U.S. Army Corps of Engineers
Galveston District

Review Plan

Corpus Christi Ship Channel, Texas - La Quinta Expansion (CCSC, La Quinta Expansion) Feasibility Study

1 April 2019

REVIEW PLAN

1 April 2019

1. OVERVIEW

This review plan (RP) defines the scope and level of peer review for the following study:

- **Study Name:** Corpus Christi Ship Channel (CCSC), Texas - La Quinta Expansion Feasibility Study
- **P2 Number:** 451953
- **Federal Project:** Corpus Christi Ship Channel, Neuces County, Texas
- **Decision Document - Type:** Integrated Feasibility Report and Environmental Assessment (EA)
- **Project Type:** Single Purpose Navigation (Deep-Draft)
- **Congressional Approval Required:** Yes
- **District:** Galveston District (SWG)
- **Major Subordinate Command (MSC):** Southwestern Division (SWD)
- **Review Management Organization (RMO):** Deep Draft Navigation Planning Center of Expertise (DDNPCX)
- **Review Plan Contacts:**
  - **District:** Project Manager, 409-766-3168
  - **Fort Worth District (SWF) Regional Planning and Environmental Center (RPEC):** Lead Planner, 409-766-3804
  - **MSC:** Senior Economist, 469-487-7065
  - **RMO:** Review Manager, 251-694-3842

2. KEY REVIEW PLAN DATES

Action	Date - Actual[1]
RMO Endorsement of RP	*Pending*
MSC Approval of RP	*Pending*
IEPR Exclusion Approval	*Pending*
Has RP changed since PCX endorsement?	*Pending*
Last RP revision[2]	*Pending*
RP posted on District Website	*Pending*
Congressional notification[3]	*Pending*

[1]Date action occurred or 'pending' if not yet approved
[2]Enter 'none' if no updates have been made since approval
[3]Date RIT notified Congress of IEPR decisions

3. MILESTONE SCHEDULE

Action	Date - Scheduled	Date – Actual	Status – Complete?
Feasibility Cost Sharing Agreement Signed	09/28/18	09/28/18	Yes
Alternatives Milestone Meeting (AMM)	12/10/18	12/10/18	Yes
Tentatively Selected Plan (TSP)	10/21/19		No
Release Draft Report to Public	01/02/20		No
Agency Decision Milestone (ADM)	05/11/20		No
Final Report Transmittal	01/05/21		No
Senior Leaders Briefing	07/27/21		No
Chief's Report	10/19/21		No

4. BACKGROUND

- **Date of 'Background' Information:** April 2019
- **RP References:**
  - Engineer Circular (EC) 1165-2-217, Review Policy for Civil Works (CW), 20 February 2018
  - EC 1105-2-412, Assuring Quality of Planning Models, 31 March 2011
  - Engineer Regulation (ER) 1105-2-100, Planning Guidance Notebook, Appendix H, Policy Compliance Review and Approval of Decision Documents, Amendment #1, 20 November 2007
  - Director's Policy Memorandum (DPM) CW Programs 2018-05, Improving Efficiency and Effectiveness in U.S. Army Corps of Engineers (USACE) CW Project Delivery (Planning Phase and Planning Activities), 3 May 2018
  - Director of Civil Works (DCW) Memorandum, 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), 7 June 2018
  - Planning Bulletin (PB) 2018-01, Feasibility Study Guidelines, 26 September 2018
  - DPM 2019-01, Policy and Legal Compliance Review, 9 January 2019
  - Draft La Quinta Expansion Project Management Plan, March 2019
  - SWD Quality Management Plan
- **Authority:** Section 1202 (23) of WRDA 2016, Public Law 114-322:

> *The Secretary is authorized to conduct a feasibility study for the following projects for water resources development and conservation and other purposes, as identified in the reports titled ''Report to Congress on Future Water Resources Development'' submitted to Congress on January 29, 2015, and January 29, 2016, respectively, pursuant to section 7001 of the Water Resources Reform and Development Act of 2014 (33 U.S.C. 2282d) or otherwise reviewed by Congress:*
>
> *(23) CORPUS CHRISTI SHIP CHANNEL, TEXAS.—Project for navigation, Corpus Christi Ship Channel, Texas.*

- **Sponsor:** Port of Corpus Christi Authority (PCCA)
- **SMART Planning Status:** This study is 3x3x3 compliant. The study is currently post-AMM in the alternatives evaluation and analysis phase.
- **Project Area:** The project area for the study encompasses the 7.1-mile long La Quinta Channel where it intersects with the CCSC and adjacent placement areas (PAs). **Figure 1** provides an overview of the entire CCSC with La Quinta Channel circled. Existing/authorized channel dimensions are provided in Table 1.

Figure 1 - Corpus Christi Ship Channel, Texas (La Quinta Channel circled)

Table 1 – Existing/Authorized Channel Dimensions

Channel Segment with Stations	Authorized Dimensions	
	Depth (feet) at MLLW[1, 2]	Width (feet)
1 – La Quinta Junction [00+00 to 32+15]	47	Varies
2 – La Quinta Channel [32+15 to 287+51]	47	300 to 400
3 – La Quinta Turning Basin [287+51 to 310+00]	47	1,200
4 – La Quinta Extension [310+00 to 362+05]	47	400
5 – San Patricio Turning Basin [362+05 to 382+52]	47	1,400
Corpus Christi Main Channel (under construction)	54	530

[1] *MLLW = mean lower low water*
[2] *Does not include advance maintenance or allowable overdepth*

- **Problem Statement**: The existing channel configuration (depth, width, turning basin dimensions) prevents efficient deep-draft vessel utilization of the La Quinta Channel resulting in delays in transiting the channel and restricted vessel movements.

