

REPORT SUMMARY

Integrated Final Report to Congress and Legislative Environmental Impact Statement for the Mississippi River – Gulf Outlet Deep-Draft De-authorization Study

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| Feasibility Scoping Meeting: | 13 Oct 2006 |
| Alternative Formulation Briefing: | 07 May 2007 |
| AFB Guidance Memorandum: | 17 May 2007 |
| Draft Report Guidance Memorandum: | 08 Aug 2007 |
| Division Engineer Transmittal: | 15 Oct 2007 |
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| CWRB Briefing: | 19 Oct 2007 |
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| 30-Day S&A Review end: | TBD |
| FEIS filed with EPA: | TBD |

STUDY INFORMATION

Study Authority. The U.S. Congress has directed the Secretary of the Army, acting through the Chief of Engineers, to develop a plan for de-authorization of deep-draft navigation for the Mississippi River-Gulf Outlet (MRGO) from the Gulf of Mexico to the Gulf Intracoastal Waterway (GIWW). The Emergency Supplemental Appropriations Act for Defense, the Global War on Terror, and Hurricane Recovery, 2006 (Public Law 109-234), reads in part:

“...the Secretary of the Army, acting through the Chief of Engineers, utilizing \$3,300,000 of the funds provided herein shall develop a comprehensive plan, at full Federal expense, to de-authorize deep-draft navigation on the Mississippi River-Gulf Outlet, Louisiana, extending from the Gulf of Mexico to the Gulf Intracoastal Waterway: Provided further, That, not later than 6 months after the date of enactment of this Act, the Secretary shall submit an interim report to Congress comprising the plan: Provided further, That the Secretary shall refine the plan, if necessary, to be fully consistent, integrated, and included in the final report to be issued in December 2007 for the Louisiana Coastal Protection and Restoration Plan.”

House Report 109-494 provides a Congressional conference committee manager’s statement accompanying the legislative language further directing that:

“The plan shall include recommended modifications to the existing authorized current use of the Outlet, including what navigation functions, if any, should be maintained and any measures for hurricane and storm protection. The plan shall be developed in consultation with St. Bernard Parish, the State of Louisiana, and affected Federal Agencies.”

Congressional direction to prepare the MRGO deep-draft de-authorization plan also requires full consistency and integration with the Louisiana Coastal Protection and Restoration (LACPR) plan due to Congress in December 2007. The LACPR plan will identify a comprehensive plan for flood control, coastal restoration, and hurricane protection in South Louisiana. The future of the MRGO navigation channel is a key decision, affecting related projects in the area, such as hurricane protection, ecosystem restoration, and navigation. Resolving questions about the future use of the MRGO channel could provide a baseline for developing other related projects. The MRGO de-authorization plan is being

integrated into ongoing measures for the LACPR plan. Specific work to integrate the components of the MRGO plan with the LACPR plan includes storm surge modeling, environmental planning, and prioritization. Every effort has been made to accelerate completion of the MRGO Final Report and LEIS in accordance with the Congressional direction found in Title IV, Chapter 3, Section 4304 of the "U.S. Troop Readiness, Veterans' Care, Katrina Recovery, and Iraq Accountability Appropriations Act, 2007" (Public Law 110-28). The MRGO Final Report and LEIS will be transmitted to the Congress as soon as is practicable and will also be included as a full appendix of the LACPR Final Report due to Congress in December 2007.

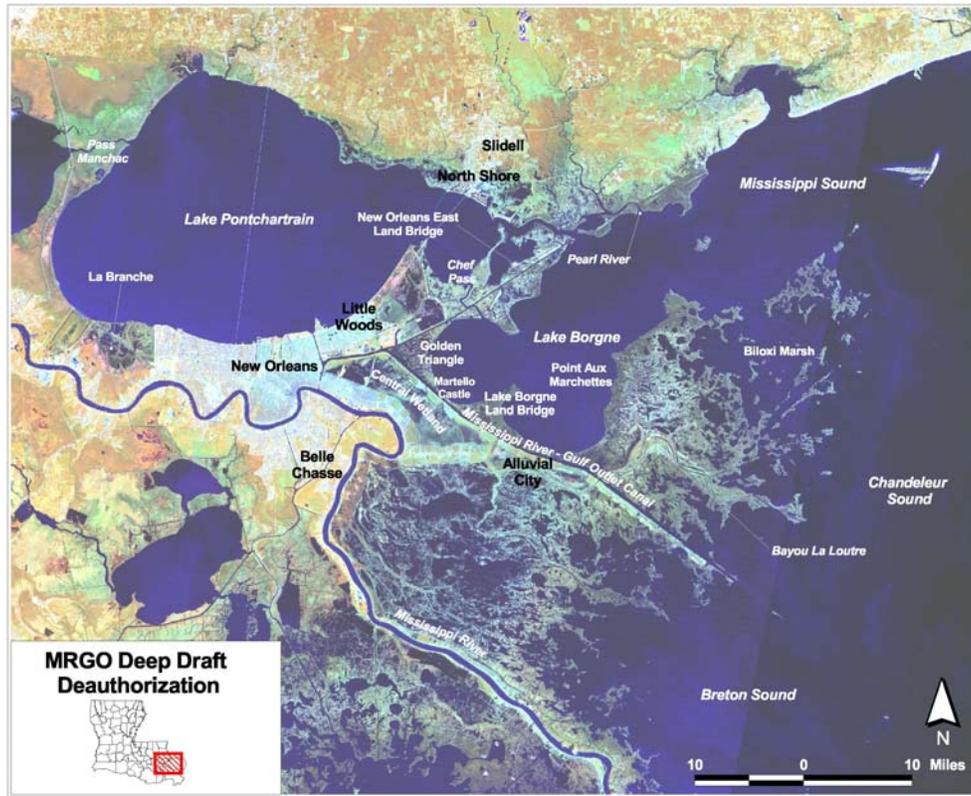
Study Sponsor. Not applicable—study was completed at 100% Federal expense.

