DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, SOUTH ATLANTIC DIVISION
60 FORSYTH STREET SW, ROOM 10M15
ATLANTA, GA 30303-8801

CESAD-PDP

28 April 2019

MEMORANDUM FOR Commander, Jacksonville District, 701 San Marco Blvd., Jacksonville, FL 32207

SUBJECT: Approval of the Review Plan for the Puerto Rico Coastal Storm Risk Management Feasibility Study

1. References:

a. Memorandum, CESAJ-PD, 5 March 2019, subject: Puerto Rico Coastal Storm Risk Management Study Review Plan submittal for Division review and approval.

b. Memorandum, CECW-P, 7 June 2018, subject: Revised Delegation of Authority in Section 2034(a)(5)(A) of the Water Resources Development Act of 2007 (WRDA 2007), as amended (33 U.S.C. 2343).

2. Jacksonville District prepared the review plan for the Puerto Rico Coastal Storm Risk Management Feasibility Study consistent with EC 1165-2-217. The District coordinated the review plan with the National Planning Center of Expertise for Coastal Storm Risk (PCX-CSRM), which is the lead office to execute this review plan. For further information, contact Larry Cocchieri, PCX-CSRM at (347) 370-4571. The review plan does not include independent external peer review (IEPR).

3. I approve this review plan and the request for exclusion from IEPR. The approved review plan is subject to change as circumstances require, consistent with study development under the project management business process. Subsequent revisions to this approved review plan due to significant changes in the study, study scope, or level of review will require new written approval from this office.

4. The point of contact for this action is [redacted], Acting Chief, Planning and Policy Division, at 404-562-5226, [redacted]@usace.army.mil.

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Encl
Review Plan

[redacted]
Brigadier General, USA
Commanding

# REVIEW PLAN

March 29, 2019

**Project Name:** Puerto Rico Coastal Storm Risk Management Feasibility Study, Puerto Rico

**P2 Number:** 461551

**Decision Document Type:** Feasibilty Study

**Project Type:** Coastal Storm Risk Management

**District:** Jacksonville District
**District Contact:** SAJ Peer Review Manager 904-232-1818

**Major Subordinate Command (MSC):** South Atlantic Division
**MSC Contact:** Senior Plan Formulator 404-562-5226
**Review Management Organization (RMO):** Coastal Storm Risk Management PCX
**RMO Contact:** (651) 290-5259

## Key Review Plan Dates

**Date of RMO Endorsement of Review Plan**: 01 March 2019
**Date of MSC Approval of Review Plan:**
**Date of IEPR Exclusion Approval:** Pending
**Has the Review Plan changed since PCX Endorsement?** No
**Date of Last Review Plan Revision:** None
**Date of Review Plan Web Posting**: Pending
**Date of Congressional Notifications:** Pending

## Milestone Schedule

| | Scheduled | Actual | Complete |
|---|---|---|---|
| FCSA execution: | 10-9-2018 | 10-9-2018 | Yes |
| Alternatives Milestone: | 12-13-2018 | 12-13-2018 | Yes |
| Tentatively Selected Plan: | 4-9-2020 | (enter date) | No |
| Release Draft Report to Public: | 6-9-2020 | (enter date) | No |
| Agency Decision Milestone: | 10-9-2020 | (enter date) | No |
| Final Report Transmittal: | 4-5-2021 | (enter date) | No |
| Chief's Report or Director's Report: | 10-12-2021 | (enter date) | No |

**Project Fact Sheet**
March 2019

**Project Name**: Puerto Rico Coastal Storm Risk Management Feasibility Study, PR

**Location**: This study will assess the shoreline problems and provide possible Coastal Storm Risk Management alternatives to reduce risk to infrastructure located along approximately 15 miles of coastline of Puerto Rico island-wide.

**Authority**: Authority for this study is granted under Section 204 of the Flood Control Act of 1970, Public Law 91-611 which authorizes the Secretary of the Army, acting through the Chief of Engineers, to prepare plans for the development, utilization and conservation of water and related land resources of drainage basins and coastal areas in the Commonwealth of Puerto Rico. Study funds were appropriated under Bipartisan Budget Act of 2018, P.L. 115-123.

