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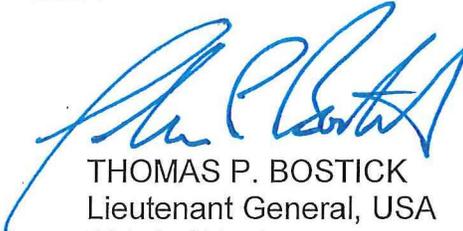
MAR 29 2016

MEMORANDUM FOR ASSISTANT SECRETARY OF THE ARMY (CIVIL WORKS)

SUBJECT: Encinitas and Solana Beach Feasibility Study San Diego, California – Final USACE Response to Independent External Peer Review

1. Independent External Peer Review (IEPR) was conducted for the subject project in accordance with Section 2034 of the Water Resources Development Act of 2007, EC 1165-2-214, and the Office of Management and Budget's Final Information Quality Bulletin for Peer Review (2004).
2. The IEPR was conducted by Battelle Memorial Institute. The IEPR panel consisted of three panel members with technical expertise in economics, Civil Works planning, coastal engineering, and environmental/biology.
3. The final written responses to the IEPR are hereby approved. The enclosed document contains the final written responses of the Chief of Engineers to the issues raised and the recommendations contained in the IEPR Report. The IEPR Report and the USACE responses have been coordinated with the vertical team and will be posted on the internet, as required in EC 1165-2-214.
4. If you have any questions on this matter, please contact me or have a member of your staff contact Mr. Bradd Schwichtenberg, Deputy Chief, South Pacific Division Regional Integration Team, at 202-761-1367.

Encl



THOMAS P. BOSTICK
Lieutenant General, USA
Chief of Engineers

**Encinitas and Solana Beach Feasibility Study
Feasibility Report and Environmental Impact Statement**

FINAL

**U.S. Army Corps of Engineers Response to
Independent External Peer Review
August 2013**

Independent External Peer Review (IEPR) was conducted for the subject project in accordance with Section 2034 of the Water Resources Development Act of 2007, EC 1165-2-214, and the Office of Management and Budget's *Final Information Quality Bulletin for Peer Review* (2004). The goal of the U.S. Army Corps of Engineers (USACE) Civil Works program is to always provide the most scientifically sound, sustainable water resource solutions for the nation. The USACE review processes are essential to ensuring project safety and quality of the products USACE provides to the American people.

Battelle Memorial Institute (Battelle), a non-profit science and technology organization with experience in establishing and administering peer review panels for USACE, was engaged to conduct the IEPR of the Encinitas and Solana Beach Draft Integrated Feasibility Report and Environmental Impact Statement (Integrated Report). The Battelle IEPR panel reviewed the Draft Integrated Report, as well as supporting documentation. The Final IEPR Battelle Report was issued in March 2013.

Overall, 17 comments were identified and documented. Of the 17 comments, 4 were identified as having high significance, 10 had medium significance, and 3 had low significance. The following discussions present the USACE Final Response to the 17 comments.

‘High’: Describes a fundamental problem with the project that could affect the recommendation or justification of the project.

‘Medium’: Affects the completeness or understanding of the reports/project.

‘Low’: Affects the technical quality of the reports but will not affect the recommendation of the project.”

The following discussions present the USACE Final Response to the Comments.

1. **IEPR Comment – *High Significance*: The UDV method may not accurately represent the actual recreation benefits attributable to the project.**

USACE Response: Adopted

Action Taken: Both recommendations made as part of the comment were adopted. The first recommendation included explaining why other models such as the Travel Cost Method and the Contingent Value Method were not used in this study. The second recommendation was to explain why the King study could not be used in this study. ER 1105-2-100 specifies that factors to be considered when applying the Unit Day Value (UDV) method include the technical challenges and the costs of developing site specific models and whether plan formulation and selection may be impacted. This information, explaining the rationale behind the use of the Unit Day Value (UDV) methodology, as well as how its use would not have an impact on the formulation of the alternatives has been added to Appendix E, Section 4.8.2.

