Final Independent External Peer Review Report East San Pedro Bay, Long Beach, California, Draft Integrated Feasibility Report and Environmental Impact Statement/ Environmental Impact Report (IFR/EIS/EIR)

Prepared by
Battelle Memorial Institute

Prepared for
Department of the Army
U.S. Army Corps of Engineers
Ecosystem Restoration Planning Center of Expertise
Baltimore District

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It can be done

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Executive Summary

Project Background and Purpose

The study area for the East San Pedro Bay ecosystem restoration study is in Long Beach, California, within East San Pedro Bay between the Long Beach Shoreline and the offshore Long Beach Breakwaters, east of the Port of Long Beach. To the west and northwest of San Pedro Bay are the communities of San Pedro and Wilmington, respectively, and the community of Seal Beach lies to the east. The study area includes the waters in the immediate vicinity (and shoreward) of the breakwaters; the beaches of Long Beach spanning from the mouth of the Los Angeles River southeastward to the San Gabriel River; and the upstream reaches of the Los Angeles River that have direct impact on the Bay. The study area will be assessed from a watershed perspective to identify how the ecosystem restoration effort may be integrated in a collaborative manner into larger watershed efforts being conducted by others (for example, coordination with other studies and efforts to target pollution and debris cleanup further upstream of Los Angeles River). The study considers the benefits of addressing ecosystem restoration measures within the Los Angeles River watershed. The boundaries of the study area are preliminary and may be refined based on findings during the feasibility study.

The Los Angeles and Long Beach harbors consist of about 1,800 acres of water in the inner navigation channels, 5,700 acres of landfill, and 6,000 acres of water (sheltered anchorages and navigation channels) between the landfills and the 8.6 miles of Federally constructed and maintained breakwaters. Two of the most prominent and contributing features within the study area include the Long Beach Breakwater and the mouth of the Los Angeles River, which are addressed below.

Long Beach Breakwater: San Pedro Bay is protected by breakwaters, totaling 8.6 miles, with two openings to allow ships to enter the Ports of Los Angeles and Long Beach. These openings divide the breakwater into three sections: the San Pedro Breakwater (which protects the Port of Los Angeles), the Middle Breakwater (which protects the Port of Long Beach), and the Long Beach Breakwater. The 2.5-mile Long Beach Breakwater is the easternmost breakwater. The Long Beach Breakwater was authorized by Congress in 1940 to extend the San Pedro Bay Breakwater in order to provide a protected anchorage for the U.S. Navy's Pacific Fleet. The Federal government constructed the breakwater from 1941 to 1949. The U.S. Army Corps of Engineers (USACE) maintains the Federal breakwaters.

The focus of the feasibility study is to evaluate ecosystem restoration measures within East San Pedro Bay. In order to design a restoration project, reconfigurations of the Long Beach Breakwater, as it affects the water quality and hydrodynamics of the area, has been analyzed as part of an array alternatives.

Potential reconfiguration could provide an opportunity for rocky materials from the breakwater reconfiguration to be used for ecosystem restoration measures.

Los Angeles River: The mainstem of the Los Angeles River is a major hydrologic feature (or waterway) of the Los Angeles basin. In the 1930s, USACE began channelizing the river for flood control, and by 1954, the entire length of the river was channelized. The river is operated and maintained by USACE and the Los Angeles County Department of Public Works. The Los Angeles River discharges into San Pedro Bay. Alternatives for the ecosystem restoration study may look at changes needed within the Los Angeles River, as they negatively impact the overall health of the bay.

In addition to the breakwater and the river, the study area contains several locations with potential for ecosystem restoration and recreational opportunities. The entire study area was analyzed for ecosystem restoration opportunities. The areas with highest potential include the nearshore habitats that have been lost or severely degraded by human activities. Habitat types for potential restoration include coastal wetlands, rocky reefs/hard bottom, kelp beds, eelgrass/seagrass beds, and intertidal zone. These habitats support a variety of marine life, including, but not limited to, marine mammals, fish, and benthic invertebrates. Elevated concentrations of metals and pesticides in sediments have been found at sites within the Los Angeles River estuary, and the harbor's water quality has been degraded, mainly due to inputs from Los Angeles River. These ecosystems and species that are dependent on healthy environments could be at risk, depending on the outcome of the feasibility study.

Independent External Peer Review Process

Independent, objective peer review is regarded as a critical element in ensuring the reliability of scientific analysis. USACE is conducting an Independent External Peer Review (IEPR) of the East San Pedro Bay, Long Beach, California, Draft Integrated Feasibility Report and Environmental Impact Statement/Environmental Impact Report (IFR/EIS/EIR) (hereinafter: East San Pedro Bay Draft IFR/EIS/EIR IEPR). As a 501(c)(3) non-profit science and technology organization, Battelle is independent, is free from conflicts of interest (COIs), and meets the requirements for an Outside Eligible Organization (OEO) per guidance described in USACE (2018). Battelle has experience in establishing and administering peer review panels for USACE and was engaged to coordinate this IEPR. The IEPR was external to the agency and conducted following USACE and Office of Management and Budget (OMB) guidance described in USACE (2018) and OMB (2004). This final report presents the Final Panel Comments of the IEPR Panel (the Panel). Details regarding the IEPR (including the process for selecting panel members, the panel members' biographical information and expertise, and the charge submitted to the Panel to guide its review) are presented in appendices.

Based on the technical content of the decision documents and the overall scope of the project, Battelle identified potential candidates for the Panel in the following key technical areas: plan formulation/ economics, marine biology, and coastal (hydraulic) engineering. Battelle screened the candidates to identify those most closely meeting the selection criteria and evaluated them for COIs and availability. USACE was given the list of all the final candidates to independently confirm that they had no COIs, and Battelle made the final selection of the three-person Panel from this list.

The Panel received electronic versions of the decision documents (1,138 pages in total), along with a charge that solicited comments on specific sections of the documents to be reviewed. Following guidance provided in USACE (2018) and OMB (2004), USACE prepared the charge questions, which were included in the draft and final Work Plans.

The USACE Project Delivery Team (PDT) briefed the Panel and Battelle during a kick-off meeting held via teleconference at the start of the review to provide the Panel an opportunity to ask questions of USACE and clarify uncertainties. Other than Battelle-facilitated teleconferences, there was no direct communication between the Panel and USACE during the peer review process.

IEPR panel members reviewed the decision documents individually and produced individual comments in response to the charge questions. The panel members then met via teleconference with Battelle to review key technical comments and reach agreement on the Final Panel Comments to be provided to USACE. Each Final Panel Comment was documented using a four-part format consisting of (1) a comment statement; (2) the basis for the comment; (3) the significance of the comment (high, medium/high, medium, medium/low, or low); and (4) recommendations on how to resolve the comment. Overall, 14 Final Panel Comments were identified and documented. Of these, one was identified as having high significance, six had medium/high significance, three had medium significance, two had medium/low significance, and two had low significance.

Battelle received public comments from USACE on the East San Pedro Bay Draft IFR/EIS/EIR (110 pages of comments) and provided them to the IEPR panel members. The panel members were charged with determining if any information or concerns presented in the public comments raised any additional discipline-specific technical concerns with regard to the Draft IFR/EIS/EIR. The Panel identified one new issue and subsequently generated one Final Panel Comment that summarized the concern.

Results of the Independent External Peer Review

The panel members agreed on their “assessment of the adequacy and acceptability of the economic, engineering, and environmental methods, models, and analyses used” (USACE, 2018) in the Draft IFR/EIS/EIR. Table ES-1 lists the Final Panel Comment statements by level of significance. The full text of the Final Panel Comments is presented in Section 4.2 of this report. The following summarizes the Panel’s findings.

Based on the Panel’s review, the report is well-written, and the documents presented the material in a comprehensive and logical approach. However, the Panel identified several elements of the project where additional analysis is needed and where project findings and objectives need to be documented or clarified.

Economics/Plan Formulation: The Panel found that the economic assumptions that underlie the study analysis are adequate and acceptable; however, the methods for integrating risk and uncertainty need further elaboration. The Draft IFR/EIS/EIR does not describe how USACE used the Abbreviated Risk Analysis (ARA) scores for individual measures to develop the collective risk ratings, which are then converted into collective contingency cost percentages. Also, it is also unclear to the Panel if the costs for maintaining the eelgrass beds account for the possibility of potential burial due to reef-induced sedimentation. Furthermore, the Panel noted that the Monitoring and Adaptive Management Plan (MAMP) may not adequately capture costs, risks, and uncertainties associated with impacts from climate change over the project’s 50-year lifespan.

Environmental: The Panel is concerned that the alternatives analysis does not consider habitat scarcity, the ability of a habitat to naturally regenerate without intervention, or the synergistic benefits derived from restoring a variety of habitat types. Also, the success of kelp restoration is uncertain because the Draft IFR/EIS/EIR does not address the root causes for historic kelp loss along California’s coast. Restoration

of the imperiled aquatic habitats is a large part of this project, and considering the quantity, quality, and cause and effect of each habitat's survival will help ensure the overall project success.

The Panel observed that indirect, post-construction benefits from coastal storm damage reduction, water quality, carbon sequestration, erosion control, and air quality were not assessed, precluding an evaluation of potential impacts from climate change.

Engineering: The Panel noted that the coastal engineering models and tools utilized to assess wave, current, and wave runup conditions are appropriate; however, some of the analyses warrant additional attention. The use of only 18 years of wave data to estimate the 50- and 100-year return period events may lead to greater uncertainty in those return period event values. The Panel also believes that potential impacts to beach renourishment backpassing operations could occur due to reef-induced shoreline changes, which would lead to additional costs and other risks.

Table ES-1. Overview of 14 Final Panel Comments Identified by the East San Pedro Bay Draft IFR/EIS/EIR IEPR Panel

No.	Final Panel Comment
Significance – High	
1	The Draft IFR/EIS/EIR does not explain how the (ARA) scores for individual measures translate into contingency cost percentages for alternative plans.
Significance – Medium/High	
2	The alternatives analysis does not take into consideration habitat scarcity, the ability of a habitat to regenerate naturally without active intervention, or the synergistic benefits derived from restoring a variety of different habitat types.
3	Operation and Maintenance, Repair, Replacement and Rehabilitation (OMRR&R) costs for maintaining the eelgrass beds due to impacts from possible reef-induced sedimentation were not considered.
4	The Draft IFR/EIS/EIR does not analyze the indirect, post-construction benefits from coastal storm damage reduction, improved water quality, carbon sequestration, erosion control, and improved air quality under each alternative.
5	Use of limited time-period wave data (spanning only 18 years) to estimate the 50- and 100-year return period events may lead to greater uncertainty in those return period event values.
6	The likelihood that the planned kelp habitat restoration will succeed is uncertain because information about this species' ability to survive or recover from project activities is not provided in sufficient detail.
7	TSP targets the restoration of kelp habitats that were not present in the project area prior to human changes, but it does not target imperiled habitats that were present prior to port development, even though restoring former lost habitats, specifically as impacted by navigation projects, is stated as the project goal.
Significance – Medium	
8	The Draft IFR/EIS/EIR does not analyze the indirect, post-construction benefits from recreation under each alternative.

Table ES-1. Overview of 14 Final Panel Comments Identified by the East San Pedro Bay Draft IFR/EIS/EIR IEPR Panel (continued)

No.	Final Panel Comment
Significance – Medium (continued)	
9	The Draft IFR/EIS/EIR and the MAMP may not adequately capture the costs, risks, and uncertainties associated with survival of restored habitats due to changes in climate, storm severity, and storm frequency to ensure success for the project's 50-year lifespan.
10	Project performance is based on habitat coverages from field observations that could be converted annually to Average Annual Habitat Units (AAHUs) in order to validate methodology and quantify project success.
Significance – Medium/Low	
11	Uncertainties regarding potential impacts to backpassing operations due to reef-induced shoreline changes could result in additional costs and risks.
12	The potential for adverse impacts to restored habitats from ongoing and future dredging operations is unclear.
Significance – Low	
13	The validity of some aspects of the coastal engineering analyses is difficult to confirm because of unclear assumptions or incomplete supporting data.
14	While the Draft IFR/EIS/EIR discusses steps that would be taken to avoid, as much as feasible, impacting existing eelgrass habitat, it does not commit to avoiding impacts to existing habitat during habitat creation projects.

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List of Acronyms

AAHU	Average Annual Habitat Unit
ADCIRC	ADvanced CIRCulation (model)
ADM	Agency Decision Milestone
ARA	Abbreviated Risk Analysis
ATR	Agency Technical Review
CDFW	California Department of Fish and Wildlife Services
CDIP	Coastal Data Information Program
CE/ICA	Cost Effectiveness/Incremental Cost Analysis
CEDEP	Cost Engineering Dredge Estimating Program
CMS	Coastal Modeling System (model)
COI	Conflict of Interest
CZMA	Coastal Zone Management Act
DDT	Dichlorodiphenyltrichloroethane
DPW	Department of Public Works
DrChecks	Design Review and Checking System
EC	Engineer Circular
EFDC	Environmental Fluid Dynamics Code
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
ER	Engineer Regulation
ERDC	Engineer Research and Development Center
ESA	Endangered Species Act
EWL	Extreme Water Level
GRR	General Reevaluation Report
HEC-RAS	Hydrologic Engineering Center-River Analysis System (model)
HSDR	Hurricane and Storm Damage Reduction
IEPR	Independent External Peer Review
IFR/EIS/EIR	Integrated Feasibility Report and Environmental Impact Statement/Environmental Impact Report
IWR	Institute for Water Resources
MAMP	Monitoring and Adaptive Management Plan

List of Acronyms

MHHW	Mean Higher High Water
MLLW	Mean Lower Low Water
MSL	Mean Sea Level
NEPA	National Environmental Policy Act
NOx	Nitrous Oxide
OEO	Outside Eligible Organization
OMB	Office of Management and Budget
OMRR&R	Operation and Maintenance, Repair, Replacement, and Rehabilitation
OPSEC	Operations Security
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PCX	Planning Center of Excellence
PDT	Project Delivery Team
RCPWAVE	Regional Coastal Process WAVE (model)
RECONS	Regional Economic System
RMA-2	River Modeling (model)
SLR	Sea Level Rise
STWAVE	Steady State Spectral Wave (model)
SWAN	Simulating Wave Nearshore (model)
TMDL	Total Maximum Daily Load
TSP	Tentatively Selected Plan
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
WIS	Wave Information Study (model)

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1. INTRODUCTION

The study area for the East San Pedro Bay ecosystem restoration study is in Long Beach, California, within East San Pedro Bay between the Long Beach Shoreline and the offshore Long Beach Breakwaters, east of the Port of Long Beach. To the west and northwest of San Pedro Bay are the communities of San Pedro and Wilmington, respectively, and the community of Seal Beach lies to the east. The study area includes the waters in the immediate vicinity (and shoreward) of the breakwaters; the beaches of Long Beach spanning from the mouth of the Los Angeles River southeastward to the San Gabriel River; and the upstream reaches of the Los Angeles River that have direct impact on the Bay. The study area will be assessed from a watershed perspective to identify how the ecosystem restoration effort may be integrated in a collaborative manner into larger watershed efforts being conducted by others (for example, coordination with other studies and efforts to target pollution and debris cleanup further upstream of Los Angeles River). The study considers the benefits of addressing ecosystem restoration measures within the Los Angeles River watershed. The boundaries of the study area are preliminary and may be refined based on findings during the feasibility study.

The Los Angeles and Long Beach harbors consist of about 1,800 acres of water in the inner navigation channels, 5,700 acres of landfill, and 6,000 acres of water (sheltered anchorages and navigation channels) between the landfills and the 8.6 miles of Federally constructed and maintained breakwaters. Two of the most prominent and contributing features within the study area include the Long Beach Breakwater and the mouth of the Los Angeles River, which are addressed below.

Long Beach Breakwater: San Pedro Bay is protected by breakwaters, totaling 8.6 miles, with two openings to allow ships to enter the Ports of Los Angeles and Long Beach. These openings divide the breakwater into three sections: the San Pedro Breakwater (which protects the Port of Los Angeles), the Middle Breakwater (which protects the Port of Long Beach), and the Long Beach Breakwater. The 2.5-mile Long Beach Breakwater is the easternmost breakwater. The Long Beach Breakwater was authorized by Congress in 1940 to extend the San Pedro Bay Breakwater in order to provide a protected anchorage for the U.S. Navy's Pacific Fleet. The Federal government constructed the breakwater from 1941 to 1949. The U.S. Army Corps of Engineers (USACE) maintains the Federal breakwaters.