"For an additional amount for 'Investigations' for necessary expenses 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 this subdivision, to reduce risk from future floods and hurricanes, at full Federal expense, $135,000,000, to remain available until expended: Provided, That of such amount, not less than $75,000,000 is available for such studies in States and insular areas that were impacted by Hurricanes Harvey, Irma, and Maria: Provided further, That funds made available under this heading shall be for high-priority studies of projects in States and insular areas with more than one flood-related major disaster declared pursuant to the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. 5121 et seq.) in calendar years 2014, 2015, 2016, or 2017: Provided further, That such amount is designated by the Congress as being for an emergency requirement pursuant to section 251 (b)(2)(A)(i) of the Balanced Budget and Emergency Deficit Control Act of 1985: Provided further, That the Assistant Secretary of the Army for Civil Works shall provide a monthly report to the Committees on Appropriations of the House of Representatives and the Senate detailing the allocation and obligation of these funds, including new studies selected to be initiated using funds provided under this heading, beginning not later than 60 days after the enactment of this subdivision."

**Sponsor**: Puerto Rico Department of Natural and Environmental Resources (DNER)

**Type of Study**: Coastal Storm Risk Management Feasibility Study (CSRM)

**SMART Planning Status**: 3X3X3 compliant

**Project Area**: Figure 1 presents the regional study location. The Puerto Rico CSRM Study is considering over 12 locations around the island coastline identified by the DNER as having coastal damages and warrant investigation via a feasibility study. These areas are located in San Juan, Vega Baja, Arecibo, Aguadilla, Aguada, Rincon, Anasco, Mayaguez, Cabo Rojo, Loiza, Luquillo, and Humacao, see Figure 2.

**Problem Statement**: Damages from coastal storms caused by inundation, erosion, and wave attack along the Puerto Rico shoreline threaten infrastructure and beach access for recreation and contribute to public safety hazards. Infrastructure is located along large portions of the study area, including commercial businesses, hotels, condominiums, residential homes, roads, public parkland, and public beach access points. Loss of protective beaches and dunes due to shoreline recession threatens infrastructure. Homeowners and hotels seeking to protect their property have constructed some shore protection measures, such as seawalls, large stone revetments and gabions. Some of the structures and materials used are inadequate to provide significant protection.

The scope of this Feasibility study will assess the shoreline problems and provide possible CSRM alternatives to reduce risk to infrastructure located along approximately 15 miles of coastline of Puerto Rico island-wide.

**Federal Interest**: The study will evaluate the Federal Interest to reduce coastal storm damages to infrastructure along specific areas along the Puerto Rico coastline. There are approximately 2,000,000 people who live and work in the San Juan Metro Area relying on tourism for their economy; San Juan Metro Area coastline contains high density of residential and commercial buildings as well as valuable reef resources which are currently at risk. Rincon area has International recognition as a surfing destination; there is an opportunity to protect/strengthening the natural barrier reef and Acroporid coral which are Designated Critical Habitat. Additionally, there is an opportunity to reduce risk to segments of major hurricane and Tsunami evacuation routes in Mayaguez and Humacao that are actually at risk.

**Risk Identification:** The risks associated with the project are minimal. The study is not anticipated to be technically, institutionally, or socially challenging. The project will use the same design and construction techniques that have been used in the past on similar projects throughout the region. The project will not be justified by life safety nor does it involve significant threat to human life/safety assurance. Failure of the project would not pose a threat to human life.

