DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, NEW ORLEANS DISTRICT
7400 LEAKE AVENUE
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DRAFT FINDING OF NO SIGNIFICANT IMPACT (FONSI)

Mississippi River, Baton Rouge to the Gulf of Mexico, Louisiana
Neptune Pass Rock Closure
Plaquemines Parish, Louisiana
Environmental Assessment #589

Introduction: The U.S. Army Corps of Engineers (USACE), New Orleans District (CEMVN), has prepared Environmental Assessment #589 (EA #589) in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended. The EA assesses the potential impacts associated with constructing flow control structures in both Neptune Pass and Quarantine Bay, located on the left descending bank of the Mississippi River, in Plaquemines Parish, Louisiana, approximately 11 miles northwest of Venice, Louisiana. In September 2022, the USACE released Draft EA #589 for a 30-day public review period and received critical feedback from Federal and State agencies, the public, and non-governmental organizations. The USACE has since undertaken additional re-design and preliminary hydraulic and hydrologic modeling resulting in the re-design of the Neptune Pass flow control feature and addition of flow control features in Quarantine Bay as discussed in EA #589.

Project Authority: The project, "Mississippi River, Louisiana, Between Baton Rouge and New Orleans" was authorized by the River and Harbor Act of 1925, in accordance with the report of the Chief of Engineers published as House Document Number 105, 69th Congress. The project, "Mississippi River at and near New Orleans, Louisiana was authorized by the River and Harbor Act of 1937 in accordance with the report of the Chief of Engineers published as House Document 597, 75th Congress. The project, Mississippi River, Baton Rouge to the Gulf of Mexico, was authorized by Section 2 of the River and Harbor Act of 1945 (PL 79-14) in accordance with the report of the Chief of Engineers in House Document No 215 of the 76th Congress, and by the River and Harbor Act of 1962 in accordance with the report of the Chief of Engineers in Senate Document No. 36 of the 87th Congress. The project, "Mississippi River Ship Channel, Gulf to Baton Rouge, Louisiana" was authorized by the Supplemental Appropriations Act of 1985 and by Section 201 of the Water Resources Development Act of 1986, both in accordance with the Report of the Chief of Engineers dated April 9, 1983.

Although the Water Resources Development Act of 1986 authorized the construction and maintenance of the project channel to a depth of 55 feet, current approved construction, as supported by a Project Partnership Agreement with the Louisiana Department of Transportation and Development, is currently being constructed and ultimately maintained (when constructed) to a depth of 50 feet. For the project reaches below the Port of New Orleans, the approved channel depth of 50 feet has been constructed and is being maintained, as necessary to sustain that depth. The proposed work at Neptune Pass must be performed in order to maintain the integrity and safety of the 50-foot navigation channel in this reach of the river.

Purpose and Need for the Action: The purpose of the proposed action is to eliminate a navigational hazard in the Mississippi River. Neptune Pass is a natural crevasse which existed prior to 1985 but has increased significantly in size and flow during recent annual high river events, with a noticeable enlargement after 2019. This newly enlarged pass is diverting approximately

eight times more water than the other five adjacent outlets combined in this 3-mile reach of the Mississippi River. In an effort to best reduce sedimentation within the Mississippi River attributed to the expansion of Neptune Pass, the location and dimensions of the proposed action were designed to approximately match the outlet before the riverside bank protection failed and the pass was allowed to develop. Approximately 16% of the Mississippi River is currently being diverted through Neptune Pass, and a reduction in diverted flow to 6%, the historical flow rate prior to expansion of Neptune Pass in 2019, is expected following construction of the proposed action; however, flow through the pass will vary according to river stage within the vicinity of the project (USACE 2023).

Construction of flow control features within Neptune Pass (inlet structure) and Quarantine Bay (outlet structures – SREDs) would decrease riverbank scour and erosion within the Pass and control water flow being diverted from the Mississippi River. The current, uncontrolled diversion is resulting in significant shoaling and the immediate need for dredging to maintain authorized navigational depths (Figure 4). In the absence of the proposed action, continued scouring within Neptune Pass would occur, resulting in an increase of flow being diverted from the Mississippi River and subsequent, increased shoaling. Additionally, an increase in dredging operations within the Mississippi River would be required to compensate for the diversion effects if the proposed action is not completed. The large amount of water flowing through Neptune Pass is also resulting in reports of pilots of deep-draft vessels experiencing suction effects as they transit the adjacent segment of the Mississippi River. Without the proposed construction of the flow control feature, conditions would continue to deteriorate resulting in an increased threat to navigation. The lower Mississippi River is a primary access point for commercial shipping to ports of call along the river, and the segment of the Mississippi River from Baton Rouge to the Gulf of Mexico supported approximately 428 million tons of waterborne commerce in 2020 (USACE 2020). There is a national interest in providing progressive channel stabilization to prevent any alteration of the river flow that could potentially pose a navigation threat for large vessels transiting these sections of the river.

Proposed Action:

Neptune Pass Flow Reduction Structures
(All elevations referenced for the proposed action structures are to North American Vertical Datum 1988 (NAVD88) (epoch 2004.65), unless otherwise noted).

The increasing flow being diverted from the Mississippi River through Neptune Pass at Mississippi River mile 24 above Head of Passes on the left descending bank following the development of a crevasse and widening of the channel is causing a hazard to navigation in the Mississippi River during higher river stages, siltation in the Mississippi River downstream of the outlet, increased saltwater intrusion during low river in the Mississippi River, and continued deterioration of the banks inside of Neptune Pass. The flow needs to be reduced to prevent this shorter route to the Gulf of Mexico from continuing to grow. There will be two features that will work together to provide a sustainable solution to remove the hazard. There will be stone placed to raise the existing river bank sill at the confluence of the Mississippi River and Neptune Pass to reduce the volume of water exiting the Mississippi River. There will be Sediment Retention Enhancement Devices (SREDs) built with earthen material excavated from adjacent mud-bottoms, as well as placement of geotextile fabric and stone riprap. The SREDs would be constructed at the outlet of Neptune Pass in Quarantine Bay to help back the water up Neptune Pass and reduce the velocity of water coming through the stone sill. All features will be placed in navigable water. The target flow after construction is approximately 80,000 cubic feet per (cfs) second at a Mississippi River flow of 1 million cfs.

Inlet Structure

The proposed Neptune Pass Inlet Structure is a stone sill that would reduce the cross-sectional area at the outlet of the Mississippi River and the inlet of Neptune Pass. The structure centerline would be curved to sit on top of the existing bank line sill at the confluence of the Mississippi River and Neptune Pass. The center of the structure would have a 100-foot-wide notch at an elevation of -26 feet and a 115-foot-wide crown. On both sides of the notch, it would slope up at a 1 vertical on 2 horizontal (1V:2H) slope to an elevation of -8 feet and a 50-foot-wide crown which would extend 170 feet on both sides of the center notch. Both sides would then slope up at a 1V:2H slope to an elevation of +5 feet and a 5-foot-wide crown to tie into the upstream and downstream Mississippi River bank. The existing foreshore dike extending approximately 675 feet upstream of the sill would be capped with stone to match the tie in elevation of +5 feet. The structure would slope down to the existing ground from the elevations previously described at a 1V:1.75H slope perpendicular to the Mississippi River bank. The inlet of Neptune Pass would be reduced to an area of approximately 7,200 square feet. The structure would be constructed with approximately 168,000 tons of stone that has a maximum stone weight of 1,200 pounds. A 3-foot-thick layer of stone paving scour protection requiring approximately 20,000 tons of 1,200-pound stone would be placed approximately 325 feet into the pass from the crown of the structure.

Outlet Structures

The proposed Neptune Pass Outlet Structures would consist of multiple ten armored V-shaped SREDs placed between the -6 and -10-foot contour. Barge mounted excavators would be utilized to excavate earthen material from adjacent mud-bottoms and side cast material to create each SRED. It is expected that a total of approximately 520,000 cubic yards of earthen material would be required for construction of the SREDs. The SREDs would have a five-foot top width and would be constructed to a target elevation of +5.0 feet, with side slopes of 1V:2H. Each SRED would consist of multiple terraces that are 300 feet long with 100-foot gaps between each terrace. The SREDs would consist of armor stone, bedding and core stone, and geotextile. The Approximately twenty SREDs would also require placement of approximately 250,000 tons of armor stone, 50,000 tons of core and bedding stone, and 100,000 square yards of geotextile. All work would be via floating plant. Placement of stone would be via barge mounted excavator or dragline. Figure 4 shows the outlet structure features (SREDs).

Alternatives Considered but Eliminated from Further Consideration:

Alternative 1

Alternative 1 (previous proposed action included in the September 2022 Draft EA #589). This alternative considered the construction of a flow control feature requiring installation of a stone closure structure within Neptune Pass via placement of stones from a barge positioned within the Pass. The structure would be built to an elevation of +5 feet with a 6-foot crown width on a 1V:2H slope perpendicular to the center line with a 100-foot notch constructed at an elevation of -10 feet in the center of the structure. A 2-foot bank paving at the inlet and outlet and 2-foot channel paving at the structure outlet would be constructed as scour protection. Stone key-in of the closure structure would require excavations and extend approximately 150 feet from the top of bank. Approximately 141,000 tons of stone would be placed in an area approximately 4.8 acres in size for construction of the closure structure and bank protection within the Pass. Installation of the key-in segment of the flow control feature would require excavation of approximately 1,500 cubic yards of material and placement of 1,750 tons of stone in approximately 0.4 acres of wetland areas adjacent to the Pass. This alternative received critical feedback from Federal and State agencies, the public, and non-governmental organizations in a September 2022 30-day public

review of Draft EA #589. The performance of the formerly proposed structure was analyzed, and findings presented include output from the 800,000 cfs simulation and suggest that the structure would significantly reduce the flow diverted through Neptune Pass but would induce hydraulic conditions that could result in flanking of the structure and/or additional marsh scour. Under high-flow scenarios on the Mississippi River, the sill-notch structure restricted flow through the pass so much that a significant water surface elevation difference across the structure was created. Continued stress under this high-flow scenario could lead to increased marsh scour, pass enlargement, and potential failure of the structure via flanking, further increasing the flow diverted through Neptune Pass. The potential for flanking and marsh erosion associated with the formerly proposed structure under this alternative rendered its implementation infeasible. After undertaking additional re-design and preliminary hydraulic and hydrologic modeling resulting in the re-design of the Neptune Pass flow control feature and addition of flow control features in Quarantine Bay, it was determined that this alternative was not the most efficient and effective alternative; therefore, it was eliminated from further consideration.

Alternative 2

Alternative 2 considered the construction of the structure on the Mississippi Riverbank at the mouth of Neptune Pass. There is an existing stone dike and revetment up and down stream of the proposed location structure to tie into. Construction on the Mississippi Riverbank would be the way to return to the local geometry to pre-existing conditions. However, the large quantity of stone being placed on a relatively narrow sill with existing stability concerns put the structure at risk of failure. Failure could occur from scour continuing to develop behind the structure as the sediment starved water enters the pass. Flanking of the structure on the upstream or downstream limits at the locations where is pass is already expanding is also a possibility. Either of these failure modes would result in redevelopment of existing conditions. Additionally, preliminary estimates indicate that this alternative would require approximately 211,000 tons of stone to complete, an increase of 70,000 tons of stone from the proposed action. This alternative was not the most efficient and effective alternative; therefore, it was eliminated from further consideration.

Alternative 3

Alternative 3 considered the construction of a structure without the inclusion of a notch. A full closure would be the most effective means of reducing the shoaling attributed to the expansion of the pass. However, failure resulting from the flanking of the structure on the upstream or downstream limits at locations where the pass is already expanding is a high possibility. Additionally, the 100 feet notch at -10 feet NAVD88 of the proposed action was designed to approximately match this outlet before the bank failed and the pass was allowed to develop. There is the best chance of reducing sedimentation in the Mississippi River by matching the historic stream power at this location to the pre failure conditions. Public concern for maintaining some connectivity from the river to adjacent marsh areas in order to facilitate land gain was also considered in the elimination of a full closure structure design. This alternative was not the most efficient and effective alternative; therefore, it was eliminated from further consideration.

Alternative 4

Alternative 4 considered the closure of adjacent channels to Neptune Pass to alleviate the shoaling occurring within the Mississippi River. However, the current enlarged outlet through Neptune Pass is diverting approximately four to eight times more water than the five adjacent outlets combined in this three-mile reach of the Mississippi River. Closure of other outlets would not be as effective. Additionally, the shoaling within the Mississippi River adjacent and downstream of the pass was not observed until after the scouring and enlargement of Neptune

Pass occurred. This alternative was not the most efficient and effective alternative; therefore, it was eliminated from further consideration.

Factors Considered in Determination: In accordance with NEPA and other applicable laws and regulations, CEMVN has assessed the impacts of the No Action alternative and the Proposed Action. All practicable and appropriate means to avoid or minimize adverse environmental effects were analyzed and incorporated into the Proposed Action. A summary of the potential effects is listed in Table 1.

Table 1: Relevant Resources and Their Impact Status, Both Adverse and Beneficial

Relevant Resource	Impacted	Not Impacted
Navigation	X	
Aquatic Resources/Fisheries	X	
Wetlands	X	
Essential Fish Habitat	X	
Wildlife	X	
Threatened and Endangered Species		X
Cultural Resources		X
Tribal Resources		X
Air Quality	X	
Greenhouse Gas	X	
Water/Sediment Quality	X	

Endangered Species Act of 1973: Pursuant to section 7 of the Endangered Species Act of 1973, as amended, the USACE has determined that the Proposed Action would not likely adversely affect the endangered species within the vicinity of the project, or any critical habitat. The U. S. Fish and Wildlife Service (USFWS) concurred with the USACE's determination in a letter dated May 21, 2024. No encounters or take of threatened, endangered, or protected species were reported during project activities.

National Historic Preservation Act of 1966: Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended, requires federal agencies to take into account the effects of their undertakings on historic properties and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on such undertakings. The procedures in 36 CFR Part 800 define how federal agencies meet these statutory responsibilities. The Section 106 process seeks to accommodate historic preservation concerns with the needs of federal undertakings through consultation on historic properties, including the State Historic Preservation Officer (SHPO) or Tribal Historic Preservation Officer (THPO) and any Tribe that attaches religious or cultural significance to historic properties that may be affected by an undertaking. The goal of consultation is to identify historic properties potentially affected by the undertaking, assess its effects and seek ways to avoid, minimize or mitigate any adverse effects on historic properties. Pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended, the USACE has determined that there are no historic properties, as defined in 36 CFR 800.16 (l) within the Neptune Pass area of potential effect (APE). Accordingly, a conclusion of "no historic properties affected" was sent to the Louisiana State Historic Preservation Office (SHPO) and interested federally recognized Tribes on June 13, 2022. Concurrence from the SHPO was received on June 28, 2022. On July 7, 2022, the Muscogee Nation responded with their wish to defer to other

Tribes. On July 11, 2022, the Choctaw of Oklahoma, and on July 13, 2022, the Chitimacha Tribe responded their concurrence with the conclusion of "no historic properties affected". No other tribal responses were received.

The current proposed project includes the same APE as was coordinated by the June 13, 2022 letters, but now adds an APE at the outlet of Neptune Pass, where sediment captures are proposed and will require borrow from adjacent areas. Coordination of effects for the new portion of APE, are currently underway.

Clean Water Act of 1972 – Section 404 and Section 401: The Clean Water Act (CWA) sets and maintains goals and standards for water quality and purity. A CWA draft Section 404(b)(1) public notice entitled "Neptune Pass Rock Closure (Plaquemines Parish)" has been prepared by the CEMVN and will be circulated for 30-day public review concurrent with the 30-day public review for Draft EA #589.