Study Purpose and Scope. The purpose of the study is to provide to Congress a comprehensive plan to de-authorize deep-draft navigation on the MRGO from the GIWW to the Gulf of Mexico. As requested in the authorizing legislation, an Interim Report to Congress was submitted in December 2006. The Interim Report stated preliminary analysis has indicated the best plan is to close the MRGO from the GIWW to the Gulf of Mexico to both deep- and shallow-draft navigation. The MRGO comprehensive de-authorization plan must be consistent with ongoing design and planning efforts related to storm protection and coastal restoration and long-term planning related to the LACPR. In terms of design and planning, this MRGO de-authorization study and subsequent Congressional action defines the navigation future of the MRGO and thus enables other related projects to move forward with more certainty.

Project Location/Congressional District. The project area includes portions of the 1st, 2nd, and 3rd Louisiana Congressional districts, located in St. Bernard, Orleans, Jefferson, St. Tammany, St. Charles, St. John the Baptist and Tangipahoa Parishes. It covers the Middle and Lower Pontchartrain Basin. The Middle Basin consists of Lake Pontchartrain with its adjacent cities and towns and surrounding wetlands. The Lower Basin consists of Lake Borgne, MRGO, Chandeleur and Breton Sounds and the surrounding wetlands. (Figure 1.1)

The MRGO provides a shorter navigation route from the Gulf of Mexico to the Port of New Orleans tidewater facilities compared to using the Mississippi River to access the port. The channel extends from the Inner Harbor Navigation Canal (IHNC) in New Orleans to the 38-foot depth contour in the Gulf of Mexico (see Figure 1.2). The stretch contiguous with the GIWW is called the GIWW Reach (mile 66-60). Where the channel diverts from the GIWW and runs through wetlands for 37 miles is known as the Inland Reach (mile 60-23). The 23 miles through Breton and Chandeleur Sounds is called the Sound Reach (mile 23-0). The portion in the Gulf of Mexico is the Bar Channel (mile 0 to -9.4). All reaches of the MRGO navigation channel are authorized as a 36-foot deep, 500-foot bottom width waterway with the exception of the Bar Channel which is authorized as a 38-foot deep, 600-foot bottom width waterway.

Figure 1.1 Project Area



Prior Reports and Existing Water Projects.

- Bayous La Loutre, St. Malo and Yscloskey, 1945.
- Inner Harbor Navigation Canal Lock Replacement Project, 1956.
- Lake Pontchartrain and Vicinity, Louisiana, Hurricane Protection Project, 1965.
- Mississippi River Outlets, Venice, Louisiana, 1968.
- MRGO, Michoud Canal, Louisiana Project, 1968.
- MRGO St. Bernard Parish, Louisiana, Reconnaissance Report, February 1988.
- MRGO North Bank Foreshore Protection Evaluation, 1996.
- Coast 2050: Toward a Sustainable Coastal Louisiana, 1998.
- MRGO Reevaluation Study 2002.
- Lake Borgne and MRGO Shoreline Protection, CWPPRA PO-32.
- Louisiana Coastal Area Ecosystem Restoration Study (LCA 2004).
- Lake Borgne Shoreline Protection Project, CWPPRA PO-30.
- \$75,000,000 in MRGO O&M activities authorized in Department of Defense, Emergency Supplemental Appropriations to Address Hurricanes in the Gulf of Mexico, and Pandemic Influenza Act, 2006 (Public Law 109-148) and Emergency Supplemental Appropriations Act for Defense, the Global War on Terror, and Hurricane Recovery, 2006 (Public Law 109-234).
- Louisiana Coastal Protection and Restoration (LACPR), 2006.
- Integrated Ecosystem Restoration and Hurricane Protection: Louisiana’s Comprehensive Master Plan for a Sustainable Coast, 2007.

Federal Interest. The recommended plan for de-authorization of deep draft navigation on the MRGO has been evaluated using NED criteria. The recommended plan is economically justified based on avoiding

future annual MRGO O&M dredging costs. Closure of the deep draft navigation on MRGO is estimated to prevent the potential loss of a significant percent of the 2,343 net acres of marsh estimated to be lost under future without project conditions.

STUDY OBJECTIVES

Problems and Opportunities. Key problems are deep-draft de-authorization; navigation functions to be maintained; hurricane and storm damage reduction; and consistency with LACPR. Key opportunities are consistency and integration with other efforts in the study area, such as ecosystem restoration and hurricane and storm damage reduction.

Planning Objectives. The goals and objectives for the MRGO deep-draft de-authorization study are derived entirely from the Congressional authorizing language and accompanying committee report. Those goals and objectives are:

- Develop a comprehensive plan to de-authorize deep-draft navigation on the MRGO channel from the GIWW to the Gulf of Mexico
- Evaluate any navigation functions that should be maintained on the MRGO channel
- Identify measures for hurricane and storm damage reduction
- Refine the plan to be fully integrated and consistent with the LACPR Final Report to Congress

Planning Constraints.

- Measures for hurricane and storm damage reduction are being investigated under the LACPR effort.
- This study should be consistent with LACPR planning objectives.

ALTERNATIVES

Plan Formulation Rationale. The Planning Guidance Notebook (ER 1105-2-100) and “Planning in a Collaborative Environment” (EC 1105-2-409) were considered in the formulation of alternatives.

A public meeting was held on October 28, 2006 at the University of New Orleans where more than 150 people were offered display space to present their plans. The meeting included a formal presentation of the study process and scope from the USACE and an open comment period for public statements from citizens, organizations, and elected officials. Public comments made in this meeting were evaluated in plan formulation for the Interim Report.

Federal, state and local government parties, environmental groups, landowners, navigation interests, other organizations, and individuals were invited to assist in plan formulation through a collaborative planning process. Through the collaborative process, several consensus measures emerged that were supported by many stakeholders. Recommendations varied from total closure to a sector gate with a draft of 28 feet, many of which were incorporated into the Interim Report. Collaborative planning continued after the submittal of the Interim Report.