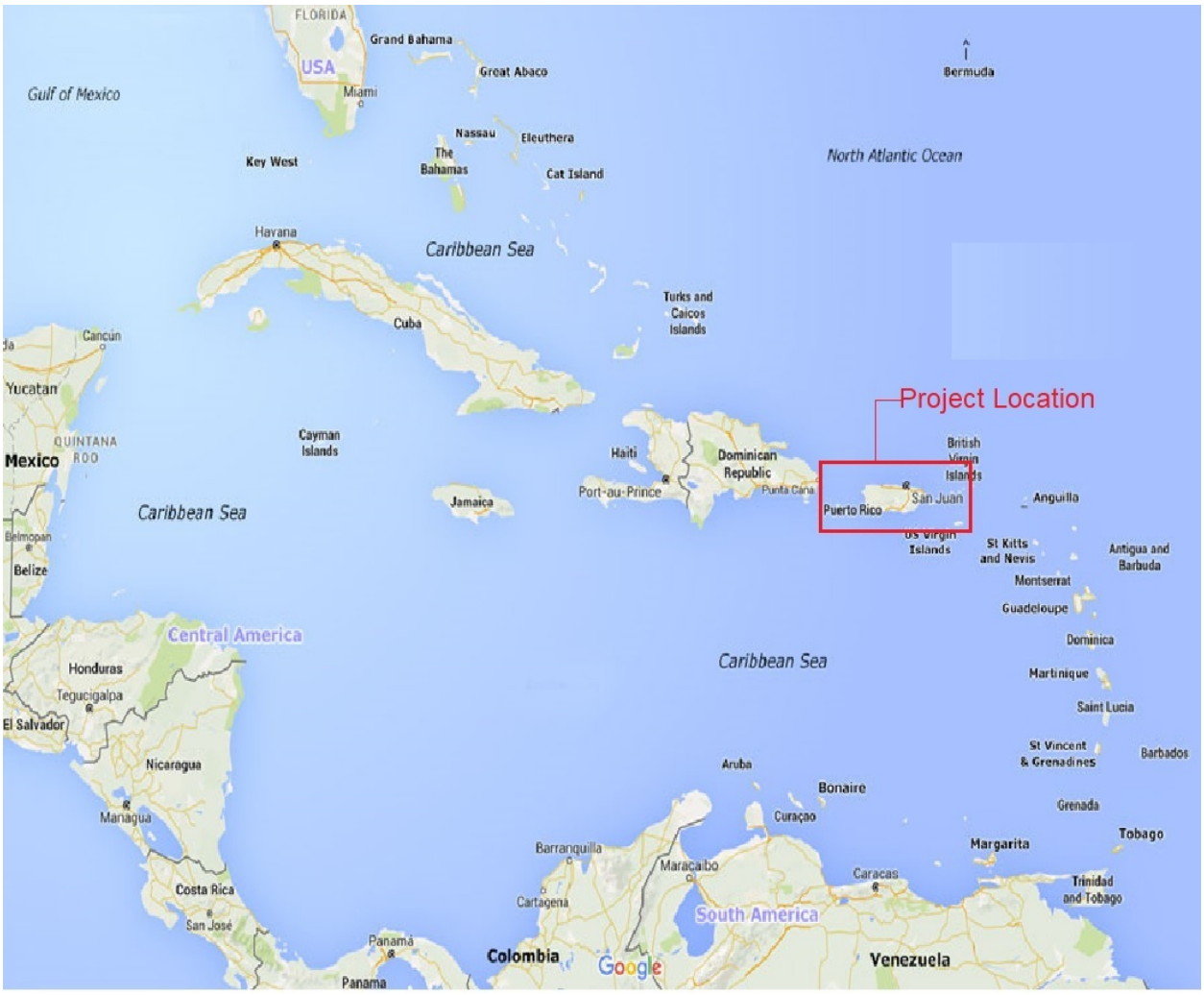


Figure 1: Regional Study Location


Figure 2: Study Location

## 1. FACTORS AFFECTING THE LEVELS OF REVIEW

**Scope of Review.** This section discusses the factors affecting the risk informed decisions on the appropriate scope and level of review. The discussion is intended to be detailed enough to assess the level and focus of review and support the PDT, PCX, and vertical team decisions on the appropriate levels of review and types of expertise represented on the various review teams. Factors affecting the risk informed decisions on the appropriate scope and level of review include the following:

- Will the study likely be challenging?
  This study is not anticipated to be technically, institutionally, or socially challenging. The project will use the same design and construction techniques that have been used in the past on similar projects throughout the region. Coordination with agencies to identify and avoid effects and level of detail needed for (environmental and cultural) surveys in feasibility phase. The presence of a variety of coral reefs/benthic resources, listed species, critical habitat, and fish habitat, in the study area have influenced plan formulation by limiting the array of management measures considered for several portions of the study area.

- Provide a preliminary assessment of where the project risks are likely to occur and assess the magnitude of those risks.
  Risks include the presence of protected environmental resources or significant cultural resources within project footprint(s). Coordination with agencies and environmental and cultural surveys will be conducted to document and assess potential effects of the project. If protected resources are discovered the risk exists of additional cost to the budget and schedule delays. The major risks in the project include the potential for adverse impacts if the Future Without Project (FWOP) condition (i.e. the No Action Plan) is selected, as severe storm impacts to life and property could occur.

- 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 will not be justified by life safety nor does it involve significant threat to human life/safety assurance. Failure of the project would not pose a threat to human life.

