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CORPS OF ENGINEERS, NEW ORLEANS DISTRICT
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NEW ORLEANS, LOUISIANA 70160-0267

Regional Planning and
Environment Division South
Environmental Planning Branch

FINDING OF NO SIGNIFICANT IMPACT (FONSI)

ENVIRONMENTAL ASSESSMENT #542
LOUISIANA COASTAL AREA (LCA)
BENEFICIAL USE OF DREDGED MATERIAL PROGRAM AT TIGER PASS PROJECT
PLAQUEMINES PARISH, LOUISIANA

Description of the Proposed Action (Recommended Plan). The U.S. Army Corps of Engineers (USACE), New Orleans District (CEMVN), has recommended a plan for the Beneficial Use of Dredged Material at Tiger Pass, Plaquemines Parish, Louisiana (Project) to be implemented as part of the Louisiana Coastal Area (LCA), Beneficial Use of Dredged Material (BUDMAT) Program, using material removed from the hopper dredge disposal area (HDDA) located near the Head of Passes in the Mississippi River as identified by the Federal Standard. The Proposed Action is to restore an approximately 5,000' long, non-continuous ridge (23 acres without plantings), constructed to an elevation of +6.5' NAVD88 with a 200' wide base. The ridge will be backed by a 500 foot wide marsh platform (55 acres) constructed to a height of +3.5' NAVD88 along the north side of the ridge.

The ridge would begin approximately 1.9 miles west of LA Hwy 23 in Venice, LA and continue to the west along the north side of Spanish Pass, in an area of open water and surrounding marsh adjacent to Spanish Pass downstream of the intersection with Tiger Pass ("Project Area" or "disposal/deposition area") in lower Plaquemines Parish, Louisiana. The construction of the ridge would impact 22.95 acres of open water mingled with patches of existing intermediate marsh in the fill footprint and 1.09 acres of intermediate marsh in the access right-of-way. The access right-of-way would be 50 ft. wide to allow for dredge pipeline and earth-moving equipment ingress-egress and would remain in state-claimed water bottoms. The construction of the ridge and marsh platform would require approximately 1,650,000 cys of dredged material which will be sourced hopper dredge disposal area (HDDA). The HDDA dredged material will be sourced from the routine maintenance dredging of the Mississippi River (including Southwest Pass, and South Pass), in accordance with the Mississippi River Baton Rouge to the Gulf of Mexico Federal Navigation Project.

Dredged material would be removed from the HDDA using a cutterhead suction dredge, then loaded onto hopper barges, and transported by tugboat to a designated pump-out location where the material would be pumped through a floating pipeline to the Project Area. Earthen retentions dikes, closures, and weirs would be constructed at multiple locations in the Project Area to maximize retention of the material and minimize material from entering adjacent lands, waterways, and pipeline rights-of-way. The retention dikes are anticipated to degrade naturally over time, but USACE may require their removal by the Non-Federal Sponsor if necessary.

The Proposed Action (Recommended Plan) is an individual BUDMAT project to be implemented pursuant to Title VII of the Water Resources Development Act of 2007 ("WRDA 2007") which authorized an ecosystem restoration Program for the Louisiana Coastal Area substantially in accordance the January 31, 2005 Report of the Chief of Engineers. Section 7006(d) of WRDA 2007 specifically authorizes the LCA BUDMAT Program for the beneficial use of material dredged from federally maintained waterways in the coastal Louisiana ecosystem. The Louisiana Coastal Area (LCA), Louisiana, Beneficial Use of Dredged Material Program, January 2010, Final Programmatic Study Report and Programmatic Environmental Impact Statement (2010 LCA BUDMAT Report and PEIS), a component of the broader-scale 2004 Louisiana Coastal Area Ecosystem Restoration Study Report and Programmatic Environmental Impact Statement (2004 LCA Study and PEIS), was approved by the Director of Civil Works on 12 March 2010, and the Assistant Secretary of the Army (ASA), Civil Works (CW) signed a Record of Decision dated 13 August 2010. Environmental Assessment (EA) #542 tiers off of the 2004 LCA Study and PEIS and the 2010 LCA BUDMAT Programmatic Report and PEIS.

Factors Considered in Determination. CEMVN has assessed the impacts of "No Action" and the Recommended Plan on important resources, including but not limited to, navigation, wetlands, scrub-shrub, wildlife, aquatic resources/fisheries, essential fish habitat, threatened and endangered species, water and sediment quality, air quality, cultural resources, recreational resources, and visual resources (aesthetics). No significant adverse impacts were identified for any of these important resources. A Phase I, hazardous, toxic, and radioactive waste (HTRW) investigation was completed by USACE on January 19, 2016 and the risk of encountering HTRW in the implementation of the Recommended Plan is considered to be "low". No impacts have been identified that would require compensatory mitigation and all practical means of avoiding adverse environmental effects have been adopted. The Recommended Plan should result in an overall net benefit to wetland resources in the Project Area, through the restoration and creation of emergent wetland habitat which is of a higher value to fish and wildlife resources than the existing open water.

In correspondence dated December 4, 2015, the Louisiana Department of Natural Resources (LDNR) concurred that the Recommended Plan is consistent, to the maximum extent practicable, with the Louisiana Coastal Resources Program. The Louisiana Department of Environmental Quality (LDEQ) issued a State Water Quality Certification on February 1, 2016 and the Section 404(b)(1) was signed on February 2,

2016. In a letter dated May 20, 2015, the Louisiana State Historic Preservation Officer (SHPO) concurred that the Recommended Plan would have no effect on historic properties. Through correspondence dated October 20, 2015, the USFWS confirmed that the Recommended Plan is not likely to adversely affect any threatened or endangered species in the Project Area. CEMVN has concurred with, or resolved, all Fish and Wildlife Coordination Act recommendations contained in a letter from the U.S. Fish and Wildlife Service (USFWS) dated February 5, 2016. CEMVN has concurred with, or resolved, all comments addressing essential fish habitat contained in a letter from the National Marine Fisheries Service (NMFS) dated January 14, 2016.

Environmental Design Commitments. The following commitments, as recommended by the USFWS, are an integral part of the Recommended Plan:

1) Any design changes that may cause potential impacts to the human environment would be evaluated to determine whether additional NEPA analysis would be required.

2) If any unrecorded cultural resources are determined to exist within the Project Area boundaries, a CEMVN-PDR-RN archeologist would be notified and final coordination with the SHPO and THPO would occur. [CEMVN-PDR-RN/SHPO Standard Operating Procedure]

3) If the Recommended Plan is changed significantly or is not implemented within one year, CEMVN will reinitiate coordination with the USFWS to ensure that the Proposed Action would not adversely affect any Federally-listed threatened or endangered species, or their habitat (See USFWS letter of October 20, 2015).

4) All on-site personnel are responsible for observing water-related activities for the presence of manatee(s). All work, equipment, and vessel operation should cease if a manatee is spotted within a 50-foot radius (buffer zone) of an active work area. Once the manatee has left the buffer zone of its own accord (manatees must not be herded or harassed into leaving), or after 30 minutes have passed without additional sightings of manatee(s) in the buffer zone, in-water work can resume under careful observation for manatee(s).

5) Avoid adverse impacts to water bird colonies through careful design of Project features and timing of construction. The USFWS recommends that a qualified biologist inspect proposed work sites for undocumented nesting colonies during the nesting season. For areas containing nesting wading birds (i.e., herons, egrets, night-herons, ibis, and roseate spoonbills, anhingas, and/or cormorants), all activity occurring within 1,000 feet of a nesting colony should be restricted to the non-nesting period. For nesting brown pelicans, activity should be avoided within 2,000 feet of the colony. Activity is restricted within 650 feet of black skimmers, gulls, and terns.

6) The impacts to Essential Fishery Habitat should be discussed with the National Marine Fisheries Service to determine if the Project complies with the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), Magnuson-Stevens Act; P.L. 104-297, as amended) and its implementing regulations.

7) Access corridors across existing wetlands should be avoided if possible and impacted wetlands should be restored to a substrate elevation similar to the surrounding marsh. Flotation access channels in open water should be backfilled upon Project completion. Post-construction surveys (e.g., centerline surveys) should be taken to ensure access channels have been adequately backfilled and provided to the natural resource agencies for review.

8) To ensure that dredged material is placed to each particular habitat's specified elevations, USACE should use an updated NAVD88 datum (i.e., current geoid) consistent with the NAVD88 datum that is referenced for the elevations of existing marsh and water level in the Project Area.

9) Containment dikes should be breached or degraded to the settled elevations of the disposal areas after consolidation of the dredged sediments and vegetative colonization of the exposed soil surface, or a maximum of 2 years after construction.

10) The USFWS recognizes the value of submerged aquatic vegetation (SAV) habitat to fish and wildlife, including Federal trust resource species. If SAV is encountered, the USACE should avoid these areas if possible and utilize un-vegetated open water areas for marsh creation.

11) Further detailed planning of Project features (e.g., Design Documentation Report, Engineering Documentation Report, Plans and Specifications, Water Control Plans, or other similar documents) and any proposed change in Project features or plans should be coordinated in advance with the USFWS, NMFS, LDWF, EPA, and LDNR and the agencies should be provided with an opportunity to review and submit recommendations on the work addressed in those reports.

12) USACE regulations generally require monitoring and adaptive management plans for ecosystem restoration projects. USACE should coordinate with the USFWS during the development of any such plans.

13) Endangered Species Act (ESA) consultation should be reinitiated if the proposed Project features change significantly or are not implemented within one year of the last ESA consultation with the USFWS, to ensure that the Proposed Action does not adversely affect any federally listed threatened or endangered species or their habitat.

Public Involvement. The Recommended Plan has been coordinated with appropriate federal, state, and local agencies and businesses, organizations, and individuals

through the distribution of EA #542 on December 21, 2015 for review and comment. No comments were received from the public or any agencies during the review period. EA #542 is attached hereto, incorporated herein by reference, and made a part of this FONSI.

Conclusion. CEMVN has assessed the potential environmental impacts of the Recommended Plan and has determined that the Plan, if implemented, would have beneficial environmental effects through the creation of wetland habitats as detailed in EA #542. Based on EA #542, a review of agency and other comments received following the publication and distribution of EA #542, and the implementation of the environmental design commitments listed above, the District Engineer has determined that the Recommended Plan would have no significant impact on the human environment. Therefore, an Environmental Impact Statement will not be prepared.

9 March 2016
Date

Richard L. Hansen
Colonel, U.S. Army
District Commander

ENVIRONMENTAL ASSESSMENT

LOUISIANA COASTAL AREA
BENEFICIAL USE OF DREDGED MATERIAL PROGRAM
AT TIGER PASS PROJECT
PLAQUEMINES PARISH, LOUISIANA

EA # 542

U.S. Army Corps of Engineers
Mississippi Valley Division
Regional Planning and Environment Division South
New Orleans District

Contents

FIGURES

TABLES

APPENDICES

ENVIRONMENTAL ASSESSMENT

LOUISIANA COASTAL AREA
BENEFICIAL USE OF DREDGED MATERIAL PROGRAM
AT TIGER PASS PROJECT
PLAQUEMINES PARISH, LOUISIANA

EA # 542

1. Introduction

The U.S. Army Corps of Engineers (USACE), Mississippi River Valley Division, Regional Planning and Environment Division South, has prepared this Environmental Assessment (EA) for New Orleans District (MVN) to evaluate the potential impacts associated with the placement and beneficial use of dredged material removed during maintenance dredging of the hopper dredge disposal area (HDDA) located near the Head of Passes in the Federally-maintained Mississippi River as identified by the Federal Standard. The designated disposal site is located on the western side of the Mississippi River, adjacent to Spanish Pass, downstream of its intersection with Tiger Pass near Venice, in lower Plaquemines Parish, LA. The proposed action involves the restoration of a historic ridge that has eroded over time and the construction/restoration of a marsh platform on the leeward side of that ridge.

This EA has been prepared in accordance with the National Environmental Policy Act of 1969 (NEPA) and the Council on Environmental Quality's Regulations (40 CFR 1500-1508), as reflected in the USACE Engineering Regulation ER 200-2-2. This EA provides sufficient information on the potential adverse and beneficial environmental effects to allow the District Commander to make an informed decision on the appropriateness of an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI).

The Louisiana Coastal Area (LCA) Beneficial Use of Dredged Material (BUDMAT) Program authorization is based on the Programmatic EIS entitled *Louisiana Coastal Area, Louisiana, Ecosystem Restoration* and Record of Decision (ROD) signed 18 November 2005. The LCA BUDMAT at Tiger Pass Project (the Project) is being proposed under the LCA BUDMAT Program which has an approved Programmatic EIS entitled *Louisiana Coastal Area Beneficial Use of Dredge Material* Programmatic EIS and ROD dated 13 August 2010 which ROD is attached hereto as Appendix A. This EA #542 tiers off of the LCA BUDMAT Programmatic EIS, which is hereby incorporated by reference.

1.1 Proposed Action

Tiger Pass Project

MVN proposes to construct a ridge restoration project in the vicinity of Tiger Pass at a location adjacent to Spanish Pass and downstream of its intersection with Tiger Pass. A similar project was proposed as part of the State's 2012 Coastal Master Plan and Plaquemines Parish Ridge Restoration Program. The proposed action would involve restoration of a historic ridge that has subsided and eroded over time. (Figure 1) The feature would include construction of an approximately 5,000-foot long ridge (without planting) backed by a 500-foot wide marsh platform, in an area of open water and surrounding marsh. The ridge would serve as a means to reduce wave energy on the leeward side of the marsh. The Proposed Action is also referred to in this EA as the Recommended Plan or the Proposed Project.

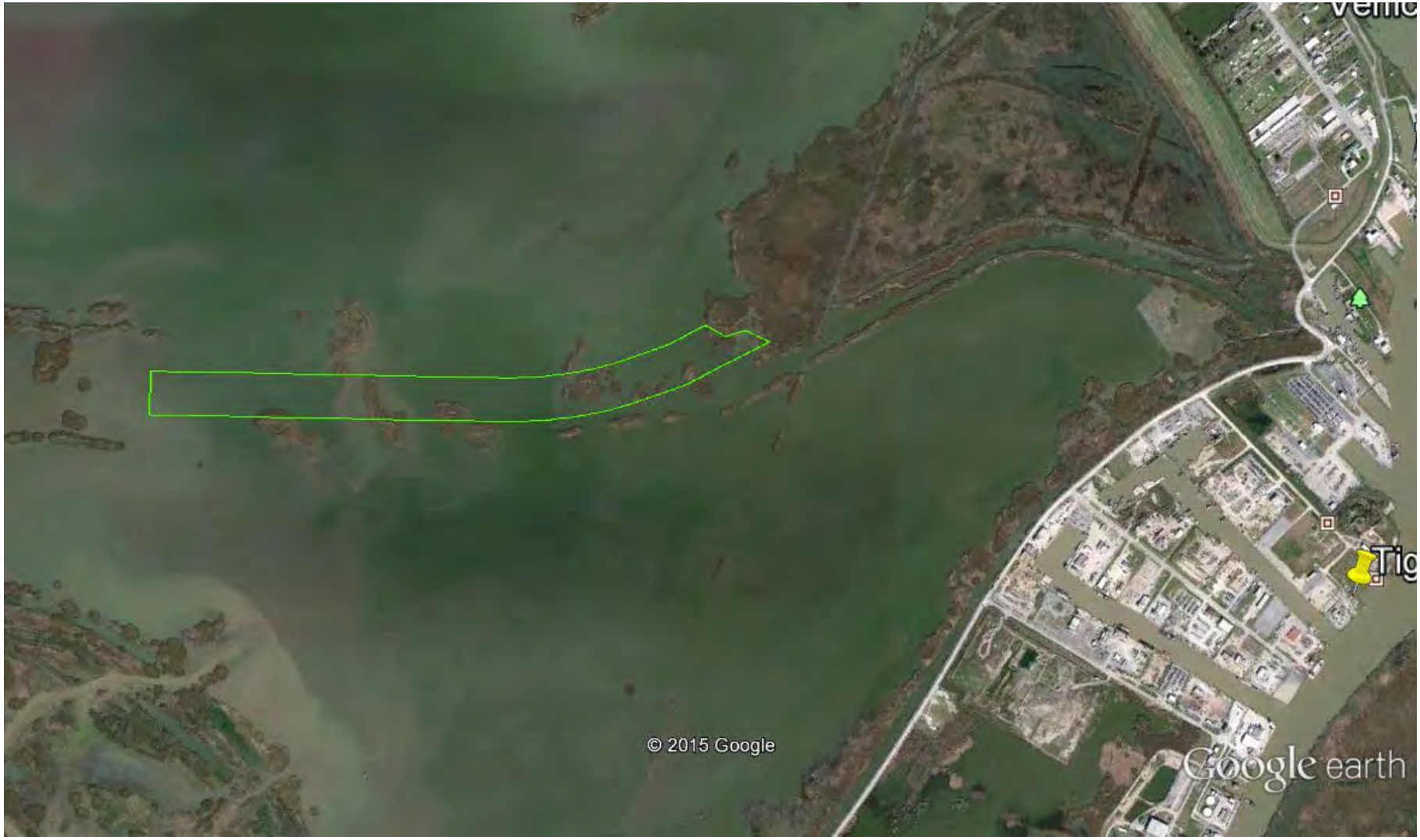


Figure 1: Tiger Pass Project Location

1.2 Authority

Title VII of the Water Resources Development Act of 2007 ("WRDA 2007") (PL 110-114) authorized an ecosystem restoration Program for the Louisiana Coastal Area substantially in accordance with the Near-Term Plan identified in the 2005 Chief's Report. Section 7006(d) of WRDA 2007 authorizes the Secretary, substantially in accordance with the Report of the Chief of Engineers dated January 31, 2005, to implement a program for the Beneficial Use of Dredged Material dredged from federally maintained waterways in the coastal Louisiana ecosystem.

Construction of the subject BUDMAT project at Tiger Pass would be implemented using materials dredged from the HDDA in association with the operation and maintenance of the Mississippi River Ship Channel, Baton Rouge to the Gulf of Mexico, Louisiana project. That project is authorized under the Rivers and Harbors Acts of 1946 and 1962, the Supplemental Appropriations Act of 1985, and the Water Resources Development Act of 1986 (Public Law 99-662), as amended.

1.3 Purpose and Need for the Proposed Action

Louisiana has 30 percent of the total coastal marsh and accounts for 90 percent of the coastal marsh loss in the lower 48 states (Dahl 2000, Field et al. 1991, USGS 2003). There is widespread public support to avert further loss of coastal habitats and to beneficially use dredged material in support of that effort. In response to the recognition of the need to reduce Louisiana Coastal wetland loss, activities like the proposed project, that are conducted under the LCA BUDMAT Program would optimize the use of dredged materials resulting from the maintenance of the federally maintained navigation channels in the Mississippi River in support of ecosystem restoration beneficial use projects.

Maintenance dredging of the Gulf of Mexico entrance channels to the Mississippi River is needed to ensure safe passage of commercial shipping from the Gulf to upriver ports of call. The Southwest Pass of the Mississippi River provides deep-draft access to the New Orleans – Baton Rouge port corridor and its associated, commerce and industries. Hopper-dredged material dredged in connection with maintenance dredging of Southwest Pass is either deposited at the HDDA or deposited in a designated ocean dredged material disposal site. When the HDDA is nearly full, dredged material is excavated and moved to permanent disposal locations, thereby maintaining storage capacity in the HDDA so that maintenance dredging in Southwest Pass may continue uninterrupted.

Projects proposed and constructed under the LCA BUDMAT Program call for the beneficial use placement of these dredged materials in locations identified as supporting ecosystem restoration efforts in coastal Louisiana. These BUDMAT disposal locations are located beyond the disposal areas that would otherwise be identified under the Federal Standard as the base operations and maintenance disposal plan for a navigation project. The objective of the proposed action would be to (1) restore critical coastal geomorphic landscape and habitat in the vicinity of Tiger Pass, LA and (2) restore coastal wetland habitat in the vicinity of Tiger Pass, LA.

Federal General Investigation's funds for Fiscal Year 2013, included funds for USACE to initiate the design of the LCA Program, which can include individual beneficial use of dredged material projects located in Plaquemines Parish, Louisiana which are elements of the overall LCA Program. A Design Agreement between the Department of the Army and the Plaquemines Parish Government of Louisiana ("Non-Federal Sponsor") was executed on 6 August 2014 for the placement of material dredged during maintenance dredging of the Mississippi River, Baton Rouge to the Gulf of Mexico, Louisiana Project in the vicinity of Tiger Pass which is generally located in

the Gulf of Mexico approximately 12 miles above Head of Passes, Southwest Pass, and South Pass near Venice, Louisiana, for purposes of wetland/marsh creation, and Chenier and ridge restoration and development.

The objective of the proposed action would be to (1) restore critical coastal geomorphic landscape and habitat in the vicinity of Tiger Pass, LA to a condition to last, at least in part, through the year 2066 and (2) restore coastal wetland habitat in the vicinity of Tiger Pass, LA to a condition, at least in part, through the year 2066.

1.4 Prior NEPA Documents

EA #535 entitled "West Bay Marsh Creation Tier 1, Louisiana Coastal Area Beneficial Use of Dredge Material Program, Plaquemines Parish, Louisiana" with a signed FONSI dated 23 March 2015.

EA #517 entitled "Mississippi River, Baton Rouge to the Gulf of Mexico, Louisiana Designation of Additional Disposal Areas for Head of Passes, Southwest Pass, and South Pass, Plaquemines Parish, Louisiana" with a signed FONSI dated 22 November 2013.

Programmatic EIS entitled "Louisiana Coastal Area Beneficial Use of Dredged Material Program" with a signed ROD dated 13 August 2010.

Programmatic EIS entitled "Louisiana Coastal Area, Louisiana, Ecosystem Restoration Program, November 2004" with a signed ROD dated 18 November 2005.

1.5 Prior Beneficial Use Studies and Reports

Additional information on other BUDMAT activities in the vicinity of this project is available online as New Orleans District Environmental Dredging Conference materials and beneficial use reports: http://www.mvn.usace.army.mil/About/Offices/Operations/BeneficialUseofDredgedMaterial.aspx

A number of studies, reports, and environmental documents on water resources development in the Project Area have been prepared by the USACE, other Federal, state, and local agencies, research institutes, and individuals. The more relevant prior studies, reports, and projects are described as follows in Table 1:

Table 1: Prior Studies and Reports

Project Year	Study/Report/Environmental Document Title	Document Type
1945	Mississippi River, Baton Rouge to the Gulf of Mexico, LA (USACE)	Study Report
1964	Mississippi River and Tributaries project (USACE)	Study Report
1976	Mississippi River and Tributaries, Levees and Channel Improvement	Environmental Impact Statement (EIS)
1980	Mississippi Deltaic Plain Region Ecological Characterization (USFWS)	Technical Report
1981	Deep-Draft Access to the Ports of New Orleans and Baton Rouge, LA (USACE)	Report
1982	Louisiana's Eroding Coastline: Recommendations for Protection (LADNR)	Report
1982	Proceedings of the Conference on Coastal Erosion and Wetland Modification in Louisiana: Causes, Consequences, and Options (USFWS)	Conference Proceedings

1982	Mississippi River Ship Channel, Gulf to Baton Rouge, Louisiana (USACE)	Environmental Assessment (EA) #62
1984	Mississippi and Louisiana Estuarine Areas (USACE)	Feasibility Report
1988	Marsh Creation, Mississippi River Outlets, Louisiana (USACE)	EA #77
1989	Louisiana Coastal Area (LCA), Hurricane Protection (USACE)	Recon Report
1990	Land Loss and Marsh Creation, St. Bernard, Plaquemines, and Jefferson Parishes, LA (USACE)	Study Report
1990	Louisiana Coastal Authority entitled Mississippi River Delta Study (USACE)	Recon Study
1993	The Louisiana Coastal Wetlands Restoration Plan (CWPPRA)	Plan
1994	An Environmental –Economic Blueprint for Restoring the Louisiana Coastal Zone: The State Plan for the Wetlands Conservation and Restoration Authority (Governor's Office of Coastal Activities Science Advisory Panel)	Report
1995	A White Paper-The State of Louisiana's Policy for Coastal Restoration Activities. (state of Louisiana)	Report
1997	Mississippi River and Tributaries	EIS
1998	Coast 2050: Toward a Sustainable Coastal Louisiana (CWPPRA/State joint effort)	Report
1999	Section 905(b) (WRDA1986) Analysis Louisiana Coastal Area, Louisiana –Ecosystem Restoration (USACE)	905(b) Report
2000	Mississippi River Outlets, Vicinity of Venice, LA, Baptiste Collette Maintenance Dredging, Beneficial Use of Dredged Material, Plaquemines Parish, LA	EA #305
2000	Mississippi River Sediment, Nutrient and Freshwater Redistribution (CWPPRA)	Feasibility Study
2004	LCA, Louisiana, Ecosystem Restoration Study	Study and Programmatic Environmental Impact Statement (PEIS)
2008	Mississippi River, Baton Rouge to the Gulf of Mexico, LA. Designation of Additional Disposal Area, Pass a Loutre, South Pass, Plaquemines Parish, LA	EA #268b
2010	LCA, Beneficial Use of Dredge Material Program	Programmatic Study Report and PEIS
2011	LCA, Medium Diversion at White Ditch	Feasibility Study and EIS
2013	Mississippi River, Baton Rouge to the Gulf of Mexico, LA, Designation of Additional Disposal Areas for Head of Passes, Southwest Pass, and South Pass, Plaquemines Parish, LA	EA #517
2015	LCA, Beneficial Use of Dredged Material at West Bay	Design and Implementation Report and EA #535

1.6 Public Concerns

The public is concerned about maintaining safe and efficient navigable channels in support of commercial activity associated with Mississippi River ports. Additionally, as described in greater detail in Section 2.1 of 2004 LCA BUDMAT Programmatic EIS, Louisiana has 30 percent of the total coastal marsh and accounts for 90 percent of the coastal marsh loss in the lower 48 states (Dahl 2000, Field et al. 1991, USGS 2003). There is widespread public support to avert further loss of coastal habitats and to beneficially use dredged material in support of that effort.

2. Alternatives Including the Proposed Action

Alternative plans for BUDMAT Projects are developed with the level of detail necessary to select a justified, acceptable, and implementable plan that is consistent with Federal law and policy and, to the extent that the project authorization, law and policy permit, consistent with the goals of the Non-Federal Sponsor. Benefit and cost, risk and uncertainty, cost effectiveness, and incremental cost analyses are undertaken using procedures that are most appropriate for the scope and

complexity of this Project. Opportunities to reasonably avoid or minimize adverse environmental impacts and mitigation requirements are considered in formulating the proposed action. The Project Delivery Team (PDT) relies on existing data and existing environmental clearances for other USACE projects that are located within the project area to expedite the completion of this document. Additionally, the locations of all alternatives under consideration are generally in open water to minimize real estate issues. The appropriate National Ecosystem Restoration benefits are used and appropriate environmental considerations taken into account by the PDT in selecting the proposed action which demonstrates acceptability, completeness, effectiveness, and efficiency.

In formulating alternatives to maximize the benefits achieved from beneficially utilizing dredged material for ecosystem restoration, such as ridge and marsh restoration in the vicinity of Tiger Pass, several management measures were identified to address coastal habitat degradation in the project area.

Measure 1: (Restoration of coastal ridge habitat)

This measure involves the construction of land, above water and above typical wetland elevation, along the footprint of a degraded coastal ridge. The ridge would be constructed using material dredged during federal O&M navigation channel maintenance dredging activities. Dredged material would be deposited to an elevation conducive to the establishment of representative vegetation for ridge habitat.

- Coastal ridge habitat is unique to southeastern coastal Louisiana and is a critical component of the coastal wetland complex. Ridge habitat provides refuge, resting and nesting habitat necessary for terrestrial and avian wildlife species and essential habitat for Neotropical migrants. Ridges are associated with distributaries from the Mississippi River formed from the deposition of heavier materials adjacent to and along the bankline during periods of high water or flooding. These areas tend to be high enough above water that they lack wetland characteristics and are usually colonized by hardwood species. In most cases, the distributary has been cut off from the its source of material so over time the ridge settles under its own weight or is degraded through natural or anthropogenic causes or both.

Although technically feasible, Measure 1 was screened based on utility as a standalone feature in relation to its surroundings. While a ridge is significant in terms of being an important component of the coastal wetland complex, a ridge extending out into open water on its own provides little habitat value and might be more susceptible to adverse coastal conditions.

Measure 2: (Restoration of coastal wetland habitat)

This measure involves the construction of marsh in areas of open water to restore previously existing marsh habitat. Marsh would be constructed using material dredged during federal O&M navigation channel maintenance dredging activities. Dredged material would be deposited to an elevation conducive for wetland development.

- The entire Louisiana coast is losing valuable coastal wetland habitat. In some areas the rate of wetland loss is as high as 25 square miles per year. Wetlands provide diverse habitat between the open waters of the Gulf of Mexico and upland habitat or coastal ridges. Numerous fisheries species and aquatic and non-aquatic wildlife species utilize wetlands as refuge, nursery grounds, and a source of food.

Measure 3: (Restoration of a coastal ridge and wetland complex)

This measure involves the construction of a coastal ridge and wetland simultaneously in the same location. The coastal ridge would be constructed above water and above typical marsh elevation, along the footprint of a degraded coastal ridge. The marsh would be constructed in areas of open water to restore previously existing marsh habitat parallel and adjacent to the coastal ridge habitat. The coastal ridge and marsh would be constructed using material dredged during federal O&M navigation channel maintenance dredging activities. Dredged material would be deposited to an elevation conducive to the establishment of representative vegetation for coastal ridge habitat and to an elevation conducive for wetland development.

- Coastal ridge habitat is associated with wetland habitat on the landward side of a ridge face. This ridge and marsh create a mosaic of diverse habitats in close proximity to one another with upland habitat adjacent to wetlands. The ridges of coastal Louisiana are unique features that provide critical habitat to many species of aquatic and non-aquatic wildlife. These areas provide refuge, resting and nesting habitat as well as a food source. The ridge also provides protection to wetland habitat, which provide fish and wildlife habitat, by reducing storm surge and protecting the estuary behind it from dynamic tidal fluctuations, waves, and (depending on location) salinity intrusion.

Measure 4: (Restoration of colonial nesting and wading bird habitat)

This measure involves the construction of an island feature in areas of open water. The island would be constructed using material dredged during federal O&M navigation channel maintenance dredging activities. Dredged material would be deposited to an elevation that is not conducive for marsh development while at the same time it does not promote the recruitment of vegetation typical of, for example, a coastal ridge.

- Commonly associated with coastal barrier systems or other areas where mud flats are exposed during low tide. These features provide nesting, resting, and foraging habitat for numerous wetland dependent avian and wildlife species.

2.1 Planning Goals, Objectives and Constraints

The intent of the proposed action is to the maximize beneficial use of dredged material deposited in the HDDA from O&M of the Federally-authorized Mississippi River, Baton Rouge to the Gulf of Mexico navigation channel in the vicinity of Venice, LA. The materials removed from the HDDA pursuant to the LCA BUDMAT Program at Tiger Pass project will be deposited in manner to maximize habitat output above current limitations imposed on the Federal navigation project by the navigation project's Federal Standard. The planning horizon, or period of analysis, for this project is 50 years.

Planning Goals

1) Maximize use of dredged material removed during routine O&M dredging of a Federal navigation channel in order to reduce impacts to remaining coastal habitat and critical infrastructure (i.e., coastal wetlands, hurricane and storm damage risk reduction features, etc.);
2) Maximize use of dredged material removed during routing O&M dredging of a Federal navigation channel in order to increase and or restore severely degraded or lost coastal habitat features.

Planning Objectives

1) Increase or restore critical coastal geomorphic landscape and habitat in the vicinity of Tiger Pass, LA, and.

2) Increase or restore coastal wetland habitat in the vicinity of Tiger Pass, LA.

Planning Constraints

The constraints identified in the LCA BUDMAT Program remain applicable for the proposed action and include those associated with restrictions to operate within existing authorized Federal navigation channels, funding limitations, sediment transport limitations, dredge source material type, hazardous, toxic, and radioactive waste concerns, unidentified cultural resource materials, and threatened and endangered species.

The following excerpt from the January 2010 Louisiana Coastal Area Beneficial Use of Dredged Material Program, Final Programmatic Study Report and Environmental Impact Statement ("2010 Report"), January 2010 programmatic BUDMAT report (pp iv & 81) explains funding constraints:

> *"Funding limitations – Currently, the minimum incremental placement cost per cubic yard (cy) of material dredged is approximately $1 per cubic yard with sediments dredged from Southwest Pass using a theoretical hopper dredged pump-out scenario. Even if this low incremental cost could be applied to beneficial use projects coast wide, beneficially using an additional 20 mcy of dredged material per year would require funding of approximately $20 million per year. It is estimated that the BUDMAT Program would be funded at $10 million over a 10-year period. Thus, the estimated funding made available through the BUDMAT Program would be insufficient to beneficially use a large portion of dredged material generated in any given year."*

2.2 Description of Alternatives

The PDT combined the measures to formulate the following alternatives:

- *1a* - 2,500 foot Ridge and Marsh Restoration (with planting, vicinity of Tiger Pass);
- *1b* - 2,500 foot Ridge and Marsh Restoration (without planting, vicinity of Tiger Pass);

These alternatives, both the planting and without planting scenarios, would restore a portion of the historic ridge that once ran along the banks of Spanish Pass, and restore marsh habitat on the leeward side of the restored ridge. Since Spanish Pass was cut off from the Mississippi River, the historic ridge (and associated marsh) has subsided and eroded through time. Construction would include a 2,500 foot long non-continuous ridge approximately 1.9 miles west of LA Hwy 23 in Venice, LA continuing west along the north side of Spanish Pass. Gaps would be left in the ridge, and the adjacent marsh platform, at locations where pipeline rights of way have been identified. The earthen ridge would be backed by a 500 foot wide marsh platform, (approximately 29 acres) along the entire length of the ridge on its north side. Construction would require approximately 825,000 cys of dredged material. The ridge and marsh platform features would serve as a means to reduce wave energy on the leeward side.

Under alternative 1a, the planting scenario, the ridge would be planted with woody vegetation post-construction, while under alternative 1b, the non-planting scenario, the ridge would be left to natural recruitment and colonization of vegetation.

- *2a* - 5,000 foot Ridge and Marsh Restoration (with planting, vicinity of Tiger Pass);
- *2b* - 5,000 foot Ridge and Marsh Restoration (without planting, vicinity of Tiger Pass);

These alternatives, both the planting and non-planting scenario, would restore a portion of the historic ridge that once ran along the banks of Spanish Pass and restore marsh habitat on the leeward side of the restored ridge. Construction would include a 5,000 foot long non-continuous ridge approximately 1.9 miles west of LA Hwy 23 in Venice, LA continuing west along the north side of Spanish Pass. Gaps would be left in the ridge, and the adjacent marsh platform, at locations where pipeline rights of way have been identified. The earthen ridge would be backed by a 500 foot wide marsh platform, (approximately 55 acres), along the entire length of the ridge on its north side. Construction would require approximately 1,650,000 cys of dredged material. The ridge and marsh platform features would serve as a means to reduce wave energy on the leeward side of the project.

Under alternative 2a, the planting scenario, the ridge would be planted with woody vegetation post-construction, while under alternative 2b, the non-planting scenario, the ridge would be left to natural recruitment and colonization of vegetation.

- *3a* - 7,500 foot Ridge and Marsh Restoration (with planting, vicinity of Tiger Pass);
- *3b* - 7,500 foot Ridge and Marsh Restoration (without planting, vicinity of Tiger Pass);

These alternatives, both the planting and non-planting scenarios, would restore a portion of the historic ridge that once ran along the banks of Spanish Pass and restore marsh habitat on the leeward side of the restored ridge. Construction would include a 7,500 foot long non-continuous ridge starting approximately 1.9 miles west of LA Hwy 23 in Venice, LA continuing west along the north side of Spanish Pass. Gaps would be left in this segment of the ridge, and the adjacent marsh platform, at locations where pipeline rights of way have been identified. The earthen ridge would be backed by a 1000 foot wide marsh platform (approximately 167 acres) along the entire length of the ridge on its north side. Construction would require approximately 4,000,000 cys of dredged material. The ridge and marsh platform features would serve as a means to reduce wave energy on the leeward side of the project.

Under alternative 3a, the planting scenario, the ridge would be planted with woody vegetation post-construction, while under alternative 3b, the non-planting scenario, the ridge would be left to natural recruitment and colonization of vegetation.

- *4* - Venice Ponds Marsh Restoration (vicinity of Tiger Pass);

Originally proposed as the "Coastal Wetlands Planning, Protection and Restoration Act Marsh Restoration – 15 (CWPPRA MR-15) - Venice Ponds Marsh Creation", this alternative provides for the creation of marsh within 2 proposed restoration sites designated as Sites TP-4A and TP-4B. This deposition site is located south east of the community of Venice, LA, in Plaquemines Parish, beginning at the fork of Tiger Pass and Grand Pass. Restoration sites TP-4A and TP-4B measure approximately 95 and 97.5 acres in size, respectively for a total of approximately 192.5 acres or 114.89 AAHUs. Habitat restoration benefits would be obtained through the deposition of approximately 2,000,000 million cys total of dredged material deposited into both restoration sites.

This alternative would involve the construction of earthen retentions dikes, closures and weirs at each site. These retentions features would be required to retain the dredged fill to reach an elevation conducive to the development of wetlands, as well as to prevent the material from entering adjacent lands, waterways, and pipeline canals. Material necessary for dike, weir and closure construction would come from within the restoration sites. The perimeter retention dikes

would be constructed inside the marsh and to an elevation of +6-feet NAVD88, with 1 on 5 side slopes.

- *5* - Bird Island Construction (vicinity of Tiger Pass);

This alternative would restore coastal bird nesting habitat for migratory shorebirds and would be constructed using a cutterhead dredge in conjunction with O&M maintenance dredging of the HDDA and assumes a submerged dredge pipeline is already installed across the navigation channel. Dredged material would be placed at the site of the Bird Island, located at approximately Tiger Mile 8.2 which is referenced to Mile 0.0 at the Jump in Venice, LA where Grand Pass meets the Mississippi River. The island would be constructed to be approximately 26 acres at the water's surface, assuming that elevation is approximately 0.0 NAVD88. Unconfined dredged material would be placed to a maximum initial elevation of +5.5-feet NAVD88 with an expected elevation of +3.5 feet NAVD88 following settlement. The dredge pipe and equipment would access the site via a designated access corridor at approximately (Tiger Pass) Mile 6.6.

Dredged material quantities estimated to be approximately 670,000 cubic yards are based off of an assumption that material would stack to a 1 on 50 natural angle of repose, and subdivided in the event good sand is encountered and slopes closer to 1 on 25 are actually achieved. The character of material would be contingent upon the location of borrow in the HDDA at the time this work is carried out, with better sands available nearest the Mississippi river ship channel. Approximate dimensions of the island, located west of Tiger Pass in open water, are 1,000 feet North-South by 1,400 feet East-West. The total quantity of 670,000 cubic yards is the gross cubic yardage that is estimated to be required to construct the bird island.

- *6* - Combinations of Ridge and Marsh Restoration with Venice ponds (vicinity of Tiger Pass);

This alternative consists of combining alternatives 1a, 1b, 2a, 2b, 3a, or 3b with alternative 4. The ridge and marsh alternatives (1a thru 3b) are mutually exclusive and cannot be combined together to make one longer ridge.

- *7* - Combinations of Ridge and Marsh Restoration with Bird Island (vicinity of Tiger Pass);

This alternative consists of combining alternatives 1a, 1b, 2a, 2b, 3a, or 3b with alternative 5. The ridge and marsh alternatives (1a thru 3b) are mutually exclusive and cannot be combined together to make one longer ridge.