Management Measures and Alternative Plans. For development of the deep-draft de-authorization plan, an initial array of alternatives was identified in the Interim Report. Some of these were eliminated from further consideration while others were modified in the Final Report to refine performance. The initial array of alternatives from the Interim Report is presented below:

Alternative 1 – Maintain a shallow-draft MRGO navigation channel.

- Alternative 1a – Maintain a shallow-draft navigation channel without a structure
- Alternative 1b – Construct a salinity control weir at Bayou La Loutre
- Alternative 1c – Construct a salinity control gate at Bayou La Loutre (normally closed)
- Alternative 1d – Construct a storm protection gate at Bayou La Loutre (normally open)

All of the shallow-draft channel Alternatives would include maintenance dredging of a 12 feet deep by 125 feet wide channel to match the dimensions of the GIWW.

Alternative 2 - Close the MRGO channel to deep-draft and shallow-draft vessels. Closure of the MRGO to all vessel traffic could be realized by blocking the channel via any of the following variations:

- Alternative 2a – Construct an armored earthen total closure structure across the MRGO at Bayou La Loutre;
- Alternative 2b – Restore both banks of Bayou La Loutre across the MRGO at Hopedale, Louisiana; or
- Alternative 2c – Fill in the entire MRGO channel from the GIWW to the Gulf of Mexico.

Alternative 3 - Cease all MRGO operations and maintenance activities (dredging, jetty repairs, and navigation aids). If Congress chooses to discontinue all activities related to maintaining the MRGO, several relic project features would need to be addressed, including navigation aids, such as buoys and lights and the offshore jetties located in Breton and Chandeleur Sounds. Development of a complete de-authorization plan should include disposal of these relic features.

Final Array of Alternatives.

Alternatives Eliminated from Further Study:

Interim Report Alternatives 1a – 1d

All of the alternatives identified in the Interim Report to Congress that included maintenance of the MRGO channel for shallow-draft navigation between the GIWW and the Gulf of Mexico were screened out based on economic analysis. The total average annual costs to maintain a 12-foot shallow-draft channel between the GIWW and the Gulf of Mexico is approximately \$6 million, whereas the estimated annual benefits are approximately \$1.2 million.

Interim Report Alternative 2b

This Alternative was eliminated because it achieves similar environmental and navigation results as Alternative 2a, but at approximately twice the cost. Also, when compared with Alternative 2a, there are additional negative impacts to recreational and commercial vessel users because access to Bayou La Loutre from the north is blocked.

Interim Report Alternative 2c

This Alternative was eliminated because of cost. A very rough estimate is that it would take approximately 250-350 million cubic yards of dredged material to fill the channel from mile 60 to mile 25 at a cost of about \$2.8 billion based on October 2006 price levels and could take from 15 to 44 years to complete.

Other Alternatives

Other alternatives were suggested after release of the Interim Report to Congress, including multiple closure locations, limited channel filling, bank restoration, and tree planting. These suggestions were eliminated from detailed analysis based upon assessment of potential costs, impacts to the environment, and effectiveness in meeting the study goals and objectives. The suggestions for multiple closures, limited channel filling, and bank restoration were screened from detailed analysis because of concerns about sediment availability, constructability, and costs. Tree or other vegetation planting was eliminated because of concerns about potential impacts to levees during storms.

Future Without De-authorization:

Since construction completion in 1968, the MRGO Project has been maintained at various depths and widths. For the past few years, the Inland Reach, the Sound Reach and Bar Channel have been maintained for one-way traffic only. Due to shoaling, the current controlling depth is approximately 22 feet. However, to determine whether it is economically feasible to maintain the project and evaluate the environmental impacts for various levels of maintenance including closure, the future without de-authorization is assumed to be a project maintained at the authorized dimensions. All alternatives will be compared to this future condition.

When dredged to its full, authorized dimensions, all material from the Inland Reach would be placed in upland disposal areas because of difficulties in locating marsh creation sites unencumbered with oyster leases. Following the restoration of the channel to its full dimensions, it would be maintained at a 500-foot bottom width for the 50-year period of analysis. A 600-foot bottom width would be maintained within the Bar Channel. However, future maintenance operations would depend on funding availability. Material from the Inland Reach would again be placed in upland confined disposal areas.

Alternatives Evaluated in Detail:

In order to prepare the Final Report to Congress and the Legislative Environmental Impact Statement, three Alternatives were developed for detailed evaluation. These are:

- Future Without De-authorization - The channel would be dredged to the Congressionally authorized dimensions of 500-foot bottom width in the Inland and Sound Reaches and a 600-foot bottom width in the Bar Channel. Dredged material would be used beneficially behind the jetties and on Breton Island. The channel would be maintained at these widths.
- Alternative 1 – Construct a Total Closure Structure Across the MRGO Near Bayou La Loutre Immediately;
- Alternative 2 – Phased Construction of a Total Closure Structure Across the MRGO Near Bayou La Loutre (phased construction would begin with a weir and be completed with a total closure structure);
- Alternative 3 – Cease All MRGO Operations and Maintenance Dredging Activities Immediately.

The following features are common to each of the alternatives:

- The MRGO channel would be de-authorized for navigation from mile 60 at the southern bank of the GIWW to the Gulf of Mexico.
- Aids to navigation and channel markers would be removed at the discretion of the United States Coast Guard.
- Existing bank stabilization features and jetties would be de-authorized, but left in place.

Alternative 1 – Construct a Total Closure Structure across the MRGO Near Bayou La Loutre Immediately

This alternative was developed to achieve positive closure of the MRGO channel and eliminate the possibility of through navigation upon de-authorization of the channel between the GIWW and the Gulf of Mexico.