The rationale behind why the King study (the travel-cost method) was not used or adapted for this study was provided to the IEPR panel. Concerns about the model included the age and seasonality of the data used in the model, modification and additional analysis that would be necessary to be applicable to this study, and whether the surveying methods and number of respondents the calculations were based upon would be acceptable for this study. Section 4.8.2 of Appendix E notes that there is not an adequate, defensible site-specific model available for application in this study. It also states that the UDV method of valuation is appropriate for the level of increased visitation expected, the resulting recreation benefits are incidental to those for coastal storm risk management and do not impact the plan formulation, and use of UDVs results in lower values than the travel cost method, so the benefits are not overstated.

2. **IEPR Comment - *High Significance*: The process of assigning point values in the UDV analysis is not transparent, as required in the Economic Guidance Memorandum (EGM) 11-03, or well-documented.**

USACE Response: Adopted

Action Taken: The three recommendations made as part of this comment were adopted. These recommendations included: describe the experts that provided information into the UDV analysis, include the scoring matrix, and explain how differences in scoring between the experts were resolved. Specifically, the expert elicitation provided an upper and lower range to establish UDV points. Based on that range and the District's experience in applying the UDV method to other Southern California beaches, the typical recreation experience in the study area under non-crowded conditions was estimated. Section 4.8.2 of Appendix E has been revised to include a description and qualifications of the experts that were consulted for the UDV analysis and to include additional text that provides additional information on the UDV methodology. Table 4.8-2 in Section 4.8.2 of Appendix E has been added to include a matrix of the expert score assignments and

additional text within the section has been added to provide additional information on the UDV methodology. No changes were required to the recreation analysis or estimated recreation benefits to address this comment.

3. **IEPR Comment - *High Significance*: The population growth of Solana Beach may be overestimated, which may affect the recreation benefit calculations.**

There are two recommendations as part of this comment, one was adopted and one was not adopted, as discussed below.

USACE Response: Adopted

Action Taken: Justification for future growth in Solana Beach has been added to Section 2.2 and 4.8.4 of Appendix E and Section 4.10.1 of the Integrated Report to provide rationale for the rate of population growth used in the analysis. In sum, the rationale is that the initial level of recreation demand for both Solana Beach and Encinitas is grown at the same rate as the population of San Diego County is projected to grow by demographers at the California Department of Finance. Since a significant share of visitation has come historically from visitors outside of both cities, applying county-wide growth rates provides a reasonable projection for future recreation demand. The visitation growth is the same with or without the project except for several years after the initial nourishment only. Presently Solana Beach, like Encinitas, has very limited "dry towel space." A larger shoreline with more "dry towel space" should lead to additional visits by locals as well as those in the surrounding communities. Studies on beach visitation at coastal communities near Solana Beach (Carlsbad and Oceanside) strongly suggest that significant changes to shoreline width will impact visitation. With the wider shoreline, projections are there will be about 150 more beach visitors at any given time along the one-and-a-half mile shoreline at Solana Beach. To give this context there are over 3.2 million residents in San Diego County and 33.8 million visitors annually according to the San Diego Tourism Authority. As a result a scenario with no additional visitation, for instance, does not seem defensible and has not been evaluated.

USACE Response: Not Adopted

The second recommendation was to recalculate the recreational use benefit based on the new growth rate estimate of Solana Beach and determine the impact on the overall recreational benefit calculation. The use of regional growth rates is well documented and validated by previous experience in this geographic area as well as other areas of the country. As described in the first response to this comment, more information about the projected visitation has been included in the report. No changes were made to the recreation analysis or estimated recreation benefits to address this comment.

4. **IEPR Comment - *High Significance*: Numerous design assumptions regarding beach fill quantities, beach fill performance (including erosion rates), and representative beach profiles have not been validated.**

There are six recommendations as part of this comment, five were adopted and one was not adopted, as discussed below.