- *8* - Combination of Venice Ponds and Bird Island Construction (vicinity of Tiger Pass);

This alternative consists of the combining alternative 4 (Venice Ponds Marsh Restoration) with alternative 5 (Bird Island Construction)

Screening

The initial list of alternatives were screened based on ability to meet the project purpose and need, planning constraints, technical feasibility, and likelihood for implementation.
The alternatives screened out early are as follows:

3a & 3b - 7,500 foot Ridge and Marsh Restoration (with and without planting, vicinity of Tiger Pass): These alternatives are technically feasible, meet all project planning goals and objectives, but cannot be implemented because of Project schedule and funding constraints.

The HDDA is dredged every two years on average. Implementing either of these alternatives would exceed the current appropriated BUDMAT funds and future federal funding beyond FY17 is uncertain. Therefore, there is high risk of aligning BUDMAT appropriations with O&M activities of the HDDA.

4 - Venice Ponds Marsh Restoration (vicinity of Tiger Pass): Venice Ponds Marsh Restoration (vicinity of Tiger Pass): This Alternative is technically feasible, but does not meet all project planning goals and objectives and cannot be implemented because of project schedule and funding constraints. Implementing this plan would exceed the current appropriated BUDMAT funds and future federal funding beyond FY17 is uncertain. Therefore, there is high risk of aligning BUDMAT appropriations with O&M activities of the HDDA.

5 - Bird Island Construction (vicinity of Tiger Pass): This alternative is technically feasible and avoids planning constraints, but cannot be implemented because it does not meet the project purpose and need. This alternative was eliminated because of the expense to construct the alternative with little return on benefits. Although dredged material is available in Tiger Pass, the dredged material is not suitable for construction of a bird island in open water. Furthermore, using BUDMAT resources at this location is not supported by the non-federal sponsor.

The following combinations of alternatives are technically feasible and meet the project purpose and need, but were screened from further evaluation because in each case the alternatives include features that cannot be imple,ented as stated previously in this Section. (see Alternatives 3a & b, 4 and 5).

6 - Combinations of Ridge and Marsh Restoration with Venice ponds (vicinity of Tiger Pass);

7 - Combinations of Ridge and Marsh Restoration with Bird Island (vicinity of Tiger Pass);

8 - Combination of Venice Ponds and Bird Island Construction (vicinity of Tiger Pass);

9 - Combinations of all alternatives (vicinity of Tiger Pass).

1a - 2,500 foot Ridge and Marsh Restoration (with planting, vicinity of Tiger Pass);
1b - 2,500 foot Ridge and Marsh Restoration (without planting, vicinity of Tiger Pass)

2a - 5,000 foot Ridge and Marsh Restoration (with planting, vicinity of Tiger Pass);
2b - 5,000 foot Ridge and Marsh Restoration (without planting, vicinity of Tiger Pass)

Final Array of Alternatives

Of the remaining alternatives, four alternatives, were carried forward for more detailed environmental analysis.

Table 1 compares the costs and benefits of the FWOP conditions along with the four action alternatives of the final array. Benefits were calculated by the United States Fish and Wildlife Service (USFWS) for the MVN using the WVA methodology.

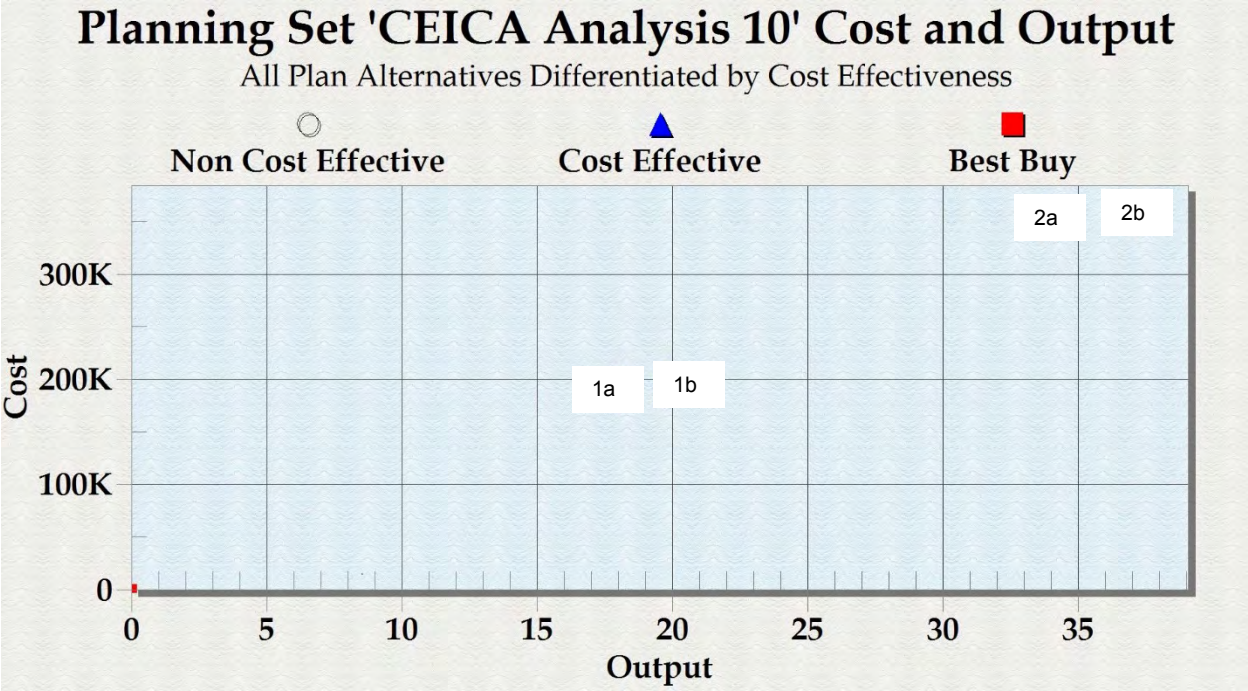
Table 2: Comparison of Benefits per Alternative

Alternative	Cost	Average Annual Cost	AAHUs	Average Annual Cost/ AAHU	Acres	Cost/Acre
No Action	$0.00	N/A	0	N/A	0	N/A
1a - 2.5k foot ridge, marsh, planting	$10,297,143	$205,943	19.67	$10,470	41.5	$ 248,124
1b - 2.5k foot ridge, marsh, no plantings	$10,097,143	$201,943	18.07	$11,176	41.5	$ 243,305
2a - 5k foot ridge, marsh, planting	$18,311,516	$366,230	37.20	$ 9,845	78	$ 234,763
2b - 5k foot ridge, marsh, no plantings	$18,111,516	$362,230	33.91	$10,682	78	$ 232,199

Cost Analysis

A cost effective/incremental cost analysis was run on the final array of alternatives including the no-action alternative and all plans were found to be cost effective.

Figure 2: Alternatives by Cost Effectiveness



Alternative 2a is the “Best Buy” plan, but was not selected as the proposed action because it was determined to be less acceptable in terms of the uncertainty in a long-term investment that does not provide significant additional benefits.

Additionally, due to the nature of the LCA BUDMAT program and the lack of opportunity for adaptive management beyond the first year of construction (Appendix F, Monitoring and Adaptive Management for more detail), 2a was ultimately not selected as the proposed action. Alternative

2a includes planting of the ridge as a feature of the alternative. Planting the ridge would require an adaptive management plan that would not be supported by the LCA BUDMAT program. However, Alternative 2a, still a cost-effective plan, provides nearly the same level of benefits without planting the ridge. Although under this alternative the ridge would not be planted, it would be colonized through natural recruitment and successional processes.

The environmental impacts associated with Alternatives 1a, (2,500 foot ridge with marsh and planting) and 1b, (2,500 foot ridge with marsh and no plantings) would be similar to those impacts associated with Alternatives 2a, (5,000 foot ridge with marsh and plantings) and 2b, (5,000 foot ridge with marsh and no plantings), but on a lesser scale. Therefore Alternatives 1a and 1b were not carried forward for a more detailed environmental impacts analysis.

Wetland Value Assessment

Evaluations of the effects of the alternatives to fish and wildlife resources were conducted using the Wetland Value Assessment (WVA) methodology. Implementation of the WVA requires that habitat quality and quantity (acreage) are measured for baseline conditions, and predicted for future without-project and future with-project conditions. Each WVA model utilizes an assemblage of variables considered important to the suitability of that habitat type to support a diversity of fish and wildlife species.

The WVA provides a quantitative estimate of project-related impacts to fish and wildlife resources; however, the WVA is based on separate models for bottomland hardwoods, chenier/coastal ridge, fresh/intermediate marsh, brackish marsh, and saline marsh. Although, the WVA may not include every environmental or behavioral variable that could limit populations below their habitat potential, it is widely acknowledged to provide a cost-effective means of assessing restoration measures in coastal wetland communities.

The WVA models operate under the assumption that optimal conditions for fish and wildlife habitat within a given coastal wetland type can be characterized, and that existing or predicted conditions can be compared to that optimum to provide an index of habitat quality. Habitat quality is estimated and expressed through the use of a mathematical model developed specifically for each wetland type. Each model consists of: (1) a list of variables that are considered important in characterizing community-level fish and wildlife habitat values; (2) a Suitability Index (SI) graph for each variable, which defines the assumed relationship between habitat quality (Suitability Index) and different variable values; and, (3) a mathematical formula that combines the SI for each variable into a single value for wetland habitat quality, termed the Habitat Suitability Index (HSI).

The product of an HSI value and the acreage of available habitat for a given target year is known as the Habitat Unit (HU) and is the basic unit for measuring project effects on fish and wildlife habitat. HUs are annualized over the period of analysis to determine the Average Annual Habitat Units (AAHUs) available for each habitat type. The change (increase or decrease) in AAHUs for each future with-project scenario, compared to future without-project conditions, provides a measure of anticipated impacts. A net gain in AAHUs indicates that the project is beneficial to the fish and wildlife community within that habitat type; a net loss of AAHUs indicates that the project would adversely impact fish and wildlife resources.

All alternative WVAs were calculated using the intermediate relative sea level rise (RSLR) scenario and a 50 year period of analysis. See Appendix C for the WVA model results and

summary of assumptions. The U.S. Fish and Wildlife Coordination Act Report (CAR) dated October 20, 2015 (Appendix D) also offers information about the WVA process.

The incremental costs for the BUDMAT project are the costs that exceed the "base plan costs" of the authorized Federal navigation project. The term "base plan costs" means the costs, as determined by the Government, to carry out the dredging and disposal of material for the construction or operation and maintenance of the Federal Navigation Project in the most cost effective way, consistent with economic, engineering, and environmental criteria, for the quantity of dredged material that would be used to construct the Project.

Essentially, the BUDMAT Program pays the additional costs for the opportunity to beneficially use dredged material above and beyond what would otherwise be typically available from the disposal of dredged material removed during routine Federal navigation channel maintenance dredging activities.

The final evaluation and comparison of the array of alternative plans is based on the incremental cost of each alternative per benefit (AAHU) earned or the highest output/least cost plan. Additionally, due to the variability of Mississippi River O&M dredging in the vicinity of the project area, BUDMAT options would also be based on opportunity to maximize use of O&M dredging events.

The proposed project (Alternative 2b) maximizes beneficial use of dredged material by combining the construction of marsh platforms with the wave reduction feature of the restored ridge. As a result, Alternative 2b – consisting of 5,000 foot Ridge and Marsh Restoration (without planting) in the vicinity of Tiger Pass alternative is identified as the tentatively selected plan.

2.3 Proposed Action

Alternative 2b – (Recommended Plan) - 5,000 foot long ridge and 500 foot wide marsh platform restoration (without planting, vicinity of Tiger Pass). The Recommended Plan provides for the restoration of a portion of the historic ridge that ran along the banks of Spanish Pass. The historic ridge has subsided and eroded over time.

The Recommended Plan provides for the restoration of a non-continuous ridge approximately 5,000-feet long (approximately 23 acres, or 11.94 AAHUs) constructed to an elevation of +6.5-feet NAVD88 with a 200-foot wide base. The ridge would begin approximately 1.9 miles west of LA Hwy 23 in Venice, LA and continue to the west along the north side of Spanish Pass. (Figure 3) Two gaps would be left in this segment of the ridge at locations where pipeline rights of way have been identified. The earthen ridge would be backed by a 500-foot wide intermediate marsh platform along the north side of the ridge (approximately 55 acres or 25.21 AAHUs) with similar gaps built into the marsh platform to accommodate the existing pipeline rights of way. The placement of dredged material in the ridge and marsh platform areas will be performed in such a manner as to avoid encroachment upon the pipeline rights of way (i.e., through use of retention dikes). The marsh platform would be constructed to a height of +3.5-feet NAVD88 and would be surrounded by a perimeter retention dike. (Figure 4) All elevations listed are considered to be post-construction. It is expected that the marsh platform would settle/dewater to an elevation of +1.5-feet NAVD88 within 1 to 3 years of completion of construction. The retention dikes would also be expected to settle over time and would be allowed to vegetate naturally. If necessary, these retention dikes would be later breached or degraded to the settled elevations of the disposal area by the non-federal sponsor.

The construction of this project would require 1,650,000 cubic yards of sandy material. The ridge and marsh platform feature would serve as a means to reduce wave energy on the leeward side. The access right-of-way would be 50-feet wide to allow for dredge pipeline and earth-moving equipment ingress-egress and, with the exception of a small portion, would remain in state-claimed water bottoms. No work areas will be identified in the area of the identified pipeline right of ways. The construction of the ridge would impact 22.95 acres of open water mingled with patches of existing intermediate marsh in the fill footprint and 1.09 acres of intermediate marsh in the access right-of-way.

Dredge Material Transport Method

To transport the dredge material from the HDDA, a cutterhead suction dredge would load hopper barges utilizing a spider barge. The arms of a spider barge are designed to optimize loading characteristics and production efficiency by loading the sediment into the hopper barges via multiple arms which allow for concurrent loading of multiple barges. This also allows for the cutterhead dredge to continue operating without having to shut down while awaiting for the arrival of offloaded barges. Once loaded, the hopper barges would be transported by tugboat to the designated pump-out location in the Mississippi River outside of the navigation channel.

Upon arrival at the designated pump out location, the material would be removed from the hopper barges by an unloader and transported via temporary floating pipeline to the fill placement area via the primary route outlined in Figure 4 as the "Temp Dredge Pipeline Access from Mississippi River". Utilizing the primary route, the dredge discharge pipeline would begin at the designated pump out location in the Mississippi River, travel along Corps Road to Jump Basin Road where a temporary ramp would be constructed over the dredge pipeline in order to facilitate traffic. The pipeline would travel through the ramp, which will be constructed along Jump Basin Road and will measure approximately 30 feet in width by approximately 150 feet in length and consist of crushed stone. The pipeline would then travel beneath LA Highway 23, via jack and bore method, to Spanish Pass Road and travel through a culvert to open water. Once in open water, the pipeline would traverse an approximate distance of 1.9 miles to reach the eastern end of the ridge and 2.8 miles to reach the western edge of the ridge. It is not expected that any utilities or pipelines would be impacted along the primary route.

Should the primary route be deemed to be unusable, (e.g., unavoidable impacts to utilities or pipelines), a secondary route has been identified as an alternative material transportation purposes. (See the alternative access route identified on Figure 5 as the "Alternative Temp Dredge Pipeline Access from Tiger Pass".) The secondary route's designated pump out site is located at the end of Halliburton Road, where the roadway meets Tiger Pass. Utilizing the secondary route, the floating pipeline would begin at the designated pump out location at Tiger Pass and travel northwest along Halliburton Road to Tide Water Road. The pipeline would rest within a ditch on the north side of Halliburton Road. Once at the intersection of Tide Water and Halliburton Roads, the pipeline would travel through an existing culvert beneath Tide Water Road to Spanish Pass Road, where it would then pass under Spanish Pass Road through a culvert to be installed under the road and into open water. From Tidewater Road to Spanish Pass Road, a 50 foot wide corridor will be provided for temporary dredge pipeline access. It is not anticipated that any utilities or facilities would be impacted by using the secondary route, however and it is expected that approximately 0.7 acres of intermittent marsh would be impacted. Upon completion of the project, the marsh would be returned to pre-project existing conditions.

Once the slurry pipeline reaches open water from either access route, the pipeline would continue through existing open water to the project site and along the entire ridge area where it would

deliver dredge material to portions of the project area in a manner that will avoid impacting pipeline rights-of-way and utilities passing through the access route and BUDMAT feature. The proposed route would not require the dredge material pipeline to traverse across any levees, federal or otherwise. The construction equipment would access the site primarily through open water bodies in order to minimize damage to existing wetlands, as well as the existing Spanish Pass Road.

Although the O&M Federal Standard limitations would not apply to the project addressed in this report, the final placement of material being pumped through the dredge pipeline would otherwise be handled in a manner similar to the handling of dredged materials for the normal O&M dredging of the navigation project when it disposes of materials in the Delta National Wildlife Refuge. (NWR). This alternative would involve the construction of earthen retention dikes, closures and weirs at each site. These retention features would be required in order to maximize retention of the dredged fill for the development of the wetlands, as well as to prevent the material from entering adjacent lands, waterways, and pipeline rights-of-way. Material necessary for dike, weir, and closure construction would come from within the restoration sites. The perimeter retention dikes would be constructed inside the marsh and to an elevation of +6-feet NAVD88, with 1 on 5 side slopes.

2.4 No-Action Alternative - Future without Project (FWOP)

In the Future without Project, or No-Action alternative, the Recommended Plan would not be implemented and the predicted additional environmental gains would not be achieved. Dredged material would continue to be disposed within the Federal Standard. The HDDA and existing disposal areas would continue to be used for disposal of maintenance-dredged material. Dredged materials excavated from the HDDA in order for the HDDA to maintain storage capacity would be hauled to an existing ocean dumping site and/or placed in disposal locations identified as falling within the Federal Standard (the base operations and maintenance disposal plan) rather than in locations to support coastal Louisiana ecosystem restoration efforts.

Without implementation of the proposed action, other Federal, state, local, and private restoration efforts within or near the proposed Project Area, the Louisiana state coastal area, and the nation's coastal areas might still occur. Some of these other efforts include the following:

- Louisiana Coastal Area (LCA), Ecosystem Restoration Study (2004 USACE) recommends 15 near-tern measures aimed at addressing the critical restoration needs. The components recommended for authorization include five critical near-term ecosystem restoration measures, a demonstration program consisting of a series of demonstration projects, a beneficial use of dredged material (BUDMAT) program, and a science and technology program. The five critical near-term ecosystem restoration measures, demonstration projects, and BUDMAT projects are all subject to the approval of feasibility level of detail decision documents by the Secretary of the Army. The January 31, 2005 Chief's Report approved the Near-Term Plan substantially in accordance with the 2004 LCA Study. Title VII of the Water Resources Development Act of 2007 (WRDA 2007) (Public Law 110-114) authorized an ecosystem restoration Program for the Louisiana Coastal Area substantially in accordance with the Near-Term Plan.

- BUDMAT project (Environmental Assessment #535). Plaquemines Parish is also the non-Federal Sponsor for two additional LCA BUDMAT projects: Ridge Restoration at Tiger Pass, and Restoration of Cat Island. These two projects are still in the study phase.

- The 2012 Louisiana's Comprehensive Master Plan for a Sustainable Coast (source: http://issuu.com/coastalmasterplan/docs/coastal_master_plan-v2?e=3722998/2447530; accessed November 23, 2015) is not authorized and not funded and is therefore not reasonably foreseeable in the future. Nevertheless, the Louisiana State Master Plan is mentioned here since there is some potential that these projects would become funded. The 2012 State Master Plan indicates that the Coastal Protection and Restoration Authority Board of Louisiana (CPRAB) has, since 2007:

    - Benefited 19,405 acres of coastal habitat
    - Secured approximately $17 billion in state and Federal funding for protection and restoration projects
    - Identified and used dozens of different Federal, state, local and private funding sources of projects
    - Moved over 150 projects into design and construction
    - Constructed projects in 20 parishes
    - Constructed 32 miles of barrier islands/berms

- CWPPRA Program – There are currently 149 active CWPPRA projects throughout coastal Louisiana. In September 2015, 101 projects were completed, benefiting over 97,401 acres. 21 projects are currently under active construction with 22 additional projects approved and in the engineering and design phase of development (source: https://lacoast.gov/new/About/FAQs.aspx; accessed November 23, 2015).

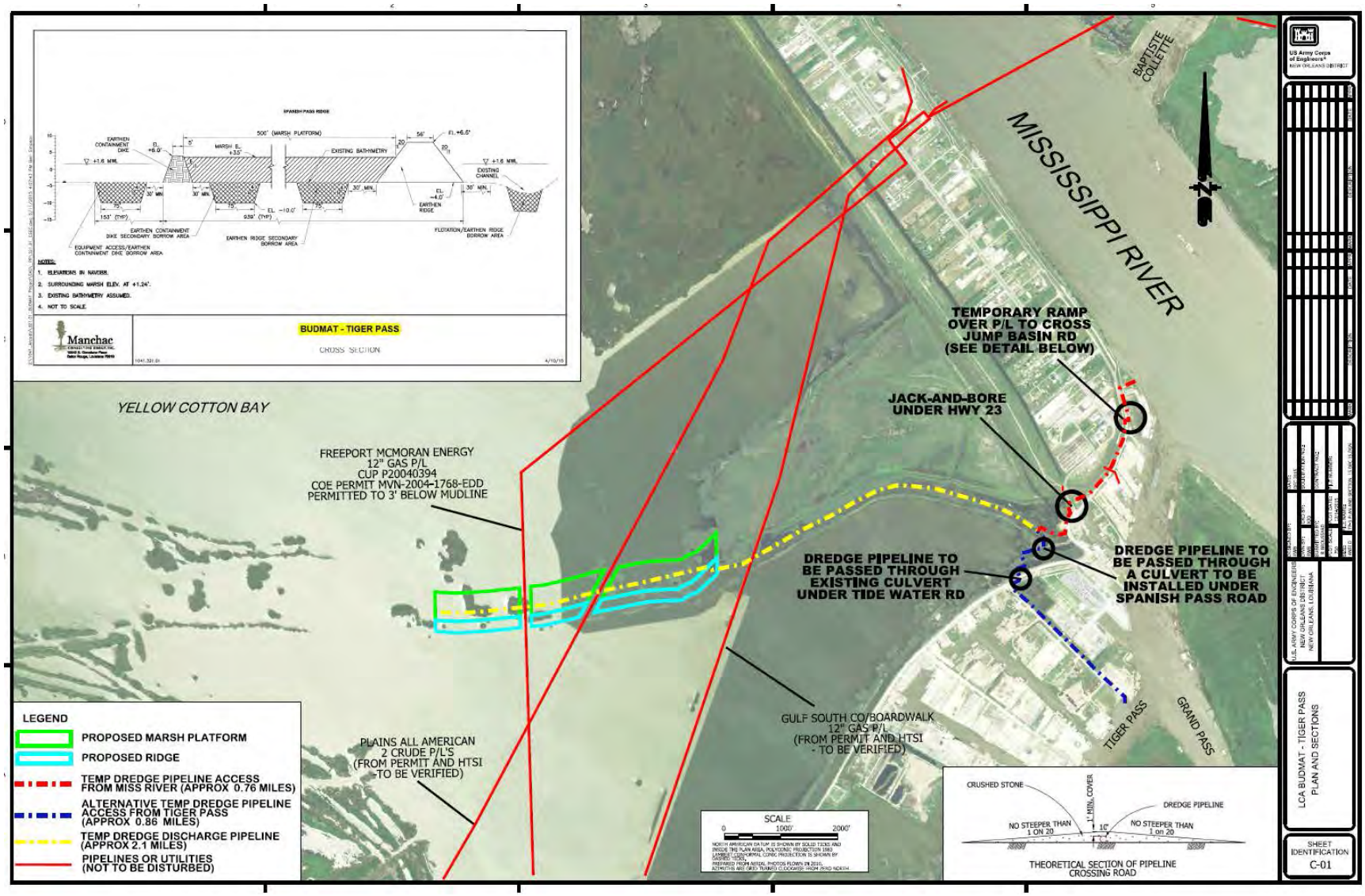
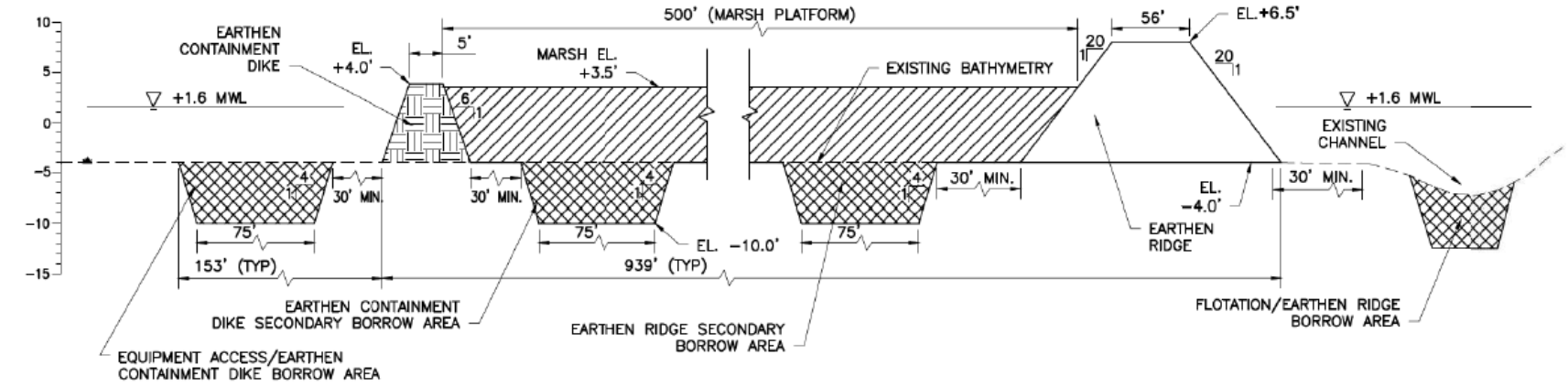


Figure 3: Project Footprint and Access Route



NOTES:

1. ELEVATIONS IN NAVD88.
2. SURROUNDING MARSH ELEV. AT +1.24'.
3. EXISTING BATHYMETRY ASSUMED.
4. NOT TO SCALE.

Figure 4: Ridge and Marsh Platform Cross Section

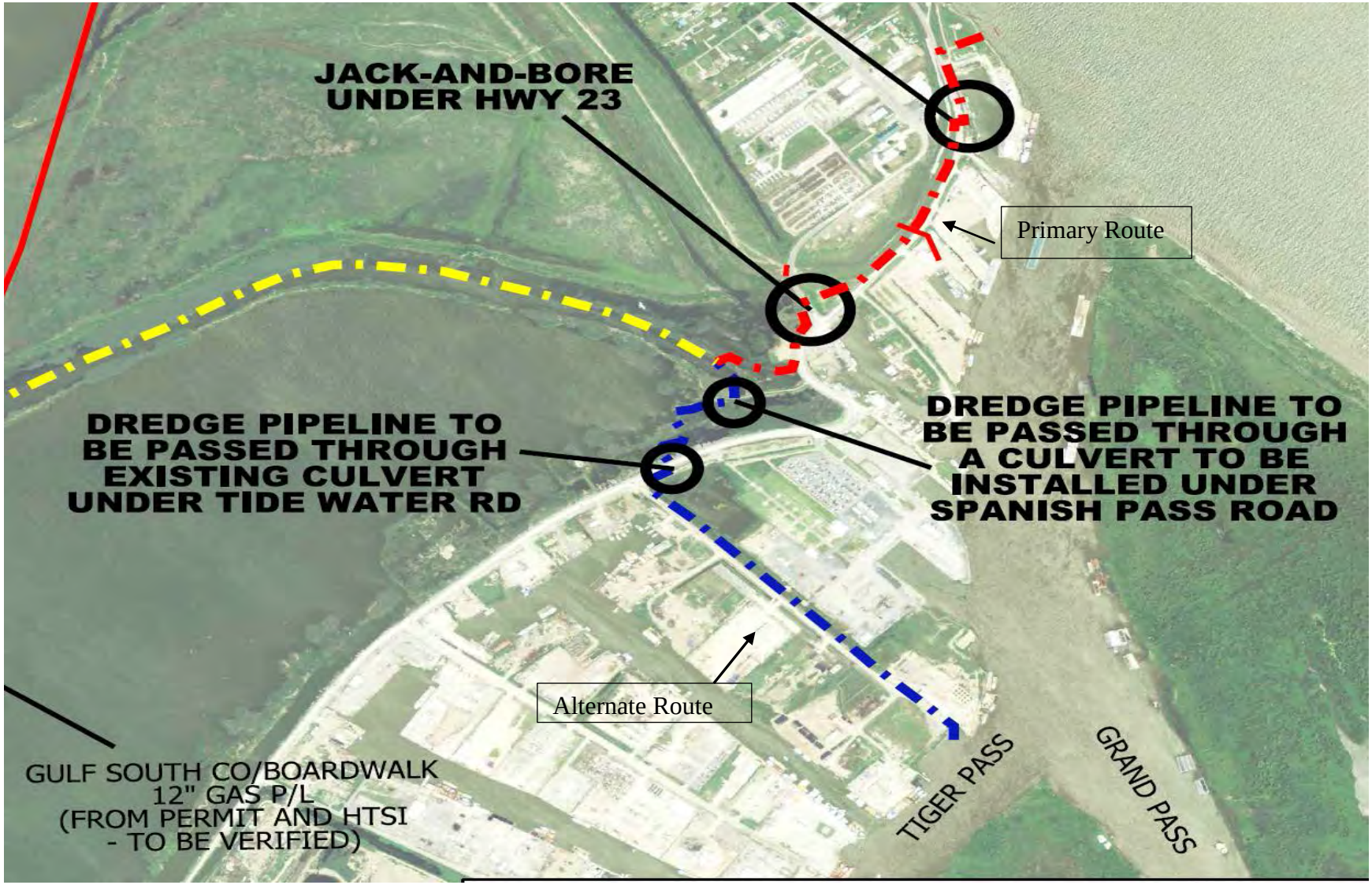


Figure 5: Primary and Alternate Dredge Material Transportation Route

3 Affected Environment

3.1 Description of the Project Area

The proposed project area is located in Plaquemines Parish within the Central Gulf Coastal Plain in southeastern Louisiana. Parish lands occupy part of the active delta of the Mississippi River, in a dynamic area dependent upon the disbursement and settlement of river sediments to maintain land elevations above water. The Mississippi River splits into three main channels within the delta region: Pass a Loutre, South Pass, and Southwest Pass. Land elevations range from sea level along the Gulf coast, to approximately +10-feet above sea level along the natural levee ridges. It is a sparsely populated region characterized by river channels with attendant channel banks, natural bayous, and man-made canals interspersed with intermediate and fresh marshes. Water levels fluctuate within the river, passes, estuarine bays, and marshes according to river flow from upstream, tide, and wind influences. The property adjacent to the proposed disposal areas includes fresh and intermediate marshes, private camps, the Pass a Loutre Water Management Area, the Delta NWR, and the navigation channels of the Mississippi River—Pass a Loutre, South Pass, Southwest Pass, and Southeast Pass.

Water depths range from less than an inch to a foot and a half in the vegetated areas and five to six feet in the open water areas. Freshwater fish that are tolerant of low salinity conditions and estuarine fish and shellfish abound. The marshes and estuarine bays provide excellent spawning and nursery areas for recreational and commercial species. The Mississippi River Delta provides important nesting and brooding habitat for mottled ducks, wading birds, and shore birds. Migratory and resident waterfowl are also abundant in the area. The National Audubon Society designated the Mississippi River Delta an Important Bird Area. The active delta provides habitat for wintering waterfowl, wading birds, marsh birds, and shore birds. The higher elevations of shrub-dominated spoil banks and willow-dominated uplands provide important stopover habitat for numerous Neotropical migratory songbird species which breed in North America and spend the winter in Mexico, the Caribbean, and Central or South America. One hundred and seventy-five avian species were detected during two seasons of transect counts on the Pass a Loutre Wetlands Management Area and the Delta National Wildlife Refuge. (Audubon 2010)

3.1.1 Description of the Watershed

The Mississippi River has the third largest drainage basin in the world, exceeded in size only by the watersheds of the Amazon and Congo Rivers. It drains 41 percent of the 48 contiguous states of the United States. The basin covers more than 1,245,000 square miles, includes all or parts of 31 states and two Canadian provinces, and roughly resembles a funnel which has its spout at the Gulf of Mexico. Waters from as far east as New York and as far west as Montana contribute to flows in the lower river.

The lower alluvial valley of the Mississippi River is a relatively flat plain of about 35,000 square miles bordering on the river which would be overflowed during time of high water if it were not for man-made protective works. This valley begins just below Cape Girardeau, Missouri, is roughly 600 miles in length, varies in width from 25 to 125 miles, and includes parts of seven states—Missouri, Illinois, Tennessee, Kentucky, Arkansas, Mississippi, and Louisiana.

The Mississippi River is the mainstem of the world's most highly developed waterway system, about 12,350 miles in length. The Mississippi River discharges the headwater flows from about

41 percent of the contiguous 48 states. Discharge at Baton Rouge ranges from 1,500,000 cfs once every 16 years, on average, to a low of 75,000 cfs recorded once during the period 1930 to the present, and average annual discharge is 450,000 cfs. Southwest Pass of the Mississippi River discharges roughly one-third of the river's total flow, with an average discharge of about 145,000 cfs. South Pass of the Mississippi River discharges roughly one-sixth of the river's total flow, with an average discharge of about 78,000 cfs. Pass a Loutre of the Mississippi River discharges almost one-third of the river's total flow or slightly less than the Southwest Pass flow. The average discharge through Pass a Loutre is just under 145,000 cfs. The combined discharge of Southwest Pass, South Pass, and Pass a Loutre is approximately 80 percent of the total river flow into the Gulf of Mexico. The remaining flow is distributed through minor passes upstream of Head of Passes.

Deep-draft navigation is a major component of waterborne traffic on the river. Currently, the river is maintained to a depth of -45 feet for deep-draft access from mile marker -22.0 in the bar channel reach up to river mile 232.4 at Baton Rouge, Louisiana. There is extensive urban and industrial development near the Baton Rouge and New Orleans metropolitan areas. The remaining areas adjacent to the river are developed primarily for agriculture; however, industrial and urban development in these areas does occur. The Mississippi River is a source for drinking water, recreation, and commerce.

3.1.2 Sustainability

Containment structures (dikes) will be built to hold dredged material in place. Dredged material will be placed to restore a portion of an historic ridge and in a manner conducive for wetland restoration. The NFS, at no cost to the Government, shall operate, maintain, repair, rehabilitate and replace the project. Coastal habitat, whether wetland, ridge, or other type of coastal feature, is ephemeral in nature. The benefits calculated consider subsidence, sea-level rise, and other impacts to determine the condition of the ecosystem restoration project over the 50 year period of analysis.

3.1.3 Sea-level Change

ER 1100-2-8162 states potential relative sea level change must be considered in every USACE coastal activity as far inland as the extent of estimated tidal influence. Benefits calculated using the WVA incorporated the "intermediate" sea-level change scenario to determine benefit outcomes over the 50 year period of analysis. The "low" and "high" sea level change rates were not run. Under the "low" sea-level change scenario, any alternative would likely underperform very soon after construction since the wetland portion of the project would be inundated beyond wetland vegetation tolerances as sea-level changes. This would be a result of not enough material being placed initially to compensate for sea-level change over time. However, under the "high" sea-level change scenario alternatives would likely not perform, or the benefits would be minimal, for an extended period post-construction until sea-level change reaches a point that is conducive for wetland function, growth, and sustainability. This would be a result of placing so much material initially, the marsh and ridge creation site would not functionally be a wetland until the deposition site is at an appropriate elevation conducive for function, growth, and sustainability. Because any alternative involves a one-time beneficial use disposal event, using only the "intermediate" sea-level change scenario presents the most reasonable expectation for calculating benefits over the 50 year period of analysis.

3.1.4 Climate and Climate Change

The climate in the project area is humid, subtropical with a strong maritime character. Warm, moist southeasterly winds from the Gulf of Mexico prevail throughout most of the year, with occasional cool, dry fronts dominated by northeast high pressure systems. The influx of cold air occurs less frequently in autumn and only rarely in summer. Tropical storms and hurricanes are likely to affect the area 3 out of every 10 years, with severe storm damage approximately once every 2 or 3 decades. The majority of these occur between early June and November. The largest recent hurricanes were Katrina and Rita in 2005 which caused damage in the project area. Hurricanes Gustav and Ike in 2008, and more recently, Isaac in 2012, caused additional damage in the project area. Summer thunderstorms are common, and tornadoes strike occasionally. Average annual temperature in the area is 67°F, with mean monthly temperatures ranging from 82°F in August to 52°F in January. Average annual precipitation is 57.0 inches, varying from a monthly average of 7.5 inches in July, to an average of 3.5 inches in October. *(http://www.plaqueminesparish.com/Visitors.php#climate).*

The 2014 USACE Climate and Resiliency Policy Statement states the "USACE shall continue to consider potential climate change impacts when undertaking long-term planning, setting priorities, and making decisions affecting its resources, programs, policies, and operations." The LCA BUDMAT Program is not intended to construct ecosystem restoration projects that last in perpetuity. A healthy and resilient coastal complex is dynamic, not static, and is subject to the ebb and flow of the various effects, adverse or beneficial, that impact conditions at any given point in time. The most significant adverse potential impact on a coastal wetland as a product of climate change is sea-level change (rise). The impact of sea-level change is addressed in section 3.1.3 Sea Level Rise and 1.4.1 Sea Level Change

3.1.5 Geology

Four main physiographic surfaces exist within Plaquemines Parish: natural levees, back swamps, coastal marshes, and barrier islands. The Mississippi River Delta complex was formed by river deposits between 700 and 7,400 years ago. The Natural Resources Conservation Service (NRCS) classifies soils within the proposed project area as typically peat, mucks, and clays mixed with organic matter, and silts derived from river deposits. The soil composition is subject to change as floodwaters and storm surges deposit new sediments. They are composed predominantly by Balize and Larose soil types. These soils are classified as continuously flooded deep, poorly drained and permeable mineral clays and mucky clays. Marsh and swamp deposits are found in the vicinity of the river from New Orleans to the Heads of Passes at the Gulf of Mexico. Marsh deposits are primarily organic, consisting of 60 percent or more by volume of peat and other organic material with the remainder being a composition of various types of clays. Total organic thickness is normally 10 feet, with variances less than one foot. Inland swamp deposits are composed of approximately 70 percent clay and 30 percent peat and organic materials. The percentage of sand and sandy silts increases with proximity to the open waters of the Gulf of Mexico. (USACE 1974)

3.2 Relevant Resources

This section contains a description of relevant resources that could be impacted by the project. The important resources described are those recognized by laws, executive orders, regulations, and other standards of National, state, or regional agencies and organizations; technical or scientific agencies, groups, or individuals; and the general public. Table 2 provides summary information of the institutional, technical, and public importance of these resources.

A wide selection of resources were initially considered and determined not to be affected by the project—mainly due to the remote and uninhabited nature of the project area and general lack of significant populated areas in the vicinity. Socioeconomic resources, including land use, population, transportation, oil and gas, environmental justice, environmental health and safety, community cohesion, desirable community growth, tax revenues, property values, public facilities and services, business activity and employment, and displacement of people, would not be affected by the proposed project. The objectives of Executive Order 11988 (Floodplain Management) were considered; however, MVN has determined that floodplain impacts, if any, from the proposed action would be mainly positive (i.e., improving the adjacent flood plain and associated habitats, and thus, maintaining their natural and beneficial values). Additionally, there is no practicable alternative for project construction outside the 100-year floodplain. No prime or unique farmlands, as defined and protected by the Farmland Protection Policy Act, would be affected by the proposed project. No portion of the project area has been designated a Louisiana Natural and Scenic River; therefore, a Scenic Rivers permit is not warranted.