- **Study/Project Goals and Objectives:** The study **goal** is to provide an efficient, reliable, and safe navigation channel while contributing to national economic development (NED) consistent with protecting the nation's environment. The following planning **objectives** were used in formulation and evaluation of alternative plans:
  - Allow for the use of larger, more efficient vessels on the La Quinta Channel during the 50-year period of analysis
  - Reduce delays to vessels traversing the La Quinta Channel during the 50-year period of analysis
  - Develop environmentally suitable placement for dredged material and maximize beneficial use (BU) of dredged material for placement over the 50-year period of analysis

- **Description of Action:** Alternatives were formulated to address the objectives through the combinations of screened management measures. The formulation strategy focused on the two users (Kiewit Offshore Services and Voestalpine) that would benefit most from a deeper and wider channel, although other users may also benefit from channel modifications.

  - **Alternative 1 (Maximum depth minimum width)**: This alternative was formulated to take full advantage of the authorized depth of the Corpus Christi Main Channel (-54 feet MLLW) while limiting width increases to the minimum extent necessary to allow deeper drafting vessels to safely transit the channel (400 feet). The channel width has been identified as the minimal width that would allow a large capesize bulker with a 210-feet beam. Alternative depths between -47 feet and -54 feet MLLW will also be evaluated based on vessel utilization.

    Key uncertainty associated with Alternative 1 pertains to the design width. It has been assumed that a 400-foot channel width would be sufficient to allow the design vessel to safely utilize the channel; however, USACE engineering design guidelines recommend a greater width. After the selection of the TSP, a limited ship simulation will be performed during the feasibility study to define the necessary channel width around the bend adjacent to Oxy Chemical. The ship simulation may result in additional width which would cause an increase in the project cost and may impact project justification.

  - **Alternative 2 (Maximum depth maximum width)**: This alternative was formulated to take full advantage of the authorized depth of the Corpus Christi Main Channel (-54 feet MLLW) while maximizing the width (530 feet) within existing constraints associated with Berry Island and the future Cheniere docks. This width would allow for some two-way traffic to move on the channel; however, the bends would be limited to one-way traffic. Alternative depths between -47 feet and -54 feet MLLW will also be evaluated based on vessel utilization. This alternative is favored by the sponsor.

  Alternatives 1 and 2 would include expansion of the turning basin(s) and bend easing to accommodate the design vessel. These alternatives would also include erosion control features if needed.

  - **Alternative 3 (La Quinta Junction maneuverability)**: This alternative would modify the existing channel at the junction of the La Quinta Channel and the Corpus Christi Main Channel to allow for easier vessel transition between the La Quinta Channel and the Corpus Christi Main Channel. If this alternative is justified it could be added as a feature to Alternatives 1 and 2 above.

  - **Alternative 4 (Maximize existing fleet)**: This alternative was formulated to maximize the utilization of the existing fleet. The current fleet cannot fully load. The channel would be deepened between -49 feet and -50 feet MLLW, but the channel width would not change. Because the design vessel will already be using the existing channel, no ship simulation or modifications to the turning basin(s) would be needed.

  - A widening only alternative was considered, but based on the existing traffic and vessel sizes it was screened from further consideration.

Several options for placement of construction and operations and maintenance (O&M) dredged sediments will be evaluated:

- Expansion of Dredged Material PA 13 toward the west
- Creation of multiple BU sites at various locations adjacent to the channel

- **Federal Interest:** There is an opportunity to contribute to NED, consistent with Army and budgetary policies, by reducing transportation costs of deep draft navigation vessels transiting harbor channels. Iron ore is imported, processed, and then exported; semi-submersibles are constructed onsite and moved on the channel in support of the oil and gas industry. The potential for new facilities is driven by the port's proximity to the Eagle Ford Shale and the Permian oil fields. It is the project delivery team's (PDTs) expectation that the total cost of any project proposed would range between $40-$80 million.

- **Risk Identification:** This project is not expected to pose any significant threat to human life now or in the future. Any environmental impact will be avoided, reduced, or mitigated. **Table 2** provides key risks and uncertainties identified to date. **Figure 2** provides an overview of the La Quinta Channel beginning at its intersection with the CCSC at the La Quinta Junction.

Table 2 – Risk Matrix

Functional Group	Risk/Concern	Mitigation/Contingency	Risk Level (H, M, L)[1]
Project Management Planning	• Scope Creep/Earned Value Management • Legislation & Planning Policy Changes • Public relations	• Active Management of quality, costs & schedule • Regular communication with sponsors & vertical team (VT) • Informal in-progress reviews as needed with VT, RPEC, ATR Lead, DQC Lead, & DDNPCX	L
Environmental	• Unknowns to be investigated: – Seagrass beds – Contamination – New PA locations and impacts • High probability of submerged cultural sites	• Marine survey • Consult with State Historic Preservation Office and Tribal Nations to develop and execute a Programmatic Agreement to cover actions to be taken during preconstruction engineering and design to close data gaps.	L-M
Economics	• Limited deepening/widening benefits in the existing movements (based on 2016 data) • What's happening with oil – new facilities on the channel? • How would non-Federal sponsor (NFS) deepening of CCSC affect oil on this spur channel?	• Because of recent changes in the oil and gas market there is not a lot of historical data to support trend of usage. Sensitivity analyses will be conducted to mitigate for this uncertainty.	M-H
Geotechnical Engineering	• Use of existing geotechnical data to evaluate channel & PA designs	• Contingency funds for additional data as needed	M
Real Estate	• Risk abandoned pipeline near PA13 is not at depth of other pipelines and add cost to project • Design width of channel may impact privately owned dredge island (Berry Island); this would add cost to the project	• Begin early investigations on ownership to confirm and resolve encroachments *Note: RE is tracking the concern regarding ship wakes and Ingleside homeowners*	L L-M
Hydrology, Hydraulics, and Coastal (HH&C)	• Ship maneuverability around the bend in front of Oxy Chem and when connecting to the main CCSC • Protection of the nearby neighborhood without exacerbating their impacts.	• Use of Engineer Manual (EM) 1110-2-1613 and possibly limited ship simulations • Analyses of ship wake performed by NFS is to be provided to USACE once completed; may inform the study.	L

[1]H = High, M = Medium, and L = Low

Figure 2 – La Quinta Channel

5. FACTORS AFFECTING THE LEVELS OF REVIEW

A. Is it likely that part(s) of the study will be challenging (EC 1165-2-217, paragraph 7.a.(1))? It is not likely that this study will be challenging as it is a single purpose deep-draft navigation project to evaluate deepening and widening of an existing channel and associated placement of dredged material, and the district has a high level of expertise in this type of project.