The focus of this feasibility study is to evaluate ecosystem restoration measures within East San Pedro Bay. In order to design a restoration project, reconfigurations of the Long Beach Breakwater, as it affects the water quality and hydrodynamics of the area, have been analyzed as part of an array alternatives. Potential reconfiguration could provide an opportunity for rocky materials from the breakwater reconfiguration to be used for ecosystem restoration measures.

Los Angeles River: The mainstem of the Los Angeles River is a major hydrologic feature (or waterway) of the Los Angeles basin. In the 1930s, USACE began channelizing the river for flood control, and by 1954, the entire length of the river was channelized. The river is operated and maintained by USACE and the Los Angeles County Department of Public Works. The Los Angeles River discharges into San Pedro Bay. Alternatives for the ecosystem restoration study may look at changes needed within the Los Angeles River, as they negatively impact the overall health of the bay.

In addition to the breakwater and the river, the study area contains several locations with potential for ecosystem restoration and recreational opportunities. The entire study area was being analyzed for ecosystem restoration opportunities. The areas with highest potential include the nearshore habitats that

have been lost or severely degraded by human activities. Habitat types for potential restoration include coastal wetlands, rocky reefs/hard bottom, kelp beds, eelgrass/seagrass beds, and intertidal zone. These habitats support a variety of marine life, including, but not limited to, marine mammals, fish, and benthic invertebrates. Elevated concentrations of metals and pesticides in sediments have been found at sites within the Los Angeles River estuary, and the harbor's water quality has been degraded, mainly due to inputs from Los Angeles River. These ecosystems and species that are dependent on healthy environments could be at risk, depending on the outcome of the feasibility study.

Independent, objective peer review is regarded as a critical element in ensuring the reliability of scientific analysis. The objective of the work described here was to conduct an Independent External Peer Review (IEPR) of the Final Independent External Peer Review Report East San Pedro Bay, Long Beach, California, Draft Integrated Feasibility Report and Environmental Impact Statement/Environmental Impact Report (IFR/EIS/EIR) (hereinafter: East San Pedro Bay Draft IFR/EIS/EIR IEPR) in accordance with procedures described in the Department of the Army, USACE, Engineer Circular (EC) *Review Policy for Civil Works* (EC 1165-2-217) (USACE, 2018) and the Office of Management and Budget (OMB), *Final Information Quality Bulletin for Peer Review* (OMB, 2004). Supplemental guidance on evaluation for conflicts of interest (COIs) was obtained from the *Policy on Committee Composition and Balance and Conflicts of Interest for Committees Used in the Development of Reports* (The National Academies, 2003).

This final report presents the Final Panel Comments of the IEPR Panel (the Panel) on the existing engineering, economic, environmental, and plan formulation analyses contained in the East San Pedro Bay Draft IFR/EIS/EIR IEPR documents (Section 4). Appendix A describes in detail how the IEPR was planned and conducted, including the schedule followed in executing the IEPR. Appendix B provides biographical information on the IEPR panel members and describes the method Battelle followed to select them. Appendix C presents the final charge to the IEPR panel members for their use during the review; the final charge was submitted to USACE in the final Work Plan according to the schedule listed in Table A-1. Appendix D presents the organizational COI form that Battelle completed and submitted to the Institute for Water Resources (IWR) prior to the award of the East San Pedro Bay Draft IFR/EIS/EIR IEPR.

2. PURPOSE OF THE IEPR

To ensure that USACE documents are supported by the best scientific and technical information, USACE has implemented a peer review process that uses IEPR to complement the Agency Technical Review, as described in USACE (2018).

In general, the purpose of peer review is to strengthen the quality and credibility of the USACE decision documents in support of its Civil Works program. IEPR provides an independent assessment of the engineering, economic, environmental, and plan formulation analyses of the project study. In particular, the IEPR addresses the technical soundness of the project study's assumptions, methods, analyses, and calculations and identifies the need for additional data or analyses to make a good decision regarding implementation of alternatives and recommendations.

In this case, the IEPR of the East San Pedro Bay Draft IFR/EIS/EIR was conducted and managed using contract support from Battelle, which is an Outside Eligible Organization (OEO) (as defined by EC 1165-2-217). Battelle, a 501(c)(3) organization under the U.S. Internal Revenue Code, has experience conducting IEPRs for USACE.

3. METHODS FOR CONDUCTING THE IEPR

The methods used to conduct the IEPR are briefly described in this section; a detailed description can be found in Appendix A. The IEPR was completed in accordance with established due dates for milestones and deliverables as part of the final Work Plan; the due dates are based on the award/effective date and the receipt of review documents.

Battelle identified, screened, and selected three panel members to participate in the IEPR based on their expertise in the following disciplines: plan formulation/economics, marine biology, and coastal (hydraulic) engineering. The Panel reviewed the East San Pedro Bay Draft IFR/EIS/EIR documents and produced 14 Final Panel Comments in response to 16 charge questions provided by USACE for the review. This charge also included two overview questions and one public comment question added by Battelle, for a total of 19 questions. Battelle instructed the Panel to develop the Final Panel Comments using a standardized four-part structure:

1. Comment Statement (succinct summary statement of concern)
2. Basis for Comment (details regarding the concern)
3. Significance (high, medium/high, medium, medium/low, or low; in accordance with specific criteria for determining level of significance)
4. Recommendation(s) for Resolution (at least one implementable action that could be taken to address the Final Panel Comment).

Battelle reviewed all Final Panel Comments for accuracy, adherence to USACE guidance (EC 1165-2-217), and completeness prior to determining that they were final and suitable for inclusion in the Final IEPR Report. There was no direct communication between the Panel and USACE during the preparation of the Final Panel Comments. The Panel's findings are summarized in Section 4.1; the Final Panel Comments are presented in full in Section 4.2.

4. RESULTS OF THE IEPR

This section presents the results of the IEPR. A summary of the Panel's findings and the full text of the Final Panel Comments are provided.

4.1 Summary of Final Panel Comments

The panel members agreed on their "assessment of the adequacy and acceptability of the economic, engineering, and environmental methods, models, and analyses used" (USACE, 2018) in the East San Pedro Bay Draft IFR/EIS/EIR IEPR review documents. The following summarizes the Panel's findings.

Based on the Panel's review, the report is well-written, and the documents presented the material in a comprehensive and logical approach. However, the Panel identified several elements of the project where additional analysis is needed and where project findings and objectives need to be documented or clarified.

Economics/Plan Formulation: The Panel found that the economic assumptions that underlie the study analysis are adequate and acceptable; however, the methods for integrating risk and uncertainty need further elaboration. The Draft IFR/EIS/EIR does not describe how USACE used the Abbreviated Risk Analysis (ARA) scores for individual measures to develop the collective risk ratings, which are then

converted into collective contingency cost percentages. Also, it is also unclear to the Panel if the costs for maintaining the eelgrass beds account for the possibility of potential burial due to reef-induced sedimentation. Furthermore, the Panel noted that the Monitoring and Adaptive Management Plan (MAMP) may not adequately capture costs, risks, and uncertainties associated with impacts from climate change over the project's 50-year lifespan.

Environmental: The Panel is concerned that the alternatives analysis does not consider habitat scarcity, the ability of a habitat to naturally regenerate without intervention, or the synergistic benefits derived from restoring a variety of habitat types. Also, the success of kelp restoration is uncertain because the Draft IFR/EIS/EIR does not address the root causes for historic kelp loss along California's coast. Restoration of the imperiled aquatic habitats is a large part of this project, and considering the quantity, quality, and cause and effect of each habitat's survival will help ensure the overall project success.

The Panel observed that indirect, post-construction benefits from coastal storm damage reduction, water quality, carbon sequestration, erosion control, and air quality were not assessed, precluding an evaluation of potential impacts from climate change.

Engineering: The Panel noted that the coastal engineering models and tools utilized to assess wave, current, and wave runup conditions are appropriate; however, some of the analyses warrant additional attention. The use of only 18 years of wave data to estimate the 50- and 100-year return period events may lead to greater uncertainty in those return period event values. The Panel also believes that potential impacts to beach renourishment backpassing operations could occur due to reef-induced shoreline changes, which would lead to additional costs and other risks.

4.2 Final Panel Comments

This section presents the full text of the Final Panel Comments prepared by the IEPR panel members.

Final Panel Comment 1

The Draft IFR/EIS/EIR does not explain how the Abbreviated Risk Analysis (ARA) scores for individual measures translate into contingency cost percentages for alternative plans.

Basis for Comment

Appendix B, page 2-2, states "The [Abbreviated Risk] Analyses, and collective risk ratings, provide a risk based contingency for each measure, which is then applied to the total project cost. Collective alternative contingencies ranged from 41 to 60%." The contingencies for individual measures, however, range from 40% (kelp reefs) to 90% (wetlands) to 100% (oyster reefs) as shown in Appendix B, Attachment 2. The table in Appendix B, Attachment 3, presents the Risk Evaluation scores for individual measures; these scores indicate that the collective risk rating for kelp forest is lower than that of wetlands, which is lower than that of oyster reefs. However, there is no explanation or justification to explain how the collective risk ratings were determined and how they are converted into collective contingency cost percentages.

Significance – High

The contingency costs are a significant part of the costs of the alternative plans. Changes to contingency costs would likely affect the selected plan.

Recommendation for Resolution

1. Clearly explain and justify how the ARA collective risk ratings for individual measures translate into contingency cost percentages for alternative plans.

Final Panel Comment 2

The alternatives analysis does not take into consideration habitat scarcity, the ability of a habitat to regenerate naturally without active intervention, or the synergistic benefits derived from restoring a variety of different habitat types.

Basis for Comment

The study problems outlined in Section 2.1.1 specifically call out “Reduced abundance and biodiversity of marine populations as a result of habitat loss” (Draft IFR/EIS/EIS, page 2-1), and a stated planning objective is to "Restore and support the sustained functioning of imperiled aquatic habitats such as kelp, rocky reef, coastal wetlands, and other types historically present in San Pedro Bay of sufficient quality and quantity to support diverse resident and migratory species within East San Pedro Bay during the period of analysis (50 years)" (Draft IFR/EIS/EIS, page 2-5).

The Draft IFR/EIS/EIR posits that wetland habitat is one of the most threatened, stating that "Under the No Action Alternative, sea level rise associated with climate change would likely reduce total saltmarsh within the project area" (Draft IFR/EIS/EIR, page 5-62). Further, Appendix D-1, page 3-12, states that "The intertidal zone is a unique habitat…”, defining the area as “…from the bottom of the bay to tidal wetlands…and transition zones…to upland areas…Intertidal zone-associated habitats represent some of **the most imperiled habitats** in the [southern California bight]" (emphasis added). These details suggest that the coastal salt marsh wetlands system should be a priority and should be targeted for restoration within the scope of this project.

The Draft IFR/EIS/EIR (page 2-2) notes that 93% of historical wetland habitat has been lost in East San Pedro Bay. Wetlands associated with the San Pedro Bay historically accounted for more than 80% of all historical wetland habitats in the southern California region. The only existing wetland within the entire project area is the relatively small, isolated 6.5-acre coastal saltmarsh in the Golden Shore Marine reserve. Wetland restoration is addressed only under Alternative 8, which clusters all scarce habitat measures in one alternative. Considering that this measure still was defined as a Best Buy Plan, if the wetland restoration were considered individually as a component to Alternative 4A, it could allow additional project objectives to be met at a lower cost and better meet cost efficiency goals.

A primary objective of the ecosystem restoration study is restoring scarce habitats. The alternatives included an array of habitat types that considered factors such as habitat productivity and reasonableness of cost. However, scarcity was not included as a metric of the alternatives analyses. A greater share of wetlands has been lost compared to other habitat types; therefore, including wetland creation in other combinations with the base plan or with Alternative 4A would strengthen the alternatives analysis, and analyzing for scarcity would help the project meet its primary objective.

Another approach that would strengthen the alternatives analysis would be to analyze the percent occurrence of each habitat, relative to its historic distribution, as a metric in the analysis. This approach would more accurately capture the ecological value and significance of each measure (rather than basing value and significance solely on cost and calculated habitat units) and thus enable prioritization of measures relative to the overall project objectives in addition to cost metrics. One way to do this would be to weight each habitat-specific Average Annual Habitat Unit (AAHU) by the proportion of lost habitat so that as the number of restored AAHUs for a specific habitat type increases, the weight associated with successive AAHUs of that habitat type decreases.

Final Panel Comment 2

The persistence of these wetland habitats is expected to be the most vulnerable to the effects of climate change and sea level rise (SLR) over time, increasing the importance of protection and restoration now. Sustaining complex physical processes and habitat structures depends on restoring and maintaining key habitats, addressing shoreline management, and supporting efforts to adapt to the uncertainties of climate change. The Draft IFR/EIS/EIR refers frequently to the expectation of continued population and economic growth, which will further threaten this system, increasing the importance of the potential ecosystem services that restoring the wetland may offer. Indirect benefits such as reducing adverse water quality impacts and improving coastal resiliency and storm damage reduction are goals often targeted directly as primary objectives in other USACE projects. In short, the need for this particular resource has been clearly demonstrated; as stated in the Draft IFR/EIS/EIR (page 2-6): "The Bight's location makes it one of the most threatened biodiversity hot spots in the world." The Draft IFR/EIS/EIR further states that "The protection and enhancement of southern California's marine environment is an important goal in the Nation's environmental quality program" (page 2-6).

Analysis of a habitat's ability to naturally regenerate would further strengthen the alternative measures. Comparing the wetland habitat restoration alternative, which is a habitat that is not likely to restore itself, versus the eelgrass or kelp habitat alternatives, which may be restored naturally or with a less targeted and less costly effort, could further prioritize habitat restoration efforts. The Draft IFR/EIS/EIR (page 3-20) states that kelp coverage in this area has increased "…from 29 acres (2007) to 120 acres (2012)" but does not describe the factors of causation leading to the substantial increase in coverage. Additional information should be presented to determine whether this was a natural recovery, and if so, whether this should be considered in the alternatives analysis. Similarly, the Draft IFR/EIS/EIR, page 2-2, states that "Ideal conditions for eelgrass do not exist except in one location where offshore placement of dredged material remained long enough for eelgrass to establish unintentionally." Placement of dredged material created ideal conditions without intending to target this habitat creation. It would be worthwhile to consider a metric in the analysis that includes the likelihood of natural restoration without this proposed project and defined targeted action, as a means of prioritizing resources for comparing alternative measures.

The embayments, marshes, and estuaries along the southern California coast are considered among the most productive habitats on the Pacific coast (Appendix D-1, page 1-2). The justification for eliminating this measure was cost. The analysis shows that there is a "broad range of costs and values for wetlands" (Draft IFR/EIS/EIR, page 4-22).

The Tentatively Selected Plan (TSP) may not fully address the project objectives because it does not restore a significant scarce resource: tidal wetlands, which offer extensive ecosystem benefits and was also determined to be a Best Buy Plan. If wetland restoration were considered individually as a component to Alternative 4A rather than combining all the scarce habitat measures together, it could allow additional project objectives to be met at a lower cost. Although coastal wetlands are effective in boosting AAHUs, no coastal wetlands are included under the TSP (Alternative 4A) due to the incremental cost per habitat unit (Draft IFR/EIS/EIR, page 4-72).

In public comment letters, both the United States Environmental Protection Agency (USEPA) and the California Department of Fish and Wildlife Services (CDFW) recommend that wetlands be given additional consideration in the Draft IFR/EIS/EIR.

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Annual emissions under Alternative 8, including dredging activities, are summarized in the Draft IFR/EIS/EIR, Table 5-10. It was determined that emissions of nitrogen oxide (NOx), a precursor for ozone, associated with Alternative 8 would exceed the applicable General Conformity Applicability rate for the compound and that impacts under the National Environmental Policy Act (NEPA) would be significant and unavoidable (Draft IFR/EIS/EIR, page 5-46) due to the cumulative impact (Draft IFR/EIS/EIR, page 5-49). If the wetland restoration measure were considered individually, and not as part of all the measures collectively for Alternative 8, it might not result in significant air quality impacts.

AAHUs are calculated by multiplying habitat acres by a quality index. The quality index of a restored habitat in a particular location may be enhanced by its proximity to other habitat types. The analysis of the alternative plans does not consider the effect of combinations of habitat types on habitat quality. In other words, the analysis does not consider the potential synergy of habitat diversity on annual habitat units under the alternative plans.