The following relevant resources are discussed in this report: navigation, wetlands, scrub-shrub, wildlife, aquatic resources/fisheries, essential fish habitat (EFH), threatened and endangered species, water and sediment quality, air quality, cultural resources, recreational resources, and visual resources (aesthetics).

Table 3: Relevant Resources and Their Institutional, Technical, and Public Importance

Resource	Institutionally Important	Technically Important	Publicly Important
Navigation	Rivers and Harbors Act of 1899 and River and Harbor Flood Control Act of 1970 (PL 91-611).	N/A	Navigation concerns affect area economy and are of significant interest to community.
Wetlands	Clean Water Act of 1977, as amended; Executive Order 11990 of 1977, Protection of Wetlands; Coastal Zone Management Act of 1972, as amended; and the Estuary Protection Act of 1968., EO 11988, and Fish and Wildlife Coordination Act.	They provide necessary habitat for various species of plants, fish, and wildlife; they serve as ground water recharge areas; they provide storage areas for storm and flood waters; they serve as natural water filtration areas; they provide protection from wave action, erosion, and storm damage; and they provide various consumptive and non-consumptive recreational opportunities.	The high value the public places on the functions and values that wetlands provide. Environmental organizations and the public support the preservation of marshes.
Scrub-Shrub	Food Security Act of 1985, as amended; the Farmland Protection Policy Act of 1981; and the Fish and Wildlife Coordination Act of 1958, as amended.	They provide habitat for both open and forest-dwelling wildlife, and the provision or potential for provision of forest products and human and livestock food products.	The high value the public places on their present value or potential for future economic value.
Aquatic Resources/ Fisheries	Fish and Wildlife Coordination Act of 1958, as amended; Clean Water Act of 1977, as amended; Coastal Zone Management Act of 1972, as amended; and the Estuary Protection Act of 1968.	They are a critical element of many valuable freshwater and marine habitats; they are an indicator of the health of the various freshwater and marine habitats; and many species are important commercial resources.	The high priority that the public places on their esthetic, recreational, and commercial value.
Essential Fish Habitat (EFH)	Magnuson-Stevens Fishery Conservation and Management Act of 1996, Public Law 104-297	Federal and state agencies recognize the value of EFH. The Act states, EFH is "those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity."	Public places a high value on seafood and the recreational and commercial opportunities EFH provides.
Wildlife	Fish and Wildlife Coordination Act of 1958, as amended and the Migratory Bird Treaty Act of 1918	They are a critical element of many valuable aquatic and terrestrial habitats; they are an indicator of the health of various aquatic and terrestrial habitats; and many species are important commercial resources.	The high priority that the public places on their esthetic, recreational, and commercial value.
Threatened and Endangered Species	The Endangered Species Act of 1973, as amended; the Marine Mammal Protection Act of 1972; and the Bald Eagle Protection Act of 1940.	USACE, USFWS, NMFS, NRCS, EPA, LDWF, and LDNR cooperate to protect these species. The status of such species provides an indication of the overall health of an ecosystem.	The public supports the preservation of rare or declining species and their habitats.

Resource	Institutionally Important	Technically Important	Publicly Important
Cultural Resources	National Historic Preservation Act of 1966, as amended; the Native American Graves Protection and Repatriation Act of 1990; and the Archeological Resources Protection Act of 1979	State and Federal agencies document and protect sites. Their association or linkage to past events, to historically important persons, and to design and construction values; and for their ability to yield important information about prehistory and history.	Preservation groups and private individuals support protection and enhancement of historical resources.
Recreation Resources	Federal Water Project Recreation Act of 1965 as amended and Land and Water Conservation Fund Act of 1965 as amended	Provide high economic value of the local, state, and national economies.	Public makes high demands on recreational areas. There is a high value that the public places on fishing, hunting, and boating, as measured by the large number of fishing and hunting licenses sold in Louisiana; and the large per-capita number of recreational boat registrations in Louisiana.
Aesthetics	USACE ER 1105-2-100, and National Environmental Policy Act of 1969, the Coastal Barrier Resources Act of 1990, Louisiana's National and Scenic Rivers Act of 1988, and the National and Local Scenic Byway Program.	Visual accessibility to unique combinations of geological, botanical, and cultural features that may be an asset to a study area. State and Federal agencies recognize the value of beaches and shore dunes.	Environmental organizations and the public support the preservation of natural pleasing vistas.
Air Quality	Clean Air Act of 1963, Louisiana Environmental Quality Act of 1983.	State and Federal agencies recognize the status of ambient air quality in relation to the NAAQS.	Virtually all citizens express a desire for clean air.
Water Quality	Clean Water Act of 1977, Fish and Wildlife Coordination Act, Coastal Zone Mgt Act of 1972, and Louisiana State & Local Coastal Resources Act of 1978.	USACE, USFWS, NMFS, NRCS, EPA, and State DNR and wildlife/fishery offices recognize value of fisheries and good water quality and the national and state standards established to assess water quality.	Environmental organizations and the public support the preservation of water quality and fishery resources and the desire for clean drinking water.

3.2.1 Navigation

Existing Conditions

Southwest Pass provides deep-draft access to the New Orleans – Baton Rouge port corridor and its associated commerce and industries. The second important access channel from the Gulf, South Pass navigational channel, provides a more easterly entrance to the Mississippi River. Continued maintenance of the current dimensions of the Mississippi River and its passes, as stated in Section 1.2 Authority, are vital to the continued growth and health of the industries and commerce they serve.

3.2.2 Wetlands

Existing Conditions

Wetlands in the vicinity are tidally influenced and classified as mainly fresh marsh, with areas of intermediate marsh near the gulfward open water areas north of West Bay, East Bay, and west/northwest of the Delta NWR. Water levels fluctuate from 6 to 12-inches or more in the vegetated areas. The wetlands are strongly influenced by freshwater discharges from the Mississippi River and associated distributary outlets. Salinity rarely increases above 2.0 parts per thousand (ppt), with a year-round average of 0.5-1.0 ppt (Chabreck 1970). Intermediate marsh in the project area is subjected to an irregular tidal regime and oligohaline conditions, with salinities generally ranging from 1.0-8.0 ppt (Chabreck 1970).

Common reed (*Phragmites australis*), also known as Roseau cane, occurs in expansive monotypic clumps (monoculture) in shallow open water areas and has displaced a variety of freshwater vascular plant species that have historically occupied the area. This could have been caused by periodic storms generating extremely high saltwater tides killing off a majority of the sensitive freshwater vegetation (Hauber et. al. 1991). Rattlebox (*Crotalaria* sp.) and

black willow (*Salix nigra*) occur along the banks of channels and on the higher crowns of areas previously used for disposal of dredged material.

Cattail (*Typha* sp.), bulltongue arrowhead (*Sagittaria lancifolia)*, maidencane (*Panicum hemitomon*), common threesquare bulrush (*Scirpus americanus*) and various sedges are common throughout the wetlands of East Bay. Other common species in the East Bay area include numerous non-native species, such as common reed, alligator weed (*Alternanthera philoxeroides*), elephant ear (*Colocasia* sp.), giant cutgrass (*Zizaniopsis miliacea*), California bulrush (*Scirpus californicus*), and delta duck potato (*Sagittaria platyphylla*). Submerged aquatic vegetation (SAV) found in the shallow water areas includes various pondweeds (*Potamogeton* spp.), coontail (*Ceratophyllum* sp.), and parrotfeather (*Myriophyllum aquaticum*).

The wetlands in the project vicinity provide nursery habitat for estuarine larval and juvenile fish, crab, and shrimp species. Additionally, numerous estuarine-dependent fish and shellfish, migratory waterfowl, furbearers and other wildlife, and several species of wading, diving, and shore birds may be found in the area.

Wetlands within Plaquemines Parish have undergone substantial loss due to subsidence, sea-level rise, and salt-water intrusion. The current trend of wetlands loss was compounded by hurricanes in 2005. Over a 4 year period from 2004 to 2008, hurricanes Katrina, Rita, Gustav and Ike transformed approximately 328 square miles of marsh to open water. (Barras et al., 2009). More losses resulted from Katrina than from Rita, and were concentrated south and east of New Orleans, with almost half the total loss occurring in Plaquemines Parish (Zinn 2006). Overall marsh loss (i.e., conversion to open water) resulting from Katrina and Rita throughout the entire Mississippi Deltaic Plain of southeastern Louisiana was as follows: fresh marsh—22 square miles; intermediate marsh—49 square miles; brackish marsh—18 square miles; salt marsh—27 square miles (USGS 2006).

The main management technique used in the Pass a Loutre WMA and the Delta NWR to create marsh habitat has been diversion of sediment-laden waters into open bay systems and the creation of crevasses to promote delta growth. Crevasses generally form when levee breaks occur in the natural river levee during high-water events. Once crevasses form, sediment-laden water flows into the bay and splays are created. Splays are land formations that result from sediment accretion near the mouth of the crevasse and contain mud flats, channels, and sediment that would build land in open water areas over time (Boyer et al.). Several natural and man-made crevasses are located near the project area.

Some of these crevasses were constructed as mitigation for activities authorized under the U.S. Environmental Protection Agency (EPA)/USACE Clean Water Act regulatory program or were funded under the auspices of the Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA). The Louisiana Department of Natural Resources (LDNR) constructed three new crevasses in 1986 at Pass a Loutre, South Pass, and Loomis Pass, and four crevasses in 1990 at South Pass and Pass a Loutre. These crevasses created over 657 acres and 400 acres of marsh from 1986 to 1993, respectively. Thirteen crevasses included in the LDNR Small Sediment Diversions Project cumulatively produced 313 acres of marsh between 1986 and 1993 (Barmore 2003). The National Marine Fisheries Service (NMFS) and LDNR initially sponsored the CWPPRA project “Delta Wide Crevasses” (MR-09) to maintain existing crevasse-splays in both the Pass a Loutre WMA and the Delta NWR. Construction of the first phase of the project was completed on July 14, 1999 and consisted of excavation of fifteen new crevasses and plugging one existing crevasse. Construction of phase two was completed

on March 17, 2005 and consisted of the excavation of two new crevasses and maintenance of four existing crevasses and deposition of dredged material for marsh creation. These crevasses are naturally creating splays and restoring wetlands in the northern portion of the proposed expansion of the disposal area (Barmore 2003). Boyer et al. (1997) determined that newly constructed crevasses in the Delta NWR created an average of 11.6 acres of emergent wetlands per year with subaerial growth occurring 2-3 years after crevasses were cut.

3.2.3 Scrub-Shrub

Existing Conditions

Scrub-shrub habitat occupies a small portion of the area. Scrub-shrub vegetation occurs along natural and man-made ridges along Southwest Pass and South Pass, and in portions of the Delta NWR and Pass a Loutre WMA where remnant maritime shrub communities persist. Wax myrtle (*Myrica cerifera*), black willow, eastern baccharis, rattlebox, and Roseau cane are the dominant plants comprising the scrub-shrub habitat in the area. The soils in this habitat are composed of compacted silt, clay, sand, and organic materials. This area remains dry most of the year except during conditions of extremely high water from periodic high tides and high river stages.

Scrub-shrub habitat is utilized by most species of marsh mammals including nutria (*Myocaster coypus*), raccoon (*Procyon lotor*), muskrat (*Ondatra zibethicus*), swamp rabbit (*Sylviagus aquaticus*), and white-tailed deer (*Odocoileus virginianus*). Scrub-shrub habitat provide essential habitat for wintering waterfowl, nesting mottled ducks, wading birds, marsh birds, and shorebirds. Shrub-dominated ridges and willow-covered areas provide important stopover habitat for many Neotropical migrants. Birds such as egrets (*Ardea alba*; *Egretta thula*), herons (*Ardea herodias*; *Egretta* spp.; *Nycticorax* spp.), rails, gallinules, and mottled ducks (*Anas fulvigula*) use scrub-shrub vegetation for nesting because nests would not be affected by occasional high water. Scrub-shrub habitat provides essential refuge for marsh animals during high water events. During hurricanes and tropical storms animals seek the highest land masses in the area and are often forced to climb into branches of scrub-shrub vegetation to escape rising waters. Scrub-shrub vegetation may provide a limited source of hard and soft mast for wildlife species utilizing the area.

3.2.4 Aquatic Resources/Fisheries

Existing Conditions

The area is primarily shallow open water and fresh marsh near Tiger Pass in the Lower Mississippi River Delta. The water bottom is composed of firm silty, sandy clay mainly deposited by the river. These submerged lands are typically soft and almost fluid, but some areas are firm where heavier silts and sands have deposited. Water depths measure approximately 1 to 5 feet with submerged aquatic vegetation (SAV) occurring in some portions of the shallow open-water areas, with the most common species including pondweed, coontail, and water millfoil (*Myriophyllum* spp.). These submerged plants provide a source of food for the large numbers of waterfowl frequently during winter. Shellfish species including oysters, shrimp, and crabs are found in the brackish marshes near the project area. Many juveniles of these species use fringe marsh, interspersed shallow ponds, and SAV for grazing.

Fishing is a major recreational and commercial activity. The estuarine nature of the area provides a dynamic aquatic environment where freshwater and saltwater meet, providing a transitional zone between the two aquatic ecosystems. The marshes and waterways provide

important spawning and nursery habitat and a food source for a wide variety of fresh and saltwater fish species. Vegetation and marsh loss degrades the utility of the area as a nursery habitat and food source.

The influx of freshwater from the Mississippi River, particularly during floods and other high water flow periods, potentially allows for riverine fisheries species to migrate downriver to the delta region. The U.S. Fish and Wildlife Service (USFWS) published Habitat Suitability Index (HSI) Models in 1982 and 1983, which included salinity tolerances for a variety of freshwater fisheries. Potential species that could occur during high water/low salinity periods include channel catfish (*Ictalurus punctatus*), blue catfish (*Ictalurus furcatus*), flathead catfish (*Pylodictis olivaris*), smallmouth bass (*Micropterus dolomieu*), largemouth bass (*Micropterus salmoides*), black crappie (*Pomoxis nigromaculatus*), white crappie (*Pomoxis annularis*), sunfish (*Lepomis* spp.), gizzard shad (*Dorosoma cepedianum*), and buffalo (*Ictiobus bubalus*), among others.

During low water periods, storm surges, and seasonally strong tidal influences, the increased saltwater intrusion from the Gulf restricts the abundance and diversity of freshwater fisheries, and provides opportunities for estuarine (brackish) species. Many of these species are economically and recreationally important, including red drum (*Sciaenops ocellatus*), black drum (*Pogonias cromis*), spotted sea trout (*Cynoscion nebulosus*), sand seatrout (*Cynoscion arenarius*), striped mullet (*Mugil cephalus*), Gulf menhaden (*Brevoortia patronus*), Atlantic croaker (*Micropogonias undulatus*), sheepshead (*Archosargus probatocephalus*), southern flounder (*Paralichthys lethostigma*), Spanish mackerel (*Scomberomorus maculates*), southern kingfish (*Menticirrhus americanus*), and spot (*Leiostomus xanthurus*).

Commercially important shellfish found include blue crab (*Callinectes sapidus*), brown shrimp (*Farfantepenaeus aztecus*), pink shrimp (*Farfantepenaeus duorarum*), white shrimp (*Litopenaeus setiferus*), Gulf stone crab (*Menippe adina*), and oysters (*Crassostrea virginica*). Other commercially less important species include grass shrimp (*Palaemonetes pugio*), mysid shrimp (*Mysidopsis bahia*), roughneck shrimp (*Trachypenaeus constrictis*), and mud crab (*Eurypanopeus depressus*).

The area also supports populations of phytoplankton and zooplankton (e.g., copepods, rotifers, fish larvae, and molluscan and crustacean larvae). Benthic invertebrate populations are comprised of both epifaunal and infaunal species (e.g., polychaete and oligochaete worms, crustaceans, bivalves and gastropod mollusks). These organisms constitute vital components of the aquatic food chain and may comprise the diets of numerous finfish and shellfish species.

3.2.5 Wildlife

Existing Conditions

The area contains a variety of birds, mammals, and other wildlife. Both migratory and resident birds occur in or near the project area. Common birds include ibis (*Plegadis* spp.; *Eudocimus albus*), egrets (*Ardea alba*; *Egretta thula*), cormorants (*Phalacrocorax* spp.), terns (*Sterna* spp.), gulls (*Larus* spp.), skimmers (*Rynchops niger*), sandpipers (*Calidris* spp.), pelicans (*Pelecanus* spp.), osprey (*Pandion haliaetus*), herons (*Ardea herodias*; *Egretta* spp.; *Nycticorax* spp.), hawks (*Accipiter* spp.; *Buteo* spp.), kestrels (*Falco sparverius*), vultures (*Coragyps atratus*; *Cathartes aura*), frigatebirds (*Fregata magnificens*), grackles (*Quiscalus* spp.), blackbirds (*Agelais phoeniceus*), and several species of swallows, flycatchers, wrens, warblers, and sparrows. Wintering migratory waterfowl using the surrounding marshes include

snow geese (*Chen caerulescens*), gadwalls (*Anas strepera*), pintails (*Anas acuta*), mallards (*Anas platyrhynchos*), blue-winged teal (*Anas discors*), green-winged teal (*Anas crecca*), shovelers (*Anas clypeata*), coot (*Fulica americana*), redheads (*Aythya americana*), lesser scaup (*Aythya affinis*), mergansers (*Mergus* spp.; *Lophodytes cucullatus*), wigeons (*Anas americana*), canvasbacks (*Aythya valisineria*), and some black ducks (*Anas rubripes*). The mottled duck (*Anas fulvigula*), highly sought by sportsmen, is the only species of waterfowl nesting and wintering in the area. Grebes (*Podilymbus podiceps*; *Podiceps* spp.) and loons (*Gavia immer*) are nongame migratory waterfowl wintering in the area, and the common snipe (*Gallinago gallinago*) is the only game species of shorebird wintering in the area. Numerous other shorebirds use the area as a resting and staging area during migration.

Mammals using the marshes and scrub-shrub habitat include numerous furbearers, such as nutria, muskrat, swamp rabbit, mink (*Mustela vison*), river otter (*Lontra canadensis*), raccoons, and white-tailed deer. Scrub-shrub provides habitat for salamanders, toads, frogs, turtles, and several species of poisonous and nonpoisonous snakes. The American alligator (*Alligator mississippiensis*) is abundant in fresh to intermediate marsh and is caught commercially for its hide and meat.

Numerous terrestrial invertebrates are found throughout the project area. The most notable are insects, which often serve as vectors, transmitting disease organisms to higher animals including man. Mosquitoes are the most important of the vectors in the area, although other groups, such as deer flies, horseflies, and biting midges are also considered vectors. The area provides suitable breeding habitat for such species as the salt-marsh mosquitoes (*Aedes sollicitans* and *Culex salinarius*), and other species of mosquitoes, which carry the West Nile virus, which has recently caused illness and death of both animals and humans in Louisiana.

3.2.6 Essential Fish Habitat

Existing Conditions

All of the marine and estuarine waters of the northern Gulf of Mexico have been designated as Essential Fish Habitat (EFH) through regulations promulgated by the National Marine Fisheries Service (NMFS) and the Gulf of Mexico Fishery Management Council as required by the Magnuson-Stevens Fishery Conservation and Management Act. EFH is described as waters and substrates necessary for Federally-managed species to spawn, breed, feed, and grow to maturity. In the northern Gulf of Mexico, EFH has generally been defined as areas where individual life-stages of specific Federally-managed species are common, abundant or highly abundant. In estuarine areas, EFH is defined as all estuarine waters and substrates (mud, sand, shell, rock and associated biological communities, including the sub-tidal vegetation (seagrasses and algae) and adjacent inter-tidal vegetation (marshes and mangroves). The open waters, waterbottom substrates, and inter-tidal marshes of the West Bay Sediment Diversion project area are considered EFH under the estuarine component.

Specific categories of EFH include all estuarine waters and substrates (mud, sand, shell, rock, and associated biological communities), including subtidal vegetation (sea grasses and algae) and adjacent intertidal wetland vegetation (marshes and mangroves). In addition, estuarine aquatic habitats provide nursery and foraging areas that support economically important marine fishery species that may serve as prey for Federally-managed fish species such as mackerels, snappers, groupers, billfishes and sharks.

The estuarine waters in the proposed project area include EFH for several Federally-managed species (Table 3). These species use the area for foraging and nursery habitat, as well as a

migration route to other areas considered to be EFH. Specific categories of EFH in the project area include estuarine emergent wetlands, mud/sand substrates, and estuarine water column. A brief description of the EFH species found in the proposed project area follows:

Red drum (*Sciaenops ocellatus*) is an important recreational gamefish found in coastal waters throughout the Gulf of Mexico. Adults inhabit nearshore waters, particularly areas within the surf zone or in the vicinity of inlets. Spawning occurs in nearshore areas, and eggs and larvae are transported by tides and wind currents into estuaries. Larvae and juveniles occupy estuarine environments until maturation. Red drum are predatory in all stages of life; however, the type of prey consumed varies with life stage. Subadult red drum primarily consume small marine invertebrates including mysids and copepods, while adults feed on large marine invertebrates, including shrimp and crabs, and small fishes.

Table 4: EFH Species in the Project Area

Common Name	Life Stage	EFH
red drum	adult	Gulf of Mexico & estuarine mud bottoms, oyster reef
red drum	juvenile	SAV, estuarine mud bottoms, marsh/water interface
red drum	larvae/post larvae	all estuaries planktonic, SAV, sand/shell/soft bottom, emergent marsh
brown shrimp	adult	Gulf of Mexico <110 m, silt sand, muddy sand
brown shrimp	juvenile	marsh edge, SAV, tidal creeks, inner marsh
brown shrimp	larvae/post larvae	planktonic, sand/shell/soft bottom, SAV, emergent marsh, oyster reef
white shrimp	adult	Gulf of Mexico <33 m, silt, soft mud
white shrimp	juvenile	marsh edge, SAV, marsh ponds, inner marsh, oyster reef
white shrimp	larvae/post larvae	planktonic, soft bottom, emergent marsh

Shrimp species include the brown shrimp (*Farfantepenaeus aztecus*) and the white shrimp (*Litopenaeus setiferus*). Adult penaeids generally occupy offshore areas of higher salinity, where spawning occurs. After hatching, larvae enter estuaries and remain there throughout the juvenile stage. Estuarine habitat serves as a nursery area offering a suitable substrate, an abundant food supply, and protection from predators. Subadult shrimp consume organic matter, including marsh grasses and microorganisms found in estuarine sediments.

3.2.7 Threatened, Endangered and Protected Species

Existing Conditions

According to a USFWS letter dated July 24, 2013, which provided comments in accordance with the Fish and Wildlife Coordination Act (FWCA), Endangered Species Act (ESA), Bald and Golden Eagle Protection Act (BGEPA), and the Migratory Bird Treaty Act (MBTA) for those areas within MVN-proposed Fiscal Year 2014 (FY14) Operations and Maintenance Dredging and Disposal Plans presented at the FY14 Environmental Dredging Conference, protected species that may occur in the project vicinity include the West Indian manatee (*Trichechus*

manatus), piping plover (*Charadrius melodus*), pallid sturgeon (*Scaphirhynchus albus*), and sea turtles. In addition, USFWS has provided general comments suggesting that the Gulf sturgeon (*Acipenser oxyrhynchus desotoi*) may occur along the east side of the Mississippi Delta. Brown pelicans and other colonial nesting wading birds and seabirds protected under the MBTA may be encountered in the project area as well. The red knot (*Calidris canutus rufa*), a candidate species for Federal listing as a threatened species, may occur in some portions of the project area. No critical habitat for any threatened or endangered species has been designated within the proposed project area, and none of these species are known to breed within the project vicinity.

West Indian manatees, also known as sea cows, are large aquatic mammals found in shallow, slow-moving rivers, estuaries, salt water bays, canals, and coastal areas. It is extremely unlikely that manatees would be found in the project area and surrounding shallow open waters; however, if manatees are observed within 100 yards of the "active work zone" during proposed construction/dredging activities, the appropriate special operating conditions (e.g., no operation of moving equipment within 50 feet of a manatee; all vessels should operate at no wake/idle speeds within 100 yards of work area; siltation barriers, if used, should be re-secured and monitored; report manatee sightings or collisions), would be implemented as provided by the USFWS, Lafayette, Louisiana Field Office. Special operating conditions for manatees would be included in any plans and specifications developed prior to dredging and disposal activities.

The piping plover, as well as its designated critical habitat, occurs along the Louisiana coast. (http://criticalhabitat.fws.gov/crithab) Piping plovers winter in Louisiana and may be present eight to ten months of the year (LDWF 2011). They depart for the wintering grounds from mid-July through late October and remain until late March or April. Piping plovers forage on intertidal beaches, mudflats, sand flats, algal flats, and wash-over passes with no or very sparse vegetation. They roost in unvegetated or sparsely vegetated areas, which may have debris, detritus, or micro-topographic relief offering refuge from high winds and cold weather. They also forage and roost in wrack deposited on beaches. Piping plovers could occur along the shoreline and in the intertidal of the project vicinity during winter migration, but are not permanent residents of the area. Critical habitat has been designated south of Pass a Loutre—mainly near the mouth of South Pass and in portions of East Bay between South and Southwest passes. Dredging and disposal areas associated with the proposed work do not lie within these critical habitat areas. Construction activities associated with the proposed project may cause piping plovers occurring near the project area to be temporarily displaced to nearby areas containing foraging and loafing habitat.

The pallid sturgeon is an endangered fish found in Louisiana, in both the Mississippi and Atchafalaya Rivers (with known concentrations in the vicinity of the Old River Control Structure Complex); it is possibly found in the Red River as well. The pallid sturgeon is adapted to large, free-flowing, turbid rivers with a diverse assemblage of physical characteristics that are in a constant state of change. Because pallid sturgeon are believed to be strictly freshwater fish, they are typically absent from the Mississippi River Delta during low river flows when salt water from the Gulf of Mexico intrudes upriver along the bottom of the channel (salt water wedge).

The Gulf sturgeon is an anadromous fish inhabiting coastal rivers from Louisiana to Florida during the warmer months and overwintering in estuaries, bays, and the Gulf of Mexico (NMFS 2011). Historically, Gulf sturgeon occurred from the Mississippi River east to Tampa Bay. Its present range extends from Lake Pontchartrain and the Pearl River system in Louisiana and Mississippi east to the Suwannee River in Florida; however, sporadic occurrences have been

recorded as far west as the Rio Grande between Texas and Mexico, and as far east and south as Florida Bay. The only documented catches of Gulf sturgeon in the Mississippi River have reportedly taken place near its mouth; however, these are considered incidental occurrences since no resident (i.e., reproducing) population for the Mississippi River is believed to exist. The USFWS and NMFS published a final rule in the Federal Register (Volume 68, No. 53) designating critical habitat for the Gulf sturgeon in Louisiana, Mississippi, Alabama, and Florida. Portions of the Pearl and Bogue Chitto Rivers, Lake Pontchartrain east of the Lake Pontchartrain Causeway, all of Little Lake, The Rigolets, Lake St. Catherine, and Lake Borgne within Louisiana were included in that designation. The proposed project area is outside those portions of Louisiana designated as critical habitat.

Loggerhead sea turtles (*Caretta caretta*) nest within the coastal United States from Louisiana to Virginia, with major nesting concentrations occurring on the coastal islands of North Carolina, South Carolina, and Georgia, and on the Atlantic and Gulf coasts of Florida (NMFS/USFWS 2009). In Louisiana, loggerhead sea turtles are known to nest on the Chandeleur Island (LDWF 2011). Nesting and hatching for loggerheads in the Gulf of Mexico occur from May through November.

Green sea turtles (*Chelonia mydas*) are more tropical in their distribution, and are rarely seen in Louisiana coastal waters (LDWF 2011). Nesting in the Southeastern U.S. occurs roughly from June through September (NMFS/USFWS 1991). Nesting within the project area is highly unlikely, as green sea turtles prefer to nest on high-energy beaches with deep sand and little organic content. Furthermore, the Minerals Management Service (1997) indicated that reports of green sea turtle nesting in the northern Gulf are "isolated and infrequent."

The most seriously endangered of the sea turtles, Kemp's Ridley turtles (*Lepidochelys kempii*) occur mainly in bays and coastal waters of the Atlantic Ocean and Gulf of Mexico (NMFS/USFWS 1992a). Nesting occurs on the northeastern coast of Mexico and occasionally on Texas Gulf Coast beaches from April to July. No Kemp's Ridley sea turtle nesting habitat occurs near the project site, and nesting has not been known to occur in the area. Along the Louisiana coast, turtles are generally found in shallow nearshore and inshore areas, and especially in salt marsh habitats, from May through October.

The hawksbill (*Eretmochelys imbricate*) is a small sea turtle, generally spending most of its life in tropical waters such as the warmer portions of the Atlantic Ocean, Gulf of Mexico, and Caribbean Sea (NMFS/USFWS 1993). Hawksbills frequent rocky areas, coral reefs, shallow coastal areas, lagoons, narrow creeks, and passes. Nesting may occur on almost any undisturbed deep-sand beach in the tropics—in North America, the Caribbean coast of Mexico is a major nesting area. In the continental United States, nesting sites are restricted to Florida where nesting is sporadic at best (NMFS/USFWS 1993). Due to the lack of suitable foraging and nesting habitats, there is a low probability of this species occurring within the project area.

The leatherback sea turtle (*Dermochelys coriacea*) is the largest, deepest diving, and most migratory and wide ranging of all the sea turtles (NMFS/USFWS 1992). Leatherbacks are mainly pelagic, inhabiting the open ocean and seldom entering coastal waters except for nesting purposes. Nesting in the United States is mainly confined to the Florida coast, and no nesting has been reported from Louisiana (Gunter 1981).

NMFS is responsible for aquatic marine endangered and threatened sea turtles. High levels of sediment in the water column and low prey availability probably preclude any high use **by**

sea turtles in the lower Mississippi River Delta. Furthermore, hydraulic cutterhead pipeline dredging operations have not been identified as a source of sea turtle mortality.

The brown pelican (*Pelecanus occidentalis*), a year-round resident of coastal Louisiana that may occur in the project area, was removed from the Federal List of Endangered and Threatened Wildlife (i.e., "delisted") by USFWS on November 17, 2009. Despite its delisting, brown pelicans, and other colonial nesting wading birds and seabirds, remain protected under the MBTA. Portions of the proposed project area may contain habitats commonly inhabited by colonial nesting wading birds and seabirds.

The red knot is a medium-sized shorebird that has been listed as a threatened species. The red knot breeds in the central Canadian arctic but is found in Louisiana during spring and fall migrations and the winter months (generally September through March). During migration and on their wintering grounds, red knots forage along sandy beaches, tidal mudflats, salt marshes, and peat banks. Observations along the Texas coast indicate that red knots forage on beaches, oyster reefs, and exposed bay bottoms, and they roost on high sand flats, reefs, and other sites protected from high tides. In wintering and migration habitats, red knots commonly forage on bivalves, gastropods, and crustaceans. Coquina clams, a frequent and often important food resource for red knots, are common along many Gulf beaches. Construction activities associated with the proposed project may cause red knots occurring near the project area to be temporarily displaced to nearby areas containing foraging and loafing habitat.

3.2.8 Water and Sediment Quality

Existing Conditions

As part of its surface water quality monitoring program, the Louisiana Department of Environmental Quality (LDEQ) routinely monitors 25 parameters on a monthly or bimonthly basis using a fixed station, long-term network (Monitored Assessments) (LDEQ 1996). Based upon those data and the use of less-continuous information (Evaluated Assessments), such as fish tissue contaminants data, complaint investigations, and spill reports, the LDEQ has assessed water quality fitness for the following uses: primary contact recreation (swimming), secondary contact recreation (boating, fishing), fish and wildlife propagation, drinking water supply and shellfish propagation (LDEQ 1996). Based upon existing data and more subjective information, water quality is determined to either fully, partially, or, not support those uses. A designation of "threatened" is used for waters that fully support their designated uses but that may not fully support certain uses in the future because of anticipated sources or adverse trends in pollution.

According to the LDEQ "2010 Louisiana Water Quality Inventory: Integrated Report," the Mississippi River – Head of Passes to Mouth of Passes, including all passes in the birdfoot delta (segment no. LA070401_00), "fully supports" designated uses for primary contact recreation, secondary contact recreation, and fish and wildlife propagation based on Evaluated Assessment data (LDEQ 2012). The segment does not support the designated use for oyster propagation (LDEQ 2012). Impairment of the oyster propagation use is due to pathogens (fecal coliform bacteria). Suspected sources of impairment include municipal point source discharges and sources outside state jurisdiction or borders (LDEQ 2012).

On July 23, 2008, a tanker collided with a barge in the Mississippi River near downtown New Orleans, Louisiana. Severe damage to the barge resulted in the release of about 380,000 gallons of No. 6 fuel oil approximately 100 miles upriver from the dredging reaches in the

Southwest and South Pass navigation channels from which dredged material would be removed to the project area for permanent placement. Almost two years later, on April 21, 2010, an explosion occurred onboard the mobile drilling platform *Deepwater Horizon* in the Gulf of Mexico. Destruction of the rig and damage at the wellhead resulted in the release of about 206 million gallons of crude oil over an 85-day period about 40 miles southeast of navigation dredging areas at the river's mouth. Due to the magnitude of both oil spills, their proximity to the river delta, and potential for river or ocean currents to transport the oil to dredging sites from which dredged material destined for the project area could originate, MVN conducted a series of evaluations to determine if oil was accumulating in the river's navigation channels – and if dredged material from the river could cause adverse environmental impacts at proposed dredged material placement sites.

Evaluations were conducted on dredged material collected from hopper dredges working in Southwest Pass in July and August of 2008; on dredged material collected after the 2008 spill from two placement sites used by hopper dredges; and on shoal material collected from South Pass in August of 2010 and from Southwest Pass in October 2010, following containment of the *Deepwater Horizon* leak. All evaluations followed a tiered approach. Chemical analyses were first conducted on shoal material and dredged material slurry to determine if oil-related contaminants were present. Detected contaminants were compared to background levels observed prior to the spills in sediment and water from the Mississippi River and adjacent marsh areas. In cases where background levels were exceeded, the ecological significance of contaminants was determined by comparison of observed concentrations to screening values developed by the National Oceanic and Atmospheric Administration (Screening Quick Reference Table for Inorganics & Organics in Sediment) and the EPA (Water Quality Screening Values). Comparison to screening values is useful in determining whether adverse ecological impacts are likely to occur and whether any additional biological testing is needed. Biological tests involve the exposure of sensitive aquatic animals to shoal material to evaluate toxicity from direct contact and to determine if contaminants accumulate in the tissues of test animals. The October 2010 evaluation of Southwest Pass was performed to evaluate the EPA-designated Ocean Dredge Material Disposal Site, (ODMDS) just west of the Southwest Pass bar channel, and biological testing was performed as a requirement of the permit (and not to ascertain the presence of a particular contaminant). Sediment and water from a reference area in East Bay were used to provide control data for shoal material test results; therefore, results from these tests are applicable to this water and sediment quality assessment.

An MVN report dated January 8, 2009 entitled "Southwest Pass Dredged Material Evaluation – 2008," provides a summary of all evaluations associated with the 2008 barge incident on the Mississippi River, and makes recommendations on the management of dredged material from the channel south of Venice, Louisiana. As to the presence of hydrocarbon contaminants in the dredged material removed by hopper dredges operating after the 2008 spill, the report concluded that:

> *Analytical results and visual inspection of hopper dredges working in (Southwest Pass) suggest that trace amounts of oil were present in sediment in all dredging reaches approximately from mile 11.0 (Below Head of Passes) to mile 5.0 (Above Head of Passes). However, analytes indicative of oil contamination in the dredged material were either below detection limits (for polycyclic aromatic hydrocarbons or "PAHs", generally less than 3.5 – 10 µg/kg for dredged material solid fraction; and <0.1 µg/kg for dredged material liquid fraction) or at concentrations that are not expected to result in adverse ecological impacts… Based on the analytical results of samples taken in the hopper dredge bins,*

dredged material from (Southwest Pass) is suitable for placement in open water without special management actions.

Regarding the presence of hydrocarbon contaminants in the dredged material deposited by hopper dredges in the Head of Passes HDDA after the 2008 spill, and intended for transfer to permanent beneficial use sites in the Mississippi River Delta, the same report concluded that:

The discharge of dredged material at the (Head of Passes Hopper Dredge Disposal Area) and (Mile 5.5 Below Head of Passes Alternate Disposal Area) does not appear to have resulted in the accumulation of contaminants indicative of #6 Fuel Oil. All detected analytes (for PAHs, >20 µg/kg) were below concentrations associated with adverse impacts to benthic communities… Therefore, special management actions are not warranted for continued use of either disposal area… Mining of the (Head of Passes Hopper Dredge Disposal Area) is not predicted to adversely impact receiving waters within the (Delta National Wildlife Refuge)… All detected analytes in sediment (for PAHs, >20 µg/kg) and elutriate (for PAHs, >1.5 µg/kg) were below concentrations associated with adverse environmental impacts, and therefore additional biological effects-based testing was not warranted. Based on the results of sediment testing and analyses, sediments removed from the (Head of Passes Hopper Dredge Disposal Area) are suitable for discharge into open waters of the (Delta National Wildlife Refuge) without special management actions.

A MVN report dated October 28, 2010 entitled "Dredged Material Evaluation of Six Federal Navigation Channels Following the Deepwater Horizon Incident" provides a summary of shoal material evaluations of Federal navigation channels in coastal areas potentially impacted by the *Deepwater Horizon* incident, including Southwest Pass and South Pass of the Mississippi River. The report observed for South Pass that:

PAHs were generally at or below analytical reporting limits (less than 4 µg/kg) for the two inland-most stations, and somewhat more prevalent at the two stations nearest to the jetties but with the sum of detected PAHs not exceeding 121 µg/kg. PAH results were compared to freshwater sediment quality benchmarks reflective of intermediate marsh adjacent to the channel's dredged material disposal areas. All detected PAHs were below applicable (Threshold Effects Level) and (Probable Effects Level) benchmarks.

The report concludes for all channels investigated that:

… navigation channels traversing areas along the Louisiana coast that were impacted by the (Deepwater Horizon) incident do not show any evidence of oil contamination. Analytes indicative of oil contamination were present in shoal material only in trace amounts, and at concentrations that are not expected to adversely impact benthic organisms. Therefore, additional biological effects-based testing is not warranted and special management of dredged material is not required during channel maintenance.

A report prepared by PBS&J (2010) entitled "Mississippi River-Southwest Pass Contaminant Assessment" provides a detailed account of collection and analysis of shoal material taken from Southwest Pass following containment of the *Deepwater Horizon* spill. The report was prepared in support of the EPA-designated ODMDS just west of the Southwest Pass bar channel. Sediment and water from a reference area in East Bay were used as control samples to compare against test results from samples of Southwest Pass shoal material. The following findings from the PBS&J report are relevant to this EA's water and sediment quality assessment:

(a) dredging "elutriates" were prepared from shoal material and site water collected in Southwest Pass and mixed in a 1:4 ratio representative of dredge material slurry. Two oil-related contaminants (Acenaphthene and Phenanthrene) were observed in one of six channel elutriates, but at concentrations less than 1 µg/l (or about 9 and 175 times lower than their respective water quality screening values). All other oil-related contaminants were below detection limits (0.3 to 1.3 µg/l for PAHs) in the elutriates;

(b) amphipods and mysid shrimp were exposed to channel shoal material and sediment from East Bay during a 10-day toxicity experiment. Survival in all channel treatments ranged between 92 percent and 96 percent, and was comparable to or exceeded survival in animals exposed to East Bay sediment (90 percent to 95 percent); and

(c) benthic worms and clams were exposed to channel shoal material and sediment from East Bay during a 28-day bioaccumulation experiment. Oil-related contaminants did not accumulate in the tissue of any of the test animals.

