in the existing NEPA document. At this time the PDT has determined the existing NEPA document sufficiently captures all identified environmental impacts to date.

Design Risk

A levee safety risk assessment will be conducted as part of the PED efforts but will not be available for the validation report. The project will utilize the same design and construction techniques that were authorized in the original project report. The project will not be justified by life safety. The project will reduce the existing potential for life/safety issues during flood events. However, the project is justified primarily by the reduction in damages associated with recurring flooding of structures within the project impact footprint.

A Safety Assurance Review (SAR), also known as a Type II Independent External Peer Review (IEPR), will be conducted during PED. SARs are managed outside the USACE and shall consider the adequacy, appropriateness, and acceptability of the design and construction activities in assuring public health safety and welfare. A site visit will be required by the SAR team during the design and construction phases. Details of the SAR review are discussed in the PED Review plan.

1. FACTORS AFFECTING THE LEVELS OF REVIEW

Scope of Review.

- Will the study likely be challenging?

The project is authorized and will utilize the same design with some refinements and optimizations, and techniques that were promoted in the original project reports previously coordinated with the public.

- Provide a preliminary assessment of where the project risks are likely to occur and assess the magnitude of those risks.

A risk and uncertainty based analysis was performed for the project as described in the original Feasibility Report in terms of the percentage chance of levees being overtopped in any particular year. The analysis also determined whether there is any significant deviation from the sizing and economics resulting from the conventional analysis upon which the final project formulation and recommendation was based. The analyses followed EC 1105-2-205 using a Monte Carlo type simulation. EC 1105-2-205 is not a currently used design requirement, but the Monte Carlo simulation is still a sound modeling approach to determine risk and uncertainty. Target stages (elevations in which levees would be overtopped) uncertainties were developed for the relationships associated with the frequency-discharge, stage-discharge, and stage-damage functions for the With Project and Without Project conditions. This will be validated as part of the current validation study efforts and confirmed in PED once the H&H analysis and modeling efforts is completed. An updated levee risk assessment will be completed during PED.

Sea level change (SLC) and inland hydrology will be assessed to determine if the project is vulnerable to climate change. The climate assessment will include a discussion on risk associated with climate change, both SLC and Inland Hydrology for Rio Guanajibo, and how resiliency or adaptation measures may be incorporated over the project life cycle.

- Is the project likely to be justified by life safety or is the study or project likely to involve significant life safety issues?

The project was not justified based on life safety risk; however, the project has potential to pose a threat to human life (public safety) in the event of levee failure. Therefore, during PED, a SAR will be performed. Products that will undergo SAR include the P&S and DDR prepared during the 65% Design, as well as construction documents at the mid-point and prior to the final inspection of construction

- Has the Governor of an affected state requested a peer review by independent experts?
No, the Governor of Puerto Rico hasn't requested a peer review by independent experts.

- Will the project likely involve significant public dispute as to the project's size, nature, or effects?
No significant public dispute is anticipated.
- Is the project/study likely to involve significant public dispute as to the economic or environmental cost or benefit of the project?
No significant public dispute to the economic or environmental costs or benefits is anticipated.
- Is the information in the decision document or anticipated project design likely to be based on novel methods, involve innovative materials or techniques, present complex challenges for interpretation, contain precedent-setting methods or models, or present conclusions that are likely to change prevailing practices?
No, the information in the study documents demonstrates that the project design is not based on novel methods, does not involve the use of innovative materials or techniques, does not present complex challenges for interpretation, nor does it contain precedent-setting methods or models, or present conclusions that are likely to change prevailing practices. The project will use standard design and construction techniques that are used on similar projects.
- Does the project design require redundancy, resiliency, and/or robustness, unique construction sequencing, or a reduced or overlapping design/construction schedule?
No, the proposed project design does not require any additional redundancy, resilience, or robustness.
- Is the estimated total cost of the project greater than \$200 million?
No, the estimated total project cost of this project does not exceed \$200 M.
- Will an Environmental Impact Statement be prepared as part of the study?
An initial EIS was filed in 1994. A water quality certificate was issued in 1998 with updated consultations from 2004. Supplemental NEPA will be completed in PED prior to construction.
- Is the project expected to have more than negligible adverse impacts on scarce or unique tribal, cultural, or historic resources?
A cultural resources assessment was conducted along portions of the Río Guanajibo Flood Control Project area of potential effects (APE) in 1986 and 1987 as part of the Feasibility Report and Environmental Impact Statement. This assessment identified 10 potentially significant archaeology sites in the Mayaguez segment of the APE and three previously unrecorded sites in the San German segment of the APE. During the Feasibility Study, the Corps determined that the project would have no effect on historic properties listed or eligible for listing on the National Register of Historic Places (NRHP). However, an updated cultural resources assessment of the APE will be required during PED based on the refinement of project features. Additionally, cultural resources may exist within the APE that have become eligible for listing in the NRHP within the last 30 years, and will need to be evaluated using the NRHP Criteria for Evaluation. Risk and uncertainty for potential mitigation for preservation of cultural resources was included in the cost and schedule risk assessment (CSRA) and is reflected in the contingency for the current working certified cost estimate.

- Is the project expected to have substantial adverse impacts on fish and wildlife species and their habitat prior to the implementation of mitigation measures?
The project is not expected to have substantial adverse impacts on fish and wildlife species. Agency consultations will be held and documented for the review process during the validation and PED efforts.
- Is the project expected to have, before mitigation measures, more than a negligible adverse impact on an endangered or threatened species or their designated critical habitat?
The project is not expected to have substantial adverse impacts on fish and wildlife species. Agency consultations will be held and documented for the review process during the validation and PED efforts..

2. REVIEW EXECUTION PLAN

This section describes each level of review to be conducted. Based upon the factors discussed in Section 1, this study will undergo the following types of reviews:

District Quality Control. All decision documents (including data, analyses, environmental compliance documents, etc.) undergo DQC. This internal review process covers basic science and engineering work products. It fulfills the project quality requirements of the Project Management Plan.