Under this alternative the MRGO channel would be de-authorized for navigation from mile 60 at the southern bank of the GIWW to the Gulf of Mexico. A total closure structure would be constructed just south of Bayou La Loutre and tie in with the southern edge of the Bayou La Loutre Ridge to totally block the MRGO channel (see Figure 2.1). Aids to navigation and channel markers would be removed at the discretion of the United States Coast Guard. Existing bank stabilization features and jetties would be de-authorized, but left in place.

The total closure structure would be made of rock and built in one construction effort of 170 days, would be 25-30 feet wide on the top and its elevation at + 5 feet MLG. Side slopes of the structure would be 1 V on 2.5 H and the bottom would be 250-275 feet wide. The estimated total project construction cost of the total closure structure is \$17,451,000 based on October 2006 price levels and have an estimated average O&M cost of \$136,000 per year. Average annual net economic benefits would be \$7.8 million. Total project costs would be shared as follows: construction costs at 100% Federal; LERRDs at 100% non-Federal; and OMRR&R at 100% non-Federal.

Alternative 2 – Phased Construction of a Total Closure Structure Across the MRGO Near Bayou La Loutre (phased construction would begin with a weir and be completed with a total closure structure)

This alternative was developed as a variation of Alternative 1 that would allow a period of “free” shallow-draft navigation benefits while ultimately achieving the goal of positive closure of the MRGO channel.

Under this alternative, the MRGO channel would be de-authorized for navigation from mile 60 at the southern bank of the GIWW to the Gulf of Mexico. No additional funds would be used to maintain any channel on the MRGO between the GIWW and the Gulf of Mexico. A total closure structure would be constructed just south of Bayou La Loutre using sequenced construction and would tie in with the southern edge of the Bayou La Loutre Ridge to totally block the MRGO channel. The total closure structure would be constructed in two phases. Aids to navigation and channel markers would be removed at the discretion of the United States Coast Guard. Existing bank stabilization features and jetties would be de-authorized, but left in place.

The first phase would construct a rock closure containing a weir 125 feet wide by 14 feet deep, allowing safe passage of 12-foot draft vessels. It is possible that guide walls and dolphin cells would be needed to funnel marine traffic through the weir. Design optimization, including possible physical modeling, would be required to assess hydraulic performance and ensure safe navigability through such a structure. The estimated total project construction cost of phase I is \$16,608,145 based on October 2006 price levels. Construction of the first phase, the rock weir, would take an estimated 150 days.

Once complete, the first phase of construction would allow the passage of vessels with a draft of 12 feet or less. Under this phase, commercial and recreational vessels with a draft less than 12-feet could still use the MRGO until the channel filled in to a depth of 12 feet. The depth of the channel would be monitored. Once any reach filled in to a depth of less than 12 feet, Phase II construction would begin. It is estimated that some reaches of the MRGO would become impassible to vessels with greater than 12-foot draft in approximately 2014, based on the best engineering estimate available. This shoaling could occur at any time if a tropical storm or hurricane passes over the sound area. If there are no such disturbances, it could be sometime after 2014 that the channel depth would be reduced to 12 feet or less.

The second phase of construction would complete the total rock closure by filling the weir opening with rock. Construction would take an estimated 60 days. The completed structure would not allow passage of any vessels traveling the length of the MRGO. The elevation of the closure would be + 5 feet MLG. The estimated total project construction cost for the second phase is \$1,107,485 based on October 2006 price levels.

The estimated total project construction cost for Alternative 2 is \$17,715,630. Estimated average O&M cost for Alternative 2 is \$133,800 per year. The average annual net economic benefits for this phased total closure structure are \$8.1 million. Total project costs would be shared as follows: construction costs at 100% Federal; LERRDs at 100% non-Federal; and OMRR&R at 100% non-Federal.

Alternative 3 – Cease All MRGO Operations and Maintenance Dredging Activities Immediately

This alternative was developed to address the study purpose and need in the least costly and most expedient manner.

Under this alternative, the MRGO channel would be de-authorized for navigation from mile 60 at the southern bank of the GIWW to the Gulf of Mexico. No additional funds would be used to maintain any channel on the MRGO between the GIWW and the Gulf of Mexico. There would be no construction costs, except, 1) aids to navigation and channel markers would be removed at the discretion of the United States Coast Guard and, 2) the USACE would dispose of some existing disposal and channel easements. Existing bank stabilization features and jetties would be de-authorized, but left in place. Under this alternative, commercial and recreational shallow-draft vessels could still use the MRGO until the channel filled in to a depth that prohibited their navigation. It is estimated that some reaches of the MRGO would become impassible to vessels greater than 12-foot draft in approximately 2014, although, a tropical storm or hurricane could cause portions of the channel to shoal much sooner. Total project construction costs are estimated to be \$825,000 based on October 2006 price levels. Average annual net economic benefits

are estimated to be \$9.1 million. Total project costs would be shared as follows: construction costs at 100% Federal; LERRDs at 100% non-Federal; and OMRR&R at 100% non-Federal.

Alternative 2 Eliminated from Further Evaluation:

Alternative 2 would involve the phased construction of a total closure structure across the MRGO at Bayou La Loutre to allow the temporary passage of shallow-draft vessels. The phased construction approach would require a longer total construction duration and a higher total project construction cost than Alternative 1. The economic information available indicates that shallow-draft traffic on the MRGO between the GIWW and the Gulf of Mexico is not economically justified in terms of National Economic Development (NED) because the net economic benefit is less than unity. Therefore, the longer construction duration, longer implementation period, and additional total project construction cost (due to an additional construction mobilization and demobilization effort) of Alternative 2 compared to Alternative 1 is not justified. Based on this rationale, Alternative 2 was not carried forward for further evaluation and comparison.