CWA Section 401 requires a Water Quality Certification from the Louisiana Department of Environmental Quality (LDEQ) that a proposed project does not violate established effluent limitations and water quality standards. Surface water quality standards are established in the Louisiana Administrative Code (LAC) Title 33, Part IX (2020). The CEMVN received a state-issued 401 Water Quality Certificate for the project on March 21, 2024 (WQC 220830-02/ CER20240001).

Clean Air Act of 1972: The Clean Air Act (CAA) sets goals and standards for the quality and purity of air. It requires the EPA to set National Ambient Air Quality Standards (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 and Louisiana Administrative Code, Title 33 to grant a general conformity determination.

Greenhouse Gas: The Council of Environmental Quality (CEQ), CEQ-2022-0005, on January 9, 2023, introduced the interim guidance on Greenhouse Gas (GHG) Emissions and how agencies are able to compute GHG emissions and the associated social cost for their projects. USACE, in coordination with USACEHQ, developed a methodology to analyze GHGs and incorporate them within NEPA documents. The GHGs analyzed are Carbon dioxide (CO_2), Methane (CH_4), and Nitrous Oxide (N_20). There would be direct emissions from the Construction of the Neptune Pass Rock Closure. The different components for the construction of the Neptune Pass Rock Closure were evaluated: Inlet Structure, Outlet Structure. The total gross GHG emissions (CO_2) for the proposed action would be 10,510 metric tons and the total social costs of GHG emissions for the proposed action would be $1,349,293 (2024 Dollars).

Coastal Zone Management Act of 1972: The Coastal Zone Management Act requires that "each federal agency conducting or supporting activities directly affecting the coastal zone shall conduct or support those activities in a manger which is, to the maximum extent practicable, consistent with approved state management programs." A Federal consistency determination, in accordance with the Louisiana Coastal Zone Management Program (LCZMP) pursuant to the Coastal Zone Management Act (CZMA) of 1972, was submitted to the Louisiana Department of Natural Resources (LDNR) on May 3, 2024. By letter dated June 18, 2024, the LDNR, Office of Coastal Management determined that the subject project was consistent with the LCZMP in accordance with Section 307 (c) of the CZMA of 1972, as amended (C20220079 Mod 03).

Magnuson-Stevens Fisheries Conservation and Management Act: The Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), as amended, Public Law (P.L.) 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 MSFCMA. 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 National Environmental Policy Act documents prepared for those projects.

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. It requires that fish and wildlife resources receive equal consideration to other project features. It requires Federal agencies that construct, license or permit water resource development project to first consult with USFWS, NMFS and state resource agencies regarding the impacts on fish and wildlife resources and measures to mitigate these impacts. The USFWS reviewed the proposed project and provided project specific recommendations in a Coordination Act Report received on April 30, 2024. The USFWS recommendations for the proposed action and USACE responses are listed in EA #589.

Decision: The USACE has evaluated the environmental impacts of the proposed action in EA #589. While unavoidable impacts would occur due to project actions within Neptune Pass and Quarantine Bay, the proposed action would result in the elimination of the present navigational threat within the river. In the absence of the proposed action, continued scouring within Neptune Pass would occur, resulting in an increase of flow being diverted from the Mississippi River and subsequent, increased shoaling. Additionally, an increase in dredging operations within the Mississippi River would be required to compensate for the diversion effects if the proposed action is not completed. The strong currents flowing through Neptune Pass are also resulting in reports of deep draft vessels experiencing suction, created by the large amount of water flowing through Neptune Pass, as these vessels transit the adjacent segment of the Mississippi River. Without the proposed construction of the flow control feature, conditions would continue to deteriorate resulting in an increased threat to navigation. The lower Mississippi River is a primary access point for commercial shipping to ports of call along the river and the segment of the Mississippi River from Baton Rouge to the Gulf of Mexico supported approximately 428 million tons of waterborne commerce in 2020 (USACE 2020). There is a national interest in providing progressive channel stabilization to prevent any alteration of the river flow that could potentially pose a navigation threat for large vessels transiting these sections of the river.

Based on this assessment, a determination has been made that the proposed action would have no significant impact on the environment. Therefore, an Environmental Impact Statement will not be prepared.

DRAFT

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Date

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CULLEN A. JONES, P.E., PMP
Colonel, U.S. Army
District Commander

DRAFT ENVIRONMENTAL ASSESSMENT

MISSISSIPPI RIVER, BATON ROUGE TO THE GULF OF MEXICO, LOUISIANA

NEPTUNE PASS ROCK CLOSURE

PLAQUEMINES PARISH, LOUISIANA

EA #589

August 2024

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

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EA #589

1 INTRODUCTION

The U.S. Army Corps of Engineers (USACE), Mississippi River Valley Division, Regional Planning and Environment Division South, has prepared this Environmental Assessment (EA) to evaluate the potential impacts associated with constructing flow control structures in both Neptune Pass and Quarantine Bay, located on the left descending bank of the Mississippi River, in Plaquemines Parish, Louisiana, approximately 11 miles northwest of Venice, Louisiana (Figure 1). In September 2022, the USACE released Draft EA #589 for a 30-day public review period and received critical feedback from Federal and State agencies, the public, and non-governmental organizations. The USACE has since undertaken additional re-design and preliminary hydraulic and hydrologic modeling resulting in the re-design of the Neptune Pass flow control feature and addition of flow control features in Quarantine Bay as discussed further in this revised draft EA. This draft EA has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969 and the Council on Environmental Quality's Regulations (40 CFR 1500-1508), as reflected in the USACE Engineering Regulation ER 200-2-2. This draft EA provides sufficient information on the potential adverse and beneficial environmental effects to allow the District Commander, USACE, New Orleans District (CEMVN), to make an informed decision on the appropriateness of an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI).

1.1 Proposed Action

1.1.1 Neptune Pass Flow Reduction Structures

(All elevations referenced for the proposed action structures are to North American Vertical Datum 1988 (NAVD88) (epoch 2004.65), unless otherwise noted).

The increasing flow being diverted from the Mississippi River through Neptune Pass at Mississippi River mile 24 above Head of Passes on the left descending bank following the development of a crevasse and widening of the channel is causing a hazard to navigation in the Mississippi River during higher river stages, siltation in the Mississippi River downstream of the outlet, increased saltwater intrusion during low river in the Mississippi River, and continued deterioration of the banks inside of Neptune Pass. The flow needs to be reduced to prevent this shorter route to the Gulf of Mexico from continuing to grow. The proposed action comprises two features that would work together to provide a sustainable solution to remove the hazard. There would be stone placed to raise the existing riverbank sill at the confluence of the Mississippi River and Neptune Pass to reduce the volume of water exiting the Mississippi River. There would be Sediment Retention Enhancement Devices (SREDs) built with earthen material excavated from adjacent mud-bottoms, as well as placement of geotextile fabric and stone riprap. The SREDs would be constructed at the outlet of Neptune Pass in Quarantine Bay to help back the water up Neptune Pass and reduce the velocity of water coming through the stone sill. All features would be placed in navigable water. The target flow after construction is approximately 80,000 cubic feet per (cfs)

second at a Mississippi River flow of 1 million cfs. Figure 1 shows the project area with inlet and outlet structures.

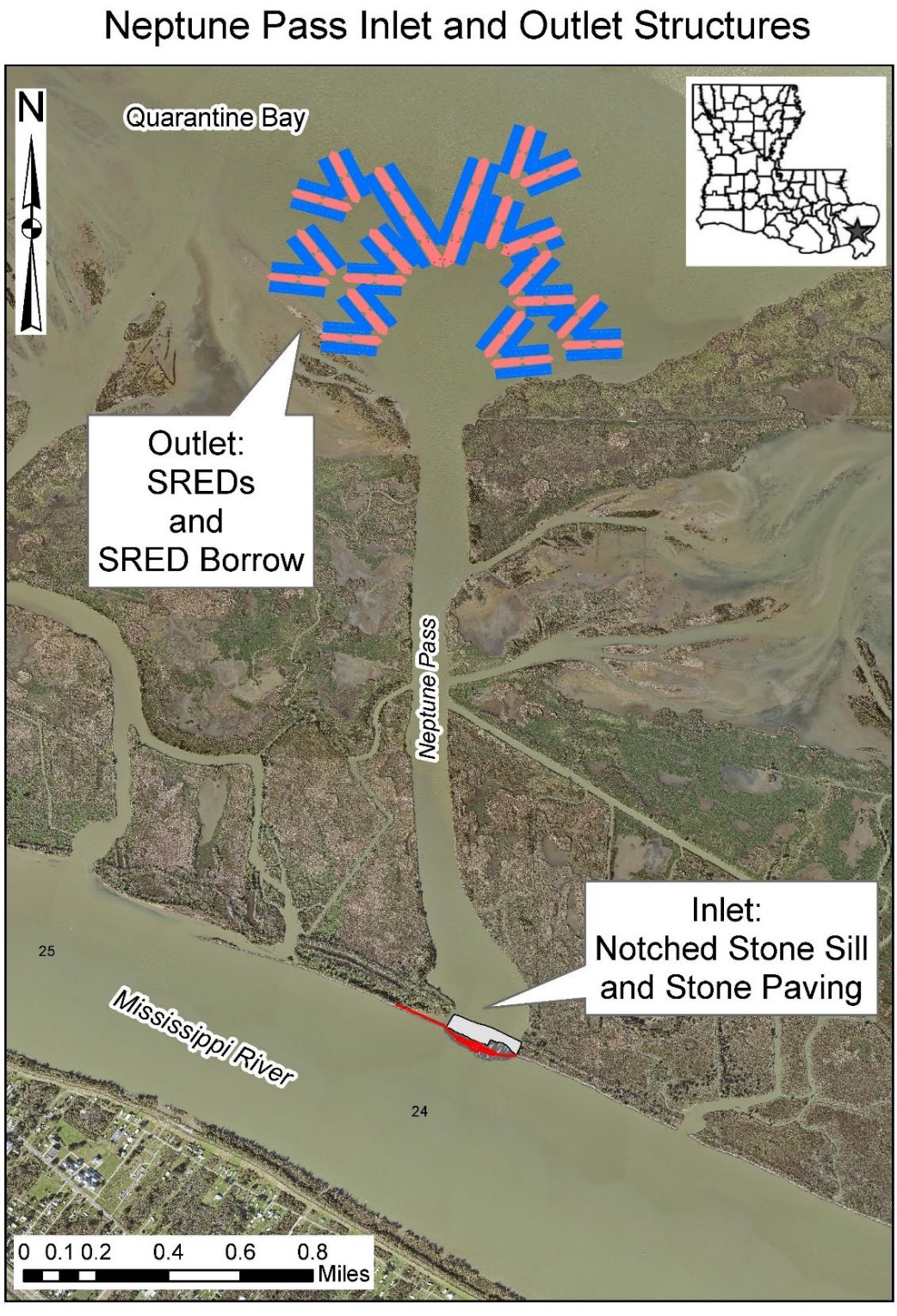

Figure 1: Project Vicinity Map and Features

1.1.2 Inlet Structure

The proposed Neptune Pass Inlet Structure is a stone sill that would reduce the cross-sectional area at the outlet of the Mississippi River and the inlet of Neptune Pass. The structure centerline would be curved to sit on top of the existing bank line sill at the confluence of the Mississippi River and Neptune Pass. The center of the structure would have a 100-foot-wide notch at an elevation of -26 feet and a 115-foot-wide crown. On both sides of the notch, it would slope up at a 1 vertical on 2 horizontal (1V:2H) slope to an elevation of -8 feet and a 50-foot-wide crown which would extend 170 feet on both sides of the center notch. Both sides would then slope up at a 1V:2H slope to an elevation of +5 feet and a 5-foot-wide crown to tie into the upstream and downstream Mississippi River bank. The existing foreshore dike extending approximately 675 feet upstream of the sill would be capped with stone to match the tie in elevation of +5 feet. The structure would slope down to the existing ground from the elevations previously described at a 1V:1.75H slope perpendicular to the Mississippi River bank. The inlet of Neptune Pass would be reduced to an area of approximately 7,200 square feet. The structure would be constructed with approximately 168,000 tons of stone that has a maximum stone weight of 1,200 pounds. A 3-foot-thick layer of stone paving scour protection requiring approximately 20,000 tons of 1,200-pound stone would be placed approximately 325 feet into the pass from the crown of the structure. Figure 2 shows the inlet structure features. Figure 3 shows a side scan rendition of the inlet structure.

1.1.3 Outlet Structures

The proposed Neptune Pass Outlet Structures would consist of multiple armored V-shaped SREDs placed between the -6 and -10-foot contour. Barge mounted excavators would be utilized to excavate earthen material from adjacent mud-bottoms and side cast material to create each SRED. It is expected that a total of approximately 520,000 cubic yards of earthen material would be required for construction of the SREDs. The SREDs would have a five-foot top width and would be constructed to a target elevation of +5.0 feet, with side slopes of 1V:2H. Each SRED would consist of multiple terraces that are 300 feet long with 100-foot gaps between each terrace. The SREDs would also require placement of approximately 250,000 tons of armor stone, 50,000 tons of core and bedding stone, and 100,000 square yards of geotextile. All work would be via floating plant. Placement of stone would be via barge mounted excavator or dragline. Figure 4 shows the outlet structure features (SREDs). Figure 5 shows a rendition of the approximate proposed location of the outlet structures (SREDs).

1.2 Authority for the Proposed Action

The project, “Mississippi River, Louisiana, Between Baton Rouge and New Orleans” was authorized by the River and Harbor Act of 1925, in accordance with the report of the Chief of Engineers published as House Document Number 105, 69th Congress. The project, “Mississippi River at and near New Orleans, Louisiana was authorized by the River and Harbor Act of 1937 in accordance with the report of the Chief of Engineers published as House Document 597, 75th Congress. The project, Mississippi River, Baton Rouge to the Gulf of Mexico, was authorized by Section 2 of the River and Harbor Act of 1945 (PL 79-14) in accordance with the report of the Chief of Engineers in House Document No 215 of the 76th Congress, and by the River and Harbor Act of 1962 in accordance with the report of the Chief of Engineers in Senate Document No. 36 of the 87th Congress. The project, “Mississippi River Ship Channel, Gulf to Baton Rouge, Louisiana” was authorized by the Supplemental Appropriations Act of 1985 and by Section 201 of the Water Resources Development Act of 1986, both in accordance with the Report of the Chief of Engineers dated April 9, 1983.

