

**Dredged Material Management Plan (DMMP) and Supplemental
Environmental Impact statement (EIS)
Calcasieu River and Pass, Louisiana
Calcasieu and Cameron Parishes**

**USACE Response to Independent External Peer Review
December 2010**

Independent External Peer Review (IEPR) was conducted for the subject project in accordance with Department of the Army, USACE, guidance *Civil Works Review Policy* (EC 1165-2-209) dated January 31, 2010, and the Office of Management and Budget's *Final Information Quality Bulletin for Peer Review*, released December 16, 2004.

The U.S. Army Corps of Engineers (USACE) has developed a plan for the management and disposal of dredged material for the Calcasieu River and Pass, Louisiana project. The actions and strategies set forth in the DMMP/SEIS provides for the management of material dredged through operations and maintenance of the ship channel and berthing areas for a minimum period of 20 years. Preparation of the DMMP/SEIS complies with requirements contained in the USACE *Policy Guidance Notebook* (ER 1105-2-100) dated April 22, 2000 as updated to the present. The current operational project lacks adequate dredged material disposal capacity needed to maintain the project to its authorized dimensions for the next 20 years. The DMMP provides for the refurbishment and expansion of existing confined disposal facilities (CDFs) with creation of new disposal facilities that would optimize the beneficial use of dredged material for coastal wetland restoration purposes. When approved, the DMMP would redefine the base plan, that is the Federal standard for the Calcasieu River and Pass project.

The goal of the USACE Civil Works program is always to 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. In July 2008 Battelle Memorial Institute, 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 Calcasieu River and Pass, Louisiana, DMMP/SEIS draft report. The peer review panel was charged to review the draft report and "...determine whether the technical approach and scientific rationale presented in the Calcasieu River and Pass, Louisiana DMMP and SEIS are credible and whether the conclusions are valid." The Calcasieu River and Pass, Louisiana DMMP/SEIS, Battelle Final External Peer Review Report dated August 29, 2008 presents the panel's final review and advice for improvements of the draft DMMP/SEIS. USACE commends the independent external peer review panel for their grasp and understanding of this important project and their comments have been integral in the shaping of the final report. This document outlines what actions USACE has or will take to address the comments provided.

The following discussions present the USACE Final Response to the 14 IEPR comments.

1. IEPR Comment - High Significance: The long-term sustainability of the project, beyond a 20-year time period, needs to be considered in the comparison of project alternatives and in the assessment of project impacts.

USACE Response: Adopted

Action taken. USACE concurs with the need to consider the long-term sustainability of the project beyond a 20-year time limit. In the final report, Section 2.6.3, Technical Risk, has been expanded to incorporate a discussion of long-term sustainability of the alternatives. The report has identified capacity that would extend beyond the 20-year period required by ER 1105-2-100.

Action to be taken. The DMMP is a living document and will be updated as necessary and at least every five years. Each update will review and reevaluate the needs for each subsequent 20-year period, thereby serving as a mechanism for extending the life of the DMMP. Follow on studies and adaptive management employed during the implementation of the DMMP will help to address sustainability issues as the plan moves forward.

2. IEPR Comment - High Significance: Options to reduce the dredging requirement (average rate of dredging) should be investigated.

USACE Response: Adopted

Action Taken. USACE concurs that options to reduce the dredging requirement should be investigated. It is noted in Sections 2.1 and 2.3.1 that the ship channel is operating under reduced dimensions. This reduction is primarily because of limited disposal capacity and funding constraints. As part of the plan development and plan selection process, the District considers that dredging would be conducted without funding constraints. The shoaling analysis was performed, and the projected amounts are consistent with the historical fully funded maintenance program.

Reducing the authorized dimensions of the Calcasieu Ship Channel threatens navigation safety and increases the cost of shipping. Reducing the depth or "draft" of the channel decreases the efficiency of shipping by requiring that the ships be light loaded to meet the draft restrictions, thereby not allowing the ship to be loaded at capacity. According to information from the Port of Lake Charles, each foot of draft reduction adds \$2.5 million dollars per day to the nation's energy costs. Reduced channel width creates delays in shipping as cargo vessels must wait until other vessels navigate the reduced passage. According to the 2008 *Draft Report, Economic Analysis for the Calcasieu River, Current and Future Port Facilities*, prepared by CH2MHill:

“Overall in 2006, total additional costs due to delay (approximately \$2,900 per hour) are estimated to be approximately \$1,370,000 for CITGO and \$850,000 for ConocoPhillips. These two companies also faced indirect and induced costs due to delays that are difficult to estimate and have not been taken into consideration in this analysis.”