Comparison of Alternatives. Alternatives 1 and 3 were analyzed using comparable information. When possible, the USACE used existing information, such as that employed for the Interim Report to Congress. In other cases, the USACE collected additional data or received input during stakeholder sessions. Alternatives were evaluated across a series of technical sectors including economics, engineering, environmental impacts and real estate. For this report, the USACE used the definition of deep-draft vessels contained in ER 1105-2-100 (Planning Guidance Notebook), which are those vessels requiring drafts greater than 14 feet. The following text provides a summary comparison of Alternatives 1 and 3.

Alternative 1 - Alternative 1 provides physical closure to eliminate attempted navigation on the channel after de-authorization. Alternative 1 immediately closes the MRGO to all navigation, which eliminates the “free” years of navigation benefits which could be realized prior to the channel filling in naturally. With this closure there is the potential for erosion to increase along the banks of Bayou La Loutre and other waterways if vessels currently using the MRGO channel utilize the other waterways as alternative routes; however, the positive impacts of the alternative far outweigh any adverse impacts to alternative routes. If authorized and fully funded, Alternative 1 could be built in one construction effort. Shallow-draft tows that use the MRGO as an alternate route when the IHNC is congested or unexpectedly closed could no longer do so. It yields the fewest average annual net economic benefits (\$7.8 million) because all navigation benefits are lost as soon as the total closure structure is constructed.

To ensure the recommended plan was fully integrated with recommendations that would be made under LACPR, the evaluation of Alternative 1 showed that it has the highest compatibility with other potential ecosystem restoration efforts being considered under LACPR, such as a freshwater diversion structure at Violet. Alternative 1 yields the most environmental benefits as it could prevent a significant percentage of the 2,343 net acres of marsh estimated to be lost over 50 years under the future without condition. Greater salinity reduction and vegetation change to historic habitat types is anticipated to occur over a larger area and in addition it is estimated that there could be a reduction in the size of the “H-A zone” in Lake Pontchartrain.

Alternative 3 - Alternative 3 does not achieve physical closure of the channel and therefore through navigation of the channel would be limited only by natural shoaling. Alternative 3 yields the greatest average annual net economic benefits (\$9.1 million) because it requires minimal investment and because shallow-draft navigation benefits would only be limited by natural shoaling within the channel. Alternative 3 has no construction costs, except 1) aids to navigation and channel markers would be removed at the discretion of the United States Coast Guard and 2) the USACE would dispose of some existing disposal and channel easements. This alternative could be implemented almost immediately after Congressional authorization and appropriation. Shallow-draft navigation would be affected over time

because the channel would not be maintained; however shallow-draft navigation would not be impeded by a structure. Most shallow-draft navigation would be unable to use the Sound Reach of the channel after about 2014. Shallow-draft tows that use the MRGO as an alternative route when the IHNC is congested or unexpectedly closed could no longer do so after about 2014.

Similar to Alternative 1, an evaluation of Alternative 3 showed that is not as compatible with the ecosystem restoration goals of LACPR as Alternative 1. It was estimated that slightly more marsh would be lost than under Alternative 3 resulting in fewer environmental benefits –while still significantly less than under the future without condition. A freshwater diversion structure at Violet could be more difficult to implement than under Alternative 1. For example, without a structure in the MRGO channel, a much larger freshwater diversion would be required at Violet, which would increase cost significantly and decrease the ability to control desired environmental results within the greater Pontchartrain Basin. In addition it is estimated that Alternative 3 is unlikely to influence salinity or marsh vegetation types or reduce the “H-A zone” in Lake Pontchartrain

As described above, the assessment of Alternative 3, raised questions about whether or not the alternative could be classified as comprehensive in not only formulating plans to de-authorize the MRGO but also to be fully integrated and consistent with the LACPR study and therefore responsive to the Congressional direction. In light of the Congressional authority, planning goals and objectives and stakeholder input, the USACE reached the conclusion that Alternative 3. is not comprehensive.

Table 2.1 Project Construction Costs by Alternative
Project Construction Costs by Alternative
(October 2006 Price Levels)

| <u>Construction Items</u> | <u>Alternative 1 Cost (\$)</u> | <u>Alternative 3 Cost (\$)</u> |
|---|------------------------------------|------------------------------------|
| Mobilization and Demobilization | 66,100 | |
| Stone Placement - Channel Proper | 10,494,000 | |
| Stone Placement - Overbank Tie-Ins | 243,000 | |
| Clearing and Grubbing (Overbank) | 16,200 | |
| Engineering and Design | 743,850 | |
| Construction Management | 1,082,000 | |
| Real Estate | 1,401,000 | 125,000 |
| Removal of Aids to Navigation | 700,000 | 700,000 |
| Contingencies | 2,704,850 | |
| Total Project Construction Costs | 17,451,000 | 825,000 |

Table 2.2 Average Annual Benefits and Costs by Alternative
Average Annual Benefits and Costs by Alternative
(October 2006 Price Level, 50-Year Period of Analysis, 4.875 Percent Discount Rate)

| | Alternative 1 | | Alternative 3 |
|---|----------------------|-----------------|----------------------|
| | Cost (\$) | | Cost (\$) |
| <u>Investment Costs</u> | | | |
| Total Project Construction Costs | 17,451,000 | | 825,000 |
| Interest During Construction | 307,000 | | 18,700 |
| Total Investment Cost | 17,758,000 | | 843,700 |
| <u>Average Annual Costs</u> | | | |
| Interest and Amortization of Initial Investment | 894,200 | | 42,300 |
| Deep-Draft Transportation Cost | 2,500,000 | | 2,500,000 |
| Shallow-Draft Transportation Cost | 1,200,000 | | 871,400 |
| OMRR&R | 136,000 | | |
| Total Average Annual Costs | 4,730,200 | | 3,413,700 |
| Average Annual Benefits | \$12,500,000 | | \$12,500,000 |
| Net Annual Benefits | \$7,769,800 | | \$9,086,300 |
| Benefit-Cost Ratio | | 2.6 to 1 | 3.7 to 1 |
| Benefit-Cost Ratio (computed at 7%)* | | 2.5 to 1 | 3.7 to 1 |

*Per Executive Order 12893

Key Assumptions. For this report, the USACE is using the definition of deep-draft vessels contained in ER-1105-2-100. This defines deep-draft as those vessels requiring greater than 14 feet.