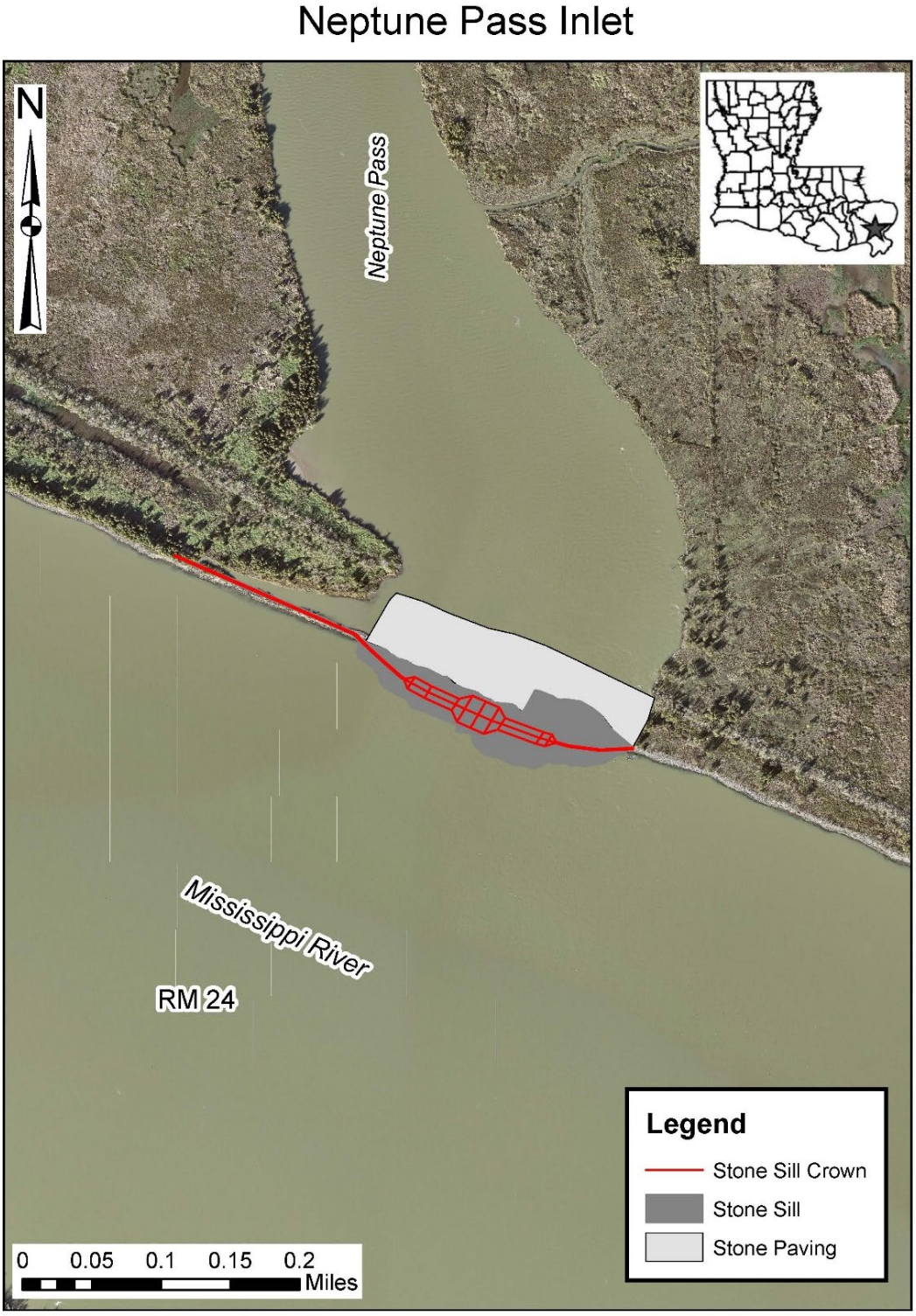

Figure 2: Inlet Structure Features

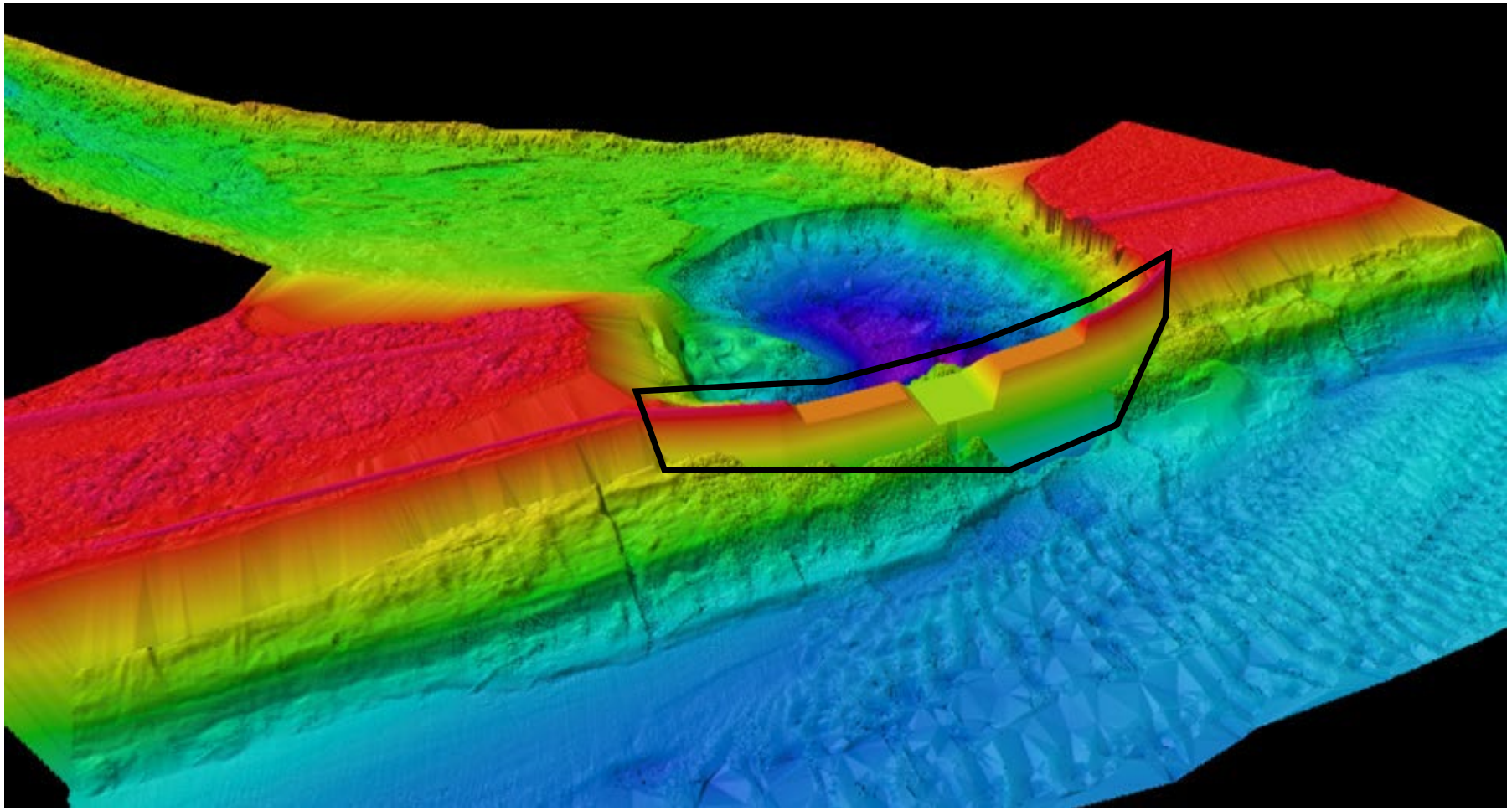

Figure 3: Side Scan Rendition of Inlet Stone Sill (Limits Delineated by Black Polygon Outline)

Figure 4: Outlet Structures Features

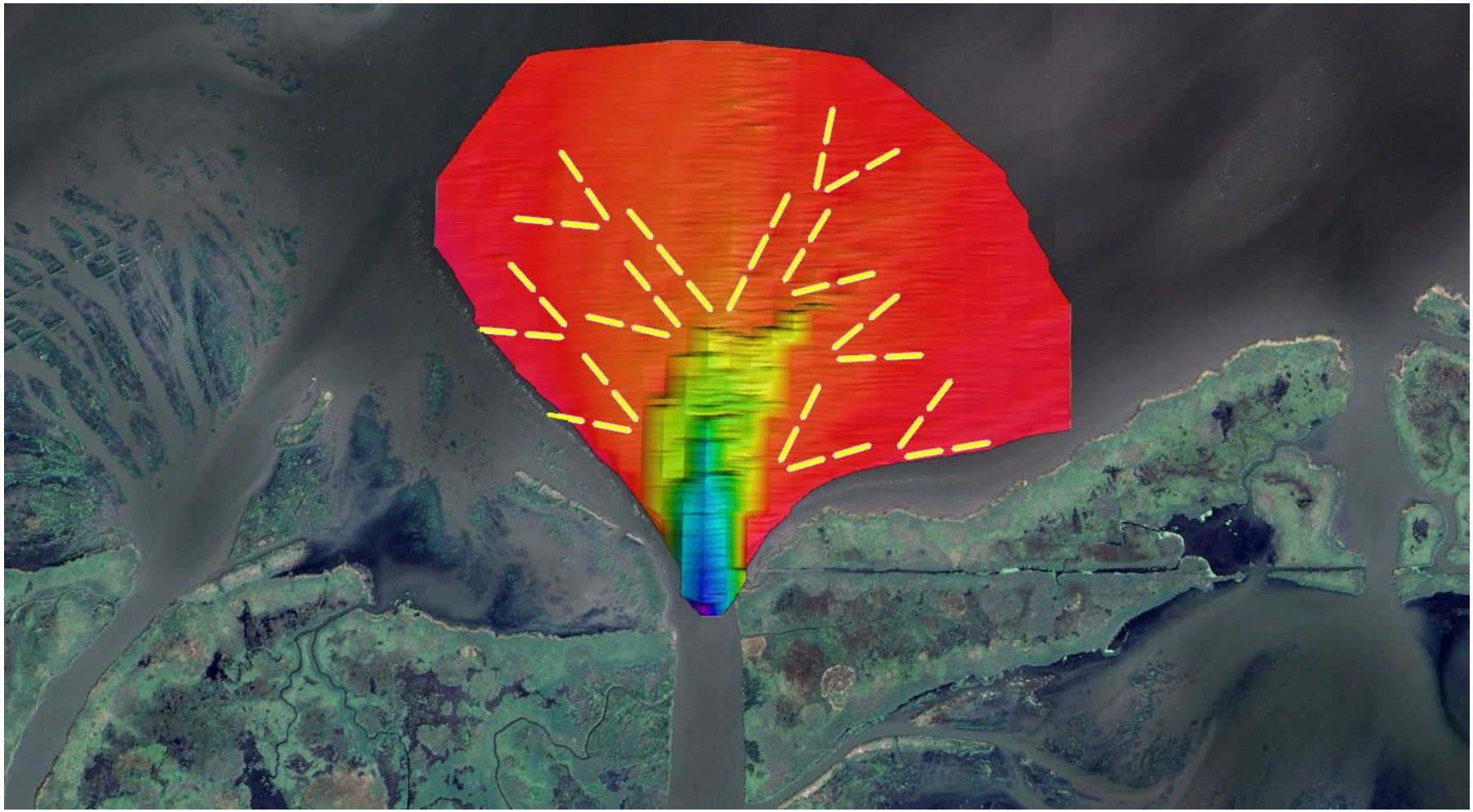

Figure 5: Rendition of Approximate Location(s) and V-shaped Design of Outlet SREDS in Quarantine Bay

1.3 Purpose and Need for the Proposed Action

The purpose of the proposed action is to eliminate a navigational hazard in the Mississippi River. Neptune Pass is a natural crevasse which existed prior to 1985 but has increased significantly in size and flow during recent annual high river events, with a noticeable enlargement after 2019. This newly enlarged pass is diverting approximately eight times more water than the other five adjacent outlets combined in this 3-mile reach of the Mississippi River. In an effort to best reduce sedimentation within the Mississippi River attributed to the expansion of Neptune Pass, the location and dimensions of the proposed action were designed to approximately match the outlet before the riverside bank protection failed and the pass was allowed to develop. Approximately 16% of the Mississippi River is currently being diverted through Neptune Pass, and a reduction in diverted flow to 6%, the historical flow rate prior to expansion of Neptune Pass in 2019, is expected following construction of the proposed action; however, flow through the pass would vary according to river stage within the vicinity of the project (USACE 2023).

Construction of flow control features within Neptune Pass (inlet structure) and Quarantine Bay (outlet structures – SREDs) would decrease riverbank scour and erosion within the Pass and control water flow being diverted from the Mississippi River. The current, uncontrolled diversion is resulting in significant shoaling and the immediate need for dredging to maintain authorized navigational depths (Figure 6). In the absence of the proposed action, continued scouring within Neptune Pass would occur, resulting in an increase of flow being diverted from the Mississippi River and subsequent, increased shoaling. Additionally, an increase in dredging operations within the Mississippi River would be required to compensate for the diversion effects if the proposed action is not completed. The large amount of water flowing through Neptune Pass is also resulting in reports of pilots of deep-draft vessels experiencing suction effects as they transit the adjacent segment of the Mississippi River. Without the proposed construction of the flow control feature, conditions would continue to deteriorate resulting in an increased threat to navigation. The lower Mississippi River is a primary access point for commercial shipping to ports of call along the river, and the segment of the Mississippi River from Baton Rouge to the Gulf of Mexico supported approximately 428 million tons of waterborne commerce in 2020 (USACE 2020). There is a national interest in providing progressive channel stabilization to prevent any alteration of the river flow that could potentially pose a navigation threat for large vessels transiting these sections of the river.

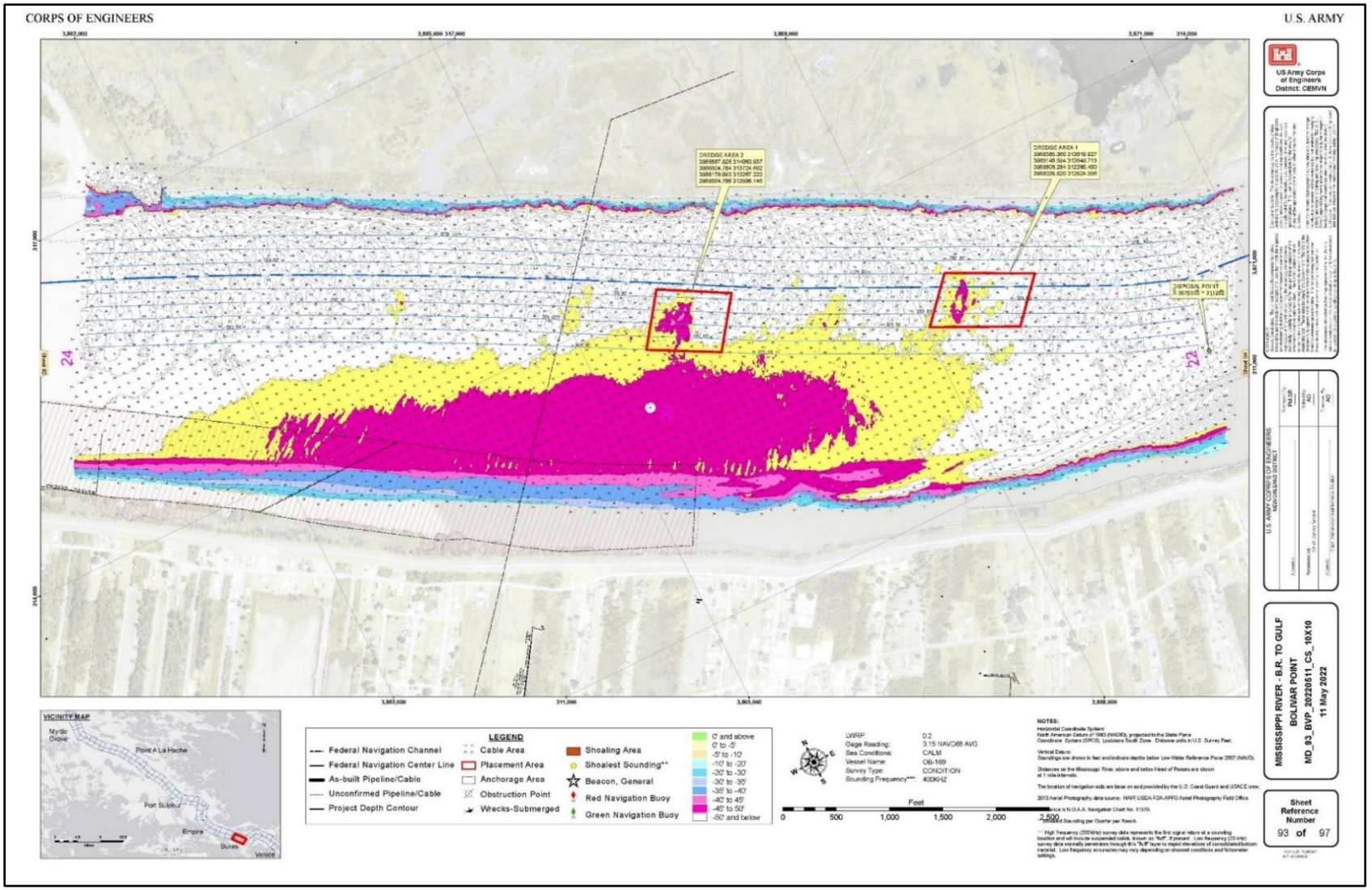

Figure 6: Shoaling Occurring Within the Mississippi River Attributed to the Expansion of Neptune Pass

1.4 Prior NEPA Documents

The environmental impacts associated with maintaining channels, outlets, and specified dimensions of the Mississippi River from Baton Rouge, Louisiana to deep water in the Gulf of Mexico were addressed in the Final Environmental Impact Statement (EIS), "Mississippi River, Baton Rouge to the Gulf of Mexico, Louisiana". A Statement of Findings (SOF) for this EIS was signed on February 15, 1974. The project commences at the Port of Baton Rouge, 128.6 miles above the Port of New Orleans, and continues through the Port of New Orleans to about 94.5 miles south to the Head of Passes. Below the Head of Passes, two channels, Southwest Pass and South Pass, connect to the Gulf of Mexico.