- Has the Governor of an affected state requested a peer review by independent experts?
  The Governor of the Commonwealth of Puerto Rico has not requested a peer review by independent experts.

- Will it likely involve significant public dispute as to the project's size, nature, or effects?
  This study has the potential to be controversial among resource agencies due to the presence of special status species, and hardbottom/coral reef resources within

the study area. During the scoping process, comments were received from residents, USFWS, NMFS, DNER, EQB, PR CMP and SHPO.

- 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. The project is anticipated to provide significant national and regional economic developments which will be well documented.

- 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?
  The information in the study document or project design will not to be based on novel methods, involve the use of 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. The project will use the same design and construction techniques that have been used in the past on similar projects throughout the region.

- Does the project design require redundancy, resiliency, and/or robustness, unique construction sequencing, or a reduced or overlapping design/construction schedule?
  The proposed project design will provide coordinated coastal storm risk management along the shoreline in the study area. This could be accomplished by implementing new alternatives and rehabilitating some areas that contain existing shoreline armor. The alternatives could include but are not limited to stand alone or combinations of soft structures (beach and dune), hard structures (breakwaters, artificial reefs, rock revetment), and non-structural alternatives (flood proofing). In the case of beach renourishment projects for CSRM purposes there could be redundancy in that periodic renourishments are included as part of the project plan when the beach requires sand to increase reliability. The project is resilient in that the beach naturally recovers to some extent after storms, and emergency nourishment may be implemented to restore projects should a natural disaster adversely impact the project. CSRM projects such as this one are robust by adding sand to the natural system and reducing damages in a way that allows the naturally dynamic beach to adjust to the ever-changing coastal environment, or by the implementation of hard structures to dissipate wave energy and reduce damages to infrastructure. The construction sequencing for this project is unique only in that there may be certain time periods when construction cannot take place during environmental windows when turtles or birds use the beach for nesting.

- Is the estimated total cost of the project greater than $200 million?
  During the planning process the study area would be reduced. The costs of the initial alternatives being analyzed range from $20,000,000 to $50,000,000 per location, which more likely would generate a total project cost of $170,000,000.

- Will an Environmental Impact Statement be prepared as part of the study?
  The team will conduct an Environmental Assessment and review the potential effects to determine whether an Environmental Impact Assessment will be required. This determination will be made by the Tentatively Selected Plan milestone and will be based upon a review of the effects of the project and the level of significance of those effects, as defined by 40 CFR §1508.27.

- Is the project expected to have more than negligible adverse impacts on scarce or unique tribal, cultural, or historic resources?
  The project is not expected to adversely affect tribal, cultural, or historical resources.

- 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. It is expected that minor mitigation may be utilized based on the reef resources location.

- 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?
  Implementation of the project could affect listed species and Acroporid coral designated critical habitat. However, properly designed the project could also provide consolidated hard substrate for coral polyp settlement enhancing Acroporid coral designated critical habitat.

## 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 study documents (including supporting data, analyses, environmental compliance documents, etc.) shall undergo DQC. DQC is an internal review process of basic science and engineering work products focused on fulfilling the project quality requirements defined in the Project Management Plan (PMP). Jacksonville District is the home district and it shall manage DQC. Documentation of DQC activities is required and should be in accordance with the Quality Manual of the Jacksonville District.

**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.

**Independent External Peer Review.** Type I IEPR may be required for decision documents under certain circumstances. This is the most independent level of review, and is applied in cases that meet criteria where the risk and magnitude of the project are such that a critical examination by a qualified team outside of USACE is warranted. A risk-informed decision is made as to whether Type I IEPR is appropriate.

**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.

**Model Review and Approval/Certification.** EC 1105-2-412 mandates the use of certified or approved models for all planning work to ensure the models are technically and theoretically sound, compliant with USACE policy, computationally accurate, and based on reasonable assumptions.