USACE Response: Adopted

Action Taken: There are five recommendations included in this IEPR comment that focused on validating the application of the shoreline to volume change relationship, providing a comparison between site conditions at this project area and the Regional Beach Sand Project sites, computing depth of closure, resolving cross-shore sediment transport inconsistencies between Encinitas and Solana Beach and documenting alongshore similarities to justify the use of one representative profile per segment. To the extent practicable, using existing data available at the time of analysis; the beach fill volume to beach width relationship, the seasonal distribution of sand across the shore, and the beach sand loss rate since the San Diego Association of Governments' (SANDAG) Regional Beach Sand Project (RBSP) have been validated. The analysis afforded bluff toe protection relies on site specific profiles that are listed in Table 8.1-1 of Appendix B. The complete plots of the profiles and their cross shore sand distribution are included in Appendix BB on Figures B8-1 and B7-1. The rate of with-project beach fill loss, depicted in Figures 13.3-1 and 13.3-2 for Encinitas and Solana Beach Segments, respectively, were obtained through interpretation of the one-line GENESIS modeling. The GENESIS model validation is discussed in Section 7.5 of Appendix B, and a comparison of beach fill volume loss predicted by the one-line model and that observed after the SANDAG RBSP is discussed in Section 13.4 of Appendix B. In order to provide additional information regarding the analysis, additional information has been provided in Sections 4.3.4, 6.2.1, 8.1, 8.2 and 8.5 of Appendix B.

USACE Response: Not Adopted

The IEPR panel recommended using sediment budget and volume change analysis as part of developing and analyzing alternatives, specifically, beach fill designs and predicting Future With Project (FWP) and Future Without Project (FWOP) conditions. The FWOP assumption is based on the current natural condition where the alongshore potential likely exceeds actualized littoral drift transport rates. The use of a one-line model allows prediction of a littoral drift loss rate greater than the historic observed rate described in the historic sediment budget. The FWP beach fills' loss rates are expected to be higher than historic sediment budget losses and higher for the larger/wider beach fills. Therefore, the current analysis is expected to provide a better estimate of future sand losses and nourishment requirements.

5. **IEPR Comment - Medium *Significance*: Performance of the beach fill constructed from the two primary borrow areas, SO-5 and SO-6, is assumed to be equal; however, these two borrow areas have varying grains size distributions and, as such, the beach fills will perform differently.**

There are four recommendations as part of this comment, two were adopted and two were not adopted, as discussed below.

USACE Response: Adopted

Action Taken: To address the recommendation that a description of how and when the overfill ratio and contingency were applied, revisions were made to Section 3.3.1 of the Integrated Report. An overfill factor of 1.20 was applied based on the long term experience of the recurring beach nourishment project at Surfside-Sunset Beach in southern California's Orange County (USACE-LAD, 2002b) where 30 years of beach fills and monitoring showed the nourished profile volume to be approximately 80 percent of the borrow site volume. Construction fill volumes can be updated during project design based on detailed surveys of the segments and detailed geotechnical evaluation of the borrow sites. In response to the other recommendation, inconsistencies in reporting of the borrow site median grain size were also resolved.

USACE Response: Not Adopted

The IEPR panel recommended using the existing grain size data for the borrow sites to discuss the difference in performance of the beach fills, based on the source of the material. To follow-on to that recommendation, a re-analysis of the volume of sediment required per nourishment event would need to be re-calculated. It is agreed that beach fills built with different grain sizes will behave differently and have different profiles given the same wave environment. However, the intent is to borrow a medium grain size sand with a D_{50} greater than 0.3mm from the three borrow sites, with SO-5 and SO-6 identified as the main sources. The most recent geotechnical investigation for borrow sites SO-5 and SO-6 showed average median grain size of 0.51mm and 0.35mm, respectively. A large difference in alongshore transport rates due to sediment grain size within this range is not predicted. The final volume weighted composite grain size distribution will not be established until further detailed design and geotechnical investigations are conducted during Preconstruction Engineering and Design (PED), but the gradation is still expected to be a medium grain size. Given that a medium grain size will be used, the variation in beach fill behavior due the range of grain sizes under consideration is secondary compared to the variation in wave conditions and longshore transport regimes. Therefore, the second recommendation regarding reevaluation of the renourishment volumes, intervals, mitigation, and costs was not considered warranted at this time.