Supplement I to the 1974 EIS addressed unintentional omissions in the original EIS and unanticipated changes in dredging requirements. A SOF for Supplement I was signed on March 8, 1976.

Supplement II to the 1974 EIS addressed the addition of recommended features to the existing project to reduce the amount of maintenance dredging required to maintain navigation within the project area. A SOF was signed for Supplement II on May 15, 1985.

The "Integrated General Reevaluation Report & Supplement III to the Final Environmental Impact Statement, Mississippi River Ship Channel, Baton Rouge to the Gulf of Mexico, Louisiana" addressed navigation improvements for deep draft navigation access to ports located along the Mississippi River in southeast Louisiana. A Record of Decision (ROD) was signed for Supplement III on August 3, 2018.

EA #595, Neptune Pass Emergency Armoring, Plaquemines Parish, Louisiana, addressed potential impacts associated with emergency construction of a stone revetment structure along the eastern bank of the mouth of Neptune Pass, adjacent to Mississippi River mile 23.9, in Plaquemines Parish, Louisiana. The emergency action required placement of approximately 58,000 tons of stone by barge mounted equipment positioned both within the Pass and Mississippi River to stabilize the rapidly eroding eastern bank of the mouth of Neptune Pass. The stone was placed in open water and no wetlands within the area were impacted by the action. The project area is approximately 8 acres of open water located along the eastern bank of the mouth of Neptune Pass. Construction of the stone revetment structure was completed on June 3, 2023. A FONSI was signed for EA #595 on March 13, 2024.

1.5 Public Concerns

Localized accretion has been observed within adjacent bays to Neptune Pass. Louisiana accounts for 80% of the continental United States' coastal wetland loss (Williams et al. 1997), and some public support exists for allowing Neptune Pass to remain open and unmodified to promote land gain and potential wetland establishment within these areas.

While additional studies would provide clarification regarding the potential land building capabilities of the diversion, the purpose and need for the proposed project is the elimination of the navigational hazard present within the Mississippi River. There is no current authority in this project for USACE to thoroughly study the marsh creation potential of leaving the pass open. The current, uncontrolled diversion is resulting in significant shoaling and the immediate need for dredging to maintain authorized navigational depths. Additionally, the large amount of water

flowing through Neptune Pass is resulting in reports of pilots of deep-draft vessels experiencing suction effects as they transit the adjacent segment of the Mississippi River. The Rivers and Harbors Acts of 1946 and 1962, the Supplemental Appropriations Act of 1985, and the Water Resources Development Act of 1986 (Public Law 99-662) provide for the maintenance of channel dimensions of the Mississippi River from the Gulf of Mexico to Baton Rouge, Louisiana. By this authority, the USACE is authorized and obligated to perform necessary project actions to maintain the prescribed navigational dimensions of the Mississippi River. The segment of the Mississippi River from Baton Rouge to the Gulf of Mexico supported approximately 428 million tons of waterborne commerce in 2020 (USACE 2020); therefore, the maintenance of this navigable waterway is vital for local and global supply chains and economies. The existing conditions within the vicinity of Neptune Pass pose a threat to navigation and commercial trade, and the potential expansion of Neptune Pass would further endanger vessels transiting the area in the absence of the proposed action.

2 ALTERNATIVES TO THE PROPOSED ACTION

2.1.1 No-Action – Future without Project Condition

In the future without project condition (a.k.a. no-action), the proposed action would not be constructed. In the absence of the proposed action, uncontrolled flow would continue to be diverted from the Mississippi River resulting in continued shoaling in the adjacent segment of the river.

Continued scouring within Neptune Pass would occur, resulting in an increase of flow being diverted from the Mississippi River and subsequent increased shoaling. Additionally, an increase in dredging operations within the Mississippi River would be required to compensate for the diversion effects if the proposed action is not completed. Deep draft vessels would continue to experience suction when transiting the Mississippi River adjacent to Neptune Pass, with a potential for an increase in suction as Neptune Pass widens and flow increases. Without the proposed construction of the flow control feature, conditions would continue to deteriorate resulting in an increased threat to navigation.

2.2 Alternatives Considered but Eliminated from Further Consideration

2.2.1 Alternative 1

Alternative 1 (previous proposed action included in the September 2022 Draft EA #589). This alternative considered the construction of a flow control feature requiring installation of a stone closure structure within Neptune Pass via placement of stones from a barge positioned within the Pass. The structure would be built to an elevation of +5 feet with a 6-foot crown width on a 1V:2H slope perpendicular to the center line with a 100-foot notch constructed at an elevation of -10 feet in the center of the structure. A 2-foot bank paving at the inlet and outlet and 2-foot channel paving at the structure outlet would be constructed as scour protection. Stone key-in of the closure structure would require excavations and extend approximately 150 feet from the top of bank. Approximately 141,000 tons of stone would be placed in an area approximately 4.8 acres in size for construction of the closure structure and bank protection within the Pass. Installation of the key-in segment of the flow control feature would require excavation of approximately 1,500 cubic yards of material and placement of 1,750 tons of stone in approximately 0.4 acres of wetland areas adjacent to the Pass. This alternative received critical feedback from Federal and State agencies, the public, and non-governmental organizations in a September 2022 30-day public

review of Draft EA #589. The performance of the formerly proposed structure was analyzed, and findings presented include output from the 800,000 cfs simulation and suggest that the structure would significantly reduce the flow diverted through Neptune Pass but would induce hydraulic conditions that could result in flanking of the structure and/or additional marsh scour. Under high-flow scenarios on the Mississippi River, the sill-notch structure restricted flow through the pass so much that a significant water surface elevation difference across the structure was created. Continued stress under this high-flow scenario could lead to increased marsh scour, pass enlargement, and potential failure of the structure via flanking, further increasing the flow diverted through Neptune Pass. The potential for flanking and marsh erosion associated with the formerly proposed structure under this alternative rendered its implementation infeasible. After undertaking additional re-design and preliminary hydraulic and hydrologic modeling resulting in the re-design of the Neptune Pass flow control feature and addition of flow control features in Quarantine Bay, it was determined that this alternative was not the most efficient and effective alternative; therefore, it was eliminated from further consideration.

2.2.2 Alternative 2

Alternative 2 considered the construction of the structure on the Mississippi Riverbank at the mouth of Neptune Pass. There is an existing stone dike and revetment up and down stream of the proposed location structure to tie into. Construction on the Mississippi Riverbank would be the way to return to the local geometry to pre-existing conditions. However, the large quantity of stone being placed on a relatively narrow sill with existing stability concerns put the structure at risk of failure. Failure could occur from scour continuing to develop behind the structure as the sediment starved water enters the pass. Flanking of the structure on the upstream or downstream limits at the locations where is pass is already expanding is also a possibility. Either of these failure modes would result in redevelopment of existing conditions. Additionally, preliminary estimates indicate that this alternative would require approximately 211,000 tons of stone to complete, an increase of 70,000 tons of stone from the proposed action. This alternative was not the most efficient and effective alternative; therefore, it was eliminated from further consideration.

2.2.3 Alternative 3

Alternative 3 considered the construction of a structure without the inclusion of a notch. A full closure would be the most effective means of reducing the shoaling attributed to the expansion of the pass. However, failure resulting from the flanking of the structure on the upstream or downstream limits at locations where the pass is already expanding is a high possibility. Additionally, the 100 feet notch at -10 feet NAVD88 of the proposed action was designed to approximately match this outlet before the bank failed and the pass was allowed to develop. There is the best chance of reducing sedimentation in the Mississippi River by matching the historic stream power at this location to the pre failure conditions. Public concern for maintaining some connectivity from the river to adjacent marsh areas in order to facilitate land gain was also considered in the elimination of a full closure structure design. This alternative was not the most efficient and effective alternative; therefore, it was eliminated from further consideration.

2.2.4 Alternative 4

Alternative 4 considered the closure of adjacent channels to Neptune Pass to alleviate the shoaling occurring within the Mississippi River. However, the current enlarged outlet through Neptune Pass is diverting approximately four to eight times more water than the five adjacent outlets combined in this three-mile reach of the Mississippi River. Closure of other outlets would

not be as effective. Additionally, the shoaling within the Mississippi River adjacent and downstream of the pass was not observed until after the scouring and enlargement of Neptune Pass occurred. This alternative was not the most efficient and effective alternative; therefore, it was eliminated from further consideration.

3 AFFECTED ENVIRONMENT

3.1.1 Description of Project Area

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

Within the immediate vicinity of the proposed action, initial stabilization efforts were completed by the USACE following the bank failure and expansion of Neptune Pass. A 90,000-ton stone revetment was placed on the remaining bank line at the confluence of Neptune Pass and the Mississippi River, which was completed on June 3, 2023. This armoring effort was done to prevent the opening of Neptune Pass from widening or deepening beyond its condition at the time of repair. This effort was completed under the USACE Channel Improvement authority, which authorizes bank stabilization efforts under the Mississippi River and Tributaries Program.

3.1.2 Description of the Watershed

The Mississippi River drains approximately 41% of the 48 contiguous states of the United States. The Mississippi River basin covers more than 1,245,000 square miles, includes all or parts of 31 states and two Canadian provinces. The river roughly resembles a funnel that 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 times 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. Discharge at Baton Rouge ranges from 1,500,000 cubic feet per second (cfs) once every 16 years, on average, to a low of 75,000 cfs recorded once during the period 1930 to the present, and average annual discharge is 450,000 cfs. Southwest Pass of the Mississippi River discharges roughly one-third of the river's total flow, with an average rate of about 145,000 cfs. South Pass of the Mississippi River discharges roughly one-sixth of the river's total flow, averaging about 78,000 cfs. Pass a Loutre of the Mississippi River discharges almost one-third of the river's total flow or slightly less than the Southwest Pass flow. The average discharge rate through Pass a Loutre is just under 145,000 cfs. The combined discharge of Southwest Pass, South Pass, and Pass a Loutre is approximately 80% of the total

river flow into the Gulf of Mexico. The remaining flow is distributed through minor passes upstream of Head of Passes.

3.1.3 Climate and Climate Change

The project area climate 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 three out of every ten years, with severe storm damage approximately once every two or three decades. The majority of these occur between early June and November. Summer thunderstorms are common, and tornadoes strike occasionally. Average annual temperature from the Boothville-Venice climate monitoring station (1981 to 2010 NOAA dataset) is around 70°F, with average temperatures ranging from 82.9°F in July and August to 54.3°F in January. Average annual precipitation is 59.4 inches, varying from a monthly average of 7.5 inches in August, to an average of 2.8 inches in May.

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." A healthy and resilient coastal complex is dynamic, not static, and is subject to the ebb and flow of the various effects, adverse or beneficial, that impact conditions at any given point in time. The most significant adverse potential impact on a coastal wetland as a product of climate change is sea-level change (rise).

3.1.4 Geology

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 mucks and clays mixed with organic matter, and silts derived from river deposits. The soil composition is subject to change as floodwaters and storm surges deposit sediment. Soil types in the project area are predominantly Gentilly, Clovelly, and Larose. 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% 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% clay and 30% peat and organic materials. The percentage of sand and sandy silts increases with proximity to the open waters of the Gulf of Mexico (USACE 1974).

3.1.5 Relevant Resources

This section contains a description of relevant resources that could be impacted by the project. The important resources described are those recognized by laws, executive orders, regulations, and other standards of national, state, or regional agencies and organizations; technical or scientific agencies, groups, or individuals; and the general public. Table 1 provides summary information of the institutional, technical, and public importance of these resources.

A wide selection of resources were initially considered and determined not to be affected by the project—mainly due to the remote and uninhabited nature of the project area and general lack of significant populated areas in the vicinity. Recreational activities, aesthetic visuals, and 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 negligible. 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.

Table 1: 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).	USACE provides safe, reliable, efficient, and environmentally sustainable waterborne transportation systems (channels, harbors, and waterways) for movement of commerce, national security needs, and recreation.	Navigation concerns affect the area's economy and are of significant interest to the community.
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.
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.
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."	The 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 or Endangered Species	The Endangered Species Act of 1973, as amended; the Marine Mammal Protection Act of 1972; and the Bald Eagle Protection Act of 1940.	USACE, USFWS, NMFS, NRCS, EPA, LDWF, and LDNR cooperate to protect these species. The status of such species provides an indication of the overall health of an ecosystem.	The public supports the preservation of rare or declining species and their habitats.

Resource	Institutionally Important	Technically Important	Publicly Important
Cultural Resources	National Historic Preservation Act of 1966, as amended; the Native American Graves Protection and Repatriation Act of 1990; and the Archeological Resources Protection Act of 1979.	State and federal agencies document and protect sites. Their association or linkage to past events, to historically important persons, and to design and construction values; and for their ability to yield important information about prehistory and history.	Preservation groups and private individuals support protection and enhancement of historical resources.
Tribal Resources	The requirement to conduct coordination and consultation with federally recognized tribes finds its basis in the constitution; supreme court cases; EO 13175: consultation and coordination with Indian Tribal Governments; and USACE Tribal Consultation Policy, 2012.	USACE consults with federally recognized tribes to determine if tribal rights, tribal lands, or protected tribal resources, would be significantly adversely affected by a proposed action.	Tribal governments and the public-at-large support the recognition of tribal lands, resources, and protected tribal resources.
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 and Sediment Quality	Clean Water Act of 1977, Fish and Wildlife Coordination Act, Coastal Zone Mgt Act of 1972, and Louisiana State & Local Coastal Resources Act of 1978.	USACE, USFWS, NMFS, NRCS, EPA, and State DNR and wildlife/fishery offices recognize the 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, fishery resources, and the desire for clean drinking water.

3.1.6 Navigation

Existing Conditions

The uncontrolled flow being diverted through Neptune Pass is resulting in shoaling within the adjacent, downstream segment of the Mississippi River. Additionally, due to the large volume of water flowing through the diversion, deep draft vessels are experiencing suction effects as these vessels transit the section of the river adjacent to Neptune Pass. The Mississippi River provides deep-draft access to the New Orleans – Baton Rouge port corridor and its associated commerce and industries. Continued maintenance of the current dimensions of the Mississippi River and its passes are vital to the continued growth and health of the industries and commerce they serve.

