US Army Corps of Engineers

Draft Integrated Design and Implementation Report and Supplement Environmental Assessment #542.B

Louisiana Coastal Area Beneficial Use of Dredged Material Program At Tiger Pass 2 Project Plaquemines Parish, Louisiana

May 2018

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1.0 Introduction

The United States Army Corps of Engineers (USACE), New Orleans District (CEMVN) has prepared this draft Integrated Design and Implementation Report and Supplemental Environmental Assessment #542.B (DIR/SEA) to evaluate the proposed action for the Louisiana Coastal Area (LCA), Beneficial Use of Dredged Material (BUDMAT) Program at Tiger Pass 2 Project, Plaquemines Parish, Louisiana (the Project). The preparation of an integrated document is consistent with 40 CFR 1506.7, which provides that any environmental document in compliance with the National Environmental Policy Act of 1969 (NEPA) (42 U.S.C. 4321 et seq.) may be combined with any other agency document.

The Tiger Pass 2 Project would be implemented as part of the LCA BUDMAT Program (Program). CEMVN evaluated the beneficial use of dredged material removed from routine maintenance dredging activities (O&M) of three Federally-authorized navigation channels and the associated use and dredging of the Hopper Dredge Disposal Area (HDDA) in the Mississippi River Bird's Foot Delta (Figure 1). The three navigation channels evaluated were the Mississippi River Outlets at Venice: Baptiste Collette Bayou and Grand-Tiger Passes; and a portion of the Mississippi River Ship Channel (MRSC) (Figure 2). The HDDA is a designated disposal area for material dredged between river mile 10, above Head of Passes (AHP, river mile 0), and river mile 11, below Head of Passes (BHP, river mile 0) (Figure 3). This dredging area is a portion of Southwest Pass. The HDDA must be routinely dredged to make room for additional material dredged during O&M of the MRSC. Dredged material would be used beneficially to restore significantly degraded or lost coastal habitat features in and in the vicinity of the Bird's Foot Delta. A similar project, the LCA BUDMAT at Tiger Pass Project, was evaluated in EA #542 and SEA #542.A, which are incorporated herein by reference. Construction of the initial LCA BUDMAT at Tiger Pass Project has been completed (Figure 4 and Figure 5).

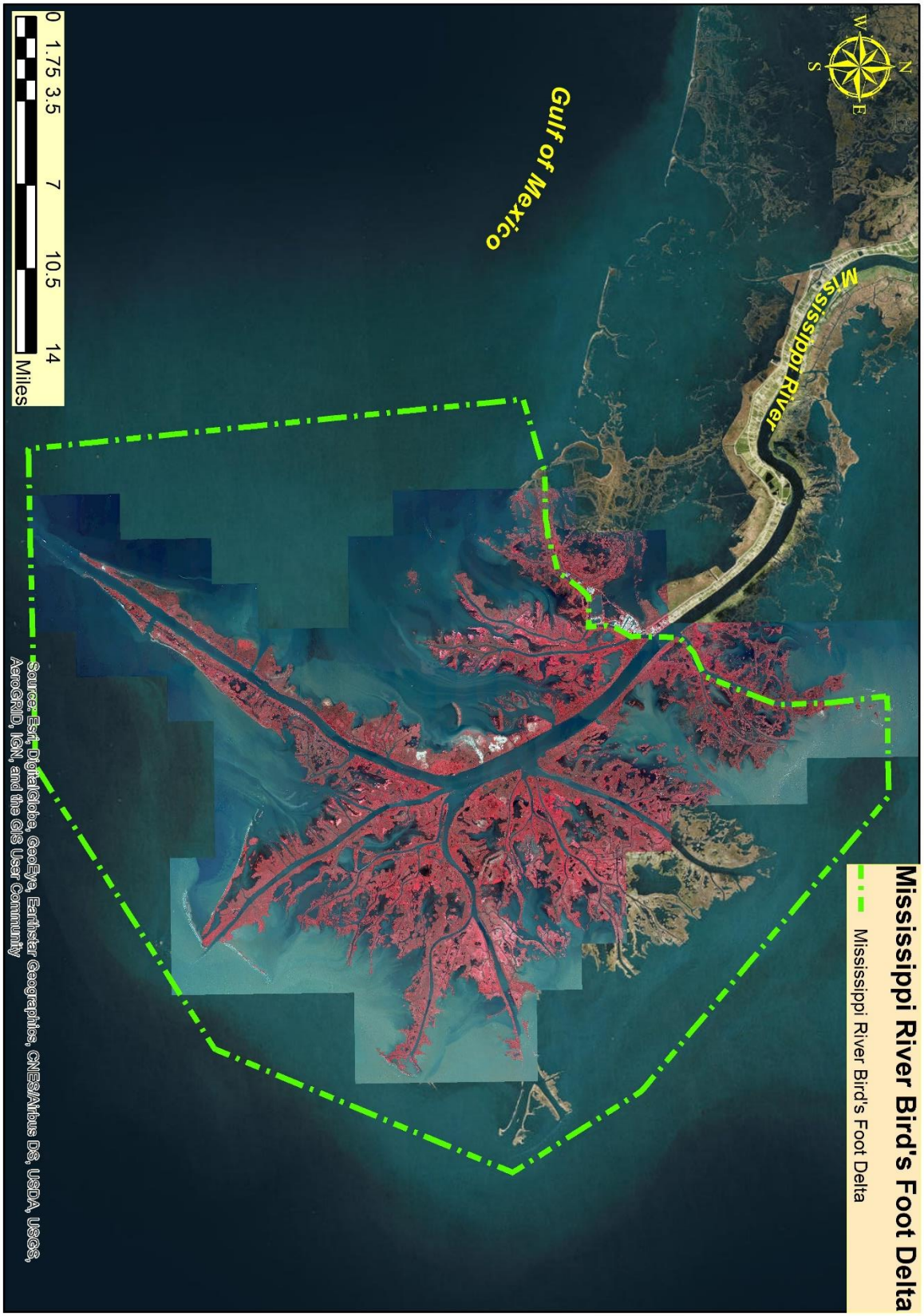

Figure 1. Mississippi River Bird's Foot Delta.

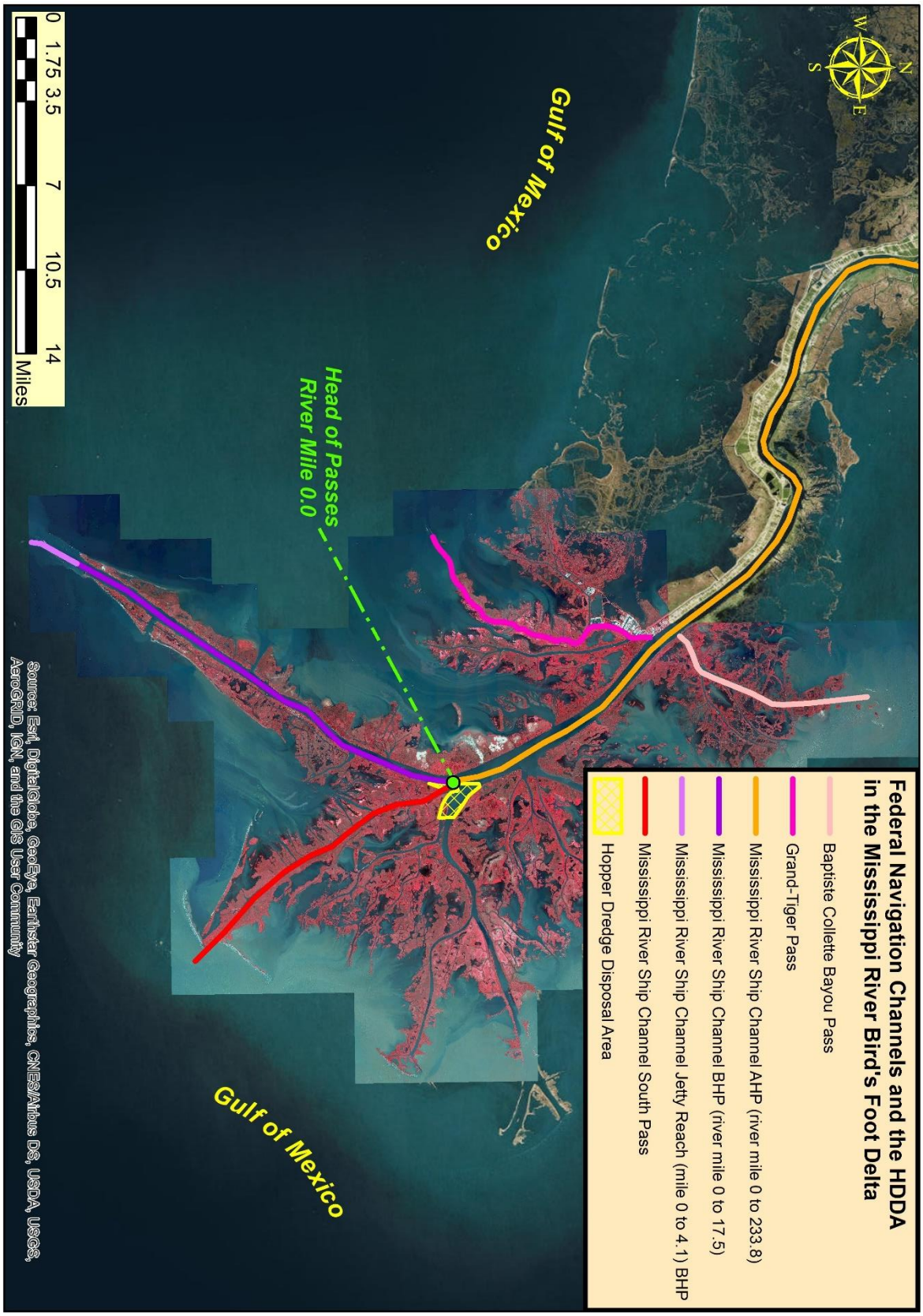

Figure 2. Federal Navigation Channels and the HDDA in the Bird's Foot Delta.

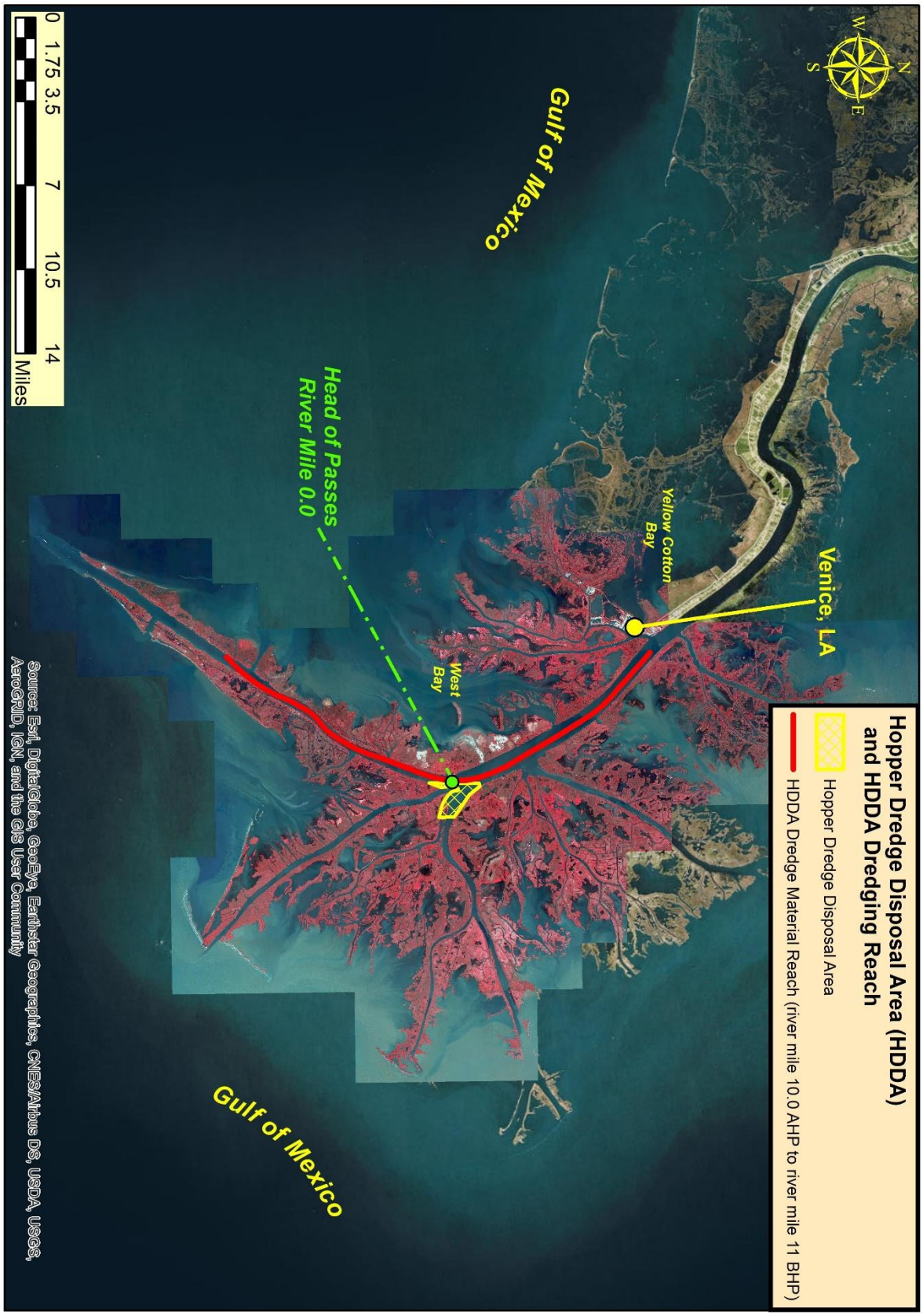

Figure 3. HDDA and HDDA Dredging Reach

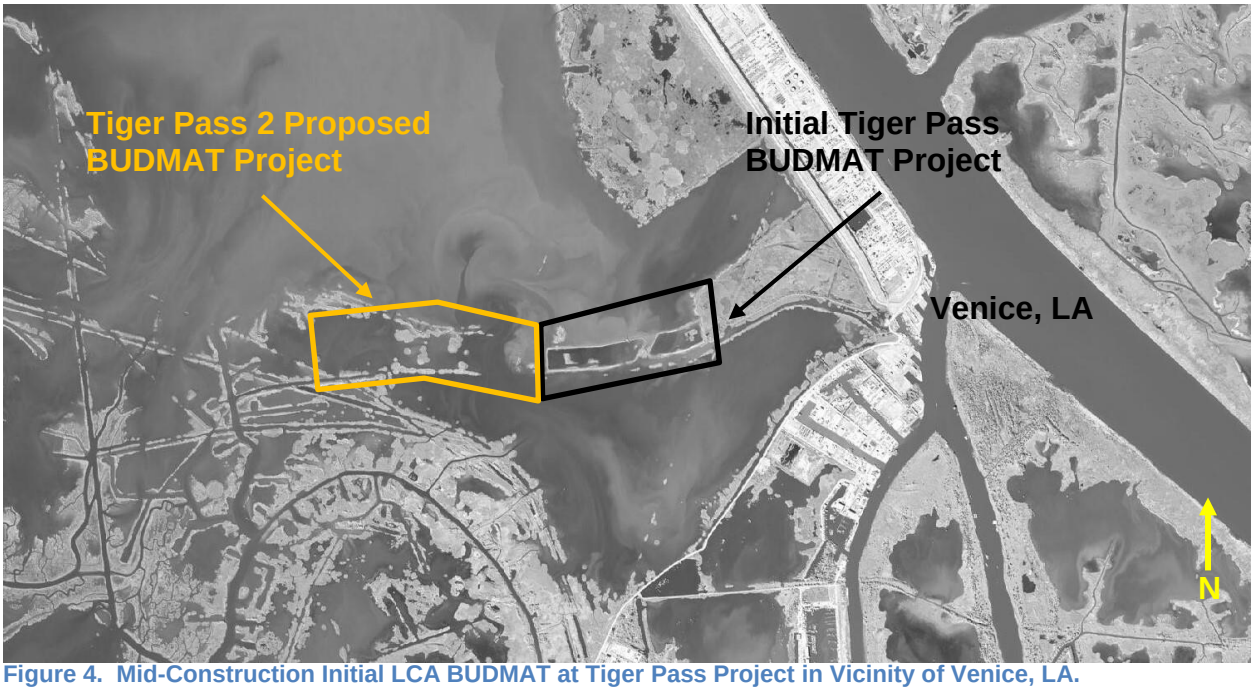

Figure 4. Mid-Construction Initial LCA BUDMAT at Tiger Pass Project in Vicinity of Venice, LA.

Figure 5. Late Stage Construction of Initial LCA BUDMAT at Tiger Pass Project in Vicinity of Venice, LA.

The objective of ecosystem restoration is to restore degraded ecosystem structure, function, and dynamic processes to a less degraded, more natural condition. However, partial restoration may also be possible, with significant and valuable improvements made to degraded ecological resources. The needs for improving or re-establishing both the structural components and the functions of the natural area should be examined. Under the Program this objective is met by restoring (or partially restoring) degraded distributary ridges, marsh habitat, or both if possible, of coastal Louisiana through beneficial use of material dredged from Federal navigation channels to restore or preserve critical geomorphic features and stall future land loss. This would be measured through the establishment of a variety of native plants and animals in the study area (see Section 2.0).

Alternative plans for individual Program projects are developed with the level of detail necessary to select a justified, acceptable, and implementable plan that is consistent and in compliance with applicable law and policy and meets the goals and objectives of the Tiger Pass 2 Project. The description of the evaluation of the alternative plans in this draft integrated DIR/SEA demonstrates the four evaluation criteria of acceptability, completeness, effectiveness, and efficiency specified in Paragraph 1.6.2(c) of the 1983 *Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies* (1983 P&G).

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 formulation of the proposed action. The Project Delivery Teams (PDT) relied on existing data for other USACE projects that are located within the study area to expedite the completion of this draft Integrated DIR/SEA. The appropriate National Ecosystem Restoration (NER) benefits were used and appropriate environmental considerations were taken into account by the Project Delivery Team (PDT) in formulating the proposed action (See Section 3.0).

The proposed project is to restore ridge and marsh habitat approximately 2.5 miles west of Louisiana Highway 23 (LA Hwy 23) in Venice, LA (Figure 11), adjacent to the existing ridge and marsh restoration site constructed as part of the initial Tiger Pass Project, and the remnant Spanish Pass distributary. Construction of the Project would be implemented using materials dredged from the HDDA in association with the routine O&M of river mile 10 above Head of Passes (AHP) to river mile 11 below Head of Passes (BHP) of the MRSC[1].

[1] The Mississippi River Ship Channel, Baton Rouge to the Gulf of Mexico, Louisiana project is authorized under the Rivers and Harbors Act of 1945 Public Law No. 79-14; Rivers and Harbors Act and 1962, Public Law No. 87-874; the Supplemental Appropriations Act of 1985, Public Law No. 99-88; and the Water Resources Development Act of 1986, Public Law No. 99-662, as amended.

The construction of this Project would use as much as 2,000,000 cubic yards (CY) of silty sandy material that would be obtained during dredging of the HDDA located at the Head of Passes. Dredged material removed from the HDDA is typically placed within Federal Standard[2] sites which are located a) along the right descending bank of the Mississippi River and within West Bay for marsh restoration, and/or b) within the Delta National Wildlife Refuge (NWR), and/or c) the Pass A Loutre Wildlife Management Area (WMA), the latter of which are both located along the left descending bank of the Mississippi River at Head of Passes. Rather than being placed within the Federal Standard sites, the dredged material would be transported to Spanish Pass and would be used to extend the initial ridge and marsh platform constructed as part of the initial LCA BUDMAT Tiger Pass Project an additional 8,700 feet westward. Due to existing pipelines at the site, the platform constructed by the Project would be non-continuous. The gaps to accommodate pipelines comprise approximately 1,900 linear feet of the ridge footprint, and the Project will restore approximately 6,800 linear feet of ridge. The new ridge and marsh platform would mimic the design used for the initial Tiger Pass Project. Ingress and egress of construction personnel and some equipment to the project site would be allowed via Spanish Pass, beginning at Spanish Pass road off of La Hwy 23, at a previously cleared staging area.

In addition to the original pipeline route utilized in the initial Tiger Pass Project, an alternate access corridor is available for the discharge pipeline. Discharge pipeline in this report refers to temporary pipeline used to transport dredged material from a source located in a Federal navigation channel or Federally designated disposal area (i.e., HDDA) to a particular location for deposition. From the permanent sleeve located at and under Tide Water Road, the discharge pipeline corridor could pass through shallow open water between Tide Water Road and Spanish Pass, and then into Spanish Pass for access to the Project site (Figure 12). This alternative access corridor is discussed in greater detail in Section 3.8, and the potential impacts associated with its use are discussed in Section 5.0.

It is estimated that the Project will restore approximately 91.6 acres of marsh and approximately 29.8 acres of ridge. Additional details describing the selected plan can be found in Section 3.8 (Description of the TSP (Alternative 1b)).

After this draft Integrated DIR/SEA is reviewed and comments are incorporated as appropriate, a Recommended Plan will be identified. Once the final Integrated DIR/SEA, which defines the Recommended Plan, is approved, USACE would proceed with the execution of a Project Partnership Agreement (PPA), as specified herein, with the non-Federal Sponsor (NFS) and the implementation of the Recommended Plan.

[2] The Federal Standard is the dredged material disposal alternative identified by the Corps that represents the least costly alternative, consistent with sound engineering practices, that meets all of the Federal environmental standards established by Section 404 of the Clean Water Act of 1972 and/or Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972, as amended. Application of the Federal Standard constitutes the base disposal plan (i.e., Base Plan) for a navigation project.

1.1 Project Authority

Restoration strategies presented in the 1998 report entitled "Coast 2050: Toward a Sustainable Coastal Louisiana," which evolved into the LCA 905(b) Reconnaissance Report, formed the basis for the broader-scale 2004 Louisiana Coastal Area Ecosystem Restoration Study Report and Programmatic Environmental Impact Statement (2004 LCA Study). The 2004 LCA Study was developed to identify cost-effective, near-term (ten-year implementation period) restoration features to reverse the degradation trend of the coastal ecosystem of Louisiana. The Near-Term Plan that resulted from the 2004 LCA Study focused on restoration strategies that would reintroduce historical flows of river water, nutrients, and sediments; restore hydrology to minimize saltwater intrusion and maintain structural integrity of coastal ecosystems. The 2004 LCA Study identified critical projects, multiple programmatic authorizations, and ten additional required feasibility studies for LCA. The Report of the Chief of Engineers dated January 31, 2005 (2005 Chief's Report) approved the Near-Term Plan substantially in accordance with the 2004 LCA Study and a Record of Decision for the 2004 LCA Study was signed on November 18, 2005. The 2004 LCA Study and its accompanying Programmatic Environmental Impact Statement is available at the main LCA website, http://www.lca.gov.

Title VII of the Water Resources Development Act of 2007 (WRDA 2007), Public Law No. 110-114, authorized an ecosystem restoration program for the LCA substantially in accordance with the Near-Term Plan identified in the 2005 Chief's Report, and Section 7006(d) specifically authorizes the LCA BUDMAT Program for the beneficial use of material dredged from federally maintained waterways in the coastal Louisiana ecosystem at a total cost of $100,000,000. The Final Programmatic Study Report and Environmental Impact Statement dated January 2010 (2010 Report) was approved by the Assistant Secretary of the Army for Civil Works (ASA (CW)) on August 13, 2010.

Page 4 of the 2005 Chief's Report describes the Program as follows:

> "6. Beneficial Use of Dredged Material Program. The reporting officers recommend a program to place dredged material to build and nourish vital coastal wetlands. At November 2004 price levels, the estimated cost of the Beneficial Use of Dredged Material program is $100,000,000."