6. **IEPR Comment - *Medium Significance*: The assumption that the beach fill unit costs would be 50% higher for subsequent renourishment events is not validated.**

USACE Response: Not Adopted

The three recommendations as part of this comment on the unit costs used for the optimization analysis were not adopted. The recommendations included recomputing the renourishment costs with validated unit costs, updating the total project costs, and updating the BCRs. Industry standard estimating practices were employed for the project cost estimate. When the cumulative borrow volumes exceed 6 million cubic yards, there

is an increase in the cost to the project because the secondary borrow site (MB-1) is located further away from the project site. The baseline estimate was developed for the most likely haul distances from SO-6 borrow site to receiver beaches: 2.5 miles for Encinitas and 1.9 miles for Solana. Sensitivity analyses indicated that the NED plan designation is not sensitive to this 50% unit cost assumption, although the net benefits and BCRS are. Subsequent, more detailed analyses using the CSRA considered the use of alternative sites when primary site capacity is exhausted and this is reflected in the final cost analysis and BCR for the NED and LPP Plans.

7. **IEPR Comment - *Medium Significance*: Although project impacts from sea level rise are addressed, the potential effects of other climate change-related consequences (e.g., increased storm severity and intensifying El Nino events) are not adequately evaluated.**

There are five recommendations as part of this comment, three were adopted and two were not adopted, as discussed below.

USACE Response: Adopted

Action Taken: The panel recommended considering the potential for a catastrophic failure in the risk discussion, defining additional emergency safety measures during severe events, and incorporating accurate renourishment costs (including unforeseen events) into the risk analysis. A qualitative description of potential changes to the wave climate based on climate change has been added to Section 1.8.9 of the Integrated Report under the Waves heading. Additionally, a description of the performance of the recommended project under various future sea level rise projections is included in the Integrated Report. A description of local safety measures to mitigate impacts of extreme storm events is included in Section 2.1.1 of the Integrated Report as well as Section 10.3.1 of Appendix E. Because the CSRA includes the potential costs of additional renourishment volumes or cycles over the project life (these are probabilistic values based on increased likelihood of extreme storm events), the alternatives were in fact evaluated for climate change consequences in addition to sea level rise.

USACE Response: Not Adopted

The panel recommended evaluating possible impacts on long-term maintenance costs (such as seawalls) and analyzing recent climate change information to update the hydrology text and evaluate impacts on the without-project and with-project conditions. While trends in relative sea level rise are clearly established, and therefore quantifiable through the scenarios identified in EC 1165-2-212, the same is not true for increased storminess. The “natural” climate variability in the hindcast record captures some of the stormiest periods of record, notably 1983, and should adequately simulate severe, isolated storm events. Existing literature does not have consensus on how climate change will affect storm waves in southern California and the time and resources to analyze recent global climate data to identify trends affecting the wave regime is beyond the scope of this study. As described in Section 3.7 of the Integrated Report and in more detail in

Appendix F, the Cost Risk analysis does include possibility of additional renourishment cycles over the project life, thus taking into account additional variability.

8. **IEPR Comment - *Medium Significance*: The development of the alternatives does not consider other construction methods aside from the hopper dredge method, nor does it incorporate the risk of a hopper dredge not being available on the West Coast.**

There are three recommendations as part of this comment, one was adopted and two were not adopted, as discussed below.

USACE Response: Adopted

Action Taken: To address the concern that alternate construction methods, other than the use of a hopper dredge, were not considered, revisions were made to Section 15 of Appendix F to further explain that a combination of dredging methods were considered for the cost estimate, but that it was ultimately determined that the hopper dredge method is the most economical.

USACE Response: Not Adopted

The panel also recommended that the risk register be revised to include dredge availability and other variables and to update the contingencies, project costs, risk register, and BCRs. The Cost and Schedule Risk Analysis (CSRA) accounts for dredge availability risk. The baseline estimate assumes mobilization and demobilization (mob/demob) from the East Coast for a hopper dredge, which is the worst case but highly likely scenario. It is unlikely that dredging equipment will mob/demob from a farther location; therefore the mob/demob scenario of deployment from further than the East Coast was assigned a low level of risk. The risk of dredge availability was documented in the CSRA. Since the CSRA already included the risk of dredge availability and the baseline cost estimate took a conservative approach, assuming mob/demob from the East Coast, it was deemed unnecessary to update the contingencies, project costs, risk register and BCRs.