Significance – Medium/High

Including restoration of coastal wetlands, one of the region's most imperiled habitats, as an individual component in the alternatives analysis may allow additional project objectives to be met at a lower cost under the TSP.

Recommendations for Resolution

1. Consider restoring either both proposed wetlands or only one of the 10-acre and 42-acre wetland scenarios as an additional component of the TSP (Alternative 4a).
2. Expand the alternatives analysis by including scarcity of habitat as a metric to capture ecological value and significance in addition to habitat unit cost.
3. Include additional information in the alternatives analysis that discusses each habitat's ability to naturally restore and regenerate.
4. Expand the alternatives analysis to capture each habitat's ability to naturally regenerate as a metric.
5. Isolate the contribution of the wetland construction to NOx exceedance during construction under Alternative 8 and re-analyze compliance with air quality regulations.
6. Determine whether the components of Alternative 4A can be adjusted to include wetlands while remaining within air quality limits during construction.
7. Include additional information in the alternatives analysis that discusses the synergistic effects of diverse habitat types.

Final Panel Comment 3

Operation and Maintenance, Repair, Replacement and Rehabilitation (OMRR&R) costs for maintaining the eelgrass beds due to impacts from possible reef-induced sedimentation were not considered.

Basis for Comment

The Draft IFR/EIS/EIR states that "No OMRR&R for eelgrass beds is expected" (page 6-15). However, altered sand patterns behind the nearshore rocky reefs and mobilization of the bay's sediments could bury or smother eelgrass beds.

As stated in the Draft IFR/EIS/EIR (page 6-22), "The effect of the nearshore reefs that break the waves before impacting the shoreline will cause additional sediments to settle in the lee…" Similarly, Appendix A (page 5-8) states "Sediments may naturally accrete in the lee of these structures…". The nearshore rocky reefs limit the amount of directional incoming wave energy and thus reduce the sediment transport potential within the area of influence of each individual structure. The amount of energy reaching the shoreline in the lee of a segmented nearshore breakwater field relates to the breakwater length "shadow," the transmission of waves through (permeability) or over (transmission) the breakwater, and the diffraction of the waves around the tip of each adjacent structure. The shoreline landward of nearshore-segmented breakwaters evolves into an oscillating curve due to the variability in wave energy and littoral transport induced by the structures themselves. GenCade modeling reveals these oscillation patterns (Appendix A, pages 7-26 through 7-40). The amplitude of shoreline oscillations (termed salients) depends on the structures' lengths, gap distance between successive structures, and structures' distances offshore. If the shoreline accretes excessively, a tombolo will form. A tombolo formation will greatly reduce the alongshore transport of material landward of the breakwaters. Proper design of the rocky reefs will balance the structure length, gap width, and distance from shore, resulting in a sinuous shoreline with a variable width salient that does not extend and connect to the reefs.

Uncertainty exists in the degree of sediment accumulation behind the rocky reefs. The Coastal Engineering Manual (USACE, 2006) acknowledges the paucity of available design guidance. Appendix A of the Draft IFR/EIS/EIR (page 9-1) refers to the need for physical modeling during the design phase of the project "…to properly capture parameters that are difficult to describe with numerical models." However, the Draft IFR/EIS/EIR is not clear regarding whether the study would assess shoreline response and sediment transport. If too much sediment accumulated in the lees of the rocky reefs, sediments could bury the eelgrass.

Additionally, other bay-area sediments could bury the eelgrass beds behind the rocky reefs. For example, sediments mobilized via storms and river discharges could adversely affect these habitats. From Appendix A of the Draft IFR/EIS/EIR, Figures 3-23 and 3-24 show that typical conditions mobilize sediments in the eastern section of the study area. Presumably, storms inside the Federal breakwaters could mobilize bay sediments given the design wave height, which approaches 12 feet for features like the tidal salt marsh (Appendix A, page 5-10). Similarly, Environmental Fluid Dynamics Code (EFDC) modeling suggests that flows exiting the L.A. and San Gabriel rivers could mobilize sediments (Appendix A, Figure 6-9). These sediments may also contain contaminants. The Draft IFR/EIS/EIR states that "…portions of [Los Angeles River Estuary] sediments were found contaminated with chemicals above sediment quality criteria and with grain size that was too fine and therefore were

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considered unsuitable for beach nourishment" (page 3-3). During storms and significant river discharge events, these sediments may mobilize and deposit onto newly restored habitats. The Draft IFR/EIS/EIR documentation does not make clear how burial of eelgrass (for example, under these contaminated sediments) may affect survival and success of the habitat.
Significance – Medium/High
Excluding OMRR&R costs associated with maintaining eelgrass beds provides no cost mechanism to repair possible sedimentation damage to the eelgrass beds should monitoring reveal such occurrences, threatening the long-term success of this restored habitat.
Recommendations for Resolution
1. Discuss potential risks stemming from burial of eelgrass habitat with sediments. 2. Include OMRR&R costs associated with maintaining eelgrass beds due to possible burial by sedimentation.

Literature Cited:

USACE (2006). Beach Fill Design. In Coastal Engineering Manual, Part V, Coastal Project Planning and Design, Chapter 4. Engineer Manual 1110-2-1100, U.S. Army Corps of Engineers, Washington, D.C.

Final Panel Comment 4

The Draft IFR/EIS/EIR does not analyze the indirect, post-construction benefits from coastal storm damage reduction, improved water quality, carbon sequestration, erosion control, and improved air quality under each alternative.

Basis for Comment

Throughout the Draft IFR/EIS/EIR documentation, there are general qualitative discussions about indirect benefits that may result from individual alternative measures, which demonstrates the desire of the project to optimize ecosystem services, maximize ecologic benefits, improve coastal storm damage reduction, and increase resiliency to potential climate change and SLR impacts. For example, Appendix D-1, page 3-27, states that "Coastal protection is arguably one of the most valuable services provided by sand shore ecosystems especially in the face of extreme storms, tsunamis, and sea level rise." Appendix F, page 1-4, of the Draft IFR/EIS/EIR also states "Expanded habitat areas that could support larger and more diverse populations of native species would further promote the sustainability and resiliency of restored ecosystems/habitats within the project area to sea level rise and coastal storm disturbance". Specific potential indirect benefits defined vary for each alternative; however, there is no metric for evaluating these important indirect benefits in the alternative measures of the analysis. Capturing these additional benefits would strengthen the analysis and make the comparison of the cost/benefit analysis more robust.

The importance of analyzing benefits qualitatively as well as quantitatively is stated throughout the Draft IFR/EIS/EIR as well as its appendices (Draft IFR/EIS/EIR, page 4-16; Appendix C, page 6-7; Appendix D-1, page 1-2). Since ecosystem restoration value is difficult to monetize, there is an inherent challenge in capturing the most important metrics that enable accurate comparison of cost and benefits. Several additional metrics that capture important ecosystem services such as the effects on water quality, improved resilience to SLR and storm damage reduction, erosion control protection, and increased carbon sequestration would strengthen this analysis substantially. These benefits could be analyzed with separate weights, as they are indirect benefits and not the primary objective, but they are important benefits that relate directly to the project area and are sometimes defined as primary objectives in other USACE projects.

According to many studies around the world, one of the most important benefits that wetlands provide is their capacity to maintain and improve water quality. (i.e., Singh et al., 2019). In addition, USACE targets wetland restoration in other projects specifically for coastal storm damage reduction benefits (i.e., Coastal Texas). Although all proposed alternative measures in the Draft IFR/EIS/EIR provide incidental unquantified secondary benefits, wetlands may have the most significant impact by reducing coastal and shoreline wave heights and current velocities and reduce the potential for shoreline erosion, yet this is not reflected in the analysis.

The Draft IFR/EIS/EIR (page 6-1) states that the TSP maximizes benefits; however, it does not define which benefits or describe how the TSP would maximize these benefits compared to the other alternatives. The art of calculating habitat values in monetary form requires a comprehensible, reasonable, and justifiable approach. The model developed for this project is thoughtful, scientifically sound, and well done. However, it does not capture important ecological values, ecosystem services, and risk-reducing benefits that should be included in the analysis to accurately conduct an ecosystem-based cost-benefit analysis. While it is costly, capturing the full range of potential benefits may exceed

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the investment cost, and justify selection of a different alternative, especially given climate change forecasts, and therefore should be estimated and included in the analysis.

In addition, costs and benefits pertaining to potential incidental benefits associated with beach erosion control are not included in analysis, and therefore there is no assessment of the potential impact of each measure on long-term beach nourishment potential costs. Similarly, other indirect benefits to reduce climate change impacts are not captured in the alternatives analyses; for example, the Draft IFR/EIS/EIR states: “Giant kelp forests also contribute significantly to elevated primary and secondary production, nutrient cycling, biodiversity, and carbon sequestration” (page 3-19).

Finally, Alternative 8 clearly provided the greatest habitat restoration output of the three Final Array Plans, but it did so at a high incremental cost when compared to Alternatives 2 and 4A. While the ecologic benefits are substantial, USACE determined that Alternative 8 would not reasonably maximize beneficial effects compared to costs (Appendix C, page 7-1). If the full range of benefits were considered for each alternative, it is unclear whether the resulting selection of a TSP would change, as the benefits could exceed the investment cost.

Significance - Medium/High

Evaluating important indirect benefits not captured in the alternatives analysis could result in a more comprehensive understanding of benefits under each alternative, since including the requested analyses may affect some of the criteria USACE uses for TSP selection, and would allow USACE to document how each alternative meets the project objectives and reduces potential adverse impacts and long-term costs resulting from climate change.

Recommendations for Resolution

1. Add text to the discussion of alternative measures that defines specific potential benefits and ecosystem services provided under each proposed measure.
2. Expand the alternatives analysis by including impacts on climate change as a metric to capture ecological value and significance in addition to habitat unit cost.
3. Re-evaluate the alternatives analysis, including potential positive impacts on climate change and water quality, to determine whether the currently selected TSP is still the most cost-efficient over the long term.

Literature Cited:

Singh, N.K., J.D. Gourevitch, B.C. Wemple, K.B. Watson, D.M. Rizzo, S. Polasky, and T.H. Ricketts. (2019). Optimizing wetland restoration to improve water quality at a regional scale. Environmental Research Letters, v. 14, no. 6.

Final Panel Comment 5

Use of limited time-period wave data (spanning only 18 years) to estimate the 50- and 100-year return period events may lead to greater uncertainty in those return period event values.

Basis for Comment

Potentially large uncertainties exist within extreme value analyses. These uncertainties generally increase for higher return periods or less frequent events because of short periods of available data. Short data records necessitate extrapolating beyond the available data points to obtain estimates of the tail behavior of the underlying statistical distributions.

Appendix A of the Draft IFR/EIS/EIR documents the extreme wave analysis performed on the Coastal Data Information Program (CDIP) buoy 092 data. The analysis treats swells from the northwest and south separately. The CDIP long-term wave statistics provide 1-, 50-, and 100-year wave heights for northwest swells (12.4, 16.9, and 17.4 feet, respectively) and south swells (5.8, 13.1, and 14.2 feet, respectively). These discrete wave conditions serve as inputs to local wave models to derive conditions within East San Pedro Bay for with- and without-project simulations. Note that swells from the northwest have less of an effect within the study area than swells from the south because the alignment of the breakwaters and port complexes limits the effects of the northwest swells. Figures 3-19 and 3-20 of Appendix A show many more occurrences of swells from the northwest than from the south. In fact, the CDIP buoy appears to have recorded only 15 south swell events over the 18-year record (Figure 3-20). A Wave Information Study (WIS) station (83101) lies very near to the CDIP buoy and in similar water depths (approximately 1,500 feet). While it represents hindcasted and not recorded wave data, its record spans 32 years, from 1980-2011. Although not stated in the appendix, some overlap between the two datasets likely exists. The WIS data (http://wis.usace.army.mil/) reports 50- and 100-year wave heights of 16.6 and 17.8 feet, respectively, which lie very near the CDIP extreme values for northwest swells. Like the WIS extreme analysis, the CDIP extreme analysis utilizes a 6.5-foot cutoff wave height. However, the study does not provide an explanation for use of this cutoff.

Appendix A (page 3-19) states that “For brevity, only CDIP data will be used throughout this study, but similar conclusions would be obtained by using WIS data.” The text implies that an assessment of the WIS data did not occur for this study. Rather, it concludes that “…the length of record of the CDIP buoy, 18 years, is enough to conduct an extremal analysis and draw conclusions for the expected project life of 50 years.” However, the Panel cannot assess the validity of this statement because the Draft IFR/EIS/EIR documentation provides no comparisons with the longer available record.

The design and costs of various plan elements rely on the estimated wave conditions at the different sites. More frequent events like the 1-year events serve to estimate the velocity conditions near the eelgrass beds and particle residence times. The 50- and 100-year events serve to determine the design conditions for the rocky reefs, kelp reef rock, sandy island revetment, tidal marsh structure, and the Los Angeles River training wall. Based on the CDIP extreme wave analysis and numerical modeling, the extreme events result in rock sizes ranging from approximately 500 pounds to 11 tons or more. As stated in the Draft IFR/EIS/EIR, the study assigns a cost contingency of 51% especially related to rock availability and pricing. Because of the quantity of large rock needed, the study further states that “Sufficient quantities of rock may not be available when required to build the reefs” (page 6-21).

Final Panel Comment 5

Reducing and assessing uncertainty in large return-period wave heights requires the use of a longer period of record and the testing of data fits to several probability distribution functions. Given that the south swell extreme values originate from only 15 data points, examination of a longer record may increase the data record to 26 or 27 values if the south swells occurred at the same frequency in both the 18- and 32-year records. Fitting the data to multiple probability distributions (as recommended by Ochi [1990] and Goda [2000]) and increasing the data points in the record could reduce uncertainty in the wave height estimates. Any increases or decreases in rock sizes would then affect the costs with the structural plan features. Calculation of confidence intervals will help quantify the uncertainty in the 50- and 100-year extreme values.

Significance – Medium/High

Uncertainties in wave heights may lead to high costs associated with protecting habitats (e.g., rocky reefs and sandy island revetment) and could affect plan selection.

Recommendations for Resolution

1. Perform an extreme wave analysis on the northwest and south swells taken from the 32-year WIS record. Calculate the 90% and 95% confidence intervals associated with 50- and 100-year values. Calculate confidence intervals associated with CDIP 50- and 100-year waves. Compare the values.
2. Consider extending the 18-year CDIP records by comparing 32-year WIS and 18-year CDIP wave time series records in areas of overlapping times, then developing factors (e.g., multiplier and translation factors) to adjust the WIS data to the CDIP data. Perform a new extreme analysis on the quasi-synthetic 32-year CDIP record, including estimates of confidence intervals.
3. Revise engineering and cost analyses as needed based on the results of steps 1 and 2.
4. As needed, update study documents with the results of steps 1-3.

Literature Cited:

Goda, Y. (2000). Random Seas and Design of Maritime Structures (2nd Edition). World Scientific, New Jersey.

Ochi, M.K. (1990). Applied Probability and Stochastic Processes in Engineering and Physical Sciences. John Wiley & Sons, New York.

Final Panel Comment 6

The likelihood that the planned kelp habitat restoration will succeed is uncertain because information about this species' ability to survive or recover from project activities is not provided in sufficient detail.

Basis for Comment

The underlying assumption of the ecosystem restoration study is "that active restoration approaches are beneficial in open marine and coastal systems where biogenic structures, such as semi-terrestrial saltmarsh vegetation, intertidal and subtidal seagrass beds, kelp beds, and rocky reefs, have been lost, reduced, or degraded" (Appendix D-1, page 1-7). This assumption provides the basis of this project, suggesting that in the absence of specific actions, restoration of these habitats may not occur. However, the Draft IFR/EIS/EIR (page 3-20) states that "Kelp coverage in this area has ranged from 29 acres (2007) to 120 acres (2012)." The Draft IFR/EIS/EIR does not describe the factors of causation leading to the substantial increase in coverage of the two kelp species between 2007 and 2012. It is unclear if the likelihood or ability of the habitat to restore itself was considered sufficiently. Additional information should be presented to determine whether this was a natural recovery, and if so, whether this should be considered in the alternatives analysis.