Title VII, Section 7006(d) of WRDA 2007 provides as follows:

> **SEC. 7006. CONSTRUCTION.**
> (d) BENEFICIAL USE OF DREDGED MATERIAL (BUDMAT). —
> (1) IN GENERAL. — The Secretary, substantially in accordance with the restoration plan, shall implement in the coastal Louisiana ecosystem a program for the beneficial use of material dredged from federally maintained waterways at a total cost of $100,000,000.

The LCA restoration plan referenced in Title VII, Section 7006(d) (1) above was also authorized by WRDA 2007 in Title VII, Section 7003, which contains the following language:

> **SEC. 7003. LOUISIANA COASTAL AREA.**
> (a) IN GENERAL. — The Secretary may carry out a program for ecosystem restoration, Louisiana Coastal Area, Louisiana, substantially in accordance with the report of the Chief of Engineers, dated January 31, 2005.

The USACE Headquarters, Civil Works, Planning and Policy Division (CECW-P) memorandum dated December 19, 2008, SUBJECT: Implementation Guidance for Section 7006(d) of the Water Resources Development Act of 2007 – Louisiana Coastal Area – Construction, recognized the recommendation of the 2005 Chief's Report that the LCA BUDMAT Program be cost shared in accordance with Section 204 of the Water Resources Development Act of 1992 (WRDA 1992). Section 204 of WRDA 1992, Public Law No. 102-580, was later modified by Section 2037 of WRDA 2007, requiring all construction work under the LCA Program be cost shared at 65% Federal and 35% non-Federal. In 2014, the cost share requirements of Section 2037 of WRDA 2007 were amended by Section 1030(d) of the Water Resources Reform and Development Act of 2014 (WRRDA 2014) to provide that the WRDA 2007 cost sharing amendment does not apply to any beneficial use of dredged material project authorized in WRDA 2007 if a report of the Chief of Engineers for the project was completed prior to the date of enactment of WRDA 2007. For those projects (specifically including the LCA BUDMAT Program, Louisiana, authorized by Section 7006(d) of WRDA 2007), the cost sharing for the beneficial use of dredged material projects is now 75% Federal and 25% non-Federal. (See Appendix A. Legislation, Reports, and Guidance).

By memorandum dated August 13, 2010, the ASA (CW) also delegated approval authority to the MVD Commander, subject to a per-project limit on the federal investment for the delegation to $15 million (See Appendix A. Legislation, Reports, and Guidance). The authorized LCA Plan includes $100 million in programmatic authority to allow for the extra cost needed for beneficial use of dredged material over a 10-year period. Funds from the BUDMAT Program are used for disposal activities associated with separate, cost-shared, individual ecosystem restoration beneficial use projects that are above and beyond the disposal activities that are covered under the USACE O&M dredging Federal Standard. Of the $100 million recommended for the Program, the 2010 Report provided that approximately 15 percent (approximately $15 million) would be used for planning, engineering, and design activities, and real estate acquisition for beneficial use projects implemented under the BUDMAT Program, and the remaining $85 million would be used for placement of dredged material within the beneficial use disposal sites.

The 2010 Report envisioned that the Coastal Protection and Restoration Authority Board (CPRAB) of Louisiana would serve as the primary NFS for the implementation of the Program. Subsequently, the CPRAB declined to serve as the primary NFS for the Program in its entirety, electing instead to serve as the NFS on individual Program projects. It became apparent that there was no willing primary NFS to cost share the

implementation of the entire Program. Therefore, individual projects in the Program are being designed and implemented by CEMVN on a proposal-by-proposal basis where a NFS is identified as a willing cost-share partner for an individual BUDMAT project. The NFS for the Project outlined in this draft Integrated DIR/SEA is Plaquemines Parish Government (PPG). This enables CEMVN to still fulfill the intent of the Program to achieve ecosystem restoration objectives in coastal Louisiana by using sediment resources generated by the maintenance of authorized federal navigation channels.

See Appendix A. Legislation, Reports, and Guidance for applicable legislation, reports, and guidance relative to the LCA BUDMAT Program and Project authority.

1.2 Non-Federal Sponsor

The NFS for the Project outlined in this draft Integrated DIR/SEA is the PPG. The Project Management Plan (PMP) was executed on February 15, 2017 by the CEMVN District Commander. The Integral Determination Report for the Project was approved on March 16, 2017. The Design Agreement between the Department of the Army and the NFS was executed on May 16, 2017.

Title VII of WRDA 2007 contained specific crediting provisions for work-in-kind performed by the NFS under the Program. Section 7007 of WRDA 2007, Public Law No. 110-114, provides authority to afford credit for work in-kind contributions provided by the NFS for the design of the Project that are determined to be integral to the Project. The NFS can elect to perform in-kind services related to the design, and to provide cash to satisfy the balance of its 25% cost share of the total Project cost for construction. Section 1019 of WRRDA 2014 amended Section 7007 of WRDA 2007, to authorize credit, in accordance with Section 221 of the Flood Control Act of 1970, as amended. Credit is afforded for the cost of in-kind contributions for a study or project authorized by Title VII of WRDA 2007 that is carried out in the Louisiana coastal ecosystem by a non-Federal interest before, on, or after the execution of the partnership agreement for the study or project.

As a result of the foregoing crediting provisions, the NFS has specific cost sharing considerations that are reflected in project cost tables contained in this draft Integrated DIR/SEA. For the Project, the in-kind contributions may include cultural resource analysis coordination, project management, design documentation report support, plans and specifications, field investigations, and monitoring for the project, as generally described in the Integral Determination Report for the Project, which was approved on March 16, 2017. All work-in-kind contributions performed by the NFS must meet federal standards, and be performed in accordance with ER 1110-2-1150, reviewed in accordance with ER 1110-1-12, and subject to peer review guidance.

The Project description, location, proposed implementation, acres restored, and other details of the proposed action are set forth in this draft Integrated DIR/SEA. Once the final Integrated DIR/SEA is approved, the Recommended Plan contained therein will serve as the decision document for the Project Participation Agreement (PPA).

1.3 Design and Implementation Report Scope

The 2005 Chief's Report, as authorized by WRDA 2007, recommended implementation of the LCA BUDMAT Program through a one-step planning and design procedure modeled upon the process for projects implemented under Section 204 of the WRDA 1992 pursuant to the Continuing Authorities Program (CAP 204) for the protection, restoration, and creation of aquatic and ecologically related habitats in connection with O&M dredging of an authorized navigation project, using procedures appropriate for the scope and complexity of the project to allow for the appropriate level of planning and design for the project. Simplified evaluation procedures are allowed for low risk/low cost projects and when the consequences of failure are minimal and do not pose a threat to human life or safety. This Project is very similar in its limited scope, complexity, and scale to a CAP 204 beneficial use project. The planning and design of this Project and preparation of this integrated DIR/SEA have been prepared in accordance with all applicable laws and USACE regulations, policies, and guidance, including but not limited to, the implementation guidance for CAP 204 projects.

1.4 Selection of the Tiger Pass 2 Project

The LCA BUDMAT Program goals are:

- to cost effectively increase the beneficial use of material dredged from federally maintained waterways at a total cost of $100 million over a 10-year period.

- to address the critical needs of the LCA BUDMAT Program by soliciting, selecting, planning, designing, and constructing individual ecosystem restoration projects that use material dredged from the federally maintained waterways to:

    - restore coastal landscape features such as, but not limited to, marshes, ridges, and islands that provide wildlife and fisheries habitat with emphasis on ecological and hydrologic functions that support the ecosystem of coastal Louisiana;

    - reduce the loss of existing coastal landscape features such as, but not limited to, marshes, ridges, and islands to help sustain the ecosystem of coastal Louisiana; and

    - provide protection to Louisiana's coastal infrastructure.

In order to meet these goals, there are two major considerations which often act as constraints in identifying and selecting projects to be implemented under the Program: (1) the need for a willing and eligible cost share partner to serve as the NFS; and (2) the ability to link the proposed project to the operation and maintenance dredging of an existing federal navigation project. The overlap of these requirements frequently limits the potential projects under the Program that can be considered for implementation by USACE.

With respect to the two major considerations mentioned above to be considered in the selection of a project under the Program, the Tiger Pass 2 Project satisfies both considerations. First, the Tiger Pass 2 Project is consistent with the ecosystem restoration goals and objectives of the *Louisiana's Comprehensive Master Plan for a Sustainable Coast* (State Master Plan), effective June 2, 2017, which is a plan for protecting, conserving, enhancing, and restoring coastal areas through the construction and management of integrated coastal protection projects and programs. The State Master Plan expressly articulates support for the implementation of beneficial use of dredged material projects, stating that the State acting through the CPRAB "fully supports beneficial use of dredged material and has financed many beneficial use projects in the past, including projects utilizing sediment from the CSC, the Mississippi River Navigation Channel, the Houma Navigation Canal, and the Atchafalaya River. As the state implements the large-scale marsh creation projects laid out in the State Master Plan, it is imperative that we use the sediment from all applicable dredging activities." (See State Master Plan at page 144 available at http://coastal.la.gov/wp-content/uploads/2017/04/2017-Coastal-Master-Plan_Web-Book_CFinal-with-Effective-Date-06092017.pdf).

The CPRAB does not desire to be the primary NFS for the entire Program, although it does participate on a project-by-project basis. As mentioned previously, the willing and eligible cost sharing partner to serve as the NFS for the Project is PPG. The NFS has the financial resources to cost share the Tiger Pass 2 Project and to fulfill all of the other requirements of local cooperation pursuant to the PPA to be executed once a Recommended Plan is approved. This Project meets the second consideration in that it will utilize dredged material sourced from a Federally authorized navigation channel. All of the navigation channels in the Bird's Foot Delta (except for Grand-Tiger Pass) receive funding on a consistent basis.

1.5 Tiger Pass 2 Study Area

The LCA BUDMAT Program Area is divided into 4 sub-provinces along coastal Louisiana. The Study Area for this Project is located within Sub-province 2 of the LCA BUDMAT Program Area (Figure 6).

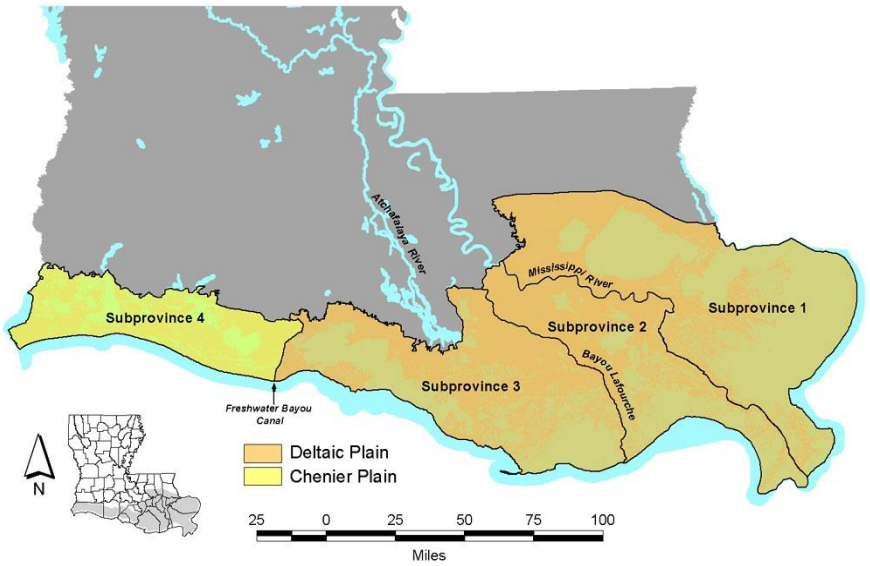

Figure 6. LCA Sub-provinces, LCA BUDMAT Project Area.

1.6 Tiger Pass 2 Project Area

The proposed project area is located within the Mississippi River Deltaic plain in southeastern Louisiana near the Mississippi River Ship Channel, Baton Rouge to the Gulf of Mexico, Louisiana project. 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 several major distributaries within the Mississippi Bird's Foot Delta (Figure 7): Grand Pass, Cubit's Gap, Main Pass, Pass a Loutre, South Pass, Southwest Pass, and Baptiste Collette Bayou. South Pass and Southwest Pass are navigation channels that are Federally authorized and maintained as part of the MRSC. Baptiste Collette Bayou is also a Federally authorized navigation channel. Additional smaller navigable distributaries include Grand-Tiger Pass, which is also a Federally authorized navigation channel, and Grand Pass. Two additional channels, or remnant distributaries, located just outside of the Bird's Foot Delta, yet pertinent to the discussion of the Project Area, are Spanish Pass and Red Pass (Figure 8). These remnant distributary channels were disconnected from the Mississippi river in the 1940s, but still persist today, although in a highly degraded state. 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. Adjacent to the proposed Project Area are fresh and intermediate marshes, private camps, the Pass a Loutre Water Management Area (WMA), the Delta National Wildlife Refuge (NWR), and the navigation channels of the Mississippi River—Pass a Loutre, South Pass, Southwest Pass.

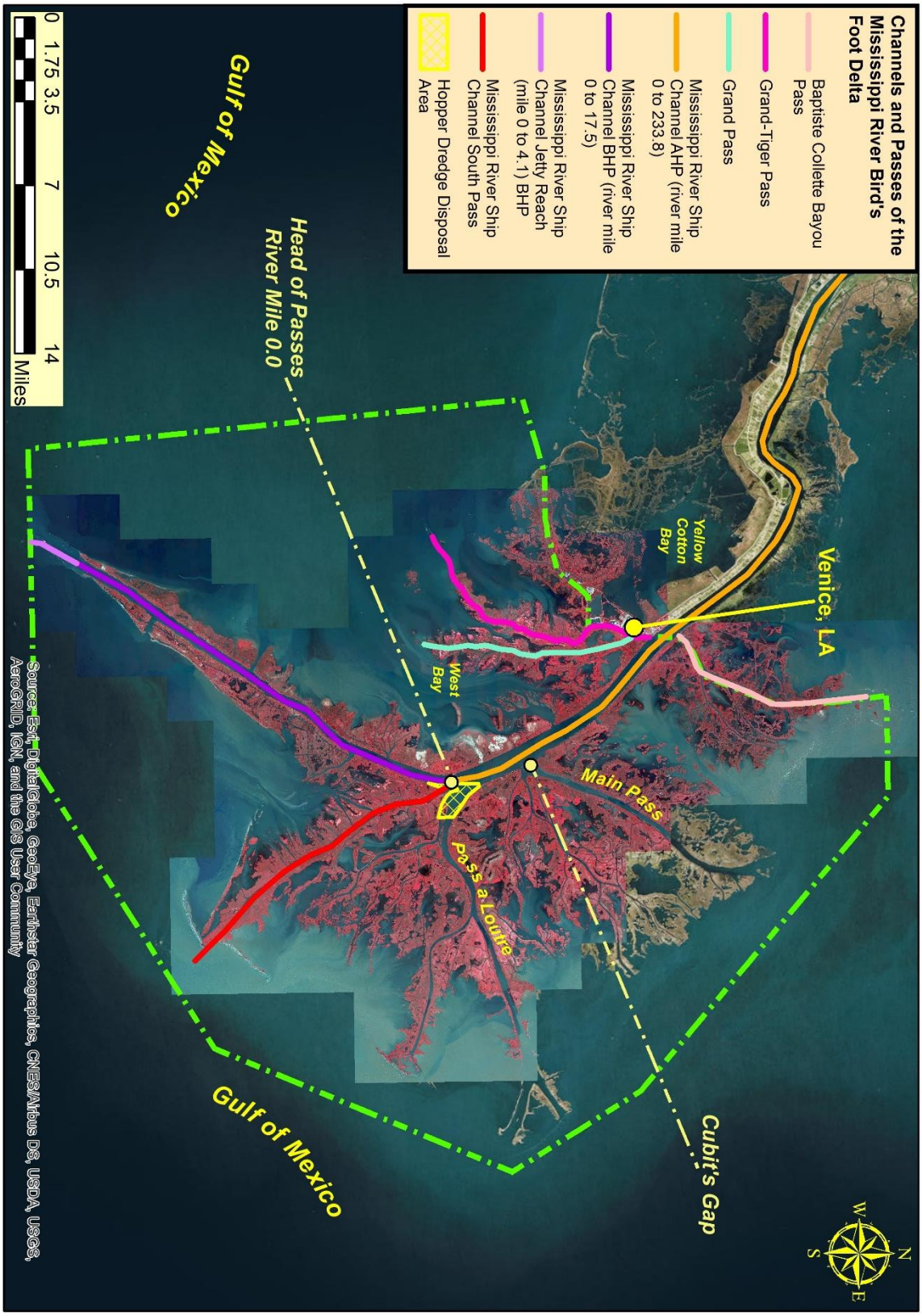

Figure 7. Channels and Passes of the Bird's Foot Delta.

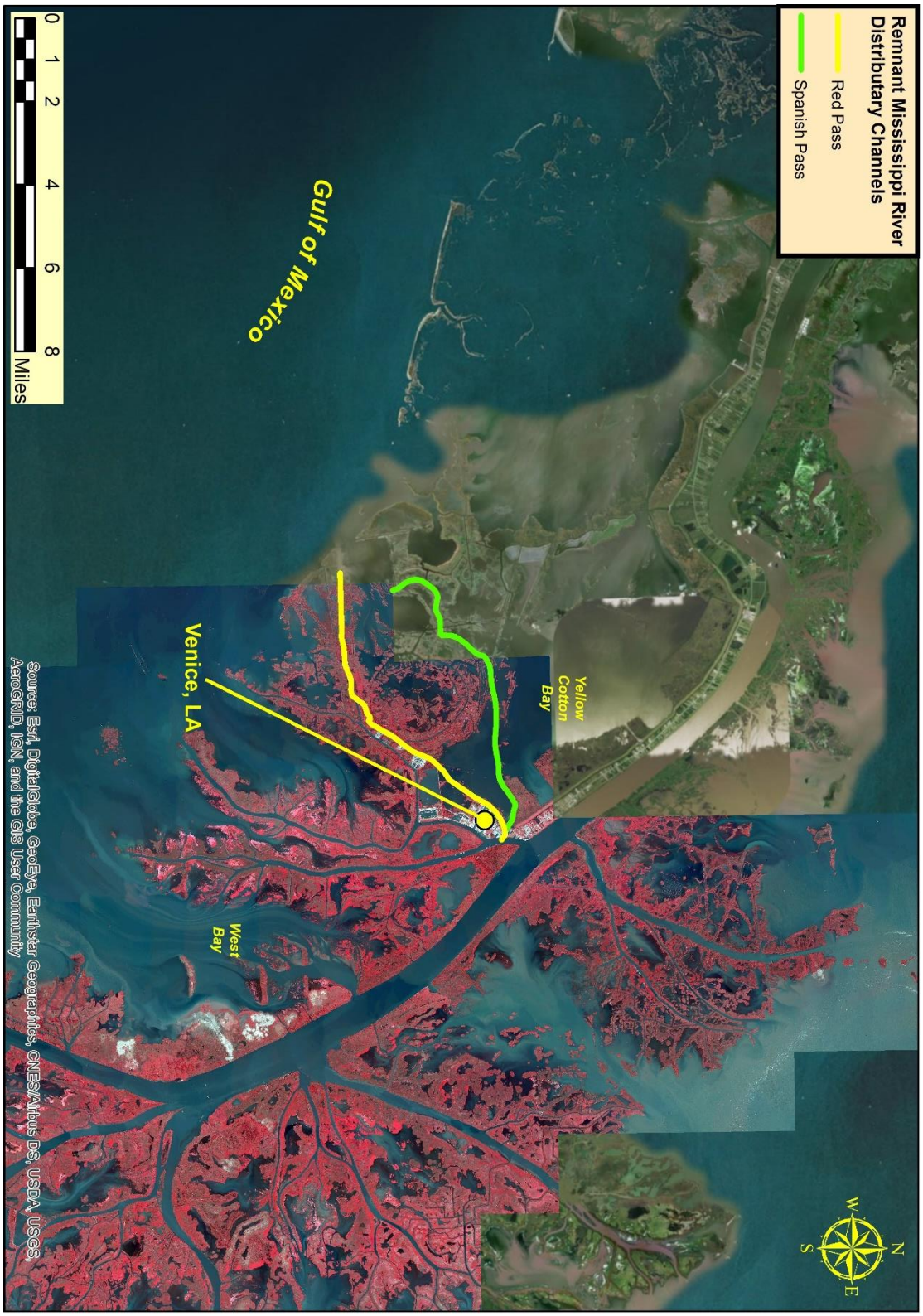

Figure 8. Remnant Mississippi River Distributary Channels.

1.7 Prior Beneficial Use Studies and Projects

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. Additional information on other BUDMAT activities in the vicinity of this Project is available online at:

http://www.mvn.usace.army.mil/About/Offices/Operations/BeneficialUseofDredgedMaterial.aspx

Table 1. Prior Studies and Environmental Documents

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)	Reconnaissance 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)	Reconnaissance 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	West Bay Marsh Creation Tier 1, Louisiana Coastal Area Beneficial Use of Dredge Material Program, Plaquemines Parish, Louisiana	EA #535

2016	Louisiana Coastal Area Beneficial Use of Dredged Material Program at Tiger Pass Project, Plaquemines Parish, Louisiana	EA #542
2017	Louisiana Coastal Area Beneficial Use of Dredged Material Program at Tiger Pass Project, Plaquemines Parish, Louisiana	SEA #542.A

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2.0 Affected Environment (NEPA Required)

NEPA requires that in analyzing alternatives, a Federal agency must consider an alternative of "No Action." The No Action Alternative evaluates the impacts associated with not implementing the proposed action and represents the Future Without Project (FWOP) condition against which alternatives considered in detail are compared. This analysis provides a benchmark, enabling decision makers to compare the magnitude of environmental effects of implementing a proposed action.

Under the Civil Works Planning process, an inventory of the critical resources (physical, demographic, economic, social, and natural, etc.) relevant to the problems and opportunities under consideration in the planning area is developed. Then, a forecast of the inventory's condition at the future date of the 50-year period of analysis is performed. Those changes in conditions are determined by the impact of all ongoing actions, man-made or natural, upon the resources if no alternatives are implemented as part of this evaluation. Sections 2.1 to 2.3 of this Report describe the historic and existing conditions of the affected environment; Section 2.4 forecasts and reflects the future conditions expected during the 50-year period of analysis if no action is taken. The description of the affected environment establishes the environmental baseline and thresholds of environmental change against which to measure the direct, indirect, and cumulative effects of an alternative necessary to support a fully informed decision-making process.

2.1 Description of the Tiger Pass 2 Study Area

The Study Area is defined as LCA Sub-province 2, which includes the Barataria Basin. It is an irregularly shaped area bounded on each side by a distributary ridge formed by the present and a former channel of the Mississippi River. A chain of barrier islands separates the Study Area from the Gulf of Mexico. In the northern half, which is segregated by the Gulf Intracoastal Waterway (GIWW), several large lakes are located between ridges. The southern half consists of tidally influenced marshes connected to a large bay system behind the barrier islands. 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 fisheries species.

Water depths in the Study Area range from less than an inch to a foot and a half in the vegetated areas and can be more than 10 feet in the open water areas. Important nesting and brooding habitat for mottled ducks, wading birds, and shore birds exist. Migratory and resident waterfowl are also abundant in the Study Area. The National Audubon Society designated the Mississippi River Delta, much of which occurs within the Study Area, 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, willow-dominated uplands, vegetative ridges, and barrier islands 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 WMA and the Delta NWR (Audubon, 2018).