Agency Technical Review. ATR is performed by a qualified team from outside the home district that is not involved in the day-to-day production of the project/product. These teams will be comprised of certified USACE personnel. The ATR team lead will be from outside the home MSC. If significant life safety issues are involved in a study or project a safety assurance review should be conducted during ATR.

Cost Engineering Review. All decision documents shall be coordinated with the Cost Engineering Mandatory Center of Expertise (MCX). The MCX will assist in determining the expertise needed on the ATR and IEPR teams. The MCX will provide the Cost Engineering certification. The RMO is responsible for coordinating with the MCX for the reviews. These reviews typically occur as part of ATR.

Policy and Legal Review. All decision documents will be reviewed for compliance with law and policy. ER 1105-2-100, Appendix H provides guidance on policy and legal compliance reviews. These reviews culminate in determinations that report recommendations and the supporting analyses and coordination comply with law and policy, and warrant approval or further recommendation to higher authority by the home MSC Commander. These reviews are further detailed in this section of the Review Plan.

Table 1 provides the schedules and costs for reviews. The specific expertise required for the teams are identified in later subsections covering each review. These subsections also identify requirements, special reporting provisions, and sources of more information.

Table 1: Levels of Review

Product(s) to undergo Review	Review Level	Start	End	Cost	Complete
Final Validation Report	DQC	2/5/2021	5/21/2021	\$30K	No
Final Validation Report	ATR	6/7/2021	8/6/2021	\$60K	No
Final Validation Report	Policy and Legal Review	6/7/2021	8/6/2021	n/a	No

a. DISTRICT QUALITY CONTROL

The home district shall manage DQC and will appoint a DQC Lead to manage the local review (see EC 1165-2-217, section 8.a.1). Table 2 identifies the required expertise for the DQC team. The Validation Report is a joint effort being prepared by the Jacksonville District (SAJ) and St. Louis District (MVS); however, SAJ is the home district that will be managing DQC. The Validation Report is being approved by MVD and is the home MSC. Attachment 2 contains the DQC Reviewers.

Table 2: Required DQC Expertise

DQC Team Disciplines	Expertise Required
DQC Lead	A supervisor, regional technical specialist, lead planner, engineering technical lead, or PM who has no production role in the study/project. The lead must have extensive experience preparing Civil Works decision documents and conducting DQC. The lead may also serve as a reviewer for a specific discipline (such as planning, economics, environmental resources, etc.).
Planning	A senior water resources planner with experience in flood risk management projects and associated planning reports and documents.
Economics	A senior economist with demonstrated experience evaluating flood risk management project benefits and costs. Experience with evaluating the appropriateness of cost effectiveness and incremental cost analysis (CE/ICA), as applied to dollar costs & ecosystem restoration benefits; familiarity with the USACE tool IWR-PLAN. Experience in identifying incidental benefits (preferably flood risk management and water supply) is required.
Environmental Resources/NEPA Compliance/Cultural	A senior biologist/ecologist/environmental engineer, preferably with experience in flood risk management and familiarity with freshwater, coastal and estuarine systems. They must be able to review for NEPA compliance (including cultural resources coordination) and quality and applicability of ecosystem benefits evaluations.
Hydrology/Hydraulic Engineering	The Hydraulic Engineer shall be a senior level engineer with experience with engineering analysis related to flood risk management

DQC Team Disciplines	Expertise Required
	and levee safety projects. The team member must demonstrate knowledge and experience with the routing of inflow hydrographs. The hydrologic engineer shall also have experience in hydrologic design considerations for tropical environments and small basin design storms.
Structural Engineer	The Structural Engineer shall be a senior level engineer with experience in pile founded floodwall design, especially with poor soil conditions in both riverine and coastal environments.
Geotechnical Engineer	The Geotechnical Engineer shall be a senior level engineer with experience with design of levees and floodwalls within populated areas.
Civil Engineering	The Civil Engineer shall be a senior level engineer with experience designing levees, floodwalls, channels, drainage structures, and closure structures within populated areas. Additionally, the team member must have experience with utility relocations and real estate drawings.
Cost Engineering	The team member must be a registered professional with experience in cost engineering.
Real Estate	The real estate reviewer must be a senior real estate specialist with experience in flood risk management projects.
Construction	Geologist/Construction Manager with over five years experience in heavy civil construction. Experience in roads, bridges, levees, floodwalls, and/or pump stations.
Climate Resilience Preparedness	Senior Hydraulic Engineer with experience in Water Resources Engineering, specifically performing Hydraulic and Hydrologic related analysis and numerical modeling during planning, design, construction, and operational phases of projects within USACE. Performed hydraulic and hydrologic modeling using HEC-RAS and HEC-HMS.
Cultural Resources	Archaeologist that has experience with compliance with cultural resource laws across USACE. A cultural resources specialist that has worked on USACE civil works projects.

Documentation of DQC. Quality Control should be performed continuously throughout the study. A specific certification of DQC completion is required at the draft and final report stages. Documentation of DQC should follow the District Quality Manual and the MSC Quality Management Plan. An example DQC Certification statement is provided in EC 1165-2-217, on page 19 (see Figure F).

Documentation of completed DQC should be provided to the MSC, RMO and ATR Team leader prior to initiating an ATR. The ATR team will examine DQC records and comment in the ATR report on the adequacy of the DQC effort. Missing or inadequate DQC documentation can result in delays to the start of other reviews (see EC 1165-2-217, section 9).

b. AGENCY TECHNICAL REVIEW

The ATR will assess whether the analyses are technically correct and comply with guidance, and that documents explain the analyses and results in a clear manner. An RMO manages ATR. The review is conducted by an ATR Team whose members are certified to perform reviews. Lists of certified reviewers are maintained by the various technical Communities of Practice (see EC 1165-2-217, section 9(h)(1)). Table 3 identifies the disciplines and required expertise for this ATR Team. Attachment 3 contains the ATR team members.