The results of these evaluations indicate that fuel oil from the 2008 barge incident and crude oil from the 2010 *Deepwater Horizon* incident have left only trace quantities of hydrocarbons, if any, in the dredged material removed from the Southwest Pass and South Pass reaches of the Mississippi River, Baton Rouge to the Gulf of Mexico, Louisiana Federal navigation project. Oil-related contaminants were either absent from sample shoal material removed from these reaches for testing or below concentrations associated with adverse environmental impacts. Moreover, direct exposure of sensitive aquatic animals to shoal material from Southwest Pass did not result in significant mortality or the bioaccumulation of oil-related contaminants.

3.2.9 Air Quality

Existing Conditions

The EPA, under the requirements of the CAA, has established NAAQS for seven contaminants, referred to as "criteria" pollutants (40 CFR 50). These are carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter less than 10 microns in diameter (PM_{10}), particulate matter less than 2.5 microns in diameter ($PM_{2.5}$), lead (Pb), and sulfur dioxide (SO_2). The NAAQS standards include primary and secondary standards. The primary standards were established at levels sufficient to protect public health with an adequate margin of safety. The secondary standards were established to protect the public welfare from the adverse effects associated with pollutants in the ambient air. The primary and secondary standards are presented in Table 4.

The EPA *Green Book Nonattainment Areas for Criteria Pollutants* (Green Book) maintains a list of all areas within the United States that are currently designated "nonattainment" areas with respect to one or more criteria air pollutants. Nonattainment areas are discussed by county or metropolitan statistical area (MSA). MSAs are geographic locations, characterized by a large population nucleus, that are comprised of adjacent communities with a high degree of social and economic integration. MSAs are generally composed of multiple counties. Review of the Green Book indicates that Plaquemines Parish is currently in attainment for all Federal NAAQS pollutants, including the 8-hour ozone standard (EPA 2013). This classification is the result of area-wide air quality modeling studies. Therefore, further analysis required by the CAA general conformity rule (Section 176(c)) would not apply for the proposed Federal action.

Table 5: Primary and Secondary NAAQS for the Seven Contaminants Established by EPA

National Ambient Air Quality Standards [3][4]				
	Primary Standard		Secondary Standard	
Criteria Pollutant	Concentration Limit	Averaging Time	Concentration Limit	Averaging Time
Carbon monoxide	9 ppmv (10 mg/m^3)	8-hour (1)	None	
	35 ppmv (40 mg/m^3)	1-hour (1)		
Sulfur dioxide	0.03 ppmv (80 µg/m^3)	Annual (arithmetic mean)	0.5 ppmv (1300 µg/m^3)	3-hour (1)
	0.14 ppmv (365 µg/m^3	24-hour (1)		
Nitrogen dioxide	0.053 ppmv (100 µg/m^3)	Annual (arithmetic mean)	Same as primary	
Ozone	0.075 ppmv (150 µg/m^3)	8-hour (2)	Same as primary	
	0.12 ppmv (235 µg/m^3)	1-hour (3)	Same as primary	
Lead	0.15 µg/m^3	Rolling 3-month average	Same as primary	
	1.5 µg/m^3	Quarterly average	Same as primary	
Particulate Matter (PM_{10})	150 µg/m^3	24-hour (4)	Same as primary	
Particulate Matter ($PM_{2.5}$)	15 µg/m^3	Annual (5) (arithmetic mean)	Same as primary	
	35 µg/m^3	24-hour (6)	Same as primary	

(1) Not to be exceeded more than once per year.
(2) The 3-year average of the fourth-highest daily maximum 8-hour average at each monitor within the area over each year must not exceed 0.075 ppmv.
(3a) The expected number of days per calendar year with maximum hourly averages above 0.12 ppm must be equal to or less than 1.
(3b) As of June 15, 2007, the U.S. EPA revoked the 1-hour ozone standard in all areas except for certain parts of 10 states.
(4) Not to be exceeded more than once per year on average over 3 years.
(5) The 3-year average of the weighted annual mean $PM_{2.5}$ concentrations from single or multiple community-oriented monitors must not exceed 15 µg/m^3.
(6) The 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within the area must not exceed 35.5 µg/m^3.

3.2.10 Cultural Resources

Existing Conditions

The National Historic Preservation Act of 1966 (Public Law 89 80 655), as amended; NEPA of 1969 (Public Law 91-90), as amended; and other applicable laws and regulations require Federal agencies to take into account the effects of their undertaking on the environment and any significant cultural resources within the project area of the proposed undertaking, as well as its area of potential effect (APE). Typically, these studies require archival searches and field surveys to identify any cultural resources. When significant sites are recorded, efforts are made to minimize adverse effects and preserve the site(s) in place. If any significant sites cannot be avoided and would be adversely impacted, an appropriate mitigation plan would be implemented to recover data that would be otherwise lost due to the undertaking.

This area is a part of the Balize Delta formation, and at between approximately 1000 – 500 years old is relatively recent in geologic terms. The HDDA area of the Mississippi River has been previously surveyed for cultural resources (Greene et al. 1984; 22-918), and has seen disturbance by disposal and retrieval processes for many years. The proposed marsh creation areas for this project have not been directly surveyed for cultural resources, but are considered very low potential areas to contain undiscovered cultural resources, because of the recent nature of the land as well as the erosion and subsidence that has been affecting it.

A conclusion of no historic properties affected, was coordinated with the Louisiana SHPO for this project in a letter dated May 8, 2015 and a response dated May 20, 2015. (Appendix D)

3.2.11 Recreational Resources

Existing Conditions

This resource is institutionally important because of the Federal Water Project Recreation Act of 1965, as amended, and the Land and Water Conservation Fund Act of 1965, as amended. Recreational resources are technically important because of the high economic value of recreational activities and their contribution to local, state and national economies. Recreational resources are publicly important because of: the high value that the public places on fishing, hunting, and boating, as measured by the large number of fishing and hunting licenses sold in Louisiana; and the large per-capita number of recreational boat registrations in Louisiana.

The Delta National Wildlife Refuge (NWR) is approximately 4.5 miles east of the project area. The NWR was established in 1935 with the legislative purposes to serve as a breeding ground for migratory birds and other wildlife, and to serve as a migratory waterfowl refuge. The refuge lands are accessible only by boat. Despite this limitation, the area has a long record of public use. The majority of this public use has been in the form of consumptive uses such as hunting and fishing (fresh and saltwater). Other public use includes wildlife observation, bird watching, boating, canoeing and kayaking and photography. Camping is not allowed on the refuge.

Recreation use in the project area is expected to be similar to the NWR and includes boating, fishing (fresh and saltwater), wildlife observation, bird watching, and photography.

3.2.12 Visual Resources (Aesthetics)

Existing Conditions

The project site is located on the southern tip of the State of Louisiana as a small piece of the massive Mississippi River Delta Complex. The area is devoid of any type of development save some industrial complexes, ship harbors and marinas located in the vicinity of Venice. Highway 23 is the nearest major thoroughfare and provides no view sheds into the immediate project area. Other thoroughfares in the area include those in and around Venice, but they also offer no view sheds into the immediate project area, and are limited in size to local streets only. The area remains relatively natural and scenic and is a haven for recreational opportunities such as fishing and nature observation, especially in the numerous canals and other natural waterways that traverse through the marshes in the area. View sheds to the project site are offered only from Spanish Pass and its surrounding waterways.

4 Environmental Consequences

4.1 Navigation

Future Conditions with No-Action

There would be no anticipated impacts to navigation without implementation of the proposed project. O&M activities would continue to dredge the HDDA and dispose of materials in one of the already approved dredge material control disposal sites.

Without implementation of the proposed action, shoaling would continue to affect the South and Southwest passes of the Mississippi River, Baton Rouge to the Gulf of Mexico, Louisiana project. Maintenance dredging would continue to be needed in portions, or all, of the passes and the HDDA approximately every one to two years (based on historical frequency).

Future Conditions with the Proposed Action

Hydraulic cutterhead dredges and disposal pipelines may cause minor and temporary interference of navigation by blocking sections of the channel, but are not expected to interfere significantly with shipping traffic. Dredging operations would be closely coordinated with representatives of the navigation industry and a Notice to Mariners would be posted by the USCG. Beneficial use-placement of dredged material in the proposed shallow open water areas could cause minor disruptions to small vessels using these portions of the project area; however, the effects on navigation would be mainly temporary. Portions of the proposed disposal areas may become inaccessible to some watercraft as wetland vegetation eventually colonizes the area; however, the shallow nature of the area currently limits most vessel access.

4.2 Wetlands

Future Conditions with No-Action

Land loss in the proposed deposition area, due to subsidence, sea level rise (SLR) and saltwater intrusion would likely continue at the current rate, estimated at approximately 0.1 square miles per year. (Couvillion et al. 2011) Construction of recent CWPRRA and beneficial use projects in the area, such as the 44 acre beneficial use marsh creation site at West Bay, has resulted in the creation of wetlands within the surrounding areas which is intended to off-set wetland loss in the area to a limited degree.

Without implementation of the proposed action, wetlands in the project vicinity would continue to be directly and indirectly impacted by the present natural and anthropogenic factors. Salinity intrusion would continue to impact vulnerable marsh habitats, causing them to either convert type or convert to open water. Subsidence and erosional land loss would continue at the present rate. The overall habitat value and acreage of the remaining wetlands would decline with the No Action alternative. Vast acreages of wetlands have been lost and would continue to be lost in this portion of the Mississippi Deltaic Plain.

Future Conditions with the Proposed Action

With implementation of the proposed action there could be some minimal and insignificant impacts to wetland resources. MVN anticipates using existing corridors to access the proposed disposal site. Direct placement of dredged material within open water which includes intermittent patches of existing intermediate marsh for the proposed project would impact approximately 17.08 acres of existing marsh in the full footprint and 1.09 acres of marsh in the access right of way. With implementation of the proposed action, there would be an overall positive impact to wetlands in the project area. Approximately 55 acres of marsh would be created in existing shallow open water.

The proposed action would offer some wave impact reduction for the marsh and SAV habitats to the north. Newly created marsh would provide additional foraging, breeding, nesting, and nursery areas, as well as refugia for a multitude of estuarine-dependent and commercially important fish and shellfish, migratory waterfowl, wildlife, and several species of wading, diving, and shore birds, and help to offset the substantial wetlands loss currently taking place in this portion of the Mississippi Deltaic Plain. Thus, positive direct and indirect impacts to wetlands and wetland-related resources would be expected with implementation of the proposed action.

The proposed action would result in the discharge of fill material into waters of the U.S. Under authority delegated from the Secretary of the Army and in accordance with Section 404 of the Clean Water Act of 1977, the USACE regulates discharges of dredged or fill material into waters (e.g., wetlands) of the U.S. Although the USACE does not process and issue permits for its own activities, the USACE authorizes its own discharges of dredged or fill material by applying all applicable substantive legal requirements, including public hearings and application of the section 404(b)(1) guidelines. Signing of the 404(b)(1) evaluation by the District Commander would finalize documentation of compliance with the Section 404(b)(1) guidelines for the proposed actions addressed in this EA. (Appendix E)

4.3 Scrub-Shrub

Future Conditions with No-Action

Land loss in the proposed deposition area, due to subsidence, SLR and saltwater intrusion would likely continue at the current rate. However, recent CWPRRA projects, such as the Grand Liard Marsh and Ridge Restoration (370 net acres benefited) and the Bayou Dupont Sediment Delivery System (326 net acres benefited), have resulted in the creation of wetlands within the surrounding areas which should help to reduce erosion of existing scrub-shrub.

The resulting loss of habitat and habitat diversity would have an indirect impact on wildlife species dependent on scrub-shrub habitat in the area.

Future Conditions with the Proposed Action

It is anticipated that the marsh islands would be colonized with flood and salt-tolerant scrub-shrub vegetation along the higher elevations as seen in previous projects. The scrub shrub vegetation would provide both nesting habitat for mottled ducks and stopover habitat for neotropical migratory songbirds, and would provide new habitat for other birds, mammals, and wildlife that use this habitat type for nesting, foraging, and refugia.

The created marsh could help to reduce erosion of existing wetlands and upland-ridge habitat that are susceptible to subsidence, sea level rise, and tropical storm surge.

4.4 Aquatic Resources/Fisheries

Future Conditions with No-Action

Without implementation of the proposed action, the proposed disposal areas would remain as shallow open water and eroding marsh. The average depth of open-water area would continue to increase as a consequence of continued subsidence, erosion, and land loss, and the resulting loss of marsh and associated vegetation to open water would have an adverse impact on fish and shellfish populations inhabiting the area. The pattern of expanding open water bays would diminish opportunities for species that typically utilize emergent wetland habitats. The average depth of open-water areas would continue to increase and the amount of open water less than or equal to 1.5 feet deep is expected to decrease. Wetland vegetation loss would degrade the quality of the area for fisheries as food sources and nursery habitat decline.

However, recent CWPRRA and BU projects and the West Bay diversion have resulted in the creation of wetlands and SAV habitat within the surrounding areas which provides highly productive fisheries habitat, increases detrital food material, and likely contributes to overall increased fisheries productivity.

Future Conditions with the Proposed Action

Implementation of the proposed action would result in some minimal direct and indirect effects to aquatic/fisheries resources in the form of altered open water bottom habitat. Approximately 23 acres would be impacted by the ridge restoration, along with 58 acres for the marsh platform at Tiger Pass Ridge.

Some positive indirect impacts to fisheries are also expected. Creation of new marsh and SAV habitat would provide highly productive fisheries habitat, increase detrital food material, and likely contribute to overall increased fisheries productivity.

Brown shrimp, white shrimp, and crabs may be directly impacted through the filling of shallow open water areas with dredged materials; however, these species could potentially indirectly benefit from the abundance of introduced detritus, and subsequent food resources, from these materials. Sessile or slow moving benthic organisms may be smothered in areas where dredged material is deposited for marsh and ridge restoration. Sediment particles that become suspended due to disposal activities may impact filter-feeding benthic invertebrates by fouling feeding apparatus if the concentration of such particles is excessively high. Clams and oysters, in particular, may experience a reduction in pumping rates with increased turbidity (Loosanoff 1961). Since the project area is a naturally turbid environment and the majority of resident finfish and shellfish species are generally adapted to, and very tolerant of, high suspended

sediment concentrations, the effects of turbidity and suspended solids on fisheries would likely be negligible.

4.5 Wildlife

Future Conditions with No-Action

Without implementation of the proposed action, land loss in the proposed deposition area would likely continue at the present rate resulting in a reduction of habitat diversity and availability for resident terrestrial wildlife such as nutria, muskrat, mink and river otter; migratory waterfowl such as snow geese, gadwalls, pintails, mallard, teal, coot redheads, lesser scaup, mergansers, wigeons, canvasbacks and black ducks; and other avian species such as ibis, egrets, cormorants, terns, gulls, skimmer, pelicans, and various raptors. Recent CWPRRA and beneficial use projects has resulted in the creation of wetlands habitat within the surrounding areas which provides valuable and diverse habitat for foraging, refugia, nesting, and loafing of terrestrial wildlife, migratory waterfowl, and other avian species.

Future Conditions with the Proposed Action

Minimal and temporary adverse direct and indirect impacts to wildlife would be anticipated. While construction activities are expected to mainly occur over open water, there is the potential for noise or wave action generated by construction activities to displace terrestrial wildlife in the area; however this would be a temporary disturbance, with wildlife likely to return following the completion of disposal activities. Migratory waterfowl and other avian species, if present, would be temporarily displaced from the project area. It is anticipated that wildlife populations would move to existing adjacent habitat areas during construction activities. The placement of dredge material for beneficial use would reduce some shallow open water habitat by converting it to marsh and ridge habitat, thereby reducing available foraging habitat for some avian species but creating nesting and resting habitat for other species. However, the reduction in the amount of shallow open water is negligible compared to that remaining in the project area. Portions of the proposed project area may contain habitats commonly inhabited by colonial nesting wading birds and seabirds.

It is anticipated that wildlife in and near the project area would ultimately benefit from the proposed activities as submerged and emergent vegetation colonizing these areas would provide valuable and diverse habitat for foraging, refugia, nesting, and loafing of terrestrial wildlife, migratory waterfowl, and other avian species.

4.6 Essential Fish Habitat

Future Conditions with No-Action

Without implementation of the proposed action, no direct impacts to EFH would occur. However, land loss in the proposed deposition area, due to subsidence, SLR and saltwater intrusion would likely continue at the current rate. Therefore, indirect impacts to EFH would likely occur as existing estuarine emergent marsh areas continue to be converted to open water due to natural and anthropogenic factors in this portion of the Mississippi Deltaic Plain.

Future Conditions with the Proposed Action

With implementation of the proposed action, initially some EFH for brown shrimp, white shrimp, and red drum would be directly impacted in the project area during the beneficial use-

placement of dredged material for wetlands development in the shallow open waters of the proposed disposal areas. Approximately 81 acres of shallow open water bottom and associated EFH habitat (e.g., mud/sand substrates, SAV) would be potentially impacted by the placement of dredged material in the proposed areas for the creation of marsh. However, as the site would be converted to a generally more productive category of EFH, they may eventually become colonized by emergent vegetation. Thus, the proposed action would provide mainly positive indirect impacts to EFH, and any direct or temporary adverse impacts would be sufficiently offset by the net benefits from the creation of marsh, new shallow open water habitat, and associated EFH.

Additional, short term EFH impacts would include a temporary and localized increase in estuarine water column turbidity during the placement of dredged material in shallow open water areas; however, the project area is a naturally turbid environment and increased turbidity is not expected to significantly affect EFH needs within the project area.

4.7 Threatened and Endangered Species

Future Conditions with No-Action

Without implementation of the proposed action, no direct or indirect impacts to threatened or endangered species or their critical habitat would occur.

Future Conditions with the Proposed Action

Although threatened or endangered species may occur within the general project vicinity, their presence within the project area is highly unlikely. The proposed project area does not contain critical habitat for Federally-listed species, and the open water areas surrounding the project area would allow them to easily avoid the project activities. Therefore, the proposed action is unlikely to cause adverse direct or indirect impacts to (i.e., “not likely to adversely affect”) Federally-listed threatened or endangered species, or their critical habitat, under the jurisdiction of USFWS. Additionally, MVN has concluded that no critical habitat for any threatened, endangered, or candidate species under the purview of NMFS has been designated within the project area, and that there would be no adverse impacts (i.e., “no effect”) to any of the NMFS Federally-listed species that could potentially occur within the project area.

Pallid and Gulf sturgeon are unlikely to occur in the project area and it is extremely unlikely that manatees would be found in the project area or in the surrounding shallow open waters; however, if manatees are observed within 100 yards of the “active work zone” during proposed construction/dredging activities, (e.g., no operation of moving equipment within 50 feet of a manatee; all vessels should operate at no wake/idle speeds within 100 yards of work area; siltation barriers, if used, should be re-secured and monitored; report manatee sightings or collisions), the appropriate special operating conditions, as provided by the USFWS, Lafayette, Louisiana Field Office, would be implemented and would be included in any plans and specifications developed prior to dredging and disposal activities.

Although pallid sturgeons are unlikely to occur in the project area, the USFWS recently provided the following recommendations in the draft CAR dated October 20, 2015. These are not requirements, but their implementation may further reduce the unlikely chance of encountering pallid sturgeons or other fish species while conducting dredging activities.

1. To the extent possible, schedule dredging activities in the project area during low flow periods, when salt water occurs on the channel bottom further upriver than during normal or high river flows.

2. The cutterhead should remain completely buried in the bottom material during dredging operations. If pumping water through the cutterhead is necessary to dislodge material or to clean the pumps or cutterhead, etc., the pumping rate should be reduced to the lowest rate possible until the cutterhead is at mid-depth, where the pumping rate can then be increased.

3. During dredging, the pumping rates should be reduced to the slowest speed feasible while the cutterhead is descending to the channel bottom.

4. If hopper dredges are utilized, explore the feasibility of using a rigid sea turtle deflector, which is designed to protect sea turtles by preventing them from entering the draghead, and evaluate the effectiveness of that device for pallid sturgeon and other fish species.

The proposed project area is outside those portions of Louisiana designated as critical habitat for Gulf sturgeon. However, if practicable the USFWS, encourages the adherence to the above recommendations to reduce the unlikely chance of encountering Gulf sturgeon while conducting dredging activities.

Piping plovers and rufa red knots could occur along the shoreline and in the intertidal and shallow waters of the project area during winter migration, but are not permanent residents of the area. Construction activities may cause piping plover and red knots in the vicinity to be temporarily displaced to nearby areas containing foraging and loafing habitat. During placement of dredged material into the proposed disposal areas, piping plovers and red knots may be temporarily displaced to other areas for foraging and loafing; however, this is not considered to be detrimental due to an abundance of similar habitat in the vicinity of the project area.

To minimize disturbance to colonial nesting wading birds and seabirds occurring in the area, special operating conditions on construction activity provided by the USFWS, Lafayette, Louisiana Field Office would be included in any MVN plans and specifications developed prior to dredging and disposal activities associated with the proposed action.. These restrictions address colonial nesting wading birds and seabirds (i.e., reporting presence of birds and/or nests; no-work distance restrictions; bird nesting prevention and avoidance measures; marking discovered nests). In addition, dredging and disposal activities would be restricted to non-nesting periods for colonial nesting wading birds and seabirds when practicable.

4.8 Water and Sediment Quality

Future Conditions with No-Action

Without implementation of the proposed action, no direct impacts to water quality or sediment quality would occur.

Indirect impacts as a result of not implementing the proposed action would be the continued degradation of water quality as the area continues to erode as a result of wave activity. However, recent CWPRRA and BU projects and the West Bay diversion have resulted in the creation of wetlands and SAV habitat within the surrounding areas which provides highly

productive fisheries habitat, increases detrital food material, and likely contributes to overall increased fisheries productivity.

Future Conditions with the Proposed Action

With implementation of the proposed action, there would be some disturbances to ambient water quality; however, direct and indirect impacts would be short-lived and highly localized. Beneficial use-placement of dredge material in the proposed open water disposal site may cause temporary increases in turbidity and suspended solids concentrations, and a reduction in light penetration in the immediate vicinity; however, since the project area is a naturally turbid environment and resident biota are generally adapted to, and very tolerant of, high suspended sediment concentrations, the effects would be negligible. A reduction in light penetration may indirectly affect phytoplankton (i.e., primary) productivity in the area as the amount of photosynthesis carried out by phytoplankton is reduced. Localized temporary pH changes, as well as a reduction in dissolved oxygen levels, may also occur during construction efforts. Water quality is expected to return to pre-construction conditions soon after the completion of disposal activities associated with the proposed project.

Based on the results of shoal material analyses following the 2008 fuel oil spill at New Orleans and the 2010 *Deepwater Horizon* incident, MVN determined there is no reason to believe that the Southwest Pass and South Pass reaches of the Mississippi River, Baton Rouge to the Gulf of Mexico, Louisiana navigation channel were adversely impacted by the spills. The beneficial placement of shoal material from South Pass and Southwest Pass in open water sites would not pose an ecological risk from hydrocarbon contamination because any hydrocarbons in the dredged material have been measured at a concentration "at or below analytical reporting limits" and may pre-date the 2008 and 2010 spills. In short, no significant environmental risk of hydrocarbon pollution is believed to exist with regard to use of the dredged material identified for placement within the project areas. Consequently, no special management would be required during dredging or disposal activities. In the wake of the *Deepwater Horizon* oil spill, MVN continues to closely monitor aerial reconnaissance surveys, shoreline assessment reports, drogue tracks, and other oil plume tracking and contaminant information available from the National Ocean Service, Office of Response and Restoration, ResponseLINK website (https://responselink.orr.noaa.gov/).

The proposed open water placement of dredged material for beneficial use, which is not expected to have any adverse effect on water quality of the receiving site, would be evaluated as part of the Section 404(b)(1) Evaluation. To comply with Section 401 of the Clean Water Act, Louisiana an application for Water Quality Certification was filed with the Louisiana Department of Environmental Quality and is currently pending. (Appendix D)

4.9 Air Quality

Future Conditions with No-Action

Without implementation of the proposed action, no direct or indirect impacts to ambient air quality would occur.

Future Conditions with the Proposed Action

With implementation of the proposed action, direct and indirect impacts to ambient air quality are expected to be temporary, and primarily due to the emissions of construction equipment. Due to the short duration of the proposed project, any increases or impacts to ambient air

quality are expected to be short-term and minor and are not expected to cause or contribute to a violation of Federal or State ambient air quality standards. Once all construction activities associated with the proposed action cease, air quality within the vicinity is expected to return to pre-construction conditions.

4.10 Cultural Resources

Future Conditions with No-Action

Without implementation of the proposed action, the conditions within the recreational environment would continue as they have in the past and would be dictated by the natural land use patterns and processes that have dominated the area in the past.

Future Conditions with the Proposed Action

With implementation of the proposed action, land would be rebuilt by mechanical and possibly by resulting natural activity. Any undiscovered cultural resource within the disposal area would be covered by disposed sediment and could be destroyed by the additional weight. Also possible is that the additional cap of sediment would protect the survival of any unknown cultural resource, although it would also hide that resource from potential future discovery. The growth of land could provide a buffer to storm surge or wind from Gulf storms, and this could protect cultural resources that are outside of the currently proposed disposal areas. To comply with Section 106 of the National Historic Preservation Act (NHPA), consultation with the Louisiana State Historic Preservation Officer (SHPO) was initiated on May 8, 2015. Concurrence from the SHPO was received on May 20, 2015.

4.11 Recreational Resources

Future Conditions with No-Action

Without implementation of the proposed action, the conditions within the recreational environment would continue as they have in the past and would be dictated by the natural land use patterns and processes that have dominated the area in the past.

Future Conditions with the Proposed Action

Recreationists would be displaced during construction activities in the project area. Fishing in the area adjacent to the project area may also be impacted temporarily as result of increased turbidity. Approximately 23 acres of open water would be converted to land/marsh eliminating boating and fishing in this area. However, the creation of marsh would provide an increase in habitat for water fowl and nursery habitat for fish.

4.12 Visual Resources (Aesthetics)

Future Conditions with No-Action

Under the no action alternative, no direct or indirect impacts to visual resources would occur at the proposed project area. Visual resources would evolve from existing conditions in a natural process over the course of time.

There are no foreseen cumulative impacts to visual resources under the no action alternative in the proposed project area. Visual resources would evolve in a natural process over the course of time.

Future Conditions with the Proposed Action

The visual resources of the project corridor would be directly impacted by construction activities related to implementing the proposed action and by transport activities needed to move equipment and materials to and from the site. However, this impact would be temporary and would most likely affect visual resources from boating and other water traffic only.

Cumulative impacts to the visual character could continue in the project area with implementation of the proposed action. Other similar activities in the vicinity have and will continue to affect visual quality in the project area. However; projects of this scope will serve to impact the region in a positive way by contributing renewed natural scenery, wildlife habitat, and significant contrast to open water areas.

4.13 Hazardous, Toxic, and Radioactive Waste

The discharge of dredged material into waters of the United States is regulated under the Clean Water Act (CWA). In the absence of a known Hazardous, Toxic, and Radioactive Waste (HTRW) concern, the proposed action would not qualify for an HTRW investigation.

Engineer Regulation (ER) 1165-2-132 provides that in the Planning, Engineering and Design (PED) Phase that, for proposed project in which the potential for HTRW problems has not been considered, an HTRW initial assessment, as appropriate for a reconnaissance study, should be conducted as a first priority. If the initial assessment indicates the potential for HTRW, testing, as warranted and analysis similar to a feasibility study should be conducted prior to proceeding with the project design. The NFS will be responsible for planning and accomplishing any HTRW response measures, and will not receive credit for the costs incurred.

An ASTM E 1527-05 Phase 1 Environmental Site Assessment (ESA), HTRW 16-01 dated January 19, 2016, has been completed for the project area. A copy of the Phase 1 ESA will be maintained on file at CEMVN. The probability of encountering HTRW for the proposed action is low based on the initial site assessment. If a recognized environmental condition is identified in relation to the project site, the U.S. Army Corps of Engineers, New Orleans District would take the necessary measures to avoid the recognized environmental condition so that the probability of encountering or disturbing HTRW would continue to be low.

4.14 Cumulative Impacts Analysis

The Council on Environmental Quality (CEQ) Regulations define cumulative impacts (CI) as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (Federal or non-Federal) or person undertakes such other actions. CI can result from individually minor but collectively significant actions taking place over a period of time."

Coastal Louisiana, including the project area, has been greatly impacted by natural subsidence, levees, hurricanes and oil and gas infrastructure. Recent events, such as hurricanes and oil spills, contribute to the loss of habitat but are largely indiscernible from other impacts. Direct and indirect impacts of past, present and reasonably foreseeable future events were considered in the analysis of the proposed project consequences. These impacts include historical and predicted future land loss rates for the area and other restoration projects in the vicinity. The proposed action would have reversible temporary adverse impacts to some

environmental resources, but overall cumulative moderate benefits to the environmental resources.

It is anticipated that through the efforts taken to avoid wetlands impacts and the beneficial use of dredged material that functionally compensates unavoidable remaining impacts, the Recommended Plan would not result in overall adverse direct, secondary, or cumulative impacts to the aquatic environment and human environment in or near the project area. Overall, the cumulative impacts of the proposed action are expected to be positive, with long-term benefits to navigation, wetlands, EFH, fisheries and wildlife resources, and recreational opportunities anticipated in the project area. Construction of the Recommended Plan would create an estimated 23 acres of forested ridge and 55 acres of intermediate marsh over the 50 year period of analysis for a net total 35 AAHUs. The net benefits of the other alternatives that were evaluated are listed in Table 1. When added to the previously constructed beneficial use (West Bay) and CWPRRA projects in the area, it is estimated that in 20 years the area could benefit from the creation of approximately 3,873 acres of marsh and an approximate 790 acres of SAV habitat.

Project impacts would be in addition to, and often synergistic with, the impacts and benefits from marsh acres restored, nourished and protected by other Federal, state, local, and private restoration efforts within or near the Project Area, the Louisiana state coastal area, and the nation's coastal areas.

Though CWPPRA projects are nominated and implemented one at a time and must have individual merit, the cumulative value of the wetland restoration and protection projects in the area can exceed the summed values of the individual projects. Similar wetland restoration projects in the area would operate synergistically with the proposed alternative to enhance the structural and functional integrity of the ecosystem, improve primary productivity rates, and thereby improve the overall environmental resources. The nearest projects for restoration listed by the state database involve shoreline protection, marsh management, and hydrological restoration: Grand Liard Marsh and Ridge Restoration (13.80 miles away, status completed), Riverine sand Mining/Scofield Island Restoration (20.40 miles away, status completed), Barrier Island/Headland Restoration (25.16 miles away, status completed), West Bay Marsh Creation (11.83 miles away, status completed).

Environmental benefits from these project types address the suite of environmental threats along this area of coast. In recognition that the environmental needs are varied in type and differ by location, the state of Louisiana developed a 2012 Coastal Master Plan for Southwest Louisiana as a way to prioritize restoration projects. The Recommended Plan is consistent with this coastwide planning.

Physical cumulative impacts are related to mining dredge materials. The effect of borrowing from offshore sources has been evaluated and determined to have no adverse impact. Cumulative impacts would result from the removal of benthic organisms. There is no difference in the cumulative and direct/indirect impacts for this project. Offshore borrow sites disruptions from the proposed and other past, current and future activities are separated by time and space, thus allowing the recolonization of benthic organisms. Separation of time and space also reduce any potential cumulative impact with other actions for wave climate. Therefore, no adverse cumulative impacts are expected.

5 Coordination

Preparation of this EA and a draft FONSI have been coordinated with appropriate Congressional, Federal, Tribal, state, and local interests, as well as environmental groups and other interested parties. The following agencies, as well as other interested parties, have received copies of the draft EA and draft FONSI:

U.S. Department of the Interior, Fish and Wildlife Service
U.S. Environmental Protection Agency, Region VI
U.S. Department of Commerce, National Marine Fisheries Service
U.S. Natural Resources Conservation Service, State Conservationist
U.S. Coast Guard Sector New Orleans
U.S. Coast Guard Marine Safety Unit Baton Rouge
Maritime Navigation Safety Association
The Associated Branch (Bar) Pilots
Crescent River Port Pilots Association
New Orleans Baton Rouge Steamship Pilot Association
Associated Federal Pilots
Big River Coalition
Lower Mississippi River Committee (LOMRC)
Coastal Protection and Restoration Authority Board of Louisiana
Advisory Council on Historic Preservation
Governor's Executive Assistant for Coastal Activities
Louisiana Department of Wildlife and Fisheries
Louisiana Department of Natural Resources, Coastal Management Division
Louisiana Department of Natural Resources, Coastal Restoration Division
Louisiana Department of Environmental Quality
Louisiana State Historic Preservation Officer
Plaquemines Parish Government
Alabama-Coushatta Tribe of Texas
Caddo Nation of Oklahoma
Chitimacha Tribe of Louisiana
Choctaw Nation of Oklahoma
Coushatta Tribe of Louisiana
Mississippi Band of Choctaw Indians
Jena Band of Choctaw Indians
Seminole Tribe of Florida
Seminole Nation of Oklahoma
Tunica-Biloxi Tribe of Louisiana

MVN received recommendations in a Draft CAR from USFWS dated October 20, 2015. The document and these recommendations can be found in Appendix D and MVN's responses are as follows:

1. Avoid adverse impacts to water bird colonies through careful design project features and timing of construction. We recommend that a qualified biologist inspect the proposed work site for the presence of undocumented nesting colonies during the nesting season. For areas containing nesting wading birds (i.e., herons, egrets, night-herons, ibis, and roseate spoonbills), anhingas, and/or cormorants, all activity occurring within 1,000 feet of a nesting colony should be restricted to the non-nesting period. For

nesting brown pelicans activity should be avoided within 2,000 feet of the colony. Activity is restricted within 650 feet of black skimmers, gulls, and terns.

Response 1 - Concur. USFWS guidelines will be followed in order to remain compliant with the Migratory Bird Treaty Act (MBTA).

2. The impacts to Essential Fishery Habitat should be discussed with the National Marine Fisheries Service to determine if the project complies with the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), Magnuson-Stevens Act; P.L. 104-297, as amended) and its implementing regulations.

   Response 2 - Concur. The NMFS is a part of the PDT. The NMFS will receive a copy of this EA and Coordination on EFH will occur during the 30-day public review process.

3. Access corridors across existing wetlands should be avoided if possible. Impacted wetlands should be restored to a substrate elevation similar to the surrounding marsh. Flotation access channels in open water should be backfilled upon project completion. Post-construction surveys (e.g., centerline surveys) should be taken to ensure access channels have been adequately backfilled. That information should be provided to the natural resource agencies for review.

   Response 3 - Concur. If existing wetlands are impacted they would be restored to pre-project elevation and expected to re-vegetate naturally. If needed, post-construction surveys would be taken and provided to the natural resource agencies for review. Floatation channels are not expected.

4. To ensure that dredged material is placed to each particular habitat's specified elevations, we recommend that the Corps use an updated NAVD88 datum (i.e., current geoid) consistent with the NAVD88 datum that is referenced for the elevations of existing marsh and water level in the project area.

   Response 4 - Concur. The most recent datum was utilized in determining the most efficient land creation location, shape and size.

5. If containment dikes are constructed, they should be breached or degraded to the settled elevations of the disposal area. Such breaches should be undertaken after consolidation of the dredged settlements and vegetative colonization of the exposed soil surface, or a maximum of 2 years after construction.

   Response 5 – Concur to the extent such action is deemed necessary. Containment dikes would be breached or degraded to settled elevation if necessary. The final design elevations of the earthen retention dikes will be determined based on a detailed in situ soil analysis. The dikes are not anticipated to increase the overall footprint. Depending on soil conditions and the nature of the dredged material (expected to be a sandy material), the dikes could be designed in a manner to avoid the need for degrading in out years. This would only apply to earthen retention dikes for the marsh creation component. Material necessary for marsh platform dike, weir and closure construction would come from within the proposed project sites. Some material for ridge restoration comes from within the project with the majority of material for ridge restoration coming from the HDDA. The retention dikes would be expected to settle over time and would

be allowed to vegetate naturally. If necessary, these retention dikes would be later breached or degraded to the settled elevations of the disposal area by the project's non-federal sponsor.

6. The Service recognizes the value of submerged aquatic vegetation (SAV) habitat to fish and wildlife, including Federal trust resource species. If SAV is encountered, the Corps should avoid these areas if possible and utilize unvegetated open water areas for marsh creation.

   Response 6 - MVN also recognizes the value of SAV habitat. The area proposed for marsh creation currently contains no SAV. In addition, the proposed action is projected to create approximately 430 net acres of SAV over the project life. Therefore, if any SAV is impacted by construction, it would be minimal and would be offset by the indirect benefits of the project.

7. Further detailed planning of project features (e.g., Design Documentation Report, Engineering Documentation Report, Plans and Specifications, Water Control Plans, or other similar documents) should be coordinated with the Service, NMFS, LDWF, EPA and LDNR. The Service shall be provided an opportunity to review and submit recommendations on the all work addressed in those reports.

   Response 7 - Concur. MVN will continue to coordinate with the resource agencies.

8. Any proposed change in project features or plans should be coordinated in advance with the Service, NMFS, LDWF, and LDNR

   Response 8 - Concur. MVN will continue to coordinate with the resource agencies.

9. The LCA BUDMAT program specifies that monitoring and adaptive management plans are required for beneficial use habitat creation project. The Corps should coordinate with the Service during development of those plans.

   Response 9 – Concur. Please see section 1.3 of the Adaptive Management and Monitoring Plan. The Corps has coordinated with USFWS on various aspects of the project throughout development. Due to the unique nature of this BUDMAT project, an adaptive management plan was determined to be unnecessary. However, a monitoring plan was developed to determine ecological success of this project and has been communicated to USFWS via the draft report.

10. ESA consultation should be reinitiated should the proposed project features change significantly or are not implemented within one year of the last ESA consultation with this office to ensure that the proposed project does not adversely affect any federally listed threatened or endangered species or their habitat.

    Response 10 – Concur.

6 Mitigation

An assessment of the potential environmental impacts to important resources found that the proposed project would have only minimal and insignificant impacts to resources in the project

area. These impacts would be mainly related to the loss of shallow open water bottom habitat and associated fisheries resources (approximately 23 acres, or 9.79 AAHUs for the ridge construction and 1.09 acres of intermediate marsh in the access right of way) due to construction activities as part of the proposed action. The presence of comparable habitat within the project vicinity minimizes the loss of shallow open water bottom habitats due to the proposed action. Furthermore, any losses of fisheries resources related to the removal of shallow open water bottom by placement of dredged material are out-weighed by the considerable fisheries benefits anticipated from the beneficial use of material dredged from the Mississippi River, Baton Rouge to the Gulf of Mexico, Louisiana project navigation channel, which would create approximately 58 acres productive marsh, marsh-related EFH (e.g., marsh edge, inner marsh, tidal creeks, marsh/water interface, etc.), and other aquatic habitat in the surrounding waters. With the creation of marsh and other productive habitat types in the proposed disposal areas, the long-term and cumulative impacts of the placement of dredged material are generally beneficial. Beneficial utilization of the dredged material for marsh creation would result in overall positive environmental benefits including a net increase of valuable breeding, nesting, foraging, and cover habitat utilized by a wide variety of fish and wildlife species. Therefore, no wetlands mitigation is required.