2.2 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 about 1,500,000 cfs to a low of 75,000 cfs, and average annual discharge is 450,000 cfs. Southwest Pass of the Mississippi River discharges roughly 35% of the river's total flow, with an average discharge of about 168,000 cfs from 2004-2017. South Pass of the Mississippi River discharges roughly 11% of the river's total flow, with an average discharge of about 50,000 cfs from 2004-2017. Pass a Loutre of the Mississippi River discharges 11% of the river's total flow, with an average discharge of about 49,000 cfs from 2004-2017. The combined discharge of Southwest Pass, South Pass, and Pass a Loutre is approximately 59% 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.

The Project Site is within the Barataria Basin, which is part of the larger Mississippi River Watershed. See Section 2.1 for a description of the Barataria Basin.

2.2.1 Sea Level Rise

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. In coastal Louisiana, *relative sea level rise* (RSLR) is the term applied to the combination of the change in eustatic (global) sea level and the change in land elevation. According to the United Nations Intergovernmental Panel on Climate Change (IPCC), mean global sea level rise was 1.7 mm/year from 1901 through 2010, and 3.2 mm/year from 1993 to 2010 (Church et al. 2013). Recent climate research has documented global warming during the 20th Century, and has predicted either continued or accelerated global warming for the 21st Century and possibly beyond (Church et al. 2013).

Land elevation change can be positive (accreting) or negative (subsiding). Land elevations decrease due to natural causes, such as compaction and consolidation of Holocene deposits and faulting, and human influences such as sub-surface fluid extraction and drainage for agriculture, flood protection, and development. Forced drainage of wetlands results in lowering of the water table resulting in accelerated compaction and oxidation of organic material. Areas under forced drainage can be found throughout coastal Louisiana and the study area. Land elevations increase as a result of sediment accretion (riverine and littoral sources) and organic deposition from vegetation. Vertical accretion in most of the area, however, is insufficient to offset subsidence, causing an overall decrease in land elevations. The combination of subsidence and eustatic sea level rise is likely to cause the landward movement of marine conditions into estuaries, coastal wetlands, and fringing uplands (Day and Templet, 1989; Reid and Trexler, 1992).

Benefits calculated using the Wetland Value Assessment (WVA) Fresh-Intermediate Marsh Community Model and the WVA Coastal Chenier/Ridge Community Model 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 (SLC) 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 restoration site would not functionally be a wetland until the site subsides or erodes to an appropriate elevation conducive for function, growth, and sustainability. The design was optimized to the medium SLC rate but the timing of the benefits to occur is uncertain and dependent on future SLC. 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.

2.2.2 Climate

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. Historically, severe storm damage occurred 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://plaqueminesparish.com/new-residents-visitors/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 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 as addressed above.

2.2.3 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.

Soils

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).

2.3 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 public. Table 2 provides summary information of the institutional, technical, and public importance of these resources.

A wide selection of resources was 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, CEMVN 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 2. 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.
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 LDNR 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.

2.3.1 Navigation

Southwest Pass provides deep-draft access from the Gulf of Mexico 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 described in Section 1.0, are vital to the continued growth and health of the industries and commerce they serve.

2.3.2 Wetlands

Existing Conditions

Wetlands in the vicinity are tidally influenced and classified as fresh and intermediate marsh. 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).

Emergent plant species include: smooth cordgrass (*Spartina alterniflora*), Walter's millet (*Echinochloa walteri*), giant cutgrass (*Zizaniopsis miliacea*), wild rice (*Zizania aquatica*), elephant ear (*Colocasia esculenta*), freshwater three square (*Schoenoplectus pungens*), and water lotus (*Nelumbo lutea*). Eastern baccharis (*Baccharis halimifolia*) 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. Submerged aquatic vegetation (SAV), such as Eurasian watermilfoil (*Myriophyllum spicatum*), water stargrass (*Heteranthera dubia*), coontail (*Ceratophyllum demersum*), southern naiad (*Najas guadalupensis*), longleaf pondweed (*Potamogeton nodosus*) is also common in the lower elevation intertidal and shallow subtidal portions.

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.

Wetland deterioration within the Study Area 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 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. 1997). 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 (LDNR 1993; Trepagnier 1994. Thirteen crevasses included in the LDNR Small Sediment Diversions Project cumulatively produced 313 acres of emergent marsh between 1986 and 1993 (LDNR 1996). 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 2007). Boyer and others (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.

2.3.3 Aquatic Resources /Fisheries

Existing Conditions

The area is primarily shallow open water, and fresh and intermediate 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. Submerged aquatic vegetation (SAV) occurs in some portions of the shallow open-water areas within the Study Area, with the most common species including pondweed, coontail, and water milfoils (*Myriophyllum* spp.). These submerged plants provide a source of food for the large numbers of waterfowl during winter. SAV occurrence within the Project Area was estimated to be 0%

waterbottom coverage on September 13, 2017. Shellfish species including oysters, shrimp, and crabs are found in the brackish marshes near the Project Area. Many juvenile aquatic organisms use fringe marsh, interspersed shallow ponds, and SAV.

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. While vegetation and marsh loss could, to a point, increase its habitat potential for some aquatic organisms (Chesney et al 2000), it is likely that increasing marsh habitat in the project's vicinity would be beneficial to aquatic organisms because the marsh is degraded.

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*), largemouth bass (*Micropterus salmoides*), black crappie (*Pomoxis nigromaculatus*), white crappie (*P. annularis*), sunfish (*Lepomis* spp.), gizzard shad (*Dorosoma cepedianum*), and smallmouth 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 (*Micropogoniasundulatus*), sheepshead (*Archosargus probatocephalus*), southern flounder (*Paralichthys lethostigma*), Spanish mackerel (*Scomberomorus maculatus*), 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 crabs (Family: Xanthidae).

2.3.4 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* spp.; *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 (*A. acuta*), mallards (*A. platyrhynchos*), blue-winged teal (*A. discors*), green-winged teal (*A. crecca*), shovelers (*A. clypeata*), coot (*Fulica americana*), redheads (*Aythya americana*), lesser scaup (*Aythya affinis*), mergansers (*Mergus* spp.; *Lophodytes cucullatus*), wigeons (*Mareca americana*), canvasbacks (*Aythya valisineria*), and some black ducks (*Anas rubripes*). The mottled duck (*A. fulvigula*), highly sought by sportsmen, is the only game 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 (*Procyon lotor*), and white-tailed deer (*Odocoileus virginianus*). Scrub-shrub provides habitat for salamanders, toads, frogs, turtles, and several species of venomous and nonvenomous 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.

2.3.5 Essential Fish Habitat

Existing Conditions

All 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 subtidal vegetation (submerged aquatic vegetation and algae) and adjacent intertidal vegetation (marshes and mangroves). The open waters, waterbottom substrates, and intertidal marshes of the Project Area are considered EFH under the estuarine component.

The estuarine waters in the 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 an 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 (Matlock, 1987; Exec. Order No. 13449, 2007). Adults inhabit nearshore waters, particularly areas within the surf zone or in the vicinity of inlets (Matlock, 1987). Spawning occurs in nearshore areas, and eggs and larvae are transported by tides and wind currents into estuaries (Matlock, 1987; Brown et al, 2004). Larvae and juveniles typically occupy estuarine environments until maturation (Matlock, 1987; Bachelor, 2008). Red drum are predatory in all stages of life; however, the type of prey consumed varies with life stage. Early Juvenile 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 (Bass and Avault Jr., 1975).

Table 3 Essential Fish Habitat for Life Stages

Species	Life Stage	Essential Fish Habitat
Brown shrimp (*Farfantepenaeus aztecus*)	Adult	Gulf of Mexico <110 m, Silt sand, muddy sand
	Early Juvenile	Marsh edge, SAV, tidal creeks, inner marsh
White shrimp (*Litopenaeus setiferus)*	Juvenile	Marsh edge, SAV, marsh ponds, inner marsh, oyster reefs
Lane Snapper (*Lutjanus synagris*)	Adult	Gulf of Mexico ≤ 132 m and ≥ 4 m; Emergent Marsh, mangrove, SAV, oyster reefs, hard bottom, sand shell, reefs, pelagic, shoal banks, shelf edge slope, and drift algae
	Early Juvenile	Gulf of Mexico ≤ 20 m; Emergent Marsh, mangrove, SAV, oyster reefs, hard bottom, sand shell, reefs, pelagic, shoal banks, shelf edge slope, and drift algae
Gray Snapper (*Lutjanus griseus*)	Adult	Gulf of Mexico ≥ 180 m; Emergent Marsh, mangrove, SAV, oyster reefs, hard bottom, sand shell, reefs, pelagic, shoal banks, and drift algae
Red Drum (*Sciaenops ocellatus*)	Adult	Gulf of Mexico & estuarine mud bottoms, oyster reef
	Early Juvenile	SAV, estuarine mud bottoms, marsh/water interface
	Post Larvae	all estuaries planktonic, SAV, sand/shell/soft

2.3.6 Threatened and Endangered Species

Existing Conditions

According to a USFWS letter dated February 8, 2018, which provided draft comments in accordance with the Fish and Wildlife Coordination Act (FWCA), protected species that may occur in the project vicinity include the endangered pallid sturgeon (*Scaphirhynchus albus*), the threatened West Indian manatee (*Trichechus manatus*), the threatened piping plover (*Charadrius melodus*), and the threatened red knot (*Calidris canutus rufa*), and sea turtles. Brown pelicans and other colonial nesting wading birds and seabirds protected under the Migratory Bird Treaty Act (MBTA) may be encountered in the Project Area as well. 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.

Pallid Sturgeon

The pallid sturgeon 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. 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.

West Indian Manatee

The threatened West Indian manatee is known to regularly occur in parts of coastal Louisiana, but is infrequent within the vicinity of the current Project Area. 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.

Piping Plover

The piping plover, 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. 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 (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. 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. Based on the information provided, the proposed action would not be located within any designated critical habitat units; therefore, no critical habitat would be affected.

Red Knot

The red knot, 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. 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. Currently, there is no critical habitat designated for the red knot.

Sea Turtles

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. Along the Louisiana coast, turtles are generally found in shallow nearshore and inshore areas, and especially in salt marsh habitats, from May through October. No Kemp’s Ridley sea turtle nesting habitat occurs near the project site, and nesting has not been known to occur in the area.

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.

Colonial Nesting Waterbirds

The proposed project would be located in an area where colonial nesting waterbirds may be present. Colonies may be present that are not currently listed in the database maintained by the Louisiana Department of Wildlife and Fisheries. That database is updated primarily by monitoring the colony sites that were previously surveyed during the 1980s. Until a new, comprehensive coast-wide survey is conducted to determine the location of newly-established nesting colonies, USFWS recommends that a qualified biologist inspect the proposed work site for the presence of undocumented nesting colonies during the nesting season.

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 (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.

2.3.7 Water and Sediment Quality

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 that 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 "2016 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 2017).

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, CEMVN 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.

A CEMVN 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 CEMVN 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.

2.3.8 Air Quality

Existing Conditions

National air quality standards have been set by the EPA for six common pollutants (also referred to as criteria pollutants) including: ozone, particulate matter, carbon monoxide, nitrogen dioxide, sulfur dioxide, and lead. States are required by the Code of Federal Regulations to report to the EPA annual emissions estimates for point sources (major industrial facilities) emitting greater than, or equal to, 100 tons per year of volatile organic compounds, nitrogen dioxide, sulfur dioxide, particulate matter less than 10 microns in size; 1,000 tons per year of carbon monoxide; or 5 tons per year of lead. Since ozone is not an emission, but the result of a photochemical reaction, states are required to report emissions of volatile organic compounds (VOC), which are compounds that lead to the formation of ozone. 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 general conformity rule of Section 176(c) of the CAA would not apply for the proposed Federal action.

2.3.9 Cultural Resources

Regulatory Setting

The National Historic Preservation Act of 1966 (NHPA), Public Law No. 89-655, as amended; NEPA of 1969, Public Law No. 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 effects. Typically, these studies to inventory existing conditions 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.

Additionally, NEPA, Section 106 of the NHPA, EO 13175 ("Consultation and Coordination with Indian Tribal Governments"), the American Indian Religious Freedom Act, and related statutes and policies have a consultation component. In accordance with CEMVN's responsibilities under these laws, regulations, and guidance, CEMVN offered federally-recognized Indian Tribes the opportunity to review and comment on the potential of the proposed action to significantly affect protected tribal resources, tribal rights, or Indian lands.

Existing Conditions

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 Project Area has not been directly surveyed for cultural resources, but due to the existing land conditions as well as the erosion and subsidence that has occurred, it was determined that there is a very low potential for undiscovered cultural resources. For these reasons, cultural resources surveys were not recommended in the Project Area.

2.3.10 Recreational Resources

Existing Conditions

The Delta NWR is approximately 4.5 miles east of the Project Area. The Delta 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. Much 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 like the NWR, and includes boating, fishing (fresh and saltwater), wildlife observation, bird watching, and photography. The following information is provided by the Louisiana Department of Wildlife and Fisheries (www.wlf.louisiana.gov) for the number of fishing and hunting licenses sold (Table 3).

Table 3. Fishing and Hunting Licenses and Boater Registrations Sold in Plaquemines Parish.

Parish	Resident Freshwater and Saltwater Fishing Licenses	Non-Resident Fishing Licenses	Hunting Licenses	Boat Registrations
Plaquemines	7,402	417	4,138	3,937

Data for licenses are from license year 2017. Data for boat registrations are from 2011. (Source: LDWF)

2.3.11 Aesthetics (Visual Resources)

Existing Conditions

The project site is located on the southern tip of the State of Louisiana as part of the massive Mississippi River Bird's Foot 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.

2.4 Future Without Project Conditions

In the FWOP, or No-Action alternative, the recommended action would not be implemented and predicted additional environmental gains would not be achieved. Dredged material would continue to be disposed within the Federal Standard.

Soil erosion and land loss would continue into the future. Natural and man-made levees would continue to subside and organic soils would not be able to maintain their elevations due to subsidence, decreased plant productivity, and wave erosion. As erosion continued, there would be a continued loss in primary productivity due to loss of vegetated wetlands. Waterbodies would grow larger and wave erosion would accelerate causing further land loss, thus making coastal communities more vulnerable to storms.

Net primary productivity within the Project Area would continue to decline and existing wetland vegetation would continue to diminish. The ongoing conversion of existing fragmented emergent wetlands to shallow open water would continue with associated indirect impacts on coastal vegetation, fish and wildlife resources, EFH, recreation, aesthetic, and socioeconomic resources. Other indirect adverse impacts that would result from the loss of important and essential vegetated habitats used by fish and wildlife are the loss of shelter, nesting, feeding, roosting, cover, nursery, and other life requirements for fish and wildlife; loss of productivity; loss of transitional habitat between estuarine and marine environments; and increased inter- and intraspecific competition between resident and migratory fish and wildlife species for decreasing wetland resources. This would also reduce the availability of important stopover habitats used by migrating Neotropical birds. Land loss and downward conversion of wetlands in the Study Area, due to subsidence, sea level rise (SLR) and saltwater intrusion would likely continue at the current rate, estimated at approximately 0.33 square miles per year (Couvillion et al. 2017). However, these wetland soil losses would be offset to some extent by other federal, state, local, and private restoration efforts through the beneficial use of dredged material within

CEMVN's O&M program or with additional funding sources such as CWPPRA, Section 204, or Coastal Impact Assistance Program (CIAP). Without implementation of the Project, other federal, state, local, and private restoration efforts within the Study Area and near the Project Area would occur.

The State Master Plan[3] has been approved by the State of Louisiana and is partially funded. The State Master Plan indicates that the CPRAB has, since 2007, completed or funded for construction 135 restoration projects resulting in:

- Over 36,000 acres of land benefited
- 282 miles of levee improvements
- Over 60 miles of barrier islands and berms constructed or under construction

Currently there are 153 active CWPPRA projects. In September 2016, 108 projects were completed, benefiting over approximately 100,000 acres. 17 projects are currently under active construction with 23 additional projects approved and in the engineering and design phase of development. (Source: https://lacoast.gov/new/About/FAQs.aspx; accessed 29 September 2017).

[3] http://coastal.la.gov/our-plan/2017-coastal-master-plan/ (last accessed May 18, 2018).

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3.0 Plan Formulation

The Program is for disposal activities associated with separate, cost-shared, individual ecosystem restoration beneficial use projects that are above and beyond the disposal activities that are covered under the USACE O&M maintenance dredging Federal standard. Dredged material would be deposited in a manner to maximize habitat output above current limitations imposed on the Federal navigation project by the navigation project's Federal Standard. The intent of the proposed action is to maximize the beneficial use of material dredged during routine O&M of Federally-authorized navigation channels in the vicinity of Venice, LA. The period of analysis for this Project is 50 years.

3.1 Programmatic Planning Problems, Needs, and Opportunities

3.1.1 Planning Problems

The problems in the Project Area include, but are not limited to:

- Loss of natural sediment transport to, and retention in, coastal marshes;
- Loss of critical coastal geomorphic features due to erosion, subsidence, and sea level change;
- Loss of coastal marshes due to erosion, subsidence, saltwater intrusion, and sea level change.

The average yearly loss rate, or historic loss rate, in the Barataria Basin over a time-span of 84 years (1932-2016) is approximately 5 square miles per year (Couvillion et al. 2017). Recent analyses by the U.S. Geological Survey (USGS; Couvillion et al. 2017) show the land area in the Barataria Basin has changed from approximately 947,155 acres in 1932 to approximately 670,397 acres in 2016 for a net change of about 276,758 acres. This net change in land area amounts to a decrease of approximately 29% of the 1932 land area. Furthermore, while "Barataria, Terrebonne, and Teche-Vermilion Basins follow a similar pattern to that of the coastwide trend of loss rates increasing to a peak in the late 1970s, followed by a reduction in loss rates since that time. In Breton Sound Basin, wetland loss rates have continued to increase and have only recently begun to suggest a decrease in that rate…" (Couvillion et al. 2017). As stated in Section 2.4, the current wetland loss rate is estimated to be 0.33 square miles per year (Couvillion et al. 2017).

3.1.2 Planning Needs

3.1.2.1 *LCA BUDMAT Program Needs*

The 2004 LCA Study identified the following "Critical Needs" in coastal Louisiana which were reiterated in the 2010 Report and led to opportunities typical of ecosystem restoration projects:

<u>Prevent future land loss where predicted to occur</u>:

"Addressing this need would create and sustain diverse coastal habitats, sustain wildlife and plant diversity, and sustain socio-economic resources. Effective measures to reverse coastal land loss should affect plant communities, in their root zone, in such a way as to promote healthy growth and reproduction, plant succession, or revegetation of denuded surfaces. Increasing nutrients and sediment in the estuarine area would increase the growth of marsh vegetation and slow the rate of land loss. Increased plant growth would result in greater production of organic detritus that is essential for a high rate of fisheries and wildlife production. Production of phytoplankton and zooplankton would increase in areas where turbidity is not limiting, and, as a result, the harvest of sport and commercial finfish and shellfish that depend on these microorganisms would increase."

Restore or preserve endangered critical geomorphic features:

"Addressing this need would restore geomorphic features, such as natural levee ridges, lake rims, land bridges, gulf shoreline barrier islands, barrier headlands, and chenier ridges. These features are essential to maintaining the integrity of coastal ecosystems because they are an integral part of the overall system and in many instances represent the first line of defense against marine influences and tropical storm events."

Protect vital local, regional, and national socio-economic resources:

"Addressing this need would reduce the increased risk of damage to cultures, communities, infrastructure, business and industry, and flood protection. Accelerated land loss and ecosystem degradation places over $100 billion of infrastructure at increased risk to damage as a result of storm events. This need could be met by increasing the coastal wetland's capacity to buffer hurricane-induced flooding through wetland creation, wetland sustenance, and retention of barrier island systems."

3.1.2.2 *Project Specific Needs*

The 2004 LCA Study and the 2010 Report identify broadly recognized specific needs within the Louisiana coastal area. In the Project Area, the specific needs are sustaining the complex of degraded distributary ridges and marsh habitat in order to restore or preserve critical geomorphic features and prevent future land loss. Coastal Louisiana wetlands make up the seventh largest delta on Earth, contain about 37 percent of the estuarine herbaceous marshes, and support the largest commercial fishery in the conterminous United States. Louisiana currently undergoes about 90 percent of the total coastal wetland loss in the continental United States (USGS 2011). 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). 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 area contains a variety of birds, mammals, and other wildlife. Both migratory and resident birds occur in or near the project area. There is widespread public support of projects intended to restore coastal habitats and avert further coastal land loss. The objective of the Project is to restore remnant ridge along Spanish Pass along with a marsh platform. The Project is an illustrative example of government action undertaken to attempt to restore lost coastal habitat in southeastern Louisiana.

3.1.3 Planning Opportunities

3.1.3.1 LCA BUDMAT Program Opportunities

Restoration of barrier islands[4]:

> "Placement of sand to restore or nourish barrier islands could sustain these geomorphic features. Doing so would provide additional protection from hurricane storm surges and protect the ecology of estuarine bays and marshes by reducing gulf influences, as well as protect nationally important water bird nesting areas."

Restoration of other geomorphic features [1]:

> "Reestablishing ridges or natural banks can help restore salinity and marsh inundation patterns and provide fishery access in previously unavailable habitats."

Restoration of Wetlands [1]:

> "The LCA Study also identified the use of sediment from dedicated dredging or maintenance dredging (e.g., beneficial use) to create a marsh platform which can create large amounts of coastal habitat quickly."
>
> Annually, there is reasonable potential to use an additional 30 million CY of material coast wide beneficially depending on funding levels. The Federal Standard for maintenance of a federal navigation project is the least cost, environmentally compliant alternative that is consistent with sound engineering standards and meets all Federal environmental standards including the environmental standards established by Section 404 of the Clean Water Act of 1972 or Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972, as amended. The LCA BUDMAT Program will optimize the beneficial use, for ecosystem restoration purposes, of dredged materials resulting from the maintenance of federally maintained navigation channels as a separable element from the Federal Standard.

[4] January 2010, LCA BUDMAT, Final Programmatic Study Report and Programmatic Environmental Impact Statement, page 48.

3.1.3.2 Project Specific Opportunities

The rationale for identifying planning opportunities are provided in the 2004 LCA Study[5] and are reiterated in the 2010 Report. The Project opportunities also align with critical needs as originally proposed in the State Master Plan (http://coastal.la.gov/our-plan/2017-coastal-master-plan/). The Project will restore a critical ridge and marsh complex in the vicinity of Venice, Louisiana and restores valuable wetland habitat in coastal Louisiana.

3.2 Project Specific Planning Goals, Objectives, and Constraints

3.2.1 Planning Goals

1) Restore critical coastal geomorphic landscape features in order to reduce impacts to remaining coastal habitat and critical infrastructure (i.e., coastal ridges, hurricane and storm damage risk reduction features).

2) Increase wetland habitat by restoring coastal marsh habitat.

3.2.2 Planning Objectives

Maximize beneficial use of dredged material from a federally maintained navigation channel to restore coastal habitat that provide wildlife and fisheries habitat with emphasis on ecological and hydrologic functions that support the ecosystem of coastal Louisiana, for a period of analysis of at least 50 years. The quality of restored coastal habitat will be measured using the WVA[6] in terms of Average Annual Habitat Units (AAHUs) and quantity is simply measured by acres restored.

1) Increase or restore critical coastal geomorphic landscape and habitat.

2) Increase or restore coastal wetland habitat.

3.2.3 Planning Constraints

The constraints identified in the 2004 LCA Study and the 2010 Report remain applicable for this Project and include those associated with restrictions to operating within existing authorized federal navigation channels, funding limitations, sediment transport limitations, dredge source material type, the potential for discovery of hazardous, toxic, and radioactive waste concerns or previously unidentified cultural resource materials, and threatened and endangered species.