9. **IEPR Comment - *Medium Significance*: The description of the existing conditions of ecologically valuable and impaired wetland resources does not meet National Environmental Policy Act (NEPA) requirements.**

USACE Response: Adopted

Action Taken: The referenced wetlands, Batiquitos Lagoon, San Elijo Lagoon, and San Dieguito Lagoon are not within the study area as depicted on Figures ES-1 and 1.8-1, and defined in Section 1.8.1. Revisions were made to Section 1.8.1 of the Integrated Report to clarify that only the mouths of the lagoons, and not the lagoons themselves, are within the study area; therefore, the referenced wetlands are not included in the description of existing conditions within the study area. The project in Encinitas and Solana Beach avoids the lagoon entrances, with the distance far enough that no impacts are expected, as

discussed in Section 3.1.4 of the Integrated Report. Post construction monitoring will include monitoring of the lagoon entrances to confirm that the project does not result in any closure or restrictions to lagoon entrances. Dredging for additional lagoon sedimentation will be conducted should the project result in closure or restrictions to lagoon entrances. By clarifying the study area boundaries, the comment has been addressed.

10. IEPR Comment - *Medium Significance*: There were inconsistencies in the evaluation of the seawall alternative and some cost assumptions were not justified.

There are four recommendations as part of this comment, three were adopted and one was not adopted, as discussed below.

USACE Response: Adopted

Action Taken: The panel recommended utilizing a consistent method of cost estimating and identifying the experts that provided cost data, justifying the assumption for a fully armored shoreline by 2065, and clarifying why a notch fill alternative was carried forward but not a seawall option. USACE does not have standard costs for the types of seawalls that would be needed within the study area. TerraCosta Consulting Group is a company that has over 35 years of experience designing and constructing seawalls in California and their expertise was used to determine design, permitting and construction costs of seawalls within the project area. Section 3.2.6 of Appendix E has been revised to elaborate on the source of the seawall construction cost data.

Section 3.1.3 of the Integrated Report includes clarifying language about the study assumption regarding future armoring of the study area. Some of these factors include: a significant portion of the study area has already been armored, the high value of the property indicates that property owners likely have the financial capability to pay for the seawalls, and the Local Sponsors verified that action would be taken to armor appropriate parcels to protect critical infrastructure such as roads and utilities.

Additional text was added to Section 3.1.6 of the Integrated Report to expand on the explanation of why the notchfill alternative was carried forward as an alternative (in conjunction with beachfills) versus seawalls. A seawall/beachfill hybrid does not substantively add to the ability of beachfill to meet the project purpose and would generate the same issues as seawall only, namely environmental impacts and significant costs. In contrast to the notchfill alternative, the seawall alternative would essentially represent the construction of features in the near term that would otherwise be constructed at most parcels in the future (i.e., part of the FWOP condition).

USACE Response: Not Adopted

The recommendation not adopted was in regards to recalculating seawall costs and benefits based upon failures during the period of analysis, and not based only on the 25-

30 year design life. A risk based analysis was conducted to account for as many unknown factors as possible. This included looking at the results based upon multiple without project scenarios and sea level rise conditions. To add to this complexity by factoring in probabilities of existing and projected seawalls failing in any given year due to a major storm event would add significant time and cost to completing the study, without having a significant impact on the results. As the report documents, a significant portion of the study area is already armored by existing seawalls. These seawalls are being maintained, in that when they have been damaged, they have been repaired. There is no basis for assuming that this would not continue to be the case in the future.

11. **IEPR Comment - *Medium Significance*: Critical components of the economic analysis are based on data sources that are not well-documented.**

USACE Response: Adopted

Action Taken: The panel recommended that the report describe how observers arrived at beach visitation estimates and that greater detail be provided to show that they are objective, consistently determined and reliable. Both recommendations made were adopted. Visitation data is based on objective measurement techniques and Section 1.9.4 of the Integrated Report has been revised to include a summary of the information presented in Appendix E.