3.1.7 Aquatic Resources / Fisheries

Existing Conditions

The estuarine nature of the area provides a dynamic aquatic environment where freshwater and saltwater meet, creating 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 nursery habitat and a food source for fisheries.

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 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, blue catfish, flathead catfish, smallmouth bass, largemouth bass, black crappie, white crappie, sunfish, gizzard shad, and smallmouth buffalo 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, as

well as provides opportunities for estuarine (brackish) species. Many of these species are economically and recreationally important, including red drum, black drum, spotted sea trout, sand seatrout, striped mullet, Gulf menhaden, Atlantic croaker, sheepshead, southern flounder, Spanish mackerel, southern kingfish, and spot. Commercially important shellfish found include blue crab, brown shrimp, pink shrimp, white shrimp, and oysters. Other commercially less important species include grass shrimp, mysid shrimp, roughneck shrimp, and mud crab.

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

3.1.8 Wetlands

Existing Conditions

Wetlands in the vicinity of the project area are classified as tidal, fresh to intermediate, emergent marsh. These wetlands are strongly influenced by freshwater discharges from the Mississippi River and associated distributary outlets. Mean annual salinity, acquired from environmental data collection stations of the Coastal Protection and Restoration Authority's (CPRA) Coastwide Reference Monitoring System (CRMS), within wetlands adjacent to the project range from 0.65 ppt at CRMS0118 and 0.56 ppt at CRMS0139 (CPRA 2022).

Common reed (*Phragmites australis*), also known as Roseau cane, occurs in expansive monotypic clumps (monoculture) in shallow water areas near the project site and has displaced a variety of freshwater vascular plant species that have historically occupied the area. This could have been caused by periodic storms generating extremely high saltwater tides, killing off a majority of the sensitive freshwater vegetation (Hauber et al. 1991). Other common species found in the vicinity of the project include alligator weed (*Alternanthera philoxeroides*), cattail (*Typha spp*.), bulltongue (*Sagittaria lancifolia*), broadleaf arrowhead (*Sagittaria latifolia*), dotted smartweed (*Polygonum punctatum*), softstem bulrush (*Schoenoplectus tabernaemontani*), chairmaker's bulrush (*Schoenoplectus* americanus), giant cutgrass (*Zizaniopsis miliacea*) and elephant ear (*Colocasia esculenta*).

Various natural and anthropogenic factors have resulted in a wetland loss of 24 square miles per year on the Louisiana coast over the 10-year period from 1990 to 2000 (Barras et al., 2003). 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. A U.S. Geological Survey (USGS) summary of wetland changes, released in February 2006, estimated that 98 square miles of wetlands were converted to open water in southeastern Louisiana (USGS 2006). Far greater loss resulted from Katrina than from Rita, and its impacts 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).

In response to wetland loss within Plaquemines Parish, projects involving multiple cooperating agencies and organizations, both public and private, have been proposed and constructed within the Parish. In the vicinity of the proposed Neptune Pass Rock Closure, the "Bay Denesse Restoration Project", a $1.2-million project involving the partnerships of Ducks Unlimited, Coastal Protection and Restoration Authority, National Wildlife Federation, Cajun Fishing Adventures, Chevron, Phillips 66, North American Wetlands Conservation Council, and Gulf Coast Initiative sponsors, is attempting to restore and enhance 2,500 acres of severely deteriorated coastal marsh. To achieve these restoration goals, marsh terraces and crevasses were constructed to optimize sediment capture from the remaining connections to the Mississippi River. These terraces and crevasses would promote the conversion of the present open water habitats within Bay Denesse into mud flats, ponds, submerged aquatic vegetation beds, and emergent marsh.

In conjunction with this project and in partnership with the Water Institute of the Gulf, the "Bay Denesse Living Lab Initiative" involves the construction of a landscape-scale laboratory within Bay Denesse in order to perform and monitor controlled restoration technique experiments. The ability to conduct these landscape-scale experiments would allow for refinement of restoration techniques to determine the most effective means of restoring, enhancing, and conserving wetlands within coastal Louisiana. Additionally, the "Delta Management at Fort St. Philip Project (BS-11)", a Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA) outfall management and sediment trapping project, was completed in 2006 in an area of approximately 1,305 acres of marsh and open water habitat east of Bay Denesse. This project, sponsored by USFWS and CPRA, included the construction of terraces with plantings and six crevasses to enhance the natural marsh-building processes and increase the growth rate of emergent wetlands.

3.1.9 Essential Fish Habitat

Existing Conditions

All the marine and estuarine waters of the northern Gulf of Mexico have been designated as Essential Fish Habitat (EFH). In the northern Gulf of Mexico, EFH has generally been defined as areas where individual life-stages of specific federally managed species are common, abundant or highly abundant. In estuarine areas, EFH is defined as all estuarine waters and substrates (mud, sand, shell, rock, and associated biological communities, including the sub-tidal vegetation (seagrasses and algae), and adjacent inter-tidal vegetation (marshes and mangroves). The open waters, water-bottom substrates, and inter-tidal marshes of the Neptune Pass Rock Closure project area are considered EFH under the estuarine component. Specific categories of EFH include all estuarine waters and substrates (mud, sand, shell, rock, and associated biological communities), including subtidal vegetation (sea grasses and algae) and adjacent intertidal wetland vegetation (marshes and mangroves). In addition, estuarine aquatic habitats provide nursery and foraging areas that support economically important marine fishery species that may serve as prey for federally managed fish species such as mackerels, snappers, groupers, billfishes, and sharks. The estuarine waters in the proposed project area include EFH for several federally managed species (Table 2). 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.

Table 2: EFH Species in the Project Area

Common Name	Life Stage	EFH
brown shrimp	postlarvae	water column associated
brown shrimp	juveniles	Submerged aquatic vegetation; emergent marsh; oyster reef; soft bottom; sand/shell
brown shrimp	subadults	soft bottom; sand/shell
pink shrimp	juveniles	submerged aquatic vegetation; soft bottom; sand/shell; mangroves; oyster reef
pink shrimp	subadults	submerged aquatic vegetation; soft bottom; sand/shell; mangroves
white shrimp	postlarvae	water column associated
white shrimp	juveniles	emergent marsh; submerged aquatic vegetation; oyster reef; soft bottom; mangroves
white shrimp	subadults	soft bottom; sand/shell
white shrimp	adults	soft bottom
white shrimp	spawning adults	soft bottom
red drum	eggs	water column associated
red drum	larvae	submerged aquatic vegetation; soft bottom; water column
red drum	postlarvae	submerged aquatic vegetation; emergent marsh; soft bottom
red drum	early juveniles	submerged aquatic vegetation; soft bottom; hard bottom; sand/shell
red drum	late juveniles	submerged aquatic vegetation; emergent marsh; soft bottom; sand/shell
red drum	adults	submerged aquatic vegetation; emergent marsh; soft bottom; hard bottom; sand/shell
Spanish mackerel	early juveniles	estuarine; water column associated
Spanish mackerel	late juveniles	estuarine; water column associated
Spanish mackerel	adults	estuarine; Mainly oceanic; water column associated
red grouper	early juveniles	submerged aquatic vegetation; hard bottom
gray snapper	adults	hard bottom; soft bottom; reef; sand/shell; banks/shoals; emergent marsh
cobia	eggs	water column associated
cobia	larvae	water column associated
lane snapper	larvae	water column associated
lane snapper	postlarvae	water column associated; submerged aquatic vegetation

3.1.9.1 Brown Shrimp *(Penaeus aztecus)*

Brown shrimp are benthic omnivores distributed from Massachusetts to southern Florida, and throughout the Gulf Coast to the northwestern Yucatan Peninsula (NOAA 1997). The highest abundance of brown shrimp occurs along the Louisiana, Texas, and Mississippi coasts and the shelf waters in the northern Gulf Coast (Allen et al. 1980, NOAA 1985, Williams 1984). Brown shrimp are an estuarine-dependent species, spending some or all of their life cycle within an estuary. Brown shrimp spawn in depths greater than 60 feet during the fall and spring, and postlarvae migrate to estuaries primarily from February to April (GMFMC 2004). Subadult brown shrimp migrate to offshore areas in the summer, supporting valuable commercial inshore and offshore fisheries (GMFMC 2016).

3.1.9.2 Pink Shrimp *(Penaeus duorarum)*

Pink shrimp occur in estuaries and nearshore to depths up to 110 m, with population densities highest in Gulf waters in or near seagrasses at depths ranging from 9-48 m (GMFMC 2016). Pink shrimp spawn year-round in the Tortugas, and postlarvae migrate into estuaries primarily during the spring and fall (GMFMC 2016). They prefer to inhabit sand/shell mud mixtures with less than one percent organic material, feeding on macrophytes, algae, diatoms, crustaceans, and fish (Eldred et al. 1961).

3.1.9.3 White Shrimp *(Penaeus setiferus)*

White shrimp can be found in coastal Gulf of Mexico within estuaries and nearshore habitat up to depths of 40 m (GMFMC 2016). White shrimp spawn from spring through fall in depths between 9-34 m, and postlarvae migrations into estuaries occurs from spring through fall, with migration peaking in June and September (GMFMC 2016). Juvenile white shrimp inhabit mostly mud bottoms, feeding on sand, detritus, organic matter and various crustaceans (Darnell 1958, GMFMC 2016). Adult white shrimp inhabit soft mud or silt bottoms of the Gulf at depths less than 30 m (GMFMC 2004).

3.1.9.4 Red Drum *(Sciaenops ocellatus)*

Red drum are distributed throughout the Gulf of Mexico. Depending on life stage, they are found from estuarine to offshore waters and occur over a variety of habitat types including submerged aquatic vegetation (SAV), soft bottom, hard bottom, emergent marsh, sand/shell; in early life stages they are associated with the water column (GMFMC 2004, 2016). Red drum spawn on the northern Gulf of Mexico shelf during a relatively brief period, generally August into October (Wilson and Nieland 1994). The larvae and early juveniles are carried by tides and currents in late fall to the shallow estuaries, with peak ingress occurring in October. Larvae are carried through barrier island passes in the surface waters and juveniles move from the bay up the estuary to quiet backwater nursery areas to grow.

3.1.9.5 Spanish Mackerel *(Scomberomorus maculatus)*

Spanish mackerel occur in coastal zones of the western Atlantic and throughout the Gulf of Mexico at depths up to 75 m (GMCMC 2016). Spanish mackerel is an epipelagic and neritic species often found in large schools which, in the past, have covered several square kilometers of area (NOAA 1997, Berrien and Finan 1977). Spawning occurs from May to September, with eggs occurring at depths less than 50 m (GMFMC 2016). Juveniles are found offshore and in beach surf and are not considered estuarine dependent (NOAA 1997). Adults are typically found offshore in neritic waters and along coastal areas, usually near barrier islands and passes (NOAA 1997). Spanish mackerel is an important commercial and recreational species along the Gulf Coasts, prized for its high food quality (NOAA 1997, Kilma 1959, Moe 1972, Powell 1975).

3.1.9.6 Red Grouper *(Epinephelus morio)*

Red grouper can be found nearshore and offshore at depths ranging from 0-100 m depending on the life stage. Early life stages are water column associated; juveniles settle on SAV and hard bottom habitats, and maturing adults transition onto reefs and hard bottom habitats offshore. Spawning occurs over hard bottoms and shelf edge/slope habitats and common prey items include fish, crustaceans, and cephalopods (GMFMC 2016).

3.1.9.7 Gray Snapper *(Lutjanus griseus)*

Gray snapper occur in estuaries and shelf waters of the Gulf of Mexico and are particularly abundant off south and southwest Florida. Considered to be one of the more abundant snappers inshore, the gray snapper inhabits waters to depths of about 180 meters. Adults are demersal and mid-water dwellers, occurring in marine estuarine and riverine habitats. They occur up to 19.9 miles offshore and inshore as far as coastal plain freshwater creeks and rivers (GMFMC 2016).

3.1.9.8 Cobia *(Rachycentron canadum)*

Cobia are a predatory pelagic species found in coastal nearshore and offshore waters of the Gulf of Mexico, at depths ranging from 1 meter to 70 meters. They are most commonly associated with shoals over hard banks, buoys, shipwrecks, oil rigs and other hard surfaces (GMFMC 2016). Adults feed on fishes and crustaceans, including crabs and shrimp. Cobia migrate seasonally from March through October between spawning and rearing habitats, determined primarily by suitable temperature conditions.

3.1.9.9 Lane Snapper *(Lutjanus synagris)*

Lane snapper can be found throughout the Gulf of Mexico and in the western Atlantic from North Carolina to southeastern Brazil. Juveniles and adults are found across most habitat types, including SAV, sand/shell, reefs, soft bottom, banks, shoals, and mangroves. Adults occupy nearshore and offshore waters, at depths from 4 meters to 132 meters and temperatures of 61 °F to 84 °F (GMFMC 2016).

3.1.10 Wildlife

Existing Conditions

Louisiana's coastal wetlands support numerous Neotropical and other migratory avian species, such as rails, gallinules, shorebirds, wading birds, and numerous songbirds. The rigors of long-distance flight require most Neotropical migratory birds to rest and refuel several times before they reach their final destination. Louisiana coastal wetlands provide Neotropical migratory birds with essential stopover habitat on their annual migration routes. Passerine birds common to the project areas include sparrows, vireos, warblers, northern mockingbirds (*Mimis polygottos*), common grackles (*Quiscalus quiscula*), red-winged blackbirds (*Agelaius phoeniceus*), marsh wrens (*Cistothorus palustris*), blue jays (*Cyanocitta cristata*), northern cardinals (*Cardinalis cardinalis*), and American crows (*Corvus brachyrhynchos*). Coastal wetlands provide important fish and wildlife habitats, especially transitional habitat between estuarine and marine environments, used for shelter, nesting, feeding, roosting, cover, nursery, and other life requirements.

Emergent and submerged aquatic vegetation (SAV) and fresh, intermediate, brackish marsh and saline marsh wetlands are typically used by many different wildlife species, including: nutria (*Myocaster coypus*), muskrat (*Ondatra zibethicus*), mink (*Mustela vison*), river otter (*Lutra canadensis*), white-tailed deer (*Odocoileus virginianus*), Virginia opossum (*Didelphis virginiana*), striped skunk (*Mephitis mephitis*), swamp rabbit (*Sylvilagus aquaticus*), eastern cottontail (*Sylvilagus floridanus*), nine-banded armadillo (*Dasypus novemcinctus*), coyote (*Canis latrans*), and a variety of smaller mammals. The Basin also provides habitat for the American alligator

(*Alligator mississippiensis*), various species of salamanders, frogs, toads, turtles, as well as several species of venomous and non-venomous snakes.

Open water habitats provide wintering and multiple use functions for American white pelican (*Pelecanus erythrorhynchos*) and brown pelicans (*P. occidentalis*), seabirds, and other open water residents and migrants. Open water habitats provide wintering and multiple use functions for brown pelicans, seabirds, dabbling and diving ducks, coots, and gallinules, as well as other open water residents and migrants (LCWCRTF & WCRA, 1999). Various raptors such as great horned owl (*Bubo virginianus*), barred owl (*Strix varia*), red-shouldered hawk (*Buteo lineatus*), northern harrier (*Circus cyaneus*), American kestrel (*Falco sparverius*), red-tailed hawk (*Buteo jamaicensis*), and bald eagle (*Haliaeetus leucocephalus*) may be present.

3.1.10.1 Species of Concern

Although it is delisted, the bald eagle (*Haliaeetus leucocephalus*) is still protected by the Bald and Golden Eagle Protection Act (BGEA) and the Migratory Bird Treaty Act (MBTA). Bald eagles nest in Louisiana from December through mid-May in mature trees (e.g., bald cypress, sycamore, willow, etc.) near fresh to intermediate marshes or open water (USFWS 2011). Nest sites typically include at least one perch with a clear view of the water or area where the eagles usually forage. Habitats suitable for use by the bald eagle are present throughout coastal Louisiana and can be found near the project area.