[5] November 2004, Louisiana Coastal Area (LCA), Louisiana, Ecosystem Restoration Study, Final, Volume 1: LCA Study - Main Report, Section 2.3 PROBLEMS, CRITICAL NEEDS, AND OPPORTUNITIES, page 2-39; January 2010, LCA BUDMAT, Final Programmatic Study Report and Programmatic Environmental Impact Statement, pages 46-47.
[6] See section 3.7.1 Wetland Valuation Assessment and Appendix B, Annex D, for more information on WVAs

1) Availability of O&M Funding and Dredged Material

Funding dictates the amount of O&M dredging that occurs in the Study Area. Typically, the MRSC receives a rather reliable and regular funding stream for O&M dredging, but funding for dredging of the passes at Baptiste Collette Bayou and Grand-Tiger is less reliable and irregular. The HDDA is dredged when necessary to make room for additional material and when funds are made available.

Dredge material availability for BUDMAT projects is a function of sedimentation in the channel combined with funding. If a channel has shoaled in and receives funding for dredging, presumably dredged material is then available. For the HDDA, it is a function of how much material has been deposited from routine O&M dredging of River Mile 10, AHP to River Mile 11 BHP of the MRSC, and the necessity to dredge the HDDA to make room for additional dredged material.

2) Project Life

It is not the intent of the LCA BUDMAT Program to construct ecosystem restoration projects that would exist in perpetuity. Coastal habitat, whether wetland, ridge, or other type of coastal feature, is ephemeral in nature. The material available from routine O&M dredging is generally suitable for building a marsh platform that is capable of sustaining a 50-year project life; however, the suitability of particular sources is evaluated in the study process and factored into the proposed action.

3.3 Formulation of Alternative Plans

3.3.1 Identifying Management Measures

A Management Measure is, potentially, a piece or part of the solution to resolve a problem, satisfy a need, or take advantage of an opportunity. A Management Measure, as defined by Yoe and Orth (IWR Report 96-R-21, November 1996, page 134), is “a means to an end; an act, step, or proceeding designed for the accomplishment of an objective. The definition of a management measure (or “measure”) is a feature or activity that can be implemented at a specific geographic site to address one or more planning objectives. Measures are the building blocks of which alternative plans are made….”

In formulating alternatives to maximize the benefits for the Tiger Pass 2 Project, the following Management Measures were identified to address coastal habitat degradation in the Project Area.

Management 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. 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 some 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.

Management 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. 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 (Couvillion, et al. 2017). 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.

Management 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. 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 restore 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.

Management Measure 4: Planting of wetland habitat feature.

This measure involves the construction of marsh in areas of open water to restore previously existing marsh habitat. Dredged material would be deposited to an elevation conducive for wetland development and planting of native vegetation would occur after construction.

- 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.

Management Measure 5: Planting of ridge habitat feature.

This measure involves the construction of land, above water and above typical wetland elevation, along the footprint of a degraded coastal ridge. Dredged material would be deposited to an elevation conducive to the establishment of representative vegetation for ridge habitat. The ridge would then be planted with woody vegetation after construction.

- 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.

Management Measure 6: Restoration of colonial nesting and wading bird habitat.

This measure involves the construction of an island feature in areas of open water. 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. The goal is to place material in a manner to create habitat that is favorable for wading birds that require shallow wet shoreline or periodically wet shoreline habitat for foraging; and colonial nesting birds that require bare ground for nesting at elevations above high tides and in a manner to discourage favorable conditions for the growth of wetlands and herbaceous or woody plants, or both, from growing.

- 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.

Management Measure 7: MRSC - Hopper Dredge Disposal Area as a source of dredged material.

Option 1, Barge Haul: A cutterhead suction dredge would utilize a spider barge to load hopper barges with dredged material from the HDDA. Once the hopper barge is filled with dredged material, it would be transported by tugboat to a designated dredged material transfer system (DDMTS), also commonly referred to in industry terms as an "off-loader," located in open water along the bankline of Grand Pass. From that location, dredged material would be hydraulically removed from the hopper barge via the DDMTS and pumped through a discharge pipeline that lies submerged across Grand Pass until it comes onto land at an existing slip at the end of Haliburton Road. The material would then be transported via discharge pipeline from the slip at Haliburton Road to the Project Area. All discharge pipeline is temporary.

Option 2, Direct Pipeline: A cutterhead dredge would remove and pump sediment dredged from the HDDA directly to the Project Area over a distance of approximately 14 miles. This direct route includes utilizing the same Haliburton Road slip route to the Project Area as was used in the initial Tiger Pass BUDMAT Project. A submerged discharge pipeline under the MRSC would be required. The discharge pipeline would be trenched and anchored, if necessary, across the MRSC between Miles 1.4 AHP and 1.2 AHP, and maintained throughout the duration of its use so that the top of discharge pipeline is always at or below elevation -49-feet MLG (-52.5-feet MLLW). The submerged anchored discharge pipeline must remain at least 20 feet from the edge of the authorized navigation channel. In order to place the discharge pipeline crossing at or below the minimum required grade, material may need to be dredged from the MRSC and disposed of, either within the HDDA or other designated disposal areas. If dredged material is disposed of within the HDDA, then it would be placed inside and along the north shoreline of Pass A Loutre in a southeasterly direction, with the discharge directed away from Southwest Pass. Disposal would be performed in a manner that would prevent impacting access to the western side of the HDDA. All work within the MRSC, and required for the installation of the submerged line, has been previously NEPA cleared[7].

[7] Mississippi River Ship Channel, Deep Draft Final EIS, 1981; Record of Decision, December 23, 1986

Management Measure 8: Baptiste Collette Bayou as a source of dredged material.

Option 1, Barge Haul: A cutterhead suction dredge would utilize a spider barge to load hopper barges with dredged material from the Baptiste Collette Bayou Federal navigation channel. Once the hopper barge is filled with dredged material, it would be transported by tugboat to a DDMTS located in open water along the bankline of Grand Pass. From that location, dredged material would be hydraulically removed from the hopper barge via the off-loader and pumped through a discharge pipeline that lies submerged across Grand Pass until it comes onto land at an existing slip at the end of Haliburton Road. The material would then be transported via discharge pipeline from the slip at Haliburton Road to the Project Area. All discharge pipeline is temporary.

Option 2, Direct Pipeline: A cutterhead dredge would remove and pump sediment dredged from the Baptiste Collette Bayou Federal navigation channel directly to the Project Area over a distance of approximately 12 miles. This direct route includes utilizing the same Haliburton Road slip route to the Project Area as was used in the initial Tiger Pass BUDMAT Project. Discharge pipeline would be submerged in a trench and anchored, if necessary, across the MRSC and maintained throughout the duration of its use so that the top of discharge pipeline is always at or below elevation -49-feet MLG (-52.5-feet MLLW). The submerged anchored discharge pipeline must remain at least 20 feet from the edge of the authorized navigation channel when running parallel to the MRSC navigation channel. In order to place the discharge pipeline crossing at or below the minimum required grade, material may need to be dredged from the MRSC. Disposal of that material would be in a manner consistent with beneficial use or ecosystem restoration. Dredging, placement of dredged material, and installation of the submerged discharge pipeline across the MRSC for this option could require additional impact analysis. All discharge pipeline is temporary.

Management Measure 9: Grand-Tiger Pass as a source of dredged material.

If O&M funding for maintenance dredging of Grand-Tiger Pass is available and material is suitable for marsh/ridge creation, there are two options available to transport the dredged material from Grand-Tiger Pass to the Project Area.

Option 1, Barge Haul: A cutterhead suction dredge would utilize a spider barge to load hopper barges with dredged material from the Grand-Tiger Pass Federal navigation channel. Once the hopper barge is filled with dredged material, it would be transported by tugboat to a DDMTS located in open water along the bankline of Grand Pass. From that location, dredged material would be hydraulically removed from the hopper barge via the DDMTS and pumped through a discharge pipeline that lies submerged across Grand Pass until it comes onto land at an existing slip at the end of Haliburton Road. The material would then be transported via discharge pipeline

from the slip at Haliburton Road to the Project Area. All discharge pipeline is temporary.

Option 2, Direct Pipeline: A cutterhead dredge would remove and pump sediment dredged from the Grand-Tiger Pass Federal navigation channel directly to the Project Area over a distance of approximately 11 miles. This direct route includes utilizing the same Haliburton Road slip route to the Project Area as was used in the initial Tiger Pass BUDMAT Project. All discharge pipeline is temporary.

3.3.2 Screening of Management Measures

Management Measures 1, 2, 4, 5, 6, 8, and 9 were screened from further consideration based on the following rationale:

Management Measure 1: Measure 1 was screened with the understanding that a coastal ridge on its own would neither provide an appreciable level of benefits compared to the cost to construct nor be sustainable enough to last, as an independent feature, for a significant amount of time.

Management Measure 2: Measure 2 was screened due to its single purpose nature. The focus of the State Master Plan for a Sustainable Coast in this area of the state is the construction of only a ridge. Therefore, while the construction of marsh habitat only is certainly beneficial, that action would not be consistent with the State Master Plan. The construction of a ridge with a marsh platform on the north side of the ridge is a more sustainable and more typical arrangement of ridge and marsh throughout coastal Louisiana.

Management Measures 4 and 5: Measures 4 and 5 were screened due to the fact that the site is expected to self-colonize with vegetation.

Management Measure 6: Measure 6 was screened because the proposed construction is highly constrained by significant pipeline relocation requirements. This measure would have involved constructing bird islands a significant distance from existing land to prevent predators from swimming to the island to prey on nesting birds, their young or eggs. It was also determined there are too many pipelines in the area to risk moving equipment across large areas since impacts to one or more pipelines is almost a certainty. This added cost was determined to force this measure implementation to be higher than any other available measure. The area was near the terminal end of Tiger Pass – SAV issues would have been a remark from resource agencies. Avoidance of high relocation costs resulted in designs that did not meet the project planning goals and planning objectives.

Management Measure 8: Measure 7 was screened early in the evaluation process because of extremely high preliminary ROM costs associated with the delivery of dredged material to the targeted disposal sites.

Management Measure 9: Measure 9 was screened early in the evaluation process because there are currently no funded O&M events scheduled. Also, material that would be dredged from the Grand-Tiger Pass navigation channel is not suitable for placement in a manner for the that would meet the goals and objectives if this project. Finally, this alternative cannot be implemented without an O&M project.

After the screening of Management Measures, only 3 and 7 were carried forward.

3.4 Initial Array of Alternatives

Through coordination between the USACE, the NFS and natural resource agencies, the following two alternatives (reference Figure 8 and Figure 9 for locations) were developed from the remaining management measures. The difficulty in locating or identifying reasonable sites that could be used for marsh and ridge restoration was based on factors that include, but are not limited to: active oil and gas exploration located in the site, which can affect access corridors; and the amount of vegetation already existing at the site, such that placement of dredged material would result in negative impacts. These factors were assessed on a qualitative basis only.

The following describes the initial array of Alternatives that were developed for comparison and selection of a Tentatively Selected Plan (TSP), then a more detailed analysis and description of the TSP was developed.

No Action Alternative: **Future Without Project Conditions**.

In the FWOP or No Action Alternative, the Proposed Action would not be implemented and the predicted additional environmental gains would not be achieved. The Project Area generally consists of open water, highly degraded remnant ridge features, and remnant marsh habitat. The FWOP condition is likely to continue a path of general habitat and resource degradation, except in those areas where dredged material from the Mississippi River maintenance events is placed in a manner conducive to coastal habitat creation and restoration (i.e., initial LCA BUDMAT at Tiger Pass Project). Dredged material would continue to be disposed within the Federal Standard.

Section 2.2, entitled "*Existing and Future Without Project or No Action Conditions*" of the 2010 Report, provides a comprehensive discussion of the FWOP conditions of various coast wide resources that remain applicable to this EA. See Section 2.2.1.2, page 21 of the 2010 Report and the 2004 LCA Study, Volume 1, Section 2.3 PROBLEMS, CRITICAL NEEDS, AND OPPORTUNITIES, page 2-39; 2010, Report, pages 46-47, which are incorporated herein by reference:

> "Soil erosion and land loss would continue into the future. Natural and man-made levees would continue to subside and organic soils would not be able to maintain their elevations due to subsidence, decreased plant productivity, and wave erosion. Delta formation would continue at the mouth of the Mississippi and Atchafalaya Rivers. As erosion continued, there would be a continued loss in primary productivity due to loss

> of vegetated wetlands. Water-bodies would grow larger and wave erosion would accelerate causing further land loss, thus making coastal communities more vulnerable to tropical storms. In addition to land loss in coastal Louisiana, a large percentage of the Nation's wetlands would continue to disappear with accompanying impacts to wildlife, fisheries, coastal communities, and socioeconomic resources."

In addition, net primary productivity within the Project Area would continue to decline and existing wetland vegetation would continue to diminish. The ongoing conversion of existing fragmented emergent wetlands to shallow open water would continue with associated indirect impacts on coastal vegetation, fish and wildlife resources, Essential Fish Habitat, recreation, aesthetic, and socioeconomic resources. Other indirect adverse impacts that would result from the loss of important and essential vegetated habitats used by fish and wildlife are the feeding, roosting, cover, nursery, and other life requirements for fish and wildlife; loss of productivity; loss of transitional habitat between estuarine and marine environments; and increased inter- and intraspecific competition between resident and migratory fish and wildlife species for decreasing wetland resources. This would also reduce the availability of important stopover habitats used by migrating Neotropical birds.

The 2004 LCA Study estimated that coastal Louisiana would continue to lose land at a rate of approximately 6,400 acres per year (10 square miles per year) over the next 50 years. It is estimated that an additional net loss of approximately 328,000 acres (513 square miles) may occur by 2050, which is almost 10 percent of Louisiana's remaining coastal wetlands. However, these wetland soil losses may be offset to some extent by other federal, state, local, and private restoration efforts across coastal Louisiana including approximately 2,650 net acres of wetland soils that would be restored through the beneficial use of dredged material within the Federal Standard from CEMVN's O&M program, or with additional funding sources.

Alternative 1: Restoration of a coastal ridge and wetland habitat complex at Spanish Pass (site SP2)[8]

The PDT combined the measures to formulate the following alternatives:

Alternative 1a: Restoration of a coastal ridge and wetland habitat complex at Spanish Pass via direct pipeline pump from the HDDA

Alternative 1b: Restoration of a coastal ridge and wetland habitat complex at Spanish Pass via barge haul from the HDDA

This alternative would restore a portion of the historic ridge that once ran along the banks of Spanish Pass (Figure 8 and Figure 9) and restore marsh habitat on the north 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.

[8] SP2 is adjacent to site SP1 from Tiger Pass I project

Construction would include an 8,700-foot-long non-continuous ridge approximately 2.5 miles west of LA Hwy 23 in Venice, LA continuing west along the north side of Spanish Pass. The ridge would be constructed to an initial elevation of +6.5 feet NAVD88 with a 200 foot wide base, and it is expected that the ridge crown would settle to an elevation of approximately +6.0 feet NAVD88 within 1-2 years of completion of construction. An approximately 500-foot-wide marsh platform would be constructed along the entire length of the earthen ridge on its north side. The marsh platform would be constructed to an initial fill height of +3.5-feet NAVD88 and would be surrounded by a perimeter retention dike. It is expected that the marsh platform would settle/dewater to an elevation of approximately +2.0-feet NAVD88, within 10 years of completion of construction.

Both the marsh platform and the ridge would be divided into sections to avoid the existing pipeline corridors. Construction could use as much as 2,000,000 CY of dredged material. The ridge and marsh platform features would serve as a means to reduce wave energy on the north side of the Project Area. Approximately 91.6 acres of marsh habitat and 29.8 acres of coastal ridge would be constructed. Additionally, the construction of these features would impact 22.9 acres of existing marsh within the fill footprint.

Under this alternative, the ridge and marsh platform would tie into the western edge of the newly constructed Tiger Pass Project along the northern side of Spanish Pass.

Alternative 2: Restoration of a coastal ridge and wetland habitat complex at Red Pass (site RP)

The PDT combined the measures to formulate the following alternatives:

Alternative 2a: Restoration of a coastal ridge and wetland habitat complex at Red Pass via direct pipeline pump from the HDDA

Alternative 2b: Restoration of a coastal ridge and wetland habitat complex at Red Pass via barge haul from the HDDA

A Red Pass Ridge Restoration project is currently recommended in the State Master Plan. This project recommends restoring a portion of the remnant ridge along Red Pass (Figure 9) and restoring degraded marsh immediately north of the ridge. A conceptual project footprint and description is proposed as part of the State Master Plan, but the project planning and engineering did not progress past this phase. The original concept called for 3,750,000 CY of material to be placed along the right descending shoreline of Red Pass to restore degraded ridges and provide marsh restoration. The Red Pass ridge is like other historic ridges of the lower delta in that it has eroded and subsided over time.

During an interagency site visit on September 13, 2017, it was discovered that the area available for ridge and marsh restoration is smaller and shallower than anticipated by the conceptual plan proposed in the State Master Plan. Due to conditions observed and verified in the field on the site visit, the proposed project restoration plan was adjusted

accordingly. The restored feature would include a ridge approximately 5,000 feet long constructed to an elevation of +6.5 feet NAVD88 with a 200-ft wide base. The ridge would begin on the right descending bank of Red Pass just west of the Red Pass/Pass Tante Phine junction. In addition to the ridge restoration, there would be two proposed marsh restoration cells at this site. The marsh platform would be constructed to a height of +3.5 feet NAVD88. Because this proposed restoration plan is smaller and shallower than the conceptual plan, the initial estimated cubic yardage of 3,750,000 CY was reduced to 825,000 CY of sandy dredged material from the HDDA. Approximately 73 acres of marsh habitat and 23 acres of coastal ridge would be constructed. Additionally, the construction of these features would impact approximately 36.05 acres of existing marsh within the fill footprint.

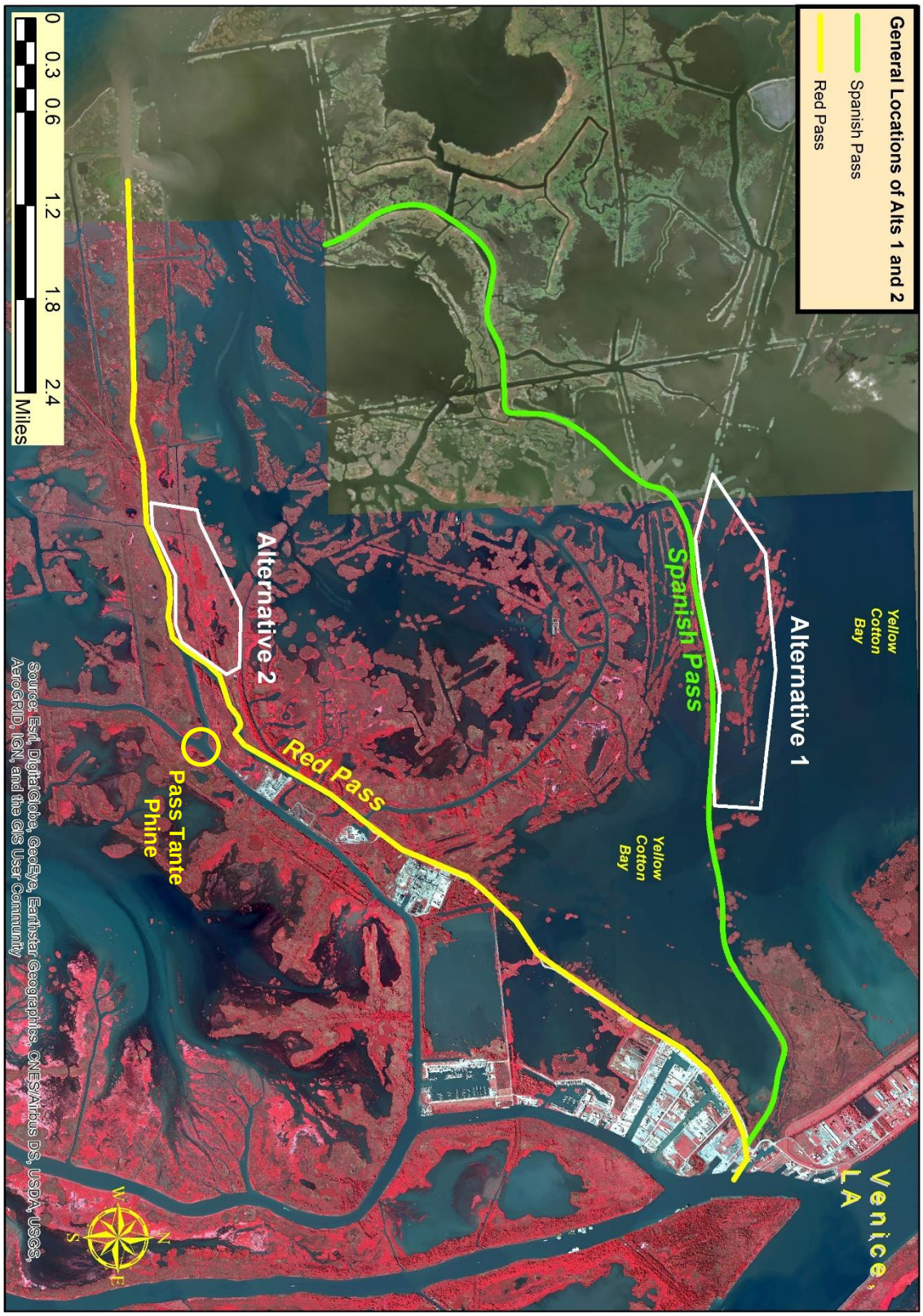

Figure 9. General Locations of Alternatives 1 and 2.

3.4.1 Screening Criteria

The initial list of alternatives was screened based on ability to meet the project purpose and need, planning constraints, technical feasibility, and likelihood for implementation. The FWOP along with Alternatives 1 and 2 were carried forward for a comparison of the benefits (Section 3.4.2) and costs (Section 3.6). Benefits were calculated by the United States Fish and Wildlife Service (USFWS) for the CEMVN using Wetland Value Assessment (WVA) methodologies (Section 3.4.2 and Appendix B, Annex D).

3.4.2 Wetland Value Assessment

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. 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 creation and 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 Proposed Action would adversely impact fish and wildlife resources.

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. Construction of the Proposed Action and the other Alternative would temporarily impact remnant degraded marsh within the Project Area but would provide a recruitment source for restored marsh to re-vegetate within the Project Area. The projected habitat benefits (expressed in estimated AAHUs)[9] are summarized in Table 4.

Table 4. LCA Tiger Pass 2 BUDMAT Alternatives with Associated Acres and Net AAHUs Generated

Alternative	Marsh restoration area (acres)	Estimated Net marsh AAHUs	Ridge restoration area (acres)	Estimated Net ridge AAHUs	Estimated Total project AAHUs
1 (a and b)	91.6	38.08	29.8	18.54	**56.62**
2 (a and b)	73	13.51	23	14.74	**28.25**

See the WVA model results and summary of assumptions (Appendix B, Annex D). The draft U.S. Fish and Wildlife Coordination Act Report (CAR) dated February 8, 2018 (Appendix G) also offers information about the WVA process.

3.4.3 Initial Screening of Alternatives

Alternative 1 (a and b) and Alternative 2 (a and b) were then compared based on the estimated acres of habitat that could be restored and parametric cost estimates to determine if there was any apparent benefit in eliminating one Alternative from further consideration. At this point in the formulation of alternatives, the entire estimated cost of each of the alternatives is used as an initial comparison between the alternatives (Table 5).