Recommended Plan.

Rationale for Selecting the Recommended Plan

Immediate construction of a rock closure structure across the MRGO at Bayou La Loutre (Alternative 1) has been identified as the Recommended Plan. The Recommended Plan addresses the study authority as described in Public Law 109-234 and explained in House Report 109-494, and also fulfills the study purpose, need, goals and objectives which are derived from the study authority. The Recommended Plan presents a comprehensive plan to de-authorize the existing Federal Deep Draft Navigation Project on MRGO channel from the GIWW to the Gulf of Mexico; proposes that navigation function be maintained outside of the GIWW to Gulf of Mexico channel; proposes plan features; and proposes existing project features to be de-authorized or to remain authorized. While the Recommended Plan does not propose hurricane or storm damage reduction features, it was selected, over Alternative 3, because of its compatibility with the ecosystem restoration and storm protection goals of LACPR.. Additionally, the Recommended Plan is consistent with all of the alternatives being evaluated under LACPR and can be fully integrated into any of the LACPR plans under consideration. The Recommended Plan provides for reduced salinities in areas targeted for restoration under LACPR, LCA, CWPPRA, as well as, restoration efforts of other Federal and State agencies. Reduction in salinities will improve the effectiveness of, and likely reduce the cost of, ecosystem restoration measures planned for these areas. The MRGO Final Report and LEIS will be included as a full appendix of the LACPR Final Report due to Congress in December 2007.

In accordance with ER 1105-2-100, USACE project alternatives were formulated and evaluated considering the following four criteria:

Completeness

The Recommended Plan is the most complete plan because it provides for all the necessary investments to physically close the MRGO from the GIWW to the Gulf of Mexico. Present channel conditions accommodate navigation up to a 22 foot draft. Vessels may attempt to navigate the channel after it is de-authorized and it would remain a safety concern. Therefore, some form of positive closure of the channel should be constructed. The rock closure structure has lower average annual net economic benefits in terms of navigation than Alternative 3; however, its effectiveness, acceptability and completeness outweigh this factor. The closure structure is not part of a hurricane protection project.

Effectiveness

Construction of a rock total closure structure at Bayou La Loutre is the most effective plan across a range of goals and objectives. This plan results in physical closure of the waterway, yields the greatest environmental benefits, and is the best choice for integration into LACPR. The plan is estimated to prevent a significant percentage of the 2,343 net acres of marsh estimated might be lost under the future without de-authorization, would have the greatest salinity reduction, and is expected to change more wetland habitat types toward historic conditions over the largest area.

Efficiency

While the Recommended Plan is not the most cost-effective alternative, it is anticipated to be the most compatible with the ecosystem restoration and storm protection goals of LACPR. The Recommended Plan is also the most compatible with the project to construct storm protection measures for the IHNC because it eliminates the need for navigable hurricane protection structures on the MRGO.

Acceptability

The Recommended Plan is the most acceptable plan. St. Bernard Parish and the state of Louisiana favor this plan. However, navigation industry representatives have expressed concerns about impacts to their businesses and the desire for an alternative route around the IHNC Lock. The Recommended Plan is also in full compliance with applicable environmental laws and regulations.

Description of the Recommended Plan

The project delivery team has developed detailed design and cost information for the recommended plan. This information has been generated through the analysis of field engineering data recently collected at the proposed closure structure location. Field data includes bathymetric surveys and subsurface geotechnical borings. Engineering analysis of the information was used to developed design and cost information to a feasibility level of detail. This level of information was developed only for the recommended plan not the entire array of alternatives. This section of the report provides the feasibility level design and cost information. The team has not updated information in earlier parts of the report because the added information does not change plan selection. This assessment is based upon the initial screening of navigation alternatives and subsequent assessment that remaining alternatives involving rock would change proportionally with the recommended plan.

Under the Recommended Plan, that portion of the MRGO Federal Deep Draft Navigation channel from mile 60 at the southern bank of the GIWW to the Gulf of Mexico would be de-authorized. The MRGO channel (mile 66 – 60), the Michoud Canal Project, and the IHNC Lock Replacement Project would remain authorized. As part of the Plan, a closure structure would be built of rock downstream of the south ridge of Bayou La Loutre in St. Bernard Parish, Louisiana. The structure would connect the two sides of the ridge, a distance of approximately 950 feet. The top width of the structure would be 12 feet and the elevation would be + 7 feet NAVD 88. The side slopes of the structure would be 1 V to 2 H and the bottom width would be 450 feet. Quarry run “A” stone would be used to increase fines in the mix and minimize voids and water exchange. The structure would cover nearly 10 acres of water bottoms. In

addition, overbank extensions would be approximately 50 feet wide and 7 feet high and extend inshore approximately 150 feet on the south bank and approximately 250 feet on the north bank. Construction of these overbank extensions will impact 0.5 acres of marsh on the north bank and 0.3 acres of scrub shrub on the south bank. Approximately 391,500 tons of stone would be used. A barge-mounted dragline would be used to place the rock. Construction would take approximately 210 days. Every effort would be made to construct the closure structure during the May through September window when Gulf sturgeon are in the rivers and not the estuaries.

The Federal government would construct the total closure structure. Navigation aids and channel markers would be considered for removal after coordination with the United States Coast Guard. Existing bank stabilization features and jetties would be de-authorized but remain in place. Disposal easements and perpetual channel easements not required for continued operation and maintenance of authorized segments of the MRGO Project would be released. Other property not required for continued operation and maintenance of authorized segments of the MRGO Project would be disposed of in accordance with the Federal Property and Administrative Services Act of 1949, as amended, 40 U.S.C. § 471 et seq. A non-Federal sponsor would be required to acquire any real estate necessary to implement the Recommended Plan and for operation, maintenance, repair, rehabilitation, and replacement (OMRR&R) of the total closure structure. In addition, the non-Federal Sponsor would be required to hold and save the Government free from all damages arising from the construction, operation, maintenance, repair and replacement of the total closure structure, except for damages due to the fault or negligence of the Government or its contractors.