B. Provide a preliminary assessment of where the project risks are likely to occur and assess the magnitude of those risks (EC 1165-2-217, paragraph 7.a.(1)). This study has low to medium (L-M) risk. A **r**isk matrix, including the estimated magnitude of each risk, is provided in Table 2. However, potential risks are similar to those inherent in any deep-draft navigation study and are not expected to inhibit successful implementation of a project.

- La Quinta Channel is protected from the large stretches of the open water of Corpus Christi Bay by the existing PAs and BU sites to the east of the channel and south of the turning basins. The channel is bordered to the west and north by the mainland. While this protects the channel it also constrains the potential width if widening the channel. Guidance from EM 1110-2-1613 *Hydraulic Design of Deep-Draft Navigation Projects* will inform the study; however, the project may require a narrower channel than recommended by the EM due to limited width between land mass and PA/BU sites. The PDTs goal is to work with ERDC to conduct limited ship simulations during the study.
- Additionally, protection of shoreline may be needed to shield the current housing development from ship wake. The NFS has an analysis underway that once completed can inform the study on effects of ship wakes on the development and ascertain as to whether the effect is from vessels transiting the La Quinta Channel, the CCSC, or both.
- The primary resource of concern in the study area is submerged aquatic vegetation (SAV). SAVs occur in and around the La Quinta Channel study area and in Corpus Christi Bay and could be impacted through channel modification and construction of PA/BU sites.
- The USACE PDT archeologist has reviewed the Texas Historical Commission's Atlas Database and determined that there are no recorded historic properties within the proposed project area. However the last comprehensive marine survey of the ship channel was done in 2003. No historic properties were identified in that survey, but due to the dynamic nature of the submarine bottom along the Texas coast, there is a possibility of encountering a previously unrecorded cultural resource. Furthermore, there are numerous terrestrial archeological sites recorded on the shorelines adjacent to the ship channel that could be affected by wave erosion or upland construction activities. The USACE Archeologist recommends more exhaustive background research and consultation with the Texas State Historic Preservation Officer and Tribal Nations to determine the Area of Potential Effect and the probability for encountering historic properties.
- Channel widening could impact Berry Island (privately owned dredge island), although the acreage would be minimal with an ability to condemn if necessary.
- The depth of one abandoned pipeline is unknown; a survey may be needed.
- There is uncertainty with economic /commodity forecasting. Due to recent changes in the oil and gas market there is not a lot of historical data to support trend of usage. Although the risk magnitude is estimated as M-H, the uncertainty will be mitigated through sensitivity analyses.

C. Is there a significant threat to human life associated with aspects of the study or with failure of the project or proposed project (Type I IEPR - EC 1165-2-217, paragraph 11.d(1)(a) and SAR - paragraph 12.h.)? It is expected that the study and any subsequent project (should one be authorized) will follow the established guidelines associated with any channel deepening, widening, and/or PA/BU construction and will pose no significant threat to human life. The dredging, placement, and construction/expansion of new PAs/BUs would fall under standard operating procedures and would not include new technologies to the industry.

By email dated 7 February 2019, the Galveston District Chief, Engineering and Construction concurred that life safety isn't anticipated to be an issue for this navigation project.

D. Is the estimated total cost of the project greater than $200 million (EC 1165-2-217, paragraph 11.d(1)(b))? No, the TSP has not yet been identified; however, the TSP is anticipated to cost in the range of $40-$80 million. Therefore, the project cost would not exceed the $200 million threshold for IEPR defined by the Water Resources Reform and Development Act of 2014.

E. Will the study/project require an environmental impact statement (EC 1165-2-217, paragraph 11.d(1)(b))? It is expected that an EA will sufficiently cover National Environmental Policy Act (NEPA) requirements. However, if after coordination with resource agencies it is determined that an EIS is needed, the PDT will coordinate an updated RP.

F. Has the Governor of an affected state requested a peer review by independent experts (EC 1165-2-217, paragraph 11.d(1)(c))? No, the Governor of Texas has not requested peer review by independent experts nor is such a request expected.

G. Has the Chief of Engineers determined that the project study is controversial due to significant public dispute over the size, nature, or effects of the project or the economic or environmental costs or benefits of the project (EC 1165-2-217, paragraph 11.d(1)(d))? No. The study is not likely to involve significant public dispute as to its size, nature, or effects of the project. This study involves modifications to an existing Federal project (channel) and possible expansion of an existing PA or BU of dredged material. The previous study did not encounter controversy, and the current study/project which is focused on a limited portion of the prior project is anticipated to have a similar public response.

H. Is the study/project likely to involve significant public dispute as to the project's size, nature, or effects (EC 1165-2-217, paragraph 11.d(1)(e))? The project is unlikely to involve significant public dispute as to the size, nature, or effects of improvements to existing channel. Placement alternatives will be considered; however, least cost, environmentally acceptable, and engineeringly sound placement is required. Concerns over shoreline erosion in the area of the subdivision, *Ingleside by the Bay*, may result in comments; however, a wave analysis underway by the non-Federal sponsor is expected to be completed in May 2019 and will be provided to the PDT to inform the study. It is anticipated that BU areas and PAs as well as dredging methods will follow consistent and established methodologies for the CCSC. Through the public review process, the TSP will be coordinated with the public and resource agencies, providing an opportunity to submit comments. The project is not expected to have significant public dispute.