Table 5. Initial Comparison of Alternatives

Alternative	Total BUDMAT Cost
Alternative 1a	$22,517,000
Alternative 1b	$19,689,000
Alternative 2a	$22,485,000
Alternative 2b	$ 9,774,000

[9] The AAHUs are based on draft WVA analyses performed by USFWS, which may change upon finalization. Acres and AAHUs reported in draft Fish and Wildlife Coordination Act Reports (CARs) are based on a less advanced level of engineering design than the final project description and, in this instance, the draft CAR reflects approximately 136 acres of marsh and ridge construction for Alternative 1 rather than the more refined estimate of approximately 121.4 acres. The current project description will be utilized in the production of the final CAR.

Table 6 displays the expected environmental outputs in terms of habitat units along with the total cost and average annual cost for Alternatives 1 and 2.

Table 6. Summary of Outputs and Costs

Alternative	Total Cost	Average Annual Cost	Estimated Average Annual Habitat Units(AAHUs)	Cost Effective
No Action	$0	$0	0	-
Alternative 1a	$22,517,000	$834,000	56.62	No
Alternative 1b	$19,689,000	$730,000	56.62	**Yes**
Alternative 2a	$22,485,000	$833,000	28.25	No
Alternative 2b	$9,774,000	$362,000	28.25	**Yes**

Note: Costs are shown at the 2018 price level and were annualized using the current FY18 Federal discount rate of 2.75 percent over a 50-year period of analysis.

Alternatives 1a and 2a were the most expensive. Because those alternatives provide the same benefits, but cost more, they are not cost-effective and were not considered for inclusion in the final array of alternatives. Alternatives 1b and 2b, and the FWOP (No Action) Alternative were carried forward for a more detailed assessment.

3.5 Final Array of Alternatives

The remaining Alternatives are technically feasible and can be implemented because they meet planning goals and objectives. These Alternatives were carried forward for comparison of benefits and cost.

No Action Alternative: Future Without Project Conditions

Alternative 1b: Restoration of a coastal ridge and wetland habitat complex at Spanish Pass via barge haul from the HDDA

Alternative 2b: Restoration of a coastal ridge and wetland habitat complex at Red Pass via barge haul from the HDDA

3.6 Comparison of Final Array Alternatives

3.6.1 Cost Effectiveness and Incremental Cost Analysis

For environmental planning, where traditional benefit-cost analysis is not possible because costs and benefits are expressed in different units, two analytical methods are used to assist USACE planners in the decision process. First, cost effectiveness (CE) analysis is conducted to ensure that the least cost solution is identified for each possible level of environmental output. Subsequent incremental cost analysis (ICA) of the cost effective solutions is conducted to reveal changes in costs for increasing levels of environmental outputs. In the absence of a common measurement unit for comparing the non-monetary benefits with the monetary costs of environmental plans, cost

effectiveness and incremental cost analysis are valuable tools to assist in decision making.

It is important to keep in mind that the most useful information developed by these two methods is what it tells decision makers about the relative relationships among solutions – that one will likely produce greater output than another, or one is likely to be more costly than another – rather than the specific numbers that are calculated. Furthermore, these analyses will usually not lead, and are not intended to lead, to a single best solution (as in economic cost-benefit analysis); however, they will improve the quality of decision making by ensuring that a rational, supportable approach is used in considering and selecting alternative methods to produce environmental outputs.

To perform the CE/ICA, use was made of the Institute for Water Resource (IWR) Planning Suite Decision Support Software developed by the USACE IWR. IWR Planning Suite has been developed to assist with plan comparison by conducting cost effectiveness and incremental cost analyses, identifying the plans which are the best financial investments ("Best Buys"), and displaying the effects of each on a range of decision variables. The software is available via the IWR Planning Suite Internet. The latest version (2.0.6.1) has been certified for use by USACE Headquarters, meaning that it has been reviewed and certified by the appropriate Planning Center of Expertise (PCX) and represents a corporate approval that the model is sound and functional. The Alternatives considered in the IWR Planning Suite are mutually exclusive and are not combinable. The combination of various sites was considered when developing the initial array of Alternatives.

3.6.1.1 *Cost Effective Solutions*

In cost effectiveness analysis, it is necessary to filter out plans that produce the same output level as another plan but cost more; or cost the same amount or more than another plan, but produce less output. The CE analysis, performed by the IWR planning model, ensures that no other plan provides equal or greater benefit for equal or lesser cost.

The No Action Alternative is, by definition, cost effective since all of the proposed Alternative plans incur some cost. Alternative 1b provides more AAHUs than any other Alternative; however, it incurs the most costs. Alternative 2b costs less than Alternative 1b, but provides fewer benefits. Alternatives 1b and 2b, as well as the No Action Alternative, are cost effective and are carried forward for incremental cost analysis to determine if one or both could be a best buy plan.

3.6.1.2 *Incrementally Justified Solutions (Best Buy Plans)*

The final step in the analysis is to determine which subset of the cost effective solutions is also incrementally justified. These solutions, also known as Best Buy Plans or Best Buy Alternatives, are those plans that provide increases in benefits at the lowest average cost (per habitat unit). The IWR Planning model was run to make the necessary

calculations producing the results shown in. In this case, Alternative 1b and 2b are both Best Buy Plans.

Table 7 depicts the "Best Buy and Incremental Costs" per habitat unit for each of the Best Buy plans that can be used to assist in the decision making process. Incremental cost is calculated by dividing the difference between two solutions' costs by the difference between the two solutions' outputs. Reviewing with the incremental cost information now allows the decision maker to make the following comparisons of alternative habitat creation and restoration plans and to progressively ask "Is it worth it?"

Table 7. Best Buy Plans and Incremental Costs.

Alternative	Total Cost	Average Annual Cost	Estimated Average Annual Habitat Units (AAHUs)	Estimated Average Annual Cost per AAHU	Estimated Additional Output (AAHUs)	Additional Average Annual Cost	Estimated Incremental Cost (per habitat unit)
No Action	$0	$0	0	$0	0	$0	$0
1b	$19,689,000	$730,000	56.62	$12,900	28.37	$367,200	$12,900
2b	$9,774,000	$362,000	28.25	$12,800	28.25	$362,000	$12,800

Note: Costs are shown at the 2017 price level and were annualized using the current FY17 Federal discount rate of 2.875 percent over a 20-year design period of analysis.

3.6.1.3 *Cost Analysis*

A cost effective/incremental cost analysis was run on the final array of Alternatives including the No-Action Alternative. Alternatives 1b and 2b are both Best Buy Plans

As noted previously, neither cost effectiveness analysis nor incremental cost analysis will tell the decision maker what choice to make. However, the information developed by both analyses will help the decision maker make a more-informed decision and, once a decision is made, better understand its consequences in relation to other choices. Figure 10 illustrates the cost analysis graphically of Alternatives 1 and 2, and highlights the cost effective solutions and the incrementally justified (Best Buy) solutions (in this case both Alternatives are cost effective and best-buys).

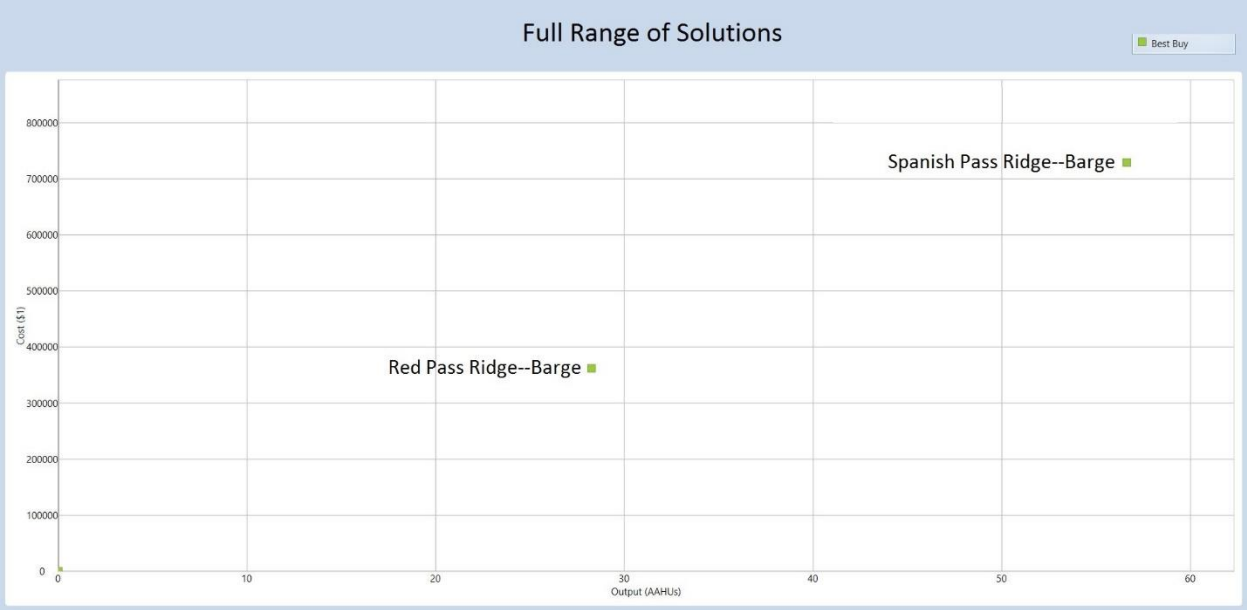

Figure 10. Cost-Effectiveness Display of Alternatives.

3.7 Selection of the Tentatively Selected Plan (TSP)

3.7.1 Summary of Accounts and Comparison of Alternatives

To facilitate the evaluation and display of effects of the alternative plans, there are four accounts which are set forth in the 1983 P&G, and referenced in ER-1105-2-100, which encompass all significant effects of a plan on the human environment that must be considered in the alternatives screening process:

(1) The National Economic Development (NED) Account displays changes in the economic value of the national output of goods and services.

(2) The Environmental Quality (EQ) Account displays non-monetary effects on ecological, cultural, and aesthetic resources including the positive and adverse effects of ecosystem restoration plans.

(3) The Regional Economic Development (RED) Account displays changes in the distribution of regional economic activity (e.g., income and employment).

(4) The Other Social Effects (OSE) Account displays plan effects on social aspects such as community impacts, health and safety, displacement, energy conservation and others.

Although the display of the NED and the EQ Accounts is required, the NED Account does not apply as a screening factor for this Project because the Project is not designed to produce economic benefits, therefore the NED account is not considered in the evaluation of alternatives for the Project. Display of the RED and OSE Accounts is discretionary.

The RED Account is not displayed or factored in this Report because the proposed Project for ecosystem restoration will not have an impact on employment or income within the Project Area. The categories of effects in the OSE Account include: urban and community impacts; life, health, and safety factors; displacement; long-term productivity; and energy requirements and energy conservation.

3.7.2 Tentatively Selected Plan Defined

As described in ER-1105-2-100, for ecosystem restoration projects, a TSP that reasonably maximizes ecosystem restoration benefits compared to costs and which is consistent with the Federal objective, shall be selected. The TSP must be shown to be cost effective and justified to achieve the desired level of output. The TSP shall be identified as the National Ecosystem Restoration (NER) Plan.

3.7.3 Acceptability, Completeness, Effectiveness, and Efficiency

Alternatives considered in any planning study, not just ecosystem creation and restoration studies, should meet minimum subjective standards of these criteria in order to qualify for further consideration and comparison with other plans. **Error! Reference source not found.** provides a summary of the acceptability, completeness, effectiveness and efficiency for the No Action and Alternatives 1b and 2b. The No Action Alternative does not provide any resolution to the problems and opportunities, nor does it meet goals and objectives. Alternative 2b does provide a resolution to the problems and opportunities; and does meet goals and objectives. However, it provides less in terms of habitat benefits, while at the same time impacting more submerged aquatic vegetation, existing marsh, and existing ridge habitat than would be impacted with implementation of Alternative 1b. Furthermore, due to the number of pipelines within the proposed footprint of Alternative 2b, implementing the project in a manner to avoid existing oil and gas infrastructure and to minimize relocations could significantly increase the cost and potentially impact additional existing habitat. Therefore, Alternative 2b was not selected as the TSP. Alternative 1b meets the requirements of completeness, effectiveness, efficiency, and acceptability, and therefore was selected as the TSP.

Alternative	Completeness	Effectiveness	Efficiency	Acceptability
No Action	This Alternative provides no benefits.	This Alternative will not alleviate any problems or achieve any opportunities.	This Alternative is neither a Best Buy nor is it Cost Effective.	This plan can be implemented by taking no action, but it provides no solution to the identified problems.
SP1b	This Alternative can be implemented and contributes to addressing all of the identified restoration problems or opportunities and provides similar benefits to other alternatives. The plan is complete in that it addresses goals and objectives of the NFS sponsor - Plaquemines Parish Government. And is consistent with the State Master Plan.	Addresses Problems and Opportunities. Meets goals and objectives by restoring critical coastal habitat.	Best Buy	Acceptable to the NFS, the CPRAB, and other state and Federal agencies.
RP2b	This Alternative can be implemented and contributes to addressing all of the identified restoration problems or opportunities and provides similar benefits to other alternatives. The plan is complete in that it addresses goals and objectives of the NFS sponsor - Plaquemines Parish Government. And is consistent with the State Master Plan.	Addresses Problems and Opportunities. Meets goals and objectives by restoring critical coastal habitat.	Cost Effective	Acceptable to the NFS, the CPRAB, and other state and Federal agencies.

Table 8. Acceptability, Completeness, Effectiveness, and Efficiency.

3.8 Description of the TSP (Alternative 1b – Restoration of a coastal ridge and wetland habitat complex at Spanish Pass via barge haul from the HDDA)

*Proposed Action (for this section, Reference**Error! Reference source not found.**)*

The Project would use as much as 2,000,000 CY of silty sandy material obtained during dredging of the HDDA, located at the Head of Passes of the Mississippi River Bird's Foot Delta, to construct a ridge and marsh platform approximately 2.5 miles west of LA Hwy 23 in Venice, LA. The Project would extend the ridge and marsh platform constructed under the initial LCA BUDMAT Tiger Pass Project an additional 8,700 (non-continuous) feet westward.

The new ridge and marsh platform would mimic the design used for the initial Tiger Pass Project, and ingress and egress of construction personnel and some equipment to the project site would be allowed via Spanish Pass, beginning at Spanish Pass road off of La Hwy 23, at a previously cleared staging area. The ridge would be constructed to an initial elevation of +6.5 feet NAVD88 with a 200 foot wide base. It is expected that the ridge crown would settle to an elevation of approximately +6.0 feet NAVD88 within 1-2 years of completion of construction. An approximately 500-foot-wide marsh platform would be constructed along the entire length of the earthen ridge on its north side. The marsh platform would be constructed to an initial fill height of +3.5-feet NAVD88 and is expected

to settle/dewater to an elevation of approximately +2.0-feet NAVD88 within 10 years of completion of construction.

Due to existing pipelines at the site, the ridge and marsh platform constructed by the Project will be non-continuous. The gaps to accommodate pipelines comprise approximately 1,900 linear feet of the ridge footprint, and the Project will restore approximately 6,800 linear feet of ridge. The Project would be constructed in three cells, which would be 27.2, 84.3, and 38.0 acres, respectively, from west to east, and surrounded by a perimeter retention dike. The total project footprint, or total diked footprint, would be 149.5 acres.

Material to construct the perimeter retention dike could come from within the project footprint or outside of the project footprint. See section below named "Retention Dikes and Retention Dike Borrow" for more details. See Table 9 below for approximate acreages of relevant project features.

Table 9. Summary of area calculations for relevant features for this Proposed Action, including estimated existing marsh acres within the Project Site.

Feature Description	WEST Cell	MIDDLE Cell	EAST Cell	TOTAL	NOTES:
Total Diked footprint	27.2	84.3	38.0	149.5	Entire Impacted fill area, based on outer toe of dike alignment
Marsh Platform*	15.8	49.9	25.9	91.6	Area within total diked footprint that would be filled to target marsh elevation. Excludes ridge and retention dike.
Restored Ridge*	4.9	19.7	5.2	29.8	Area within total diked footprint that is filled above target marsh elevation to restore ridge
Retention Dike*	6.5	14.7	6.9	28.1	Acreage of retention dikes within total diked footprint
Existing Marsh	4.0	17.2	1.7	22.9	Existing marsh within the total diked footprint
Exterior Borrow North	1.1	5.8	4.4	11.3	Exterior borrow source outside of Spanish Pass and north of the total diked footprint
Exterior Borrow South	1.9	7.7	1.9	11.5	Exterior borrow source inside of Spanish Pass and north of the total diked footprint

*Components of the Total Diked Area

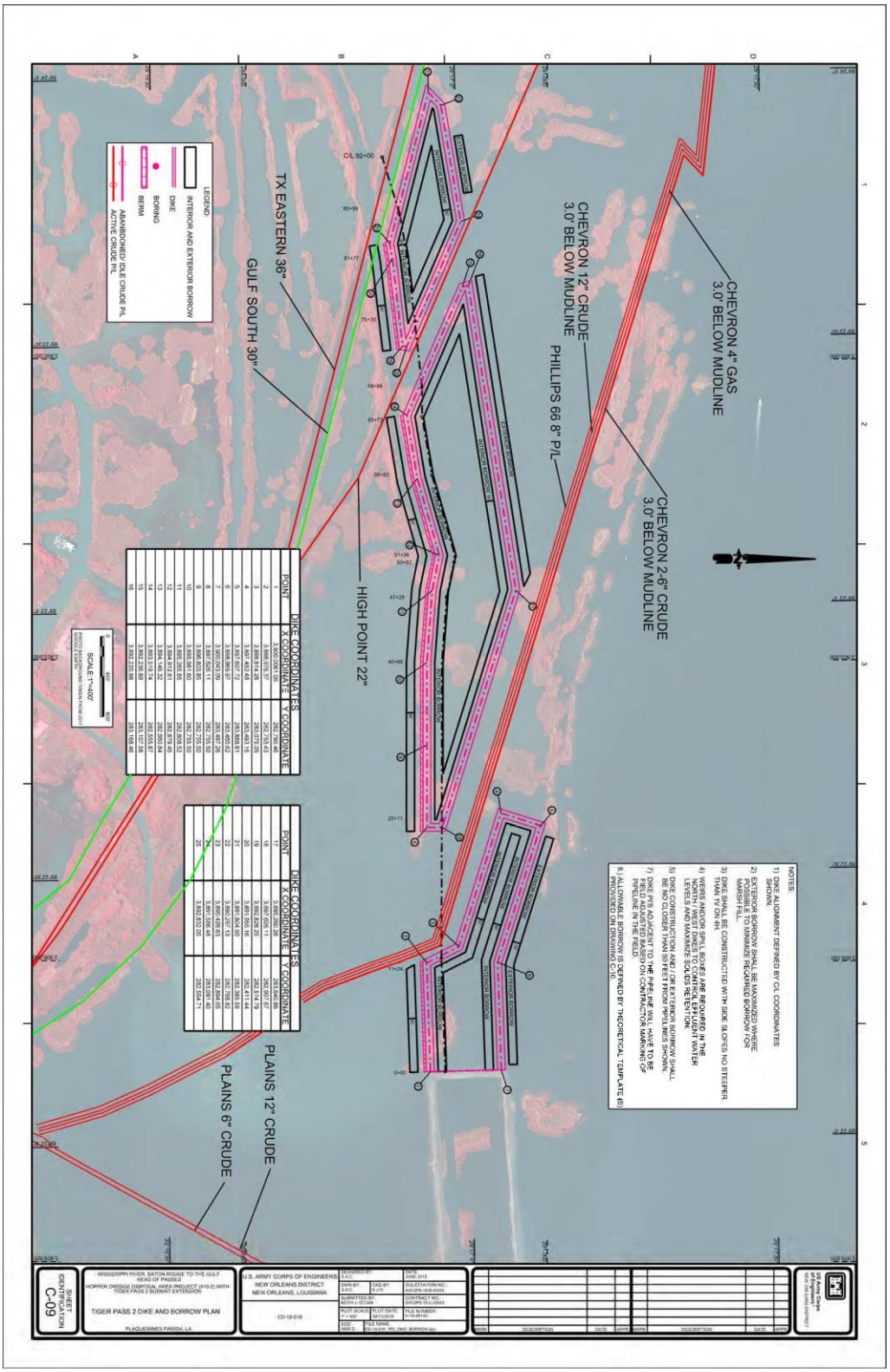

Figure 11. Proposed Action for the LCA BUDMAT Tiger Pass 2, Alternative 1b.

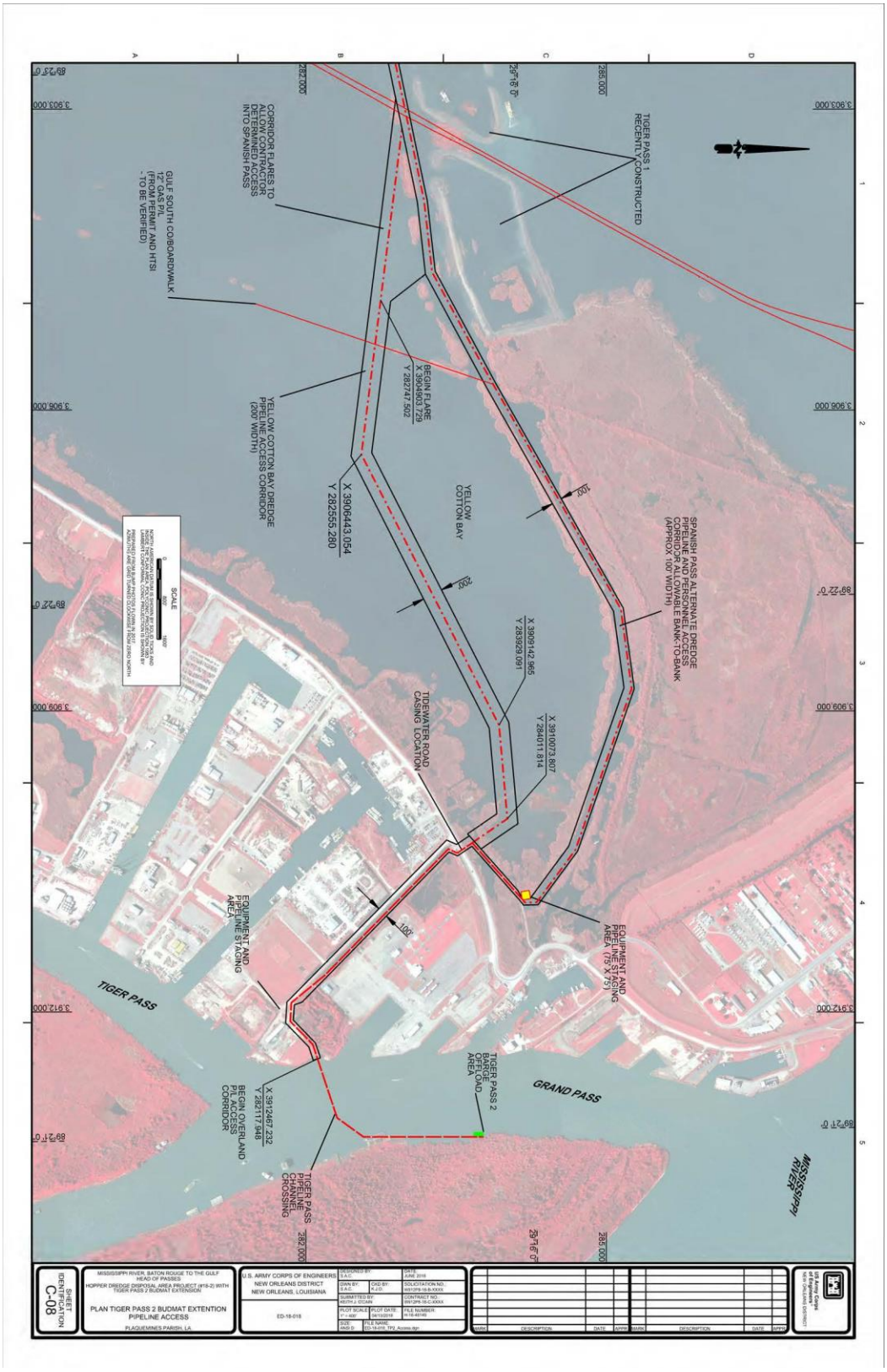

Figure 12. Proposed Discharge Pipeline Routes to the LCA BUDMAT Tiger Pass 2 TSP Project Site

Dredge Material Transport Method

There are two options for transporting the dredge material from the HDDA to a slip at Haliburton Road via barge haul.