For the with-project visitation projections, Section 5.2.1 in Appendix E, already included information that the Similar Project Method was utilized to assess increased demand and visitation at the Study Area beaches, accounting for the additional beach area created by the proposed alternatives. The input from local lifeguards was one factor that was used to assess the reasonableness of the projections, along with the actual visitation at the similar beaches. Also, research conducted by Dr. King on the impact of reduced beach area on visitation was also considered (as referenced in Appendix E).

12. **IEPR Comment - *Medium Significance*: The Preconstruction Engineering and Design (PED) costs for the Encinitas and Solana Beach project segments are disproportionately higher than industry standard construction costs.**

There are three recommendations as part of this comment, which were not adopted, as discussed below. However, revisions were made to the report, as indicated below, because of editorial comments.

USACE Response: Not Adopted

The panel recommended computing Preconstruction, Engineering and Design (PED) costs using industry standards, updating the total project costs, and updating the Benefit Cost Ratios. PED and Construction Management estimates were based on detailed labor-hour estimates provided by section chiefs for each dredging event. Associated burdened hourly rates are based on USACE labor rates. Each portion of PED was broken out, analyzed and estimated, including the following: Programs and Project Management

(PPMD) oversight; Engineering and Design; Cost estimates; Detailed Design Report (DDR); Plans & Specs; Value engineering; Engineering during construction; Economics; and Engineering and technical reviews.

The driver behind the high costs revolves around the fact that the same amount of PED efforts are required regardless of the volume. USACE will commit comparable resources on PED efforts for dredging a million yards of sand versus dredging half a million yards of sand. USACE uses its own approved methodology for calculating PED costs which may be different than the industry standards cited in the panel recommendation; no changes were made in the Report related to PED costs, total project costs, or BCRs.

Action Taken: Table 3.6-3 of the Integrated Report has been revised - the costs for Solana and Encinitas were reversed as mentioned in this comment. Table 9.2-1 of the Integrated Report was also revised to make it consistent with the Cost Estimate in Appendix F.

13. **IEPR Comment - *Medium Significance*: The impacts on public safety are difficult to assess given that the bluff failure data are spread throughout the report and the failure locations are not correlated with project segments.**

USACE Response: Adopted

Action Taken: All four recommendations were adopted. The recommendations included providing more specific locations for bluff failures, correlating them to project segments, confirming that year 2000-2011 bluff failures were considered in the plan formulation, and identifying how alternatives and the recommended plan achieve planning objectives including public safety. More specific location information of bluff collapses in the project area have been added to Table 2.1-1 and Figures 2.1-2 and 2.1-3 in the Integrated Report. Section 2.1 of the Integrated Report has also been revised to explain how the bluff collapse data is a factor in plan formulation. The 2000-2011 bluff failure data was used to validate the economic model, specifically the long-term retreat rate and distribution of the block sizes. Since the economic model is instrumental in determining the benefits of each of the alternatives, the bluff failure data is used in plan formulation. Discussion regarding Life Safety is included in Section 3.7 of the Integrated Report.

14. **IEPR Comment - *Medium Significance*: There is little documentation provided in the report on the Economic Model's assumptions, limitations, and how risk and uncertainty are incorporated.**

There are two recommendations as part of this comment, one was adopted and one was not adopted, as discussed below.

USACE Response: Adopted

Action Taken: The panel recommended providing details on the technical underpinnings of the model and how it incorporates risk and uncertainty. Section 7.1 of Appendix E has been revised to document the critical factors of uncertainty in the Economic Model, which included (1) variability in the cost of seawall construction, (2) sea-level rise, (3) the share of parcels that armor in time to prevent structure loss given the episodic nature of these bluff collapses, and (4) whether Segments 1 and 2 can be nourished jointly.