Table 3: Required ATR Team Expertise

ATR Team Disciplines	Expertise Required
ATR Lead	The ATR team lead is a senior professional outside the home MSC with extensive experience in preparing Civil Works documents and conducting ATRs. The lead has the necessary skills and experience to lead a virtual team through the ATR process. The ATR lead may also serve as a reviewer for a specific discipline.
Plan Formulator	The plan formulator should be a senior water resources planner with experience in flood risk management studies and associated planning reports and documents. Plan formulation ATR certification is required.
Economics	An economist that is certified to perform ATR with demonstrated experience evaluating flood risk management project benefits and costs. Experience in identifying incidental benefits (preferably flood risk management).
Environmental Resources/NEPA Compliance/Cultural	A senior biologist, ecologist or environmental engineer certified to perform ATR, with experience in ecosystem restoration and familiarity with freshwater, coastal and estuarine systems. Must be able to review for NEPA compliance (including cultural resources coordination) and quality and applicability of ecosystem benefits evaluations.
Hydraulic and Hydrologic Engineer	The H&H Engineer shall be a senior level, and professionally registered engineer with experience with engineering analysis related to flood risk management and levee safety projects. The team member must demonstrate knowledge and experience with the routing of inflow hydrographs. Shall have experience in RMC-RFA, HEC-SSP, HEC-HMS, and HEC-RAS successfully using those methods and tools in Flood Risk Management Studies and Semi-Qualitative Risk Assessments. The hydrologic engineer shall also have experience in hydrologic design considerations for tropical environments and small basin design storms.
Civil Engineering	The Civil Engineer shall be a senior level, professionally registered engineer with experience designing levees, floodwalls, channels, drainage structures, and closure structures within populated areas. Additionally, the team member should have experience with utility relocations and real estate drawings.
Structural Engineering	Recognized expert in the field of structural engineering analysis, design, and construction of reconstruction projects consisting of portions of floodwalls, levees, closure

ATR Team Disciplines	Expertise Required
	structures, and pump stations. Working familiarity with ACI 350 and the pertinent Corps' Engineering Manuals is required. Shall have a proven track record of design of structures used in flood damage reduction systems. The Structural Engineer shall be a licensed professional engineer. The reviewer will also be certified and listed in CERCAP.
Geologist*	The engineering geologist will have experience in assessing the geologic setting, bedrock geology, unconsolidated deposits, and hydrogeology and correlating the performance of foundations with the significant engineering properties.
Geotechnical Engineering*	The Geotechnical Engineer shall be a senior level, professionally registered engineer with experience with design of levees and floodwalls within populated areas. The team member must be familiar with dealing with poor soil conditions in both riverine and coastal environments and the development of pile capacities. An understanding of graduate level soil mechanics, to include: soil shear strength, soil-structure interaction, deep foundations, slope stability, in addition to other methodologies required by the project.
Cost Engineering	The team member should be a registered professional with a minimum of 5 years' experience in cost engineering. Related construction experience is also desired. The team member will be a certified reviewer from the Cost MCX out of Walla Walla.
Real Estate	The real estate reviewer should be a senior real estate specialist with experience in flood risk management civil works projects.
Climate Preparedness and Resilience CoP Reviewer	One member of an Agency Technical Review Team for projects covered by this ECB must be certified by the Climate Preparedness and Resilience CoP in the Corps of Engineers Review Certification and Access Program (CERCAP).
Risk Analysis	The reviewer will be experienced with performing and presenting risk analyses in accordance with ER 1105-2-101 and other guidance, including familiarity with how information from the various disciplines involved in the analysis interact and affect the results.

*These roles may be served by the same reviewer if the reviewer has the appropriate experience / qualifications.

Documentation of ATR. DrChecks will be used to document all ATR comments, responses and resolutions. Comments should be limited to those needed to ensure product adequacy. If a concern cannot be resolved by the ATR team and PDT, it will be elevated to the vertical team for resolution using the EC 1165-2-217 issue resolution process. Concerns can be closed in DrChecks by noting the concern has been elevated for resolution. The ATR Lead will prepare a Statement of Technical Review (see EC 1165-2-217, Section 9), for the draft and final reports, certifying that review issues have been resolved or elevated. ATR may be certified when all concerns are resolved or referred to the vertical team and the ATR documentation is complete.

c. INDEPENDENT EXTERNAL PEER REVIEW

(i) Type I IEPR.

Decision on Type I IEPR. This study is limited in scope that it would not significantly benefit from a Type I IEPR. . The validation report is being developed only to verify that construction of the project's authorized features is still environmentally acceptable, economically justified and feasible from an engineering and design standpoint. Furthermore, none of the three mandatory conditions described in CECW-CE memo dated 5 April 2020, subject: Interim Guidance on Streamlining Independent External Peer Review (IEPR) for Improved Civil Works Product Delivery are triggered by the validation study. The estimated cost is below \$200 million, the governor has not requested a peer review by independent experts, and the study is not controversial due to significant public dispute over the size, nature, or effects of the project, or the economic or environmental costs or benefits. A Type II IEPR (Safety Assurance Review (SAR)) will be conducted during PED prior to construction.

(ii) Type II IEPR.

The second kind of IEPR is Type II IEPR. These Safety Assurance Reviews (SAR) are managed outside of the USACE and are conducted on design and construction for hurricane, storm and flood risk management projects or other projects where existing and potential hazards pose a significant threat to human life. A Type II IEPR Panel will be convened to review the design and construction activities before construction begins, and until construction activities are completed, and periodically thereafter on a regular schedule.

Decision on Type II IEPR.

The District Chief of Engineering has made a risk-informed decision that this project poses a threat to human life (public safety) in the event of levee or bridge failure. Therefore, during PED, a SAR will be performed. More detail regarding the SAR review can be found in the PED Review Plan.

d. MODEL CERTIFICATION OR APPROVAL

EC 1105-2-412 mandates the use of certified or approved models for all planning activities to ensure the models are technically and theoretically sound, compliant with USACE policy, computationally accurate, and based on reasonable assumptions. Planning models are any models and analytical tools used to define water resources management problems and opportunities, to formulate potential alternatives to address the problems and take advantage of the opportunities, to evaluate potential effects of alternatives and to support decision making. The use of a certified/approved planning model does not constitute technical review of a planning product. The selection and application of the model and the input and output data is the responsibility of the users and is subject to DQC, ATR, and IEPR.

There are no planning models being used for the validation report efforts.