7 Compliance with Environmental Laws and Regulations

Environmental compliance for the proposed action would be achieved upon the following:

- Coordination of this EA and draft FONSI with appropriate agencies, organizations, and individuals for their review and comments;
- NMFS concurred via a letter dated January 14, 2016 that the impacts to NMFS-trust resources has been adequately described and evaluated and agrees with the determination that the impacts to essential fish habitat would be temporary and minimal and in no need of compensatory mitigation. (Appendix D.)
- LDNR concurred by letter dated December 4, 2015 with the determination that the proposed action is consistent, to the maximum extent practicable, with the Louisiana Coastal Resources Program; Consistency (C20150185). (Appendix D)
- Receipt of and acceptance or resolution of all USFWS Fish and Wildlife Coordination Act recommendations; CEMVN is in receipt of Draft CAR dated October 20, 2015, USFWS recommendations have been accepted or resolved and responses are provided in section 5.0 Coordination. (Appendix D)
- In a letter dated (pending) USFWS concurred with a determination of not likely to adversely affect Federally-listed threatened or endangered species, or their critical habitat, under the jurisdiction of USFWS. (Appendix D)
- A State Water Quality Certificate was received from the Louisiana Department of Environmental Quality on (pending). (Appendix D)
- A Section 404(b)(l) evaluation was signed on (pending) (Appendix D)
- In a letter dated May 20, 2015, the Louisiana State Historic Preservation Officer (SHPO) concurred with a recommendation of no effect on historic properties. (Appendix D)
- On (pending), the CEMVN offered federally-recognized Tribes the opportunity to review and comment on a “no historic properties affected” finding that included the APE for the proposed action.
- A Phase 1 HTRW is currently underway and the findings will be included in the Final EA #542.

The FONSI will not be signed until the proposed action achieves environmental compliance with applicable laws and regulations, as described above.

8 Conclusion

The proposed action would allow for the beneficial use of material dredged from routine maintenance dredging of a federal navigation HDDA to be deposited in the Project Area for marsh and ridge creation and restoration. Beneficial use-placement of dredged material in the proposed Project Area would result in the creation of approximately 58 acres (25.2 AAHUs) of intermediate marsh habitat and approximately 23 acres (9.79 AAHUs) of forested ridge habitat over the 50 year period of analysis for a net total of 35 AAHUs.

This office has assessed the environmental impacts of the proposed action and has determined that the proposed action would have no significant adverse impact on the human and natural environment.

9 Prepared By

EA #542 and the associated FONSI were prepared by Patricia S. Leroux, biologist, U.S. Army Corps of Engineers, New Orleans District; Regional Planning and Environment Division South, MVN-PDN-CEP; P.O. Box 60267; New Orleans, Louisiana 70160-0267.

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10 References

EA #535 entitled “West Bay Marsh Creation Tier 1, Louisiana Coastal Area Beneficial Use of Dredge Material Program, Plaquemines Parish, Louisiana” with a signed FONSI dated 23 March 2015.

EA #517 entitled “Mississippi River, Baton Rouge to the Gulf of Mexico, Louisiana Designation of Additional Disposal Areas for Head of Passes, Southwest Pass, and South Pass, Plaquemines Parish, Louisiana” with a signed FONSI dated 22 November 2013.

Programmatic EIS entitled “Louisiana Coastal Area Beneficial Use of Dredged Material Program” with a signed ROD dated 13 August 2010.

Programmatic EIS entitled “Louisiana Coastal Area, Louisiana, Ecosystem Restoration Program, November 2004” with a signed ROD dated 18 November 2005.

APPENDIX A
Louisiana Coastal Area Beneficial Use of Dredge Material Programmatic EIS, 2010

The Louisiana Coastal Area Beneficial Use of Dredge Material Programmatic EIS can be found on the Nola Environmental website at http://www.nolaenvironmental.gov/

APPENDIX B
Louisiana Coastal Area, Louisiana – Ecosystem Restoration PEIS, 2004

RECORD OF DECISION

LOUISIANA COASTAL AREA
LOUISIANA - ECOSYSTEM RESTORATION

I have reviewed the correspondence and pertinent documents for the final programmatic Environmental Impact Statement (EIS) for the Louisiana Coastal Area (LCA) Ecosystem Restoration Program, November 2004. Based on this review, and after consideration of the views of interested agencies, I find the recommended Program fully addresses the planning objectives. The Program is in accordance with environmental statutes and is in the public interest. Implementing this program would begin to reduce the wetland losses in coastal Louisiana. In accordance with the Council on Environmental Quality regulations, further National Environmental Policy Act documents would be tiered to this programmatic EIS prior to construction of any LCA Ecosystem Restoration Program feature.

A series of alternative plans were formulated as part of the LCA Program planning effort. Three plans were considered in detail: Alternative Plan B focused on river reintroductions of sediment and nutrients from the Mississippi River into the coastal wetlands, while Alternative Plan D emphasized restoring geomorphic structures to promote coastal wetland protection and restoration. The third alternative, the LCA Ecosystem Restoration Program, included both river diversions and restoration of geomorphic structures. The report of the Chief of Engineers recommends the LCA Ecosystem Restoration Plan as the near term plan. In the context of this programmatic EIS, this is the environmentally preferable alternative. My recommendation to Congress reflects this recommendation with a more open opportunity for implementation of the recommended features, without changing the basic findings of the programmatic EIS or conclusions of the Chief of Engineers. My recommendation for Congressional authorization of the LCA Program includes the following:

- Programmatic authorization for restoration features for which construction would begin within 5 to 10 years, with implementation subject to approval of feasibility-level of detail decision documents by the Secretary of the Army.
- Programmatic authorization of a Science and Technology (S&T) Program for data acquisition and analysis, monitoring, model development and application, and research.
- Programmatic authorization to establish a Demonstration Program to determine the effectiveness of engineering advances developed by the S&T Program.
- Programmatic authorization for the beneficial use of dredged material.

- Investigations of modifications of existing structures.
- Investigations and preparation of necessary feasibility-level of detail decision documents for additional near-term critical restoration features.
- Investigations for assessing potentially promising large-scale and long-term restoration concepts.

The LCA Program would facilitate the implementation of critical restoration features and essential science and technology demonstration projects, increase the beneficial use of dredged material, and determine the need for modification of selected existing projects to support coastal restoration objectives. The S&T Program would provide for acquisition of data and development of analytic tools to further resolve scientific uncertainties and support program implementation. The remaining recommended plan components would provide the basis for continued restoration within an established framework.

The benefits provided by the LCA Program include: the sustainable reintroduction of riverine sediment and nutrient resources; rebuilding wetlands in areas at high risk for future loss; the preservation and maintenance of critical coastal geomorphic structure; the preservation of critical areas within the coastal ecosystem; and the opportunity to begin to identify and evaluate potential long-term solutions. The proposed beneficial use program would allow the Corps of Engineers to take greater advantage of existing maintenance dredging material to achieve restoration objectives. There is a reasonable potential to beneficially use an additional 30 million cubic yards of dredged material annually. The LCA Program presents significant capacity for the prevention of future wetland losses with a smaller component of wetland building capacity; however, overall levels of environmental outputs will remain significantly reduced compared to historical conditions. Implementation of the near term plan could offset an estimated 175,000 of the 328,000 acres projected to be lost within coastal Louisiana under the no action alternative.

Comment from individuals, organizations, and government agencies were received during the 30-day comment period (November 5, 2004 to December 6, 2004) following publication in the Federal Register of the notice of availability of the final EIS. The majority of the comments received were generally directed at registering support for the LCA Program while pointing out that this near-term action is only a first step and should be followed by a comprehensive, coastwide, large-scale and long-term restoration of coastal Louisiana. All appropriate means to avoid, minimize, reduce and/or rectify adverse environmental effects will be incorporated into subsequent feasibility level of detail decision documents. Compensatory mitigation for unavoidable environmental impacts is not anticipated, as the LCA Program will create, restore, and

protect significantly more coastal wetland ecosystems than the relatively small unavoidable adverse impacts associated with the construction of restoration features.

18 November 2005
Date

John Paul Woodley, Jr.
Assistant Secretary of the Army
(Civil Works)

The Louisiana Coastal Area, Louisiana, Ecosystem Restoration Programmatic EIS can be found on the LCA Program website at http://www.lca.gov/Library/ProductList.aspx?Prodtype=0&folder=1118

APPENDIX C
WVA Model Results and Summary of Assumptions

WETLAND VALUE ASSESSMENT COMMUNITY MODEL
Coastal Chenier/Ridge

Project: TP3 Ridge component 5K ft. Alt._No Plantings Project Area: 23.03

Condition: Future Without Project

Variable		TY	0	TY	50	TY	
		Class/Value	SI	Class/Value	SI	Class/Value	SI
V1	Tree Canopy Cover (%)	0	0.10	0	0.10		
V2	Shrub/Midstory Cover (%)	0	0.10	0	0.10		
V3	Species Diversity	0	0.10	0	0.10		
		HSI =	0.10	HSI =	0.10	HSI =	

Project: TP3 Ridge component 5K ft. Alt._No Plantings Project Area: 23.03

FWOP

Variable		TY		TY		TY	
		Class/Value	SI	Class/Value	SI	Class/Value	SI
V1	Tree Canopy Cover (%)						
V2	Shrub/Midstory Cover (%)						
V3	Species Diversity						
		HSI =		HSI =		HSI =	

Project: TP3 Ridge component 5K ft. Alt._No Plantings Project Area: 23.03

FWOP

Variable		TY		TY		TY	
		Class/Value	SI	Class/Value	SI	Class/Value	SI
V1	Tree Canopy Cover (%)						
V2	Shrub/Midstory Cover (%)						
V3	Species Diversity						
		HSI =		HSI =		HSI =	

WETLAND VALUE ASSESSMENT COMMUNITY MODEL
Coastal Chenier/Ridge

Project: TP3 Ridge component 5K ft. Alt._No Plantings Project Area: 23.03

Condition: Future With Project

Variable		TY	0	TY	1	TY	3
		Class/Value	SI	Class/Value	SI	Class/Value	SI
V1	Tree Canopy Cover (%)	0	0.10	0	0.10	0	0.10
V2	Shrub/Midstory Cover (%)	0	0.10	0	0.10	10	0.36
V3	Species Diversity	0	0.10	1	0.22	3	0.45
		HSI =	0.10	HSI =	0.13	HSI =	0.25

Project: TP3 Ridge component 5K ft. Alt._No Plantings Project Area: 23.03

FWP

Variable		TY	5	TY	20	TY	50
		Class/Value	SI	Class/Value	SI	Class/Value	SI
V1	Tree Canopy Cover (%)	5	0.17	20	0.38	35	0.59
V2	Shrub/Midstory Cover (%)	15	0.49	45	1.00	55	1.00
V3	Species Diversity	4	0.57	5	0.69	5	0.69
		HSI =	0.36	HSI =	0.64	HSI =	0.74

1/29/2016

Project: TP3 Ridge component 5K ft. Alt._No Plantings Project Area: 23.03

FWP

Variable		TY Class/Value	SI	TY Class/Value	SI	TY Class/Value	SI
V1	Tree Canopy Cover (%)						
V2	Shrub/Midstory Cover (%)						
V3	Species Diversity						
		HSI =		HSI =		HSI =	

AAHU CALCULATION

Project: TP3 Ridge component 5K ft. Alt._No Plantings

Future Without Project TY	Acres	x HSI	Total HUs	Cummulative HUs
0	0	0.10	0.00	
50	0	0.10	0.00	0.00
Max TY =	50		Total CHUs =	
			AAHUs =	

Future With Project TY	Acres	x HSI	Total HUs	Cummulative HUs
0	0	0.10	0.00	
1	23.03	0.13	2.98	1.38
3	23.03	0.25	5.83	8.81
5	23.03	0.36	8.33	14.16
20	21.7	0.64	13.86	167.31
50	17.64	0.74	13.04	405.51
Max TY =	50		Total CHUs =	597.17
			AAHUs =	11.94

NET CHANGE IN AAHUs DUE TO PROJECT	
A. Future With Project AAHUs =	11.94
B. Future Without Project AAHUs =	
Net Change (FWP - FWOP) =	#VALUE!

1/29/2016

WETLAND VALUE ASSESSMENT COMMUNITY MODEL
Coastal Chenier/Ridge

Project: TP3 7.5K ftRidge component_No Plantings Project Area: 34

Condition: Future Without Project

Variable		TY 0 Class/Value	SI	TY 50 Class/Value	SI	TY Class/Value	SI
V1	Tree Canopy Cover (%)	0	0.10	0	0.10		
V2	Shrub/Midstory Cover (%)	0	0.10	0	0.10		
V3	Species Diversity	0	0.10	0	0.10		
		HSI =	0.10	HSI =	0.10	HSI =	

Project: TP3 7.5K ftRidge component_No Plantings Project Area: 34

FWOP

Variable		TY Class/Value	SI	TY Class/Value	SI	TY Class/Value	SI
V1	Tree Canopy Cover (%)						
V2	Shrub/Midstory Cover (%)						
V3	Species Diversity						
		HSI =		HSI =		HSI =	

Project: TP3 7.5K ftRidge component_No Plantings Project Area: 34

FWOP

Variable		TY Class/Value	SI	TY Class/Value	SI	TY Class/Value	SI
V1	Tree Canopy Cover (%)						
V2	Shrub/Midstory Cover (%)						
V3	Species Diversity						
		HSI =		HSI =		HSI =	

WETLAND VALUE ASSESSMENT COMMUNITY MODEL
Coastal Chenier/Ridge

Project: TP3 7.5K ftRidge component_No Plantings Project Area: 34

Condition: Future With Project

Variable		TY 0 Class/Value	SI	TY 1 Class/Value	SI	TY 3 Class/Value	SI
V1	Tree Canopy Cover (%)	0	0.10	0	0.10	0	0.10
V2	Shrub/Midstory Cover (%)	0	0.10	0	0.10	10	0.36
V3	Species Diversity	0	0.10	1	0.22	3	0.45
		HSI =	0.10	HSI =	0.13	HSI =	0.25

Project: TP3 7.5K ftRidge component_No Plantings Project Area: 34

FWP

Variable		TY 5 Class/Value	SI	TY 20 Class/Value	SI	TY 50 Class/Value	SI
V1	Tree Canopy Cover (%)	5	0.17	20	0.38	35	0.59
V2	Shrub/Midstory Cover (%)	15	0.49	45	1.00	55	1.00
V3	Species Diversity	4	0.57	5	0.69	5	0.69
		HSI =	0.36	HSI =	0.64	HSI =	0.74

1/29/2016

Project: TP3 7.5K ftRidge component_No Plantings Project Area: 34

FWP

Variable		TY Class/Value	SI	TY Class/Value	SI	TY Class/Value	SI
V1	Tree Canopy Cover (%)						
V2	Shrub/Midstory Cover (%)						
V3	Species Diversity						
		HSI =		HSI =		HSI =	

AAHU CALCULATION

Project: TP3 7.5K ftRidge component_No Plantings

Future Without Project TY	Acres	x HSI	Total HUs	Cummulative HUs
0	0	0.10	0.00	
50	0	0.10	0.00	0.00
Max TY =	50		Total CHUs =	
			AAHUs =	

Future With Project TY	Acres	x HSI	Total HUs	Cummulative HUs
0	0	0.10	0.00	
1	34	0.13	4.40	2.03
3	34	0.25	8.61	13.01
5	34	0.36	12.30	20.91
20	32	0.64	20.43	246.85
50	26	0.74	19.22	597.85
Max TY =	50		Total CHUs =	880.65
			AAHUs =	17.61

NET CHANGE IN AAHUs DUE TO PROJECT	
A. Future With Project AAHUs =	17.61
B. Future Without Project AAHUs =	
Net Change (FWP - FWOP) =	#VALUE!

1/29/2016

WETLAND VALUE ASSESSMENT COMMUNITY MODEL
Coastal Chenier/Ridge

Project: TP3 Ridge component 5K ft. alt._With Plantings Project Area: 23.03

Condition: Future Without Project

Variable		TY	0	TY	50	TY	
		Class/Value	SI	Class/Value	SI	Class/Value	SI
V1	Tree Canopy Cover (%)	0	0.10	0	0.10		
V2	Shrub/Midstory Cover (%)	0	0.10	0	0.10		
V3	Species Diversity	0	0.10	0	0.10		
		HSI =	0.10	HSI =	0.10	HSI =	

Project: TP3 Ridge component 5K ft. alt._With Plantings Project Area: 23.03

FWOP

Variable		TY		TY		TY	
		Class/Value	SI	Class/Value	SI	Class/Value	SI
V1	Tree Canopy Cover (%)						
V2	Shrub/Midstory Cover (%)						
V3	Species Diversity						
		HSI =		HSI =		HSI =	

Project: TP3 Ridge component 5K ft. alt._With Plantings Project Area: 23.03

FWOP

Variable		TY		TY		TY	
		Class/Value	SI	Class/Value	SI	Class/Value	SI
V1	Tree Canopy Cover (%)						
V2	Shrub/Midstory Cover (%)						
V3	Species Diversity						
		HSI =		HSI =		HSI =	

WETLAND VALUE ASSESSMENT COMMUNITY MODEL
Coastal Chenier/Ridge

Project: TP3 Ridge component 5K ft. alt._With Plantings Project Area: 23.03

Condition: Future With Project

Variable		TY	0	TY	1	TY	3
		Class/Value	SI	Class/Value	SI	Class/Value	SI
V1	Tree Canopy Cover (%)	0	0.10	0	0.10	0	0.10
V2	Shrub/Midstory Cover (%)	0	0.10	0	0.10	25	0.75
V3	Species Diversity	0	0.10	1	0.22	10	1.00
		HSI =	0.10	HSI =	0.13	HSI =	0.42

Project: TP3 Ridge component 5K ft. alt._With Plantings Project Area: 23.03

FWP

Variable		TY	5	TY	20	TY	50
		Class/Value	SI	Class/Value	SI	Class/Value	SI
V1	Tree Canopy Cover (%)	10	0.24	35	0.59	40	0.66
V2	Shrub/Midstory Cover (%)	30	0.88	55	1.00	45	1.00
V3	Species Diversity	9	0.95	8	0.90	8	0.90
		HSI =	0.59	HSI =	0.81	HSI =	0.84

1/29/2016

Project: TP3 Ridge component 5K ft. alt._With Plantings Project Area: 23.03

FWP

Variable		TY Class/Value	SI	TY Class/Value	SI	TY Class/Value	SI
V1	Tree Canopy Cover (%)						
V2	Shrub/Midstory Cover (%)						
V3	Species Diversity						
		HSI =		HSI =		HSI =	

AAHU CALCULATION

Project: TP3 Ridge component 5K ft. alt._With Plantings

Future Without Project TY	Acres	x HSI	Total HUs	Cummulative HUs
0	0	0.10	0.00	
50	0	0.10	0.00	0.00
Max TY =	50		Total CHUs =	
			AAHUs =	

Future With Project TY	Acres	x HSI	Total HUs	Cummulative HUs
0	0	0.10	0.00	
1	23.03	0.13	2.98	1.38
3	23.03	0.42	9.71	12.69
5	23.03	0.59	13.48	23.19
20	21.7	0.81	17.57	233.65
50	17.64	0.84	14.83	486.63
Max TY =	50		Total CHUs =	757.55
			AAHUs =	15.15

NET CHANGE IN AAHUs DUE TO PROJECT	
A. Future With Project AAHUs =	15.15
B. Future Without Project AAHUs =	
Net Change (FWP - FWOP) =	#VALUE!

1/29/2016

WETLAND VALUE ASSESSMENT COMMUNITY MODEL
Coastal Chenier/Ridge

Project: TP3 Ridge component_With Plantings Project Area: 34

Condition: Future Without Project

Variable		TY	0	TY	50	TY	
		Class/Value	SI	Class/Value	SI	Class/Value	SI
V1	Tree Canopy Cover (%)	0	0.10	0	0.10		
V2	Shrub/Midstory Cover (%)	0	0.10	0	0.10		
V3	Species Diversity	0	0.10	0	0.10		
		HSI =	0.10	HSI =	0.10	HSI =	

Project: TP3 Ridge component_With Plantings Project Area: 34

FWOP

Variable		TY		TY		TY	
		Class/Value	SI	Class/Value	SI	Class/Value	SI
V1	Tree Canopy Cover (%)						
V2	Shrub/Midstory Cover (%)						
V3	Species Diversity						
		HSI =		HSI =		HSI =	

Project: TP3 Ridge component_With Plantings Project Area: 34

FWOP

Variable		TY		TY		TY	
		Class/Value	SI	Class/Value	SI	Class/Value	SI
V1	Tree Canopy Cover (%)						
V2	Shrub/Midstory Cover (%)						
V3	Species Diversity						
		HSI =		HSI =		HSI =	

WETLAND VALUE ASSESSMENT COMMUNITY MODEL
Coastal Chenier/Ridge

Project: TP3 Ridge component_With Plantings Project Area: 34

Condition: Future With Project

Variable		TY	0	TY	1	TY	3
		Class/Value	SI	Class/Value	SI	Class/Value	SI
V1	Tree Canopy Cover (%)	0	0.10	0	0.10	0	0.10
V2	Shrub/Midstory Cover (%)	0	0.10	0	0.10	25	0.75
V3	Species Diversity	0	0.10	1	0.22	10	1.00
		HSI =	0.10	HSI =	0.13	HSI =	0.42

Project: TP3 Ridge component_With Plantings Project Area: 34

FWP

Variable		TY	5	TY	20	TY	50
		Class/Value	SI	Class/Value	SI	Class/Value	SI
V1	Tree Canopy Cover (%)	10	0.24	35	0.59	40	0.66
V2	Shrub/Midstory Cover (%)	30	0.88	55	1.00	45	1.00
V3	Species Diversity	9	0.95	8	0.90	8	0.90
		HSI =	0.59	HSI =	0.81	HSI =	0.84

1/29/2016

Project: TP3 Ridge component_With Plantings Project Area: 34

FWP

Variable		TY Class/Value	SI	TY Class/Value	SI	TY Class/Value	SI
V1	Tree Canopy Cover (%)						
V2	Shrub/Midstory Cover (%)						
V3	Species Diversity						
		HSI =		HSI =		HSI =	

AAHU CALCULATION

Project: TP3 Ridge component_With Plantings

Future Without Project TY	Acres	x HSI	Total HUs	Cummulative HUs
0	0	0.10	0.00	
50	0	0.10	0.00	0.00
Max TY =	50		Total CHUs =	
			AAHUs =	

Future With Project TY	Acres	x HSI	Total HUs	Cummulative HUs
0	0	0.10	0.00	
1	34	0.13	4.40	2.03
3	34	0.42	14.34	18.74
5	34	0.59	19.90	34.24
20	32	0.81	25.91	344.75
50	26	0.84	21.86	717.46
Max TY =	50		Total CHUs =	1117.22
			AAHUs =	22.34

NET CHANGE IN AAHUs DUE TO PROJECT	
A. Future With Project AAHUs =	22.34
B. Future Without Project AAHUs =	
Net Change (FWP - FWOP) =	#VALUE!

1/29/2016

WETLAND VALUE ASSESSMENT COMMUNITY MODEL
Fresh/Intermediate Marsh

Project: TigerPass BUDMAT_TP3 alt Marsh Creation component

Project Area:	55
% Fresh	0
% Intermediate	100

Condition: Future Without Project

Variable		TY	0	TY	10	TY	20
		Value	SI	Value	SI	Value	SI
V1	% Emergent	25	0.33	23	0.31	20	0.28
V2	% Aquatic	0	0.10	0	0.10	0	0.10
V3	Interspersion	%		%		%	
	Class 1	0	0.20	0	0.20	0	0.18
	Class 2	0		0		0	
	Class 3	0		0		0	
	Class 4	100		100		80	
	Class 5	0		0		20	
V4	%OW <= 1.5ft	1	0.11	1	0.11	1	0.11
V5	Salinity (ppt)						
	fresh		1.00		1.00		1.00
	intermediate	1.57		1.57		1.57	
V6	Access Value						
	fresh	1.0000	0.00	1.0000	0.00	1.0000	0.00
	intermediate						
	Emergent Marsh HSI =		0.13	EM HSI =	0.13	EM HSI =	0.13
	Open Water HSI =		0.10	OW HSI =	0.10	OW HSI =	0.10

Project: TigerPass BUDMAT_TP3 alt Marsh Creation component

FWOP

Variable		TY	50	TY		TY	
		Value	SI	Value	SI	Value	SI
V1	% Emergent	13	0.22				
V2	% Aquatic	0	0.10				
V3	Interspersion	%		%		%	
	Class 1	0	0.10				
	Class 2	0					
	Class 3	0					
	Class 4	0					
	Class 5	100					
V4	%OW <= 1.5ft	0	0.10				
V5	Salinity (ppt)						
	fresh		1.00				
	intermediate	1.57					
V6	Access Value						
	fresh	1.0000	0.00				
	intermediate						
	EM HSI =		0.12	EM HSI =		EM HSI =	
	OW HSI =		0.09	OW HSI =		OW HSI =	

Project: TigerPass BUDMAT_TP3 alt Marsh Creation component

FWOP

	TY		TY		TY	

Revised V5 7/24/06 1/29/2016

Variable		Value	SI	Value	SI	Value	SI
V1	% Emergent						
V2	% Aquatic						
V3	Interspersion	%		%		%	
	Class 1						
	Class 2						
	Class 3						
	Class 4						
	Class 5						

Revised V5 7/24/06 1/29/2016

V4	%OW <= 1.5ft						
V5	Salinity (ppt)						
	fresh						
	intermediate						
V6	Access Value						
	fresh						
	intermediate						
		EM HSI =		EM HSI =		EM HSI =	
		OW HSI =		OW HSI =		OW HSI =	

WETLAND VALUE ASSESSMENT COMMUNITY MODEL
Fresh/Intermediate Marsh

Project: TigerPass BUDMAT_TP3 alt Marsh Creation component

Project Area:	55
% Fresh	0
% Intermediate	100

Condition: Future With Project

Variable		TY 0 Value	TY 0 SI	TY 1 Value	TY 1 SI	TY 3 Value	TY 3 SI
V1	% Emergent	25	0.33	5	0.15	40	0.46
V2	% Aquatic	0	0.10	0	0.10	0	0.10
V3	Interspersion	%		%		%	
	Class 1	0	0.20	0	0.10	0	0.40
	Class 2	0		0		0	
	Class 3	0		0		100	
	Class 4	100		0		0	
	Class 5	0		100		0	
V4	%OW <= 1.5ft	1	0.11	100	0.60	100	0.60

Revised V5 7/24/06 1/29/2016

V5	Salinity (ppt)						
	fresh		1.00		1.00		1.00
	intermediate	1.57		1.57		1.57	
V6	Access Value						
	fresh	1.0000	0.20	0.0000	0.00	0.0000	0.00
	intermediate						
	Emergent Marsh HSI =		0.37	EM HSI =	0.12	EM HSI =	0.16
	Open Water HSI =		0.19	OW HSI =	0.13	OW HSI =	0.15

Project: TigerPass BUDMAT_TP3 alt Marsh Creation component

FWP

Variable		TY	5	TY	6	TY	25
		Value	SI	Value	SI	Value	SI
V1	% Emergent	98	0.98	98	0.98	88	0.89
V2	% Aquatic	0	0.10	1	0.11	15	0.24
V3	Interspersion	%		%		%	
	Class 1	50	0.70	100	1.00	80	0.92
	Class 2	0		0		20	
	Class 3	50		0		0	
	Class 4	0		0		0	
	Class 5	0		0		0	
V4	%OW <= 1.5ft	100	0.60	100	0.60	100	0.60
V5	Salinity (ppt)						
	fresh		1.00		1.00		1.00
	intermediate	1.57		1.57		1.57	
V6	Access Value						
	fresh		0.98		0.98		0.99
	intermediate	0.9800		0.9800		0.9900	
		EM HSI =	0.95	EM HSI =	0.99	EM HSI =	0.92
		OW HSI =	0.31	OW HSI =	0.34	OW HSI =	0.45

Project: TigerPass BUDMAT_TP3 alt Marsh Creation component

FWP

Variable		TY	50	TY		TY	
		Value	SI	Value	SI	Value	SI
V1	% Emergent	70	0.73				
V2	% Aquatic	5	0.15				
V3	Interspersion	%		%		%	
	Class 1	0	0.60				
	Class 2	100					
	Class 3	0					
	Class 4	0					
	Class 5	0					
V4	%OW <= 1.5ft	83	1.00				
V5	Salinity (ppt)						
	fresh		1.00				
	intermediate	1.57					
V6	Access Value						
	fresh		1.00				
	intermediate	1.0000					
		EM HSI =	0.78	EM HSI =		EM HSI =	
		OW HSI =	0.38	OW HSI =		OW HSI =	

Revised V5 7/24/06 1/29/2016

AAHU CALCULATION - EMERGENT MARSH

Project: TigerPass BUDMAT_TP3 alt Marsh Creation component

Future Without Project			Total	Cummulative
TY	Marsh Acres	x HSI	HUs	HUs
0	13.52	0.13	1.80	

Revised V5 7/24/06 1/29/2016

10	12.38	0.13	1.65	17.27
20	11.15	0.13	1.46	15.56
50	6.95	0.12	0.85	34.48
Max=	50		AAHUs =	1.35

Future With Project			Total	Cummulative
TY	Marsh Acres	x HSI	HUs	HUs
0	13.52	0.37	4.95	
1	2.75	0.12	0.34	2.21
3	21.74	0.16	3.38	3.51
5	53.92	0.95	51.38	46.21
6	53.68	0.99	52.94	52.16
25	48.57	0.92	44.66	926.15
50	38.37	0.78	29.78	924.41
Max=	50		AAHUs	39.09

NET CHANGE IN AAHUs DUE TO PROJECT		
A. Future With Project Emergent Marsh AAHUs	=	39.09
B. Future Without Project Emergent Marsh AAHUs	=	1.35
Net Change (FWP - FWOP) =		37.75

AAHU CALCULATION - OPEN WATER

Project: TigerPass BUDMAT_TP3 alt Marsh Creation component

Future Without Project			Total	Cummulative
TY	Water Acres	x HSI	HUs	HUs
0	41.48	0.10	4.03	
10	42.62	0.10	4.14	40.84
20	43.85	0.10	4.19	41.67
50	48.05	0.09	4.27	127.12
Max=	50		AAHUs =	4.19

Future With Project			Total	Cummulative
TY	Water Acres	x HSI	HUs	HUs
0	41.48	0.19	7.87	
1	0.21	0.13	0.03	3.51
3	0.65	0.15	0.10	0.12
5	1.08	0.31	0.33	0.41

Revised v5 7/24/06 1/29/2016

6	1.32	0.34	0.45	0.39
25	6.43	0.45	2.88	29.90
50	16.63	0.38	6.24	117.20
Max=	50		AAHUs	3.03

NET CHANGE IN AAHUs DUE TO PROJECT		
A. Future With Project Open Water AAHUs	=	3.03
B. Future Without Project Open Water AAHUs	=	4.19
Net Change (FWP - FWOP)	=	-1.16

TOTAL BENEFITS IN AAHUs DUE TO PROJECT		
A. Emergent Marsh Habitat Net AAHUs	=	37.75
B. Open Water Habitat Net AAHUs	=	-1.16
Net Benefits=(2.1xEMAAHUs+OWAAHUs)/3.1		25.20

Revised V5 7/24/06 1/29/2016

WETLAND VALUE ASSESSMENT COMMUNITY MODEL
Fresh/Intermediate Marsh

Project: TigerPass BUDMAT_TP3 alt Marsh Creation component

Project Area:	167
% Fresh	0
% Intermediate	100

Condition: Future Without Project

Variable		TY	0	TY	10	TY	20
		Value	SI	Value	SI	Value	SI
V1	% Emergent	14	0.23	13	0.22	12	0.21
V2	% Aquatic	0	0.10	0	0.10	0	0.10
V3	Interspersion	%		%		%	
	Class 1	0	0.10	0	0.10	0	0.10
	Class 2	0		0		0	
	Class 3	0		0		0	
	Class 4	0		0		0	
	Class 5	100		100		100	
V4	%OW <= 1.5ft	1	0.11	1	0.11	1	0.11
V5	Salinity (ppt)						
	fresh		1.00		1.00		1.00
	intermediate	1.57		1.57		1.57	
V6	Access Value						
	fresh intermediate	1.0000	0.00	1.0000	0.00	1.0000	0.00
	Emergent Marsh HSI =		0.12	EM HSI =	0.12	EM HSI =	0.12
	Open Water HSI =		0.09	OW HSI =	0.09	OW HSI =	0.09

Project: TigerPass BUDMAT_TP3 alt Marsh Creation component

FWOP

Variable		TY	50	TY		TY	
		Value	SI	Value	SI	Value	SI
V1	% Emergent	7	0.16				
V2	% Aquatic	0	0.10				
V3	Interspersion	%		%		%	
	Class 1	0	0.10				
	Class 2	0					
	Class 3	0					
	Class 4	0					
	Class 5	100					
V4	%OW <= 1.5ft	0	0.10				
V5	Salinity (ppt)						
	fresh		1.00				
	intermediate	1.57					
V6	Access Value						
	fresh intermediate	1.0000	0.00				
	EM HSI =		0.12	EM HSI =		EM HSI =	
	OW HSI =		0.09	OW HSI =		OW HSI =	

Project: TigerPass BUDMAT_TP3 alt Marsh Creation component

FWOP

	TY	TY	TY

Revised V5 7/24/06 1/29/2016

Variable		Value	SI	Value	SI	Value	SI
V1	% Emergent						
V2	% Aquatic						
V3	Interspersion	%		%		%	
	Class 1						
	Class 2						
	Class 3						
	Class 4						
	Class 5						

Revised V5 7/24/06 1/29/2016

V4	%OW <= 1.5ft						
V5	Salinity (ppt)						
	fresh						
	intermediate						
V6	Access Value						
	fresh						
	intermediate						
		EM HSI =		EM HSI =		EM HSI =	
		OW HSI =		OW HSI =		OW HSI =	

WETLAND VALUE ASSESSMENT COMMUNITY MODEL
Fresh/Intermediate Marsh

Project: **TigerPass BUDMAT_TP3 alt Marsh Creation component**

Condition: Future With Project

Project Area:	167
% Fresh	0
% Intermediate	100

Variable		TY 0		TY 1		TY 3	
		Value	SI	Value	SI	Value	SI
V1	% Emergent	14	0.23	5	0.15	40	0.46
V2	% Aquatic	0	0.10	0	0.10	0	0.10
V3	Interspersion	%		%		%	
	Class 1	0	0.10	0	0.10	0	0.40
	Class 2	0		0		0	
	Class 3	0		0		100	
	Class 4	0		0		0	
	Class 5	100		100		0	
V4	%OW <= 1.5ft	1	0.11	100	0.60	100	0.60

Revised V5 7/24/06 1/29/2016

V5	Salinity (ppt)						
	fresh		1.00		1.00		1.00
	intermediate	1.57		1.57		1.57	
V6	Access Value						
	fresh	1.0000	0.20	0.0000	0.00	0.0000	0.00
	intermediate						
	Emergent Marsh HSI =		0.29	EM HSI =	0.12	EM HSI =	0.16
	Open Water HSI =		0.18	OW HSI =	0.13	OW HSI =	0.15

Project: TigerPass BUDMAT_TP3 alt Marsh Creation component

FWP

Variable		TY Value	5 SI	TY Value	6 SI	TY Value	25 SI
V1	% Emergent	98	0.98	98	0.98	88	0.89
V2	% Aquatic	0	0.10	1	0.11	15	0.24
V3	Interspersion	%		%		%	
	Class 1	50	0.70	100	1.00	80	0.92
	Class 2	0		0		20	
	Class 3	50		0		0	
	Class 4	0		0		0	
	Class 5	0		0		0	
V4	%OW <= 1.5ft	100	0.60	100	0.60	100	0.60
V5	Salinity (ppt)						
	fresh		1.00		1.00		1.00
	intermediate	1.57		1.57		1.57	
V6	Access Value						
	fresh		0.98		0.98		0.99
	intermediate	0.9800		0.9800		0.9900	
		EM HSI =	0.95	EM HSI =	0.99	EM HSI =	0.92
		OW HSI =	0.31	OW HSI =	0.34	OW HSI =	0.45

Project: TigerPass BUDMAT_TP3 alt Marsh Creation component

FWP

Variable		TY Value	50 SI	TY Value	SI	TY Value	SI
V1	% Emergent	70	0.73				
V2	% Aquatic	5	0.15				
V3	Interspersion	%		%		%	
	Class 1	0	0.60				
	Class 2	100					
	Class 3	0					
	Class 4	0					
	Class 5	0					
V4	%OW <= 1.5ft	83	1.00				
V5	Salinity (ppt)						
	fresh		1.00				
	intermediate	1.57					
V6	Access Value						
	fresh		1.00				
	intermediate	1.0000					
		EM HSI =	0.78	EM HSI =		EM HSI =	
		OW HSI =	0.38	OW HSI =		OW HSI =	

Revised V5 7/24/06

1/29/2016

AAHU CALCULATION - EMERGENT MARSH

Project: TigerPass BUDMAT_TP3 alt Marsh Creation component

Future Without Project			Total	Cummulative
TY	Marsh Acres	x HSI	HUs	HUs
0	23.42	0.12	2.86	

Revised V5 7/24/06

1/29/2016

10	21.45	0.12	2.62	27.42
20	19.32	0.12	2.36	24.92
50	12.05	0.12	1.47	57.51
Max=	50		AAHUs =	2.20

Future With Project			Total	Cummulative
TY	Marsh Acres	x HSI	HUs	HUs
0	23.42	0.29	6.90	
1	8.35	0.12	1.02	3.53
3	66	0.16	10.27	10.65
5	163.71	0.95	156.00	140.30
6	162.98	0.99	160.74	158.38
25	147.47	0.92	135.60	2811.95
50	116.5	0.78	90.42	2806.74
Max=	50		AAHUs	118.63

NET CHANGE IN AAHUs DUE TO PROJECT		
A. Future With Project Emergent Marsh AAHUs	=	118.63
B. Future Without Project Emergent Marsh AAHUs	=	2.20
Net Change (FWP - FWOP) =		116.43

AAHU CALCULATION - OPEN WATER

Project: TigerPass BUDMAT_TP3 alt Marsh Creation component

Future Without Project			Total	Cummulative
TY	Water Acres	x HSI	HUs	HUs
0	143.58	0.09	12.88	
10	145.55	0.09	13.06	129.71
20	147.68	0.09	13.25	131.55
50	154.96	0.09	13.77	405.40
Max=	50		AAHUs =	13.33

Future With Project			Total	Cummulative
TY	Water Acres	x HSI	HUs	HUs
0	143.58	0.18	26.16	
1	0.65	0.13	0.08	11.78
3	1.99	0.15	0.29	0.37
5	3.29	0.31	1.01	1.24

Revised v5 7/24/06 1/29/2016

6	4.02	0.34	1.36	1.19
25	19.53	0.45	8.76	90.85
50	50.05	0.38	18.79	353.68
Max=	50		AAHUs	9.18

NET CHANGE IN AAHUs DUE TO PROJECT		
A. Future With Project Open Water AAHUs	=	9.18
B. Future Without Project Open Water AAHUs	=	13.33
Net Change (FWP - FWOP)	=	-4.15

TOTAL BENEFITS IN AAHUs DUE TO PROJECT		
A. Emergent Marsh Habitat Net AAHUs	=	116.43
B. Open Water Habitat Net AAHUs	=	-4.15
Net Benefits=(2.1xEMAAHUs+OWAAHUs)/3.1		77.54

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WETLAND VALUE ASSESSMENT COMMUNITY MODEL
Fresh/Intermediate Marsh

Project: TigerPass BUDMAT_TP3 Ridge 5KftAug8FWOP

Project Area:	23
% Fresh	0
% Intermediate	100

Condition: Future Without Project

Variable		TY Value	0 SI	TY Value	10 SI	TY Value	20 SI
V1	% Emergent	14	0.23	14	0.23	12	0.21
V2	% Aquatic	0	0.10	0	0.10	0	0.10
V3	Interspersion	%		%		%	
	Class 1	0	0.11	0	0.11	0	0.10
	Class 2	0		0		0	
	Class 3	0		0		0	
	Class 4	10		10		0	
	Class 5	90		90		100	
V4	%OW <= 1.5ft	1	0.11	1	0.11	1	0.11
V5	Salinity (ppt)						
	fresh		1.00		1.00		1.00
	intermediate	1.57		1.57		1.57	
V6	Access Value						
	fresh	1.0000	0.00	1.0000	0.00	1.0000	0.00
	intermediate						
	Emergent Marsh HSI =		0.12	EM HSI =	0.12	EM HSI =	0.12
	Open Water HSI =		0.09	OW HSI =	0.09	OW HSI =	0.09