I. Is the study/project likely to involve significant public dispute as to the economic or environmental cost or benefit of the project (EC 1165-2-217, paragraph 11.d(1)(f))? No, it is not likely that there will be significant public dispute as to economic and/or environmental costs and benefits. Seagrasses in the area will be avoided to the extent possible; however, should impacts occur, any required mitigation will be coordinated with the resource agencies. Through NEPA, public comments will be taken into consideration. Prior study efforts, consisting of similar economic benefits/costs did not result in public dispute (significant or otherwise); therefore, a similar response is anticipated for this project. Likewise, based on prior study efforts, the project is unlikely to involve significant public dispute as to environmental benefits/costs.

J. Is the information in the decision document or anticipated project design likely to contain influential scientific information or be a highly influential scientific assessment – i.e., 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 (Type I IEPR - EC 1165-2-217, paragraph 11.d(1)(g); SAR paragraph 12.i.(1); and paragraph 15.d)? No, the project is a typical channel improvement project and will not involve influential scientific information or be a highly influential scientific project that would change prevailing practices. The project will involve traditional methods of dredging and placement of dredged material. Overall, it is anticipated that there will be low risk associated with the project. Standard engineering, economic and environmental analyses and information will be included in the final feasibility report and supporting documentation. Novel methods will not be utilized. If this decision is changed, the RP will be updated and re-coordinated.

K. Does/will the study/project have significant interagency interest (EC 1165-2-217, paragraph 7.f(1))? The project is unlikely to have significant interagency interest. Modeling efforts will be coordinated with the resource agencies; however, modeling of any proposed impacts and subsequent mitigation are not expected to qualify as significant based on prior study efforts. Additionally, placement options are expected to involve expansion of an existing PA or BU of dredged material. Resource agency coordination will be ongoing.

L. Are there any other circumstances that would lead the Chief of Engineers to determine Type I IEPR is warranted (EC 1165-2-217, paragraph 11.d(1)(h))? No, there are no known circumstances that would lead the Chief of Engineers to determine the review by an independent panel of external experts is warranted.

M. Is the project expected to have more than negligible adverse impacts on scarce or unique tribal, cultural, or historic resources (EC 1165-2-217, paragraph 11.d(4)(a))? No, the project is not expected to have more than negligible adverse impacts on scarce or unique tribal, cultural, or historic resources (see risk assessment provided in 5.B). A cultural archeologist is assigned to the PDT.

N. Is the project expected to have substantial adverse impacts on fish and wildlife species and their habitat prior to the implementation of mitigation measures (EC 1165-2-217, paragraph 11.d(4)(a))? No. Although seagrasses are known to be in the project area and impacts are likely, the project is anticipated to have less than substantial adverse impacts prior to implementation of mitigation measures. The extent of potential impacts will be estimated

through seagrass surveys performed during the feasibility study. The model used and any impacts or mitigation will be coordinated with the resource agencies.

O. 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 (EC 1165-2-217, paragraph 11.d(4)(a))? No. Threatened and Endangered Species (T&E) in the study area include piping plover, red knot, and whooping crane; however, it is expected that the project would have no effect on these species. The primary resource of concern in the study area is SAV; however, it is not designated as critical habitat. Essential fish habitat will be coordinated through the NEPA/ public review processes.

P. Does the project study pertain to an activity for which there is ample experience within the USACE and industry to treat the activity as being routine (EC 1165-2-217, paragraph 11.d(4)(b))? Yes, navigation improvement studies and implementation of those projects (deepening and widening of deep-draft navigation channels) are activities for which there is ample experience within USACE and industry to treat those activities as routine.

Q. Does the project study have minimal life safety risk (EC 1165-2-217, paragraph 11.d(4)(b))? This project is considered a standard navigation improvement project with minimal life safety risk.

R. Does the project design require redundancy, resiliency, and/or robustness (EC 1165-2-217, paragraph 12.i.(2))? No, the project design will follow standard dredging, PA/BU construction, and placement methodologies typically conducted by the District for navigation projects, and the project design will not require redundancy, resiliency, and/or robustness.

S. Will the project have unique construction sequencing or a reduced or overlapping design construction schedule (e.g., significant project features will be accomplished using the Design-Build or Early Contractor Involvement delivery systems) (EC 1165-2-217, paragraph 12.i.(3))? No, the project design will follow standard dredging, PA/BU construction, and placement methodologies typically conducted by the District for navigation projects. As such the project design is not anticipated to require redundancy, resiliency, and/or robustness, unique construction sequencing, or a reduced or overlapping design construction schedule.

6. REVIEW EXECUTION PLAN

This RP section provides a general description of each type of review and identifies the reviews anticipated for this study/project.

A. Types of Review

1) **District Quality Control (DQC).** DQC is an internal review process of basic science and engineering work products focused on fulfilling the project quality requirements of the project management plan. All decision documents (including data, analyses, environmental compliance documents, etc.) undergo DQC review. Additionally, DQC of milestone submittals is required (PB 2018-01).

2) **Agency Technical Review (ATR).** ATR is performed to assess whether study/project analyses are technically correct and comply with USACE guidance and whether documentation explains the analyses and results in a clear manner. Further, the ATR team will ensure that proper and effective DQC has been performed (as assessment of which will be documented in the ATR report) and will ensure that the product is consistent with established criteria, guidance, procedures, and policy. If significant life safety issues are involved in a study or project, a safety assurance review should be conducted during ATR. At a minimum, ATR of the draft and final decision documents and supporting analyses is required (EC 1165-2-217, paragraph 9.i.(3)); however, targeted reviews may be scheduled as needed.