EC 1105-2-412 does not cover engineering models used in planning. The responsible use of well-known and proven USACE developed and commercial engineering software will continue. The professional practice of documenting the application of the software and modeling results will be followed. The USACE Scientific and Engineering Technology Initiative has identified many engineering models as preferred or acceptable for use in studies. These models should be used when appropriate. The selection and application of the model and the input and output data is still the responsibility of the users and is subject to DQC, ATR, and IEPR.

Model Name	Version
Microstation	V8i SS4
HEC-RAS	5.0.7
MII	4.4.2

e. POLICY AND LEGAL REVIEW (MSC)

This validation report will be reviewed for compliance with law and policy by MVD. Guidance for policy and legal compliance reviews of decision documents is addressed in Appendix H, ER 1105-2-100. These reviews culminate in determinations that the recommendations in the report and the supporting analyses and coordination comply with law and policy, and warrant approval or further recommendation, or in this case validation, to higher authority. The technical review efforts (DQC and ATR) augment and complement the policy review processes by addressing compliance with pertinent published Army policies, particularly policies on analytical methods and the presentation of findings in decision documents.

Policy and legal compliance reviews for draft and final planning decision documents are delegated to the MSC (see Director’s Policy Memorandum 2018-05, paragraph 9). Attachment 4 contains the policy and legal team members.

(i) Policy Review.

The policy review team is identified through the collaboration of the MSC Chief of Planning and Policy and the HQUSACE Chief of the Office of Water Project Review. The team is identified in Attachment 1 of this Review Plan. The makeup of the Policy Review team will be drawn from Headquarters (HQUSACE), the MSC, the Planning Centers of Expertise, and other review resources as needed.

- The Policy Review Team will be invited to participate in key meetings during the development of decision documents as well as SMART Planning Milestone meetings. These engagements may include In-Progress Reviews, Issue Resolution Conferences or other vertical team meetings plus the milestone events.
- The input from the Policy Review team should be documented in a Memorandum for the Record (MFR) produced for each engagement with the team. The MFR should be distributed to all meeting participants.
- In addition, teams may choose to capture some of the policy review input in a risk register if appropriate. These items should be highlighted at future meetings until the issues are resolved. Any key decisions on how to address risk or other considerations should be documented in an MFR.

(ii) Legal Review.

Representatives from the Office of Counsel will be assigned to participate in reviews. Members may participate from the District, MSC and HQUSACE. The MSC Chief of Planning and Policy will coordinate membership and participation with the office chiefs.

- In some cases legal review input may be captured in the MFR for the particular meeting or milestone. In other cases, a separate legal memorandum may be used to document the input from the Office of Counsel.
- Each participating Office of Counsel will determine how to document legal review input.

ATTACHMENT 1: Project Delivery Team (PDT)

Name	Professional Registration (EI, PE, Etc.)	PDT Area of Responsibility	District
	PE	Project Management	MVS
	PE	Project Management	SAJ
	PE	Technical Lead	MVS
	PE	Technical Lead	MVM
	PE	Technical Lead	SAJ
		Project Management	SAJ
	PE	Project Management	SAJ
	PE	Geotechnical	MVS
		Geotechnical	MVS
		Geotechnical	MVS
	PE	Geotechnical	MVM
		Civil-Site	MVS
	PE	Civil-Site	MVS
	PE	Civil-Site	MVM
	PE	Hydraulics	MVS
	PE	Hydraulics	MVM
	PE	Structural	MVS
	PE	Structural	MVM
		Geology	MVS
	PG	Geology	MVS
	PE	Cost Estimating	MVS
	PE	Cost Estimating	MVM
	PLS	Surveying	MVM
	PLS	Surveying	MVM
		Specifications	MVS
		Construction	MVS
	C.V.S., C.C.C.	Value Engineering	MVM
		Value Engineering	MVS
		Real Estate	SAJ
		Real Estate	SAJ
		Real Estate	SAJ
		NEPA	MVS
		NEPA	SAJ
		Cultural	SAJ
		Legal	SAJ

ATTACHMENT 2: DQC Reviewers

Discipline	Name	Description of Credentials
Geotechnical Engineering/DQC Lead		is a PE that has over 10 years of experience in the field of geotechnical engineering, analysis, design, subsurface investigations, soil mechanics, internal erosion (seepage and piping), slope stability evaluations, erosion protection design, soil ground improvement (vertical drains, preload/surcharge, etc.), embankment monitoring instrumentation, development of pile capacity curves, and construction of earthen levees. She has participated in multiple DQC reviews and is familiar with the civil works decision documents.
Planning		is the Plan Formulation Branch Chief in Planning Division, Jacksonville District. She has approximately 10 years of planning experience with the majority of it focused on the Everglades Restoration in South Florida. More recently since becoming branch chief she oversees flood risk management, coastal storm risk reduction, deep draft navigation and ecosystem restoration studies within Jacksonville District's area of responsibility. She holds her doctorate in environmental science. She is a published author in natural sciences and economics and is ATR certified for plan formulation.
Economics		has been the Regional Chief of Economics for the five districts within the USACE South Atlantic Division since 2016 and in 2018 also became the Deputy Chief of Planning for the Jacksonville District. is responsible for direct oversight of the economists and economic workload for all programs in SAD except for navigation. He graduated from Virginia Tech with a dual major in Economics and Sociology. In 2000, joined the Army Corps of Engineers Jacksonville District Planning Division- Socioeconomics Branch as the primary economist working on implementing the Comprehensive Everglades Restoration Plan (CERP). Kevin became an expert in conducting cost effectiveness/incremental cost analysis and was instrumental in determining methods for calculating habitat valuations. was also actively involved in recreation, flood risk management and water supply evaluations; economic input/output multipliers, and addressing environmental justice.
Civil Engineering		Registered Professional Civil Engineer currently serving as a Civil Engineer in the Levee and Drainage Section in the Design Branch in the USACE Vicksburg District. Ms. has 7 years of experience working on Civil Works projects with the Corps of Engineers including geotechnical, design, and construction of levee projects. She has a Bachelor of