Project: TigerPass BUDMAT_TP3 Ridge 5KftAug8FWOP

FWOP

Variable		TY Value	50 SI	TY Value	SI	TY Value	SI
V1	% Emergent	7	0.16				
V2	% Aquatic	0	0.10				
V3	Interspersion	%		%		%	
	Class 1	0	0.10				
	Class 2	0					
	Class 3	0					
	Class 4	0					
	Class 5	100					
V4	%OW <= 1.5ft	0	0.10				
V5	Salinity (ppt)						
	fresh		1.00				
	intermediate	1.57					
V6	Access Value						
	fresh	1.0000	0.00				
	intermediate						
	EM HSI =		0.12	EM HSI =		EM HSI =	
	OW HSI =		0.09	OW HSI =		OW HSI =	

Project: TigerPass BUDMAT_TP3 Ridge 5KftAug8FWOP

FWOP

	TY	TY	TY

Revised V5 7/24/06 1/29/2016

Variable		Value	SI	Value	SI	Value	SI
V1	% Emergent						
V2	% Aquatic						
V3	Interspersion	%		%		%	
	Class 1						
	Class 2						
	Class 3						
	Class 4						
	Class 5						

Revised V5 7/24/06 1/29/2016

V4	%OW <= 1.5ft						
V5	Salinity (ppt)						
	fresh						
	intermediate						
V6	Access Value						
	fresh						
	intermediate						
		EM HSI =		EM HSI =		EM HSI =	
		OW HSI =		OW HSI =		OW HSI =	

WETLAND VALUE ASSESSMENT COMMUNITY MODEL
Fresh/Intermediate Marsh

Project: TigerPass BUDMAT_TP3 Ridge 5KftAug8FWOP

Project Area:	23
% Fresh	0
% Intermediate	100

Condition: Future With Project

Variable		TY 0 Value	TY 0 SI	TY 1 Value	TY 1 SI	TY 3 Value	TY 3 SI
V1	% Emergent	14	0.23	0	0.10	0	0.10
V2	% Aquatic	0	0.10	0	0.10	0	0.10
V3	Interspersion	%		%		%	
	Class 1	0	0.11	0	0.10	0	0.40
	Class 2	0		0		0	
	Class 3	0		0		100	
	Class 4	10		0		0	
	Class 5	90		100		0	
V4	%OW <= 1.5ft	1	0.11	100	0.60	100	0.60

Revised V5 7/24/06 1/29/2016

V5	Salinity (ppt)						
	fresh		1.00		1.00		1.00
	intermediate	1.57		1.57		1.57	
V6	Access Value						
	fresh	1.0000	0.20	0.0000	0.00	0.0000	0.00
	intermediate						
	Emergent Marsh HSI =		0.30	EM HSI =	0.12	EM HSI =	0.16
	Open Water HSI =		0.18	OW HSI =	0.13	OW HSI =	0.15

Project: TigerPass BUDMAT_TP3 Ridge 5KftAug8FWOP

FWP

Variable		TY	5	TY	6	TY	25
		Value	SI	Value	SI	Value	SI
V1	% Emergent	0	0.10	0	0.10	0	0.10
V2	% Aquatic	45	0.51	60	0.64		
V3	Interspersion	%		%		%	
	Class 1	50	0.70	100	1.00		
	Class 2	0		0			
	Class 3	50		0			
	Class 4	0		0			
	Class 5	0		0			
V4	%OW <= 1.5ft	100	0.60	100	0.60	100	0.60
V5	Salinity (ppt)						
	fresh		1.00		1.00		1.00
	intermediate	1.57		1.57		1.57	
V6	Access Value						
	fresh	0.9700	0.00	0.9900	0.00	1.0000	0.00
	intermediate						
		EM HSI =	0.19	EM HSI =	0.22	EM HSI =	
		OW HSI =	0.17	OW HSI =	0.19	OW HSI =	

Project: TigerPass BUDMAT_TP3 Ridge 5KftAug8FWOP

FWP

Variable		TY	50	TY		TY	
		Value	SI	Value	SI	Value	SI
V1	% Emergent	0	0.10				
V2	% Aquatic						
V3	Interspersion	%		%		%	
	Class 1						
	Class 2						
	Class 3						
	Class 4						
	Class 5						
V4	%OW <= 1.5ft						
V5	Salinity (ppt)						
	fresh		1.00				
	intermediate	1.57					
V6	Access Value						
	fresh	1.0000	0.00				
	intermediate						
		EM HSI =		EM HSI =		EM HSI =	
		OW HSI =		OW HSI =		OW HSI =	

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AAHU CALCULATION - EMERGENT MARSH

Project: TigerPass BUDMAT_TP3 Ridge 5KftAug8FWOP

Future Without Project			Total	Cummulative
TY	Marsh Acres	x HSI	HUs	HUs
0	3.28	0.12	0.40	

Revised V5 7/24/06 1/29/2016

10	3	0.12	0.37	3.87
20	2.7	0.12	0.33	3.50
50	1.69	0.12	0.21	8.05
Max=	50		AAHUs =	0.31

Future With Project			Total	Cummulative
TY	Marsh Acres	x HSI	HUs	HUs
0	3.28	0.30	0.97	
1	0	0.12	0.00	0.39
3	0	0.16	0.00	0.00
5	0	0.19	0.00	0.00
6	0	0.22	0.00	0.00
25	0		0.00	0.00
50	0		0.00	0.00
Max=	50		AAHUs	0.01

NET CHANGE IN AAHUs DUE TO PROJECT		
A. Future With Project Emergent Marsh AAHUs	=	0.01
B. Future Without Project Emergent Marsh AAHUs	=	0.31
Net Change (FWP - FWOP) =		-0.30

AAHU CALCULATION - OPEN WATER

Project: TigerPass BUDMAT_TP3 Ridge 5KftAug8FWOP

Future Without Project			Total	Cummulative
TY	Water Acres	x HSI	HUs	HUs
0	19.75	0.09	1.79	
10	20.03	0.09	1.81	17.99
20	20.33	0.09	1.82	18.18
50	21.34	0.09	1.90	55.82
Max=	50		AAHUs =	1.84

Future With Project			Total	Cummulative
TY	Water Acres	x HSI	HUs	HUs
0	19.75	0.18	3.61	
1	0	0.13	0.00	1.62
3	0	0.15	0.00	0.00
5	0	0.17	0.00	0.00

Revised v3 7/24/06 1/29/2016

6	0	0.19	0.00	0.00
25	0		0.00	0.00
50	0		0.00	0.00
Max=	50		AAHUs	0.03

NET CHANGE IN AAHUs DUE TO PROJECT		
A. Future With Project Open Water AAHUs	=	0.03
B. Future Without Project Open Water AAHUs	=	1.84
Net Change (FWP - FWOP) =		-1.81

TOTAL BENEFITS IN AAHUs DUE TO PROJECT		
A. Emergent Marsh Habitat Net AAHUs	=	-0.30
B. Open Water Habitat Net AAHUs	=	-1.81
Net Benefits=(2.1xEMAAHUs+OWAAHUs)/3.1		-0.79

Revised V5 7/24/06 1/29/2016

Wetland Value Assessment Project Information Sheet

August 8, 2015

Prepared for:
BUDMAT Team

Prepared by
U.S. Fish and Wildlife Service and the NOD Corps of Engineers and NMFS

Project Name: Tiger Pass LCA BUDMAT Habitat Creation

Project Type(s): Marsh Creation, Maritime Ridge Creation, Coastal Bird Island Habitat Creation.

Project Area: Plaquemines Parish, Louisiana.

Project Goal:
This BUDMAT program project is intended to create habitat for fish and wildlife with dredged material from the Mississippi River. A variety of habitat types will be considered for construction, including: supratidal maritime ridge, fresh/intermediate marsh, supratidal island suitable for nesting, foraging, and loafing of water birds, such as black skimmers, terns, piping plover, etc.

Habitat Assessment Method
The WVA operates under the assumption that optimal conditions for general fish and wildlife habitat within a given coastal wetland type can be characterized, and that existing or predicted conditions can be compared to that optimum to provide an index of habitat quality. Habitat quality is estimated or expressed through the use of a mathematical model developed specifically for each wetland type. Each model consists of 1) a list of variables that are considered important in characterizing fish and wildlife habitat, 2) a Suitability Index graph for each variable, which defines the assumed relationship between habitat quality (Suitability Index) and different variable values, and 3) a mathematical formula that combines Suitability Index for each variable into a single value for wetland habitat quality; that single value is referred to as the Habitat Suitability Index, or HSI.

The procedure for evaluating project benefits on fish and wildlife habitats, the WVA model, uses a series of variables that are intended to capture the most important conditions and functional values of a particular habitat. Values for these variables are derived for existing conditions and are estimated for conditions projected into the future if no restoration efforts are applied (i.e., future-without-project), and for conditions projected into the future if the proposed restoration project is implemented (i.e., future-with-project), providing an index of quality or habitat

suitability of the habitat for the given time period. The HIS is combined with the acres of habitat to get a number that is referred to as "habitat units". Expected project benefits are estimated as the difference in habitat units between the future-with-project (FWP) and future-without project (FWOP). To allow comparison of WVA benefits to costs for overall project evaluation, total benefits are averaged over a 50-year period, with the result reported as Average Annual Habitat Units (AAHUs).

The WVA model for marsh habitat attempts to assess the suitability of each habitat type for providing resting, foraging, breeding, and nursery habitat to a diverse assemblage of fish and wildlife species. While the model does not specifically assess other wetland functions and values such as storm-surge protection, floodwater storage, water quality improvement, nutrient import/export, and aesthetics, it can be generally assumed that these functions and values are positively correlated with fish and wildlife habitat quality.

Fresh/Intermediate Marsh

Variable V_1 - Percent of wetland area covered by emergent vegetation

Existing – The project area is the open water and surrounding fresh marsh near Tiger Pass in the Lower Mississippi River Delta. The vegetation in the vicinity of the TP4 alternatives is classified as fresh marsh (O'Neil 1949, Chabreck and Linscombe 1997, Sasser et al. 2007) and receives riverine input. Emergent plant species include: smooth cordgrass, Walter's millet, Schoenoplectus pungens, Nelumbo lutea. Submerged aquatic vegetation, such as Myriophyllum spicatum, Heteranthera dubia, Ceratophyllum demersum, Najas guadalupensis, Potamogeton nodosus are also common in the lower elevation intertidal and shallow subtidal portions of the project area. The two major soil types in the project area are commonly found together and are classified as Balize and Larose soils (BA) (Trahan 1987). Both soil types are level and very poorly drained. They are flooded by Mississippi River water most of the time and support freshwater marshes.

Land Loss

In the Corps' 2009 Engineer Research and Development Center (ERDC) report (John A. Barras, et.al., 2009), researchers determined a land loss/gain rate of + 0.19%/yr based on a regression of land acre changes in satellite imagery over the years 1984-2009 (regression slope = 23.8 acres/yr. The study polygon area =12,292acres so 0.001936 or+0.1936%/yr (almost same time interval used by USGS; 1985-2009) for the West Bay area. There was no attempt to remove land gains attributable to placement of dredged material in the area, so the natural rate is confounded with human-made land building. In the report, some land gain unrelated to dredged material placement was noted in the northwest corner of the analysis polygon. Most of the land gain reported was not in the proposed TP4 alternative area. However, land loss in that area has been minimal since 1991 and there has been some land gains since 1991. The LA Land Change Trends 1985 to 2009 USGS Final regression 1-12-2011 excel workbook reported a land gain rate of +0.009% for West Bay. The USGS polygon used for analysis was much larger than the one

used by ERDC and included areas much further gulfward including beneficial use marsh creation.

With consideration of the available data and its limitations, the Service assumed for FWOP, no loss or gain for the TP4 marsh creation areas. And for FWP we used the standard CWPPRA and HSDRSS assumption of a 50% loss rate reduction for created marsh (but rate reverts back to FWOP rate when accretion equals 10 inches). For the TP3 site, we assumed the loss rate from USGS polygon that covered the area (0.77%)

Sea Level Rise Effects
Land loss rates estimated by the Service were adjusted by the projected effects of the medium relative sea level rise (RSLR) scenario for these analyses. The nearest water level gauge to the project area that is listed for use with the sea-level change curve calculator on the corpsclimate.us website is the one at Venice. The stimated a subsidence rate of about 24 mm/yr, Eustatic sea level rise was assumed to be 1.7 mm/yr.

FWOP –TP4-existing conditions persist. TP3-marsh acres decrease; land loss spreadsheet guidance.

1) TP4 = 190 acres

TY0-TY50 0%

2) TP3 7.5Kft Alt Marsh = 167 acres (23.8 acres of existing marsh)

TY0 14%
TY10 13%
TY20 12%
TY50 7%

3) TP3 5,000 foot Alt Marsh = 55 acres (13.74 acres of existing marsh)

TY0 %
TY10 %
TY20 %
TY50 %

FWP –For marsh created by acre amounts for TY years 0 – 6 we follow the standard marsh creation assumptions co-developed by the Service, Corps and other natural resource agencies. Created marsh platform has limited marsh function until material settlement, flooding and channel development. We made slight reductions in the assumptions of marsh credit for TP3 because that site is intermediate marsh and will not be planted (according to draft assumptions document prepared by Clay Carithers formerly of the Corps). The assumption document suggests 0%, 15%, 50%, and 100% for TY years 0, 1, 3, 5, and 6 respectively. Because this area is in close proximity to the freshwater and nutrients of the Mississippi River Delta, we adjusted

the assumptions to reflect a more rapid vegetative response.

1) TP4

TY0	0%
TY1	10%
TY3	50%
TY5	100%
TY6	100%
TY25	98%
TY50	92%

2) TP3 7.5Kft Marsh

TY0	14%
TY1	5%
TY3	40%
TY5	98%
TY6	98%
TY25	88%
TY50	70%

3) TP3 5,000 foot Alt Marsh

TY0	%
TY1	%
TY3	%
TY5	%
TY6	%
TY25	%
TY50	%

Variable V_2 – Percent of open water covered by submerged aquatic vegetation (SAV)

Existing Conditions –The project area is primarily shallow open water with SAV known to exist in the area. Our field visits were conducted in April. SAV, especially in river deltas where water temps are cooler than non-riverine influenced marshes, is not at maximum coverage in the spring. The highest coverage is at end of growing season (late summer or early fall before waterfowl arrive). CWPPRA sampling was in October which is already in the time of seasonal senescence and depredation by waterfowl and likely not maximum coverage. Therefore, we are conservatively assuming that the average SAV coverage is approximately 60%. Optical area estimation and transect rake sampling for presence or absence was conducted on April 7, 2015, and by April 21, 2015, USFWS, NOAA, Manchac, and Corps personnel.

FWOP

1) TP4 We considered three estimates of SAV in the TP4 project area: from 2013 aerial photography = 78 acres = 20%; from CWPPRA WVA from October 2011 = 75% in area in the northwest parts of our project area; from 21 Apr 2015 Corps/Service survey = 18%

TY0	60%
TY10	60%
TY20	60%
TY50	54%

2) TP3 7.5Kft Marsh

TY0-TY50	0%

3) TP3 5,000 foot Marsh

TY0-TY50	0%

FWP – When the marsh land platform is constructed, all existing SAV will be buried. Until the created marsh platform settles to marsh elevation it is assumed that very little open water, or SAV volunteers exists to support SAV growth. The Civil Works "green table" assumptions document was used to project future coverage.

1) TP4

TY 0	60%
TY 1	0%
TY 3	0%
TY 5	45%
TY 6	60%
TY 25	69%
TY 50	60%

2) TP3 7.5Kft Marsh

TY 0	0%
TY 1	0%
TY 3	0%
TY 5	0%
TY 6	1%
TY 25	15%
TY 50	5%

1) TP3 5,000 foot Marsh

TY 0	0%

TY 1	0%
TY 3	0%
TY 5	0%
TY 6	1%
TY 25	15%
TY 50	5%

Variable Va- Marsh edge and interspersion

Existing Conditions –Project areas are in open water with no marsh -TP4 -(100% Class 5) or fragmented marsh –TP3- with mostly open water (100% Class 5).

FWOP

1) TP4

TY0 -TY50 100% Class 5

2) TP3 7.5Kft Marsh

TY0-TY50 100% Class 5

3) TP3 5,000 foot Marsh

TY0-TY50 % Class

FWP

For areas created by dredged material placement, the standard civil works marsh creation assumptions were used until TY6. For target years after TY6, projections were guided by the amount of marsh acres predicted by the land loss spreadsheet model.

1) TP4

TY 0:	100 % Class 5 (all water)
TY 1	100% Class 5 (all supratidal land platform; not much vegetation)
TY 3	100% Class 3 ("carpet marsh")
TY 5	50% Class 1 50% Class 3
TY 6- TY 50	100% Class 1

2) TP3 7.5Kft Marsh

TY0	100 % Class 5 (mostly water)
TY1	100% Class 5 (all supratidal land platform; not much vegetation)
TY3	100% Class 3 ("carpet marsh")
TY5	50% Class 1 50% Class 3

TY6	100% Class 1
TY25	80% Class 1 20% Class 2
TY 50	100 % Class 2

3) TP3 5,000 feet Marsh

TY0	% Class (mostly water)
TY1	100% Class 5 (all supratidal land platform; not much vegetation)
TY3	100% Class 3 ("carpet marsh")
TY5	50% Class 1 50% Class 3
TY6	100% Class 1
TY25	80% Class 1 20% Class 2
TY 50	100 % Class 2

Variable V4 – Percent of open water area <=1.5 feet deep in relation to marsh surface

Existing Conditions
Water depths were measured with a survey rod in the project area on 7 April 2015, and 21 April 2015. The average water depth for the area was calculated using the nearby CRMS2608 and CRMS 0163 gage data. Using the gage data, the collected data was corrected for the effect of the tides and wind on the day the measurements were recorded. Water depth sample locations with associated values were plotted on a map of the project area using ArcMap GIS software. Sample locations with shallow water were highlighted. Polygon estimates of the extent of shallow water based on these point values were digitized and their acreage calculated.

FWOP – TY0 is based on collected data, and standard assumptions used for later target years.

1) TP4

TY0	33%
TY10	33%
TY20	33%
TY50	22%

2) TP3 7.5Kft Marsh

TY0	1%
TY10	1%
TY20	1%
TY50	0%

3) TP3 -5,000 feet -Marsh

TY0	1%
TY10	1%

TY20 1%
TY50 0%

FWP
For the areas created by placement of dredged material, the project land platform would be built to a subaerial elevation with dredged material. Marsh that is lost is assumed to become open water <= 1.5 feet deep until TY50. According to the Civil Works standard assumptions for marsh creation a percentage of the open water would become non-shallow,

1) TP4

TY0 33%
TY1-TY25 100%
TY50 83%

2) TP3 7.5Kft Marsh

TY0 1%
TY1-TY25 100%
TY50 83%

3) TP3-5,000 feet- Marsh

TY0 1%
TY1-TY25 100%
TY50 83%

Variable V_S - Salinity

Existing conditions – An estimate for salinity in the area was calculated from data recorded at the (TP4 and TP Bird Island) and (TP3) which are in the near vicinity of the project area. The Tiger Pass BUDMAT project area is located near the Gulf of Mexico, but receives continuous freshwater input from the Mississippi River. The mean annual salinity recorded at CRMS2608 for the 2010, 2011, 2013 growing seasons was approximately 0.5 ppt. and for CRMS0163, 1.57 ppt.

1) TP4

FWOP & FWP
TY0 – TY50 0.5 ppt

TP3 7.5Kft & TP3-5,000 feet
FWOP & FWP
TY0 – TY50 1.57 ppt

Variable V6 – Aquatic organism access

Existing conditions – The proposed marsh creation sites are not currently impounded or hydrologically controlled by any structures. However, much of the TP4 project area is surrounded by supratidal elevation landforms and aquatic organism access is limited a few relatively narrow channels.

FWOP

Existing conditions are expected to persist.

1) TP4

TY0 – TY50	0.99

2) TP3 7.5Kft Marsh and TP3-5,000 feet-Marsh

TY0-TY50	1.00

FWP

For marsh created by dredged material placement, for all alternatives, the following assumptions were used. They are based on the standard assumptions developed by the Service and the Corps and NMFS, but modified because of differences in site conditions (i.e., TP4 project area is partially surrounded by supratidal elevation landforms). Immediately after construction, TY1, it is assumed that aquatic organisms will not have access to the created marsh platform because dikes will still be in place. By TY5 it is assumed that aquatic organisms have near full access, but not yet equivalent to natural marsh. By TY50 it is assumed that aquatic organisms have access to the project area equivalent to the current existing marsh. The TP3 site is assumed to have slightly better access because unlike the TP4 area there is no existing supratidal land form partially surrounding the marsh creation area.

1) TP4

TY0	0.99
TY1	0
TY3	0
TY5	0.93
TY6	0.94
TY25	0.98
TY50	0.99

2) TP3 7.5Kft Marsh Component and 3)

TY0	1
TY1	0
TY3	0

TY5	0.98
TY6	0.98
TY25	0.99
TY50	1

Chenier/Coastal Ridge Model

TP3 7.5Kft Ridge Component = 34 acres

The ridge component is assumed to have minimal secondary benefits as protection of existing habitat from storm surge or wind driven waves. There is very little marsh to the south of the proposed ridge. There is approximately 800 acres of marsh to the north of the proposed ridge, but it is not adjacent. The nearest habitat is almost a mile away and more than half of the 800 acres are 1.5 miles or more from the ridge alternative.

The ridge would be built to +8ft NAVD88 to settle to approximately +6 ? NAVD88 (geoid?). Approximately 6ft of land would be subaerial (avg water level is about +0.18 ft NAVD88[geoid12a]). Assuming 15 mm subsidence per year plus approximately 2 mm/yr of eustatic sea level rise, (17 mm/yr or 0.0557743 ft/yr) the ridge would lose approximately 3 ft of height by TY50. The loss is approximately 0.55 ft at TY10 and 1.12 ft by TY20. That information was used to guide our assumption of acres remaining at future target years.

The Fresh/Intermediate marsh model was used to generate the FWOP conditions, for both planted and unplanted analyses for the existing marsh within the footprint of the proposed ridge; not compared to FWP by variable, only as the overall AAHU value for the FWOP scenario.

FWOP –Follows standard marsh assumptions in "green table"document developed jointly by the Service, the Corps and NMFS for V_4. Emergent marsh (V1) and interspersion estimated using land loss spreadsheet model predictions for marsh acres at different target years.

Planted:

Variable V_1
Existing Conditions- 6 acres of fragmented intermediate emergent marsh, no existing ridge habitat.

FWP	
TY0	0%
TY1	0%
TY3	0%
TY5	10%
TY20	35%

TY50 40%

Variable V_2 Shrub/Midstory Cover %

Existing Conditions Fragmented intermediate emergent marsh, no existing ridge habitat.

FWP
TY0 0%
TY1 0%
TY3 25%
TY5 30%
TY20 55%
TY50 45%

Variable V_3 Native Species Diversity

Existing Conditions-Fragmented intermediate emergent marsh, no existing ridge habitat.

FWP
TY0 0
TY1 1
TY3 10
TY5 9
TY20 8
TY50 8

Not Planted:

Variable V_1
Existing Conditions-Fragmented intermediate emergent marsh, no existing ridge habitat.

FWP
TY0 0%
TY1 0%
TY3 0%
TY5 5%
TY20 20%
TY50 35%

Variable V_2 Shrub/Midstory Cover %

Existing Conditions Fragmented intermediate emergent marsh, no existing ridge habitat.

FWP

TY0	0%
TY1	0%
TY3	10%
TY5	15%
TY20	45%
TY50	55%

Variable V3 Native Species Diversity

Existing Conditions- Fragmented intermediate emergent marsh, no existing ridge habitat.

FWP	
TY0	0
TY1	1
TY3	3
TY5	4
TY20	5
TY50	5

Information from Grand Liard Marsh and Ridge restoration CWPPRA project WVA was used to formulate most assumptions. Other WVAs were also reviewed and some information gleaned from literature.

United States Army Corps of Engineers. 2010. Mississippi River-Gulf Outlet Ecosystem Restoration Feasibility Study Wetland Value Assessment

Monte, Judith. 1978. The Impact of Petroleum Dredging on Louisiana's Coastal Landscape: A Plant Biogeographical Analysis and Resource Assessment of Spoil Bank Habitats in the Bayou Lafourche Delta. PhD. Dissertation, Louisiana State University

National Marine Fisheries Service. 2007. Bayou Dupont Ridge and Marsh Creation, Candidate Project for the Seventeenth Priority Project List of the Coastal Wetlands Planning, Protection and Restoration Act: Project Information Sheet for Wetland Value Assessment (WVA).

National Marine Fisheries Service. 2008. Grand Liard Marsh and Ridge Restoration, Candidate Project for the Eighteenth Priority Project List of the Coastal Wetlands Planning, Protection and Restoration Act: Project Information Sheet for Wetland Value Assessment (WVA).

National Marine Fisheries Service. 2010. Bayou Dupont Ridge and Marsh Creation (BA-48), 95% Design Review of the Coastal Wetlands Planning, Protection and Restoration Act: Project Information Sheet for Wetland Value Assessment (WVA).

Calcasieu Lock Fish and Wildlife Coordination Act Report -WVA

Barrier Island Model

TP Bird Island Alternative = 26 acres

The Corps provided this preliminary project description: the proposed site, located west of Tiger Pass, would have an island footprint ranging from 49.4 Acres (assuming 1 on 50 S/S) to 23.0 Acres (assuming 1 on 25 S/S). The crown of the island, to be constructed to +6.0' NAVD88 (approximately +9' MLG), would be approximately 6.5 acres in size. The proposed island will be approximately 26 Acres in size (assuming 1 on 50 slope) at the water's surface, which is assumed to be approximately 0.0 NAVD88.

Variable 1 V_1 % Dune

Existing Conditions-Open water, no subaerial landforms.

FWOP
TY 0-TY 50 0%

FWP
Dune habitat (V1) is defined in the model as the highest elevation on the island (>+5ft NAVD88-assuming water is 0ftNAVD88). There would be approximately 6.5 acres out of 26 total acres at this elevation on the proposed bird island (using area formula for circle), so 25 % of the island would be considered dune.

Using best professional judgement and the same land loss project model spreadsheet that was used for the marsh alternatives as a guide, we estimated the decreasing amount of each habitat as the acres of subaerial land expected to persist declined over time. As expected, intertidal habitat persisted for the longest time and increased in percentage relative to the higher elevation habitats.

TY0	0%
TY1	25%
TY3	25%
TY5	25%
TY6	20%
TY25	10%
TY50	0%

Variable V_2 % Supratidal

Existing Conditions-Open water, no subaerial landforms.

FWOP - existing conditions persist.
TY 0-TY 50 0%

FWP

Supratidal habitat (V2) extends from dune down to the intertidal zone. Elevation of the supratidal area is approximately +5 ft NAVD88 to +2 ft.NAVD88. To get down to 2ft NAVD88 requires going down 3 ft in elevation, which requires 150 ft of horizontal distance. Using the area formula for a circle we calculated 14.5 acres. So after subtracting the dune acres (6.5) within that gives 8acres or 31% of the island total acres.

Using the same land loss project model spreadsheet that was used for the marsh alternatives as a guide, we estimated the decreasing amount of each habitat as the acres of subaerial land expected to persist declined over time. As expected, intertidal habitat persisted for the longest time and increased in percentage relative to the higher elevation habitats.

TY 0	0%
TY 1	31%
TY 3	31%
TY 5	31%
TY 6	30%
TY 20	15%
TY 50	0%

Variable V_3 % Intertidal

Existing Conditions-Open water, no subaerial landforms

FWOP - existing conditions persist
TY 0-TY 50 0%

FWP
The area left from the supratidal and dune habitat is 26acres minus 14.5 acres. This area is intertidal (+2 ft. NAVD88) and comprises 44% of the island total acres.

Using the same land loss project model spreadsheet that was used for the marsh alternatives as a guide, we estimated the decreasing amount of each habitat as the acres of subaerial land expected to persist declined over time. As expected, intertidal habitat persisted for the longest time and increased in percentage relative to the higher elevation habitats.

TY 0	44%
TY 1	44%
TY 3	44%
TY 5	50%
TY 6	75%
TY 25	95%
TY 50	100%

Variable V_4 % Vegetative Cover (All habitat types)

Existing Conditions-Open water, no subaerial landforms.

FWOP-existing conditions persist
TY0-TY50 0%

FWP-Assume that vegetation in the intertidal zone is established quickly, but higher elevations develop more slowly.

TY0	0%
TY1	5%
TY3	15%
TY5	50%
TY6	75%
TY25	95% (most of island is established, intermediate vegetated marsh)
TY50	90% (wave energy and subsidence reduce veg cover)

Variable V_5 % Woody Cover and # Woody Species (e.g., baccharis, iva, mangrove, wax myrtle)

Existing Conditions-Open water, no subaerial landforms

FWOP-existing conditions persist
TY0-TY50 0%

FWP-Best professional judgment based on review of aerial photography of created habitat from Operations and Maintenance beneficial use at Baptiste Collette and Delta National Wildlife Refuge.

TY 0	0% - 0 species (Woody species slower to establish compared to marsh grasses)
TY 1	0% - 0 species
TY 3	0% - 1 species
TY 5	1% - 2 species
TY 6	2% - 2 species
TY 25	3% - 3 species (peak; time enough for seed transfer and still most of island intact, multiple habitat types still exist)
TY 50	0% - 0 species (assumes island is all intertidal, woody species can't survive)

Variable V_6 Interspersion –Similar to interspersion in marsh model, but considers all habitat types expected on the island.

Existing Conditions-Open water, no subaerial landforms.

FWOP-existing conditions persist

TY 0-TY 50 100% Class 5

FWP-Assumptions were guided by the marsh model assumptions;

TY 0	100% Class 5
TY 1	100% Class 5
TY 3	100% Class 3
TY 5	50% Class 1 50% Class 3
TY 6	100% Class 1
TY 25	100% Class 3 (Interspersion is assumed to decline as subsidence and overwash degrade the island
TY 50	100% Class 5 (assume intra-island features are further reduced or eliminated; only intertidal marsh remains)

V7 Beach /surf Zone Features Values Range 1 to 5 with 1 being a natural shoreline and higher values corresponding to suboptimal beach/surf features such as rock dikes or containment or protection structures. A value of 5 may also be used for areas with no emergent habitat.

Existing Conditions-Open water, no subaerial landforms

FWOP -existing conditions persist

TY0-TY50	5

FWP-Island is constructed in TY1 by dredged material placement to subaerial elevation without containment or any structures at the land-water interface.

TY 0	5
TY1-TY50	1

Literature Cited

Louisiana Coastal Wetlands Conservation and Restoration Task Force and the Wetlands Conservation and Restoration Authority. 1999. Coast 2050: Toward a Sustainable Coastal Louisiana, The Appendices. Appendix C – Region 1 Supplemental Information. Louisiana Department of Natural Resources. Baton Rouge, La.

Trahan, Larry. 1987. Soil Conservation Service Soil Survey of Plaquemines Parish, Louisiana. United States Department of Agriculture, Soil Survey Service. January 1987.

Chabreck, R.H., and C.M. Hoffpauir 1962. The use of weirs in coastal marsh management in coastal Louisiana. Proceedings of the Annual Conference of the Southeastern Association of Game and Fish Commisioners 16:103-112.

Tiger Pass BUDMAT alternatives (TP3 5Kft alt)– WVA model results

1a) TP3 5K ft Ridge and Marsh (No planting on ridge)

TP3 No Plant Ridge Component FWP 23 acres; 11.94 AAHUs

TP3 No Plant Ridge Component FWOP 2.15 AAHUs

TP3 marsh component 55 acres; 25.2 net AAHUs

So for the total net AAHUs for the TP3 (no plantings) alternative (78 acres total), 11.94-2.15=**9.79**(net ridge AAHUs)+**25.2**(net marsh AAHUs)= **34.99** total net Alternative **AAHUs**

0.45 AAHU/acre

1b) TP3 5K ft. Ridge and Marsh (Woody species planting on ridge)

TP3 Plantings Ridge Component FWP 23 acres; 15.15 AAHUs

TP3 Plantings Ridge Component FWOP 2.15 AAHUs

TP3 marsh component 55 acres; 25.2 net AAHUs

So for the total net AAHUs for the TP3 5Kft. (Plantings) alternative (78 acres total), 15.15-2.15=**13**(net ridge AAHUs)+**25.2**(net marsh AAHUs)= **38.2** total net Alternative **AAHUs**

0.49 AAHU/acre

2a) TP3 7.5Kft Ridge and Marsh (No planting on ridge)

TP3 No Plant Ridge Component FWP 34 acres; 17.61 AAHUs

TP3 No Plant Ridge Component FWOP 3.31 AAHUs

TP3 marsh component 167 acres; 77.54 net AAHUs

So for the total net AAHUs for the TP3 (no plantings) alternative (201 acres total), 17.61-3.31=**14.3**(net ridge AAHUs)+**77.54**(net marsh AAHUs)= **91.84** total net Alternative **AAHUs**

0.46 AAHU/acre

2b) TP3 7.5Kft Ridge and Marsh (Woody species planting on ridge)

TP3 Plantings Ridge Component FWP 34 acres; 22.34 AAHUs

TP3 Plantings Ridge Component FWOP 3.31 AAHUs

TP3 marsh component 167 acres; 77.54 net AAHUs

So for the total net AAHUs for the TP3 (Plantings) alternative (201 acres total), 22.34-3.31=**19.03**(net ridge AAHUs)+**77.54** (net marsh AAHUs)= **96.57** total net Alternative **AAHUs**

0.48 AAHU/acre

3) TP4 marsh creation: 190 acres; **114.89 AAHUs**

0.60 AAHU/acre

4) TP Bird Island : 26 acres; **15.08 AAHUs**

0.58 AAHU/acre

APPENDIX D
Agency Coordination

BOBBY JINDAL
GOVERNOR

STEPHEN CHUSTZ
SECRETARY

State of Louisiana

DEPARTMENT OF NATURAL RESOURCES

OFFICE OF COASTAL MANAGEMENT

December 4, 2015

Patricia Leroux
Corps of Engineers- New Orleans District
P.O. Box 60267
New Orleans, LA 70160-0267

RE: **C20150185, Coastal Zone Consistency**
New Orleans District, Corps of Engineers
Direct Federal Action
Spanish Pass Ridge Restoration (LCA BUDMAT)
Plaquemines Parish, Louisiana

Dear Ms. Leroux:

The above referenced project has been reviewed for consistency with the Louisiana Coastal Resources Program in accordance with Section 307 (c) of the Coastal Zone Management Act of 1972, as amended. The project, as proposed in this application, is consistent with the LCRP.

If you have any questions concerning this determination please contact Carol Crapanzano of the Consistency Section at (225) 342-9425 or 1-800-267-4019.

Sincerely yours,

/S/ Don Haydel
Acting Administrator
Interagency Affairs/Field Services Division

DH/SK

cc: Dave Butler, LDWF
Frank Cole, OCM

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February 5, 2016

Colonel Richard L. Hansen
District Commander
U.S. Army Corps of Engineers
Post Office Box 60267
New Orleans, Louisiana 70160-0267

Dear Colonel Hansen:

The U.S. Army Corps of Engineers (Corps), New Orleans District has proposed Environmental Assessment (EA) #542 titled "Tiger Pass Marsh/Ridge Restoration Tier 2, Louisiana Coastal Area (LCA), Beneficial Use of Dredged Material Program (BUDMAT) Project, Plaquemines Parish, Louisiana" (EA #542) and . That EA evaluates the potential impacts of the designated disposal site for the placement and beneficial use of dredged material removed during maintenance dredging of various federal navigation channels in the Mississippi River, and the hopper dredge disposal area (HDDA) located in the Federally-maintained Mississippi River. This report contains an analysis of the impacts on fish and wildlife resources that would result from the implementation of the proposed project and provides recommendations to minimize adverse project impacts while maximizing beneficial project impacts on those resources. This final report has been prepared under the authority of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), and a draft copy of the report was provided to the National Marine Fisheries Service (NMFS) and the Louisiana Department of Wildlife and Fisheries (LDWF) for review.

Wetland deterioration in the Mississippi River Delta (MRD) has been caused by anthropogenic factors, such as leveeing, canal dredging, gas and oil exploration, as well as natural processes such as eustatic sea level rise, subsidence, saltwater intrusion, and erosion. The LCA BUDMAT program was created to help fund the beneficial use of dredged material from federally-maintained waterways in coastal Louisiana. The program is only utilized for ecosystem restoration projects that are beyond the scope of disposal activities covered under the Corps' Operations and Maintenance (O&M) dredging program Federal Standard. The program is authorized at $100 million, and funds have been appropriated for the Tiger Pass project in partnership with the Plaquemines Parish Government.

The objectives for the Tiger Pass Marsh/Ridge Creation Tier 2, LCA, BUDMAT Project are to create coastal forested ridge and emergent marsh habitat adjacent to Spanish Pass in coordination with the Corps' O&M dredging program. Dredged material removed during routine maintenance of the HDDA, located near Head of Passes (HOP), in the lower MRD would be pumped through pipelines to the project area and placed at identified locations outside of the Federal Standard. The

area identified for the Tiger Pass project is located north of Venice, LA approximately 1.7 miles west of the of the Mississippi River's west bank.

STUDY AREA

The Tiger Pass Marsh/Ridge Creation Tier 2, LCA, BUDMAT Project area is located in the northern part of the West Bay subdelta of the MRD, in extreme southeast Plaquemines Parish, Louisiana. The project area is the open water and surrounding marsh of Spanish Pass, a remnant distributary. The vegetation in the study area is classified as fresh and intermediate marsh (O'Neil 1949, Chabreck and Linscombe 1997, Sasser et al. 2007). Parts of the area receive riverine input, and support many species of emergent and submerged vegetation. Emergent plant species include: smooth cordgrass, Walter's millet, giant cutgrass, wild rice, elephant ear, freshwater three square, and water lotus. Submerged aquatic vegetation (SAV), such as Eurasian watermilfoil, water stargrass, coontail, southern naiad, longleaf pondweed is also common in the lower elevation intertidal and shallow subtidal portions of the project area. Black willow and eastern baccharis occur along the higher-elevation areas. The two major soil types in the project area are commonly found together and are classified as Balize and Larose soils (BA). Both soil types are level and very poorly drained. They are flooded by Mississippi River water most of the time and support freshwater marshes. Subsidence in the area is high, and substantial sediment has not been deposited in the area since the original land formation of the West Bay subdelta. During periods of low river flow and/or strong south winds, gulf water intrudes and temporarily increases the salinity of the area.

FISH AND WILDLIFE RESOURCES

The fresh and intermediate marshes in the project area provide habitat for federal trust species including wading birds, waterfowl, and neotropical migrants. Freshwater and estuarine fish and crustacean species are abundant. Marsh in the project area provides important habitat for the growth and production of estuarine-dependent species such as blue crab, white shrimp, brown shrimp, Gulf menhaden, Atlantic croaker, spot, red drum, black drum, sand seatrout, spotted seatrout, southern flounder, striped mullet, and other finfishes. Commercial shrimp harvests have been positively correlated with the area of tidal emergent wetlands (Turner 1977 and 1982). Future commercial harvests of shrimp and other fishes and shellfishes would likely be adversely impacted by losses in marsh habitat (Turner 1982). Other wildlife includes alligators, swamp rabbit, nutria, muskrat, mink, river otter, raccoon, white-tailed deer, and coyote.