3) **Independent External Peer Review.** Type I IEPR may be required for decision documents under certain circumstances. IEPR is the most independent level of review and is applied in cases that meet criteria where the risk and magnitude of the proposed 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. If the District anticipates requesting an exclusion from Type I IEPR, that effort should be coordinated with the RMO for assessment prior to submitting to the MSC for approval. Should IEPR be required, the RMO should be contacted at least three months in advance of the anticipated start of the concurrent review period to allow sufficient time to obtain contract services. If required, Type I IEPR will be managed by an Outside Eligible Organization, external to USACE. Neither the public nor scientific or professional societies would be asked to nominate potential external peer reviewers. ***The District intends to pursue an exclusion from IEPR.***

4) **Cost Engineering Review**. All decision documents will be coordinated with the Cost Engineering and ATR Mandatory Center of Expertise (MCX). The MCX will provide the cost engineering expertise needed on the ATR team and will provide certification of cost estimates. The RMO is responsible for coordinating with the MCX for cost reviews. Cost reviews may occur as part of the draft/final report ATRs but the schedule for specific reviews may also vary. Accordingly, the PDT should coordinate closely review related needs with both the MCX and RMO.

5) **Model Review and Approval/Certification.** EC 1105-2-412 established the process and requirements for ensuring the quality of planning models. The EC mandates use of certified or approved planning models for all planning activities to ensure that planning products are technically and theoretically sound, compliant with USACE policy, computationally accurate, and based on reasonable assumptions regarding the availability of data, transparent, and described in sufficient detail to address any limitations of the model or its use.

6) **Policy and Legal Compliance Reviews.** All decision documents will be reviewed throughout the study process for compliance with law and policy. ER 1105-2-100, Appendix H, and DPM CW/DCW memos, provide guidance on policy and legal compliance reviews. These reviews culminate in determination whether report recommendations, supporting analyses, and coordination comply with law and policy and whether the decision document warrants approval or further recommendation to higher authority by the home MSC Commander.

7) **Public Review.** The home District will post the RMO endorsed and MSC approved RP on the District's public website. Internet posting of the RP provides opportunity for the public to comment on that document. It is not considered a formal comment period, and there is no set timeframe for public comment. The PDT should consider any comments received and determine if RP revisions are necessary. During the public comment period, the public will also be provided with the opportunity to review and comment on the draft and final reports. Should IEPR be required, public comments will be provided to the IEPR panel for consideration.

B. Anticipated Project Reviews and Estimated Costs

Table 3 provides the estimated schedule and cost for reviews anticipated for this study.

Table 3: CCSC, La Quinta Channel Expansion – Anticipated Reviews

Product to Undergo Review	Review	Start Date	End Date	Cost	Complete
TSP Milestone Submittals	District Quality Control	10/03/2019	10/07/2019	$2,000	No
DIFR-EA	District Quality Control[1]	10/31/2019	11/25/2019	$24,000	No
	Agency Technical Review[2]	01/02/2020	01/31/2020	$69,720	No
	Type I IEPR (if not exempted)[3]	01/02/2020	03/16/2020	$150,000	No
	Policy and Legal Review	01/02/2020	02/03/2020	N/A	No
ADM Milestone Submittals	District Quality Control	04/29/2020	05/04/2020	$2,000	No
FIFR-EA	District Quality Control [1]	09/24/2020	10/19/2020	$24,000	No
	Agency Technical Review[4]	10/29/2020	11/24/2020	$52K-70K	No
	Policy and Legal Review	06/24/2021	07/27/2021	N/A	No
In-kind products or services[5]	N/A	N/A	N/A	N/A	N/A

[1] Estimated as $3K/reviewer
[2] Estimated as $5,720 for DDNPCX RMO, $4,000 ATR Lead, $5,000/Reviewer – maximum 12 reviewers
[3] IEPR would occur concurrent with other reviews if exclusion is not approved
[4] Estimated as $5,720 for DDNPCX RMO, $4,000 ATR Lead, $3,500-5,000/Reviewer – maximum 12 reviewers
[5] Products and analyses provided by non-Federal sponsors as in-kind services are subject to DQC, ATR, and IEPR. No in-kind products or analyses will be developed by the non-Federal sponsor.

C. 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).

1) Review Team Expertise. Table 4 identifies the required expertise for the DQC team.

Table 4: Required DQC Expertise

DQC Team Disciplines	Expertise Required
DQC Lead	A senior professional with extensive experience preparing CW decision documents and conducting DQC. The lead may also serve as a reviewer for a specific discipline (such as planning, economics, environmental resources, etc.).
Plan Formulation	A senior water resources planner with experience in leading a team through a deep draft navigation study and familiarity with the SMART Planning process.
Economics[1]	The economics reviewer should be a senior economist with experience in deep draft navigation studies and familiarity with economic models identified in Table 6.
Environmental Resources/ Cultural Resources	The environmental reviewer should have expertise in evaluating the impacts associated with deep draft navigation improvements / dredging projects and dredged material placement requirements (including BU assessments and assessing impacts to open water bottom habitats using Habitat Evaluation Procedures and CE/ICA). The reviewer should also be experienced with environmental coordination and NEPA requirements for deep draft navigation projects and be familiar with the environmental model identified in Table 6. Cultural resources reviewer should have expertise in evaluating the impacts associated with deep draft navigation channel improvement and dredging projects as well as extensive knowledge of underwater archaeology. The reviewer should also be familiar with the environmental coordination and NEPA/National Historic Preservation Act (NHPA) requirements for coastal deep draft navigation projects. The reviewer should also be able to assess the adequacy of mitigation planning documents.
HH&C Engineer	The HH&C engineering reviewer should be knowledgeable in the field of hydraulics, have a thorough understanding of open channel dynamics and have experience in deep draft navigation studies/projects. The reviewer should also be familiar with computer modeling techniques that will be used in the study (as identified in Table 7.
Geotechnical Engineer	The reviewer will have an understanding of the behavior or soils, site characterization, material management, slope stability, and the analysis and placement of dredged material. The reviewer should also be familiar with computer modeling techniques identified in Table 7.
Cost Engineer	The cost engineering reviewer should have experience in evaluating cost requirements for a deep draft navigation channel improvement project and experience with the cost engineering models identified in Table 7.
Operations	The operations reviewer should have experience in the O&M of deep draft navigation projects to include channel maintenance dredging, placement, and BU.
Real Estate	The real estate reviewer should have expertise in the real estate requirements of deep draft navigation projects.