		Science in Civil Engineering from the University of New Orleans. has performed geotechnical analyses for multiple levee designs and is involved in the design of levee enlargements and seepage remediation projects throughout the Lower Mississippi Valley Division. She has served on DQC teams for construction projects within the Vicksburg District.
Structural Engineer		is a Structural Engineer with 13 years of experience in structural engineering and civil work projects. has experience in design, inspection and review of several retaining wall projects, and has coordinated and evaluated reviews for several project types in the Vicksburg District.
Construction		Geologist/Construction Manager that has 20 years of private sector experience as a principal of a heavy civil construction company performing contracts for USACE along with various Federal and State agencies. Project experience to include roads, bridges, levees, floodwalls, pump stations, gravity drains, box culverts, hydraulic dredging, deep soil mixing and pile driving. Extensive experience in estimating, project management, contract administration and cost accounting. Government experience includes the last two years as a Senior Construction Manager/Geologist with USACE supporting construction branch to include DQC and BCOES reviews, contract administration, problem solving, estimating for contract modifications, mentoring of COR staff, support of emergency management and various other duties.
Cost Engineering		PE that has 6.5 years of experience in the field of cost engineering of navigation and civil works projects and 2 years of experience in construction management in the private sector.
Hydrology/Hydraulic Engineering		PE Senior Hydraulic Engineer and MMC Modeling Technical Coordinator with 14+ years of experience working on hydraulic and hydrologic modeling and flood control projects both in the private and public sector. is a licensed Professional Engineer in Mississippi. experience with USACE involves performing hydraulic modeling of canal/river systems, dam breaches, levee breaches and hydraulic design using HEC RAS incorporating survey data, hydrology data, hydraulic structures as-built data, levees, etc. has also taught HEC-RAS courses and other hydraulic related courses both in the US and overseas. He also has extensive experience preparing flood mapping to show areas of inundation, performing engineering design using hydraulic design programs, spreadsheets, and GIS.
Climate Resilience Preparedness		Senior Hydraulic Engineer with 8+ years of experience in Water Resources Engineering, specifically performing Hydraulic and Hydrologic related analysis and numerical modeling during planning, design, construction, and operational phases of projects within the Jacksonville District. has performed hydraulic and hydrologic

		<p>modeling using HEC-RAS and HEC-HMS for a vast array of projects across multiple programs including environmental restoration, flood risk reduction, storm damage reduction, and emergency response. has experience in the modeling and design of water control structures such as pump stations, culverts, and spillways, as well as levees, dams, and canals. Additionally, she has completed and reviewed multiple climate change assessments for both sea level change and inland hydrology. holds a Bachelor of Science degree in Civil Engineering and a Master's degree in Water Resources Engineering from the University of North Florida and is a registered professional Engineer in the State of Florida.</p>
Environmental Resources/NEPA Compliance/Cultural		<p>Environmental Branch Chief, Jacksonville District Ms. Dunn is a biologist with over 12 years of experience working in Planning for Jacksonville District, Nashville District, and as a Planner for the NWD/POD RIT at Headquarters. Graduated from East Carolina University with a B.S. in Biology in 1997, an M.S. in Biology from the University of North Florida in 2004, and an M.S. in Risk Management from Notre Dame of Maryland University in 2019. Her accomplishments include completion of EA's and EIS's documents for Everglades Ecosystem Restoration projects, Flood Risk Management projects, Coastal Storm Damage Reduction projects, and a Dam Safety Modification Study. Ms. Dunn has completed DQC and policy reviews on multiple planning studies (including associated NEPA) within the Nashville District including J. Percy Priest Water Supply Reallocation Study, Duck River Watershed Study, and numerous Section 206 studies. Ms. Dunn has completed DQC with a focus on NEPA most recently in Jacksonville District for the Loxahatchee River Ecosystem Restoration Project EIS/Feasibility Report, Lake Okeechobee Watershed Restoration Project EIS/FR, Manatee Harbor O&M EA, Miami Harbor O&M EA, and Port Everglades O&M EA among others.</p>
Cultural Resources		<p>Archaeologist in the Jacksonville District in the Restoration and Resources Section of the Environmental Branch. Mr. Altes is responsible for ensuring compliance with cultural resource laws across USACE budget lines across the Southeast and Caribbean. He has served as the cultural resources specialist on environmental restoration, military construction, navigation, shore protection, disposition, and water operations projects with the Jacksonville and Savannah Districts. He has worked with USACE for 1.5 years, after spending 13 years in as a cultural resources contractor primarily in the Southeast and Caribbean. He holds a Bachelor of Arts and Master of Arts in Anthropology, with a focus on Caribbean archaeology.</p>
Real Estate		<p>Chief, Acquisition Branch, Real Estate Division in the Jacksonville District, U.S. Army Corps of Engineers (Corps). has been with the Jacksonville District since</p>

		<p>beginning with the Corps in February 1991, starting as new hire intern to his present position. Mr. Bealyer started off working in the In-Leasing Section and progressed to his current position as Chief, Acquisition Branch. Mr. Bealyer has extensive Civil Works experience, working on numerous projects that span the entire study process, from RECON to an approved Feasibility Report. Mr. Bealyer has prepared numerous real estate plans during his career and in his current position oversees a staff who works as the Real Estate Technical Leads for civil works, support for others, and emergency operations projects in the Jacksonville District. As a supervisor, I oversee the preparation of real estate plans and review/recommend to Chief, Real Estate Division for final approval.</p>
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*Ms. Moore is no longer with MVK but has provided comments as part of DQC.