Rock or riprap would be placed along the channel edges of the dikes, especially in the lake reaches of the project, to reduce erosion, reduce deterioration of dikes, and regain CDF capacities lost to past erosion from storm surges and ship wakes. A foreshore dike was recently constructed by USACE from approximate mile 11.2 to 15.6 on the eastern side of the channel. The combination foreshore rock dike and/or general shore protection would be placed on both the ship channel and bay sides of the CDFs and adjacent land from approximate mile 12 to 20, which includes CDFs 17, 19, 22, 23, D and E. The placement of shore protection in these areas is anticipated to reduce the dredging need over the 20-year life of the DMMP by 12 million cubic yards. In addition, rock shore protection is planned on the west side of the ship channel from approximate mile 16.7 to 18.7 to protect the shorelines in this narrow, high-energy section of the channel.

3. IEPR Comment - High Significance: A Sediment Budget Analysis is needed to diagnose the causes of the very high shoaling rates, and to improve the DMMP.

USACE Response: Adopted

Action taken. USACE concurs that a more detailed sediment budget analysis is needed for this project. A shoaling analysis was performed for the development of this report, and the projected amounts are consistent with the historical fully funded maintenance program.

Action to be taken. The Port of Lake Charles, in coordination with USACE, is partnering with McNeese University to develop a sediment study to attempt to determine the source of sediment in the ship channel. Upon completion of this study, the results will be examined to determine if the results adequately address the source of sediment in the channel. If not, a determination stating whether further analysis is necessary will be made. Implementation and appropriation of the Regional Sediment Management Study by Congress and USACE may allow for further study. As additional studies are authorized, funded, and completed, more information will be gathered to better address the shoaling rates, and the findings will be incorporated into the DMMP during periodic updates.

4. IEPR Comment - High Significance: Several appendices were written primarily to support Alternative B and thus do not evaluate Alternative C. If Alternative C is ultimately selected as the preferred plan, several appendices may not apply and additional work may be required.

USACE Response: Adopted

Action taken. USACE concurs that several appendices of the draft report were written to support Alternative B. The IEPR comment appears to be referring to Appendix J, the Clean Water Act Section 404(b)(1) Report, Appendix K, the Coastal Zone Consistency Determination, and possibly Appendix M, the Fish and Wildlife Coordination Act Report (prepared by USFWS). These evaluation reports are prepared not to compare alternatives, but subsequent to the selection of the Recommended Plan. These reports are necessary to satisfy statutory requirements. The IEPR comment is correct in noting that if Alternative C had ultimately been selected as the Recommended Plan, it would have been necessary to revise these appendices. All other appendices were written to support the formulation and evaluation of all alternatives and clarification was made in the appendices and in the main report to reflect this.

5. IEPR Comment - High Significance: Technical analyses do not sufficiently establish the required dike cross sections, placement locations, or stability. The feasibility of many dike sections is not established.

USACE Response: Adopted

Action taken. USACE concurs that the draft report did not demonstrate to the reader the establishment of feasibility level of design for all disposal sites. As stated in the DMMP, limited existing and current survey, engineering and geotechnical data are available for the proposed disposal areas. Three sites were selected for a feasibility analysis by a consensus of geotechnical engineers familiar with the area. The sites were considered to contain dredged material typical of the reach in which the site is located and were concluded to represent the best and worst cases on the Calcasieu River and Pass. Geotechnical evaluations and analyses were used to generate dike cross-sections, which were prepared at a feasibility level of detail and not for detailed engineering designs. The analyses show that the planned construction is feasible. Section 5.3 was expanded to include discussions on slope stability methodologies employed in the analyses. Mention was also made of the experience with conceptual dike designs at the nearby Sabine National Wildlife Refuge and through the Coastal Wetlands Planning, Protection, and Restoration Act and Coastal Impacts Assistance Program programs

Action to be taken. Section 5, *Implementation*, additional detailed analysis will be conducted at each disposal area to include further surveys, geotechnical analysis, and detailed engineering plans and specifications prior to construction.

