

APPENDIX E: Consistency Determination

Volume III
APPENDIX E:

CONSISTENCY DETERMINATION

Louisiana Coastal Use Guidelines

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Convey Atchafalaya River Water to Northern Terrebonne Marshes and Multipurpose Operation of Houma Navigation Lock

April 26, 2010 Draft

1.0 INTRODUCTION

Section 307 of the Coastal Zone Management Act of 1972, 16 U.S.C. 1451 et. seq. requires that "each federal agency conducting or supporting activities directly affecting the coastal zone shall conduct or support those activities in a manner which is, to the maximum extent practicable, consistent with approved state management programs." In accordance with Section 307, a Consistency Determination has been prepared for the proposed conveyance of Atchafalaya River water to the Northern Terrebonne Marshes. This project was identified as a Near-term Critical Restoration Feature Recommended for Study and Future Congressional Authorization in the Louisiana Coastal Area (LCA) Main Report dated January 21, 2005. The project is described in detail in the draft Integrated Feasibility Study and Environmental Impact Statement, "Convey Atchafalaya River Water to Northern Terrebonne Marshes and Multipurpose Operation of Houma Navigation Lock." The proposed action is located mostly in Terrebonne Parish in southeast Louisiana at the northern edge of the Gulf of Mexico (Figure 1). Coastal Use Guidelines were written in order to implement the policies and goals of the Louisiana Coastal Resources Program (LCRP), and serve as a set of performance standards for evaluating projects. Compliance with the LCRP, and therefore, Section 307, requires compliance with applicable Coastal Use Guidelines.

2.0 PURPOSE AND NEED FOR THE PROPOSED ACTION

The natural processes of subsidence, habitat switching, and erosion, combined with human activities, have caused significant adverse impacts to the Northern Terrebonne Marshes, including accelerated wetland loss and ecosystem degradation. Wetlands in the project area are deteriorating for several reasons: 1) subsidence, 2) lack of sediment and nutrient deposition, 3) erosion via tidal exchange, 4) channelization, and 5) saltwater intrusion. These activities have resulted in the loss of several thousand acres of solid, vegetated marsh. Deterioration will continue unless preventative measures are taken.

In the absence of supplemental fresh water from the Atchafalaya River, subsidence, sea-level rise, wave erosion, and saltwater intrusion will continue to be problems. Protection and enhancement of this area are dependent on providing a hydrologic regime that minimizes the physiological stress to wetland vegetation from saltwater intrusion and tidal energy and is conducive to the retention of locally provided fresh water and sediments. Several channels have been dredged which cut through the natural ridges, increasing both drainage and tidal exchange in the project area, exposing the soil to erosive forces.

The wetland communities within the northwestern portion of the Terrebonne Basin, including those located both north and south of the Gulf Intracoastal Waterway (GIWW), have been, in part, separated from the influence of the Atchafalaya River. Instead, the hydrology of these areas

is influenced by a widely variable pattern of Atchafalaya River backwater effect, rainfall runoff events, and marine processes. Major navigation channels in the subprovince are the Atchafalaya River, Wax Lake Outlet, Houma Navigation Canal, GIWW, and Lower Atchafalaya River (south of Morgan City). Each of these navigation channels introduces and/or compounds marine influences in many of the interior coastal wetlands and water bodies within the subprovince. Without action, the fresh water, intermediate, and brackish marshes in the northern and eastern areas of the Terrebonne Basin would continue to deteriorate and disappear due to the combined effects of subsidence, saltwater intrusion, and a lack of riverine influence. The flotant marshes within the Penchant Basin, located in northwest Terrebonne Basin, would continue to deteriorate due to excessive backwater flooding events from the Atchafalaya River. To the south, the brackish marshes surrounding Lake Mechant would continue to deteriorate due to saltwater intrusion and a lack of riverine influence.

The project will provide opportunities to naturalize the distribution of fresh water and deltaic forming sediments—including those necessary for the creation of sustainable marsh communities, improve hydrologic distribution of fresh water, improve topographic diversity, and reduce the negative impacts of Gulf storm events.

- **Fresh Water Supply** – Re-introduction of fresh water supplies is an opportunity to restore a degraded and impaired deltaic forming process. Furthermore, fresh water introduction has the potential to balance the altered salinity regime, improve the viability of fresh water marsh plant life and therefore restore fish and wildlife habitats.
- **Hydraulic Distribution** – Human induced habitat fragmentation (canals) has resulted in a degraded condition whereby the limited existing fresh water supplies are directed towards Terrebonne Marshes and into the Gulf. Opportunities exist to improve the internal distribution of fresh water to restore and improve the sustainability of fresh water marsh habitats.
- **Sediment Supply and Distribution** – The lack of marsh forming sediments from riverine environments has accelerated the degradation of all marsh types. Opportunities exist to re-introduce sediments from the Atchafalaya River and several bayous to use on site sediments displaced by Gulf storm events to create new marsh area.
- **Sustainability** – As marsh degradation has accelerated, seasonal Gulf events have a magnified impact on the remaining marsh areas. Opportunities exist through fresh water supply and distribution and sediment supply and distribution to create a healthier marsh which will be more resistant to the normal range of Gulf events.