On November 17, 2009, the brown pelican (*Pelecanus occidentalis*) was removed from the federal list of threatened and endangered species. However, the brown pelican is still protected under the MBTA and is a state listed species. Brown pelicans are known to nest on barrier islands and the other coastal islands in St. Bernard, Plaquemines, Jefferson, Lafourche, and Terrebonne Parishes, and on Rabbit Island in lower Calcasieu Lake, in Cameron Parish. Habitat suitable for use by the brown pelican is present throughout coastal Louisiana, including the project area.

3.1.10.2 Colonial Nesting Birds and Seabirds

Coastal Louisiana contains habitat suitable for the support of colonial nesting waterbirds and seabirds which are protected by the MBTA. Colonial nesting birds (e.g., herons, egrets, night-herons, ibises, roseate spoonbills, anhingas, and cormorants) typically nest on islands or areas of higher ground that support small trees and shrubs. Some of the representative nesting seabird species in coastal Louisiana include: laughing gull (*Leucophaeus atricilla*), sooty tern (*Onychoprion fuscatus*), least tern (*Sternula antillarum*), gull-billed tern (*Gelochelidon nilotica*), caspian tern (*Hydroprogne caspia*), Forster's tern (*Sterna forsteri*), royal tern (*Thalasseus maximus*), sandwich tern (*Thalasseus sandvicensis*), black skimmer (*Rynchops niger*), herring gull (*Larus argentatus*), kelp gull (*Larus dominicanus*), and common tern (*Sterna hirundo*). Portions of the project area may contain habitats commonly inhabited by colonial nesting birds and seabirds.

3.5.5 Threatened And Endangered Species

Existing Conditions

Eight animal species under the jurisdiction of the USFWS and/or NMFS and presently classified as endangered or threatened are known to occur within the vicinity of the project area (Table 3). Currently, American alligators and shovelnose sturgeon (*Scaphirhynchus platorynchus*) are listed as threatened under the Similarity of Appearance clause in the ESA of 1973, as amended, but

are not subject to ESA Section 7 consultation. No critical habitat for any threatened or endangered species has been designated within the project area, and none of these species are known to breed within the project vicinity.

Table 3: Threatened or Endangered Species That May Occur in Project Area

Common Name	Scientific Name	Status	Jurisdiction	
			USFWS	NFMS
Common Name	Scientific Name	Status		
West Indian Manatee	*Trichechus manatus*	T	X	
Eastern Black Rail	*Laterallus jamaicensis ssp. jamaicensis*	E	X	
Pallid Sturgeon	*Scaphirhynchus albus*	E	X	
Gulf Sturgeon	*Acipenser oxyrhynchus desotoi*	T	X	X
Kemp's Ridley Sea Turtle	*Lepidochelys kempii*	E	X	X
Loggerhead Sea Turtle	*Caretta caretta*	T	X	X
Green Sea Turtle	*Chelonia mydas*	T	X	X
Giant Manta Ray	*Manta birostris*	T		X

3.1.10.3 West Indian Manatee *(Trichechus manatus)*

West Indian manatees, also known as sea cows, are large aquatic mammals found in shallow, slow-moving rivers, estuaries, saltwater bays, canals, and coastal areas. Manatees forage on submerged, floating, and shoreline vegetation including seagrasses, algae, and invasive water hyacinth. There is a low chance that manatees would be found in the project area and surrounding shallow open waters; however, if manatees are observed within 100 yards of the "active work zone" during construction and dredging activities, the appropriate special operating conditions would be implemented as provided by the USFWS.

3.1.10.4 Eastern Black Rail *(Laterallus jamaicensis ssp. jamaicensis)*

Eastern black rails are sensitive, sparrow-sized marsh birds found in a variety of wetland habitats along the Gulf Coast. Eastern black rails require dense vegetative cover, foraging on seeds, insects, and other invertebrates as they walk along the shallows. Pairing and nesting occur in spring and summer. The primary stressors to the eastern black rail include suitable habitat loss, degradation, and fragmentation.

3.1.10.5 Pallid Sturgeon *(Scaphirhynchus albus)*

The pallid sturgeon is an endangered fish found in Louisiana, in both the Mississippi and Atchafalaya Rivers (with known concentrations in the vicinity of the Old River Control Structure Complex); it is possibly found in the Red River as well. The pallid sturgeon is adapted to large, free-flowing, turbid rivers with a diverse assemblage of physical characteristics that are in a constant state of change. Pallid sturgeon occur in the Mississippi River downstream of its confluence with the Missouri River and Ohio River, and inhabit large, deep turbid river channels, usually in strong current over firm sand or gravel.

3.1.10.6 Gulf sturgeon *(Acipenser oxyrhynchus desotoi)*

The Gulf sturgeon was listed as threatened throughout its range on September 30, 1991. The Gulf sturgeon is an anadromous fish that migrates from salt water into coastal rivers to spawn

and spend the warm summer months. Subadults and adults typically spend the three to four coolest months of the year foraging in estuaries of the Gulf of Mexico before migrating inland into rivers. This migration typically occurs from mid-February through April. Most adults arrive in the rivers when temperatures reach 70 degrees Fahrenheit and spend eight to nine months each year in the rivers before returning to estuaries or the Gulf of Mexico by the beginning of October.

3.1.10.7 Giant Manta Ray *(Manta birostris)*

In 2018, NOAA Fisheries listed the giant manta ray as threatened under the ESA. The species is found worldwide in tropical, subtropical, and temperate bodies of water and has been observed in estuarine waters, oceanic inlets, and within bays and intercoastal waterways. Based on a comprehensive review of scientific data available, to date, there are no areas within the jurisdiction of the United States that meet the definition of critical habitat for the giant manta ray.

3.1.10.8 Sea Turtles

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 area, and nesting has not been known to occur in the area.

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). 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 turtles nesting in the northern Gulf are "isolated and infrequent."

3.5.6 Cultural Resources

Existing Conditions

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

The project area is located among small natural distributaries of the Mississippi River and among marsh lands between the river and Bays or the Gulf of Mexico itself. The long natural history of the delta region has given much opportunity for land to be created and destroyed by the movement of water. Prior to modern historic development and settlement in Plaquemines Parish and the subsequent attempts at flood control and navigation improvement, this area was undoubtedly used by Native American populations, and prehistoric sites have been recorded in the general area but not within the currently proposed project area. In Historic times, the channels and Head of Passes passed through Spanish, French, Spanish again, and then American exploration and rule. Various existing passes were predominant over that time, with various small attempts at fortifications and dredging and deepening of channels for use. All the while, increasing settlement and trade within Plaquemines Parish was increasing ship traffic down the river, and events such as the Civil War led to increased shipwrecks and attempts to fortify or block the river. In the more recent era, several cultural resources surveys have been conducted both for terrestrial resources and for underwater resources such as shipwrecks. There have been no Phase I cultural resources surveys within the proposed footprint of the flow control feature or closure structure, and no cultural resources have been recorded.

The attempt to manage possible or perceived negative and positive effects to the environment as result of the Neptune Pass crevasse, has led to design changes of the engineering efforts for this management. Coordination letters to SHPO and Tribes have previously been written that document the evidence for a finding of no historic properties affected despite that no Phase I cultural resources survey overlays the APE. Prior designs managed the incoming waters and sediments at Neptune Pass, and waters and sediment midway through the Neptune Pass, but did not capture sediments that build land at the outlet of Neptune Pass. These designs have been added to the current efforts and to this EA, as depicted in Figures 1 and 3 of this EA.

3.1.7 Tribal Resources

Existing Conditions

Nine federally recognized tribes have an aboriginal/historic interest in this portion of Plaquemines Parish, Louisiana. The tribes are: 1) the Alabama Coushatta Tribe of Texas, 2) the Chitimacha Tribe of Louisiana, 3) the Choctaw Nation of Oklahoma, 4) the Coushatta Tribe of Louisiana, 5) the Jena Band of Choctaw Indians, 6) the Mississippi Band of Choctaw Indians, 7) the Muscogee Nation, 8) the Seminole Nation of Oklahoma, and 9) the Tunica Biloxi Tribe of Louisiana.

There are no tribal lands, nor are there specific tribal treaty rights related to access or traditional use of the natural resources in Plaquemines Parish. There are many protected tribal resources within the parish. However, there is no evidence of them being in the project area.

3.1.8 Air Quality

Existing Conditions

National ambient air quality standards (NAAQS) have been set by the Environmental Protection Agency (EPA) for six common pollutants (also referred to as criteria pollutants) including: ozone, particulate matter, carbon monoxide (CO), 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 CO; 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, which are compounds that lead to the formation of ozone. Plaquemines Parish is currently classified as in attainment of all NAAQS. 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 Clean Air Act would not apply for the proposed action.

3.1.9 Greenhouse Gas

Existing Conditions

The Council of Environmental Quality (CEQ), CEQ-2022-0005, on January 9, 2023, introduced the interim guidance on Greenhouse Gas (GHG) Emissions and how agencies are able to compute GHG emissions and the associated social cost for their projects. USACE, in coordination with USACEHQ, developed a methodology to analyze the components for GHG and incorporate them within NEPA documents. The GHGs analyzed are Carbon dioxide (CO_2), Methane (CH_4), and Nitrous Oxide (N_20). Primary sources of CO_2 can be natural sources like decomposition of organic material and anthropogenic sources like burning of fossil fuel (Carbon Dioxide 101, 2023). For CH_4, emissions can come from a variety of natural sources as well as anthropogenic processes, i.e., industrial sources (Methane Emissions, 2023). For N_20, a majority of the emissions revolve around agricultural processes, such as application of fertilizers (Nitrous Oxide Emissions, 2023). CO_2 is the primary contributor to GHG emissions and climate change, followed by CH_4 and N_20. The pie chart below outlines the relative contribution of each GHG to total gross U.S. GHG emissions in 2021, in terms of global warming potential, showing that over 75% of total GHG emissions were CO_2 (Overview of Greenhouse Gases, 2023) (Figure 7).

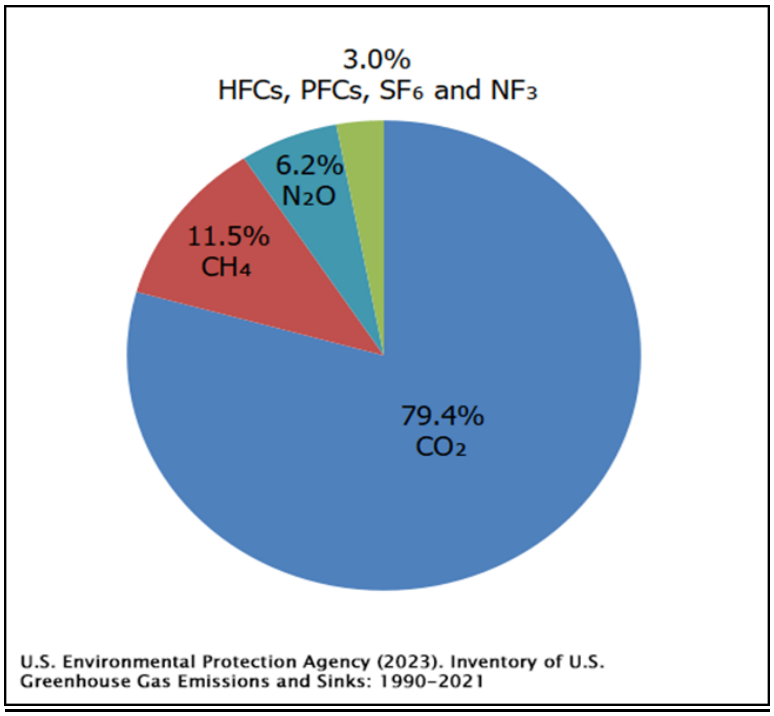

Figure 7: 2021 Gross Total U.S. Emissions of GHGs by Gas (Percentages based on MMT CO_2 Eq.)

3.1.10 Water and Sediment Quality

Existing Conditions

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

According to the LDEQ "2022 Louisiana Water Quality Inventory: Integrated Report," the Mississippi River – from Monte Sano Bayou to Head of Passes (segment no. LA070301_00), "fully supports" designated uses for primary contact recreation, secondary contact recreation, fish and wildlife propagation, and drinking water supply based on Evaluated Assessment data (LDEQ 2022). No sources of impairment were identified within this segment.

4 ENVIRONMENTAL CONSEQUENCES

This section describes the direct, indirect, and cumulative effects of the No Action Alternative and the proposed action. Table 4 provides a list of resources in the project area and the anticipated impact(s) from implementation of the proposed action.

Table 4: Relevant Resources and Their Impact Status, Both Adverse and Beneficial

Relevant Resource	Impacted	Not Impacted
Navigation	X	
Aquatic Resources/Fisheries	X	
Wetlands	X	
Essential Fish Habitat	X	
Wildlife	X	
Threatened and Endangered Species		X
Cultural Resources		X
Tribal Resources		X
Air Quality	X	
Greenhouse Gas	X	
Water/Sediment Quality	X	

4.1 Navigation

Future Conditions with No-Action

Without implementation of the proposed action, shoaling would continue to occur in the segments of the Mississippi River adjacent to and downstream from Neptune Pass. Without increased maintenance dredging, further accumulations of shoal material would result in potentially restricted access to upstream ports and other facilities, with adverse impacts to the shipping industry and to area port economy. As scouring continues within Neptune Pass, the associated shoaling effects are likely to increase without implementation of the proposed action. Additionally, deep draft vessels would continue to experience suction when transiting the Mississippi River adjacent to Neptune Pass, with a potential for an increase in suction effects as Neptune Pass widens and flow increases.

Future Conditions with the Proposed Action

Construction of flow control structures would have positive direct impacts to navigation. Regulating the diverted flow from the Mississippi River through Neptune Pass would reduce current shoaling and scouring impacts occurring within the vicinity of the project, resulting in stability of the dimensions of the navigation channel and reduction in the required amount of maintenance dredging. Construction of the inlet flow control feature would also be expected to minimize the suction effects experienced by vessels transiting the adjacent segment of the Mississippi River. The target flow through Neptune Pass after construction is anticipated to fluctuate between approximately 80,000 cfs and 90,000 cfs at a Mississippi River flow of 1 million cfs (USACE 2023).

4.2 Aquatic Resources / Fisheries

Future Conditions with No-Action

Without implementation of the proposed action, the uncontrolled flow from the Mississippi River through Neptune Pass would continue to promote scouring within the pass. The scoured area creates limited habitat for most fisheries species due to the resulting deep-water channel and reduction in shallow water habitat within the vicinity of the project area. However, the deposition of sediment from Neptune Pass and subsequent vegetative establishment occurring in the bays and waterways adjacent to the project area could result in newly created shallow water bottoms and marsh, providing habitat for numerous aquatic species.

Future Conditions with the Proposed Action

With implementation of the proposed action, water bottom habitat loss and displacement of benthic organisms and fishes within the project area would occur at both the inlet structure at the entrance of Neptune Pass and outlet structures (SREDs) in Quarantine Bay. However, these effects are expected to be temporary. Connectivity of the Mississippi River, Neptune Pass, and the adjacent bays and waterways would be maintained by constructing a “notch” within the flow control feature. This notch would allow for some water and sediment flow and allow for passage of aquatic species through Neptune Pass. Displaced fisheries species are expected to return to the project area once project activities are complete. Additionally, the flow control feature is also expected to slow the incoming flow from the Mississippi River into Neptune Pass, allowing for some suspended sediments to settle in the area surrounding the project. Over time, as the deep-water depths within the scoured area are reduced, benthic organisms and other fisheries species

would be expected to colonize the new shallow, mud-bottom habitat. Furthermore, the stone substrate used for constructing both the inlet and outlet structures can be considered suitable habitat for some fisheries and aquatic species (Pennington et al. 1983).