6. IEPR Comment - High Significance: The impacts to the aquatic ecosystems in the vicinity need to be better addressed. Impacts to the Gulf shore are not mentioned.

USACE Response: Adopted

Action Taken. USACE concurs that the draft report did not clearly describe in the report the impacts to the aquatic ecosystems in the vicinity of the Gulf shore. The two reaches potentially affecting the Gulf shore are the entrance channel and the pass channel. A discussion in Section 1.2 mentions that because no additional measures are needed for the pass channel or the entrance channel, this study would focus on the inland reaches of the ship channel. Section 2.5.2 points out that because of strong tidal currents, no sediment accumulates in the pass channel, therefore, no action is necessary. The environmental effects of dredging in the Entrance Channel and the use of the Ocean Dredged Material Disposal Site (ODMDS) were evaluated in the 1976 *Final Environmental Impact Statement for Calcasieu River and Pass Ocean Dredged Material Disposal Site Designation*, prepared by the US Environmental Protection Agency, the agency responsible for ocean disposal sites. The findings of this report remain valid today. Section 2.5.4 was expanded to state that 1976 FEIS was incorporated by reference, and a summary of the findings was provided.

7. IEPR Comment - Medium Significance: The report does not provide sufficient detail about the proposals and the selection process for Beneficial Use sites.

USACE Response: Adopted

Action taken. USACE concurs that the draft report did not provide sufficient detail about the proposals and the selection process for Beneficial Use. Section 2.4, Plan Formulation, was revised to explain more clearly the screening of proposed options. Section 2.4.1 was revised to include a discussion of how the initial array of proposed options was developed. Table 2-4 was prepared to show the results of screening of all options, including beneficial use sites, with justification for rejecting or accepting each option. Table 2-6 was prepared to provide a summary of the options remaining following screening. Table 2-7 was prepared to list beneficial use sites that were retained for use as dredged material placement sites as well as the confined disposal facilities that would be used.

8. IEPR Comment - Medium Significance: The method for combining evaluation criteria to determine evaluation scores is not sufficiently supported.

USACE Response: Adopted

Action taken. USACE concurs that the draft report did not clearly show the method for combining evaluation criteria to determine evaluation scores. Section 2.6, Comparison of Alternatives, has been revised to refine the quantitative and qualitative criteria used for comparing alternatives. Quantitative comparison criteria considered included acres of marsh restored from the beneficial use of dredged material, total capacity provided by placement areas, and total costs. Qualitative criteria included discussions and comparisons of technical risk, acceptability risk, and logistical risk. Table 2-11 was prepared to provide a summary of qualitative and quantitative evaluation measures.

9. IEPR Comment - Medium Significance: Several elements within the economic analysis are not sufficiently described.

USACE Response: Adopted

Action taken. USACE concurs that the draft report did not sufficiently describe several elements within the economic analysis. The description of the accrual of benefits over the period of analysis, the estimate of benefit-to-cost ratios, and the assumptions used in the economic analysis were elaborated upon.

The limiting depths of the Calcasieu River under with- and without-project conditions were estimated using historical dredging cycle data, and two shoaling scenarios for the limiting segment of the river were developed. Without-project shoaling rates or draft reductions are not available; however, past experience indicates that the channel at mile 14-17 will shoal at a rate of less than two feet a year over the long-term, with draft reductions most likely occurring at a rate of approximately 1 foot per year (starting two years after dredging). For this analysis, two average annual shoaling rates (draft reduction rates) were assumed: (1) one foot of draft reduction per year, and (2) one foot of draft reduction every two years (one-half foot a year) over the life of the project.

The two assumed draft reduction rates were used to estimate the shipping costs per project year, based on the amount of light loading required to access the shoaled river segment. Based on the two shoaling rate assumptions, benefit-to-cost ratios were developed for three alternate LNG facility operational scenarios.

The major assumptions used in the economic analysis were enumerated in the report and include: origins and quantities of commodities included in the analysis; definition of LNG facility operational scenarios and associated commodity movements; and assumptions (vessel sizes, types, drafts, underkeel clearances, and vessel displacement rates) used to develop vessel operating costs.

10. IEPR Comment - High Significance: The selection, use and assumptions used for the Wetland Value Assessment functional assessment procedure and the details for how the measures of wetland services and functions are translated into Habitat Suitability Index are poorly described.