Another underlying assumption of the project is that if the TSP (or another Best Buy alternative) were implemented and suitable habitats were restored (for example, by constructing rock reefs), aquatic species that rely on these habitats such as kelp would successfully establish. For example, the Draft IFR/EIS/EIR (page 4-33) states that "Establishment of giant kelp on restored rocky reefs stones would occur through passive colonization of propagules over time." No other evidence is provided documenting successful establishment in previous instances. Evidence from other projects that rely on this method demonstrating successful recruitment and establishment, with a defined expected timeline, would strengthen the analysis. It is also unclear if creating suitable kelp habitat would result in a restored high-value kelp habitat without incurring significant additional costs to facilitate recovery and success. No other active measures to increase or facilitate restoration have been defined. The potential success of kelp restoration using only natural recruitment at this site under current environmental conditions is unproven. A letter from the CDFW submitted as a public comment states that "Multiple efforts are underway throughout California with varying levels of success to restore kelp habitat." Additional information regarding kelp establishment and defined contingency plans would increase the likelihood of the success of this project.

Appendix D, page 3-13, states that "…the movement of propagules (e.g., eelgrass seeds, kelp sporophytes) among beds is mediated by water motion, and therefore this motion must be considered in efforts to restore or enhance these habitats. In this case, the bay location and placement of substrates is critical so that these surfaces have the best chance of being passively colonized by the marine species that are appropriate to the habitat type being restored." It is unclear if the proposed locations optimize potential passive colonization, as no discussion or justification for location of measures is presented. In addition, Appendix D, page 3-18, states that "…both patch size and patch isolation play into probability of extinction. Giant kelp has a relatively short spore dispersal distance(s), so more isolated patches may not rebound following disturbance." Although the project seeks to increase connectivity, it is unclear if the placement and size of the restored measures are optimal to achieve project objectives.

Final Panel Comment 6

Although there has been loss of kelp habitat within the southern California bight, much of the loss occurred outside East San Pedro Bay (public comment, CDFW letter). This can be seen in Figure 2-1 of the Draft IFR/EIS/EIR, which shows extensive kelp cover west and north of San Pedro Bay where historically hard-bottom substrate occurs to support kelp beds. However, the substrate targeted in this project for kelp restoration is the conversion of soft-bottom habitat. It has not been demonstrated that this method would succeed in achieving project objectives.

As stated in the Draft IFR/EIS/EIR (page 2-2): “Historically, a large kelp bed existed in the San Pedro Bay area, but disappeared by the 1930s from unknown causes.” It is unclear if something may threaten the extent of such habitat and its long-term survival today because this scenario is not discussed. In addition, new threats may threaten the success of kelp restoration. According to the CDFW letter mentioned above, "Due to a variety of environmental factors such as loss of sea stars that predate on urchins, rising ocean temperatures, runoff and environmental contaminants, and invasive species, ecological conditions may not exist that support natural recruitment of giant kelp at the project site at this time." (public comment, CDFW letter)

Finally, historical and ongoing degradation of water quality, combined with adverse impacts from trash, heavy urbanization, and high recreational use, may also threaten the success of the restoration habitat. The Draft IFR/EIS/EIR (page 3-8) notes that water quality concerns in Eastern San Pedro Bay include the following pollutants: chlordane, dieldrin, dichlorodiphenyltrichloroethane (DDT), polychlorinated biphenyl (PCB), and toxaphene. Total maximum daily loads (TMDLs) for sediment were metals, chlordane, polycyclic aromatic hydrocarbon (PAH), and DDT. It is unclear how much these factors may influence the success of the project, with future conditions potentially worsening. In addition, the Draft IFR/EIS/EIR (page 3-55) states that the majority of the city’s wastewater is delivered to and treated at the Terminal Island Treatment Plant, while the remainder is sent to the Long Beach Water Reclamation Plant of the Los Angeles County Sanitation Districts. Potential impacts on kelp habitat from continued and likely increased wastewater treatment plant discharges into the system are not discussed in detail.

Significance – Medium/High

Without defining the root cause of historic kelp loss in California, and without justification of the project’s reliance only on passive colonization or a contingency plan to assist in the establishment of kelp on the rocky reefs, the success of the project is uncertain.

Recommendations for Resolution

1. Research the increased coverage of kelp between 2007 and 2012, add information regarding the findings, and provide updated information about current coverage and causation.
2. Provide information about this species’ ability to recover naturally.
3. Provide information regarding kelp establishment methodologies and define contingency plans if passive colonization does not succeed.
4. Justify the proposed locations for kelp restoration and confirm that these locations would optimize the potential for passive colonization.

Final Panel Comment 6

5. Provide data from other studies that have converted soft-bottom substrate successfully to create kelp habitat.
6. Discuss in greater detail the historic extent of the large kelp beds that existed in the San Pedro Bay area, including potential factors that may have resulted in the disappearance of this community.
7. Discuss potential risks from water quality degradation on the kelp beds and other potentially restored habitats.

Final Panel Comment 7

The TSP targets the restoration of kelp habitats that were not present in the project area prior to human changes, but it does not target imperiled habitats that were present prior to port development, even though restoring former lost habitats, specifically as impacted by navigation projects, is stated as the project goal.

Basis for Comment

One of the key assumptions of the Draft IFR/EIS/EIR is stated as follows: "The Project's ecosystem restoration goals focuses [*sic*] on alternatives that meet the study's objectives of **restoring scarce coastal and marine habitat types that have been lost or are imperiled due to port development, associated navigation activities, and the effects of urbanization**" (emphasis added) (Draft IFR/EIS/EIR, page 4-3). For some of the targeted habitats, the cause for their reduction is unclear; however, Appendix D-1, page 1-3, states that in southern California, "…estuarine wetlands have been eliminated by 75 percent to 90 percent as a result of filling or dredging in the last century…In addition, the persistence of these habitats is expected to be the most vulnerable to the effects of climate change and sea level rise over time." The anthropogenic impacts that resulted in the loss of wetlands are directly related to port and navigation activities and previous USACE projects, which is the target habitat for restoration as stated in project objectives. Yet, the TSP selects kelp habitat for restoration, even though this habitat was not lost due to navigation impact, as stated in the Draft IFR/EIS/EIR (page 2-2): "Historically, a large kelp bed existed in the San Pedro Bay area, but disappeared by the 1930s from unknown causes."

A public comment letter submitted by the consulting firm Integral Consulting Inc. raised the concern that the alternatives presented in the Draft IFR/EIS/EIR do not focus on key habitats that were present prior to human changes, habitats that are still present and are stressed today (e.g., sandy beach, sandy intertidal, and sandy subtidal habitats), and wetlands. The public comment letter (page 5) states that "The cliff backed shoreline is common to geomorphic regions supporting kelp habitat along the California coast. The regions of kelp habitat loss, while tragic for the overall [southern California bight], are not located within the study or project areas. The IFR does not address that this highly valued habitat targeted for restoration was not of significance historically in the [East San Pedro Bay] project area."

Further, a public comment from the CDFW states that although there has been loss of kelp habitat within the southern California bight, much of the loss occurred outside East San Pedro Bay. This can be seen in Figure 2-1 of the Draft IFR/EIS/EIR, which shows extensive kelp cover west and north of San Pedro Bay where historically hard-bottom substrate occurs to support kelp beds.

It is not clear that the proposed natural regeneration of kelp habitats will succeed in achieving project objectives, and it is not clear why restoration is targeting this species, which may not have been dominant in this area and whose habitat loss was due to unknown causes not directly linked to port expansion and associated navigation activities.

Significance – Medium/High

Final Panel Comment 7

The TSP may not fully meet project objectives because it targets habitats that, while valuable, may not have been dominant within the study area, even as it excludes those habitats that were known to dominate this study system and were reduced by port and navigation activities.

Recommendations for Resolution

1. Provide a more detailed description of historical habitats within East San Pedro Bay and identify each site improvement as habitat restoration or creation.
2. Explain why the primary scarce habitats that dominated this region were not selected under the TSP, although they resulted in Best Buy Plans and best meet the project objectives.
3. Reanalyze the alternatives to consider their efficacy in achieving the project goal of restoring scarce habitat that previously dominated this area and that were impacted by navigation, port development, and urbanization.

Final Panel Comment 8

The Draft IFR/EIS/EIR does not analyze the indirect, post-construction benefits from recreation under each alternative.

Basis for Comment

All of the proposed plans are assigned an orange rating, indicating that they have mixed positive and negative impacts to various recreation activities (Appendix C, page 9-13). The overall recreation value decreased only slightly when compared to the without-project condition. This is primarily because the losses to recreation experience related directly to water-based recreation, primarily defined here as boating and fishing, would be counterbalanced by improvements to environmental quality associated with the ecosystem restoration project (Appendix C, page 9-18) The analysis does not adequately define improvements to environmental quality. Further, the improved recreational benefits from wetland restoration are insufficiently described.

Tidal wetlands have the potential to provide recreational, educational, and social benefits, because the restored tidal wetland could be used as a park with a boardwalk, viewing area, and educational signs. In the analysis of social justice and recreational benefits, the Draft IFR/EIS/EIR asserts that this restoration project may result in increased rent to lower-income populations, as rents may increase in proximity to parks. Specifically, Appendix C, page 10-3, states “It is possible that the project could result in increased local property values, which could benefit minority homeowners but may result in a burden to minority home renters in underserved areas should rents increase.” Appendix C, page 10-6, further states that “The real estate market consistently demonstrates that many people are willing to pay a larger amount for property located close to parks and open space areas.” Access to parks and open space would not change under the TSP; therefore, this proposed benefit does not seem justified.

The scope of the TSP with primarily underwater measures is not likely to significantly affect the rent or willingness-to-pay metric, with all other aspects of the existing condition remaining the same. Presenting data from anywhere in the nation that demonstrates that rents increase when this type of in-water restoration occurs would support this assertion. However, a tidal wetland, in contrast, increases the land use to include a nature reserve and natural lands in this densely urbanized port complex and does have the potential to affect real estate, as it would change the recreational opportunities and aesthetics of the site significantly. These benefits and other potential positive impacts specifically under Alternative 8 are not adequately considered in the alternatives analysis. This potential benefit should be discussed and captured in the assessment of recreational benefits defined for each measure in Appendix C.

Level of Significance – Medium

Failure to properly account for recreational benefits may have affected the selection of the TSP.

Recommendation for Resolution

1. Acknowledge and discuss the potentially large recreational benefits associated with wetland restoration in Appendix C.

Final Panel Comment 9

The Draft IFR/EIS/EIR and the MAMP may not adequately capture the costs, risks, and uncertainties associated with survival of restored habitats due to changes in climate, storm severity, and storm frequency to ensure success for the project's 50-year lifespan.

Basis for Comment

Persistent threat from the effects of climate change, climate change-induced alteration to rainfall patterns, and SLR over time are expected to threaten the existing habitats within the project area. It is likely that these habitats will become increasingly vulnerable and less resilient to the effects of these stressors (e.g., exacerbated loss of existing habitat, decreased viability of existing habitat, increased chances of wetland/habitat type conversion, submergence of transitional habitats) (Appendix C, page 6-15). This likelihood is a primary assumption of the project and supports the need for action. However, there is still a risk of an extreme event destroying or having substantial adverse impacts on any one of the restored habitats (for example, destroying a kelp bed or mobilizing large quantities of rock).

The Draft IFR/EIS/EIR (page 4-18) states that "OMRR&R costs include costs incurred after each measure is constructed or installed and the measure is established to where it addresses the ecosystem restoration objective as intended." The MAMP defines actions from potential impacts due to severe storms. It is unclear the extent to which climate change impacts may adversely affect the restored habitats and whether sufficient costs are allocated if maintenance is higher than expected (for example, replacing large quantities of rocks). Also, although the Draft IFR/EIS/EIR considers climate change, it is difficult to estimate the extent to which resources would be needed over the next 50 years in order to accurately capture future costs. The MAMP was designed to reduce these uncertainties. However, the document states that Federal responsibility would end after performance measures have been met, based on a 5- or 10-year evaluation. The MAMP does not describe what will happen if the habitat is destroyed after being deemed as meeting the performance standards. Therefore, it is unclear if long-term survival would be assured given the defined MAMP, although the project life is targeted as 50 years.

A severe storm could tear out many of the species targeted, such as kelp or eelgrass, or remove sand islands. This could have impacts comparable to initiating the project again. Although this scenario is characterized in the Draft IFR/EIS/EIR, the extent to which actions would be needed, and the associated costs, carry a high level of uncertainty. The MAMP is forward-looking in that it defines triggers for actions. The primary concern is whether the long-term cost is conservative, in order to ensure success.

Eelgrass beds are especially vulnerable to predicted increased storm intensity and frequency associated with climate change. Extreme storm frequency has the likelihood to scour benthic sediments beneath eelgrass beds and degrade its existing distribution and functionality. Under the No Action Alternative (Draft IFR/EIS/EIR, page 5-63), the functions and distribution of eelgrass beds within the project area would likely be decreased by projected extreme storm events. The Draft IFR/EIS/EIR does not describe how the future with-project conditions would be protected from these projected extreme storm events.

Appendix D, page18 states that "While *Zostera* requires flow over habitat, wave energy also has sheer [*sic*] stress that may uproot plants." Potential effects of climate change include increased storm events

Final Panel Comment 9

that likely will include higher wave energy. The risk of adverse impacts to eelgrass from increased wave activity is not adequately discussed in the Draft IFR/EIS/EIR, although the MAMP states that monitoring would be conducted after significant storm events, with transplanting, if needed. With the expected increased frequency of storm events, it is unclear if the costs associated with recovery from the storms, including restoring damaged restoration features, are sufficient.

The Draft IFR/EIS/EIR does not commit to designing each restorative measure with consideration of the specific needs to preserve functions and services over time and identify anticipated enhancements that each measure may need due to a changing condition. “For example, rocky reefs may need heavier or more stone material to maintain habitat requirements, and sunlight requirements of eelgrass may need to be adjusted to accommodate rising sea levels" (USEPA public comment letter). It is important to commit to maintaining or restoring components of each implemented measure that may become inundated or damaged by large waves or severe storm events beyond the proposed 10 years, in order to ensure long-term project success and functionality.

Significance – Medium

Because costs due to climate change impacts may be underestimated and Federally defined responsibilities are limited, the success of the project over the 50-year lifespan may be at risk.

Recommendation for Resolution

1. Define contingencies to provide funding for long-term management of the restored habitats if severe climate change impacts require more OMRR&R than is predicted.

Final Panel Comment 10

Project performance is based on habitat coverages from field observations that could be converted annually to AAHUs in order to validate methodology and quantify project success.

Basis for Comment

AAHUs serve as the ecological performance measure when evaluating features of the contemplated alternatives. The monitoring program presented in Appendix F of the Draft IFR/EIS/EIR (Monitoring and Adaptive Management Plan) establishes standards to evaluate the performance and success of the measures but does not produce results in terms of AAHUs. Establishing a method for the monitoring program to verify the level of AAHUs expected under the TSP (or the plan ultimately constructed) would strengthen the MAMP.

Currently, the methodology lacks a means to convert measured parameters to AAHUs. This conversion would enable a true assessment of project success in terms that USACE has defined and could validate the predicted results. Table ES-3 of the Draft IFR/EIS/EIR indicates that USACE expects Alternative 4A (the TSP) to yield 160.9 AAHUs by restoring kelp beds, installing nearshore and open-water rocky reefs, and restoring eelgrass beds. Prudence dictates that the monitoring results provide enough information on whether the plan produced this desired increase in AAHUs by year 10, the last year of monitoring cost-shared by the Federal and local sponsors. Converting monitoring data to AAHUs minimally at years 5 and 10 would better determine whether project “success” is achieved earlier (year 5) than the last year of cost-shared monitoring (year 10).

A site-specific habitat suitability model, utilizing inputs from other models and analyses, determines the AAHUs for the evaluated habitats. Table 4-2 of the Draft IFR/EIS/EIR lists the key parameters for the different plan elements. For the TSP elements only, kelp reef suitability relies on measures of temperature, substrate, and depth; rocky reef suitability relies on measures of connectivity, residence time, and substrate; and eelgrass bed suitability relies on “circulation” (water velocity at seabed), depth, temperature, and substrate. Residence time and circulation parameters rely on Environmental Fluid Dynamics (EFDC) modeling and desktop coastal engineering analyses (Appendix A).