With construction of the Outlet Structures, minimal adverse direct and indirect impacts to aquatic resources are anticipated. There is potential for increases in localized turbidity, noise, and wave action generated by construction activities to displace fisheries in the area; however, this would be a temporary disturbance, with aquatic species and fisheries likely to return following the completion of excavation and disposal activities. Overall, aquatic and fisheries populations would not likely be adversely affected because these species would move to existing adjacent habitat areas during construction activities.

4.3 Wetlands

Future Conditions with No-Action

Without implementation of the proposed action, continued scouring and widening of Neptune Pass would result in additional wetland loss and conversion of wetlands into open water habitat within Neptune Pass. However, deposition of sediment from Neptune Pass may be resulting in marsh creation in the bays and waterways adjacent to the project area.

Future Conditions with the Proposed Action

Implementation of the proposed action would not result in any direct impacts to wetland resources. Construction of the inlet feature would tie into the existing bankline adjacent to Neptune Pass but would not overlap any existing vegetated wetlands. Additionally, machinery required for any deposition of stone material and/or grading adjacent to the inlet feature would be expected to have minimal temporary indirect impacts to any existing vegetated wetlands. Indirectly, with construction of the inlet feature, cross-sectional area of the pass at the structure site will be reduced by 88 percent, reducing the freshwater influence of the river and the sediment it transports. It is anticipated that the splay-nourishing suspended sediment will continue to be maintained through a combination of sediment that flows through the inlet structure while being captured with the outlet structure (SREDs). Any existing deltaic splays would likely experience no major changes (i.e., no growth and no loss).

Implementation of the outlet features (SREDs) would result in indirect impacts to wetland resources within Quarantine Bay and potentially other waterways in the vicinity of the project as the flow through Neptune Pass would be reduced following project completion. These impacts are primarily associated with the indirect effects of the reduction in sediment deposition following project completion. The sediment that once was transported from the river, through Neptune, and deposited further out in Breton Sound would now be trapped near the outlet of Neptune. In accumulating sediment nearer to the east bank marsh (i.e., Neptune outlet), the efficiency of the SREDs to reduce the flow capacity throughout Neptune Pass will increase over time as the deposited sediment becomes emergent, vegetates, and becomes established land. Transportation and subsequent accretion of sediments could partially counteract on-going erosive forces experienced in coastal Louisiana and help to stabilize any existing emergent marsh vegetation, but those effects and benefits would ultimately be more localized within Quarantine Bay.

4.4 Essential Fish Habitat

Future Conditions with No-Action

Without implementation of the proposed action, no direct impacts to EFH within the immediate project area would occur. However, indirect impacts to EFH would likely occur as existing emergent marsh within Neptune Pass continues to be converted to open water habitat due to scouring and erosion caused by the uncontrolled flow being diverted through the pass. However, essential fish habitat may be positively impacted by the deposition of sediment from Neptune Pass and subsequent vegetative establishment in bays and waterways adjacent to the project area. These newly created shallow water bottoms and marsh provide essential habitat for numerous fish species.

Future Conditions with the Proposed Action

With implementation of the proposed action, short-term EFH impacts would include temporary and localized increases in water column turbidity during the excavation and construction of the Outlet Structure. However, the project area is a naturally turbid environment and increased turbidity is not expected to significantly affect EFH needs within the project area. Additionally, the stone substrate used for constructing the inlet flow control feature can be considered suitable habitat for some fisheries and aquatic species (Pennington et al. 1983).

Implementation of the proposed action would result in both a permanent direct impact as well as indirect impacts to EFH within the bays and waterways in vicinity of the project as the flow through Neptune Pass and sediment deposition would be reduced following project completion. With implementation of the proposed action, initially some EFH for dependent species would be permanently directly impacted during the construction of the outlet features (SREDs) from excavation of in-situ dredged borrow material for SREDs development in the shallow open waters of Quarantine Bay. The shallow open water bottom and associated EFH habitat (e.g., mud/sand substrates, SAV) would also be permanently directly impacted by the placement of stone material along the perimeters of each SRED. Indirectly, the SREDs would ultimately be converted to generally more productive categories of EFH (e.g., estuarine emergent marsh, marsh edge, inner marsh, marsh/water interface) as they eventually become colonized by emergent vegetation. Accretion of any sediments flowing through Neptune Pass on each SRED could potentially provide advantageous conditions for colonization by SAV. Thus, the proposed action would provide mainly positive indirect impacts to EFH in the project area.

While additional studies may provide clarification regarding the potential land building capabilities of the diversion in conjunction with the outlet features (SREDs), the purpose and need for the proposed project is the elimination of the navigational hazard present within the Mississippi River. There is no current authority in this project for USACE to thoroughly study the marsh creation potential of leaving the pass open. The existing conditions within the vicinity of Neptune Pass pose a threat to navigation and commercial trade, and the potential expansion of Neptune Pass would further endanger vessels transiting the area in the absence of the proposed action.

4.5 Wildlife

Future Conditions with No-Action

Without implementation of the proposed action, wildlife within the immediate project may be indirectly impacted. Scour and erosion of the existing marsh along the banks of Neptune Pass

and the Mississippi River would continue to occur, resulting in a reduction of habitat diversity and availability for resident terrestrial wildlife, migratory foul, and other avian species. However, wildlife may be positively impacted by the deposition of sediment from Neptune and subsequent vegetative establishment in bays and waterways adjacent to the project area. These newly created shallow water bottoms and marsh provide habitat for numerous wildlife species.

Future Conditions with the Proposed Action

With implementation of the proposed action, minimal adverse direct and indirect impacts to wildlife are anticipated. There is 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 likely be only temporarily displaced from the project area. Overall populations would not likely be adversely affected because these species would move to existing adjacent habitat areas during construction activities.

Implementation of the proposed action would result in indirect impacts to wildlife within the bays and waterways in the vicinity of the project as the flow through Neptune Pass would be reduced following project completion. The sediment that once was transported from the river, through Neptune, and deposited further out in Breton Sound would now be trapped near the outlet of Neptune. In accumulating sediment nearer to the east bank marsh (i.e., Neptune outlet), the efficiency of the SREDs to reduce the flow capacity throughout Neptune Pass will increase over time as the deposited sediment becomes emergent, vegetates, and becomes established land. Transportation and subsequent accretion of sediments could partially counteract on-going erosive forces experienced in coastal Louisiana and help to stabilize any existing emergent marsh vegetation, but those effects and benefits would ultimately be more localized within Quarantine Bay. As such, any wildlife habitat benefits derived from additional land building processes would similarly be mostly restricted to Quarantine Bay, as opposed to areas further out in the Breton Sound.

While additional studies may provide clarification regarding the potential land building capabilities of the diversion in conjunction with the outlet features (SREDs), the purpose and need for the proposed project is the elimination of the navigational hazard present within the Mississippi River. There is no current authority in this project for USACE to thoroughly study the marsh creation potential of leaving the pass open. The existing conditions within the vicinity of Neptune Pass pose a threat to navigation and commercial trade, and the potential expansion of Neptune Pass would further endanger vessels transiting the area in the absence of the proposed action.

4.6 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. Furthermore, the proposed project area does not contain critical habitat for Federally listed species, and the open water areas surrounding the

project area would allow them to easily avoid the project activities. The USFWS concurred with CEMVN's determination of "not likely to adversely affect" in a letter dated May 21, 2024.

Additionally, CEMVN has determined that no critical habitat for any threatened, endangered, or candidate species under the purview of the National Marine Fisheries Service (NMFS) has been designated within the project area, and that there would be no effect to any of the NMFS Federally listed species that could potentially occur within the project area.

4.7 Cultural Resources

Future Conditions with No-Action

Without implementation of the proposed action, the flow of water may increase or the existing banklines of the river may shift. Although no cultural resources have been reported within the direct APE, such shifts may eventually affect more distant or unrecorded resources.

Future Conditions with the Proposed Action

With implementation of the proposed action, no direct or indirect impacts to cultural resources would occur. To comply with Section 106 of the National Historic Preservation Act (NHPA), a conclusion of no historic properties affected was sent to the Louisiana State Historic Preservation Office (SHPO) and interested federally recognized tribes on June 13, 2022. Concurrence from the SHPO was received on June 28, 2022. On July 7, 2022, the Muscogee Nation responded their wish to defer to other tribes. On July 11, 2022, the Choctaw of Oklahoma, and on July 13, 2022, the Chitimacha Tribe, responded their concurrence with the conclusion of no historic properties affected. No other tribal responses were received.

The current proposed project includes the same APE as was coordinated by the June 13, 2022 letters, but now adds an APE at the outlet of Neptune Pass, where sediment captures are proposed and will require borrow from adjacent areas. Coordination for effects to this new area of APE are currently underway.

4.8 Tribal Resources

Future Conditions with No-Actions

Without implementation of the proposed action, the flow of water may increase or the existing banklines of the river may shift. Although no tribal resources have been reported within the direct APE, such shifts may eventually affect more distant resources.

Future Conditions with the Proposed Action

While Plaquemines Parish has a long history of occupation by Native American communities, prior to its establishment and throughout its history, there are currently no protected tribal resources, tribal rights, or Indian lands that have the potential to be significantly affected by the proposed actions within the project area. Therefore, CEMVN has determined that no tribal resources, rights, or lands would be significantly affected by implementing this action. The results of the NHPA Section 106 process thus far have confirmed this determination.

4.9 Air Quality

Future Conditions with No-Action

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

Future Conditions with the Proposed Action

With implementation of the proposed action, direct and indirect impacts to ambient air quality within the project area—and possibly farther afield—are expected to be temporary and primarily due to the emissions of construction equipment. Due to the short duration of the proposed project, any increases or impacts to ambient air quality are expected to be short-term and minor and are not expected to cause or contribute to a violation of federal or state ambient air quality standards. Once all construction activities associated with the proposed action cease, air quality within the vicinity is expected to return to pre-construction conditions.

4.10 Greenhouse Gas

Within this evaluation, two alternatives for Neptune Pass Rock Closure were considered for GHG emission: No Action and Proposed Plan. The GHG emissions were calculated using the type, quantity, horsepower, total hours, and associated emission factors of the equipment (e.g., boats pushing the equipment and the excavators placing the stone). For this analysis, there are foreseeable GHG emissions that were not computed within the GHG analysis that could account for GHG emissions. Example of foreseeable GHG would be support vessels supplying tanker ships commodities while at idle. The social cost of greenhouse gas emissions (SC-GHG) were calculated for each project alternative by summing the individual emissions from the major greenhouse gas pollutants CO2, CH4, and N2O, and then multiplying by the social cost of each pollutant for the year in which they were generated using the tables from the Interagency Working Group on Social Cost of Greenhouse Gases (IWGSC) report as established by Executive Order 13990 to provide interim updated social costs values, with a 3% discount rate (IWG 2021). Social cost (SC) was estimated using the below formula to translate the climate impact to the proposed metric of dollars.

$$SC - GHG = CO_2 * SC - CO_2 + CH_4 * SC - CH_4 + N_2O * SC - N_2O$$

Where:

$$SC - GHG = the\ social\ cost\ of\ greenhouse\ gas\ emissions\ in\ dollars$$
$$CO_2 = total\ carbon\ dioxide\ emissions\ in\ metric\ tons$$
$$CH_4 = total\ methane\ emissions\ in\ metric\ tons$$
$$N_2O = total\ nitrous\ oxide\ emissions\ in\ metric\ tons$$
$$SC - CO_2 = social\ cost\ of\ carbon\ dioxide$$
$$SC - CH_4 = social\ cost\ of\ methane$$
$$SC - N_2O = social\ cost\ of\ nitrous\ oxide$$

The GHG emission and the social costs were computed using Net Emissions Analysis Tool (NEAT) version 1.1.

Future Conditions with No-Action

If the construction activities for Neptune Pass Rock Closure did not occur, there would be emissions from navigational avoidance. Without the proposed construction of the flow control

features, conditions would continue to deteriorate, resulting in vessels that stall above and below Mississippi River Mile 24 Above Head of Passes until safe conditions are allowed. The unsafe conditions would be expected to occur approximately 2 months a year. It is estimated that up to 710 vessels could be impacted. The below table outlines the proposed GHG emissions if 710 vessels are unable to traverse pass Mississippi River Mile 24 Above Head of Passes. It should be noted that the total vessels computed for this GHG evaluation are based off of the common vessel traversing the Mississippi River: Tanker Ship.

Table 5*:* Total GHG Emissions of 710 Waterborne Vessels Unable to Traverse River

Emissions	CO_2	CH_4	N_2O	CO_{2eq}
Total (metric tons)	58,364	2	0	58,565

Future Conditions with the Proposed Action

There would be direct emissions from the Construction of the Neptune Pass Rock Closure. The different components for the construction of the Neptune Pass Rock Closure were evaluated: Inlet Structure, Outlet Structure. The data within the table includes the usage of a variety of different equipment that would be used to construct the features.

Table 6: Total GHG Emissions from Construction Equipment

Emissions	CO_2	CH_4	N_2O	CO_{2eq}
Total (metric tons)	10,510	0	0	10,546

Comparison of No action, and the Proposed Action:
The total of the efforts within this analysis were compared in the below table: Total Gross and Net. Social costs were computed for the alternatives. Both the No action and the Proposed action were compared.

Table 7*:* Total Gross GHG Emissions (Metric Tons)

Alternative	CO_2	CH_4	N_2O	CO_2e
No-Action Alternative	58,364	2	0	58,565
Proposed Action	10,510	0	0	10,546

Table 8: Total Net GHG Emissions (Metric Tons)

Alternative	CO_2	CH_4	N_2O	CO_2e
Proposed Action	-47854	-2	0	-48,018

Table 9: Total Social Costs of Greenhouse Gases (2024 Dollars)

Alternative	CO_2	CH_4	N_2O	Total
No-Action Alternative	$7,470,623	$3,608	$18,477	$7,492,708
Proposed Action	$1,345,315	$650	$3,327	$1,349,293

4.11 Water and Sediment Quality

Future Conditions with No-Action

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

Future Conditions with the Proposed Action

With implementation of the proposed action, there would be some disturbances to ambient water quality in the project area; however, direct, and indirect impacts would be short-lived and highly localized near the inlet structure at Neptune Pass and the outlet structures in Quarantine Bay. Water bottom disturbances associated with construction activities would be expected cause temporary increases in turbidity and suspended solid concentrations, and a reduction in light penetration in the immediate vicinity. However, since the project 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. Water quality is expected to return to pre-construction conditions soon after the completion of the construction of the proposed project.

A Clean Water Act Section 404 Public Notice entitled “Neptune Pass Rock Closure (Plaquemines Parish)” has been prepared by the CEMVN and will be circulated for 30-day public review concurrent with the 30-day public review for Draft EA #589. Additionally, the CEMVN received a state-issued 401 Water Quality Certificate for the project on March 21, 2024 (WQC 220830-02/ CER20240001).

4.12 Cumulative impacts

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

Construction of the Inlet Structure (stone sill) is anticipated to reduce flows through Neptune Pass, while maximizing sediment transport efficiency using a notched sill approach. This will not only increase the likelihood of continued marsh growth in the receiving bays, but also decrease potential shoaling in the river downstream. Furthermore, increased deposition in the receiving bays and behind constructed SREDs further decreases the future flow capacity of the pass and associated navigational hazards.