USACE Response: Adopted

Action taken. USACE concurs that the draft report did not clearly describe the selection, use and assumptions used for the Wetland Value Assessment functional assessment procedure and the details for how the measures of wetland services and functions are translated into Habitat Suitability Index. The Wetland Value Assessment (WVA) used the Coastal Marsh Community Models developed by the Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA) Environmental Work Group, which consisted of Federal, state, and academic biologists, to determine the suitability of marsh and open water habitats in the Louisiana Coastal Zone. Application of the methodology was a collaborative effort of the USACE, US Fish and Wildlife Service (USFWS), and National Marine Fisheries Service. The WVA has been used extensively by Federal and Louisiana agencies, and it is the standard method for assessing wetland losses and gains in coastal Louisiana. Use of the WVA maintains consistency with other studies. The USFWS, the lead agency in performing the WVA, participated in an expansion of the introductory statements in Appendix P, the WVA appendix, to provide a more thorough description of background and methodology for a WVA analysis. A statement was added to Section 4.7.2.2, Wetlands, stating that details on the WVA methodology and assumptions for each site could be found in Appendix P.

11. IEPR Comment - High Significance: The hydrodynamic modeling did not fully support the alternative analysis. It is not clear that the lateral extents of the model are sufficient to fully model the system.

USACE Response: Adopted

Action to be taken. The need for additional studies is recognized. The District will coordinate with the Port, the State of Louisiana, and other Federal agencies to identify additional authorities and budgets to conduct further hydrodynamic studies. If successful, DMMP updates will incorporate the findings.

During the scoping of the DMMP, a modeling effort was requested by resource agencies to determine the effects of possible expansion of CDFs into Calcasieu Lake. The model that was developed was also a tool for evaluating the current condition and future conditions of the Calcasieu Ship Channel. The state-of-the-art model selected to evaluate the fine silty sediments found in the Calcasieu environment could also be upgraded to a three-dimensional model for use

in follow-on studies. A full hydrodynamic modeling effort of the Calcasieu estuary system is beyond the scope of a DMMP and would not affect the selection of the recommended plan.

12. IEPR Comment - Low Significance: A more thorough summary of prior studies, and of public and agency input, is needed.

USACE Response: Adopted

Action taken. With respect to prior studies, the environmental effects of dredging in the Entrance Channel and the use of the Ocean Dredged Material Disposal Site (ODMDS) were evaluated in the 1976 *Final Environmental Impact Statement for Calcasieu River and Pass Ocean Dredged Material Disposal Site Designation*, prepared by the US Environmental Protection Agency, the agency responsible for ocean disposal sites. Section 2.5.4 was expanded to state that 1976 FEIS was incorporated by reference, and a summary of the findings was provided.. The draft document that was reviewed for this independent external peer review had not yet been made available for public and agency review and input, although a series of interagency meetings regarding preparation of the DMMP had been conducted, as documented in Section 1.11, Scoping and Interagency Coordination. The final report was amended to include a summary of comments and responses provided during the formal public review. Section 2.5.4 was amended to incorporate by reference the *Final Environmental Impact Statement for Calcasieu River and Pass Ocean Dredged Material Disposal Site Designation*. A summary of the FEIS findings are also included.

13. IEPR Comment - Low Significance: Report needs to eliminate inconsistencies between appendices and the main body of the report.

USACE Response: Adopted.

Action taken: USACE concurs that inconsistencies between appendices and the main body of the report need to be eliminated. The main body of the DMMP and the appendices were reviewed and revised to ensure that no inconsistencies remain.

14. IEPR Comment - Low Significance: There is little discussion of risk or uncertainty, and limitations of the data or analysis methods may impact the credibility of some conclusions.

USACE Response: Adopted.

Action taken: Discussions in sections 2.6.2, Quantitative Risk Criteria 2.6.3, Qualitative Risk Criteria; 2.6.4 Trade-Off Analysis; and 2.7, Selection of the Recommended Plan, were revised and expanded to better clarify the risks and uncertainties associated with the project. Quantitative comparison criteria considered included acres of marsh restored from the beneficial use of dredged material, total capacity provided by placement areas, and total costs. Qualitative criteria included discussions and comparisons of technical risk, acceptability risk, and logistical risk. Table 2-11, Summary of Alternative Evaluations, was revised to summarize the comparison of alternatives and includes risks and uncertainties.