The monitoring plan described in Appendix F intends to measure the success of these plan elements as follows. Kelp reef monitoring calls for obtaining aerial imagery to help delineate kelp locations and compute coverage areas. Rocky reef monitoring would consist of quantitative acoustic surveys (or lead-line surveys) and qualitative underwater (diver) surveys. Eelgrass monitoring would consist of quantitative aerial imagery or side-scan sonar surveys and qualitative descriptions of localized wave action and water circulation patterns at the restored sites. These monitoring efforts, along with pre-design considerations, address connectivity, substrate, and depth measures of suitability.

Because the rocky reef and eelgrass bed plan features would rely on EFDC model output and other analyses, a concentrated focus on measuring the outputs provided by these analyses—water velocities at the seabed and estimated particle residence times (two key habitat suitability parameters identified)—would strengthen the MAMP. As implied in Appendix D in the “Rocky Reef (non-kelp)” and “Glossary” sections, the habitat suitability model utilizes residence time (in days) as a proxy for pollutant flushing time and circulation. Longer residence times result in lower rocky reef suitability indices. Further, the model ascribes eelgrass survival indices to seabed current velocities that reflect an ideal velocity range for optimal growth. Additionally, water temperature measurements appear to be needed as part of the monitoring plan, as they serve as one of the key parameters in the habitat

Final Panel Comment 10

suitability model for kelp and eelgrass beds. A two-month average temperature relates to kelp growth indices, whereas monthly values relate to eelgrass mortality. The current monitoring plan does not measure water velocities at the seabed, estimate particle residence times, and measure water temperatures important to the suitability of the rocky reef, eelgrass, and kelp habitat areas. The value of these measurements would increase should data collection efforts fall within the range of tidal and hydrologic conditions examined in the EFDC modeling and supporting analyses, which forms the basis of the expected outcomes.

Significance – Medium

Linking the monitoring plan to evaluate project success in terms of desired benefit or expected outcomes, and specifically targeting the set increase in AAHUs, would enable a better measurement of the success of the project.

Recommendations for Resolution

1. Revise the monitoring plan to establish a measure of project performance that links field measurements/observations to estimates of AAHUs, with an emphasis on key habitat suitability parameters such as circulation.
2. Consider utilizing drogue and dye studies to evaluate residence time pertinent to suitability indices of rocky reefs; collecting temperature data via data loggers or field surveys pertinent to kelp and eelgrass beds; and measuring seabed current velocities concurrently with acoustic/lead-line surveys pertinent to eelgrass beds. Attempt to measure and capture the range of tidal and hydrologic conditions examined in the EFDC modeling and supporting analyses, which forms the basis of the expected outcomes.

Final Panel Comment 11

Uncertainties regarding potential impacts to backpassing operations due to reef-induced shoreline changes could result in additional costs and risks.

Basis for Comment

Appendix A (page 5-8) states that sediments could accumulate in the lee of the rocky reefs installed under the with-project alternatives. The beach shoreline would respond with a sinuous shape as a function of rocky reef length, gaps between the rocky reefs, and distance from shore to the rocky reefs. The oscillating shape would result in areas of accretion and areas of erosion relative to a pre-project shoreline if no change in net sediments occurred.

The Draft IFR/EIS/EIR (main report) states, “The City currently conducts an annual re-nourishment program to maintain Peninsula Beach. The program is a backpassing operation that transfers sand from the wide, sheltered beaches in the lee (wind blowing into shore from the sea) of the Long Beach Breakwater to narrow, exposed shoreline of Peninsula Beach” (page 5-12). The study assumes that the city would maintain these ongoing efforts under both the with- and without-project conditions. However, the city’s practices could change depending on the locations of shoreline perturbations caused by the rocky reefs, and any change in the city’s practices would likely result in changes to its cost and risk. Risks include the possible need to import larger quantities of sand or conduct nourishments more frequently if existing backpassing efforts proved insufficient after reef installation. Notably, some public comments reviewed by the Panel also expressed concerns related to possible erosion from installing nearshore rocky reefs.

Significance – Medium/Low

After the installation of nearshore rocky reefs, the city could incur greater costs due to the need for more frequent backpassing nourishment events and larger sand quantities to combat erosion.

Recommendations for Resolution

1. Discuss potential risks to the current city-sponsored backpassing operations at Peninsula Beach.
2. Discuss a mitigation plan for potential unintended erosive effects on Peninsula Beach and breakwater-sheltered beaches.

Final Panel Comment 12

The potential for adverse impacts to restored habitats from ongoing and future dredging operations is unclear.

Basis for Comment

Dredging activities are an ongoing activity in the project area, as stated in the Draft IFR/EIS/EIR:

> "Construction activities and impacts would occur for those cumulative projects that are currently underway, including the Alamitos Bay Marina rebuild project, San Pedro Breakwater repair project, Middle Breakwater repair project, and Long Beach Breakwater repair project, and for some of those that would be constructed in the future, including the Los Angeles Harbor maintenance dredging project, Long Beach Harbor maintenance dredging project, Los Angeles River Estuary maintenance dredging project, Naval Weapons Station Seal Beach maintenance dredging project, Naval Weapons Station Seal Beach Harbor Expansion project, Port of Long Beach (POLB) Deep Draft Navigation project, and Surfside/Sunset Storm Damage Reduction project." (Draft IFR/EIS/EIR, page 5-163).

The Draft IFR/EIS/EIR (page 1-7) also states that the Los Angeles County Drainage Area project, specifically the Los Angeles River channelization, is subject to ongoing dredging at the mouth of the river within the proposed project area. However, the Draft IFR/EIS/EIR does not define protective measures over the long term to ensure that dredging activities do not directly impact any of the restored habitats, including indirect impacts such as sediment mobilization and potential burying of habitats.

Significance – Medium/Low

Potential impacts have not been fully defined; therefore, the long-term success of the East San Pedro Bay project may be affected.

Recommendation for Resolution

1. Define protective measures to ensure that direct and indirect adverse impacts to restored habitats from ongoing and future dredging operations are avoided.

Final Panel Comment 13

The validity of some aspects of the coastal engineering analyses is difficult to confirm because of unclear assumptions or incomplete supporting data.

Basis for Comment

Appendix A of the Draft IFR/EIS/EIR describes engineering analyses conducted to establish existing conditions as well as assess alternative plan elements. While the analyses generally follow industry standards, the Panel noted the following observations:

1. Table 4-1 presents the design water levels. They appear to be referenced to mean lower low water (MLLW) and do not represent depths. The MLLW, mean sea level (MSL), and mean higher high water (MHHW) appear to originate from Table 3-1. However, the source of the 50-year EWL (assumed to mean Extreme Water Level) is unclear. Accounting for El Niño effects involves adding 1 foot to the 50-year EWL. The low, medium, and high SLR values likely account for SLR from 1992 until 2080, the end of the 50-year project life. The text is unclear how USACE derived these values.
2. Page 4-3 cites the Stockdon et al. formula, which was used to estimate wave runup levels for existing conditions under different event scenarios. The results appear reasonable with respect to overall trends. However, Appendix A does not provide the equation and inputs that result in the values shown in Table 4-2. On page 4-4, Equation 4 should read (D/B)^(1/C) for the second part of the equation. The appendix also does not provide the inputs that result in the values shown in Table 4-3. Similarly, wave runup figures (Figures 7-60 through 7-69) do not provide input conditions to confirm reported wave runup levels resulting from breakwater modifications.
3. Page 5-3 provides the formula for estimating stable rock sizes for the rocky reefs. The Panel cannot evaluate stone size for rocky reefs without inputs/outputs or calculation examples to confirm the 500-pound stone size result. However, the Panel understands that rocky reefs would incorporate 10-ton rock to ensure desired voids for habitat.
4. Table 5-3 presents the maximum expected reflection coefficients for the rocky reefs. The text does not make clear whether these coefficients apply to the nearshore or open-water reefs. As a result, the Panel could not evaluate the expected wave reflection coefficients.
5. Table 5-4 presents the transmitted wave heights associated with the rocky reefs under typical conditions. Equation 10 shows that the transmission relates to additional parameters besides the level of submergence and incident wave height. Neither the table nor the text provides the values of these other input parameters.
6. Page 5-10 discusses the design of the tidal salt marsh. The text provides the approximate resistive force needed to withstand the force associated with a 12-foot design wave. However, the text does not provide calculation details associated with the needed resistive force.
7. Page 5-12 discusses the revetment needed to protect the sandy island plan element. Appendix A does not provide the input conditions or formula used for the 11-ton rock needed other than the design wave height.

Final Panel Comment 13

8. Table 5-5 summarizes wave runup levels and overtopping rates for the sandy island. Appendix A does not present the formula and include all input parameters such as reduction factors and structure slope.
9. Page 5-13 discusses the training wall for the Los Angeles River. The design includes armor stone up to 12 tons for design conditions. The Panel cannot assess this value because the study does not describe how USACE derived it or provide design conditions.

Significance – Low

The unclear assumptions and lack of supporting data affect the Panel's ability to understand how the USACE arrived at its results.

Recommendation for Resolution

1. Revise Appendix A to clarify the issues enumerated in the Basis for Comment.

Final Panel Comment 14

While the Draft IFR/EIS/EIR discusses steps that would be taken to avoid, as much as feasible, impacting existing eelgrass habitat, it does not commit to avoiding impacts to existing habitat during habitat creation projects.

Basis for Comment

The Draft IFR/EIS/EIR provides a list of environmental commitments, one of which states that "A pre-construction survey would be performed to document eelgrass extent in the areas of nearshore reef placement. If eelgrass is present, the location of rocky reef and sand placement would be adjusted **as much as feasible** during the detailed design phase as well as during construction to avoid impacts to all existing eelgrass habitat" (emphasis added). Another commitment states that "During the creation of eelgrass habitats, no more than 10 percent of the plants from eelgrass donor beds would be harvested to minimize potential impacts to existing eelgrass beds" (Draft IFR/EIS/EIR, page 4-70). With all the costs invested in restoring these habitats, it seems prudent to avoid any direct impact to the species that is targeted for restoration. While this is the intention of the Draft IFR/EIS/EIR, additional defined measures are necessary to ensure that no direct impact would occur. during construction or future maintenance dredging. A stronger statement committing to avoiding direct impacts would strengthen both the Draft IFR/EIS/EIR and the project and increase the likelihood for long-term success.

Significance – Low

Avoiding any impact to existing eelgrass increases the success of this project.

Recommendations for Resolution

1. Revise the Draft IFR/EIS/EIR text to state clearly that direct impacts to restored habitats and existing habitats would be avoided.
2. Define clear measures to ensure that such impacts would be avoided.

5. REFERENCES

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OMB (2004). Final Information Quality Bulletin for Peer Review. Executive Office of the President, Office of Management and Budget, Washington, D.C. Memorandum M-05-03. December 16.

Singh, N.K., J.D. Gourevitch, B.C. Wemple, K.B. Watson, D.M. Rizzo, S. Polansky, and T.H. Ricketts. (2019). Optimizing wetland restoration to improve water quality at a regional scale. Environmental Research Letters, v. 14, no. 6.

The National Academies (2003). Policy on Committee Composition and Balance and Conflicts of Interest for Committees Used in the Development of Reports. The National Academies (National Academy of Science, National Academy of Engineering, Institute of Medicine, National Research Council). May 12.

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APPENDIX A

IEPR Process for the East San Pedro Bay Draft IFR/EIS/EIR Project

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A.1 Planning and Conduct of the Independent External Peer Review (IEPR)

Table A-1 presents the major milestones and deliverables of the Independent External Peer Review (IEPR) of the East San Pedro Bay, Long Beach, California, Draft Integrated Feasibility Report and Environmental Impact Statement/Environmental Impact Report (IFR/EIS/EIR) (hereinafter: East San Pedro Bay Draft IFR/EIS/EIR IEPR). Due dates for milestones and deliverables are based on the award/effective date listed in Table A-1. The review documents were provided by USACE on December 6, 2019. Note that the actions listed under Task 6 occur after the submission of this report. Battelle anticipates submitting the pdf printout of the USACE's Design Review and Checking System (DrChecks) project file (the final deliverable) on April 30, 2020. The actual date for contract end will depend on the date that all activities for this IEPR are conducted and subsequently completed.

Table A-1. Major Milestones and Deliverables of the East San Pedro Bay Draft IFR/EIS/EIR IEPR

Task	Action	Due Date
1	Award/Effective Date	11/12/2019
	Review documents available	12/6/2019
	Public comments available	1/30/2020
	Battelle submits draft Work Plan[a]	11/22/2019
	USACE provides comments on draft Work Plan	12/3/2019
	Battelle submits final Work Plan[a]	12/6/2019
2	Battelle submits list of selected panel members[a]	12/2/2019
	USACE confirms the panel members have no COI	12/6/2019
3	Battelle convenes kick-off meeting with USACE	11/26/2019
	Battelle convenes kick-off meeting with panel members	1/6/2020
	Battelle convenes kick-off meeting with USACE and panel members	1/7/2020
4	Panel members complete their individual reviews	2/4/2020
	Panel members provide draft Final Panel Comments to Battelle	2/18/2020
	Battelle sends public comments to panel members for review	2/7/2020
	Panel drafts Final Panel Comment(s) regarding public comments, if necessary	2/21/2020
	Panel finalizes Final Panel Comments	3/3/2020
5	Battelle submits Final IEPR Report to USACE[a]	3/5/2020
6[b]	Battelle convenes Comment Response Teleconference with panel members and USACE	4/15/2020
	Battelle submits pdf printout of DrChecks project file[a]	4/30/2020
	Agency Decision Milestone (ADM) meeting[c]	6/15/2020
	Contract End/Delivery Date	11/30/2020

[a] *Deliverable.*
[b] *Task 6 occurs after the submission of this report.*
[c] *The ADM meeting was listed in the Performance Work Statement under Task 3 but was relocated in this schedule to reflect the chronological order of activities.*

At the beginning of the Period of Performance for the East San Pedro Bay Draft IFR/EIS/EIR IEPR, Battelle held a kick-off meeting with USACE to review the preliminary/suggested schedule, discuss the IEPR process, and address any questions regarding the scope (e.g., terminology to use, access to DrChecks, etc.). Any revisions to the schedule were submitted as part of the final Work Plan. The final charge consisted of 16 charge questions provided by USACE, two overview questions and one public comment question added by Battelle (all questions were included in the draft and final Work Plans), and general guidance for the Panel on the conduct of the peer review (provided in Appendix C of this final report).

Prior to beginning their review and after their subcontracts were finalized, all the members of the Panel attended a kick-off meeting via teleconference planned and facilitated by Battelle in order to review the IEPR process, the schedule, communication procedures, and other pertinent information for the Panel. Battelle planned and facilitated a second kick-off meeting via teleconference during which USACE presented project details to the Panel. Before the meetings, the IEPR Panel received an electronic version of the final charge, as well as the review documents and reference/supplemental materials listed in Table A-2.

Table A-2. Documents to Be Reviewed and Provided as Reference/Supplemental Information

Review Documents	No. of Review Pages
Draft IFR/EIS/EIR	422
Appendix A - Coastal Engineering: A1 EFDC Modeling and A2: Wave Conditions (basically wave condition maps)	324
Appendix B - Cost	30
Appendix C - Economics and Social Considerations	80
Appendix D - Habitat Evaluation Model	100
Appendix E - Air Quality	38
Appendix F - Monitoring and Adaptive Management Plan	24
Appendix G - Clean Water Act	26
Appendix H – U.S. Fish & Wildlife Service (USFWS) Biological Supplement	10
Appendix I - Geotechnical and Geology	26
Appendix J - Real Estate	26
Appendix K - Cultural Resources	4
Appendix L - Environmental Justice	10
Appendix M - Coastal Zone Management	8
Appendix N - Public Involvement	10
Total # of pages *to be reviewed*	**1,138**

Table A-2. Documents to Be Reviewed and Provided as Reference/Supplemental Information (cont'd)

Reference/Supplemental Information	
Risk Register	14
Total # of pages *for information only* [a]	**14**
Public comments	110

[a] *Supporting documentation only. These documents are not for Panel review and should be used as information sources only. They are not included in the total page count.*

In addition to the materials provided in Table A-2, the panel members were provided the following USACE guidance documents.