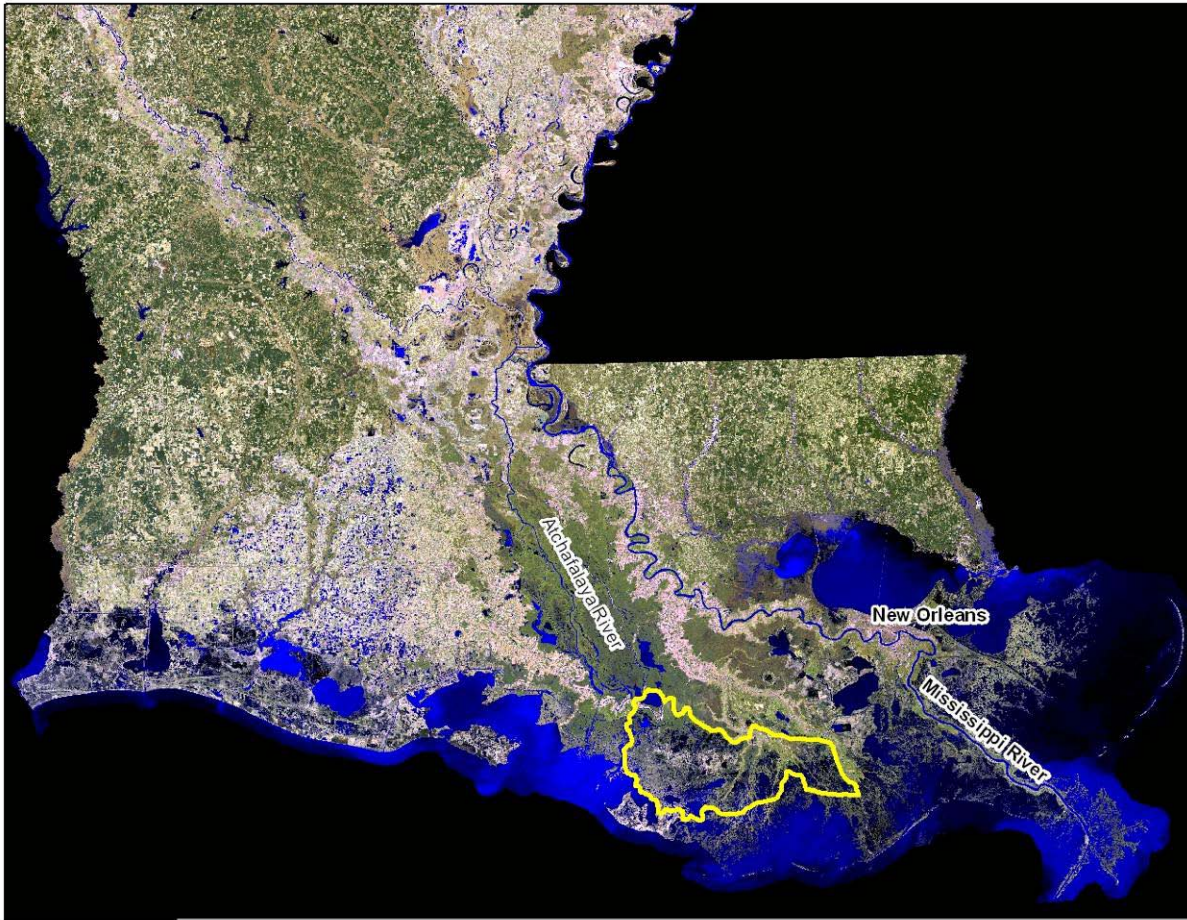


Figure 1. Project vicinity for the project, Convey Atchafalaya River Water to Northern Terrebonne Marshes and Multipurpose Operation of Houma Navigation Lock.

3.0 DESCRIPTION OF THE PROPOSED ACTION

The overall study area is located mostly in Terrebonne Parish in southeast Louisiana at the northern edge of the Gulf of Mexico and encompasses approximately 1,100 square miles (700,000 acres). A portion of Lafourche Parish between Bayou Lafourche and Bayou Pointe au Chien is also included in the study area. Small portions of St. Mary, St. Martin, and Assumption Parishes are also included. The study area is approximately 55 miles wide from west to east and averages 20 miles across from the north to south boundaries.