**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 not further detailed in this 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**

| Products to Undergo Review | Review Level | Start Date | End Date | Cost | Complete |
|---|---|---|---|---|---|
| FWOP Conditions | Agency Technical Review | July 2019 | August 2019 | $15,000 | No |
| FWP Conditions | Agency Technical Review | November 2019 | December 2019 | $15,000 | No |
| Draft Feasibility Report, appendices and NEPA | District Quality Control | April 2020 | May 2020 | $20,000 | No |
| Draft Feasibility Report, appendices and NEPA | Agency Technical Review | June 2020 | July 2020 | $40,000 | No |
| Draft Feasibility Report, appendices and NEPA Concurrent Review | Policy and Legal Review | June 2020 | July 2020 | n/a | No |
| Pre-Final Feasibility Report, appendices and NEPA | District Quality Control | November 2020 | December 2020 | $20,000 | No |
| Final Feasibility Report, appendices and NEPA | Agency Technical Review | December 2020 | January 2021 | $30,000 | No |
| Final Feasibility Report, appendices and NEPA Concurrent Review | Policy and Legal Review | December 2020 | January 2021 | n/a | No |

## a. DISTRICT QUALITY CONTROL

The district shall manage DQC and will appoint a DQC Lead to manage the local review (see EC 1165-2-217, section 8.a.1). The DQC Lead should prepare a DQC Plan and provide it to the RMO and MSC prior to starting DQC reviews. Table 2 identifies the required expertise for the DQC team.

**Table 2: Required DQC Expertise**

| DQC Team Disciplines | Expertise Required |
|---|---|
| DQC Lead | A senior professional with 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 CSRM projects with periodic renourishment and associated planning reports and documents. |
| Economics | A senior economist with experience evaluating CSRM project benefits and costs. Experience with evaluating incremental analysis & storm damage reduction benefits; familiarity with the USACE tool IWR-PLAN. Experience in identifying incidental benefits (preferably recreation) is required. |
| Environmental Resources/NEPA Compliance | A senior biologist/ecologist/environmental engineer, preferably with experience in CSRM projects. They must be able to review for NEPA compliance (including cultural resources coordination) and have a thorough understanding of coastal ecosystems, marine ecosystems, CBRA and CSRM projects. |
| Coastal Engineering | The team member should be a registered professional with experience in CSRM projects, experience with or knowledge of Beach-fx, beach nourishment, sand sources, and coastal structures. |
| Cost Engineering | A registered professional with experience in cost engineering and have a thorough understanding of CSRM projects, dredging costs and coastal structures estimates. |
| Real Estate | The real estate reviewer should be a senior real estate specialist with experience in CSRM 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, for this study the RMO will be the Planning Center of Expertise for Coastal Storm Risk Management (PCX-CSRM). The PCX-CSRM will be responsible for identifying the ATR team members. 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.

**Table 3: Required ATR Team Expertise**

| ATR Team Members/Disciplines | Expertise Required |
|---|---|
| ATR Lead | The ATR lead should be a senior professional with extensive experience in preparing Civil Works decision documents, CSRM studies and conducting ATR. The lead should also have the necessary skills and experience to lead a virtual team through the ATR process. The ATR lead may also serve as the reviewer for a specific discipline. |
| Plan Formulator | The plan formulator should be a senior water resources planner with experience in CSRM projects and associated planning reports and documents. Plan formulation ATR certification is required. |
| Economics | The economics reviewer will be an expert in the field of economics and have a thorough understanding of CSRM projects with periodic renourishment, BCR updates, Beach-fx and incidental benefits (preferably recreation). |
| Environmental Resources/NEPA Compliance | A senior biologist/ecologist/environmental engineer, preferably with experience in CSRM projects. The environmental reviewer will be an expert in the field of environmental resources and have a thorough understanding of NEPA, coastal ecosystems, marine ecosystems, CBRA and CSRM projects. |
| Coastal Engineering | The team member should be a registered professional with a minimum of 5 years' experience that encompasses CSRM |

| ATR Team Members/Disciplines | Expertise Required |
|---|---|
| | projects, experience with or knowledge of Beach-fx, beach nourishment, sand sources, and coastal structures. |
| Cost Engineering | A registered professional with a minimum of 5 years' experience in cost engineering. The cost engineering reviewer will be an expert in the field of cost engineering and have a thorough. understanding of CSRM projects, dredging costs and coastal structures estimates. The cost engineer should be Walla Wall Cost MCX/TCX approved cost reviewer as the cost estimate for this document is anticipated to need CSRA and Cost MCX/TCX review and Certification. |
| Real Estate | The real estate reviewer should be a senior real estate specialist with experience in CSRM projects. |
| 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. This review can be combined with either the Economics or Coastal reviews. |
| Climate Change | The reviewer should be experienced in performing and presenting climate change information in accordance with ECB 2018-14. The team member must be certified by the Climate Preparedness and Resilience CoP. |