FUTURE FISH AND WILDLIFE RESOURCES

The MRD is generally experiencing high rates of land loss due to subsidence, erosion, etc., with localized areas of stability and marsh progradation. The loss of marsh acreage would result in less foraging, protection, nesting, etc., resources for fish and wildlife. Localized areas would maintain existing marsh or have an increase due to sedimentation and will continue to support fish and wildlife, but the MRD in general would experience decreased abundances of fish and wildlife.

Threatened and Endangered Species and Migratory Birds

Federally-listed threatened and endangered species that could be encountered in the project area are the endangered West Indian manatee (*Trichechus manatus*), the endangered pallid sturgeon (*Scaphirhynchus albus*), the threatened piping plover (*Charadrius melodus*), and the threatened

red knot (*Calidris canutus rufa*), and sea turtles (the Corps will consult with the NMFS regarding sea turtles. The Corps should consult with the Service and include any Service-recommended protective measures in their work plan.

The endangered West Indian manatee (*Trichechus manatus*) is known to regularly occur in Lakes Pontchartrain and Maurepas and their associated coastal waters and streams. It also can be found less regularly in other Louisiana coastal areas, most likely while the average water temperature is warm. Based on data maintained by the Louisiana Natural Heritage Program (LNHP), over 80 percent of reported manatee sightings (1999-2011) in Louisiana have occurred from the months of June through December. Manatee occurrences in Louisiana appear to be increasing and they have been regularly reported in the Amite, Blind, Tchefuncte, and Tickfaw Rivers, and in canals within the adjacent coastal marshes of southeastern Louisiana. Manatees may also infrequently be observed in the Mississippi River and coastal areas of southwestern Louisiana. Cold weather and outbreaks of red tide may adversely affect these animals. However, human activity is the primary cause for declines in species number due to collisions with boats and barges, entrapment in flood control structures, poaching, habitat loss, and pollution.

During in-water work in areas that potentially support manatees all personnel associated with the project should be instructed about the potential presence of manatees, manatee speed zones, and the need to avoid collisions with and injury to manatees. All personnel should be advised that there are civil and criminal penalties for harming, harassing, or killing manatees which are protected under the Marine Mammal Protection Act of 1972 and the Endangered Species Act of 1973. Additionally, personnel should be instructed not to attempt to feed or otherwise interact with the animal, although passively taking pictures or video would be acceptable.

- All on-site personnel are responsible for observing water-related activities for the presence of manatee(s). We recommend the following to minimize potential impacts to manatees in areas of their potential presence:

- All work, equipment, and vessel operation should cease if a manatee is spotted within a 50-foot radius (buffer zone) of the active work area. Once the manatee has left the buffer zone on its own accord (manatees must not be herded or harassed into leaving), or after 30 minutes have passed without additional sightings of manatee(s) in the buffer zone, in-water work can resume under careful observation for manatee(s).

- If a manatee(s) is sighted in or near the project area, all vessels associated with the project should operate at "no wake/idle" speeds within the construction area and at all times while in waters where the draft of the vessel provides less than a four-foot clearance from the bottom. Vessels should follow routes of deep water whenever possible.

- If used, siltation or turbidity barriers should be properly secured, made of material in which manatees cannot become entangled, and be monitored to avoid manatee entrapment or impeding their movement.

- Temporary signs concerning manatees should be posted prior to and during all in-water project activities and removed upon completion. Each vessel involved in construction activities should display at the vessel control station or in a prominent location, visible to all employees operating the vessel, a temporary sign at least 8½ " X 11" reading language

similar to the following: "CAUTION BOATERS: MANATEE AREA/ IDLE SPEED IS REQUIRED IN CONSRUCTION AREA AND WHERE THERE IS LESS THAN FOUR FOOT BOTTOM CLEARANCE WHEN MANATEE IS PRESENT". A second temporary sign measuring 8½ " X 11" should be posted at a location prominently visible to all personnel engaged in water-related activities and should read language similar to the following: "CAUTION: MANATEE AREA/ EQUIPMENT MUST BE SHUTDOWN IMMEDIATELY IF A MANATEE COMES WITHIN 50 FEET OF OPERATION".

Collisions with, injury to, or sightings of manatees should be immediately reported to the Service's Louisiana Ecological Services Office (337/291-3100) and the Louisiana Department of Wildlife and Fisheries, Natural Heritage Program (225/765-2821). Please provide the nature of the call (i.e., report of an incident, manatee sighting, etc.); time of incident/sighting; and the approximate location, including the latitude and longitude coordinates, if possible.

The pallid sturgeon (*Scaphirhynchus albus*) is an endangered, bottom-oriented, fish that inhabits large river systems from Montana to Louisiana. Within this range, pallid sturgeon tend to select main channel habitats in the Mississippi River and main channel areas with islands or sand bars in the upper Missouri River. In Louisiana it occurs in the Atchafalaya and Mississippi Rivers, and below Lock and Dam Number 3 on the Red River (with known concentrations in the vicinity of the Old River Control Structure Complex). The pallid sturgeon is adapted to large, free-flowing, turbid rivers with a diverse assemblage of physical characteristics that are in a constant state of change. Many life history details and subsequent habitat requirements of this fish are not known. However, the pallid sturgeon is believed to utilize Louisiana riverine habitat during reproductive stages of its life cycle. Habitat loss through river channelization and dams has adversely affected this species throughout its range.

Entrainment issues associated with dredging operations in the Mississippi and Atchafalaya Rivers and through diversion structures off the Mississippi River are two potential effects that should be addressed in future planning studies and/or in analyzing current project effects. We recommend the following to minimize potential impacts to pallid sturgeon associated with dredging to ensure protection of the pallid sturgeon: (1) the cutterhead should remain completely buried in the bottom material during dredging operations. If pumping water through the cutterhead is necessary to dislodge material or to clean the pumps or cutterhead, etc., the pumping rate should be reduced to the lowest rate possible until the cutterhead is at mid-depth, where the pumping rate can then be increase; (2) during dredging, the pumping rates should be reduced to the slowest speed feasible while the cutterhead is descending to the channel bottom.

The piping plover (*Charadrius melodus*), federally listed as a threatened species, is a small (7 inches long), pale, sand-colored shorebird that winters in coastal Louisiana and may be present for 8 to 10 months annually. Piping plovers arrive from their northern breeding grounds as early as late July and remain until late March or April. They feed on polychaete marine worms, various crustaceans, insects and their larvae, and bivalve mollusks that they peck from the top of or just beneath the sand. Piping plovers forage on intertidal beaches, mudflats, sand flats, algal flats, and wash-over passes with no or very sparse emergent vegetation. They roost in unvegetated or sparsely vegetated areas, which may have debris, detritus, or micro-topographic relief offering refuge to plovers from high winds and cold weather. They also forage and roost in wrack (i.e., seaweed or other marine vegetation) deposited on beaches. In most areas, wintering piping plovers are dependent on a mosaic of sites distributed throughout the landscape, because the

suitability of a particular site for foraging or roosting is dependent on local weather and tidal conditions. Plovers move among sites as environmental conditions change, and studies have indicated that they generally remain within a 2-mile area. Major threats to this species include the loss and degradation of habitat due to development, disturbance by humans and pets, and predation.

On July 10, 2001, the Service designated critical habitat for wintering piping plovers (Federal Register Volume 66, No. 132); a map of the seven critical habitat units in Louisiana can be found at http://criticalhabitat.fws.gov/crithab. Their designated critical habitat identifies specific areas that are essential to the conservation of the species. The primary constituent elements for piping plover wintering habitat are those habitat components that support foraging, roosting, and sheltering and the physical features necessary for maintaining the natural processes that support those habitat components. Constituent elements are found in geologically dynamic coastal areas that contain intertidal beaches and flats (between annual low tide and annual high tide), and associated dune systems and flats above annual high tide. Important components (or primary constituent elements) of intertidal flats include sand and/or mud flats with no or very sparse emergent vegetation. Adjacent unvegetated or sparsely vegetated sand, mud, or algal flats above high tide are also important, especially for roosting plovers

The red knot (*Calidris canutus rufa*), federally listed as a threatened species, is a medium-sized shorebird about 9 to 11 inches (23 to 28 centimeters) in length with a proportionately small head, small eyes, short neck, and short legs. The black bill tapers steadily from a relatively thick base to a relatively fine tip; bill length is not much longer than head length. Legs are typically dark gray to black, but sometimes greenish in juveniles or older birds in non-breeding plumage. Non-breeding plumage is dusky gray above and whitish below. The red knot breeds in the central Canadian arctic but is found in Louisiana during spring and fall migrations and the winter months (generally September through May).

During migration and on their wintering grounds, red knots forage along sandy beaches, tidal mudflats, salt marshes, and peat banks. Observations along the Texas coast indicate that red knots forage on beaches, oyster reefs, and exposed bay bottoms, and they roost on high sand flats, reefs, and other sites protected from high tides. In wintering and migration habitats, red knots commonly forage on bivalves, gastropods, and crustaceans. Coquina clams (*Donax variabilis*), a frequent and often important food resource for red knots, are common along many gulf beaches. Major threats to this species along the Gulf of Mexico include the loss and degradation of habitat due to erosion, shoreline stabilization, and development; disturbance by humans and pets; and predation

The brown pelican (*Pelecanus occidentalis*), a year-round resident of coastal Louisiana that may occur in the project area, was removed from the Federal List of Endangered and Threatened Wildlife (i.e., "delisted") by the Service on November 17, 2009. Despite its recent delisting, brown pelicans—and other colonial nesting wading birds and seabirds—remain protected under the MBTA. Portions of the proposed project area may contain habitats commonly inhabited by colonial nesting wading birds and seabirds. To minimize disturbance to pelicans and other colonial nesting birds and seabirds potentially occurring in the project area, the Corps would observe restrictions on activity provided by the Fish and Wildlife Service, Lafayette, Louisiana Field Office. Special operating conditions addressing pelicans and other colonial nesting wading birds and seabirds (including reporting presence of birds and/or nests; no-work distance

restrictions—2000 feet for brown pelicans, 1000 feet for colonial nesting wading birds, and 650 feet for terns, gulls, and black skimmers; bird nesting prevention and avoidance measures; marking discovered nests) would be included in any Corps plans and specifications developed prior to dredging and disposal activities. In addition, dredging and disposal activities would be restricted to non-nesting periods for colonial nesting wading birds and seabirds when practicable

Essential Fish Habitat

The project may be located within an area identified as Essential Fish Habitat (EFH) by the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA, Magnuson-Stevens Act; P.L. 104-297). The Corps should consult with NMFS regarding EFH.

Species of Management Concern

Species of fish, wildlife, and plants labeled as "S1" and S2" by the Louisiana Department of Wildlife and Fisheries are extremely and very rare species, respectively, that are vulnerable to extirpation in Louisiana. These species, along with those identified as priority species by the Gulf Coast Joint Venture are species of management concern. Continued population declines could result in these species becoming candidates for listing under the Endangered Species Act. Some of these species may also be referred to as at-risk species; the Service has defined at-risk species as those species that have either been proposed for listing, are candidates for listing, or have been petitioned for listing.

Species of concern which use the study area include Wilson's plover, gull-billed tern, reddish egret, black skimmer, and peregrine falcon. Species of concern that would use study area's fresh, intermediate, brackish and saline marsh habitat and adjacent open waters, include the Louisiana-eyed silk moth, glossy ibis, seaside sparrow, black rail, mottled duck, and the peregrine falcon.

DESCRIPTION OF TENTATIVELY SELECTED PLAN AND EVALUATED ALTERNATIVES

Through coordination between the Corps' Product Development Team (PDT), the non-federal sponsor (Plaquemines Parish), and natural resource agencies, the following initial list of alternatives was developed:

Tentatively Selected Plan (TSP): Tiger Pass Marsh/Ridge (5,000 feet) Restoration at Spanish Pass (TP-3)

The LCA BUDMAT - Spanish Pass Ridge Restoration project alternative was originally proposed as part of the State's 2012 Coastal Master Plan and Plaquemines Parish Ridge Restoration Program. The project calls for the restoration of a portion of the historic ridge that ran along the banks of Spanish Pass. Since Spanish Pass was cut off from the Mississippi River by levees, the historic ridge has subsided and eroded through time.

The created feature would include an approximately 5,000-feet long ridge (approximately 23 acres) constructed to an elevation of +6.5 feet North American Vertical Datum 1988 (NAVD88) with a 200-feet wide base. The ridge would begin west of LA Hwy 23 in Venice, LA and continue to the west along the north side of Spanish Pass. The earthen ridge would be backed by a 500-feet wide marsh platform (approximately 55 acres) along the entire length of the ridge on its north side. The marsh platform would be constructed to a height of +3.5 feet NAVD88. All

elevations listed are considered to be post-construction. The construction of this project would require 1,650,000 cubic yards of sandy material. The ridge and marsh platform feature would serve as a means to reduce wave energy on the leeward side of the project. The construction of this feature would impact 17.08 acres of existing marsh in the fill footprint and 1.09 acres of marsh in the access right-of-way. The access right-of-way would be 50 feet wide to allow for dredge pipeline and earth-moving equipment ingress-egress and would remain in state-claimed water bottoms.

To transport the dredge material from the HDDA, a cutterhead suction dredge would load hopper barges utilizing a spider barge. The arms of a spider barge are designed to optimize loading characteristics and production efficiency of loading the sediment into the hopper barges. Once loaded, the hopper barges would be transported by tugboat to the designated pump-out location in the Mississippi River outside of the navigation channel. The material would be removed from the hopper barges by an unloader and transported via pipeline to the fill placement area. Once the slurry line reaches shore from the unloader, it would travel along and under Jump Basin Road to open water. The pipeline would continue through existing open water to its terminus at the project site. The proposed route would not require the pipeline to traverse any levees, federal or otherwise. The construction equipment would access the site through open water bodies in order to prevent damage to existing wetlands.

The final placement of material being pumped through the dredge pipe would be handled similarly to material placement in the Corps' disposal projects in the Delta National Wildlife Refuge. This method does not require the use of retention dikes from in situ material; rather the hydraulically dredged material would be pumped to the project site and shaped by conventional land based construction equipment (dozers, front end loaders, excavators, marsh cranes, etc.). The side slopes are allowed to take a natural angle of repose, and the crown elevations are well above the water surface permitting cost effective management of the fill material.

Tiger Pass Marsh/Ridge (7,500 feet) Restoration at Spanish Pass (TP-3)
This alternative would be located in the same area and similar to the TSP, but the created feature would include an approximately 7,500-feet long ridge (approximately 34 acres) constructed to an elevation of +6.5 feet NAVD88 with a 200-feet wide base. The ridge would begin west of LA Hwy 23 in Venice, LA and continue to the west along the north side of Spanish Pass. The earthen ridge would be backed by a 1000-feet wide marsh platform (approximately 167 acres) along the entire length of the ridge on its north side. The marsh platform would be constructed to a height of +3.5 feet NAVD88. The construction of this project would require 4,000,000 cubic yard of sandy material. The ridge and marsh platform feature would serve as a means to reduce wave energy on the leeward side of the project. Dredged material transport would be the same as the TSP.

Tiger Pass Marsh/Ridge (2,500 feet) Restoration at Spanish Pass (TP-3)
This alternative would be located in the same area and similar to the TSP, but the created feature would include an approximately 2,500-feet long ridge (approximately 11.5 acres) constructed to an elevation of +6.5 feet NAVD88 with a 200-feet wide base. The ridge would begin west of LA Hwy 23 in Venice, LA and continue to the west along the north side of Spanish Pass. The earthen ridge would be backed by a 500-feet wide marsh platform (approximately 30 acres) along the entire length of the ridge on its north side. The marsh platform would be constructed to a height of +3.5 feet NAVD88. The construction of this project would require 4,000,000 cubic yard of

sandy material. The ridge and marsh platform feature would serve as a means to reduce wave energy on the leeward side of the project. Dredged material transport would be the same as the TSP.

Venice Ponds Marsh Creation (TP-4 A&B)

This alternative would create marsh within 2 proposed marsh restoration sites designated as Sites TP-4A and TP-4B, and is located south east of the community of Venice, LA, beginning at the fork of Tiger Pass and Grand Pass. Restoration sites TP-4A and 4B would be approximately 95 and 97.5 acres in size, respectively. The dredge material for this alternative would be obtained from the lower portion of Tiger Pass through long distance transport of dredged material that would be obtained during Corps of Engineers O&M dredging of the lower portion of Tiger Pass.

Dredge material will be limited to a maximum elevation of between +4 feet and +4.5 feet NAVD88. The dredge discharge pipeline and dike construction equipment would access the sites through a natural opening in the west bank of Tiger Pass and from there follow existing shallow water bodies to the restoration sites in order to prevent damage to existing wetlands. Approximately 2,000,000 cubic yards would be required to construct the project.

Construction of earthen retentions dikes (10,650 linear feet), closures (2,680 linear feet), and weirs at each site would be required in order to maximize retention of the dredged fill for the development of the wetlands, and to prevent the material from entering adjacent lands, waterways, and pipeline canals. Material necessary for dike, weir and closure construction would come from within the restoration sites themselves. The perimeter retention dikes would be constructed inside the marsh and to an elevation of +6 feet NAVD88, with 1 on 5 side slopes. The weirs would be constructed to an elevation of +4 feet NAVD88, with 1 on 5 side slopes.

Tiger Pass Bird Island

This alternative would create coastal bird nesting habitat for migratory shorebirds. Unconfined dredge spoil placement would be placed to a maximum initial elevation of +5.5 feet NAVD88 with an expected final elevation of approximately +3.5 feet NAVD88. Approximate dimension are 1,000 feet North-South by 1,400 feet East-West and the island would be located west of Tiger Pass.

EVALUATION METHODS FOR SELECTED PLAN AND ALTERNATIVES

Wetland Value Assessment (WVA)

Evaluations of the effects of the alternatives to fish and wildlife resources were conducted using the WVA methodology. Implementation of the WVA requires that habitat quality and quantity (acreage) are measured for baseline conditions, and predicted for future without-project and future with-project conditions. Each WVA model utilizes an assemblage of variables considered important to the suitability of that habitat type to support a diversity of fish and wildlife species. The WVA provides a quantitative estimate of project-related impacts to fish and wildlife resources; however, the WVA is based on separate models for bottomland hardwoods, chenier/coastal ridge, fresh/intermediate marsh, brackish marsh, and saline marsh. Although, the WVA may not include every environmental or behavioral variable that could limit populations below their habitat potential, it is widely acknowledged to provide a cost-effective means of assessing restoration measures in coastal wetland communities.

The WVA models operate under the assumption that optimal conditions for fish and wildlife habitat within a given coastal wetland type can be characterized, and that existing or predicted conditions can be compared to that optimum to provide an index of habitat quality. Habitat quality is estimated and expressed through the use of a mathematical model developed specifically for each wetland type. Each model consists of: (1) a list of variables that are considered important in characterizing community-level fish and wildlife habitat values; (2) a Suitability Index graph for each variable, which defines the assumed relationship between habitat quality (Suitability Index) and different variable values; and, (3) a mathematical formula that combines the Suitability Indices for each variable into a single value for wetland habitat quality, termed the Habitat Suitability Index (HSI).

The product of an HSI value and the acreage of available habitat for a given target year is known as the Habitat Unit (HU) and is the basic unit for measuring project effects on fish and wildlife habitat. HUs are annualized over the project life to determine the Average Annual Habitat Units (AAHUs) available for each habitat type. The change (increase or decrease) in AAHUs for each future with-project scenario, compared to future without-project conditions, provides a measure of anticipated impacts. A net gain in AAHUs indicates that the project is beneficial to the fish and wildlife community within that habitat type; a net loss of AAHUs indicates that the project would adversely impact fish and wildlife resources.

IMPACTS OF SELECTED PLAN AND ALTERNATIVES

Because all of the alternatives include placement of dredged material in shallow water bottoms, they would impact benthic and slower moving aquatic demersal organisms; however shallow water bottom habitat area is increasing relative to emergent marsh area and coastal islands in most of coastal Louisiana. The construction of the TSP and the other ridge/marsh alternatives would impact remnant degraded marsh but they would create new ridge habitat and emergent marsh with greater refugia and forage benefits than open water bottoms and would increase the overall net habitat value of the area. The projected effects of the alternatives are summarized in Table 1.

Table 1. Tiger Pass BUDMAT alternatives with associated acres and net AAHUs that would be generated.

Alternative	Marsh created by dredged material placement (acres)	Net marsh AAHUs	Forested ridge habitat created by dredged material placement (acres)	Net ridge AAHUs	Coastal island migratory bird nesting habitat (acres)	Total project AAHUs
TP3 5,000 ft ridge (not planted) and marsh creation **(TSP)**	55	24.11	23	9.8		33.9
TP3 5,000 ft ridge (planted) and marsh creation	55	24.11	23	13.01		37.1
TP3 7,500 ft ridge (not planted) and marsh creation	167	74.33	34	14.29		88.6

TP3 7,500 ft ridge (planted) and marsh creation	167	74.33	34	19.01		93.3
TP3 2,500 ft ridge (not planted) and marsh creation	30	13.17	11.5	4.9		18.07
TP3 2,500 ft ridge (planted) and marsh creation	30	13.17	11.5	6.5		19.67
TP4 marsh creation	190	70.99				70.99
TP Bird Island					26	15.08

SERVICE POSITION AND RECOMMENDATIONS

The Service's analysis of project alternatives considered for the study area has shown the potential for beneficial effects on fish and wildlife resources. Construction of the TSP (TP3 5,000 feet) is projected to create 23 acres of forested ridge and 55 acres of intermediate marsh over the 50 year life of the project for a net total 33.9 AAHUs. The net benefits of the other alternatives that were evaluated are listed in Table 1. The Service supports this habitat creation project provided the following fish and wildlife conservation measures are implemented concurrently with project implementation to help ensure that fish and wildlife conservation is maximized:

1. Avoid adverse impacts to water bird colonies through careful design project features and timing of construction. We recommend that a qualified biologist inspect the proposed work site for the presence of undocumented nesting colonies during the nesting season. For areas containing nesting wading birds (i.e., herons, egrets, night-herons, ibis, and roseate spoonbills), anhingas, and/or cormorants, all activity occurring within 1,000 feet of a nesting colony should be restricted to the non-nesting period. For nesting brown pelicans activity should be avoided within 2,000 feet of the colony. Activity is restricted within 650 feet of black skimmers, gulls, and terns.

2. The impacts to Essential Fishery Habitat should be discussed with the National Marine Fisheries Service to determine if the project complies with the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), Magnuson-Stevens Act; P.L. 104-297, as amended) and its implementing regulations.

3. Access corridors across existing wetlands should be avoided if possible. Impacted wetlands should be restored to a substrate elevation similar to the surrounding marsh. Flotation access channels in open water should be backfilled upon project completion. Post-construction surveys (e.g., centerline surveys) should be taken to ensure access channels have been adequately backfilled. That information should be provided to the natural resource agencies for review.

4. To ensure that dredged material is placed to each particular habitat's specified elevations, we recommend that the Corps use an updated NAVD88 datum (i.e., current geoid) consistent with the NAVD88 datum that is referenced for the elevations of existing marsh and water level in the project area.

5. If containment dikes are constructed, they should be breached or degraded to the settled elevations of the disposal area. Such breaches should be undertaken after consolidation of the dredged sediments and vegetative colonization of the exposed soil surface, or a maximum of 2 years after construction.

6. The Service recognizes the value of submerged aquatic vegetation (SAV) habitat to fish and wildlife, including Federal trust resource species. If SAV is encountered, the Corps should avoid these areas if possible and utilize unvegetated open water areas for marsh creation.

7. Further detailed planning of project features (e.g., Design Documentation Report, Engineering Documentation Report, Plans and Specifications, Water Control Plans, or other similar documents) should be coordinated with the Service, NMFS, LDWF, EPA and LDNR. The Service shall be provided an opportunity to review and submit recommendations on the all work addressed in those reports.

8. Any proposed change in project features or plans should be coordinated in advance with the Service, NMFS, LDWF, and LDNR

9. The LCA BUDMAT program specifies that monitoring and adaptive management plans are required for beneficial use habitat creation projects. The Corps should coordinate with the Service during development of those plans.

10. ESA consultation should be reinitiated should the proposed project features change significantly or are not implemented within one year of the last ESA consultation with this office to ensure that the proposed project does not adversely affect any federally listed threatened or endangered species or their habitat.

We appreciate the opportunity to assist in the development of and provide comments on the Tiger Pass BUDMAT project. We look forward to your response to our recommendations and to future coordination to further protect fish and wildlife resources as more specific plans are developed. If you need further assistance or have questions regarding this letter, please contact David Castellanos (337/291-3112) or John Savell (337/291-3144) of this office.

Sincerely,

David A. Walther
Acting Field Supervisor
Louisiana Ecological Services Field Office

11

cc: Corps, NOD, New Orleans, LA (Attn: Ms. Patricia Leroux)
EPA, Dallas, TX
NMFS, Baton Rouge, LA
FWS, Southeast Refuge Complex, Lacombe, LA (Attn: Mr. James Harris)
LDWF, Baton Rouge, LA
LDNR, CMD, Baton Rouge, LA
CPRA, Baton Rouge, LA

Literature Cited

Chabreck, R., and G. Linscombe. 1997. Vegetative Type Map of the Louisiana Coastal Marshes. Louisiana Department of Wildlife and Fisheries, New Orleans, LA.

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O'Neil, T. 1949. Map of Louisiana showing the vegetation types of Louisiana coastal marshes 1949. U.S. Geological Survey, National Wetlands Research Center Coastal Restoration Project Office.

Turner, R.E. 1977. Intertidal vegetation and commercial yields of penaeid shrimp. Trans. Am. Fish. Soc. 106:411-416.

Turner, R.E. 1982. Wetland losses and coastal fisheries: an enigmatic and economically significant dependency. *In* Boesch, D.F.(ed.). Proceedings of the conference on coastal erosion and wetland modification in Louisiana: causes, consequences, and options. Fish and Wildlife Service, Biological Services Program, Washington, D.C. FWS/OBS-82/59. 256 pp.

JOHN BEL EDWARDS
GOVERNOR

CHUCK CARR BROWN, PH.D.
SECRETARY

State of Louisiana

DEPARTMENT OF ENVIRONMENTAL QUALITY
ENVIRONMENTAL SERVICES

February 1, 2016

Ms. Jean M. Exnicios
US Army Corps of Engineers, New Orleans District
CEMVN-PDN-CEP
Post Office Box 60267
New Orleans, Louisiana 70160-0267

AI No.: 84834
Activity No.: CER20150001

RE: Spanish Pass Ridge Restoration Project (LCA BUDMAT)
Water Quality Certification WQC 151210-02
Plaquemines Parish

Dear Ms. Exnicios:

The Louisiana Department of Environmental Quality, Water Permits Division (LDEQ), has reviewed the application to provide dredged material from the maintenance of federally maintained navigation channels for the Spanish Pass Ridge Restoration Project, Plaquemines Parish.

The information provided in the application, the Section 404(b)(1) Evaluation, Environmental Assessment #542 (EA #542) titled "Tiger Pass Marsh/Ridge Restoration Tier 2 Louisiana Coastal Area (LCA) Beneficial Use of Dredged Material Program BUDMAT" and the draft Finding of No Significant Impact (FONSI) has been reviewed in terms of compliance with State Water Quality Standards, the approved Water Quality Management Plan and applicable state water laws, rules and regulations. LDEQ determined that the requirements for a Water Quality Certification have been met. LDEQ concludes the discharge of dredged material will not violate water quality standards as provided for in LAC 33:IX.Chapter 11. Therefore, LDEQ hereby issues US Army Corps of Engineers, New Orleans District - Spanish Pass Ridge Restoration Project Water Quality Certification, WQC 151210-02.

Should you have any questions concerning any part of this certification, please contact Elizabeth Hill (225) 219-3225 or by email at elizabeth.hill@la.gov. To ensure all correspondence regarding this certification is properly filed into the Department's Electronic Document Management System, please reference Agency Interest (AI) number 84834 on all future correspondence to this Department.

Sincerely,

Chuck Carr Brown, Ph.D.
Secretary

c: IO-W

Post Office Box 4313 • Baton Rouge, Louisiana 70821-4313 • Phone 225-219-3181 • Fax 225-219-3309
www.deq.louisiana.gov

APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT (33 CFR 325)	OMB APPROVAL NO. 0710-003 Expires October 1996

Public reporting burden for this collection of information is estimated to average 5 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Service Directorate of Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0710-0003), Washington, DC 20503. Please DO NOT RETURN your form to either of those addresses. Completed applications must be submitted to the District Engineer having jurisdiction over the location of the proposed activity.

PRIVACY ACT STATEMENT

Authority: 33 USC 401, Section 10; 1413, Section 404. Principal Purpose: These laws require permits authorizing activities in, or affecting, navigable waters of the United States, the discharge of dredged of fill material into waters of the United States, and the transportation of dredged material for the purpose of dumping it into ocean waters. Routine Uses: Information provided on this form will be used in evaluating the application or a permit. Disclosure: Disclosure of requested information is voluntary. If information is not provided, however, the permit application cannot be processed nor can a permit be issued.

One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned.

(ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)

1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED	4. DATE APPLICATION COMPLETED

(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME	8. AUTHORIZED AGENT'S NAME AND TITLE (an agent is not required)
US Army Corps of Engineers, New Orleans District	Same as Applicant
6. APPLICANT'S ADDRESS Planning , Programs and Programs and Project Management Division CEMVN-PDN-CEP P.O. Box 60267 New Orleans, LA 70160-0267 ATTN:	**9. AGENT'S ADDRESS**
7. APPLICANT'S PHONE NOS. W/AREA CODE	10. AGENT'S PHONE NOS. W/AREA CODE
a. Residence **b. Business** (504) 862-1544	a. Residence b. Business

11. STATEMENT OF AUTHORIZATION

Joe M Ensminger 12-5-15

APPLICANT'S SIGNATURE DATE

NAME, LOCATION AND DESCRIPTION OF PROJECT OR ACTIVITY

12. PROJECT NAME OR TITLE (see instructions)

Tiger Pass Marsh/Ridge Restoration Tier 2, Louisiana Coastal Area (LCA) Beneficial Use of Dredged Material Program (BUDMAT)

13. NAME OF WATERBODY, IF KNOWN (if applicable)	14. PROJECT STREET ADDRESS (if applicable)
Yellow Cotton Bay	
15. LOCATION OF PROJECT Plaquemines COUNTY Louisiana STATE	

16. OTHER LOCATION DESCRIPTIONS, IF KNOWN, (see instructions)

17. DIRECTIONS TO THE SITE

18. Nature of Activity (Description of project, include all features.)

Spanish Pass Ridge Restoration Alternative (5,000 linear feet)

The Spanish Pass Ridge Restoration project calls for the restoration of a portion of the historic ridge that ran along the banks of Spanish Pass. Since Spanish Pass was cut off from the Mississippi River by levees, the historic ridge has subsided and eroded through time.

The created feature would include an approximately 5,000-ft long ridge (approximately 23 acres) constructed to an elevation of +6.5-ft NAVD88 with a 200-ft wide base. The ridge would begin west of LA Hwy 23 in Venice, LA and continue to the west along the north side of Spanish Pass. The earthen ridge would be backed by a 500-ft wide marsh platform (approximately 58 acres) along the entire length of the ridge on its north side. The marsh platform would be constructed to a height of +3.5-ft NAVD88. All elevations listed are considered to be post-construction. The construction of this project would require 1,650,000 cubic yard (cy) of sandy material. The ridge and marsh platform feature would serve as a means to reduce wave energy on the leeward side of the project. The access right-of-way would be 50-ft wide to allow for dredge pipeline and earth-moving equipment ingress-egress and would remain in state-claimed water bottoms. The construction of the ridge would impact 17.08 acres of existing marsh in the fill footprint and 1.09 acres of marsh in the access right-of-way.

Dredge Material Transport Method

To transport the dredge material from the HDDA, a cutterhead suction dredge would load hopper barges utilizing a spider barge. The arms of a spider barge are designed to optimize loading characteristics and production efficiency of loading the sediment into the hopper barges. Once loaded, the hopper barges would be transported by tugboat to the designated pump-out location in the Mississippi River outside of the navigation channel. The material would be removed from the hopper barges by an unloader and transported via pipeline to the fill placement area. Once the slurry line reaches shore from the unloader, it would travel along and under Jump Basin Road to open water. The pipeline would continue through existing open water to its terminus at the project site. The proposed route would not require the pipeline to traverse any levees, federal or otherwise. The construction equipment would access the site through open water bodies in order to prevent damage to existing wetlands.

The final placement of material being pumped through the dredge pipe would be handled in a similar manner as USACE's disposal projects in the Delta National Wildlife Refuge. (NWR) This method does not require the use of retention dikes from in situ material; rather the hydraulically dredged material would be pumped to the project site and shaped by conventional land based construction equipment (dozers, front end loaders, excavators, marsh cranes, etc.). The side slopes are allowed to take a natural angle of repose, and the crown elevations are well above the water surface permitting cost effective management of the fill material.

19. Project Purpose (Describe the reason or purpose of the project, (see instruction.)

Maintenance dredging of the Gulf of Mexico entrance channels to the Mississippi River is needed to ensure safe passage of commercial shipping from the Gulf to upriver ports of call. The Southwest Pass of the Mississippi River is the principal shipping channel between the Gulf of Mexico and the Head of Passes, where Southwest Pass and two other distributary channels, South Pass and Pass a Loutre, split from the main stem of the Mississippi River. The approximately 22-mile-long Southwest Pass navigation channel is currently maintained at a depth of (-) 45-ft mean low Gulf (MLG) to provide deep-draft access to the New Orleans – Baton Rouge port corridor and its associated commerce and industries.

Hopper-dredged material removed from the reach between Venice and Mile 11.0 below Head of Passes is hauled and deposited into a location in the river located just above the Head of Passes, called the Hopper Dredge Disposal Area (HDDA).

Management of the HDDA involves maintaining sufficient depths in the area to allow continuous use by hopper dredges during routine maintenance dredging of Southwest Pass. When the site is nearly full, dredged material is excavated using a hydraulic cutterhead dredge and moved to permanent beneficial use-disposal locations, thereby maintaining storage capacity in the HDDA so that maintenance dredging in Southwest Pass may continue uninterrupted. When hydraulic cutterhead dredges are occasionally used in Southwest Pass, dredged material is placed unconfined in shallow open-water areas on either side of the channel for wetlands creation and development.

USE BLOCKS 20-22 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

20. Reason(s) for Discharge

Activities like the proposed activity that are conducted under the Louisiana Coastal Area Beneficial Use of Disposal Material program would optimize the use of dredged materials resulting from the maintenance of these federally maintained navigation channels for ecosystem restoration beneficial use projects that are above and beyond the disposal activities that are covered under the USACE operations and maintenance (O&M) dredging Federal Standard or the base disposal plan for a navigation project (identified as the least costly environmentally compliant alternative that is consistent with sound engineering standards).

21. Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards

22. Surface Area in Acres of Wetlands or Other Waters Filled (see instructions)

Approximately 81 acres, including 18.17 acres of existing marsh and 62.83 acres of open water

23. Is Any Portion of the Work Already Complete? Yes ____ No __X__ IF YES, DESCRIBE THE COMPLETED WORK

24. Addresses of Adjoining Property Owners, Lessees, Etc., Whose Property Adjoins the Waterbody (If more than can be entered here, please attach a supplemental

list.

25. List of Other Certifications or Approvals/Denials Received from other Federal, State or Local Agencies for Work Described in This Application.

AGENCY	TYPE APPROVAL.	IDENTIFICATION NO.	DATE APPLIED	DATE APPROVED	DATE DENIED

To the best of my knowledge the proposed activity described in my permit application complies with and will be conducted in a manner that is consistent with the LA Coastal management Program.
*Would include but is not restricted to zoning, building and flood plain permits.

26. Application is hereby made for a permit or permits to authorize the work described in this application. I certify that the information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

SIGNATURE OF APPLICANT — DATE: 2-5-15 — SIGNATURE OF AGENT — DATE

The application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 11 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency The United States knowingly and willfully falsifies, conceals, or covers up by any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statement or entry, shall be fined not more than $10,000 or imprisoned not more than five years, or both.

*U.S. : 1994-520-478/82018

DEPARTMENT OF THE ARMY
NEW ORLEANS DISTRICT, CORPS OF ENGINEERS
P. O. BOX 60267
NEW ORLEANS, LOUISIANA 70160-0267

REPLY TO
ATTENTION OF

MAY 0 8 2015

Regional Planning and
Environmental Division, South
New Orleans Environmental Branch

No known historic properties will be affected by this undertaking. This effect determination could change should new information come to our attention.

Pam Breaux 5-20-15
Pam Breaux Date
State Historic Preservation Officer

Ms. Pam Breaux
State Historic Preservation Officer
Department of Culture, Recreation and Tourism
Office of Cultural Development
P.O. Box 44247
Baton Rouge, Louisiana 70804

Re: Proposed Beneficial Use of Dredged Material project, Plaquemines Parish, Louisiana.

Dear Ms. Breaux:

The U.S. Army Corps of Engineers, New Orleans District (USACE) proposes to place dredged material from the Mississippi River Hopper Dredge Disposal Area (HDDA) to create and rebuild marsh. Five areas for placement are intended, in the proximity of Tiger Pass and Spanish Pass (LCA BUDMAT Project Overview Map).

This area is a part of the Balize Delta formation, and at between approximately 1000 – 500 years old is relatively recent in geologic terms. The HDDA area of the Mississippi River has been previously surveyed for cultural resources (Greene et al. 1984; 22-918), and has seen disturbance by disposal and retrieval processes for many years. The proposed marsh creation areas for this project have not been directly surveyed for cultural resources, but are considered very low potential areas to contain undiscovered cultural resources, because of the recent nature of the land as well as the erosion and subsidence that has been affecting it.

The USACE concludes that no cultural resources survey is necessary for this proposed project, and concludes that no historic properties will be affected. We ask that you provide comments to this conclusion within 30 days. Please contact Dr. Paul Hughbanks at (504) 862-1100 if you have any questions.

Sincerely,

Joan M. Exnicios

Joan M. Exnicios
Chief, Environmental Planning Branch

Enclosure

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southeast Regional Office
263 13th Avenue South
St. Petersburg, Florida 33701-5505
http://sero.nmfs.noaa.gov

January 14, 2016 F/SER46/KC:jk
225/389-0508

Ms. Joan Exnicios, Chief
Environmental Planning and Compliance Branch
New Orleans District, U.S. Army Corps of Engineers
Post Office Box 60267
New Orleans, Louisiana 70160-0267

Dear Ms. Exnicios:

The NOAA's National Marine Fisheries Service (NMFS) has received the unsigned Finding of No Significant Impact (FONSI) and draft Environmental Assessment (EA) titled "**Louisiana Coastal Area, Beneficial Use of Dredged Material Program at Tiger Pass Project, Plaquemines Parish, Louisiana**" (EA#542) transmitted by your letter dated December 18, 2015. The draft EA evaluates the potential impacts associated with the placement and beneficial use of dredged material removed during maintenance dredging of the hopper dredge disposal area located in the Mississippi River in the vicinity of Venice, Louisiana. The proposed action involves restoration of 5,000 feet of historic ridge and construction of 55 acres of marsh platform adjacent to the intersection of Tiger Pass and Spanish Pass in Plaquemines Parish, Louisiana.

The NMFS has reviewed the draft EA and finds impacts to NMFS-trust resources have been adequately described and evaluated. Given the potential beneficial impacts of the proposed use of dredged material to create habitat supportive of marine fishery resources, we support the actions described in the draft document. In addition, NMFS agrees with the determination in the draft EA the impacts to essential fish habitat would be temporary and minimal and in no need of compensatory mitigation. As such, we have no comments to provide on the draft EA and do not object to the completion of the FONSI.

We appreciate the opportunity to review and comment on the draft EA and unsigned FONSI.