[1]The economics DQC team member will be identified by the DDNPCX (OPORD 2012-15).

2) **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 (Figure F). **DrChecks software will be used to document DQC review comments, responses, and issue resolution.**

   Documentation of completed DQC will be provided to the MSC, RMO and ATR Team leader prior to initiating an ATR. The ATR team will assess the quality of the DQC performed and provide a summary of that assessment in the ATR report. Missing or inadequate DQC documentation can result in delays to the start of other reviews (EC 1165-2-217, Section 9).

D. Agency Technical Review

ATR will be performed on the draft and final decision documents and supporting analyses (EC 1165-2-217, paragraph 9.i.(3)). The RMO will manage the ATR. ATR will be performed by a qualified team from outside the home district that is not involved in the day-to-day production of the project/product. **ATR will be performed by a team whose members are certified or approved by their respective Communities of Practice (CoPs) to perform reviews**. The RMO will identify an ATR lead and ATR team members. Neither the home District nor the MSC will nominate review team members. The ATR team lead will be from outside the home MSC. The ATR team lead is expected to participate in the study's milestone meetings (PB 2018-01), the cost of which is not included in the estimates provided in Table 3.

1) **Review Team Expertise.** Table 5 identifies the anticipated disciplines and ATR team expertise required for study efforts.

Table 5: Required ATR Team Expertise

ATR Team Disciplines	Expertise Required
ATR Lead	The ATR lead will be a senior professional with extensive experience preparing CW decision documents and conducting ATR. The lead should have the skills to manage a virtual team through an ATR. The lead may serve as a reviewer for a specific discipline (e.g., plan formulation, economics, etc.).
Plan Formulation	The plan formulation reviewer should be a senior water resources planner with experience in leading a team through a deep draft navigation channel improvement study and analysis of dredged material placement requirements.
Economics	The economics reviewer should be a senior deep draft navigation economist with experience in performing economic evaluations for channel deepening/widening projects. Experience with evaluating containerized and tanker trade is required. Typically, two economics reviewers will be required, one to review the economics appendix and the other to review inputs/outputs of economic models to be used (as identified in Table 6).
Environmental Resources / Cultural Resources	The environmental reviewer should have expertise in evaluating the impacts associated with deep draft navigation improvements / dredging projects and dredged material placement requirements (including BU assessments, assessing impacts to open water bottom habitats using Habitat Evaluation Procedures and CE/ICA). The reviewer should also be experienced with environmental coordination and NEPA requirements for deep draft navigation projects and be familiar with the environmental model identified in Table 6. Cultural resources reviewer should have expertise in evaluating the impacts associated with deep draft navigation channel improvement and dredging projects as well as extensive knowledge of underwater archaeology. The reviewer should also be familiar with the environmental coordination and NEPA/NHPA requirements for coastal deep draft navigation projects. The reviewer should also be able to assess the adequacy of mitigation planning documents.
HH&C Engineer	The HH&C engineering reviewer should have experience designing deep-draft navigation channels, channel maintenance and placement (including BU) and a thorough understanding of open channel dynamics. The reviewer should also be familiar with computer modeling techniques identified in Table 7.
Geotechnical Engineer	The reviewer will have experience performing geotechnical evaluations for deep draft navigation channel improvement projects, including evaluating the behavior of soils, site characterization, material management, slope stability, and the analysis and placement of dredged material (including BU). The reviewer should also be familiar with computer models identified in Table 7.
Cost Engineer	The cost engineering reviewer will be identified by the Cost MCX and will have experience evaluating cost requirements for a deep draft navigation project (channel deepening, widening, placement site construction, BU, etc.). Cost engineering models to be used are identified in Table 7.
Operations	The operations reviewer should have experience in the O&M of deep-draft navigation projects to include channel maintenance dredging, placement, and BU.
Real Estate	The real estate reviewer should have expertise in the real estate requirements of deep draft navigation improvement projects.
Climate Preparedness and Resilience/HH&C Climate	A member of the Climate Preparedness and Resiliency CoP or a HH&C Climate reviewer will participate on the ATR team. Another reviewer can fulfill this requirement as long as that reviewer has the required expertise.

2) **Documentation of ATR.** DrChecks will be used to document ATR comments, responses, and issue resolution. Comments should be limited to those needed to ensure product adequacy. All members of the ATR team should use the four part comment structure (EC 1165-2-217, Section 9(k)(1)). If a concern cannot be resolved by the ATR team and PDT, it will be elevated to the vertical team for resolution using the issue resolution process identified in EC 1165-2-217. The comment(s) can then be closed in DrChecks by noting the concern has been elevated for resolution. The ATR Lead will prepare a Statement of Technical Review Report (EC 1165-2-217, Section 9), for both draft and final decision documents. Any unresolved issues will be documented in the ATR report prior to certification. The Statement of Technical Review (ATR completion) should always include signatures from the ATR Lead, Project Manager, and RMO, and the Certification of ATR should always include signatures from the District's Chiefs of Engineering and Planning Divisions.

E. Independent External Peer Review

1) **Decision on Type I IEPR.** Type I IEPR is managed outside of USACE and is typically conducted on studies. Type I IEPR panels assess the adequacy and acceptability of the economic and environmental assumptions and projections, project evaluation data, economic analysis, environmental analyses, engineering analyses, formulation of alternative plans, methods for integrating risk and uncertainty, models used in the evaluation of environmental impacts of proposed projects, and biological opinions of the project study. Based upon the criteria identified in EC 1165-2-217 and the scope of the study, the PDT's risk informed assessment is that the study does not require Type I IEPR. Therefore, the District will begin preparation of a request for exclusion from Type I IEPR for endorsement by the DDNPCX and approval by the MSC. This Review Plan will be updated to incorporate the results of that coordination.