ATTACHMENT 3: ATR Reviewers

Discipline	Name	Description of Credentials
ATR Lead		<p>Registered Professional Civil Engineer currently working as a Construction Liaison Engineer for USACE's Risk Management Center. has 30 + years of experience working on design and construction of Safety of Dams and Levee remediation projects with the Corps of Engineers and the Bureau of Reclamation. He has a Bachelor of Civil Engineering from University of Colorado-Boulder (with emphasis in Geotechnical Engineering). As a designer, has been involved in the design of a multitude of Safety of Dam projects including Jackson Lake Dam, Black Lake Dam, Buffalo Bill Dam, New Waddell Dam, Oneill Dam, and Twin Buttes Dam. As a Resident Engineer and COR, Mr. Sheskier oversaw field engineering and personnel for Safety of Dams modifications at Twin Buttes Dam, Casitas Dam, Horsetooth Dam, Soldier Canyon Dam, Dixon Dam, Spring Canyon Dam, Wickiup Dam, Mormon Island Aux Dam, and Folsom Dam and Dikes. As a Construction Liaison Engineer, has been involved in assisting USACE PDTs on development of P&S and QA for Safety of Dams and Levee modifications. The dams include Howard Hansen Dam, Addicks and Barker Dams, Isabella Dam, Rough River Dam, Bolivar Dam, and East Branch Dam to name a few. The levee projects I've assisted with are Natomas Levee, Marysville Ring Levee, Zoar Levee, Magnolia Levee, Caruthersville Floodwall, Helena Floodwall, Carrollton District Floodwall, Lower Wood River Levees, Princeville Levee, and Dallas Floodway levees to name a few. He has served on Source Selection Boards for several major dam rehabs. He has served as the Team Leader for constructability reviews and served on numerous Agency Technical Review teams for the Bureau of Reclamation and USACE's Tulsa, Sacramento, Pittsburgh, Louisville, Alaska, Galveston, and Huntington Districts. He has served as ATR Team Leader of many multi-disciplinary teams for both dam and levee safety and flood protection projects for Galveston, Louisville, Memphis, New Orleans, St. Louis, Sacramento, Vicksburg, and Wilmington. I worked on Team revising the guide specifications for Levee construction.</p>
Plan Formulation		<p>is a Planning Regional Technical Specialist (RTS) for Flood Risk Management. She is the Great Lakes and Ohio River Division (LRD) and North Atlantic Division (NAD) Regional Program Manager for the Flood Risk Management Planning Center of Expertise (FRM-PCX). Karen received a</p>

		<p>BS degree in Civil Engineering from West Virginia Institute of Technology in 1984, a MS in Engineering Management from West Virginia College of Graduate Studies in 1993 and has worked as a water resources planner within USACE on flood risk management, ecosystem restoration, and multi-purpose projects for over 28 years. has additional experience in Hydrology and Hydraulics, Engineering Management and Project Management. is the former Chief of Plan Formulation in Huntington District. In addition to Huntington District PDT experience, Karen serves as an alternate for the FRM-PCX and Planning Community of Practice on the Levee Senior Oversight Group (LSOG) meetings, has participated on numerous Agency Technical Review Teams (ATRs) for FRM projects throughout USACE as both a Subject Matter Expert (SME) for Plan Formulation/Policy review and as an ATR Lead, and has experience in facilitating and participating in charrettes. completed the USACE pilot Online Risk Management Graduate Certificate program offered through the Notre Dame of Maryland University in 2015.</p>
Environmental, NEPA Compliance, Cultural Resources		<p>is a Regional Technical Specialist of Biology in MVD working for the Regional Planning and Environmental Division North working on local, regional, and national projects and issues related to ecosystem restoration. He is the lead Biologist supporting execution of projects within the UMRS Environmental Management Program, Continuing Authorities Program, and other feasibility studies in the District. He also serves as subject matter expert providing technical and planning support for benefit evaluations, ecosystem output methodology development and/or selection, preparation of Environmental Assessments, preparation of adaptive management and monitoring plans, and conducting ATR for aquatic ecosystem restoration studies. He supports the National Ecosystem Restoration Planning Center of Expertise (ECO-PCX) through management of the Assuring Quality of Planning Models Program to include coordination and certification of ecological models across the nation for over 60 ecological models within FRM, ECO, CSDR, and DDN business lines.</p>
Econ/Risk 101		<p>currently works in Galveston for the Fort Worth District's Regional Planning and Environmental Center (RPEC) as a Regional Technical Specialist in Navigation Economics. Mr. Sansom began his career with USACE in 1995 with the Huntington District near his hometown of Barboursville, WV. He continued his career with USACE in Sacramento (2001-2003), Fort Worth (2003-2006), and San Francisco (2006-2016) Districts. While primarily serving as a Regional Economist in Flood Risk Management and Deep Draft Navigation, he has also served as a Plan Formulator and Project Manager. He completed two degrees at Marshall University: a BA in Economics (1993) and an MA in Mathematics/Statistics (2000).</p>
Real Estate		<p>is a Cost Share Real Estate Program Manager with over 10 years of experience in flood control and ecosystems restoration real estate planning and acquisition experience. In addition to supporting the Seattle District's real estate needs, has provided real estate technical support to the Portland and Chicago Districts. has a Master of Business Administration from the University of Phoenix, a Master of Science Degree from Claremont University, and a Masters of Theology from Fuller Seminary. She is currently working toward a Doctorate Degree from Seattle University. brings over 19 years of industrial work experience</p>