USACE Response: Not Adopted

The panel also recommended providing clear and thorough documentation of the model's assumptions, intended usage, and limitations. The model and model appendix were reviewed and approved by the Coastal Storm Risk Management Planning Center of Expertise and its use was approved by HQUSACE on 25 October 2011. The model appendix addresses the points cited in the comment including extensive discussions of risk and uncertainty and sensitivity analysis conducted to assess the impact of key assumptions on economic justification.

15. **IEPR Comment - *Low Significance*: Watershed management measures to address sediment starvation are not included as part of a long-term strategy.**

USACE Response: Not Adopted

The three recommendations associated with this comment were not adopted because the recommendations are being addressed by other efforts and are beyond the scope of this study. These recommendations included identifying locations with potential for removal of concrete channels and dams, identifying opportunities that may exist for ecosystem restoration that may have system benefits of restoring natural sediment input, and incorporating watershed scale irrigation practices and other ways to provide benefits by minimizing infiltration that contributes to bluff top erosion. A reference and brief explanation of the Regional Sediment Management Plan (RSMP) that has been developed for San Diego County has been added to Section 1.7.1 of the Integrated Report. The RSMP was developed for San Diego County through a cost-shared feasibility study (California Coastal Sediment Master Plan) between USACE and the California Division of Boating and Waterways. If a more natural sediment regime was established and sediment was more regularly supplied to the project area, project costs could potentially be reduced because of increasing the time between beach nourishment events. Additionally, it is understood by the Project Delivery Team (PDT) that the natural supply of sediment has been altered due to development and construction of dams and debris basins in the watershed. These larger issues and how to address them are quite complicated and beyond the scope of this study. The beaches in the study area are not naturally wide, and they would still be sediment starved even with a natural supply of sediment. San Luis Rey and Santa Margarita Rivers are the only potential rivers for sediment supply. San Diego Association of Governments (SANDAG) has a Shoreline Preservation Working Group that is looking at a long-term strategy of managing and

maintaining the coastal resources, from a larger watershed perspective, along San Diego County.

16. **IEPR Comment - Low Significance: While adaptive management elements have been considered, it is unclear how they have been incorporated into the total project cost summary and the National Economic Development (NED) Plan.**

There are three recommendations as part of this comment, two were adopted and one was not adopted, as discussed below.

USACE Response: Adopted

Action Taken: The panel recommended including procedures and processes to learn from and adjust to information gained through monitoring and preparing a detailed Adaptive Management Plan that includes adjustments to beachfill templates and volumes based on monitoring results. Changes to the project that might be required during successive nourishment cycles have not been defined. Due to the range of issues that could be encountered, it would seem to be more prudent to address those issues when and if they arise. Each of the successive nourishment cycles will require a new set of plans and specs and the monitoring results from the previous nourishment would be evaluated and adaptive management of project elements be implemented, if necessary. Section 6 in Appendix H now addresses adaptive management measures that could be implemented, such as adjustment of the longshore fill distribution or design slope of the fill, which could minimize impacts to nearshore habitat or surfing resources.

USACE Response: Not Adopted

The panel recommended that an Adaptive Management Plan be incorporated into the total project cost summary and NED plan. The PED costs that are currently included in the total project cost are sufficient to cover re-design efforts associated with adaptive management. The contingency included in the construction estimates would compensate for additional costs due to potential design changes.

17. **IEPR Comment - Low Significance: It is not clear how the Del Mar reach was used in the National Economic Development (NED) benefit analysis.**

There are two recommendations as part of this comment, one was adopted and one was not adopted, as discussed below.

USACE Response: Adopted

Action Taken: The panel recommended that the report describe in detail why Reach 9 should not be extended to include Del Mar. Section 1.5.10 of Appendix E has been revised to note that the Del Mar reach would be impacted by sand placement extending to reach 9, and that it is also evaluated in the with-project analysis for Segment 2.

USACE Response: Not Adopted

The panel also recommended that the report better describe how the Del Mar reach was treated in the NED benefit analysis. The study authorities include the shorelines within the cities of Encinitas and Solana Beach, which does not include the city of Del Mar. Sand placed along Solana Beach will be naturally transported according to projections and the shoreline along the city of Del Mar is predicted to receive incidental benefits from the project. These NED benefits have been captured in the with project analysis.