- Review Policy for Civil Works (EC 1165-2-217, February 20, 2018)
- Office of Management and Budget's Final Information Quality Bulletin for Peer Review (December 16, 2004)
- USACE ER 1110-1-8159, Engineering and Design, DrChecks, May 10, 2001.
- Foundations of SMART Planning
- Feasibility Study Milestones (PB 2018-01, September 30, 2018 and PB 2018-01(S), June 20, 2019)
- SMART – Planning Overview
- Planning Modernization Fact Sheet
- USACE Climate Change Adaptation Plan (2015)
- Procedures to Evaluate SLR Change Impacts Responses Adaptation (ETL 1100-2-1 – June 30, 2014)
- Incorporating SLR Change in CW Programs (ER 1100-2-8162 – December 31, 2013).

About halfway through the review, a teleconference was held with USACE, Battelle, and the Panel so that USACE could answer any questions the Panel had concerning either the review documents or the project. Prior to this teleconference, Battelle submitted 15 panel member questions to USACE. USACE was able to provide responses to the questions during the teleconference and also provided written responses to all the questions prior to the end of the review.

In addition, USACE provided one additional document at the request of panel members. This document was provided to Battelle and then sent to the Panel as additional information only; it was not part of the official review. The additional document requested by the Panel is provided below.

- San Pedro Bay Ecosystem Conceptual Model

A.2 Review of Individual Comments

The Panel was instructed to address the charge questions/discussion points within a charge question response form provided by Battelle. At the end of the review period, the Panel produced individual comments in response to the charge questions/discussion points. Battelle reviewed the comments to identify overall recurring themes, areas of potential conflict, and other overall impressions. At the end of the review, Battelle summarized the individual comments into a preliminary list of overall comments and discussion points. Each panel member's individual comments were shared with the full Panel.

A.3 IEPR Panel Teleconference

Battelle facilitated a teleconference with the Panel so that the panel members could exchange technical information. The main goal of the teleconference was to identify which issues should be carried forward as Final Panel Comments in the Final IEPR Report and decide which panel member should serve as the lead author for the development of each Final Panel Comment. This information exchange ensured that the Final IEPR Report would accurately represent the Panel's assessment of the project, including any conflicting opinions. The Panel engaged in a thorough discussion of the overall positive and negative comments, added any missing issues of significant importance to the findings, and merged any related individual comments. At the conclusion of the teleconference, Battelle reviewed each Final Panel Comment with the Panel, including the associated level of significance, and confirmed the lead author for each comment.

A.4 Preparation of Final Panel Comments

Following the teleconference, Battelle distributed a summary memorandum for the Panel documenting each Final Panel Comment (organized by level of significance). The memorandum provided the following detailed guidance on the approach and format to be used to develop the Final Panel Comments for the East San Pedro Bay Draft IFR/EIS/EIR IEPR:

- Lead Responsibility: For each Final Panel Comment, one panel member was identified as the lead author responsible for coordinating the development of the Final Panel Comment and submitting it to Battelle. Battelle modified lead assignments at the direction of the Panel. To assist each lead in the development of the Final Panel Comments, Battelle distributed a summary email detailing each draft final comment statement, an example Final Panel Comment following the four-part structure described below, and templates for the preparation of each Final Panel Comment.

- Directive to the Lead: Each lead was encouraged to communicate directly with the other panel members as needed and to contribute to a particular Final Panel Comment. If a significant comment was identified that was not covered by one of the original Final Panel Comments, the appropriate lead was instructed to draft a new Final Panel Comment.

- Format for Final Panel Comments: Each Final Panel Comment was presented as part of a four-part structure:

    1. Comment Statement (succinct summary statement of concern)
    2. Basis for Comment (details regarding the concern)
    3. Significance (high, medium/high, medium, medium/low, and low; see description below)

4. Recommendation(s) for Resolution (see description below).

- Criteria for Significance: The following were used as criteria for assigning a significance level to each Final Panel Comment:

  1. **High:** There is a fundamental issue within study documents or data that will influence the technical or scientific basis for selection of, justification of, or ability to implement the recommended plan.

  2. **Medium/High:** There is a fundamental issue within study documents or data that has a strong probability of influencing the technical or scientific basis for selection of, justification of, or ability to implement the recommended plan.

  3. **Medium:** There is a fundamental issue within study documents or data that has a low probability of influencing the technical or scientific basis for selection of, justification of, or ability to implement the recommended plan.

  4. **Medium/Low:** There is missing, incomplete, or inconsistent technical or scientific information that affects the clarity, understanding, or completeness of the study documents, and there is uncertainty whether the missing information will affect the selection of, justification of, or ability to implement the recommended plan.

  5. **Low:** There is a minor technical or scientific discrepancy or inconsistency that affects the clarity, understanding, or completeness of the study documents but does not influence the selection of, justification of, or ability to implement the recommended plan.

- Guidelines for Developing Recommendations: The recommendation section was to include specific actions that USACE should consider to resolve the Final Panel Comment (e.g., suggestions on how and where to incorporate data into the analysis, how and where to address insufficiencies, areas where additional documentation is needed).

Battelle reviewed and edited the Final Panel Comments for clarity, consistency with the comment statement, and adherence to guidance on the Panel's overall charge, which included ensuring that there were no comments regarding either the appropriateness of the selected alternative or USACE policy. At the end of this process, 14 Final Panel Comments were prepared and assembled. There was no direct communication between the Panel and USACE during the preparation of the Final Panel Comments. The full text of the Final Panel Comments is presented in Section 4.2 of the main report.

A.5 Conduct of the Public Comment Review

Following the schedule in Table A-1, Battelle received a PDF file containing 110 pages of public comments on the East San Pedro Bay Draft IFR/EIS/EIR from USACE. Battelle then sent the public comments to the panel members in addition to the following charge question:

1. **Do the public comments raise any additional discipline-specific technical concerns with regard to the overall report?**

The Panel produced individual comments in response to the charge question. Each panel member's individual comments for the public comment review were shared with the full Panel. Battelle reviewed the

comments to identify any new technical concerns that had not been previously identified during the initial IEPR. The Panel identified one new issue from the public comments and subsequently generated a final panel comment (Final Panel Comment 7) to address the concern.

A panel member also noted that a public comment raised the issue of the placement of rocky reefs and kelp beds as a potential hazard to recreational vessels; however, this issue was not developed as a Final Panel Comment because the panel member noted that Appendix A of the review documents indicates that this matter will be addressed in the Preconstruction Engineering and Design phase. The Panel also noted that some of the issues raised in the public comments were similar to concerns raised in the IEPR Final Panel Comments; specifically, both agency and public comments noted that the TSP did not address restoration of scarce habitats (in particular, coastal wetlands).

A.6 Final IEPR Report

After concluding the review and preparation of the Final Panel Comments, Battelle prepared a final IEPR report (this document) on the overall IEPR process and the IEPR panel members' findings. Each panel member and Battelle technical and editorial reviewers reviewed the IEPR report prior to submission to USACE for acceptance.

A.7 Comment Response Process

As part of Task 6, Battelle will enter the 14 Final Panel Comments developed by the Panel into USACE's DrChecks, a Web-based software system for documenting and sharing comments on reports and design documents, so that USACE can review and respond to them. USACE will provide responses (Evaluator Responses) to the Final Panel Comments, and the Panel will respond (BackCheck Responses) to the Evaluator Responses. All USACE and Panel responses will be documented by Battelle. Battelle will provide USACE and the Panel a pdf printout of all DrChecks entries, through comment closeout, as a final deliverable and record of the IEPR results.

APPENDIX B

Identification and Selection of IEPR Panel Members for the East San Pedro Bay Draft IFR/EIS/EIR Project

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B.1 Panel Identification

The candidates for the Independent External Peer Review (IEPR) of the East San Pedro Bay, Long Beach, California, Draft Integrated Feasibility Report and Environmental Impact Statement/Environmental Impact Report (IFR/EIS/EIR) (hereinafter: East San Pedro Bay Draft IFR/EIS/EIR IEPR) Panel were evaluated based on their technical expertise in the following key areas: plan formulation/economics, marine biology, and coastal (hydraulic) engineering. These areas correspond to the technical content of the review documents and overall scope of the East San Pedro Bay Draft IFR/EIS/EIR project.

To identify candidate panel members, Battelle reviewed the credentials of the experts in Battelle's Peer Reviewer Database, sought recommendations from colleagues, contacted former panel members, and conducted targeted Internet searches. Battelle evaluated these candidate panel members in terms of their technical expertise and potential conflicts of interest (COIs). Of these candidates, Battelle chose the most qualified individuals, confirmed their interest and availability, and ultimately selected three experts for the final Panel. The remaining candidates were not proposed for a variety of reasons, including lack of availability, disclosed COIs, or lack of the precise technical expertise required.

Candidates were screened for the following potential exclusion criteria or COIs. These COI questions were intended to serve as a means of disclosure in order to better characterize a candidate's employment history and background. Battelle evaluated whether scientists in universities and consulting firms that are receiving USACE-funding have sufficient independence from USACE to be appropriate peer reviewers. Guidance in OMB (2004, p. 18) states,

> "…when a scientist is awarded a government research grant through an investigator-initiated, peer-reviewed competition, there generally should be no question as to that scientist's ability to offer independent scientific advice to the agency on other projects. This contrasts, for example, to a situation in which a scientist has a consulting or contractual arrangement with the agency or office sponsoring a peer review. Likewise, when the agency and a researcher work together (e.g., through a cooperative agreement) to design or implement a study, there is less independence from the agency. Furthermore, if a scientist has repeatedly served as a reviewer for the same agency, some may question whether that scientist is sufficiently independent from the agency to be employed as a peer reviewer on agency-sponsored projects."

The term "firm" in a screening question referred to any joint venture in which a firm was involved. It applied to any firm that serves in a joint venture, either as a prime or as a subcontractor to a prime. Candidates were asked to clarify the relationship in the screening questions.

Panel Conflict of Interest (COI) Screening Statements for the IEPR of the East San Pedro Bay, Long Beach, California, Draft Integrated Feasibility Report and Environmental Impact Statement/ Environmental Impact Report (IFR/EIS/EIR)
1. Previous and/or current involvement by you or your firm in the East San Pedro Bay, Long Beach, California, Draft Integrated Feasibility Report and Environmental Impact Statement/Environmental Impact Report (IFR/EIS/EIR) (hereinafter: East San Pedro Bay Draft IFR/EIS/EIR) and related projects.

Panel Conflict of Interest (COI) Screening Statements for the IEPR of the East San Pedro Bay, Long Beach, California, Draft Integrated Feasibility Report and Environmental Impact Statement/ Environmental Impact Report (IFR/EIS/EIR)
2. Previous and/or current involvement by you or your firm in ecological restoration or related studies within the East San Pedro Bay, Los Angeles River, San Gabriel River, or their watersheds in California.
3. Previous and/or current involvement by you or your firm in the conceptual or actual design, installation, construction, monitoring, and maintenance of ecological restoration projects in the East San Pedro Bay or its watershed.
4. Current employment by the U.S. Army Corps of Engineers (USACE).
5. Previous and/or current involvement with paid or unpaid expert testimony related to the East San Pedro Bay Draft IFR/EIS/EIR project or related projects.
6. Previous and/or current employment or affiliation with the non-Federal sponsors or any of the following cooperating Federal, State, County, local and regional agencies, environmental organizations, and interested groups *(for pay or pro bono):* • City of Long Beach • Los Angeles (LA) County Department of Public Works (DPW) • Surfrider Foundation • Port of Long Beach (part of City of Long Beach) • Port of Los Angeles • Long Beach Energy Resources (part of City of Long Beach) • U.S. Navy • LA County Board of Supervisors as an interested party with whom a potential conflict could exist • LA County Flood Control District (separate entity from LA County DPW)
7. Past, current, or future interests or involvements (financial or otherwise) by you, your spouse, or your children related to East San Pedro Bay, Los Angeles River, or their watersheds.
8. Current personal involvement with other USACE projects, including whether involvement was to author any manuals or guidance documents for USACE. If yes, provide titles of documents or description of project, dates, and location (USACE district, division, Headquarters, Engineer Research and Development Center [ERDC], etc.), and position/role. Please highlight and discuss in greater detail any projects that are specifically with the Los Angeles District.
9. Previous or current involvement with the development or testing of models that were used for, or in support of, the East San Pedro Bay Draft IFR/EIS/EIR project. Note: The following models were used to prepare this project: Habitat Evaluation Index, RECONS, IWR Planning Suite Version 2.0.6.0, CMS-Wave, GenCade, EFDC, MII, Crystal Ball, CEDEP, ArcGIS, and Automated Risk Assessment Modeling System.

Panel Conflict of Interest (COI) Screening Statements for the IEPR of the East San Pedro Bay, Long Beach, California, Draft Integrated Feasibility Report and Environmental Impact Statement/ Environmental Impact Report (IFR/EIS/EIR)
10. Current firm involvement with other USACE projects, specifically those projects/contracts that are with the Los Angeles District. If yes, provide title/description, dates, and location (USACE district, division, Headquarters, ERDC, etc.), and position/role. Please also clearly delineate the percentage of work you personally are currently conducting for the Los Angeles District. Please explain.
11. Any previous employment by USACE as a direct employee, notably if employment was with the Los Angeles District. If yes, provide title/description, dates employed, and place of employment (district, division, Headquarters, ERDC, etc.), and position/role.
12. Any previous employment by USACE as a contractor (either as an individual or through your firm) within the last 10 years, notably if those projects/contracts are with the Los Angeles District. If yes, provide title/description, dates employed, and place of employment (district, division, Headquarters, ERDC, etc.), and position/role.
13. Previous experience conducting technical peer reviews. If yes, please highlight and discuss any technical reviews concerning ecosystem restoration and include the client/agency and duration of review (approximate dates).
14. Pending, current, or future financial interests in contracts/awards from USACE related to the East San Pedro Bay Draft IFR/EIS/EIR project.
15. Significant portion of your personal or office's revenues within the last three years came from USACE contracts.
16. Significant portion of your personal or office's revenues within the last three years came from the City of Long Beach contracts.
17. Any publicly documented statement (including, for example, advocating for or discouraging against) related to the East San Pedro Bay Draft IFR/EIS/EIR project.
18. Participation in relevant prior and/or current Federal studies related to the East San Pedro Bay Draft IFR/EIS/EIR project.
19. Previous and/or current participation in prior non-Federal studies related to the East San Pedro Bay Draft IFR/EIS/EIR project.
20. Has your research or analysis been evaluated as part of the East San Pedro Bay Draft IFR/EIS/EIR project?
21. Is there any past, present, or future activity, relationship, or interest (financial or otherwise) that could make it appear that you would be unable to provide unbiased services on this project? If so, please describe.

Providing a positive response to a COI screening question did not automatically preclude a candidate from serving on the Panel. For example, participation in previous USACE technical peer review committees and other technical review panel experience was included as a COI screening question. A positive response to this question could be considered a benefit.

B.2 Panel Selection

In selecting the final members of the Panel, Battelle chose experts who best fit the expertise areas and had no COIs. Table B-1 provides information on each panel member's affiliation, location, education, and overall years of experience. Battelle established subcontracts with the panel members when they indicated their willingness to participate and confirmed the absence of COIs through a signed COI form. USACE was given the list of candidate panel members, but Battelle selected the final Panel.

Table B-1. East San Pedro Bay Draft IFR/EIS/EIR IEPR Panel: Summary of Panel Members

Name	Affiliation	Location	Education	P.E.	Exp (yrs)
Plan Formulator / Economist					
Jeff Mullen	Independent	Athens, GA	Ph.D., Applied Economics	No	24
Marine Biologist					
Felicia Rein	Watershed Solutions Inc.	Boca Raton, FL	Ph.D., Ecosystem science, water resources	No	29
Coastal (Hydraulic) Engineer					
Michael Krecic	INTERA Incorporated	Gainesville, FL	M.S., Coastal and Oceanographic Engineering	Yes	25

Table B-2 presents an overview of the credentials of the final three members of the Panel and their qualifications in relation to the technical evaluation criteria. More detailed biographical information on the panel members and their areas of technical expertise is given in Section B.3.