		through the Southern Pacific and Union Pacific Railroads. She has served as an internal Real Estate Subject Matter Expert on flood control and ecosystem ATR Teams around the Corps of Engineers.
Climate Resilience Preparedness		<p>has worked in water resources management, engineering research and development, climate change preparedness, and natural disaster management during his 22-year career at the U.S. Army Corps of Engineers (USACE) and is a registered professional engineer (Oregon PE 70988PE). He has played a critical role in managing several of the nation's largest and most complex river systems including the Mississippi and Columbia River watersheds. has been a lead engineer on major multipurpose water resource infrastructure projects for the New Orleans, Portland and San Francisco Districts of USACE, including the Mt. Saint Helens and Columbia River Channel Deepening Projects, and more recently the South San Francisco Bay Shoreline Project. He participated or led emergency response missions in the immediate aftermath of three recent natural disasters: a temporary roofing mission following Hurricane Charley, a temporary housing mission following Hurricane Ivan, and a debris mission for three months following Hurricane Katrina.</p> <p>is a leading USACE expert on climate change and global sea level rise, which impact national security globally. He has been instrumental in implementing global sea level rise science and policy directives into national USACE planning and engineering guidance receiving the 2016 USACE Climate Champion Award and was the agency nominee for the Presidential GreenGov award in 2016.</p> <p>In his role as a Subject Matter Expert for the Climate Preparedness and Resilience Community of Practice, he has authored or co-authored multiple USACE policy and technical documents about sea level rise, including the Engineering Technical Letter <i>Procedures to Evaluate Sea Level Change; Impacts, Responses, and Adaption</i> (2014), the Engineering and Construction Bulletin <i>Use of non-NOAA Tide Gage Records for computing of Relative Sea Level Change Rates</i> (2013), and the Engineering Regulation and Technical Letter <i>Procedures to Evaluate the Magnitude and Effects of Total Water Levels at USACE Projects</i> (in press). was awarded a PhD from Colorado State university in 2017 and his current research introduces an innovative method to assess the vulnerability of coastal infrastructure under global sea level rise scenarios and will directly influence USACE climate policy through the publication of Engineering and Construction Bulletin <i>Climate Preparedness and Risk Register: Framework for the Analysis of Coastal Infrastructure Vulnerability Under Global Sea Level Rise</i> (in preparation).</p>
Cost Engineering		<p>is the Civil Works Cost ATR Coordinator at the Cost Engineering Center of Expertise, Walla Walla District. He is a cost engineer with over 15 years of experience in military, HTRW and civil works projects including flood risk management and navigation improvement projects. Since 2011, has served as the assistant and now Lead Cost ATR Coordinator for the MCX performing ATRs on various civil works projects throughout the nation. On average Mr. Bolte has been involved with forty or more ATR reviews per year, ranging from \$5M or less CAP projects to Multi-Billion programmatic updates. Mr. Bolte earned a Bachelor's Degree in Civil Engineering and Master's Degree in Structural Engineering from the Missouri University of Science and Technology, Rolla. He is a licensed Professional Engineer in the state of Washington and is registered with the Corps of Engineers as a Certified Cost Engineer. has served many lead roles in both developing and reviewing budgets for Department of Energy</p>

		and Corps projects.
Structural		<p>Bachelors of Science degree in Civil Engineering, 1985, and a Master's Degree in Civil Engineering, 1989, from the University of Nebraska. is a registered engineer with over 35 years of structural and geotechnical engineering experience in USACE with flood risk reduction projects, dams, and navigation projects. For the last 14 years has served as a structural Regional Technical Specialist for MVD. Experience in the analysis and design of many civil works structural types including: locks and dams, concrete dam spillways, flood walls of all types, retaining walls, sheet pile walls, anchored walls, pile foundations, road and railroad closures, Tainter gates, miter gates, bulkheads, pipes and culverts, and service bridges.</p> <p>Experience in design shallow founded, pile founded and anchored structures. Served as the structural lead for the design of pile founded floodwalls for a number of projects in New Orleans after Hurricane Katrina. As part of that effort helped to develop guidance for several unique pile foundation conditions related to design of coastal walls in very soft foundations. Experience with design of box culverts and bridge and application of the AASHTO bridge design manual. Significant experience with structural and geotechnical risk and reliability analysis and with risk assessments of levee and dam projects. Lead or participant in revision of numerous USACE engineer manuals including: EM 1110-2-2502, ETL 1110-2-575, EM 1110-2-2104, EM 1110-2-2107, EM 1110-2-2906, EM 1110-2-2504, EM 1110-2-2902 (ATR), EC 1110-2-6066, ER 1110-2-1806. Member of the USACE seismic committee.</p>
Civil		<p>Registered Professional Civil Engineer currently working as the Deputy Chief of the Eastern Division for the U.S. Army Corps of Engineers (Corps) Risk Management Center. has 15+ years of experience working on the design, development, oversight, management, and review of levee safety, dam safety, flood risk management, aquatic ecosystem restoration, land use development, recreation, and municipal engineering programs and projects with the Corps of Engineers and private consulting firms. She has a Bachelor of Science degree in Civil Engineering from the Pennsylvania State University and a Master of Science degree in Civil Engineering from the University of Pittsburgh. has served in a variety of roles with the Pittsburgh District, including Chief of the Dam and Levee Safety Section, Levee Safety Program Manager, and Project Engineer. She has performed numerous technical and quality control reviews for both design and feasibility level projects, including leading an ATR effort for the design of a levee system for Kansas City District.</p>
Geologist/ Geotechnical Engineer & Risk Reviewer		<p>Licensed Professional Engineer and Professional Geologist with over 33 years of experience in geotechnical engineering and engineering geology, with Bachelors of Science degrees in Engineering and Geological Engineering, and a Master of Science in Civil Engineering with a geotechnical emphasis. Facilitated and advisor on 40 risk assessments including 15 levee risk assessments, and performed Agency Technical Review (ATR) of over 50 USACE dam and levee projects including 17 as the lead. Have performed dam and levee inspections, over a dozen dam investigations, over a dozen design and modifications for dams, and construction observation of dams, modifications to dams, and water supply projects. Reviewed and managed reviews of 84 Interim Risk Reduction Measures Plans (IRRMPs) for USACE and over 100 dam and 80 levee Drilling Development Plans (DDPs) from USACE and non-USACE organizations for dam and levee investigations. Performed rock and soil</p>