   The risk informed decision to request exclusion from IEPR was based on consideration of the following:

   The decision document does not meet any of the mandatory triggers for Type I IEPR described in paragraph 11.D.(1) of EC 1165-2-217 and described in detail in Section 5 of this Review Plan. There is no significant threat to human life, the estimated total cost of the project is between $40-$80M, which is less than the $200M trigger; the Governor of Texas has not requested peer review by independent experts; and neither the DCW nor the Chief of Engineer's has determined that the project study is controversial due to significant public dispute over either the size, nature, or effects of the project or the economic or environmental costs or benefits of the project.

   Additionally, the following were considered:

   – The consequences of non-performance on project economics, the environmental and social well-being (public safety and social justice). This project will promote economic efficiency for commercial navigation interests. Should the project not perform as expected, the impact would be a lower than expected benefit to NED, which does not impact human life and/or safety. Non-performance of the project would not affect the

well-being of the general public and/or environment, but may negatively affect transportation cost for commercial vessels/commerce.

- The project is not likely to contain influential scientific information or be highly influential scientific assessment. The project is a typical channel improvement project involving traditional methods of dredging and placement of sediments. The final report and supporting documentation will contain standard engineering, economic, and environmental analyses and information.

- The decision document also meets both exclusions (a) and (b) as described on pages 36 and 37 of EC 1165-2-217 and discussed in detail in Section 5 of this RP:
  - Exclusion (a): The project study does not include an EIS; the Chief of Engineers has not determined it to be controversial; it has no more than negligible adverse impacts on scarce or unique tribal, cultural, or historic resources; and it has no substantial adverse impacts on fish and wildlife species and their habitat prior to implementation of mitigation measures; and before implementation of mitigation measures it has no more than a negligible adverse impact on a species listed as endangered or threatened under the ESA or the critical habitat of such species designated under such Act.
  - Exclusion (b): The project is for an activity for which there is ample experience within USACE and industry to treat the activity as being routine and the project study has minimal life safety risk.

2) **Decision on Type II IEPR.** Type II IEPR, Safety Assurance Review, is managed outside of the USACE and is performed on design and construction for any project where potential hazards pose a significant threat to human life. For Type II IEPRs, a panel is convened to review the design and construction activities before construction begins and periodically thereafter until construction activities are completed.

   The PDT has assessed this single purpose deep draft navigation project and determined that it does not meet the criteria for conducting Type II IEPR:
   - The federal action is not justified by life safety and failure of the project will not pose a significant threat to human life.

   - The project does not involve the use of innovative materials or techniques where the engineering is based on novel methods; it does not present complex challenges for interpretations; it does not contain precedent-setting methods or models; and it does not present conclusions that are likely to change prevailing practices. Proposed improvements are to an existing Federal navigation project. Construction and maintenance techniques have been standardized and no new techniques are expected to be utilized for design and construction activities.

   - The project design does not require redundancy, resiliency, or robustness as the design of navigation improvements at the Port of Corpus Christi will be based upon previously developed and utilized construction techniques which do not require redundancy, resiliency, and/or robustness.

– The project does not have unique construction sequencing or a reduced or overlapping design construction schedule.

F. 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 study area problems and take advantage of 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 assessment of input and output data is the responsibility of the users and is subject to DQC, ATR, and IEPR (if required). Table 6 provides the models that may be used to develop the decision document.

Table 6: Planning Models

Model Name and Version	Brief Model Description and How It Will Be Used in the Study	Model Status
Habitat Evaluation Procedure Habitat Suitability Index (Environmental Resources)	The Habitat Evaluation Procedure Habitat Suitability Index (HEP-HSI) model will be used to quantify the potential impacts associated with the project or outputs of proposed BU or mitigation.	Certified
HarborSym 1.5.8.3 (Economics)	HarborSym is a discrete event Monte-Carlo simulation model designed to facilitate economic analyses of proposed navigation improvement projects in coastal harbors. Incorporating risk and uncertainty, the model will be used to estimate transportation cost savings (benefits) attributable to fleet and loading changes under future with project conditions.	Certified
Regional Economic System (RECONS) (Economics)	RECONS is a regional economic impact modeling tool that estimates jobs, income, and sales associated with Corps CW spending and additional economic activities. The model will be used to estimate the regional economic impacts of project implementation.	Certified

EC 1105-2-412 does not address 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 the responsibility of the user and is subject to DQC, ATR, and IEPR (if required). The following engineering models may be used to develop the decision document.