Table B-2. East San Pedro Bay Draft IFR/EIS/EIR IEPR Panel: Technical Criteria and Areas of Expertise

Technical Criterion	Mullen	Rein	Krecic
Plan Formulator / Economist			
Minimum 15 years of demonstrated experience in economics and planning	X		
M.S. degree or higher in economics	X		
Minimum 5 years of direct experience with the U.S. Army Corps of Engineers (USACE) six-step planning process (Engineer Regulation [ER] 1105-2-100, Planning Guidance Notebook)	X		
Experience in and applying the USACE plan formulation process, procedures, and standards with experience evaluating alternative plans for ecosystem restoration studies	X		
Extensive knowledge of cost/benefit analysis for ecosystem restoration projects, including experience with conducting cost effectiveness and incremental cost analysis (CE/ICA) using the USACE Certified Institute for Water Resources (IWR) Planning Suite software	X		
Marine Biologist			
At least 15 years of experience directly related to water resources environmental evaluation or review and National Environmental Policy Act (NEPA) process and analysis		X	
A biological or environmental background that is familiar with the project area and environmental impact analysis and mitigation		X	
Expertise in marine biology, ideally in coastal California, specifically with knowledge of endangered coastal and near-shore marine species and habitats		X	
Familiarity with USACE environmental analyses, ecosystem restoration studies, the Endangered Species Act (ESA), Coastal Zone Management Act (CZMA), essential fish habitat (EFH), and other regulatory requirements, and feasibility reports		X	
Coastal (Hydraulic) Engineering			
Registered Professional Engineer (P.E.)			X
Minimum 15 years of experience in coastal engineering design and analysis in an open-ocean marine environment			X
Extensive experience with aquatic ecosystem restoration, wave and circulation modeling, and USACE coastal engineering requirements for feasibility studies			X

B.3 Panel Member Qualifications

Detailed biographical information on each panel member's credentials, qualifications, and areas of technical expertise is provided in the following paragraphs.

Name	**Jeff Mullen, Ph.D.**
Role	**Economist**
Affiliation	**Independent Consultant**

Dr. Mullen is an independent consultant and an associate professor in the Department of Agricultural and Applied Economics at the University of Georgia, specializing in water resource, natural resource, and environmental economics. He earned his Ph.D. in Agricultural and Applied Economics/Natural Resource Economics from Virginia Polytechnic Institute and State University in 1999. He has over 24 years of experience conducting numerous studies in the field of environmental and natural resources economics and has taught graduate courses in environmental and natural resource economics and econometrics.

Dr. Mullen recently was the Planning Formulator/Economist on an IEPR for USACE's Calumet Harbor, which was conducted for the Inland Navigation Planning Center of Expertise (PCX), and previously served on the Kissimmee River Restoration Project IEPR Panel for the Ecosystem Restoration PCX (2010-2011). He is exceptionally qualified to evaluate the appropriateness of cost effectiveness/ incremental cost analysis (CE/ICA) applied to dollar costs and ecosystem restoration. In addition, he has taught theory and application of the techniques used by USACE to estimate National Economic Development, Environmental Quality, Regional Economic Development, and Other Social Effects benefits. He has detailed knowledge of USACE benefit and cost calculations for ecosystem restoration, agricultural production, urban flood damage, transportation, and recreation. In addition, both IEPRs that Dr. Mullen participated in required the extensive application of CE/ICA. He has detailed knowledge of the USACE Certified IWR Planning Suite, the Six Step Planning Process detailed in ER 1105-2-100, and the USACE tool for CE/ICA, all of which he uses in his Water Resource Economics course to illustrate the complexity of water management decisions and incremental cost analysis.

Dr. Mullen has coauthored numerous peer-reviewed articles concerning economic analyses and impacts related to municipal, wastewater, irrigation, and water impoundment projects and has been a contributing author to numerous publications concerning environmental economics and evaluation, economic modeling, and price analysis. In addition to covering ecosystem service valuation (including the value of restorations) in his graduate courses, he has served as a consultant on ecosystem restoration projects in the Prairie Pothole region and coastal marshlands of the Southeast. Additionally, he serves as a frequent reviewer for peer-review journals, including Land Economics, Ecological Economics, Journal of Agricultural and Resource Economics, Journal of Environmental Economics and Management, and Ecosystem Services, all of which publish articles related to ecosystem service valuation (including methods and applications related to restoration projects). Dr. Mullen is a past president of the Southern Natural Resource Economics Committee and is a member of the American Agricultural Economics Association.

Name	**Felicia Rein, Ph.D.**
Role	**Marine Biologist**
Affiliation	**Watershed Solutions Inc.**

Dr. Rein has 29 years of professional scientific and environmental management experience implementing large-scale multidisciplinary research and evaluation projects. Currently a researcher and Affiliate Professor of Geosciences for Florida Atlantic University, she earned a Ph.D. in ecosystem science and water resource management from the University of California, Santa Cruz, in 2000 and a B.S. in biology, environmental science, and English from Tufts University in 1988. Dr. Rein's areas of expertise include water quality, river science, watershed management, ecological restoration, impact assessment, and environmental compliance monitoring and evaluation, with expertise in National Environmental Policy Act (NEPA) assessment. Dr. Rein is experienced with the IEPR process, having served on past IEPR panels as biology and environmental compliance analyst. She has experience with coastal storm risk management (Encinitas-Solana Beach Coastal Storm Damage Reduction Project) and ecosystem restoration (Delta Islands and Levees Feasibility Study, Sacramento, California; Jamaica Bay Feasibility Report IEPR; Alviso Creek Stream Restoration Feasibility Study and Final Environmental Impact Report). She has prepared and reviewed NEPA documents for two environmental planning firms and has reviewed many projects to assess compliance, specifically pertaining to the Endangered Species Act (ESA), Coastal Zone Management Act (CZMA), and essential fish habitat (EFH). Her expertise includes assessing environmental impacts, analyzing environmental trade-offs for threatened species, managing water resources, conducting restoration ecology, developing mitigation plans; conducting wetland delineations; and monitoring construction sites for erosion control compliance.

Dr. Rein's experience is focused on water resource management and environmental evaluation. Her primary expertise is in ecosystem science, stream restoration, and water resource management at the land-water interface. Her interdisciplinary doctoral program included environmental policy and economics. She is familiar with ecological studies and potential impacts on habitat, and with fish and wildlife species that may be affected under various project alternatives. For more than 29 years, she has managed projects along southern California's Pacific coast, gaining experience in the region's coastal ecology, including beach erosion, wetlands and riparian habitats, and ecologic restoration. Her expertise in marine biology includes specific knowledge of endangered coastal and near-shore marine species and habitats. Her doctoral research was conducted in Elkhorn Slough, which drains into the Monterey Bay National Marine Sanctuary, where she investigated grass buffer strips as a best management practice to simultaneously restore ecosystem biodiversity and reduce agricultural non-point-source pollution, targeting water quality and soil conservation.

Dr. Rein has worked for the Port Authority of New York and New Jersey, assessing impacts on both habitat and specific species potentially resulting from dredging activities. This project required environmental analysis to mitigate the cumulative effects of a five-year dredging program to deepen the New York-New Jersey harbor and ensure the economic viability of the port through blasting operations to deepen the channels and harbor while protecting threatened habitats. Solutions included defining cost-effective mapping of limited dredging operation windows in specific locations during nesting season. She has also managed a project on the Carmel River in California at the California State Water Resources Control Board dealing with a complex multi-objective environmental study. Cumulative impacts of an existing on-stream lake in Carmel Valley, Central Pacific Coast, were analyzed to balance water right claims, wetland habitats, and competing endangered species habitat trade-offs, focused on the California

steelhead salmon and the California red-legged frog. Dr. Rein has had specific experience with the U.S. Fish and Wildlife Service on interagency coordination for several projects in compliance with the Fish and Wildlife Coordination Act.

Name	**Michael Krecic, P.E.**
Role	**Coastal (Hydraulic) Engineer**
Affiliation	**INTERA Incorporated**

Mr. Krecic is a senior coastal engineer at INTERA Incorporated with 25 years of experience in coastal engineering, coastal processes, circulation and mixing, statistics, and computer modeling. He is a registered P.E. in Florida, Mississippi, Louisiana, Texas, New York, and Puerto Rico. He earned a M.S. in coastal and oceanographic engineering from the University of Florida in 1995 and a B.S. in mathematics and applied physics (double major) from Marietta College in 1993. His project experience includes design of coastal structures (revetments, breakwaters, and seawalls) and construction for urban waterfronts, marinas, and other projects; storm impact analyses for coastal development; beach nourishment for natural and man-made (pocket) beaches; shoreline management and feasibility studies; ecosystem restoration; wave hindcast studies for open and interior water bodies; boat/ship wake and surge; bridge hydraulic studies; and water quality studies for outfall discharge circulation studies. Mr. Krecic has worked on coastal projects located in the United States (including southeast, Atlantic, Pacific, Gulf of Mexico, Great Lakes, and New York coastlines), and in the Caribbean, Canada, Mexico, and South America.

Most of Mr. Krecic's coastal engineering design and analysis experience relates to open-ocean marine environments. He has evaluated coastal structure design and performance, including many projects involving breakwaters. These coastal structure projects have included evaluating segmented breakwaters to support ecological functions in their lee and conducting annual inspections of a large breakwater protecting a water treatment plant as part of the Federal Chicago Shoreline Protection Project. He also has redesigned Reef Ball breakwaters to protect a nuclear power plant located along the open Atlantic Ocean coast while also providing environmental habitat benefits, and has assessed concrete armor unit offshore breakwater alternatives for a new port development along the Atlantic Ocean coast in Argentina. Recent coastal structure experience includes designing and permitting a series of rock T-head groins along the Cabo San Lucas, Mexico (Pacific open coast), shoreline to reduce wave runup and overtopping of upland infrastructure.

Mr. Krecic also has experience with numerous ecosystem restoration projects encompassing planning (feasibility), permitting, design, construction, and peer review. The segmented breakwater project mentioned above as part of the Federal Chicago Shoreline Protection Project proposed the re-creation of historical wetland and prairie features along the urban Lake Michigan shoreline. Representative design and construction experience includes several projects involving ocean coastlines and lakeshores. For example, to restore a privately held relic spoil island inside an inlet located along the Florida Atlantic Ocean coast, Mr. Krecic designed for channel dredging, shoreline stabilization, and mangrove plantings for ecosystem restoration that worked with nature. Mr. Krecic also analyzed the hydrodynamic stability of selected limestone rock sizes and scour along the reef due to waves and settlement for two Atlantic Ocean hard-bottom mitigation sites.

Mr. Krecic routinely models waves and currents as a part of nearly every study. He applies a variety of models (depending on important coastal processes, data availability and budget) to generate design conditions for coastal structures and assess coastal structures effects on littoral processes, wave

disturbance, mixing, and circulation. His modeling experience covers such hydrodynamic models as Hydrologic Engineering Center-River Analysis System (HEC-RAS), DYNLET, River Modeling (RMA-2), ADvanced CIRCulation (ADCIRC), FES Watershed Modeling System (FES WMS), MIKE-21 HD, and CMS-Flow and wave models including ACES, Simulating Wave Nearshore (SWAN), REFDIF, RCPWAVE, Steady State Spectral Wave (STWAVE), MIKE-21 BW, MIKE-21 SW, MIKE-21 NSW, Coastal Modeling System (CMS)-Wave, and CGWAVE. In addition to these wave and hydrodynamic models, Mr. Krecic has experience evaluating the use of beach process models such as USACE's GENESIS and SBEACH, along with other similar tools for understanding sediment pathways; developing regional sediment budgets; and predicting shoreline storm response.

Mr. Krecic has primarily served local, state, and Federal clients, including USACE districts, and is familiar with the coastal engineering requirements for USACE feasibility studies, decision documents, and other studies. For USACE Jacksonville District coastal storm damage reduction projects, Mr. Krecic prepared the main text of the Nassau County (Florida) Shore Protection Project General Reevaluation Report (GRR) and economics appendix; managed development of a GENESIS model calibration and verification study and report for Vilano Beach as part of the St. Johns County (Florida) Hurricane and Storm Damage Reduction (HSDR) Feasibility Study; and led preparation of the Section 934 report (updated project engineering, economics [Beach-fx], and environmental conditions) to determine whether Federal interest still exists in the Palm Beach County (Florida) Shore Protection Project, Jupiter/Carlin segment. For the USACE Mobile District, Mr. Krecic managed and supervised engineering (GENESIS and SBEACH) analyses and a report for incorporation into the Limited Reevaluation Report for Panama City Beaches HSDR to add 1 mile to the overall project length.

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APPENDIX C

Final Charge for the East San Pedro Bay Draft IFR/EIS/EIR IEPR

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Charge Questions and Guidance to the Panel Members for the Independent External Peer Review (IEPR) of the Final Independent External Peer Review Report East San Pedro Bay, Long Beach, California, Draft Integrated Feasibility Report and Environmental Impact Statement/Environmental Impact Report (IFR/EIS/EIR)

This is the final Charge to the Panel for the East San Pedro Bay Draft IFR/EIS/EIR IEPR. This final Charge was submitted to USACE as part of the final Work Plan, originally submitted on December 6, 2019. The dates and page counts in this document have not been updated to match actual changes made throughout the project.

BACKGROUND

The study area is in Long Beach, California, within East San Pedro Bay between the Long Beach Shoreline and the offshore Long Beach Breakwaters, east of the Port of Long Beach. To the west and northwest of San Pedro Bay are the communities of San Pedro and Wilmington, respectively, and to the east the community of Seal Beach. The study area includes the waters in the immediate vicinity (and shoreward) of the breakwaters, the beaches of Long Beach spanning from the mouth of the Los Angeles River southeastward to the San Gabriel River, and the upstream reaches of the Los Angeles River that have direct impact on the Bay. The study area will be assessed from a watershed perspective to identify how this effort may be integrated in a collaborative manner into larger watershed efforts being conducted by others. For example, coordination with other studies and efforts to target pollution and debris clean up further upstream of Los Angeles River. The study may consider the benefits of addressing ecosystem restoration measures within the Los Angeles River watershed. The boundaries of the study area are preliminary and may be refined based on findings during the feasibility study. The Los Angeles and Long Beach harbors consist of about 1,800 acres of water in the inner navigation channels, 5,700 acres of landfill, and 6,000 acres of water (sheltered anchorages and navigation channels) between the landfills and the 8.6 miles of federally constructed and maintained breakwaters. Two of the most prominent and contributing features within the Study Area include the Long Beach Breakwater and the mouth of the Los Angeles River, which are addressed below.

Long Beach Breakwater: San Pedro Bay is protected by breakwaters, totaling 8.6 miles, with two openings to allow ships to enter the Ports of Los Angeles and Long Beach. These openings divide the breakwater into three sections: the San Pedro Breakwater, the Middle Breakwater, and the Long Beach Breakwater. The San Pedro and Middle Breakwaters protect the Ports of Los Angeles and Long Beach, respectively. The 2.5-mile Long Beach Breakwater is the easternmost breakwater. The Long Beach Breakwater was authorized by Congress in 1940 to extend the San Pedro Bay Breakwater in order to provide a protected anchorage for the U.S. Navy's Pacific Fleet. The federal government constructed the breakwater from 1941-1949. The U.S. Army Corps of Engineers (USACE) maintains the federal breakwaters.

The focus of this study is to evaluate ecosystem restoration measures within East San Pedro Bay. In order to design a restoration project, reconfigurations of the Long Beach Breakwater, as it affects the water quality and hydrodynamics of the area, may be analyzed as part of an array alternatives. Potential reconfiguration could provide an opportunity for rocky materials from the breakwater reconfiguration to be used for ecosystem restoration measures.

The mainstem of the Los Angeles River is a major hydrologic feature (or waterway) of the Los Angeles basin. In the 1930s, USACE began channelizing the river for flood control and by 1954, the entire length of the river was channelized. The river is operated and maintained by the USACE and the LA County Department of Public Works. The Los Angeles River discharges into San Pedro Bay. Alternatives for this ecosystem restoration study may look at changes needed within the Los Angeles River, as they negatively impact the overall health of the bay.

In addition to the breakwater and the river, the study area contains several locations with potential for ecosystem restoration and recreational opportunities. The entire study area will be analyzed for ecosystem restoration opportunities. The areas with highest potential include the nearshore habitats that have been lost or severely degraded by human activities. Habitat types for potential restoration include coastal wetlands, rocky reef/hard bottom, kelp, eelgrass/seagrass, and intertidal zone. These habitats support a variety of marine life including, but not limited to, marine mammals, fish and benthic invertebrates. Elevated concentrations of metals and pesticides in sediments have been found at sites within the Los Angeles River estuary and the Harbor's water quality has been degraded. Water quality degradation is mainly due to inputs from Los Angeles River. These ecosystems and species that are dependent on healthy environments could be at risk depending on the feasibility study outcome.