1. This option would be done using a cutterhead dredge in the HDDA that pumps material into hopper barges. Once the hopper barge is filled with dredged material, it would be transported by tugboat to a DDMTS located in open water along the bankline of Grand Pass. From that location, dredged material would be hydraulically removed from the hopper barge via the DDMTS and pumped through a discharge pipeline that lies submerged across Grand Pass until it comes onto land at an existing slip at the end of Haliburton Road. From the slip at Haliburton Road to the project site, material would be transported via discharge pipeline to the Project Area. All discharge pipeline is temporary.

2. This option would use a hopper dredge with pump-out capability. A shallow hopper dredge could be loaded with dredged material and then transit to Grand Pass, at which point the material within the hopper dredge would then be pumped out and discharged through a discharge pipeline at the Haliburton Road slip. From the slip at Haliburton Road to the project site, material would be transported via discharge pipeline to the Project Area. All discharge pipeline is temporary.

At the slip at Haliburton Road, the discharge pipeline would then travel along the north side of Haliburton Road and be placed within the existing drainage canal paralleling the road. Impacts to traffic on Haliburton Road would be minimal during dredged material disposal operations. A small triangular staging area is proposed at the pipeline's intersection with Haliburton Road to accommodate pipeline and /or equipment offloading and reloading.

The discharge pipeline would then cross under Tide Water Road via a 42-inch casing that was bored under the road during the initial LCA BUDMAT Tiger Pass Project. Upon exiting the casing under Tide Water Road, the pipeline could travel via one of two access corridors. For both options, the reach of the pipeline corridor is currently defined as a 200 foot wide direct route[10] from the bored casing location to Spanish Pass, of which the contractor would be limited to using 100 feet. Impacts to marsh within these corridors would be temporary. Upon completion of dredging and disposal activities, any use of either access corridor that results in impacts to existing marsh would be backfilled to approximately the elevation of the surrounding marsh and not to exceed approximately +3 feet NAVD88 in an effort to restore these degraded corridors to pre-project marsh elevations.

[10] The western end of the corridor flares to a width greater than 200 ft. to allow the contractor to go around existing marsh islands to enter Spanish Pass. See Figure 12 and subsequent discussion of the alternate corridor.

One alternate pipeline access corridor, via the open waters between Tide Water Road and Spanish Pass, and then into Spanish Pass to access the project site, was cleared in SEA 542.A with temporary impacts to marsh estimated to be approximately 1.1 acres.

Another, new alternate pipeline access corridor would be made available that occurs primarily in open water between Spanish Pass and Tide Water Road, and is 20.25 acres of open water at the maximum 100 foot width that contractors would be allowed to use. Potential temporary impacts to existing marsh at the maximum width would be approximately 0.96 acres on the eastern side. The western end of the new alternate corridor flares to a width greater than 200 ft. to allow the contractor to go around existing marsh islands to enter Spanish Pass (See Figure 12). No impacts to wetlands would be allowed on the western end of the new alternate corridor. No impacts to existing pipeline right-of-ways would be allowed for either corridor.

None of the proposed routes would require the discharge 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.

Refurbishment of a staging area, located at the west end of Spanish Pass Road and adjacent to Spanish Pass, and previously cleared and constructed during the initial Tiger Pass Project, would possibly be required. The staging area, comprised of crushed stone aggregate, was constructed for the initial Tiger Pass Project and measures approximately 75-feet in width and 75-feet in length, and impacted approximately 1.3 acres of intermediate marsh at that time. The staging area will remain in place for future use.

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 routine O&M dredging of the HDDA when it disposes of materials in the Delta NWR, the Pass A Loutre WMA, and the open waters of West Bay.

All discharge pipeline is temporary.

Retention Dikes and Retention Dike Borrow

Earthen retention dikes would be needed in order to facilitate construction of the ridge and marsh platforms, and would be allowed to settle and/or erode, as well as vegetate naturally over time. If necessary, these retention dikes would be later breached or degraded to the settled elevations of the disposal area by the NFS.

Site conditions are assumed to be similar to the adjacent Tiger Pass Project, although a geotechnical investigation is ongoing. Based on these assumptions, the retention dikes would be constructed to a crown width of 5 feet, crown elevation of +5 feet NAVD88, and side slopes no steeper than 1V on 4H. The dikes to be constructed along the south side of the ridge would also include a berm (approximately 25 feet in width), to be constructed

to elevation 0.0-feet NAVD88, and with slopes no steeper than 1V on 4H. The berm would tie into the southern slope of the retention dike, extend at elevation 0.0 feet NAVD88, and then tie into the water bottom (approximately -3.5 feet NAVD88) on a slope no steeper than 1V on 4H. The above referenced berm width, side slopes and ground elevations will be verified by geotechnical investigations , testing and design, as well as surveys, to be performed for the proposed ridge and marsh platform.

Borrow for construction of the retention dikes would be obtained from either an adjacent borrow site or would come from within the proposed ridge and marsh platform footprint, or both. Borrow excavation or placement would not be allowed within any pipeline corridors. Although borrow excavation for retention dikes would be allowed adjacent to and outside of the project footprint, it would not be allowed where existing wetlands are present. Approximately 11.3 acres could be used for borrow to construct retention dikes north of the project footprint and outside of the Spanish Pass. Approximately 11.5 acres could be used for borrow south of the project footprint and within Spanish Pass.

Error! Reference source not found.Error! Reference source not found. provides general design details associated with ridge and marsh platform, as well as proposed borrow locations and dimensions for retention dike construction.

Pipeline/ Utility Corridors

There are several pipeline/utility corridors that pass through the Project Area. To avoid impacts to pipelines, no-work corridors will be established at each pipeline crossing location between each section of the ridge and marsh platform. With the exception of allowable placement of dredge fill over the pipelines to provide a land bridge for equipment access, no work will be performed within 50-feet of any pipelines, unless they have been abandoned in place and the pipeline owner has consented to construction over their pipeline(s). The no work area includes the outside toes of the earthen retention dikes that are to be constructed adjacent to and parallel to the pipelines.

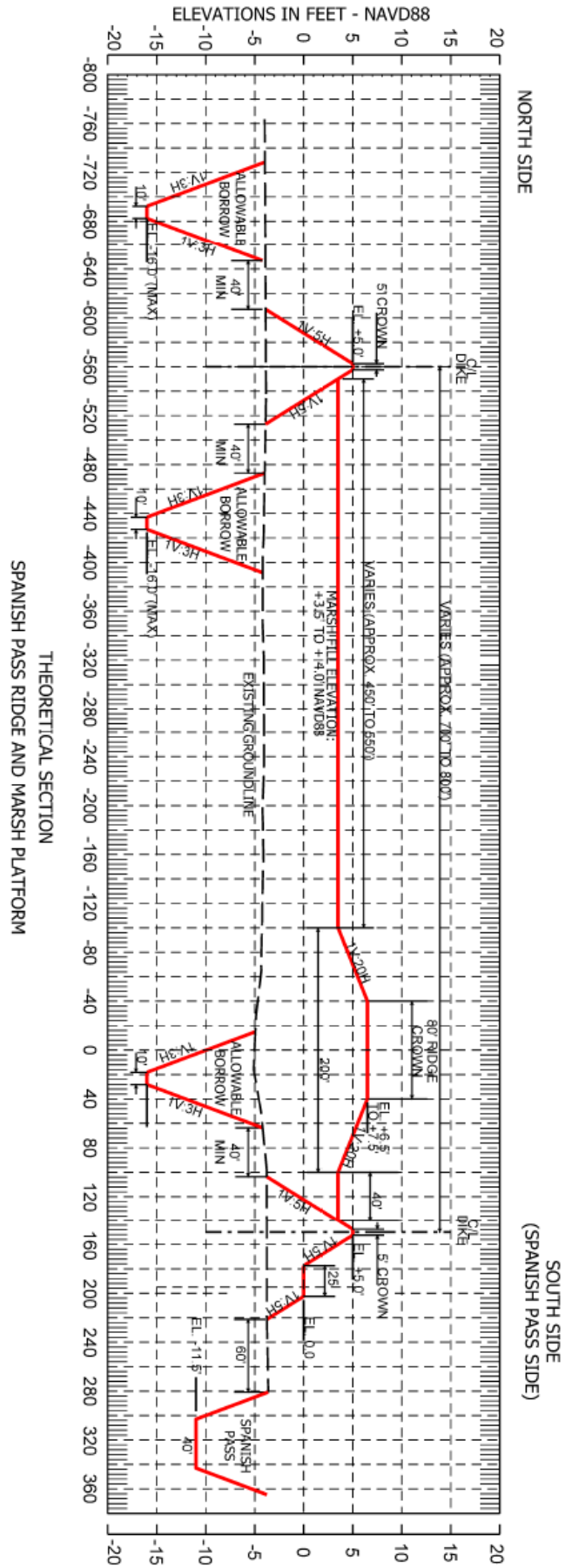

Figure 13. Alternative 1b – Theoretical X-Section.

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4.0 Implementation of the TSP (Alternative 1b)

The following sections outline the expected outcomes of the TSP.

4.1 Significance of the TSP

As indicated in Section 3.7 (Selection of the Tentatively Selected Plan) the TSP meets the Planning and Guidance criteria of acceptability, completeness, effectiveness, and efficiency. Restoration of critical geomorphic features enjoys a high profile and broad base of support from the public at large. The TSP meets the goals and objectives of the Project by restoring a critical coastal geomorphic feature, the ridge component, and restoring coastal marshes behind the ridge in an area that has and continues to experience a significant rate of marsh loss. The TSP will be constructed to an elevation that will allow for the marsh to exist for at least 50 years after construction. The construction of retention dikes is also effective and efficient as it maximizes the cost per benefit output and utilizes a resource that is readily available in a manner that has the potential to restore the most useable habitat. The institutional, public, and technical significance of the TSP and its impact on various coastal resources is consistent with those outlined in Section 2.2 of the 2010 Report.

4.2 Cost of the TSP

The following describes the Project cost for the TSP and the cost per total estimated AAHUs. A Micro-Computer Aided Cost Engineering System Second Generation (or M2) Total Project Cost Summary (Appendix F. Cost Certification and Total Project Cost Summary). The incremental costs for this Project are the costs that exceed the “base plan costs” of the authorized Federal navigation project. The term “base plan costs” describes the Federal Standard, and refers to the costs, as determined by the USACE, to carry out the dredging and disposal of material for the for O&M of the Federal navigation project in the most cost effective way, consistent with economic, engineering, and environmental criteria.

Table 10 provides the estimated cost of the Federal Standard for O&M, the Project Cost for implementation of the TSP, and the incremental difference of the two which is the Total Project Cost for the Project. Table 10 further provides the Federal and Non-Federal Responsibility for the Project (cost are rounded to the nearest $1K from the estimates provided in Appendix F. Cost Certification and Total Project Cost Summary.

Table 10. Project Cost (in 100s of dollars)

	O&M at the Federal Standard (100% Federal)	BUDMAT TSP	BUDMAT Project Cost	Federal Responsibility under BUDMAT (75%)	NFS Responsibility under BUDMAT (25%
First Construction Cost	13,500	27,300	19,000	14,000	4,700
LERRD*	0	705	705	0	705
Total Project Cost	**13,500**	**28,000**	**19,700**	**14,000**	**5,400**

4.3 Benefits of the TSP

The initial comparison of alternatives, and selection of the TSP was based on preliminary design assumptions. For comparison of alternatives it was assumed that the available acres of open water would successfully convert to marsh.

Once the TSP is confirmed as the Recommended Plan in a final DIR/SEA, a more detailed design of the marsh and ridge restoration sites would be developed and the pipeline route will be finalized. The design on the Recommended Plan could provide additional refined details related to the pipeline route and the potential acres being restored through implementation of the Recommended Plan. Table 11 provides the total costs of the TSP, the estimated AAHUs, TSP cost/AAHU, -and a TSP cost/Acre[11].

Table 11. Project Cost and Benefits

TSP cost (rounded to nearest $100)	Recommended Plan Estimated AAHUs	TSP cost/AAHU	TSP cost/Acre
19,700	56.62	348	161

[11] See Footnote 9 (page 57).

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5.0 Environmental Consequences

5.1 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.

Future Conditions with the Proposed Action

Hydraulic cutterhead dredges and discharge 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, with the exception of the marsh and ridge restoration site. Currently, some areas within the marsh and ridge restoration site are accessible to some shallow draft watercraft; however, the shallow nature of the area currently limits most vessel access. Portions of the marsh and ridge restoration site may become permanently inaccessible to some watercraft as wetland vegetation colonizes the area.

5.2 Wetlands

Future Conditions with No Action

Land loss and downward conversion of wetlands in the Study Area, due to subsidence, sea level rise (SLR) and saltwater intrusion would likely continue at the current rate, estimated at approximately 0.33 square miles per year (Couvillion et al. 2017). Construction of recent CWPRRA and beneficial use projects in the area would result in the creation of wetlands within the surrounding area which is intended to offset wetland loss in the area to a limited degree. For example, the adjacent Tiger Pass Project has been constructed and is projected to restore 98.4 acres of wetlands over a 50 year project life.

Without implementation of the Proposed Action, wetlands in the 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 to a less productive 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 vicinity.

However, these wetland losses would be offset to some extent by other federal, state, local, and private restoration efforts through the beneficial use of dredged material within CEMVN's O&M program or with additional funding sources such as CWPPRA, Section 204, or CIAP. Without implementation of the Project, other federal, state, local, and private restoration efforts within the Study Area and near the Project Area would occur. For more information see Section 2.4.

Future Conditions with the Proposed Action

A brief description below was included to better understand how the Proposed Action would both positively and negatively impact wetlands.

The Proposed Action includes three non-contiguous ridge/marsh platform cells (Table 9) (Figure 15). The entire area impacted by fill (Project Site) would be approximately 149.5 acres; approximately 91.6 acres of marsh platform and 29.8 acres of ridge would be restored. These habitats would be restored using dredged material placed within retention dikes. The approximately 28.1 acre earthen retention dikes would be constructed by using nearby material from within the Project Site and if necessary from outside the Project Site. Approximately 11.3 acres could be used for borrow to construct retention dikes north of the Project Site and outside of the Spanish Pass. Approximately 11.5 acres could be used for borrow south of the Project Site and within Spanish Pass. Impacts to existing wetlands would not be allowed when digging borrow pits outside of the Project Site. In addition, no borrow would be removed from pipeline right of ways. Approximately, 22.9 acres of marsh that exist within the Project Site would be impacted during construction, which is much less than the approximately 91.6 acres of marsh that would be restored by the Proposed Action. For a summary of all acreages discussed here, see Table 9.

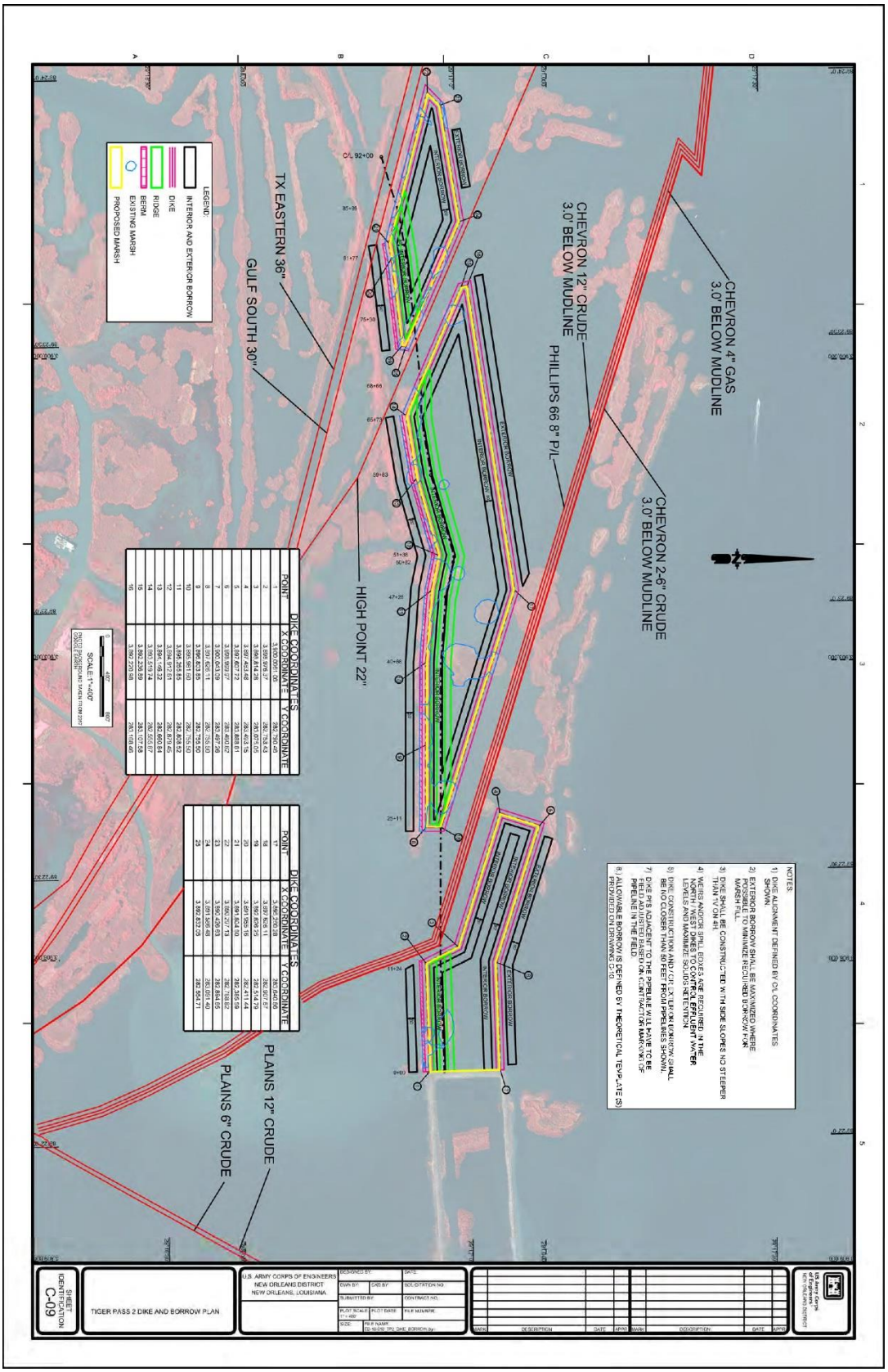

Figure 14. This Figure indicates relevant construction that would occur for the Proposed Action, and the area used to estimate existing marsh (shown as blue polygons). See Table 9 for calculated areas.

There would be two discharge pipeline access routes made available to the contractor, as described in Section 3.8 (Figure 16). Impacts to marsh within these corridors would be temporary. Upon completion of dredging and disposal activities, any use of either access corridor that results in impacts to existing marsh would be backfilled to approximately the elevation of the surrounding marsh and not to exceed approximately +3 feet NAVD88 in an effort to restore these degraded corridors to pre-project marsh elevations. One discharge pipeline corridor was cleared in SEA 542.A with temporary impacts estimated to be approximately 1.1 acres. The new alternate corridor provides a 200 ft. wide path, of which the contractor would only be allowed to use 100 feet of the 200 foot width for access. The total size for this access corridor is 20.25 acres at the 100 ft. width. Potential temporary impacts to existing marsh at a maximum would be approximately 0.96 acres on the eastern side within the 200 ft. width. The western end of the new alternate corridor flares to a width greater than 200 ft. to allow the contractor to go around existing marsh islands to enter Spanish Pass. No impacts to wetlands would be allowed on the western end of the new alternate corridor.

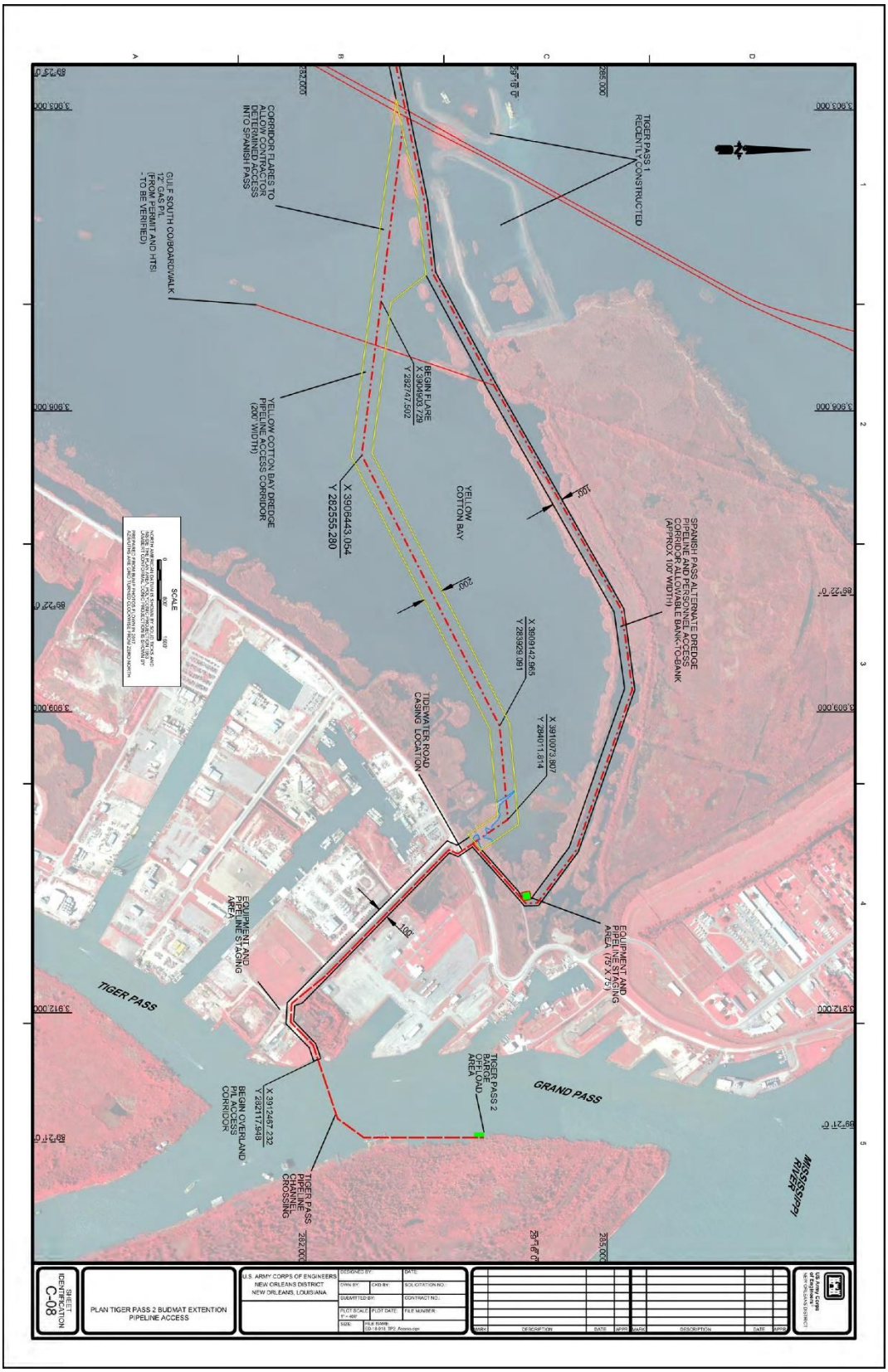

Figure 15. This Figure indicates both access corridors available for use by the contractor. The area outlined in blue on the eastern end of the southern new alternate pipeline indicates the area of estimated maximum temporary marsh impacts.