Table 7: Engineering Models

Model Name and Version	Brief Model Description and How It Will Be Used in the Study	Model Status
Coastal Modeling System (HH&C Engineer)	CMS (Coastal Modeling System) will be used in coordination with ADH (Adaptive Hydraulics), and STWAVE (Steady State Spectral Wave Model) for the input parameters into the ERDC ship simulator. CMS provides the average current velocities projected in a vector format that the ship simulator can use to create a proper simulation.	Allowed
Adaptive Hydraulics (HH&C Engineer)	Adaptive Hydraulics (ADH) is a state-of-the-art Adaptive Hydraulics Modeling system. It is capable of handling both saturated and unsaturated groundwater, overland flow, three-dimensional Navier-Stokes flow, and two- or three-dimensional shallow water problems. ADH contains other essential features such as wetting and drying and wind effects. ADH model provides ship wake analysis that will be used to determine whether shoreline erosion from ship induced waves will occur to the subdivision along the channel with project implementation.	Allowed
Steady State Spectral Wave Model (HH&C Engineer)	Steady State Spectral Wave Model (STWAVE) simulates depth-induced wave refraction and shoaling, current-induced refraction and shoaling, depth- and steepness-induced wave breaking, diffraction, parametric wave growth because of wind input, and wave-wave interaction and white capping that redistribute and dissipate energy in a growing wave field. STWAVE provides distributed waves calculated based on wind speed and direction projected in a vector format that the ship simulator can use to create a proper simulation.	CoP Preferred
ERDC Ship/Tow Simulator (HH&C Engineer)	The ERDC Ship/Tow Simulator features two bridges set up for real-time ship maneuvering, and were specifically developed for evaluating navigation channel designs, modifications, and safety issues. Located at ERDC, Coastal and Hydraulics Laboratory, the model portrays currents, wind and wave conditions, shallow water effects, bank forces, ship handling, ship to ship interaction, fender forces, anchor forces, and tug assistance. ERDC Ship simulator will be used to reduce the channel width to an optimized dimension to reduce costs and provide safe vessel transit.	Allowed
SLOPE/W and SIGMA/W (*Part of GeoStudio Family available to USACE*) (Geotechnical Engineer)	SLOPE/W is a leading slope stability software for soil or rock slopes. SLOPE/W will be mainly used to analyze proposed channel slopes and the stability on any other features (e.g., raise of Placement Areas, BU creations, etc.) SIGMA/W could be used in combination with SLOPE/W to analyze the stress redistribution (i.e., construction sequence of BUs or raise of the PA). This software could be used to conduct strength reduction slope stability analysis, model stress transfer onto embankment or foundation to even calculate settlements or permanent deformations depending on the loading case. Both software are part of the GeoStudio family available to the USACE.	Allowed
Microcomputer Aided Cost Engineering System, MII (Cost Engineer)	Microcomputer Aided Cost Engineering System (MCACES) is the cost estimating software program tools used by cost engineering to develop and prepare Class 3 CW cost estimates.	CW Cost Engineering and ATR MCX mandatory
Cost Schedule Risk Analysis (Cost Engineer)	Cost risk analyses identify the amount of contingency that must be added to a project cost estimate and define the high risk drivers. The analyses will include a narrative identifying the risks or uncertainties. During the alternatives evaluation, the PDT will assist the cost engineer in defining confidence/risk levels associated with the project features within the abbreviated risk analysis. For the Class 3 estimate, an evaluation of risks will be performed using Crystal Ball Cost Schedule Risk Analysis for construction costs over $40 million.	

Model Name and Version	Brief Model Description and How It Will Be Used in the Study	Model Status
Total Project Cost Summary (Cost Engineer)	The Total Project Cost Summary (TPCS) is the required cost estimate document that will be submitted for either division or headquarters USACE (HQUSACE) approval. The total project cost for each CW project includes all Federal and authorized non-Federal costs represented by the CW Work Breakdown Structure features and respective estimates and schedules, including the lands and damages, relocations, project construction costs, construction schedules, construction contingencies, planning and engineering costs, design contingencies, construction management costs, and management contingencies.	
Corps of Engineers Dredge Estimating Program (Cost Engineer)	Corps of Engineers Dredge Estimating Program (CEDEP) is the required software program that will be used for dredging estimates using floating plants. CEDEP contains a narrative documenting reasons for decisions and selections made by the cost engineer. Software distribution is restricted as it is considered proprietary to the Government.	

G. Policy and Legal Compliance Review

In accordance with DPM CW 2018-05, policy and legal compliance reviews (P&LCRs) for draft and final planning decision documents are delegated to the MSC responsible for the execution of the study.

With input from MSC and HQUSACE functional leaders and through collaboration with the Chief of Office of Water Project Review (OWPR), the MSC Chief of Planning and Policy is responsible for establishing a competent interdisciplinary P&LCR team (DPM 2019-01). The composition of the policy review team will be drawn from HQUSACE, the MSC, the Planning Center of Expertise (PCX), and other review resources as needed. The identification of Counsel members will follow the procedures set forth by the HQUSACE Chief Counsel, as coordinated by HQUSACE and MSC Counsel functional leaders. The MSC Chief of Planning and Policy and the Chief of OWPR will collaborate to identify and endorse a P&LCR Manager from among the P&LCR team identified for the study. The manager may be a MSC, PCX, or HQUSACE employee. The team is identified in Attachment 1 of this RP.

The P&LCR team will:

- Provide advice and support to the PDT and decision makers at the District, MSC, HQUSACE, and Assistant Secretary of the Army for Civil Works levels.
- Engage at both the MSC and HQUSACE levels, ensuring that the vertical teaming aspect of SMART planning is maintained.
- Help guide PDTs through project development and the completion of policy and legally compliant documents, identifying policy and legal issues as early as possible such that issues can be addressed while minimizing impacts to study and project costs and schedules.
- Provide impartial and unbiased recommendations, advice, and support to decision makers.

ATTACHMENT 1: TEAM ROSTERS

PROJECT DELIVERY TEAM			
Name	Office	Position	Phone Number
Nicholas Laskowski	CESWG-PM-J	Project Manager	(409) 766-3168
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Harmon Brown	CESWF-PEC-CC	Lead Environmental	(409) 766-3837
Carlos Tate	CESWG-EC-EG	Lead Engineer	(409) 766-3819
Jennifer Bowers	CESWG-EC-EG	Lead Engineer (future)	(409) 766-6365
Arden Sansom	CESWF-PEC-PE	Economist	(409) 766-3841
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DISTRICT QUALITY CONTROL TEAM			
Name	Office	Position	Phone Number
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TBD		Economics	
TBD		Environmental/Cultural Resources	
TBD		HH&C Engineer	
TBD		Geotechnical Engineer	
TBD		Cost Engineer	
TBD		Operations	
TBD		Real Estate	

AGENCY TECHNICAL REVIEW TEAM			
Name	Office	Position	Phone Number
Andrew Bazzle	CESAM-PD-D	ATR Lead	(251) 694-4101
TBD		Plan Formulation	
TBD		Economics (Appendix)	
TBD		Economics (HarborSym)	
TBD		Environmental/Cultural Resources	
TBD		HH&C Engineer	
TBD		Geotechnical Engineer	
TBD		Cost Engineer	
TBD		Operations	
TBD		Real Estate	
TBD		Climate Preparedness & Resilience/HH&C Climate	

VERTICAL TEAM			
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POLICY AND LEGAL COMPLIANCE REVIEW TEAM			
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