OBJECTIVES

The objective of this work is to conduct an independent external peer review (IEPR) of the East San Pedro Bay, Long Beach, California, Draft Integrated Feasibility Report and Environmental Impact Statement/Environmental Impact Report (IFR/EIS/EIR) (hereinafter: East San Pedro Bay Draft IFR/EIS/EIR IEPR) in accordance with the USACE, Water Resources Policies and Authorities' *Review Policy for Civil Works* (Engineer Circular [EC] 1165-2-217, dated February 20, 2018), and the Office of Management and Budget's (OMB's) *Final Information Quality Bulletin for Peer Review* (December 16, 2004). Peer review is one of the important procedures used to ensure that the quality of published information meets the standards of the scientific and technical community. Peer review typically evaluates the clarity of hypotheses, validity of the research design, quality of data collection procedures, robustness of the methods employed, appropriateness of the methods for the hypotheses being tested, extent to which the conclusions follow from the analysis, and strengths and limitations of the overall product.

The purpose of the IEPR is to "assess the adequacy and acceptability of the economic and environmental assumptions and projections, project evaluation data, economic analyses, environmental analyses, engineering analyses, formulation of alternative plans, methods for integrating risk and uncertainty, models used in evaluation of economic or environmental impacts, and any biological opinions" (EC 1165-2-217; p. 39) for the decision documents. The IEPR will be limited to technical review and will not involve policy review. The IEPR will be conducted by subject matter experts (i.e., IEPR panel members) who meet the technical criteria and areas of expertise required for and relevant to the project.

The Panel will be "charged" with responding to specific technical questions as well as providing a broad technical evaluation of the overall project. Per EC 1165-2-217 (p. 41), review panels should identify, explain, and comment upon assumptions that underlie all the analyses, as well as evaluate the soundness of models, surveys, investigations, and methods. Review panels should be able to evaluate whether the interpretations of analysis and the conclusions based on analysis are reasonable. Reviews should focus on assumptions, data, methods, and models. The panel members may offer their opinions as to whether there are sufficient analyses upon which to base a recommendation.

DOCUMENTS PROVIDED

The following is a list of documents, supporting information, and reference materials that will be provided for the review. The review assignments for the panel members may vary slightly according to discipline.

Review Documents	No. of Review Pages	Subject Matter Experts		
		Planning Formulator/ Economist	Marine Biologist	Coastal (Hydraulic) Engineer
Draft IFR/EIS/EIR	350	350	350	350
Economics and Social Considerations	75	75	75	
Biological Supplement	30	30	30	
Real Estate	50	50	50	
Geotechnical and Geology	30			30
Cost	20	20	20	20
Coastal Engineering: A1 EFDC Modeling and A2: Wave Conditions (basically wave condition maps)	300			300
Cultural Resources	30			30
Southern California Coastal Bay Ecosystem Model	80		80	
Monitoring and Adaptive Management Plan	50		50	50
404b1	15		15	
Total Number of Review Pages	**1,030**	**525**	**670**	**780**
Public Review Comments[a]	200	200	200	200

[a] *USACE will submit public comments to Battelle who will in turn submit to the IEPR Panel.*

Documents for Reference

- Review Policy for Civil Works, (EC 1165-2-217, February 20, 2018)
- Office of Management and Budget's Final Information Quality Bulletin for Peer Review (December 16, 2004)
- Foundations of SMART Planning
- Feasibility Study Milestones (PB 2018-01, September 30, 2018; PB 2018-01(S), June 20, 2019)
- SMART – Planning Overview
- Planning Modernization Fact Sheet
- USACE Climate Change Adaptation Plan (2015)
- ETL 1100-2-1 – Procedures to Evaluate SLR Change Impacts Responses Adaptation
- ER 1100-2-8162 – Incorporating SLR Change in CW Programs.

SCHEDULE

This schedule is based on the receipt date of the final review documents and may be revised if review document availability changes. This schedule may also change due to circumstances out of Battelle's control such as changes to USACE's project schedule and unforeseen changes to panel member and USACE availability. As part of each task, the panel member will prepare deliverables by the dates indicated in the table (or as directed by Battelle). All deliverables will be submitted in an electronic format compatible with MS Word (Office 2003).

Task	Action	Due Date
Meetings	Subcontractors complete mandatory Operations Security (OPSEC) training	1/16/2020
	Battelle sends review documents to panel members	1/6/2020
	Battelle convenes kick-off meeting with panel members	1/7/2020
	Battelle convenes kick-off meeting with USACE and panel members	1/8/2020
	Battelle convenes mid-review teleconference for panel members to ask clarifying questions of USACE	1/21/2020
Review	Panel members complete their individual reviews	2/4/2020
	Battelle provides talking points for Panel Review Teleconference to panel members	2/6/2020
	Battelle convenes Panel Review Teleconference	2/7/2020
	Battelle provides Final Panel Comment templates and instructions to panel members	2/10/2020
	Panel members provide draft Final Panel Comments to Battelle	2/18/2020
	Battelle provides feedback to panel members on draft Final Panel Comments; panel members revise Final Panel Comments	2/19/2020 - 2/25/2020
	Panel finalizes Final Panel Comments	2/26/2020
Public Comment Review	Battelle receives public comments from USACE	2/3/2020
	Battelle sends public comments to Panel	2/6/2020
	Panel completes its review of public comments	2/11/2020
	Battelle and Panel review the Panel's responses to the charge question regarding the public comments	2/12/2020
	Panel drafts Final Panel Comment for public comments, if necessary	2/21/2020
	Panel finalizes Final Panel Comment regarding public comments, if necessary	2/25/2020

Task	Action	Due Date
Final Report	Battelle provides Final IEPR Report to panel members for review	2/28/2020
	Panel members provide comments on Final IEPR Report	3/3/2020
	*Battelle submits Final IEPR Report to USACE	3/5/2020
	USACE Planning Center of Expertise (PCX) provides decision on Final IEPR Report acceptance	3/12/2020
Comment Response Process	Battelle inputs Final Panel Comments to Design Review and Checking System (DrChecks) and provides Final Panel Comment response template to USACE	3/16/2020
	Battelle convenes teleconference with Panel to review the Comment Response process	3/16/2020
	USACE Project Delivery Team (PDT) provides draft Evaluator Responses to USACE PCX for review	3/30/2020
	USACE PCX reviews draft Evaluator Responses and works with USACE PDT regarding clarifications to responses, if needed	4/3/2020
	USACE PCX provides draft PDT Evaluator Responses to Battelle	4/6/2020
	Battelle provides draft PDT Evaluator Responses to panel members	4/8/2020
	Panel members provide draft BackCheck Responses to Battelle	4/13/2020
	Battelle convenes teleconference with panel members to discuss draft BackCheck Responses	4/14/2020
	Battelle convenes Comment Response Teleconference with panel members and USACE	4/15/2020
	USACE inputs final PDT Evaluator Responses to DrChecks	4/22/2020
	Battelle provides final PDT Evaluator Responses to panel members	4/23/2020
	Panel members provide final BackCheck Responses to Battelle	4/28/2020
	Battelle inputs panel members' final BackCheck Responses to DrChecks	4/29/2020
	*Battelle submits pdf printout of DrChecks project file	4/30/2020
ADM	Agency Decision Milestone (ADM) Meeting	June 2020
	Contract End/Delivery Date	11/30/2020

CHARGE FOR PEER REVIEW

Members of this IEPR Panel are asked to determine whether the technical approach and scientific rationale presented in the decision documents are credible and whether the conclusions are valid. The Panel is asked to determine whether the technical work is adequate, competently performed, and properly documented; satisfies established quality requirements; and yields scientifically credible conclusions. The Panel is being asked to provide feedback on the economic, engineering, environmental resources, and plan formulation. The panel members are not being asked whether they would have conducted the work in a similar manner.

Specific questions for the Panel (by report section or appendix) are included in the general charge guidance, which is provided below.

General Charge Guidance

Please answer the scientific and technical questions listed below and conduct a broad overview of the decision documents. Please focus your review on the review materials assigned to your discipline/area of expertise and technical knowledge. Some sections have no questions associated with them; however, you may still comment on them. Please feel free to make any relevant and appropriate comment on any of the sections and appendices you were asked to review. In addition, please note that the Panel will be asked to provide an overall statement related to 2 and 3 below per USACE guidance (EC 1165-2-217).

1. Your response to the charge questions should not be limited to a “yes” or “no.” Please provide complete answers to fully explain your response.
2. Assess the adequacy and acceptability of the economic and environmental assumptions and projections, project evaluation data, and any biological opinions of the project study.
3. Assess the adequacy and acceptability of the economic analyses, environmental analyses, engineering analyses, formulation of alternative plans, methods for integrating risk and uncertainty, and models used in evaluating economic or environmental impacts of the proposed project.
4. If appropriate, offer opinions as to whether there are sufficient analyses upon which to base a recommendation.
5. Identify, explain, and comment upon assumptions that underlie all the analyses, as well as evaluate the soundness of models, surveys, investigations, and methods.
6. Evaluate whether the interpretations of analysis and the conclusions based on analysis are reasonable.
7. Please focus the review on assumptions, data, methods, and models.

Please **do not** make recommendations on whether a particular alternative should be implemented, or whether you would have conducted the work in a similar manner. Also, please **do not** comment on or make recommendations on policy issues and decision making. Comments should be provided based on your professional judgment, **not** the legality of the document.

1. If desired, panel members can contact one another. However, panel members **should not** contact anyone who is or was involved in the project, prepared the subject documents, or was part of the USACE Agency Technical Review (ATR).
2. Please contact the Battelle Project Manager, Patti Connaughton-Burns (burnsp@battelle.org), or Program Manager, Lynn McLeod (mcleod@battelle.org), for requests or additional information.
3. In case of media contact, notify the Battelle Program Manager, Lynn McLeod (mcleod@battelle.org), immediately.
4. Your name will appear as one of the panel members in the peer review. Your comments will be included in the Final IEPR Report but will remain anonymous.

Please submit your comments in electronic form to the Project Manager, no later than 10 pm ET by the date listed in the schedule above.

Independent External Peer Review of the East San Pedro Bay, Long Beach, California, Draft Integrated Feasibility Report and Environmental Impact Statement/Environmental Impact Report (IFR/EIS/EIR)

Charge Questions and Relevant Sections as Supplied by USACE

The following Review Charge to Reviewers outlines the objectives of the Independent External Peer Review (IEPR) for the subject study and identifies specific items for consideration for the IEPR Review Panel.

The objective of the IEPR is to obtain an independent evaluation of whether the interpretations of analysis and conclusions based on analysis are reasonable for the subject study. The IEPR Review Panel is requested to offer a broad evaluation of the overall study decision document in addition to addressing the specific technical and scientific questions included in the Review Charge. The Review Panel has the flexibility to bring important issues to the attention of decision makers, including positive feedback or issues outside those specific areas outlined in the Review Charge. The Review Panel can use all available information to determine what scientific and technical issues related to the decision document may be important to raise to decision makers. This includes comments received from agencies and the public as part of the public review process.

The Panel review is to focus on scientific and technical matters, leaving policy determinations for USACE and the Army. The Panel should not make recommendations on whether a particular alternative should be implemented or present findings that become “directives” in that they call for modifications or additional studies or suggest new conclusions and recommendations. In such circumstances, the Review Panel would have assumed the role of advisors as well as reviewers, thus introducing bias and potential conflict in their ability to provide objective review.

Panel review comments are to be structured to fully communicate the Panel’s intent by including the comment, why it is important, any potential consequences of failure to address, and suggestions on how to address the comment.

The Review Panel is asked to consider the following items as part of its review of the decision document and supporting materials.

Broad Evaluation Charge Questions

1. Is the need for and intent of the decision document clearly stated?
2. Does the decision document adequately address the stated need and intent relative to scientific and technical information?
3. Given the need for and intent of the decision document, assess the adequacy and acceptability of the project evaluation data used in the study analyses.
4. Given the need for and intent of the decision document, assess the adequacy and acceptability of the economic, environmental, and engineering assumptions that underlie the study analyses.
5. Given the need for and intent of the decision document, assess the adequacy and acceptability of the economic, environmental, and engineering methodologies, analyses, and projections.

6. Given the need for and intent of the decision document, assess the adequacy and acceptability of the models used in the evaluation of existing and future without-project conditions and of economic or environmental impacts of alternatives.

7. Given the need for and intent of the decision document, assess the adequacy and acceptability of the methods for integrating risk and uncertainty.

8. Given the need for and intent of the decision document, assess the adequacy and acceptability of the formulation of alternative plans and the range of alternative plans considered.

9. Given the need for and intent of the decision document, assess the adequacy and acceptability of the quality and quantity of the surveys, investigations, and engineering sufficient for conceptual design of alternative plans.

10. Given the need for and intent of the decision document, assess the adequacy and acceptability of the overall assessment of significant environmental impacts and any biological analyses.

Further,

11. Evaluate whether the interpretations of analysis and the conclusions based on analysis are reasonable, and

12. Assess the considered and tentatively selected alternatives from the perspective of systems, including systemic aspects being considered from a temporal perspective, including the potential effects of climate change.

For the tentatively selected plan, assess whether:

13. The models used to assess life safety hazards are appropriate.

14. The assumptions made for the life safety hazards are appropriate.

15. The quality and quantity of the surveys, investigations, and engineering are sufficient for a concept design considering the life safety hazards and to support the models and assumptions made for determining the hazards.

16. The analysis adequately addresses the uncertainty and residual risk given the consequences associated with the potential for loss of life for this type of project.

Battelle Summary Charge Questions to the Panel Members[1]

Summary Questions

17. Please identify the most critical concerns (up to five) you have with the project and/or review documents. These concerns can be (but do not need to be) new ideas or issues that have not been raised previously.

18. Please provide positive feedback on the project and/or review documents.

Public Comment Questions

19. Do the public comments raise any additional discipline-specific technical concerns with regard to the overall report?

[1] Questions 17 through 19 are Battelle-supplied questions and should not be construed or considered part of the list of USACE-supplied questions. These questions were delineated in a separate appendix in the final Work Plan submitted to USACE.

APPENDIX D

Conflict of Interest Form

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David Kaplan
USACE, Institute for Water Resources
November 7, 2019
C-2

Conflicts of Interest Questionnaire

Independent External Peer Review

East San Pedro Bay, Long Beach, California Integrated Feasibility Report and Environmental Impact Statement/ Environmental Impact Report (IFR/EIS/EIR)

The purpose of this document is to help the U.S. Army Corps of Engineers identify potential organizational conflicts of interest on a task order basis as early in the acquisition process as possible. Complete the questionnaire with background information and fully disclose relevant potential conflicts of interest. Substantial details are not necessary; USACE will examine additional information if appropriate. Affirmative answers will not disqualify your firm from this or future procurements.

NAME OF FIRM: **Battelle Memorial Institute Corporate Operations**
REPRESENTATIVE'S NAME: **Courtney Brooks**
TELEPHONE: **614-424-5623**
ADDRESS: **505 King Avenue, Columbus, Ohio 43201**
EMAIL ADDRESS: **brooksc1@battelle.org**

I. INDEPENDENCE FROM WORK PRODUCT. Has your firm been involved in any aspect of the preparation of the subject study report and associated analyses (field studies, report writing, supporting research etc.) **No** Yes (if yes, briefly describe):

II. INTEREST IN STUDY AREA OR OUTCOME. Does your firm have any interests or holdings in the study area, or any stake in the outcome or recommendations of the study, or any affiliation with the local sponsor? **No** Yes (if yes, briefly describe):

III. REVIEWERS. Do you anticipate that all expert reviewers on this task order will be selected from outside your firm? No **Yes** (if no, briefly describe the difficulty in identifying outside reviewers):

IV. AFFILIATION WITH PARTIES THAT MAY BE INVOLVED WITH PROJECT IMPLEMENTATION. Do you anticipate that your firm will have any association with parties that may be involved with or benefit from future activities associated with this study, such as project construction? **No** Yes (if yes, briefly describe):

V. ADDITIONAL INFORMATION. Report relevant aspects of your firm's background or present circumstances not addressed above that might reasonably be construed by others as affecting your firm's judgment. Please include any information that may reasonably: impair your firm's objectivity; skew the competition in favor of your firm; or allow your firm unequal access to nonpublic information.

No additional information to report.

Courtney M. Brooks
Courtney Brooks

November 7, 2019
Date

Use or disclosure of data contained on this sheet is subject to the restriction on the title page of this proposal

BATTELLE

It can be done