The Proposed Action would offer some wave impact reduction for the marsh and SAV habitats to the north. Restored 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 the vicinity. 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 document (Appendix B).

5.3 Aquatic Resources/Fisheries

Future Conditions with No Action

Without implementation of the Proposed Action, the Project Area 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 conversion of marsh and associated vegetation to open water would have an adverse impact on fish and shellfish populations inhabiting the area. Consequently, the amount of open water less than 1.5 feet deep is expected to decrease. The pattern of expanding open water bays would diminish opportunities for species that typically utilize emergent wetland habitats. Wetland vegetation loss would degrade the quality of the area for fisheries as food sources and nursery habitat decline.

Aquatic resources and fisheries habitat losses would be offset to some extent by other federal, state, local, and private restoration efforts through the beneficial use of dredged material within CEMVN's O&M program or with additional funding sources such as CWPPRA, Section 204, or CIAP. Many of these projects would provide highly productive fisheries habitat, increases detrital food material, and likely contributes to overall increased fisheries productivity. For more details see Section 2.4.

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 29.8 acres would be positively impacted by the ridge restoration, along

with 91.6 acres for the marsh platform. In addition, a maximum of approximately 39.44 acres of open water habitat would be temporarily impacted by the discharge pipeline access corridor. There is abundant open water habitat and a lack of wetland habitat in the vicinity. Therefore, the Project is expected to have an overall net benefit to aquatic resources and fisheries despite the reduction in open water habitat.

Some positive indirect impacts to fisheries are also expected. Restoration of marsh and creation of Submerged Aquatic Vegetation (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.

5.4 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 Project 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, gray snapper, lane snapper, and red drum will be directly impacted by filling shallow open water areas and mud bottoms with dredged material. Within a growing season, some marsh vegetation should establish on the restored marsh platform provide marsh edge/water interface, smaller marsh ponds, and mud bottoms. The areas created could potentially provide more EFH for the ecosystem once the material settles to a higher marsh elevation than pre-project conditions. Benthic organisms within placement site would be lost, however, the restoration of 91.6 acres of marsh would benefit the fishery

by adding nutrients and detritus to the existing food web and indirectly contribute to the overall productivity of the estuary.

5.5 Wildlife

Future Conditions with No Action

Without implementation of the Proposed Action, land loss in the Project 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 area. Portions of the 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 USACE would observe restrictions on activity provided by the Fish and Wildlife Service, Lafayette, Louisiana Ecological Services 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 the USACE's plans and specifications developed prior to dredging and disposal activities.

5.6 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 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, CEMVN 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 impacts (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. It is extremely unlikely that manatees would be found either 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 February 9, 2018. 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.

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, 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.

5.7 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.

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 Action.

Based on the results of shoal material analyses following the 2008 fuel oil spill at New Orleans and the 2010 Deepwater Horizon incident, CEMVN determined there is no reason to believe that the Southwest 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 dredged 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. CEMVN 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 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, an application for Water Quality Certification was filed with the Louisiana Department of Environmental Quality. By e-mail from the Louisiana Department of Quality, dated April 30, 2018 concurred with modification of existing WQC 151210-02, stating that the Water Quality Certification WQC 151210-02 is valid for the Project (Appendix B. Environmental).

5.8 Air Quality

Future Conditions with No Action

Plaquemines Parish is currently in attainment for all Federal NAAQS pollutants. In the future, without the implementation of the Proposed Action, it is likely that the quality of ambient air would not be adversely affected.

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 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.

5.9 Cultural Resources

Future Conditions with No Action

Without implementation of the Proposed Action, the conditions within the existing 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. No historic properties would be directly affected by this action, but through future land loss archaeological deposits not currently exposed to erosional effects might surface or otherwise be subjected to erosion.

Future Conditions with the Proposed Action

CEMVN determined that no historic properties will be directly or indirectly impacted by the implementation of the Proposed Action (see Section 9). However, because 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. It is not anticipated that any cultural resources exist within the Project Area, and therefore no cultural resource work is recommended. If cultural resources are located during the course of construction, those resources would be evaluated to determine eligibility for listing to the National Register of Historic Places. If determined to be eligible, measures would be developed to avoid eligible historic properties. If avoidance is not possible, strategies would be developed in consultation with the Louisiana State Historic Preservation Officer (SHPO) and Federally-recognized Indian tribes to mitigate for adverse effects to significant cultural resources.

The construction of the marsh platform and ridge could provide a buffer to storm surge and/or wind from the Gulf that would help to protect cultural resources that may be located outside of the Project Area but within the general Project vicinity.

The use of the project site for the construction of a ridge and marsh platform was coordinated with the SHPO and Federally-recognized Indian tribes in a letter dated November 3, 2017 with a determination of “No Historic Properties Affected.” The SHPO concurred with this determination on November 30, 2017. The Choctaw Nation of Oklahoma concurred via email, dated December 5, 2017. To date, no other responses have been received from the tribes. In accordance with 36 CFR 800.4 (d)(1)(i), CEMVN has fulfilled its consultation responsibilities under the NHPA.

5.10 Recreation 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. Without implementation of the Proposed Action, the existing conditions would persist, but with continued conversion of existing marsh to open water habitats. Most of the recreational activities that occur in the Project Area consist of hunting, fishing, wildlife observation, and general enjoyment of the aesthetic marsh environment. Recreational resources in the region that would most likely be affected in the FWOP are those related to loss of wetlands and habitat diversity. Wildlife abundances are directly related to the amount of wetlands present. As high land loss through either erosion or subsidence continues, the

wildlife abundances in the Project Area would decrease. The abundance of migratory birds and other animals directly dependent on the wetlands would also decrease as they moved to more suitable habitat.

With a continued conversion of marsh to open water, much of the estuarine fishery abundances would be expected to decline over time. Lower quality fishery spawning, nursery, and foraging habitat would translate to a decline in sport fishing success in the future. As the usage by game species declines, so would the hunting opportunities. As usage by migratory birds declines, so would the opportunities for viewing.

In general, conversion of intertidal, emergent wetlands to shallow, unvegetated open water would result in decreased fishery production and therefore have negative impacts on recreational fishing. Conversion of intertidal marsh and associated SAV to large, unvegetated open-water areas would diminish habitat value for all wildlife species. The result is a loss of emergent marsh and diminished capacity of the area to support fish and wildlife populations.

Marsh wetlands reduce storm surges from tropical systems. An increase in storm surge impacts from a reduction in marsh land can directly affect land loss, which can result in loss of boat launches, parking areas, access roads, marinas, and supply shops. The loss of access features, such as boat launches, impacts an individual's ability to recreate in particular areas. The economic loss felt by marinas and other shops may be two-fold. One is potential loss of the actual facility or access to the facility; the other is the change in opportunities.

Future Conditions with the Proposed Action

Recreationists would be temporarily displaced in the Project Area during disposal of dredged material. Less open water in the Project Area would be available for boating and fishing; however, an increase in habitat value is expected as the 91.6 acres of marsh develops. The restoration of marsh would provide an increase in fish and wildlife habitat including nesting habitat for water fowl and nursery habitat for fish. Consumptive recreational use would likely increase as a result of an increase in quality and quantity of fish and wildlife habitat. Bird watching opportunities are also expected to increase as a result of improved habitat for neo-tropical migratory songbirds and other avian species.

Positive long-term recreational benefits would be realized from the deposition of dredged material into shallow open water areas and onto eroding marsh. Marsh plants consisting of emergent and/or submerged aquatic vegetation would become established, complementing the already existing fish and wildlife habitat and increasing future recreational activities in the area. Recreational fishing opportunities could increase due to the increase in fisheries habitat in the Project Area.

Other direct, short-term impacts to recreational resources would result from the Project Area being unavailable during construction for recreational activities. During and immediately after construction there would be a decrease in the quality of habitat, and

wildlife and fishery species associated with recreational opportunities would be displaced; however, the area would reestablish emergent wetland vegetation. Therefore, these adverse impacts would be temporary and localized. Adverse direct impacts would be offset by the restoration of marsh that would contribute to restoring the base of organisms used for recreational activities such as fishing, bird watching and hunting. Following construction, the Project Area would again be available for recreational activities.

Creating wetlands and reducing loss rates for the Project Area may protect nearby recreational infrastructure, such as boat launches. Wildlife-dependent recreational activities may be maintained and possibly increase. Recreation activities dependent upon wetland habitat would be maintained and possibly increase. There would be a temporary decrease in boat traffic accessibility through the Project Area during placement of material. Fishing and hunting activities could continue in areas near the Project Area.

Cumulative impacts would be the synergistic effect with the additive combination of impacts and benefits for overall net acres created by other federal, state, local, and private marsh creation and restoration efforts including beneficial use of dredged material under the Federal Standard. Beneficial use of dredged material above the Federal Standard will result in an even larger amount of wetlands and habitat created than would be allowed under the Federal Standard. More wetlands and habitat translates into more opportunity for recreational use of the Project Area.

5.11 Aesthetics (Visual Resources)

Future Conditions with No Action

Under the no action alternative, the visual resources of the Project corridor would not be impacted by construction and equipment transportation activities related to implementing the action approved in the Proposed Action. However, this impact would be temporary and would most likely affect visual resources from boating and other water traffic only. The Project Area would evolve based on federal, state or local operation and maintenance practices.

Future Conditions with the Proposed Action

Under the proposed action alternative, impacts to visual resources would be similar to the No Action alternative. Visual impacts would be temporary and noted from boating and other water traffic only because the Project Area, including the construction right of way, is remote and visually inaccessible from LA Hwy 23.

5.12 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.

The USACE Engineer Regulation, ER 1165-2-132, Hazardous, Toxic, and Radioactive Waste for Civil Works Projects, states that dredged material and sediments beneath navigable waters proposed for dredging qualify as HTRW only if they are within the boundaries of a site designated by the EPA or a state for a response action (either a removal or a remedial action) under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), or if they are a part of a National Priority List (NPL) site under CERCLA (NPL is also known as Superfund). No portion of the Project Area proposed for dredging and disposal is included in the NPL.

Based upon a review of the NPL and CERCLA action sites, the probability of encountering HTRW in connection with this Project is low. The Proposed Action does not qualify for an HTRW investigation and its impacts are evaluated as a water quality issue.

5.13 Cumulative Impacts

The Council on Environmental Quality's (CEQ) regulations (40 CFR 1500-1508) implementing the procedural provisions of the NEPA define cumulative effects as "the impact on the environment which results from the incremental impact of the action when added to other past, present, or reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions." (40 CFR 1508.7). Cumulative Effects 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 Proposed Action 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 ridge restoration and marsh platform project would restore an estimated 29.8 acres of ridge and 91.6 acres of marsh over the 50 year period of analysis for an estimated net total

56.62 AAHUs[12]. When added to the benefits created by the adjacent Tiger Pass Project, it is estimated that the Project Area vicinity could benefit from the restoration of approximately 53 acres of ridge and 190 acres of marsh platform.

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 Action to enhance the structural and functional integrity of the ecosystem, improve primary productivity rates, and thereby improve the overall environmental resources.

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 State Master Plan for Southwest Louisiana as a way to prioritize restoration projects. The Proposed Action is consistent with this coast-wide planning.

[12] See Footnote 9 (page 57).

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6.0 Other Considerations

6.1 Monitoring and Adaptive Management

The primary reason for implementing Monitoring and Adaptive Management (AM) is to increase the likelihood of achieving desired outcomes. The multi-year BUDMAT Program is being implemented using the principles of AM and a "lessons learned" approach in the selection and implementation of beneficial use projects (2010 Report). Where past performance of individual LCA BUDMAT Program projects and other ecosystem restoration projects indicate certain restoration approaches or types of restoration opportunities provide more benefit from use of dredged material for ecosystem creation and restoration, these findings will be used to reduce risk and uncertainty in the Program (Section 3.1.3, "Risk and Uncertainty", of the 2010 Report), to make adjustments based on the increased restoration knowledge, and make better decisions for future projects.

Section 2039 of 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 creation and restoration and develop an AM Plan (or contingency plan) should the Project monitoring show that the Project is not performing as expected.

6.1.1 Monitoring

As currently authorized, the intent of the LCA BUDMAT Program is to advance the beneficial use of maintenance dredged material executed by USACE maintenance navigation projects. The individual LCA BUDMAT Program projects are developed as one-time events to supplement the navigation projects' beneficial use of dredged material by providing funds that would pay for the increment to transport dredged material distances above and beyond the Federal Standard.

In 1994, CEMVN implemented the large-scale Beneficial Use of Dredged Material Monitoring Program (BUMP) to quantify the amount of new habitat created and to improve dredge disposal placement techniques to maximize beneficial use. Each year, aerial photography is acquired and digital mosaics are produced for each of the BUDMAT Project sites. GIS habitat analysis and field surveys are conducted to generate habitat change maps. From the analysis, coastal change data quantifies the restoration and creation of new coastal lands and other habitats. The field program includes ground truthing operations to verify and update the habitat maps and field monitoring to collect information about vegetation, disposal elevations, and placement practices (configurations and containment) to assess best practices for maximizing habitat benefits from the beneficial use of dredged material. Habitat types are broken into simple classes and sub-classes based on the types of vegetation present: water, wetlands (marsh and forested wetlands), and land (beach, bare, dune, upland, shrub/scrub, and forest).

Currently, under its existing O&M Program, CEMVN conducts aerial flights to obtain aerial photography for each of its beneficial use placement sites on an annual basis. Since

2000 and due to funding constraints, CEMVN no longer funds the analyses of the aerial photography to produce habitat change maps. Additionally, CEMVN no longer conducts a field program including ground truthing and field surveys. It is anticipated that CEMVN would, at a minimum, continue to acquire the aerial photography on an annual basis under the Federal Standard.

Monitoring of the Project through the form of collecting aerial photography would be performed under BUMP. Under most situations, since each individual LCA BUDMAT Program project is planned as a one-time event and is of limited complexity and low risk, it is anticipated that successful monitoring data provided on the individual projects would not be used to modify or perform additional construction at completed projects (2010 Report). Although no corrective/contingency actions would be taken under the individual projects, monitoring results will be used to support the overall LCA BUDMAT Program and future Program activities will build upon the information gained and lessons learned from the earlier projects. The LCA BUDMAT Program will document lessons learned and all new information would be used programmatically to inform, make adjustments and optimize the selection and implementation of subsequent LCA BUDMAT Program projects, as well as other restoration efforts in the Louisiana Coastal Area. Specifically, 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 creation and restoration and beneficial use projects.

6.1.2 Adaptive Management Evaluation Summary

All projects implemented under the LCA BUDAT Program were considered and evaluated for application of adaptive management pursuant to the requirements of WRDA 2007, Section 2039 and Implementation guidance for Section 2039, in form of CECW-PB Memorandum dated 31 August 2009. These evaluations were conducted consistent with ERDC TN-EMRRP-EBA-10 dated April 2012 entitled "The Application of Adaptive Management to Ecosystem Restoration Projects' by Fischenich et al. (2012) which states in pertinent part as follows:

"Paragraph (3)(d) in Section 2039 of WRDA 2007 states that ‘an adaptive management plan will be developed for all ecosystem restoration projects...appropriately scoped to the scale of the project.’ However, it is anticipated that only projects characterized by high uncertainty in achieving results will need to include specific costs and actions for adaptive management."

The following uncertainty and risks associated with success of the project were considered to be “low” indicating that LCA BUDMAT Program projects in general, and this Project specifically, need not include specific costs and actions.

1. LCA BUDMAT Program projects are authorized only for a one time placement of maintenance dredged material for beneficial use.

2. LCA BUDMAT Program projects are not authorized for OMRR&R.

3. Any adaptive management measures implemented would be considered new construction which is not within the scope of the LCA BUDMAT Program project.

4. CEMVN has conducted numerous beneficial use of dredged material actions across the entire state of Louisiana and the Study Area. There is little uncertainty or risks associated with this common practice which, in and of itself is sufficient to determine that adaptive management is not warranted in this particular project.

5. The retention dikes will be designed to an elevation conducive to containment of the material, to allow it to settle to the appropriate marsh elevation. After settlement of the dredged slurry material, breaching of the retention dikes will allow for re-establishment of the intertidal exchange between the marsh and adjacent shallow open waters.

The methodology has been used successfully throughout coastal Louisiana as well as within the Study Area.

Consequently, the uncertainty and risks associated with the success of the Project is determined to be low. Evaluations determined that this Project is not a candidate that could benefit from AM. An assessment revealed that the reasonably foreseeable adaptations to this Project would all effectively constitute new construction. Although there is no opportunity for AM of BUDMAT Program projects, the LCA BUDMAT Program would document lessons learned and would be used programmatically to inform and make adjustments to subsequent LCA BUDMAT Program projects, as well as other restoration efforts in the Louisiana Coastal Area. Specifically, monitoring results from the Project would help refine modeling, design, and predictions of physical and ecological processes that would in turn inform design of future restoration and beneficial use projects.

Containment structures would be built for the Recommended Plan to hold the dredged material in place. Dredged material would be placed to restore a platform conducive to the development of coastal marsh restoration. It is not the intent of the LCA BUDMAT Program to construct ecosystem restoration projects that necessarily will exist in perpetuity. Coastal habitat, whether wetland, ridge, or other type of coastal feature, is ephemeral in nature. The period of analysis for this Project is 50 years. The benefits calculated consider subsidence, sea-level rise, and other impacts to determine the condition of the ecosystem restoration project over the period of analysis.

6.2 Real Estate

Placement of dredged material will be in open waters that may have dual ownership by the state of Louisiana and private landowners. A nonstandard estate is required for land to be acquired for this purpose. Access corridors would be required to allow construction equipment and the discharge pipeline to reach the restoration site. Adverse impacts to areas of existing marsh would be avoided to the maximum extent practicable. Any use

of discharge pipeline access corridors that results in the impact of existing marsh would be backfilled to a maximum elevation of approximately +3 feet of adjacent marsh elevation upon completion of dredging and disposal activities to restore these degraded corridors to pre-project marsh elevations and ultimately functioning marsh habitat. The lands, easements and rights-of-way required for the Project are outlined in Appendix H. Real Estate Plan is in accordance with the requirements of Engineering Regulation 405-1-12.

6.3 Relocations

There will be no relocations of any facility or utility as part of this Project. Numerous oil and gas pipelines are located within the Project Area, however there are none located within the retention dikes of the TSP. Necessary precautions will be taken to avoid adversely impacting all pipelines. Pipeline owners will be notified prior to the initiation of construction. Ownership of the pipelines along with contact information will be included with the plans and specifications for this Project (See Appendix D. Relocations Summary provides additional information on pipelines in the Project Area).

6.4 Risk and Uncertainty

Risk and uncertainty are intrinsic in water resources planning and design. Section 3.1.3, “Risk and Uncertainty”, of the 2010 Report, which is incorporated herein by reference, provides a comprehensive discussion of the items of risk and uncertainty considered. That discussion remains valid for the purposes of this DIR. The following describes risk and uncertainty related to the TSP for the Project.

6.4.1 Geotechnical Analysis

Design and implementation of the TSP is based on the 2017 Draft Geotechnical Report which is a preliminary geotechnical analysis completed and available at the time of publication of this Integrated DIR/SEA. Additional geotechnical investigations, including soil borings and a detailed design of the earthen weir are ongoing. The results of this analysis will not affect the selection of the TSP. The results will be incorporated into the Project’s pre-construction engineering and design and the development of plans and recommendations for the Alternative (Site 1) identified as the TSP.

6.4.2 Availability of Dredged Material

Selection of the TSP is based on the assumption that at least 2,000,000 CY of material would be available from the hopper dredge disposal area (HDDA) located near the Head of Passes in the Mississippi River at the time of Project construction.

6.5 Value Engineering

The VE Team identified **(2)** items that are believed to either improve project performance and/or cost-effectiveness.

1. ***Identify barge loading area(s) to allow proper maneuvering in Baptiste Collette;***

2. ***Address and get waiver to allow equipment passage on state owned land created/purchased for Tiger Pass 1 access.***

Since the conclusion of the VE study, item one has been overcome by events as the source of dredged material would originate from the HDDA as was done in the initial BUDMAT Tiger Pass Project. Item 2 is being addressed through coordination with the NFS. Additionally, coordination with landowners would also be carried out. A copy of the VE study is available upon request.

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7.0 Coordination

Preparation of this draft EA and draft Finding of No Significant Impact is being coordinated with appropriate Congressional, federal, state, and local interests, as well as environmental groups and other interested parties.

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
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
Coastal Protection and Restoration Authority
Louisiana Department of Environmental Quality
Louisiana State Historic Preservation Officer
Plaquemines Parish Government
Alabama-Coushatta Tribe of Texas
Caddo Nation of Oklahoma
Chickasaw Nation
Chitimacha Tribe of Louisiana
Choctaw Nation of Oklahoma
Mississippi Band of Choctaw Indians
Coushatta Tribe of Louisiana
Jena Band of Choctaw Indians
Quapaw Tribe of Oklahoma
Seminole Tribe of Florida
Seminole Nation of Oklahoma
Tunica-Biloxi Tribe of Louisiana

8.0 Mitigation

This analysis of the Proposed Action indicates that it would cause no significant impacts to the human environment. The beneficial use of dredged material from the HDDA is expected to restore approximately 91.6 acres of coastal marsh and 29.8 acres of ridge habitat and thus positively impact the resources present in the Study Area and Project Area. Construction will impact approximately 22.9 acres of marsh, and some additional temporary impacts are expected to occur as explained in Section 3.8 and Section 5.2; however, the marsh restoration benefits would far outweigh the construction detriments. The Proposed Action is self-mitigating.

9.0 Compliance with Environmental Laws and Regulations

There are many federal and state laws pertaining to the enhancement, management, and protection of the environment. Federal projects must comply with environmental laws,

regulations, policies, rules and guidance. Compliance with laws will be accomplished upon 30-day public and agency review of this draft Integrated DIR/EA #542.B and associated draft Finding of No Significant Impact.

Clean Air Act of 1972

The Clean Air Act (CAA) sets goals and standards for the quality and purity of air. It requires the Environmental Protection Agency to set NAAQS for pollutants considered harmful to public health and the environment. The Project Area is in Plaquemines Parish, which is currently in attainment of NAAQS. The Louisiana Department of Environmental Quality is not required by the CAA or Title 33 of the Louisiana Administrative Code to grant a general conformity determination.

Clean Water Act of 1972 – Section 401 and Section 404

The CWA sets and maintains goals and standards for water quality and purity. Section 401 requires a Water Quality Certification (WQC) from the LDEQ that a proposed project does not violate established effluent limitations and water quality standards. By e-mail from the Louisiana Department of Quality, dated April 30, 2018 concurred with modification of existing WQC 151210-02, as follows: “The application for modification of WQC 151210-02 has been reviewed and it has been determined that this modification does not propose any additional impacts to water quality. Water Quality Certification WQC 151210-02 is valid for the Tiger Pass project. The administrative record has been updated to include the modification and Draft Integrated Design and Implementation Report and Supplemental Environmental Assessment (SEA) #542.B.”