**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.** The purpose of the proposed feasibility report is to determine Federal interest and recommended plan for hurricane and storm damage reduction to infrastructure along approximately 12 reaches of Puerto Rico shoreline:

**Decision on Type I IEPR.** None of the mandatory triggers for Type I IEPR have been met.

- If the document doesn't meet the Type I IEPR mandatory triggers in EC 1165-2-217, discuss:
  - the consequences of non-performance on project economics, the environmental and social well-being (public safety and social justice);

    The Puerto Rico CSRM Project is expected to address current storm damage risks in the project areas. Construction of the features proposed are not expected to produce significant risks to public safety nor social justice issues.

  - If the product is likely to contain influential scientific information or highly influential scientific assessment;

    The project will not contain influential scientific information or highly influential scientific assessment.

  - If and how the decision document meets any of the possible exclusions described in EC 1165-2-217.

    Additionally, this CSRM project satisfies the criteria in EC 1165-2-217, paragraph 11.d(4)(a) for eligibility exclusion from Type I IEPR. The project involves construction of beach and dunes using earthmoving equipment to reduce storm damages to infrastructure. The activity is one in which there is ample experience within the USACE and industry to perform and there is minimal life safety risk. The work on the proposed project is limited in scope that the study would not significantly benefit from Type I IEPR.

**(ii) Type II IEPR.**

The second kind of IEPR is Type II IEPR. These Safety Assurance Reviews 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.** Based on the project as currently envisioned, the District Chief of Engineering, as the Engineer-In-Responsible-Charge, has concluded that a Type II IEPR Safety Assurance Review of this project is not required for this decision document. A risk-informed decision concerning the timing and the appropriate level of reviews for the project implementation phase will be prepared and submitted for approval in an updated Review Plan prior to initiation of the design/implementation phase of this project.

**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.

**Table 5: Planning Models.** The following models may be used to develop the decision document:

| Model Name and Version | Brief Model Description and How It Will Be Used in the Study | Certification / Approval |
|---|---|---|
| IWR Plan | The USACE Institute for Water Resources has developed IWR Planning Suite Decision Support Software to assist with the formulation and comparison of alternative plans. IWR Planning Suite will assist with plan formulation by combining solutions to planning problems and calculating the additive effects of each combination, or "plan." IWR Planning Suite will also assist with plan comparison by conducting cost effectiveness and incremental cost analyses (CE/ICA), identifying the plans which are the best financial investments, and displaying the effects of each on a range of decision variables. | Certified |
| Beach-fx | Beach-fx is a data-driven economics model derived primarily from socioeconomic data and engineering model input. Beach-fx assists with the evaluation and analysis of benefits and life cycle costs of coastal storm risk management projects. It is a national model developed by the Corps that does not require certification specific to this individual project. | Certified |

EC 1105-2-412 does not cover engineering models used in planning. The process that the Hydrology, Hydraulics and Coastal Community of Practice (HH&C CoP) of USACE follows to validate engineering software for use in planning studies and to satisfy the requirements of the Corps' Scientific and Engineering Technology (SET) initiative is provided in Enterprise Standard (ES)-08101 Software Validation for the Hydrology, Hydraulics and Coastal Community of Practice. 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 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 selection and application of the model and the input and output data is still the responsibility of the users and is subject to DQC and ATR.

The HH&C CoP list of preferred, acceptable, and approved models that may be used for this study is located on the SharePoint site:
https://cops.usace.army.mil/sites/HHC/Lists/HHC%20Software%20Lists/Approved.aspx

**Table 6: Engineering Models.** These models may be used to develop the decision document:

| Model Name and Version | Brief Model Description and How It Will Be Used in the Study | Approval Status |
|---|---|---|
| SBEACH | SBEACH (Storm-induced BEAch CHange model), which simulates cross-shore beach, berm, and dune erosion produced by storm waves and water levels will be used in conjunction with the Beach-fx planning model listed above. | Approved |
| GENESIS and STWAVE | Currently, it is possible that the use of GENESIS and STWAVE will be required but this will not be known for certain until the PDT determines data availability and appropriate modeling assumptions. GENESIS (GENEralized model for Simulating Shoreline Change) simulates the long-term platform evolution of the beach in response to imposed wave conditions, coastal structures, and other engineering activity (e.g., beach nourishment). STWAVE (STeady state spectral WAVE) simulates nearshore wind-wave growth and propagation. | Approved |

## e. POLICY AND LEGAL REVIEW

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).