SREDs placement in Quarantine Bay (backbay) reduces the head difference between the Mississippi River and backbay stage through a backwater effect, which, while significantly reducing the conveyance of Neptune Pass, leads to a more gradual spatial gradient in head loss. Most of this head loss would occur in the open water of the backbay and would not lead to scour of the existing marsh platform. It is expected that placement of SREDs alone reduces the Lower Mississippi River discharge diverted through Neptune from 16% to 10%. Similar flow reduction through sill structure placement alone would require constructing the sill height to at least -3 feet, significantly constricting the cross-sectional area of the channel and hindering small vessel trafficability (USACE 2023).

The concentration of sediment in the diverted water does not instantaneously affect the ability of the structure to reduce flow but rather slowly reduces its capacity over time. Continued aggradation within the pass and backbay, induced by the chevrons, will progressively decrease the flow diversion capacity until eventual crevasse closure, essentially accelerating the natural evolution of a delta (Kleinhans et al, 2013). Optimizing the sediment to water ratio (SWR) of the sill structure allows design flow thresholds to be met while increasing the amount of sediment that can be diverted and advancing the natural delta-building processes.

Conversely, a full closure would leave the pass deprived of sediment, allowing factors such as sea level rise, erosional wave energy, and subsidence to further increase the head differences, leading to more frequent and more consequential crevasse formations along the lower Mississippi River east bank. The holistic approach of leveraging conveyance and energy potential energy factors offers a robust long-term solution instead of short-term repair.

Recent studies concerning the Mid-Barataria, Mid-Breton, and West Bay sediment diversions (Brown et al. 2019, Meselhe et al. 2012, Yuill et al. 2016) have analyzed the hydrodynamic and morphodynamic impacts of their implementation, and their findings corroborate those in this study of Neptune Pass. The previous studies advocate for the use of a SWR to quantify and assess the morphological changes in both the river and receiving bay and confirm that sediment aggradation in the receiving bay creates a backwater effect which propagates upstream to the river, reducing the flux through the pass over time. Furthermore, recent data and analysis of the West Bay diversion support the use of strategically placed SREDs as a technique to induce land building and accelerate basin filling in future diversions and crevasses (Henkel 2022).

4.13 Hazardous, Toxic and Radioactive Waste (HTRW)

The USACE is obligated under Engineer Regulation (ER) 1165-2-132 to assume responsibility for the reasonable identification and evaluation of all Hazardous, Toxic, and Radioactive Waste (HTRW) contamination within the vicinity of proposed actions. ER 1165-2-132 identifies that HTRW policy is to avoid the use of project funds for HTRW removal and remediation activities. An ASTM E1527-21 Phase 1 Environmental Site Assessment, HTRW 24-03, dated April 9, 2024, has been prepared for the Neptune Pass Channel, Neptune Pass Inlet Structure and Quarantine Bay Outlet Structures project area. The project area is not within the boundaries of any site designated by the EPA or State of Louisiana for a response action (either a removal action or a remedial action), under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), or part of a National Priority List site under CERCLA. Aerial photographs were also reviewed, and a database search was conducted to identify possible Recognized Environmental Conditions (REC). No RECs were located within the footprints of the proposed project sites, and no evidence of HTRW was found. There is a low probability of encountering HTRW during construction of the project.

5 COORDINATION

Preparation of this draft EA and a draft Finding of No Significant Impact (FONSI) have been coordinated with appropriate congressional, federal, tribal, state, and local interests, as well as environmental groups and other interested parties. The following agencies, as well as other interested parties, have received copies of the draft EA and draft FONSI:

U.S. Department of the Interior, Fish and Wildlife Service
U.S. Environmental Protection Agency, Region VI
U.S. Department of Commerce, National Marine Fisheries Service
U.S. Natural Resources Conservation Service, State Conservationist
Advisory Council on Historic Preservation
Governor's Executive Assistant for Coastal Activities
Louisiana Department of Wildlife and Fisheries
Louisiana Department of Natural Resources, Coastal Management Division
Louisiana Department of Natural Resources, Coastal Restoration Division
Louisiana Department of Environmental Quality
Louisiana State Historic Preservation Officer
Plaquemines Parish Government
Alabama-Coushatta Tribe of Texas
Chitimacha Tribe of Louisiana
Choctaw Nation of Oklahoma
Coushatta Tribe of Louisiana
Mississippi Band of Choctaw Indians
Muscogee Nation
Jena Band of Choctaw Indians
Seminole Nation of Oklahoma
Tunica Biloxi Tribe of Louisiana

6 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 the 30-day public and agency review of EA #589 and associated Finding of No Significant Impact (FONSI).

6.1 Clean Air Act of 1972

The Clean Air Act (CAA) sets goals and standards for the quality and purity of air. It requires the EPA to set National Ambient Air Quality Standards (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 and Louisiana Administrative Code, Title 33 to grant a general conformity determination.

6.2 Clean Water Act of 1972 – Section 404 and Section 401

The Clean Water Act (CWA) sets and maintains goals and standards for water quality and purity. A CWA draft Section 404(b)(1) public notice entitled “Neptune Pass Rock Closure (Plaquemines Parish)” has been prepared by the CEMVN and will be circulated for 30-day public review concurrent with the 30-day public review for Draft EA #589.

CWA Section 401 requires a Water Quality Certification from the Louisiana Department of Environmental Quality (LDEQ) that a proposed project does not violate established effluent limitations and water quality standards. Surface water quality standards are established in the Louisiana Administrative Code (LAC) Title 33, Part IX (2020). The CEMVN received a state-

issued 401 Water Quality Certificate for the project on March 21, 2024 (WQC 220830-02/ CER20240001).

6.3 Coastal Zone Management Act of 1972

The Coastal Zone Management Act requires that "each federal agency conducting or supporting activities directly affecting the coastal zone shall conduct or support those activities in a manger which is, to the maximum extent practicable, consistent with approved state management programs." A Federal consistency determination (C20220079 Mod 03) in accordance with the Louisiana Coastal Zone Management Program (LCZMP) pursuant to the Coastal Zone Management Act (CZMA) of 1972 was submitted to the Louisiana Department of Natural Resources (LDNR) on May 3, 2024. By letter dated June 18, 2024, the LDNR, Office of Coastal Management determined that the subject project was consistent with the LCZMP in accordance with Section 307 (c) of the CZMA of 1972, as amended (C20220079 Mod 03).

6.4 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. Pursuant to section 7 of the Endangered Species Act of 1973, as amended, the USACE has determined that the Proposed Action would not likely adversely affect the endangered pallid sturgeon, West Indian Manatee, eastern black rail, or any critical habitat. The USFWS concurred with the USACE's determination in a letter dated May 21, 2024.

6.5 Magnuson-Stevens Fisheries Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), as amended, Public Law (P.L.) 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 MSFCMA. 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 National Environmental Policy Act documents prepared for those projects. This draft EA represents CEMVN's initiation of essential fish habitat consultation as required under the Magnuson-Stevens Fishery Conservation and Management Act.

6.6 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. It requires that fish and wildlife resources receive equal consideration to other project features. It requires Federal agencies that construct, license or permit water resource development project to first consult with USFWS, NMFS and state resource agencies regarding the impacts on fish and wildlife resources and measures to mitigate these impacts. The USFWS reviewed the proposed project and provided project specific recommendations in a Coordination Act Report received on April 30, 2024. The USFWS recommendations for the proposed action are listed below:

1. The Service recommends that the project area is monitored annually post-construction to determine if existing delta splays impacted by the project are experiencing land loss. If

monitoring indicates changes from the conditions determined in the project WVAs, then the need for mitigation will have to be assessed.

Response 1 – Acknowledged.

2. The Service recommends that the project area is monitored annually post-construction to determine if salinities increase beyond expected as well as to determine any changes in marsh types and/or accelerated marsh loss. If monitoring indicates changes from the conditions determined in the project WVAs, then the need for mitigation will have to be assessed.

Response 2 – Acknowledged.

3. West Indian manatees occasionally enter Louisiana coastal waters and streams during the warmer months (i.e., June through September). During in-water work in areas that potentially support manatees all personnel associated with the project should be instructed about the potential presence of manatees, manatee speed zones, and the need to avoid collisions with and injury to manatees. All personnel should be advised that there are civil and criminal penalties for harming, harassing, or killing manatees, which are protected under the Marine Mammal Protection Act of 1972, the Endangered Species Act of 1973, and state law. Additionally, personnel should be instructed not to attempt to feed or otherwise interact with manatees, although passively taking pictures or video would be acceptable. For more detail on avoiding contact with manatees refer to the Endangered and Threatened Species section of this document or contact this office.

Response 3 – Acknowledged. CEMVN will implement appropriate special operating conditions (e.g., no operation of moving equipment within 50 feet of a manatee; all vessels should operate at no wake/idle speeds within 100 yards of work area; siltation barriers, if used, should be re-secured and monitored; report manatee sightings or collisions), as provided by the USFWS, Lafayette, Louisiana Field Office. Special operating conditions for manatees will also be included in the contract specifications.

4. Avoid adverse impacts to bald eagle nesting locations and wading bird colonies through careful design of project features and timing of construction. During project construction, a qualified biologist should inspect the proposed construction site for the presence of documented and undocumented wading bird nesting colonies and bald eagles.
    a. All construction activity during the wading bird nesting season (February through October 31 for wading bird nesting colonies, exact dates may vary) should be restricted within 1,000 feet of a wading bird colony. If restricting construction activity within 1,000 feet of a wading bird colony is not feasible, the USACE should coordinate with the Service to identify and implement alternative best management practices to protect wading bird nesting colonies.
    b. During construction activities, if a bald eagle nest is within or adjacent to the proposed project footprint, the applicant should follow the bald and golden eagle guidelines found on-line here to determine whether disturbance will occur and/or an incidental take permit is needed.

Response 4 – Acknowledged. The bald eagle was removed from the list of Endangered and Threatened Species in August 2007 but continues to be protect under the BGEPA and the MBTA. During nesting season, construction must take place outside of the USFWS/LDWF buffer zones.

Additionally, the project area is located in habitats which are commonly inhabited by colonial nesting waterbirds and/or seabirds. The following conservations measures will be implemented to minimize disturbance to colonial nesting birds:

1. *For colonies containing nesting brown pelicans, all activity occurring within 2,000 feet of a rookery should be restricted to the non-nesting period (i.e. September 15 through March 31). Nesting periods may vary considerably among Louisiana's brown pelican colonies, however, so it is possible that this activity window could be altered based upon the dynamics of the individual colony. Brown pelicans are known to nest on barrier islands and the other coastal islands in St. Bernard, Plaquemines, Jefferson, Lafourche, and Terrebonne Parishes, and on Rabbit Island in lower Calcasieu Lake, in Cameron Parish.*

2. *For colonies 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 rookery should be restricted to the non-nesting period (i.e., September 1 through February 15, exact dates may vary within this window depending on species present).*

3. *For colonies containing nesting gulls, terns, and/or black skimmers, all activity occurring within 650 feet of a rookery should be restricted to the non-nesting period (i.e., September 16 through April 1, exact dates may vary within the window depending on species present).*

In addition, on-site contract personnel including project-designated inspectors will 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). Should on-site contractors and inspectors observe potential nesting activity, coordination with the LDWF and USFWS will be needed.

5. The Service recommends that the USACE contact the Service and the NMFS for additional ESA section 7 consultation if: 1) the scope or location of the proposed Project is changed significantly, 2) new information reveals that the action may affect listed species or designated critical habitat, 3) the action is modified in a manner that causes effects to listed species or designated critical habitat, or 4) a new species is listed or critical habitat designated. Additional consultation as a result of any of the above conditions or for changes not covered in this consultation should occur before changes are made or finalized.

Response 5 – Acknowledged.

6.7 National Historic Preservation Act of 1966

Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended, requires federal agencies to take into account the effects of their undertakings on historic properties and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on such undertakings. The procedures in 36 CFR Part 800 define how federal agencies meet these statutory responsibilities. The Section 106 process seeks to accommodate historic preservation concerns with the needs of federal undertakings through consultation on historic properties, including the State Historic Preservation Officer (SHPO) or Tribal Historic Preservation Officer (THPO) and any Tribe that attaches religious or cultural significance to historic properties that

may be affected by an undertaking. The goal of consultation is to identify historic properties potentially affected by the undertaking, assess its effects and seek ways to avoid, minimize or mitigate any adverse effects on historic properties. Pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended, the USACE has determined that there are no historic properties, as defined in 36 CFR 800.16 (I) within the Neptune Pass area of potential effect (APE). Accordingly, a conclusion of "no historic properties affected" was sent to the Louisiana State Historic Preservation Office (SHPO) and interested federally recognized Tribes on June 13, 2022. Concurrence from the SHPO was received on June 28, 2022. On July 7, 2022, the Muscogee Nation responded with their wish to defer to other Tribes. On July 11, 2022, the Choctaw of Oklahoma, and on July 13, 2022, the Chitimacha Tribe responded their concurrence with the conclusion of "no historic properties affected". No other tribal responses were received.

The current proposed project includes the same APE as was coordinated by the June 13, 2022 letters, but now adds an APE at the outlet of Neptune Pass, where sediment captures are proposed and will require borrow from adjacent areas. Coordination of effects for the new portion of APE, are currently underway.

7 CONCLUSION

Under the Proposed Action, sediment that is currently being transported from the river, through Neptune Pass, and deposited further out in Breton Sound would be trapped near the outlet of Neptune Pass. In accumulating sediment nearer to the east bank marsh (i.e., Neptune outlet), the efficiency of the SREDs to reduce the flow capacity throughout Neptune Pass will increase over time as the deposited sediment becomes emergent, vegetates, and becomes established land. Transportation and subsequent accretion of sediments could partially counteract on-going erosive forces experienced in coastal Louisiana and help to stabilize any existing emergent marsh vegetation, but those effects and benefits would ultimately be more localized within Quarantine Bay. As such, any benefits to wetlands, aquatic species, essential fish habitat, and wildlife derived from additional land building processes would similarly be mostly restricted to Quarantine Bay, as opposed to areas further out in the Breton Sound. While unavoidable impacts to previously discussed relevant resources would occur due to project actions within Neptune Pass and Quarantine Bay, the proposed action would not constitute a major federal action significantly affecting the human environment. Construction of the proposed action would result in the elimination of the present navigational threat within the river.

In the absence of the proposed action, continued scouring within Neptune Pass would occur, resulting in an increase of flow being diverted from the Mississippi River and subsequent, increased shoaling. Additionally, an increase in dredging operations within the Mississippi River would be required to compensate for the diversion effects if the proposed action is not completed. The strong currents flowing through Neptune Pass are also resulting in reports of deep draft vessels experiencing suction, created by the large amount of water flowing through Neptune Pass, as these vessels transit the adjacent segment of the Mississippi River. Without the proposed construction of the flow control feature, conditions would continue to deteriorate resulting in an increased threat to navigation. The lower Mississippi River is a primary access point for commercial shipping to ports of call along the river and the segment of the Mississippi River from Baton Rouge to the Gulf of Mexico supported approximately 428 million tons of waterborne commerce in 2020 (USACE 2020). There is a national interest in providing

progressive channel stabilization to prevent any alteration of the river flow that could potentially pose a navigation threat for large vessels transiting these sections of the river.

8 PREPARED BY

Draft EA #589 and the associated draft FONSI were prepared by Mr. Mark Lahare, Environmental Protection Specialist, with relevant sections prepared by: Mr. Joseph Musso – HTRW; Mr. David Day – Greenhouse Gas; and Dr. Paul Hughbanks – Cultural Resources. The address of the preparers is: U.S. Army Corps of Engineers, New Orleans District; Regional Planning and Environment Division South, CEMVN-PDC-C; 7400 Leake Avenue; New Orleans, Louisiana 70118.

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