The construction costs of the total closure structure would be 100% Federal (except real estate) and the OMRR&R costs of the total closure structure would be 100% non-Federal. The estimated total project construction cost of the rock total closure structure is \$24,680,000 based on October 2006 price levels. Total average annual costs for the Recommended Plan (including OMRR&R costs and the costs to navigation) are estimated to be approximately \$5,140,000 and total average annual benefits are estimated to be \$12,500,000. This results in an estimated total average annual net benefit of \$7,360,000.

Additionally, the Recommended Plan contemplates that de-authorization would not extend to measures undertaken pursuant to the authorization provided under the heading "Operation and Maintenance" in Title I, Chapter 3 of Division B of Public Law 109-148, as modified by Section 2304 in Title II, Chapter 3 of Public Law 109-234. The Recommended Plan does contemplate, however, that OMRR&R of any measures constructed pursuant to that authorization would become a non-Federal responsibility at 100% non-Federal cost.

Systems / Watershed Context. The USACE is the lead agency. There are no cooperating agencies.

The LACPR effort is the primary systems/watershed effort of which the de-authorization study is a part. The Recommended Plan was identified because it is more compatible with the ecosystem restoration and storm protection goals of LACPR than Alternative 3. The plan is anticipated to prevent a significant percentage of the 2343 net acres of marsh estimated to be lost under the future without de-authorization, would have the greatest salinity reduction, and is expected to change more wetland habitat types toward historic conditions over the largest area. The Recommended Plan is consistent with all of the alternatives being evaluated under LACPR and can be fully integrated into any of the LACPR plans under consideration. The MRGO Final Report and LEIS will be included as a full appendix of the LACPR Final Report due to Congress in December 2007.

De-authorization of the MRGO eliminates an alternative navigation route around the IHNC Lock. The IHNC Lock was constructed in the 1920s and has been authorized for replacement to better accommodate modern maritime traffic. Options to implement the lock replacement are currently being developed in a Supplemental EIS. Occasionally the lock experiences multi-day delays associated with high use and more rarely the lock is closed to vessel traffic for prolonged maintenance. In the event of delay or

closure, the MRGO currently serves as an important link in an alternative route enabling traffic to by-pass the IHNC Lock and continue to points along the GIWW in Louisiana and neighboring states across the Gulf coast. The route is especially important for the movement of fuel, energy, and chemical products. However, the economic evaluation of deep draft and shallow draft commerce found no National Economic justification for continued Federal investment in an MRGO navigation channel. Working with stakeholders the study team identified four alternative by-pass routes around the IHNC Lock that would not involve a fully open MRGO channel. In addition, the team identified an emergency plan that would allow temporary removal of the MRGO rock closure to allow vessel passage. However, none of the identified routes or options has been endorsed by navigation industry users for varying reasons such as added travel time and expense and concerns about navigation safety raised by the U.S. Coast Guard.

Environmental Operating Principles.

The comprehensive plan to de-authorize the Mississippi River Gulf Outlet was developed recognizing and utilizing the U.S. Army Corps of Engineers Environmental Operating Principles. Foremost the effort to develop the plan centered on working with a diverse group of stakeholders in local government, businesses, Federal resource agencies, environmental organizations, and interested citizens. Communication lines with these stakeholders included an interactive web page with project a library, frequent roundtable meetings, and large public meetings launched using an open house philosophy. Development of the plan included display of USACE developed scientific information about the project area environment and acceptance of additional information from external scientists, engineers and business leaders. A key lesson in the process has been that working together enables diverse groups to understand various points of view and seek common solutions to problems.

In developing the MRGO de-authorization plan the project delivery team conducted a tabletop systems analysis to help understand the performance of various alternatives and to inform the decision making process with respect to other related actions or projects. Assessment of the plan includes recognition of environmental benefits and impacts and identification of relation to past actions and expected new initiatives. Two particular areas emerged for the team to further investigate and assessments of the interrelation to hurricane protection projects and navigation customer concerns are fully evaluated and detailed.

The recommended plan, total closure of the MRGO navigation channel, springs from the conclusions of an economic benefits analysis and embodies the coastal restoration needs of the area. Implementing the plan is expected to result in reduction in shoreline erosion, restoration of tidal circulation patterns, preservation of ecological diversity, and basin-scale enhancement of water quality in the Lake Borgne and Lake Pontchartrain estuaries. In the end, the MRGO de-authorization plan has not satisfied all of the stakeholders but all of the groups have remained committed to working together and to continuing to work with the Corps of Engineers. Further, the plan will compliment other local initiatives such as the Coastal Impact Assistance Program and the plan sets the stage for larger efforts through tie-ins to the Louisiana Coastal Protection and Restoration Plan or the Louisiana Coastal Area Ecosystem Restoration plan. As a single project, the recommended plan does not address all of the environmental issues identified in the estuaries of southeast Louisiana but it does establish a key water resources driver that will compliment other ongoing or future efforts.

Independent Technical Review.

The Independent Technical Review of the study is being lead by the Mobile District under the Planning Center of Expertise for Deep Draft Navigation out of the South Atlantic Division. Arrangements for the ITR were initially set up through the Galveston District in consultation with the New Orleans District and Mobile District teams as part of the development of the Interim Report to Congress. To incorporate broad experience and expertise members of the ITR team were drawn from districts nationwide including Nashville, New England, Jacksonville, Walla Walla, and Mobile. Disciplines represented on the ITR

include engineering, economics, environmental compliance, planning, real estate, and cost estimating. Reviews of the development of the report occurred as part of development of the Interim and Final Reports to Congress. Dr. Checks was employed to help manage the review of the Final Report. The ITR team found some difficulty in reviewing the report because it does not fit into traditional USACE planning category stages. In addition, the team identified some substantial concerns about the level of detail and the support for decision-making provided in the study report. However, despite these concerns the team could "not point to any specific concern regarding the function of the recommended plan."