Sincerely,

Virginia M. Fay

Virginia M. Fay
Assistant Regional Administrator
Habitat Conservation Division

APPENDIX E
404 (b)(1)

SECTION 404(b)(1) EVALUATION

The following short form 404(b)(1) evaluation follows the format designed by the Office of the Chief of Engineers. As a measure to avoid unnecessary paperwork and to streamline regulation procedures while fulfilling the spirit and intent of environmental statutes, the New Orleans District is using this format for all proposed project elements requiring 404 evaluation, but involving no significant adverse impacts.

PROJECT TITLE. Louisiana Coastal Area Beneficial Use of Dredged Material Program at Tiger Pass Project, Plaquemines parish, Louisiana

PROJECT DESCRIPTION. This ridge and marsh restoration project calls for the restoration of a portion of the historic ridge that ran along the banks of Spanish Pass. The historic ridge has subsided and eroded through time.

This feature would include restoration of a non-continuous ridge approximately 5,000-feet long (approximately 23 acres, or 9.79 AAHUs) constructed to an elevation of +6.5-feet NAVD88 with a 200-foot wide base. The ridge would begin approximately 1.9 miles west of LA Hwy 23 in Venice, LA and continue to the west along the north side of Spanish Pass. (Figure 1) Two gaps would be left in this segment of the ridge at locations where pipeline rights of way have been identified. The earthen ridge would be backed by a 500-foot wide intermediate marsh platform along the north side of the ridge (approximately 58 acres or 25.21 AAHUs) with similar gaps built into the marsh platform to accommodate the existing pipeline rights of way. The placement of dredged material in the ridge and marsh platform areas will be performed in such a manner as to avoid encroachment upon the pipeline rights of way (i.e., through use of retention dikes). The marsh platform would be constructed to a height of +3.5-feet NAVD88 and would be surrounded by a perimeter retention dike. (Figure 2) All elevations listed are considered to be post-construction. It is expected that the marsh platform would settle/dewater to an elevation of +1.5-feet NAVD88 within 1 to 3 years of completion of construction. The retention dikes would also be expected to settle over time and would be allowed to vegetate naturally. If necessary, these retention dikes would be later breached or degraded to the settled elevations of the disposal area by the project's non-federal sponsor.

The construction of this project would require 1,650,000 cubic yards of sandy material. The ridge and marsh platform feature would serve as a means to reduce wave energy on the leeward side of the project. The access right-of-way would be 50-feet wide to allow for dredge pipeline and earth-moving equipment ingress-egress and, with the exception of a small portion, would remain in state-claimed water bottoms. No work areas will be identified in the area of the identified pipeline right of ways. The construction of the ridge would impact 22.95 acres of open water mingled with patches of existing intermediate marsh in the fill footprint and 1.09 acres of intermediate marsh in the access right-of-way.

To transport the dredge material from the HDDA, a cutterhead suction dredge would load hopper barges utilizing a spider barge. The arms of a spider barge are designed to optimize loading characteristics and production efficiency by loading the sediment into the hopper barges via multiple arms which allow for concurrent loading of multiple barges. This also allows for the cutterhead dredge to continue operating without having to shut down while awaiting for the arrival of offloaded barges. Once loaded, the hopper barges would be transported by tugboat to the designated pump-out location in the Mississippi River outside of the navigation channel.

Upon arrival at the designated pump out location, the material would be removed from the hopper barges by an unloader and transported via temporary shore and floating pipeline to the fill placement area via the primary route outlined in Figure 1 as the "Temp Dredge Pipeline Access from Mississippi River". Utilizing the primary route,

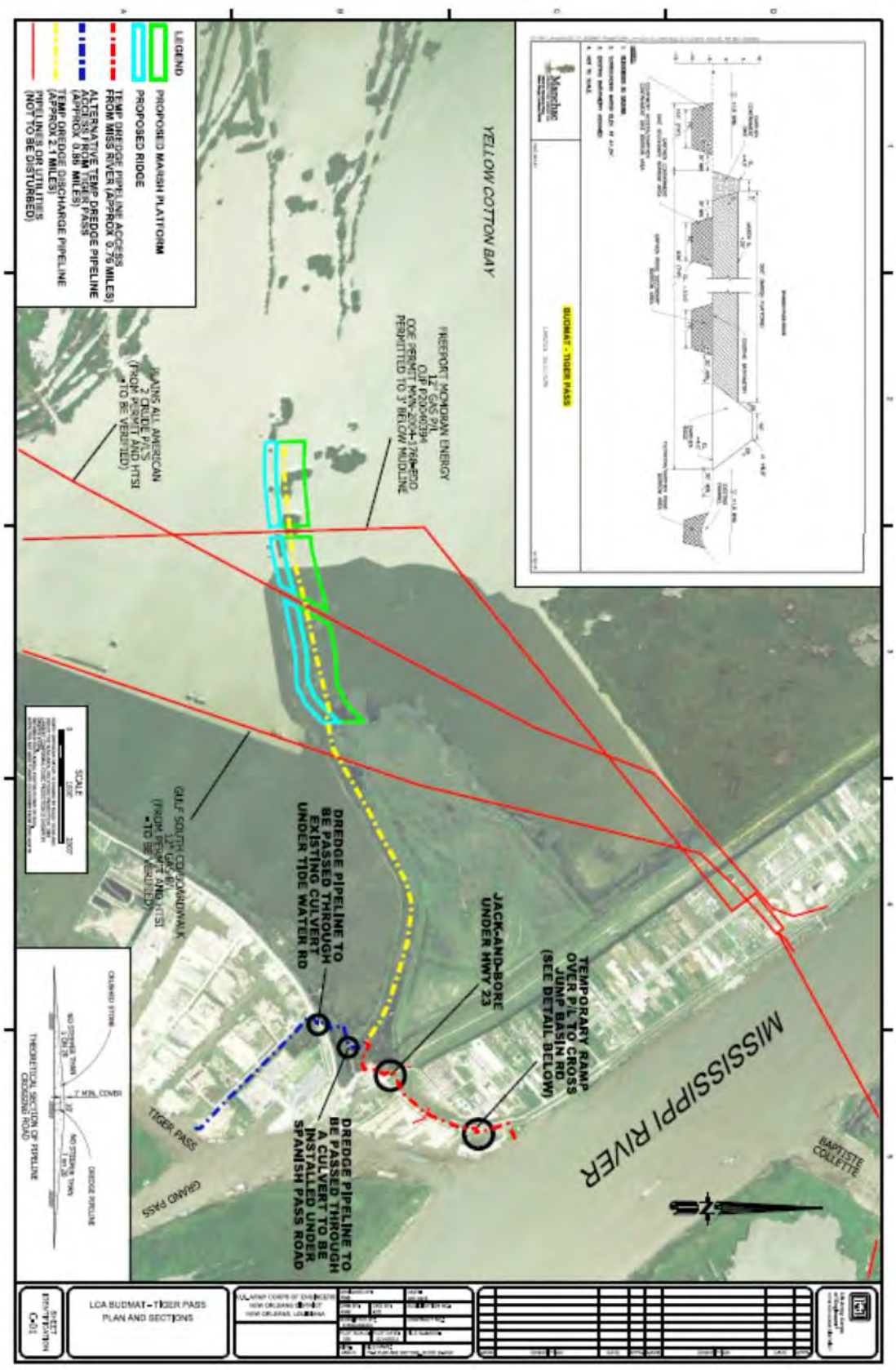
the dredge discharge pipeline would begin at the designated pump out location in the Mississippi River, travel along Corps Road to Jump Basin Road where a temporary ramp would be constructed over the dredge pipeline in order to facilitate traffic. The pipeline would travel through the ramp, which will be constructed along Jump Basin Road and will measure approximately 30 feet in width by approximately 150 feet in length and consist of crushed stone. The pipeline would then travel beneath LA Highway 23, via jack and bore method, to Spanish Pass Road and travel through a culvert to open water. Once in open water, the pipeline would traverse an approximate distance of 1.9 miles to reach the eastern end of the ridge and 2.8 miles to reach the western edge of the ridge. It is not expected that any utilities or pipelines would be impacted along the primary route.

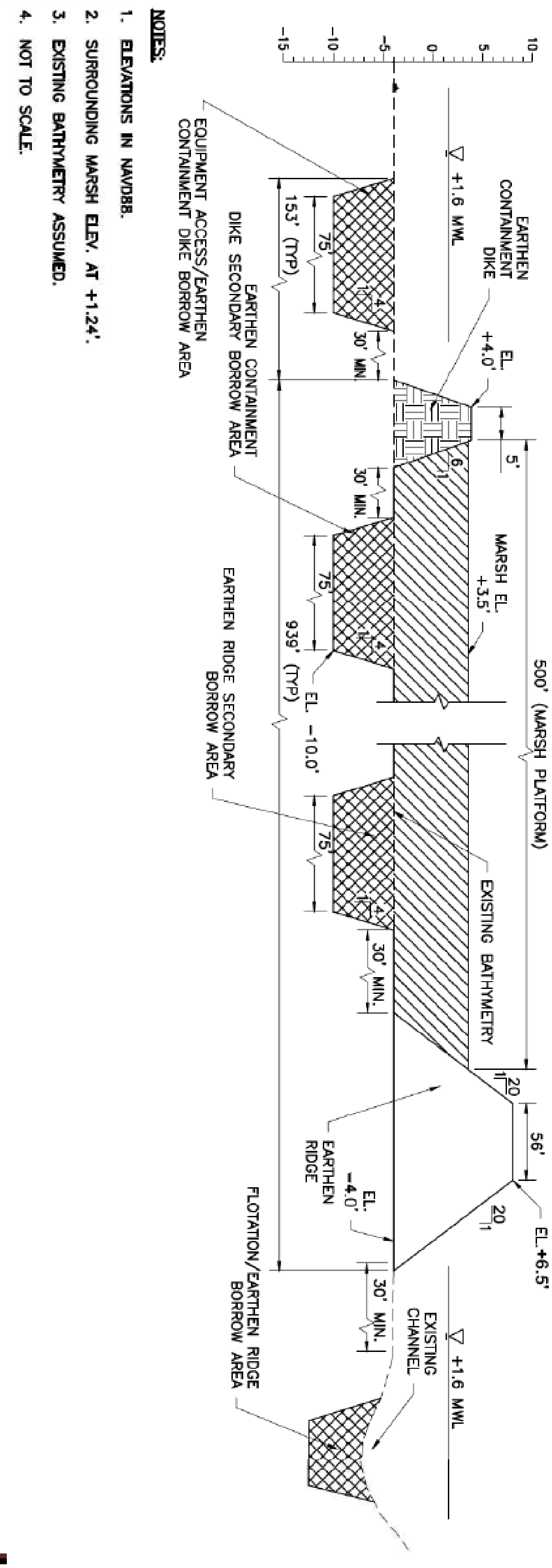
Should the primary route be deemed to be unusable, (e.g., unavoidable impacts to utilities or pipelines), a secondary route has been identified as an alternative material transportation purposes. (See the alternative access route identified on Figure 3 as the "Alternative Temp Dredge Pipeline Access from Tiger Pass".) The secondary route's designated pump out site is located at the end of Haliburton Road, where the roadway meets Tiger Pass. Utilizing the secondary route, the floating pipeline would begin at the designated pump out location at Tiger Pass and travel northwest along Haliburton Road to Tide Water Road. The pipeline would rest within a ditch on the north side of Haliburton Road. Once at the intersection of Tide Water and Haliburton Roads, the pipeline would travel through an existing culvert beneath Tide Water Road to Spanish Pass Road, where it would then pass under Spanish Pass Road through a culvert to be installed under the road and into open water. From Tidewater Road to Spanish Pass Road, a 50 foot wide corridor will be provided for temporary dredge pipeline access. It is not anticipated that any utilities or facilities would be impacted by using the secondary route, however and it is expected that approximately 0.7 acres of intermittent marsh would be impacted. Upon completion of the project, the marsh would be returned to existing conditions.

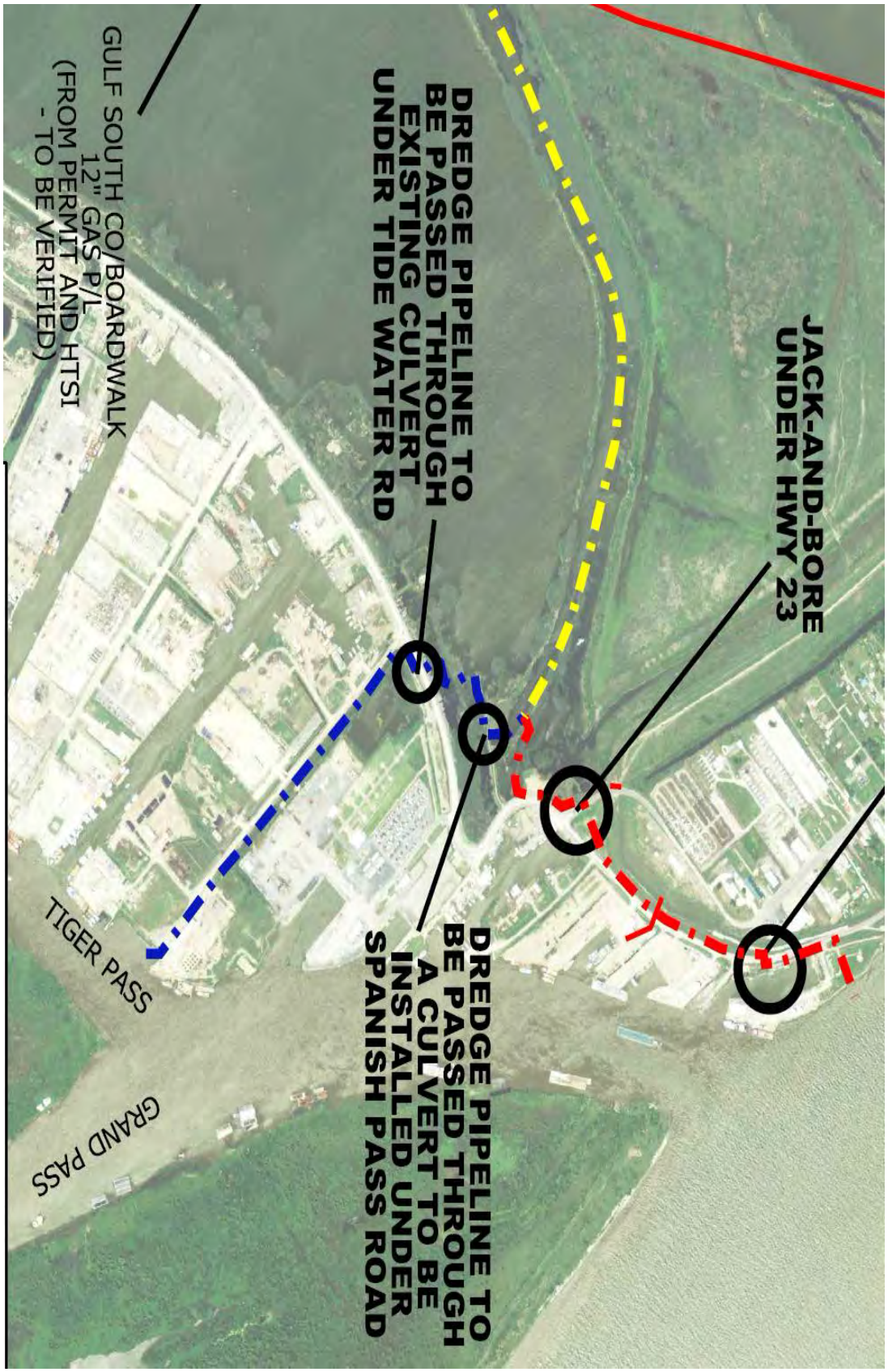
Once the slurry pipeline reaches open water from either access route, the pipeline would continue through existing open water to the project site and along the entire ridge area where it would deliver dredge material to portions of the project area in a manner that will avoid impacting pipeline rights-of-way and utilities passing through the access route and BUDMAT feature. The proposed route would not require the dredge material pipeline to traverse across any levees, federal or otherwise. The construction equipment would access the site primarily through open water bodies in order to minimize damage to existing wetlands, as well as the existing Spanish Pass Road.

Although the O&M Federal Standard limitations would not apply to the LCA BUDMAT project addressed in this report, the final placement of material being pumped through the dredge pipeline would otherwise be handled in a manner similar to the handling of dredged materials for the normal O&M dredging of the navigation project when it disposes of materials in the Delta National Wildlife Refuge. (NWR). This alternative would involve the construction of earthen retention dikes, closures and weirs at each site. These retention features would be required in order to maximize retention of the dredged fill for the development of the wetlands, as well as to prevent the material from entering adjacent lands, waterways, and pipeline rights-of-way. Material necessary for dike, weir, and closure construction would come from within the restoration sites. The perimeter retention dikes would be constructed inside the marsh and to an elevation of +6-feet NAVD88, with 1 on 5 side slopes.

The proposed action itself consists of measures to minimize the adverse effects of storm water erosion and thus requires no separate measures or controls for compliance with CWA Section 402(p) and LAC 33:IX.2341.B.14.j.


LEGEND
PROPOSED MARSH PLATFORM
PROPOSED RIDGE
TEMP DREDGE PIPELINE ACCESS FROM MISS RIVER (APPROX 0.76 MILES)
ALTERNATIVE TEMP DREDGE PIPELINE ACCESS FROM TIGER PASS (APPROX 0.88 MILES)
TEMP DREDGE DISCHARGE PIPELINE (APPROX 2.1 MILES)
PIPELINES OR UTILITIES (NOT TO BE DISTURBED)
YELLOW COTTON BAY
FREEPORT MCMORAN ENERGY 12" GAS P/L CUP P2004394 COE PERMIT MVN-2004-1768-EDO PERMITTED TO 3' BELOW MUDLINE
PLAINS ALL AMERICAN 2 CRUDE P/L'S (FROM PERMIT AND HTSI - TO BE VERIFIED)
GULF SOUTH CORP 24" GAS P/L (FROM PERMIT AND HTSI - TO BE VERIFIED)
DREDGE PIPELINE TO BE PASSED THROUGH EXISTING CULVERT UNDER TIDE WATER RD
JACK-AND-BORE UNDER HWY 23
TEMPORARY RAMP OVER P/L TO CROSS JUMP BASIN RD (SEE DETAIL BELOW)
DREDGE PIPELINE TO BE PASSED THROUGH A CULVERT TO BE INSTALLED UNDER SPANISH PASS ROAD
MISSISSIPPI RIVER
TIGER PASS
GRAND PASS
BAPTISTE COLLETTE
SCALE
LCA BUDMAT - TIGER PASS PLAN AND SECTIONS
SHEET IDENTIFICATION C-01


10
5
0
-5
-10
-15
+1.6 MWL
EARTHEN CONTAINMENT DIKE
EL. +4.0'
5'
6
1
4
1
500' (MARSH PLATFORM)
MARSH EL. +3.5'
EXISTING BATHYMETRY
20
1
56'
20
1
EL. +6.5'
153' (TYP)
75'
30' MIN.
30' MIN.
75'
939' (TYP)
EL. -10.0'
75'
30' MIN.
EL. -4.0'
EARTHEN RIDGE
30' MIN.
EXISTING CHANNEL
+1.6 MWL
EQUIPMENT ACCESS/EARTHEN CONTAINMENT DIKE BORROW AREA
EARTHEN CONTAINMENT DIKE SECONDARY BORROW AREA
EARTHEN RIDGE SECONDARY BORROW AREA
FLOTATION/EARTHEN RIDGE BORROW AREA
NOTES:
1. ELEVATIONS IN NAVD88.
2. SURROUNDING MARSH ELEV. AT +1.24'.
3. EXISTING BATHYMETRY ASSUMED.
4. NOT TO SCALE.


JACK-AND-BORE
UNDER HWY 23
DREDGE PIPELINE TO
BE PASSED THROUGH
EXISTING CULVERT
UNDER TIDE WATER RD
DREDGE PIPELINE TO
BE PASSED THROUGH
A CULVERT TO BE
INSTALLED UNDER
SPANISH PASS ROAD
GULF SOUTH CO/BOARDWALK
12" GAS P/L
(FROM PERMIT AND HTSI
- TO BE VERIFIED)
TIGER PASS
GRAND PASS

1. Review of Compliance (230.10 (a)	Preliminary[1]		Final[2]	
A review of this project indicates that:				
a. The discharge represents the least environmentally damaging practicable alternative and if in a special aquatic site, the activity associated with the discharge must have direct access or proximity to,	YES	NO*	YES	NO
b. The activity does not appear to: (1) violate applicable state water quality standards or effluent standards prohibited under Section 307 of the Clean Water Act; (2) jeopardize the existence of Federally listed endangered or threatened species or their	YES	NO*	YES	NO
c. The activity will not cause or contribute to significant degradation of waters of the United States including adverse effects on human health, life stages	YES	NO*	YES	NO
d. Appropriate and practicable steps have been taken to minimize potential adverse impacts of the discharge on the aquatic ecosystem (if no, see section	YES	NO*	YES	NO

2. Technical Evaluation Factors (Subparts C-F).	N/A	Not Significant	Significant*
a. Physical and Chemical Characteristics of the Aquatic Ecosystem (Subpart C).			
(2) Suspended particulates/turbidity impacts.			X
(3) Water column impacts.		X	
(4) Alteration of current patterns and water		X	
(5) Alteration of normal water fluctuations/			X
			X
(3) Effect on other wildlife (mammals, birds,			
		X	
(5) Effects on parks, national and historical			
	X		

Remarks. Where a check is placed under the significant category, preparer has attached explanation.

* See attached memo

3. Evaluation of Dredged or Fill Material (Subpart G).[3]

a. The following information has been considered in evaluating the biological availability of possible contaminants in dredged or fill material.

(3) Results from previous testing of the material or similar material in the

(4) Known, significant sources of persistent pesticides from land runoff or

(5) Spill records for petroleum products or designated (Section 311 of CWA)

(6) Other public records of significant introduction of contaminants from industries, municipalities,

(7) Known existence of substantial material deposits of substances which could

Appropriate references:

1. Environmental Regulatory Code, Part IX. Water Quality Regulation, Louisiana Department of Environmental Quality, 1994, 3rrd Edition.

2. State of Louisiana Water Quality Management Plan, Volume 5, Part B – Water Quality Inventory, Louisiana Department of Environmental Quality, Office of Water Resources, 1994.

3. Louisiana DEQ, Chapter 11 Surface Water Quality Standards, May 2007: http://www.deq.louisiana.gov/portal/LinkClick.aspx?link=planning%2fregs%2ftitle33%2f33v09.pdf&tabid=1674

4. Louisiana Department of Environmental Quality. 2015. *2014 Louisiana Water Quality Inventory: Integrated Report*. http://www.deq.louisiana.gov/portal/DIVISIONS/WaterPermits/WaterQualityStandardsAssessment/WaterQualityInventorySection305b/2014IntegratedReport.aspx. Last accessed on September 4, 2015

5. US Coast Guard, National Response Center: www.nrc.uscg.mil/index.htm

6. US EPA, CERCLIS Database of Hazardous Waste Sites: www.epa.gov/superfund/sites/cursites/index.htm

7. US EPA, EnviroMapper StoreFront: http://www.epa.gov/enviro/html/em/index.html

8. US EPA, National Recommended Water Quality Criteria, 2006: http://epa.gov/waterscience/criteria/wqcriteria.html

9. US EPA, Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material, July 2004: http://www.epa.gov/owow/wetlands/pdf/40cfrPart230.pdf

3. Evaluation of Dredged or Fill Material (Subpart G).[3]

b. An evaluation of the appropriate information in 3a above indicates that there is reason to believe the proposed dredge or fill material is not a carrier of contaminants, or the material meets the testing exclusion criteria.

YES	NO

4. Disposal Site Delineation (§230.11(f)).

a. The following factors, as appropriate, have been considered in evaluating the disposal site.

(7) Dredged material characteristics (constituents, amount, and type of

Appropriate references:

Same as 3(a)

b. An evaluation of the appropriate factors in 4a above indicates that the disposal site and/or size of mixing zone are acceptable.

YES	NO*

5. Actions to Minimize Adverse Effects (Subpart H).

All appropriate and practicable steps have been taken, through application of the recommendations of §230.70-230.77 to ensure minimal adverse effects of the proposed discharge.

YES	NO*

Actions taken:

6. Factual Determination (ɔ230.11).

A review of appropriate information as identified in items 2-5 above indicates that there is minimal potential for short- or long-term (adverse) environmental effects of the proposed discharge as related to:

a. Physical substrate at the disposal site (review sections 2a, 3, 4, and 5 above). ☐

b. Water circulation, fluctuation and salinity (review sections 2a, 3, 4, and 5). ☐

c. Suspended particulates/turbidity (review sections 2a, 3, 4, and 5) ☐

☐

e. Aquatic ecosystem structure and function (review sections 2b and c, 3, and 5). ☐

☐

☐

☐

*A negative, significant, or unknown response indicates that the proposed project may not be in compliance with the Section 404(b)(1) Guidelines.

[1]Negative responses to three or more of the compliance criteria at this stage indicates that the proposed project may not be evaluated using this "short form procedure". Care should be used in assessing pertinent portions of the technical information of items 2a-d, before completing the final review of compliance.

[2]Negative responses to one of the compliance criteria at this stage indicates that the proposed project does not comply with the guidelines. If the economics of navigation and anchorage of Section 404(b)(2) are to be evaluated in the decision-making process, the "short form" evaluation process is inappropriate.

[3]If the dredged or fill material cannot be excluded from individual testing, the "short form" evaluation process is inappropriate.

7. Evaluation Responsibility.

Evaluation prepared by: Lindsey Foster

Position: Student Environmental Engineer

Date: 09/15/2015

Evaluation reviewed by: Danielle Washington and Ron Taylor

Position: Hydraulic Engineers

Date: 09/16/2015

8. Findings.

a. The proposed disposal site for discharge of dredged or fill material complies with the Section 404(b)(1) guidelines ..... _____

b. The proposed disposal site for discharge of dredged or fill material complies with the Section 404(b)(1) guidelines with the inclusion of the following conditions ..... _____

c. The proposed disposal site for discharge of dredged or fill material does not comply with the Section 404(b)(1) guidelines for the following reason(s):

(1) There is a less damaging practicable alternative ..... _____

(2) The proposed discharge will result in significant degradation of the aquatic ecosystem ..... _____

(3) The proposed discharge does not include all practicable and appropriate measures to minimize potential harm to the aquatic ecosystem ..... _____

_____ _____

Date

Joan M. Exnicios

Chief, Environmental Planning Branch

US Army Corps of Engineers,

New Orleans District

To: File

From: Lindsey Foster, CEMVN-ED-H

CC:

Date: 15 September 2015

Re: LCA BUDMAT – Spanish Pass Ridge Restoration Project Alternative

Historic water and sediment quality data from Spanish Pass and surrounding areas were used to make factual determinations for the subject actions. The following summarizes the review process and comments noted:

I. Subpart B – Review of Compliance

a. *230.10 (b) (1)*: After consideration of disposal site dilution and dispersion, there are no expected violations of State water quality from the proposed Federal actions.

II. Subpart C – Physical and Chemical Characteristics of the Aquatic Ecosystem

a. *230.20 - Substrate Impacts*: The material obtained for the Spanish Pass Ridge Restoration will come from the HDDA maintenance dredging. The material will be pumped to the project site then shaped using conventional land-based construction equipment (dozers, front end loaders, excavators, etc.) to form the final ridge and marsh templates. The project will convert approximately 23 acres of open water to earthen ridge and 55 acres to marsh platform by altering the substrate elevation. Therefore, significant changes in water circulation, depth, and current pattern are expected.

The benthic community will also change from shallow open water benthic organisms to marshland benthic organisms. The borrow for this action will be composed of mostly sandy material, and therefore should not contribute to the toxicity of benthic organisms in the project area.

b. *230.21 – Suspended Particulates/Turbidity Impacts*: The creation of the ridge and marsh template will cause a temporary increase in suspended particles and turbidity. This may result in the elevation of oxygen demand and dissolved solids, lower the rate of photosynthesis, raise water temperature, or increase the

biological availability of constituents in the water column and substrate. However, no significant long-term suspended particulates/turbidity impacts are expected due to the placement of dredged material in the mitigation area. Retention dikes will be used to minimize the possibility of significant impacts outside of the project area.

c. *230.22 – Water Column Impacts*: Physical and chemical factors associated with dredging, placement of dredged material, and construction would be expected to cause a temporary reduction in pH. These pH variations would be minor and short-lived. Therefore, no impacts to the water column are expected.

d. *230.23 – Alteration of Current Patterns and Water Circulation*: The creation of the ridge and marsh platform using dredged material is expected to alter the substrate elevation, which would result in changes in water circulation and current pattern. As a result, changes in: location, structure, and dynamics of aquatic communities; substrate erosion and deposition rates; the deposition of suspended particulates; and the rate and extent of mixing of dissolved and suspended components of the water body are expected. These alterations are desired, and are considered to be beneficial effects of wetland restoration.

e. *230.24 – Alteration of Normal Water Fluctuations/Hydroperiod*: The creation of the Spanish Pass Ridge and marsh platform using dredged material is expected to alter the substrate elevation, which would result in changes in water fluctuation. However, the impacts will restore the area to historically normal water fluctuations/hydroperiod that existed before erosion of the historic ridge that occurred due to subsidence and erosion after being cut off from the Mississippi River by levees.

f. *230.25 – Alteration of Salinity Gradients:* No significant alteration of salinity gradients is expected due to the proposed project because of the location of the project features.

Subpart F – Human Use Characteristics

a. *230.50 – Effects on Municipal and Private Water Supplies*: **N/A**

III. Subpart G – Evaluation of Dredged or Fill Material

a. *230.61 (a) – Considerations in Evaluating the Biological Availability of Possible Contaminants in Dredged or Fill Material:* Research of environmental records and spills lists did not return any results for possible contaminants in the dredged and fill materials of the HDDA. Also, the majority of the dredge material will be sand, which has a low probability of containing chemical, biological, and other pollutants. Therefore, the dredge material is expected to be free of contaminants.

Appropriate references: See VIII below

b. An evaluation of the appropriate information in VI(a) above indicates that there is reason to believe the proposed dredge or fill material is not a carrier of contaminants, or the material meets the testing exclusion criteria: **YES**

IV. Disposal Site Delineation

a. 230.11 (f) – Considerations in Evaluating the Disposal Site: Retention dikes will be utilized for the Spanish Pass Restoration Project to allow the sediment to settle and prevent erosion during construction of the ridge and marsh platform.

b. An evaluation of the appropriate factors in V(a) above indicates that the disposal site and/or size of mixing zone are acceptable: **YES**

V. Subpart H - Actions to Minimize Adverse Effects

All appropriate and practicable steps have been taken, through application of the recommendations of *230.70 – 230.77* to ensure minimal adverse effects of the proposed discharge: **YES**

Factual Determinations

A review of appropriate information as identified in items I - VI above indicates that there is minimal potential for short- or long-term environmental effects of the proposed discharge:

a. Physical substrate at the disposal site (review sections II, IV, V, and VI above): **NO**

b. Water circulation, fluctuation and salinity (review sections II, IV, V, and VI): **NO**

c. Suspended particulates (review sections II, IV, V, and VI): **YES**

d. Contaminant availability (review sections II, IV, and V): **YES**

VIII. References

a. Environmental Regulatory Code, Part IX. Water Quality Regulation, Louisiana Department of Environmental Quality, 1994, 3rd Edition.

b. State of Louisiana Water Quality Management Plan, Volume 5, Part B – Water Quality Inventory, Louisiana Department of Environmental Quality, Office of Water Resources, 1994.

c. Louisiana DEQ, Chapter 11 Surface Water Quality Standards, May 2007: http://www.deq.louisiana.gov/portal/LinkClick.aspx?link=planning%2fregs%2ftitle33%2f33v09.pdf&tabid=1674

d. Louisiana Department of Environmental Quality. 2015. 2014 Louisiana Water Quality Inventory: Integrated Report. http://www.deq.louisiana.gov/portal/DIVISIONS/WaterPermits/WaterQualityStandardsAssessment/WaterQualityInventorySection305b/2014IntegratedReport.aspx. Last accessed on September 4, 2015

e. US Coast Guard, National Response Center: www.nrc.uscg.mil/index.htm

f. US EPA, CERCLIS Database of Hazardous Waste Sites: www.epa.gov/superfund/sites/cursites/index.htm

g. US EPA, EnviroMapper StoreFront: http://www.epa.gov/enviro/html/em/index.html

h. US EPA, National Recommended Water Quality Criteria, 2006: http://epa.gov/waterscience/criteria/wqcriteria.html

i. US EPA, Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material, July 2004: http://www.epa.gov/owow/wetlands/pdf/40cfrPart230.pdf

APPENDIX F
Monitoring and Adaptive Management

1.1 Monitoring and Adaptive Management

Section 2039 of the Water Resources Development Act (WRDA) of 2007 and Implementation guidance for Section 2039, in the form of a CECW-PB Memorandum dated 31 August 2009, require ecosystem restoration projects develop a plan for monitoring the success of the ecosystem restoration and develop an Adaptive Management Plan (contingency plan) should the project monitoring show that the project is not performing as expected. The required elements include:

- Nature, duration, and periodicity of monitoring, analysis, costs, and responsibilities
- Scope and duration should include the minimum monitoring actions necessary to evaluate success.
- An evaluation of predicted outcomes compared to actual results to determine success
- Monitoring plan has been reviewed during Agency Technical Review (ATR)
- Monitoring will be continued until "ecological success" is documented by the USACE in consultation with the local sponsor
- Monitoring can end sooner than 10 years if success is determined
- Necessary monitoring for a period not to exceed 10 years will be considered a project cost and will be cost shared as a project construction cost and funded under Construction
- Financial and implementation responsibilities for the monitoring plan will be identified in the Project Partnership Agreement
- The developed Adaptive management plan must be appropriately scoped to project scale
- The rationale and cost of AM and anticipated adjustments will be reviewed as part of the decision document
- Significant changes needed to achieve ecological success that can't be addressed through operational changes or the AM plan may be examined under other authorities
- Costly AM plans may lead to re-evaluation of the project

1.2 Restoration Objectives and Performance Criteria

The objective of this project is to restore the natural coastal landscape through creation of ridge and marsh habitat along the historic Spanish Pass Ridge. Ecological Success will be indicated by a positive gain in upland ridge and marsh habitat acreage post construction.

1.3 Data Collection

Monitoring will be conducted to ensure project designs were correctly implemented and to evaluate project effectiveness and ecological success. This monitoring plan will be implemented by the USACE, the non-federal sponsor or their contractor and will be cost shared. The monitoring plan activities may be modified over time based on management needs for this Project and in coordination with the USACE and the non-federal sponsor, and as needed to determine ecological success. Data collection will begin with pre-construction and will continue post-construction until ecological success is realized as measured by the success criteria.

Proposed parameters include:

- Aerial Photography Collection & Analysis- Data will be collected by the USACE Beneficial Use Monitoring Program (or BUMP) aerial photography taken annually as part of the New Orleans District (CEMVN) Federal navigation channel operation and maintenance program. The BUMP

program monitors land gain or loss for those navigation projects where dredged material is used beneficially. Total land losses or gains would be reported in acres.

- Frequency- Annually before and after construction
- Reporting- BUMP aerial photography is typically acquired in November or December of each calendar year and is available by March or April of the following year. The digital photography is geo-referenced into a suitable format for the use in GIS from which land loss or gain can be calculated. Brief reports based on land loss or gain data using BUMP aerial photography should be released annually prior to 1 June of each calendar year.

- Physical Elevation Surveys- Surveys of the Project site should be carried out pre- and post-construction of this project. Elevation, Bathymetric and As Built Surveys will be conducted by the USACE and/or the local Sponsor (or their designees) before and after construction and will be used to calculate benefits (land acres created) attributed to this project.
  - Frequency- Before and after construction/as built
  - Reporting- From the survey, a brief report describing the land gain or land loss since will be developed. Total land losses or gains would be reported in acres.

- Field surveys – Site visits will be conducted post construction for *in situ* verification of ridge and marsh settlement, vegetative recruitment, and constructed land loss or gain. Field surveys will be conducted by the USACE or the local Sponsor (or their designees)
  - Frequency- Post construction after the initial settlement period

- Data from other projects or programs will be leveraged and used when possible
  - Coastwide Reference Monitoring System (CRMS) Program
    - Annual data from CRMS2608 and CRMS0163 can be used to report on the seasonal variations of salinity, water quality, tide, etc., in the general vicinity of the project area.
    - Annually coastwide aerial imagery is collected that covers this Project area is conducted.
    - Annually land water analysis is conducted for the hydrologic using satellite imagery

1.4 Reporting

Annually all applicable and available data will be compiled, assessed, summarized and archived. The USACE Environmental Management and the non-federal sponsor or its designee will document each of the performed assessments and communicate the results of its deliberations to the managers and decision-makers for the Project. An Annual Project Report will be developed by September 31 of each year to measure project performance against the stated success criteria, make recommendations for decisions and path forward and document lessons learned based on assessment results. Data reporting will continue until ecological success has been documented.

The annual reports will compile lessons learned, best practices and experiences relevant to implementation and beneficial use of dredged material for restoration, technical and organizational challenges, and monitoring and adaptive management approaches. Lessons and experiences will be clearly documented with recommendations so that they can be easily applied to future projects. Documenting the lessons learned ultimately aims to reduce recurring, technical or programmatic issues that negatively impact cost, schedule, restoration project performance and success.

1.5 Adaptive Management

The following questions were considered to determine if adaptive management should be applied:

1) Are the ecosystems to be restored sufficiently understood in terms of hydrology and ecology, and can project outcomes be accurately predicted given recognized natural and anthropogenic stressors?

2) Can the most effective Project design to achieve Project goals and objectives be readily identified?

3) Are the measures of this restoration Project's performance well understood and agreed upon by all parties?

4) Can Project management actions be adjusted in relation to monitoring results?

It was determined that the response to Questions 1 through 3 was "yes" and that the response to Question 4 was "no". These responses determined that the Project is not a candidate that could benefit from adaptive management. The CEMVN has been carrying out beneficial use of dredged material within the geographic boundaries of the New Orleans District for a number of years. In particular, the beneficial use of dredged material in the Delta region of the Mississippi River has been used as a part of the ordinary maintenance of the authorized Baton Rouge to the Gulf of Mexico navigation project in the vicinity of Venice, Louisiana, but only to the extent authorized by the application of the requisite Federal Standard. For the maintenance of an authorized Federal navigation project, beneficial use of dredged material is limited to the area defined by the Federal Standard – that is, the least costly, environmentally compliant placement of dredged material that meets sound engineering practices. For the maintenance of this portion of the authorized navigation project, depending on the location, material is stacked to various elevations in open water behind existing banklines of the Mississippi River and other outlets in the Mississippi River Delta. All parties (CEMVN, PPG, USFWS, etc.) are in agreement with the intended consequences of this Project.

There is no opportunity to adjust the Project once it has been completed. Therefore it was determined that, the Project is not a good candidate for adaptive management because there are no actions that could be taken in response to monitoring results for the purposes of adaptive management as it would relate to the intent of the LCA BUDMAT program. Although some activities could be conducted to adjust Project performance, those actions would have to be part of a separate ecosystem restoration or beneficial use of dredged material project.

Although there is no opportunity for AM, the BUDMAT program will document lessons learned and provide information and or recommendations to future projects or similar programs. Monitoring results from the Project will help refine modeling, design, and predictions of physical and ecological processes that will in turn inform design of future restoration and beneficial use projects.

1.5.1 Costs

Aerial Photography Collection & Analysis	No additional cost. Study area covered by the existing annual BUMP collections
Elevation Surveys	No additional cost. These surveys are

	already being conducted under the Construction contract and or Engineering design.
Field Surveys	No additional cost. These surveys are already being conducted under the Construction contract and or Engineering design.
CRMS Data Collection	No additional cost.
Adaptive Management	N/A
Management/Evaluation/Assessment/Decision Making/Report/Data Management	$10,000 annually