### a. 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 (see Attachment). 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.

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.

**b. 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: TEAM ROSTERS

| PROJECT DELIVERY TEAM | | | |
|---|---|---|---|
| Name | Office | Position | Phone Number |
| | CESAJ-PM-WN | Project Manager | (904) 232 |
| | CESAJ-PD-PN | Planning, PTL | (904) 232 |
| | CESAJ-EN-DW | Engineering, ETL | (904) 232 |
| | CESAJ-EN-TC | Engineering Cost | (904) 232 |
| | CESAJ-EN-WC | Coastal Engineering | (904) 232 |
| | CESAJ-EN-WC | CoastalEngineering | (904) 232 |
| | CESAJ-EN-GG | Geologist | (904) 232 |
| | CESAJ-PD-D | Economist | (904) 232 |
| | CESAJ-PD-D | Economist | (904) 232 |
| | CESAJ-PD-EC | Planning Environmental | (904) 232 |
| | CESAJ-PD-ES | Planning Cultural | (904) 232 |
| | CESAJ-RE-A | Real Estate Acquisition | (904) 232 |
| | CESAJ-OC | Office Council | (904) 232 |

| DISTRICT QUALITY CONTROL TEAM | | | |
|---|---|---|---|
| Name | Office | Position | Phone Number |
| | CESAJ-PD-PW | PD Peer Review Manager | (904) 232 |
| | CESAJ-PD-PN | DQC Lead | (904) 232 |
| | CESAJ-EN-QC | EN DQC Review Coordinator | (904) 232 |
| | CESAJ-PD-PN | Plan Formulation | (904) 232 |
| TBD | CESAJ-EN-DW | Branch/Section Chief/Designee | TBD |
| TBD | CESAJ-EN-TC | Branch/Section Chief/Designee | TBD |
| TBD | CESAJ-EN-WC | Branch/Section Chief/Designee | TBD |
| TBD | CESAJ-EN-GG | Branch/Section Chief/Designee | TBD |
| TBD | CESAJ-PD-D | Branch/Section Chief/Designee | TBD |
| TBD | CESAJ-PD-EC | Branch/Section Chief/Designee | TBD |
| TBD | CESAJ-PD-ES | Branch/Section Chief/Designee | TBD |
| TBD | CESAJ-RE-A | Branch/Section Chief/Designee | TBD |
| TBD | CESAJ-OC | Branch/Section Chief/Designee | TBD |

| AGENCY TECHNICAL REVIEW TEAM | | | |
|---|---|---|---|
| Name | Office | Position | Phone Number |
| TBD | | ATR Lead | |
| TBD | | Plan Formulator | |

| AGENCY TECHNICAL REVIEW TEAM | | | |
|---|---|---|---|
| Name | Office | Position | Phone Number |
| TBD | | Economics | |
| TBD | | Environmental | |
| TBD | | Coastal Engineering | |
| TBD | | Cost Engineering | |
| TBD | | Real Estate | |
| TBD | | Risk Analysis | |
| TBD | | Climate Change | |

| VERTICAL TEAM | | | |
|---|---|---|---|
| Name | Office | Position | Phone Number |
| | CECW-PD | Acting Chief, USACE Planning and Policy Division | (202) 761 |
| | CECW-SAD-RIT | CESAD-RIT Planner | (904) 472 |
| | CENAD-PD | Chief, Planning and Policy, Director CSRMPCX | (347) 370 |
| | CECW-PC | Acting Chief, OWPR | (202) 761 |
| | CESAD-PD | Acting Chief, Planning and Policy Division, SAD | (404) 562 |
| | CESAD-RBT | Chief, Engineering Division, SAD | (404) 562 |

| POLICY REVIEW TEAM | | | |
|---|---|---|---|
| Name | Office | Position | Phone Number |
| | CESAD-PDH | Review Manager | (404) 562 |
| | CENAD-PD | Economics | (917) 359 |
| | CESAD-PDP | Environmental | (917) 359 |
| | CECW-PD | Plan Formulation | (202) 761 |
| | CESAD-RBT | Engineering | (404) 562 |
| | CECW-EC | CPR CoP | (202) 761 |
| | CESAD-PDR | Real Estate | (404) 562 |
| | CESAD-OC | Attorney | (404) 562 |