EXPECTED PROJECT PERFORMANCE

**Project First Costs
MRGO Deep-Draft De-authorization Study
Closure Structure
(October 2006 Price Levels)**

| <u>Construction Items</u> | <u>Cost (\$)</u> |
|---|-------------------|
| Mobilization and Demobilization | 85,000 |
| Stone Placement - Channel Proper | 11,773,000 |
| Stone Placement - Overbank Tie-Ins | 403,650 |
| Crushed Stone Blanket | 3,400,000 |
| Geotextile Separator Fabric | 31,500 |
| Clearing and Grubbing (Overbank) | 11,000 |
| Engineering and Design | 1,094,300 |
| Construction Management | 1,591,800 |
| Real Estate* | 1,401,000 |
| Removal of Aids to Navigation | 700,000 |
| Contingencies | 4,193,000 |
| Total Project Construction Costs | 24,684,250 |

* \$125,000 of the first real estate costs are 100% federal for easement disposal.
\$1,276,000 for the remaining real estate costs are 100% non-Federal.

Equivalent Annual Costs and Benefits.

**Equivalent Annual Benefits And Costs
MRGO Deep-Draft De-Authorization Study
Closure Structure**

(October 2006 Price Level, 50-Year Period of Analysis, 4.875 Percent Discount Rate)

Investment Costs:

| | |
|----------------------------------|--------------|
| Total Project Construction Costs | \$24,684,250 |
| Interest During Construction | 452,000 |
| Total Investment Cost | \$25,136,250 |

Average Annual Costs:

| | |
|---|--------------|
| Interest and Amortization of Initial Investment | \$ 1,264,500 |
| Deep-Draft Transportation Cost | 2,500,000 |
| Shallow-Draft Transportation Cost | 1,200,000 |
| OMRR&R | 172,000 |
| Total Average Annual Costs | \$5,136,500 |

| | | |
|--------------------------------------|--------------|----------|
| Average Annual Benefits | \$12,500,000 | |
| Net Annual Benefits | \$ 7,363,500 | |
| Benefit-Cost Ratio | | 2.4 to 1 |
| Benefit-Cost Ratio (computed at 7%)* | | 2.3 to 1 |

*Per Executive Order 12893

Local Sponsor Responsibilities.

| | |
|--|-------------|
| First Costs – Real Estate (100% Local) | \$1,276,000 |
| Annual OMM&R (100% local) | \$172,000 |

Project Implementation. The Coastal Protection and Restoration Authority of Louisiana has sent a letter expressing interest as the non-Federal sponsor. The USACE will pursue formalization of the partnership for project implementation.

Operation, Maintenance, Repair, Rehabilitation, and Replacement (OMRR&R). OMRR&R will be 100% non-Federal responsibility. OMRR&R is estimated to be \$172,000 annually and includes OMRR&R of the total closure structure.

Key Social And Environmental Factors. Key social and environmental factors that were considered in plan formulation and plan selection are listed below:

- The Recommended Plan was identified because it is more compatible with the ecosystem restoration and storm protection goals of LACPR than Alternative 3, is consistent with all of the alternatives being evaluated under LACPR, and can be fully integrated into any of the LACPR plans under consideration.
- The Recommended Plan is the most compatible with the project to construct storm protection measures for the IHNC because it eliminates the need for navigable hurricane protection structures.
- The Recommended Plan is the most complete plan because it provides for all the necessary investments to physically close the MRGO from the GIWW to the Gulf of Mexico; Alternative 3 does not result in physical closure of the channel.

- The Recommended Plan has lower average annual net economic benefits in terms of navigation and is not as cost effective as Alternative 3; however, its effectiveness, acceptability and completeness outweigh this factor.
- The Recommended Plan yields greater environmental benefits than Alternative 3. (Environmental benefits are incidental and are not used to justify the Recommended Plan). The Recommended Plan is estimated to prevent the potential loss of a significant percent of the 1,863 net acres of marsh estimated to be lost under the future without de-authorization, would have the greatest salinity reduction, and is expected to change more wetland habitat types toward historic conditions over the largest area.
- The Recommended Plan is the most acceptable plan. St. Bernard Parish and the State of Louisiana have expressed support for total closure of the MRGO.

Other environmental commitments include: 1) Removal of aids to navigation and channel markers at the discretion of the United States Coast Guard. 2) Adopting seasonal construction windows and conservation practices to protect threatened Gulf sturgeon. 3) Full integration of the MRGO Deep-Draft De-authorization Recommended Plan into the LACPR Final Report to Congress.

Stakeholder Perspectives and Differences. Federal, state and local government parties, environmental groups, landowners, navigation interests, other organizations and individuals were invited to assist in preparation of the reports. A series of public stakeholder forums was held on October 18, 2006 and May 19, 2007 which included technical presentations and open discussions on topics such as wetlands, navigation, storm protection, and the local economy. Many of the measures from the stakeholder plans were incorporated into the Interim Report to Congress. Collaborative planning continued after the submittal of the Interim Report to Congress.

The document is an integrated report and LEIS. Therefore, the report is in full compliance with NEPA and related environmental regulations. The draft report and LEIS were made available for a 45-day public review and comment period which closed on September 4, 2007. Around 2,500 comment letters were received. The comments generally fall into the following categories: Support closing MRGO but want more environmental restoration; Support closing MRGO but want more storm surge protection; The shipping/oil industry indicates that their costs were underestimated and that repairing the IHNC needs to be addressed, they do not generally indicate support.