As required by Section 404(b)(1) of the CWA, an evaluation to assess the short- and long-term impacts associated with the discharge of dredged and fill materials into waters of the United States resulting from this Project has been completed. Section 404(b)(1) public notice will be mailed out for public review and a 30 day comment period. Comments received during this time period will be considered and added, as appropriate, to the final document prior to signing of Section 404(b)(1).

Coastal Zone Management Act of 1972

The Coastal Zone Management Act (CZMA) requires that "each federal agency conducting or supporting activities directly affecting the coastal zone shall conduct or support those activities in a manner which is, to the maximum extent practicable, consistent with approved state management programs." In accordance with Section 307, a Consistency Determination was submitted on February 28, 2018 to Louisiana Department of Natural Resources (DNR) for the Proposed Action. On May 16, 2018, DNR concurred that the Proposed Action is consistent with the Louisiana Coastal Resources Program in accordance with Section 307 (c) of the CZMA (Appendix B, Annex E)).

Endangered Species Act of 1973

The Endangered Species Act (ESA) is designed to protect and recover threatened and endangered (T&E) species of fish, wildlife and plants. The USFWS identified five threatened or endangered species, the Pallid sturgeon, West Indian manatee, piping plover, red knot, and sea turtles that are either known to occur or believed to occur within the vicinity of the Project Area. No plants were identified as being threatened or endangered in the Project Area. On February 23, 2018, USFWS reviewed this project for effects to Federal trust resources under their jurisdiction and currently protected by the Endangered Species Act of 1973, finding that the project, as proposed, is not likely to adversely affect these resources (Appendix B, Annex E).

Fish and Wildlife Coordination Act of 1934

The Fish and Wildlife Coordination Act (FWCA) provides authority for the USFWS involvement in evaluating impacts to fish and wildlife from proposed water resource development projects. The FWCA requires that fish and wildlife resources receive equal consideration to other project features. The FWCA also requires federal agencies that construct, license or permit water resource development projects to first consult with the USFWS, NMFS and state resource agencies regarding the impacts on fish and wildlife resources and measures to mitigate these impacts. Section 2(b) requires the USFWS to produce a CAR that details existing fish and wildlife resources in a Project Area, potential impacts due to a proposed project and recommendations for a project. The USFWS provided a Draft CAR with project specific recommendations on February 8, 2018. The Draft CAR is contained in Appendix G and CEMVN's responses to the USFWS recommendations are as follows:

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 would result in 30 acres[13] of forested ridge and 106 acres of intermediate marsh with an estimated net total 56.62 AAHUs. 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 of 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

[13] Acres and AAHUs reported in draft CARs are based on a less advanced level of engineering design than the final project description and, in this instance, the draft CAR reflects approximately 30 acres of forested ridge and 106 acres of marsh for the TSP rather than the more refined estimate of approximately 29.8 acres of ridge and 91.6 acres of marsh to be constructed. The current project description will be utilized in the production of the final CAR.

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. Bird abatement procedures would be implemented to prevent wading birds (i.e., herons, egrets, night-herons, ibis, and roseate spoonbills), anhingas, and/or cormorants from nesting during their nesting period. In the event that implementation of the bird abatement plan is not successful and nesting does occur, all activity occurring within 1,000 feet of a nesting colony would be restricted to the non-nesting period. For nesting brown pelicans activity should be avoided within 2,000 feet of the colony. Activity would be restricted within 650 feet of nesting 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 it's implementing regulations.

   Response 2 - Concur. The NMFS is a part of the PDT. The NMFS would receive a copy of this EA during the public comment period.

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. Access corridors across existing wetlands will be avoided if possible. If existing wetlands are impacted they would be restored to pre-project elevation and expected to re-vegetate naturally. If needed, at CEMVN's discretion, 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 USACE 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. GEOID is a model of global mean sea level that is used to measure precise surface elevations. In the case of the Spanish Pass ridge surveys, the GEOID used for vertical control was the latest available - GEOID 12A, and this was used in developing the elevations that are referenced to NAVD88 (2009.55 Epoch) datum.

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.

   Response 5: Concur, in part. As provided in Section 3.8 of Integrated Design and Implementation Report and SEA #542.B, earthen retention dikes will be needed in order to facilitate construction of the ridge and marsh platforms, and will be allowed to settle and/or erode, as well as vegetate naturally over time. If necessary, these retention dikes would be later breached or degraded to the settled elevations of the disposal area by the NFS.

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 USACE should avoid these areas if possible and utilize unvegetated open water areas for marsh creation.

   Response 6 - CEMVN also recognizes the value of SAV habitat. SAV occurrence within the Project Area was estimated to be 0% water-bottom coverage on September 13, 2017. Therefore we assume there would be no negative impacts to SAV.

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. CEMVN 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. CEMVN 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 projects. The USACE should coordinate with the Service during development of those plans.

   Response 9 - Please see section 6.1.2 of the Integrated DIR/ SEA. 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 with 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 of their habitat.

    Response 10 – Concur.

Magnuson-Stevens Fisheries Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act, as amended, Public Law No. 104-208, addresses the authorized responsibilities for the protection of EFH by NMFS in association with regional fishery management councils. The NMFS has a findings with the CEMVN on the fulfillment of coordination requirements under provisions of the Magnuson-Stevens Fishery Conservation and Management Act. In those findings, the CEMVN and NMFS have agreed to complete EFH coordination requirements for federal civil works projects through the review and comment on NEPA documents prepared for those projects. EA #542.B will be provided to the NMFS for review and comment.

Species of Management Concern

The USFWS draft CAR notes that 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 Project vicinity include Wilson's plover, gull-billed tern, reddish egret, black skimmer, and peregrine falcon. Species of concern that would use Project vicinity'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.

Migratory Bird Treaty Act

The bald eagle was removed from the List of Endangered and Threatened Species in August 2007 but continues to be protected under the Bald and Golden Eagle Protection Act (BGEPA) and the MBTA, as amended. During nesting season, construction must

take place outside of USFWS/LDWF buffer zones. A USACE Biologist and USFWS Biologist will survey for nesting birds prior to the start of construction.

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 by the Service on November 17, 2009. Despite its delisting, brown pelicans - and other colonial nesting wading birds and seabirds - remain protected under the Migratory Bird Treaty Act. 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 USACE would observe restrictions on activity provided by the Fish and Wildlife Service, Lafayette, Louisiana Ecological Services 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 the USACE's 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.

In addition, CEMVN recommends that on-site contract personnel be trained to identify colonial nesting birds and their nests and avoid affecting them during the breeding season (i.e., the time period outside the activity window).

National Historic Preservation Act of 1966

Consultation and Coordination

CEMVN consulted with the Louisiana State Historic Preservation Officer, the Alabama-Coushatta Tribe of Texas, the Caddo Nation of Oklahoma, the Chitimacha Tribe of Louisiana, the Choctaw Nation of Oklahoma, the Coushatta Tribe of Louisiana, the Jena Band of Choctaw Indians, the Mississippi Band of Choctaw Indians, the Muscogee (Creek) Nation, the Seminole Nation of Oklahoma, the Seminole Tribe of Florida, and the Tunica-Biloxi Tribe of Louisiana via letter on November 3, 2017 with a determination of "No Historic Properties Affected." Letters were mailed to the tribal leaders and to Tribal Historic Preservation Offices, requesting input regarding the Proposed Action. SHPO concurred with this determination on November 30, 2017. The Choctaw Nation of Oklahoma concurred via email, dated December 5, 2017. To date, no other responses have been received from the tribes. In accordance with 36 CFR 800.4 (d)(1)(i), CEMVN has fulfilled its consultation responsibilities under the NHPA. (Appendix B, Annex E).

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10.0 Description of the Non-Federal Sponsor's Project Implementation Requirements, Roles and Responsibilities.

Prior to commencement of construction, the NFS must enter into a Project Partnership Agreement (PPA), with the Government to provide its required cooperation. The NFS must agree to meet the requirements for Non-Federal responsibilities, as summarized below and in future legal documents.

The NFS for this Project is in basic agreement with the requirements of the Model PPA to be used for beneficial use of dredged material projects implemented under the Louisiana Coastal Area Beneficial Use of Dredged Material Program. (See CECW-MVD Memorandum dated April 10, 2015). The review, approval, and signature of an LCA BUDMAT PPA that does not deviate from the approved Model PPA has been delegated to the MSC Commander, and has been further delegated to the District Commander. (See Memorandum, CEMVD-PD-L dated April 14, 2015 and Memorandum, ASA (CW), dated August 13, 2010).

Federal implementation of this Project is subject to the Non-Federal Sponsor agreeing to comply with applicable Federal laws and policies in the Model PPA, including but not limited to:

1. The Non-Federal Sponsor shall provide 25 percent of the total Project costs in accordance with Section 1030(d) of the WRRDA of 2014, which amended Section 2037 of WRDA of 2007.

2. The Non-Federal Sponsor shall provide the real property interests, relocations, and investigations for hazardous substances required for construction, operation, and maintenance of the Project.

3. The Non-Federal Sponsor shall prevent obstructions or encroachments on the Project (including prescribing and enforcing regulations to prevent such obstructions or encroachments) that might reduce the outputs produced by the Project, hinder operation and maintenance of the Project, or interfere with the Project's proper function.
4. The Non-Federal Sponsor shall not use the Project, or real property interests required by the PPA, as a wetlands bank or mitigation credit for any other project.

5. The Non-Federal Sponsor shall not use Federal Program funds to meet any of its obligations under the PPA unless the Federal agency providing the funds verifies in writing that the funds are authorized to be used for the Project. Federal program funds are those funds provided by a Federal agency, plus any non-Federal contribution required as a matching share therefor.

6. Except as provided in the PPA, the Non-Federal Sponsor shall not be entitled to any credit or reimbursement for costs it incurs in performing its responsibilities under the PPA.

7. In carrying out its obligations under the PPA, the Non-Federal Sponsor shall comply with all the requirements of applicable Federal laws and implementing regulations, including, but not limited to: Title VI of the Civil Rights Act of 1964 (Public Law No. 88-352), as amended (42 U.S.C. 2000d), and Department of Defense Directive 5500.11 issued pursuant thereto; the Age Discrimination Act of 1975 (42 U.S.C. 6102); and the Rehabilitation Act of 1973, as amended (29 U.S.C. 794), and Army Regulation 600-7 issued pursuant thereto.

8. The Non-Federal Sponsor shall acquire the real property interests that the Government has determined are necessary for the construction, operation, and maintenance of the Project. The Non-Federal Sponsor shall provide the Government with authorization for entry thereto in accordance with the Government's schedule for construction of the Project. The Non-Federal Sponsor shall ensure that real property interests provided for the Project are retained in public ownership for uses compatible with the authorized purposes of the Project.

9. The Non-Federal Sponsor shall perform or ensure the performance of the relocations that the Government has determined are necessary for the construction, operation, and maintenance of the Project in accordance with the Government's construction schedule for the Project.

10. The Non-Federal Sponsor shall comply with the applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, as amended (42 U.S.C. 4601-4655), and the Uniform Regulations contained in 49 C.F.R. Part 24, in acquiring real property interests for construction, operation, and maintenance of the Project and shall inform all affected persons of applicable benefits, policies, and procedures in connection with said Act.

11. The Non-Federal Sponsor shall be responsible for undertaking any investigations to identify the existence and extent of any hazardous substances regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 U.S.C. 9601-9675), that may exist in, on, or under real property interests required for the construction, operation, and maintenance of the Project.

12. In the event it is discovered that hazardous substances regulated under CERCLA exist in, on, or under any of the required real property interests, the Non-Federal Sponsor and the Government, in addition to providing any other notice required by applicable law, shall provide prompt written notice to each other, and the Non-Federal Sponsor shall not proceed with the acquisition of such real property interests until the parties agree that the Non-Federal Sponsor should proceed.

13. If hazardous substances regulated under CERCLA are found to exist in, on, or under any required real property interests, the parties shall consider any liability that might arise under CERCLA and determine whether to initiate construction, or

if already initiated, whether to continue construction, suspend construction, or terminate construction. Should the parties initiate or continue construction, the Non-Federal Sponsor shall be responsible, as between the Government and the Non-Federal Sponsor, for the costs of cleanup and response, including the costs of any studies and investigations necessary to determine an appropriate response to the contamination. Such costs shall be paid solely by the Non-Federal Sponsor without reimbursement or credit by the Government.

14. As between the Government and the NFS, the NFS shall be considered the operator of the Project for purposes of CERCLA liability. To the maximum extent practicable, the NFS shall operate, maintain, repair, rehabilitate, and replace the Project in a manner that will not cause liability to arise under CERCLA.

15. To the maximum extent practicable, no later than 6 months after it provides the Government with authorization for entry onto a real property interest or pays compensation to the owner, whichever occurs later, the NFS shall provide the Government with documents sufficient to determine the amount of credit to be provided for the real property interest in accordance with the provisions of the PPA.

16. The NFS shall obtain, for each real property interest, an appraisal of the fair market value of such interest that is prepared by a qualified appraiser who is acceptable to the parties. Subject to valid jurisdictional exceptions, the appraisal shall conform to the Uniform Standards of Professional Appraisal Practice. The appraisal must be prepared in accordance with the applicable rules of just compensation, as specified by the Government.

17. For real property interests acquired by eminent domain proceedings instituted after the effective date of the PPA, the NFS shall notify the Government in writing of its intent to institute such proceedings and submit the appraisals of the specific real property interests to be acquired for review and approval by the Government.

18. Any credit afforded under the terms of the PPA for relocations for construction, operation, and maintenance of the Project is subject to satisfactory compliance with applicable Federal labor laws covering non-Federal construction, including, but not limited to, 40 U.S.C. 3141-3148 and 40 U.S.C. 3701-3708 (labor standards originally enacted as the Davis-Bacon Act, the Contract Work Hours and Safety Standards Act, and the Copeland Anti-Kickback Act). Notwithstanding any other provision of the PPA, credit may be withheld, in whole or in part, as a result of the Non-Federal Sponsor’s failure to comply with its obligations under these laws.

19. The NFS shall not be entitled to credit for value of or costs it incurs for real property interests that were previously provided as an item of local cooperation for another Federal project.

20. No later than 60 calendar days prior to the beginning of a fiscal year in which the Government will be incurring costs for construction, the Government shall notify

the NFS in writing of the amount of funds required from the Non-Federal Sponsor during that fiscal year. No later than 30 calendar days prior to the beginning of that fiscal year, the NFS shall make the full amount of such required funds available to the Government.

21. Any suspension or termination shall not relieve the parties of liability for any obligation previously incurred. Any delinquent payment owed by the NFS pursuant to the PPA shall be charged interest at a rate, to be determined by the Secretary of the Treasury, equal to 150 per centum of the average bond equivalent rate of the 13 week Treasury bills auctioned immediately prior to the date on which such payment became delinquent, or auctioned immediately prior to the beginning of each additional 3 month period if the period of delinquency exceeds 3 months.

22. The Non-Federal Sponsor's costs for participation on the Project Coordination Team shall not be included in the construction costs and shall be paid solely by the NFS without reimbursement or credit by the Government.

23. If at any time the Non-Federal Sponsor fails to fulfill its obligations under the PPA, the Government may suspend or terminate construction of the Project unless the Assistant Secretary of the Army (Civil Works) determines that continuation of such work is in the interest of the United States or is necessary in order to satisfy agreements with other non-Federal interests.

24. The NFS, at no cost to the Government, shall operate, maintain, repair, rehabilitate, and replace the Project. The NFS shall conduct its operation, maintenance, repair, rehabilitation, and replacement responsibilities in a manner compatible with the authorized purpose of the Project and in accordance with applicable Federal and State laws and specific directions prescribed by the Government in the OMRR&R Manual and any subsequent amendments thereto.

25. The Government may enter, at reasonable times and in a reasonable manner, upon real property interests that the NFS now or hereafter owns or controls to inspect the Project, and, if necessary, to undertake any work necessary to the functioning of the Project for its authorized purpose.

26. The NFS shall hold and save the Government free from all damages arising from design, construction, operation, maintenance, repair, rehabilitation, and replacement of the Project, except for damages due to the fault or negligence of the Government or its contractors.

27. The parties shall develop procedures for maintaining books, records, documents, or other evidence pertaining to Project costs and expenses in accordance with 33 C.F.R. 33.20 for a minimum of three years after the final accounting.

28. The NFS is responsible for complying with the Single Audit Act Amendments of 1996 (31 U.S.C. 7501-7507). To the extent permitted under applicable Federal

laws and regulations, the Government shall provide to the NFS and independent auditors any information necessary to enable an audit of the Non-Federal Sponsor's activities under the PPA. The costs of non-Federal audits shall be paid solely by the NFS without reimbursement or credit by the Government.

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11.0 Conclusion

The purpose of this draft Integrated DIR/SEA #542.B is to recommend a plan that will optimize the beneficial use of dredged material for ecosystem restoration purposes in a manner that exceeds the dredged material deposition that can be implemented under the Federal Standard associated with the USACE O&M dredging. The TSP is Alternative 1b which would restore a coastal ridge and wetland habitat complex at Spanish Pass via barge haul from the HDDA, extending the 5,000-foot ridge and marsh platform constructed during the initial Tiger Pass Project. The entire Project length along the ridge face is over 8,700 feet in length. However, due to numerous active oil and gas pipelines located within the Project Area, there are several breaks in the ridge; therefore, the length of the ridge with the breaks is approximately 6,800 feet. The TSP would mirror the design developed for the initial Tiger Pass Project that was recently constructed. Tiger Pass 2, Alternative 1b, would entail the placement of as much as 2,000,000 CY of material to be dredged from the HDDA, located at the Head of Passes in the MRSC.

CEMVN has assessed the environmental impacts of the Proposed Action and determined that the Proposed Action would have no significant impact upon the human environment; specifically: no significant impact on cultural resources and endangered or threatened species; and no significant adverse impacts on intermediate marsh, brackish marsh, SAV, wooded swamp, water bodies, water quality, fisheries, EFH, wildlife, recreational resources, aesthetics, noise, and air quality.

A Model PPA for the LCA BUDMAT Program has been approved by the ASA (CW), (See Memorandum, ASA(CW), 2 April 2015, Subject: Louisiana Coastal Area Beneficial Use of Dredged Material Projects - Model Project Partnership Agreement (PPA); Delegation of Approval and Execution Authority; and Memorandum, CECW-MVD, 10 April 2015, Subject: Approved Model Project Partnership Agreement (PPA) for Louisiana Coastal Area Beneficial Use of Dredged Material; Memorandum, CECW-MVD, 14 April 2015, Subject: Approved Model Project Partnership Agreement(PPA) for Louisiana Coastal Area Beneficial Use of Dredged Material (LCA BUDMAT) Program. The NFS, PPG, for this Project is in agreement with the requirements of the Approved LCA BUDMAT Program Project PPA.

12.0 Recommendation

Approve the TSP, Alternative 1b – Restoration of a Coastal Ridge and Wetland Habitat Complex at Spanish Pass via Barge Haul from the HDDA, as described in this document, as the Recommended Plan. Obtain approval from HQUSACE to use a nonstandard estate (NSE), a fixed term Ecosystem Restoration Easement, similar to that which was approved specifically for the LCA BUDMAT HNC Project by HQUSACE in Memorandum dated April 2, 2018, for the property interests necessary for this ecosystem restoration project. Proceed with negotiation and execution of a PPA with the PPG. Upon conclusion of all Real Estate related activities and the receipt of non-Federal construction funds, the Recommended Plan would be implemented.

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13.0 Preparers

This draft Integrated DIR and EA and the associated draft FONSI were prepared by Patrick Smith, PhD, and Mr. Michael Morris, Environmental Resources Specialists; Mrs. Katelyn Costanza, Engineer, and Mr. Sean Mickal, Water Resources Planner with relevant sections prepared by: Mr. Joe Musso - HTRW; Mr. Noah Fulmer - Cultural Resources; Mr. Rick Broussard, Mr. Keith O'Cain, and Mr. Scott Clement – Engineering. The address of the preparers is: US Army Corps of Engineers, New Orleans District, CEMVN-PD, Plan Formulation Branch, 7400 Leake Avenue New Orleans, LA 70118.

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APPENDICES

Appendix A. Legislation, Reports, and Guidance

Appendix B. Environmental

Annex A: DRAFT Finding of No Significant Impact (FONSI)

Annex B: Louisiana Coastal Area Beneficial Use of Dredge Material Programmatic EIS, 2010
(http://www.mvn.usace.army.mil/Portals/56/docs/environmental/LCA/LCA_BUDMAT_Final_EIS_Jan_19_2010.pdf)

Annex C: Louisiana Coastal Area, Louisiana, Ecosystem Restoration PEIS, 2005
Record of Decision, signed 18 November 2005
http://www.mvn.usace.army.mil/Missions/Environmental/Louisiana-Coastal-Area/2004-programmatic-EIS-for-the-Louisiana-Coastal-Area-projects/)

Annex D: DRAFT Wetland Value Assessment (WVA) Project Information Sheet (PIS), prepared January 30, 2018.

Annex E: Agency Coordination

- Tribal Consultation – Letter submitted to tribes on November 3, 2017 with a determination of "No Historic Properties Affected"; The Choctaw Nation of Oklahoma concurred via email on December 5, 2017. As of February 16, 2018, no other responses have been received from the tribes.
- State Historic Preservation Office Response – Letter submitted to SHPO on November 3, 2017 with a determination of "No Historic Properties Affected"; SHPO concurred on November 30, 2017.
- Department of Environmental Quality, Water Quality Certificate – State Water Quality Certification was submitted on March 2, 2018 and by e-mail from the Louisiana Department of Quality, dated April 30, 2018 concurred with modification of existing WQC 151210-02, stating that the Water Quality Certification WQC 151210-02 is valid.
- Department of Natural Resources, Coastal Zone Consistency – In accordance with Section 307, a Consistency Determination was submitted on February 28, 2018 to Louisiana Department of Natural Resources (DNR) for the Proposed Action. On May 16, 2018, DNR concurred that the Proposed Action is consistent with the Louisiana Coastal Resources Program in accordance with Section 307 (c) of the CZMA.
- U.S. Fish and Wildlife Service
    - Fish and Wildlife Coordination Act – A draft Coordination Act Report has been submitted. Draft responses have been completed and further coordination with USFWS will occur (see Appendix G).
    - Endangered Species Act of 1973 – coordination with the USFWS under Section 7 of the Endangered Species has been completed and USFWS found that the project is not likely to adversely effect trust resources.
- National Marine Fisheries Service – Coordination under the Magnuson-Stevens Fishery Conservation and Management Act is ongoing. The NMFS would receive a copy of this EA during the public comment period.

Annex F: Draft 404(b)(1) Determination

Appendix C. NFS Letter of Intent and Statement of Financial Capability

This will be included in the final report

Appendix D. Relocations Summary

Available Upon Request due to size of the file.

Appendix E. LCA BUDMAT at Tiger Pass 2, Draft 2017 Geotechnical Report

Based on similarities between Tiger Pass 2 and the immediately adjacent and recently constructed Tiger Pass project, it is assumed site conditions are similar. However, a geotechnical investigation is ongoing. Conclusions from the investigation would be made available in a Geo-technical Report at a later date.

Appendix F. Cost Certification and Total Project Cost Summary

Cost Certification, Total Project Cost Summary, and the Abbreviated Risk Analysis will be included in the final report.

Appendix G. US Fish and Wildlife Draft Coordination Report

Appendix H. Real Estate Plan

Appendix I. DQC & ATR Certification

Certification Completion Statements will be included with the final report

Appendix J. Value Engineering Study