		<p>slope stability evaluations, and slope stabilization design for dams, levees, and other projects. Have developed, managed and performed hundreds of geotechnical and geological investigations including laboratory, multiple types of non-destructive and in-situ testing, geologic hazards, foundation analysis and design, geophysics, and environmental site investigations for dams, levees, floodwalls, and thousands of other structures. Organized, presented, and led multiple training workshops for USACE, private and professional organizations including the Levee Screening Tool (LST) training, site Investigation workshops, led Potential Failure Modes Analysis (PFMA) exercises at multiple training events, in-situ testing (CPT, SCPT, Vane Shear, and instrumented SPT) and have given presentations on specific projects at multiple professional meetings, and governmental public meetings. Worked on updates to the ER1110-1-1807 Drilling in Earth Embankments for Dams and Levees, EM1110-2-1908 Instrumentation, and <u>Best Practices in Dam and Levee Safety</u>.</p>
Hydraulic and Hydrologic Engineer		<p>Graduated from Valparaiso University in 1997 with a Bachelor of Science degree in Civil Engineering and the University of Minnesota in 2001 with a Master of Science degree in Civil Engineering. She is a registered engineer in the State of Minnesota with over 20 years of experience in hydraulics analysis and design. has experience with the evaluation and design of embankment dams and levees. She has designed and provided HH construction support for multiple habitat restoration projects and dam embankment repairs on the Mississippi River. She assisted in the development and implementation of dam safety design guidance for the Devils Lake and FMM projects. She has participated in numerous dam safety periodic inspections and assisted with St. Paul District's dam safety training. Since 2006 has been involved with efforts to evaluate dams and levees on a risk basis, participating in screening level and higher level risk assessments. served as cadre lead for the St. Paul Risk Cadre which undertook risk assessments for the St. Paul, North Kansas City, Sutter Basin, and Freeport levees. Additionally, she has facilitated and reviewed numerous periodic assessments and semi-quantitative risk assessments for the USACE Risk Management Center. is currently the Chief of Hydraulics Section in the St. Paul District.</p>
Hydrologic Engineer		<p>Registered Professional Civil Engineer currently working in the Los Angeles District. He has been with the Los Angeles District for over 11 years and is currently a Regional Technical Specialist in the South Pacific Division. has a Bachelor's degree in Civil Engineering and Master of Science degree in Civil Engineering from the University of Southern California. He was an ATR reviewer for Stillhouse Dam IES, Grand River Feasibility Study, and American River Common Features, and Lower Cache Creek Feasibility Study. He currently serves as the SPD representative on USACE's Committee on Hydrology and H&H member on the NWD Risk cadre. He has conducted hydraulic and hydrologic analysis as well as quality checks and DQC reviews for civil and military projects such as Corte Madera, Little Colorado Winslow and Fort Huachuca Hydrology Study. He has conducted numerous DQCs and Consistency Reviews for the Dam Safety Program's PAs, SQRA's, IES's. He was the lead district hydrologic engineer for the Whittier Narrows Dam Safety Modification Study. He is currently the hydrologic engineer for the Prado Dam Spillway Modification. Additionally, he has been involved in Emergency Measures for Emergency Management for White Mountain Apache Tribe Project and Mount Charleston Project. Also he has supported the National Levee Safety Program and the Corps Water Management System.</p>

ATTACHMENT 4: Vertical Team and Policy Reviewers

VERTICAL TEAM		
Name	Office	Position
	RPEDN	Chief, Regional Planning and Environment Division North
	RPEDN	Branch Chief, Environmental Compliance
	MVS	Chief, Engineering Division
	SAJ	Chief, Real Estate Division
	MVS	Chief, Programs and Project Management Division
	MVS	Commander
	MVD	Chief, Planning and Policy
	MVD	Chief, Civil Works Integration Division
	MVD	Commander

POLICY REVIEWERS		
Name	Office	Position
	Mississippi Valley Division	Planning Policy Reviewer
	Mississippi Valley Division	Senior Environmental Planner
	Mississippi Valley Division	Plan Formulation
	Mississippi Valley Division	Cultural Resources
	Mississippi Valley Division	Economist
	South Atlantic Division	Real Estate
	Mississippi Valley Division	Structural Engineer
	Mississippi Valley Division	Levee Safety PM / Geotechnical Engineer
	Mississippi Valley Division	H&H Engineer
	Mississippi Valley Division	Counsel
	Mississippi Valley Division	Civil Engineer
	Mississippi Valley Division	Cost Engineering



DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, JACKSONVILLE DISTRICT
701 SAN MARCO BLVD
JACKSONVILLE, FL 32207-8175

CESAJ-PD

MEMORANDUM FOR Commander, U.S. Army Corps of Engineers, South Atlantic Division (CESAD-PDP/Mr. Eric Bush), 60 Forsyth Street SW, RM 10M15, Atlanta, GA 30303

SUBJECT: Approval and Type I Independent External Peer Review Exclusion for Rio Guanajibo, Puerto Rico Validation Report Review Plan.

1. References:

- a. Engineering Circular (EC) 1165-2-217, Review Policy for Civil Works, 20 February 2018.
- b. Memorandum, CECW-CE, 5 April 2019, subject: Interim Guidance on Streamlining Independent External Peer Review (IEPR) for Improved Civil Works Project Delivery.
- c. Memorandum, ASA(CW), 29 July 2019, subject: Supplemental Scope Verification for Rio Grande de Loiza, Rio Guanajibo at Mayaguez, and Rio Nigua at Salinas, Puerto Rico.
- d. Memorandum for Record, CECW-P, 7 April 2019, Subject: Supplemental Scope Verification/ "3Es" Determination for Rio Grande de Loiza, Rio Guanajibo at Mayaguez, and Rio Nigua at Salinas.
- e. Memorandum, DCW, 9 July 2019, subject: Additional Information for the Scope Verification Reports for Rio Grande de Loiza, Rio Guanajibo at Mayaguez, and Rio Nigua at Salinas.
- f. Memorandum for Commander, 30 October 2019, subject: Supplemental Guidance - Deauthorized Project Validation Scope for Rio Grande de Loiza, Rio Guanajibo at Mayaguez, and Rio Nigua at Salinas, Puerto Rico.
- g. Rio Guanajibo, Puerto Rico Scope Verification Report dated 12 June 2019.
- h. OASACW Comments on the Puerto Rico Scope Verification Reports dated 28 June 2019 with Corps Responses 8 July 2019.

CESAJ-PD

SUBJECT: Approval and Type I Independent External Peer Review Exclusion for Rio Guanajibo, Puerto Rico Validation Report Review Plan

2. The purpose of this memorandum is to transmit the Rio Guanajibo, Puerto Rico Validation Report Review Plan (Enclosure 1) for MSC approval and request for a Type I Independent External Peer Review (IEPR) exclusion.

3. The enclosed Review Plan for Rio Guanajibo, Puerto Rico Validation Report has been prepared to be consistent with Engineering Circular 1165-2-217. The Review Plan and Type I IEPR exclusion request has been coordinated and endorsed by the Review Management Organization, the Risk Management Center (Enclosure 2) and the Flood Risk Management Planning Center of Expertise.

4. The POC is .



2 Encls

1. Review Plan

2. RMO Endorsement