For the purposes of this Consistency Determination, the study area has been divided into three sub-areas: West-Bayou Penchant Area, Central-Lake Boudreaux Area, and East-Grand Bayou Area (Figure 2). The study area lies within the Barataria-Terrebonne estuary. This estuary extends from the west bank levees of the Mississippi River (north and east), to the East Guide Levee of the Atchafalaya River (west), to the Gulf of Mexico (south), and to the town of Morganza (north). The Barataria Basin covers about 1,551,800 acres while the Terrebonne Basin covers an area of about 2,063,500 acres. The study area lies within the southern end of the

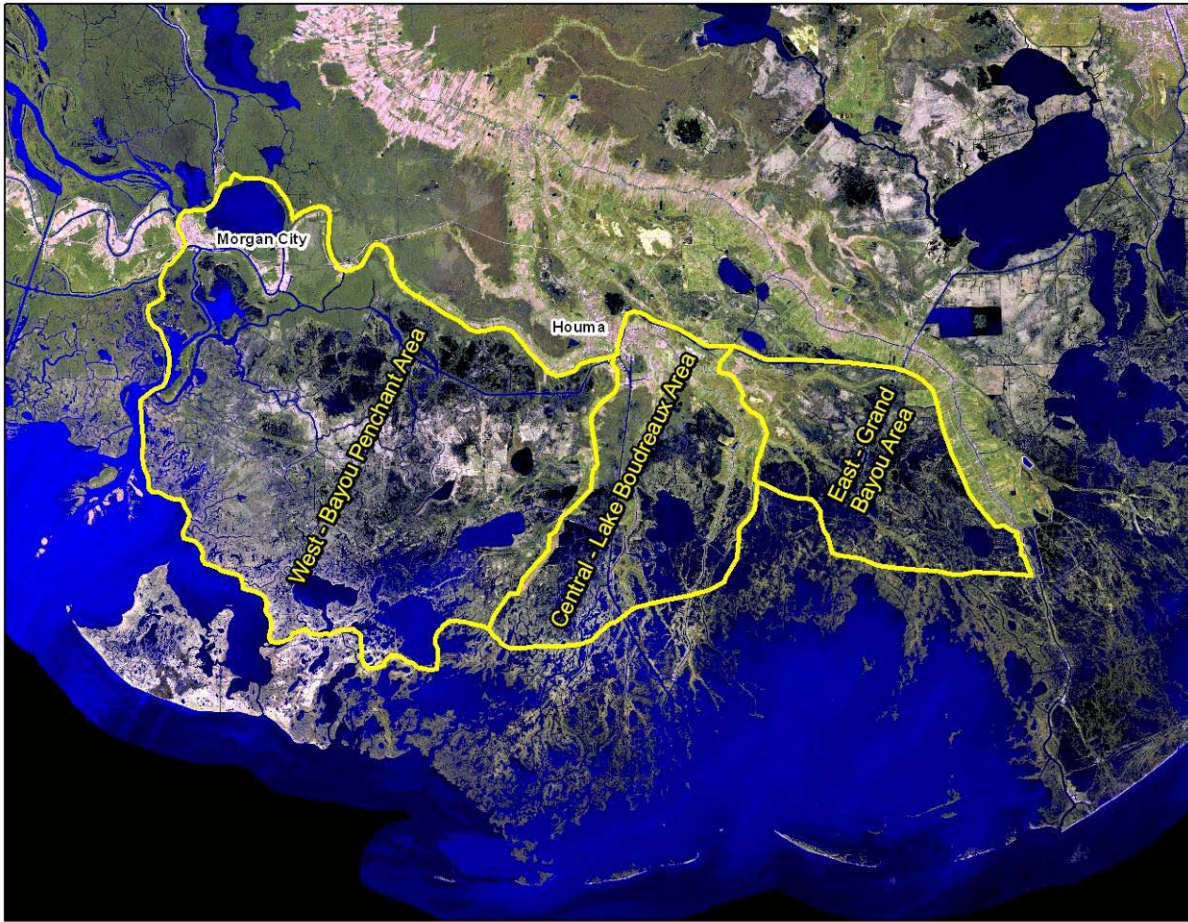


Figure 2. Map of project area for Convey Atchafalaya River Water to Northern Terrebonne Marshes and Multipurpose Operation of Houma Navigation Lock. Project sub-areas are shown.

Terrebonne Basin and contains a complex of habitat types, including natural levees, lakes, swamps, marshes, and bayous formed from sediments of abandoned Mississippi River deltas.

Elevations in the study area vary. Near Houma, the largest city in the area, the elevation is approximately 10 feet National Geodetic Vertical Datum (NGVD). The elevation along the bayou ridges is 4-5 feet NGVD and less than 1 foot NGVD along the southern portion near the Gulf of Mexico.

The major streams located in the study area or that influence the study area are the Atchafalaya River, Bayou du Large, Bayou Grand Caillou, Bayou Petit Caillou, Bayou Terrebonne, Bayou Pointe au Chien, Bayou Lafourche, Bayou L'eau Blue, and Bayou Black. There are no scenic streams in the study area designated under the Louisiana Natural and Scenic River System. The Houma Navigation Canal runs north and south from the GIWW to the Gulf of Mexico mainly between Bayou du Large and Bayou Grand Caillou. The GIWW follows an east-west path in the northern portion of the study area. These two waterways, along with the natural channels in the area, have a strong influence on surface water in the area.

The proposed action involves construction of 57 structures and other water management features (Figure 3), in an effort to holistically address the declining health of the Terrebonne Marshes ecosystem. For this Consistency Determination, construction features (measures) are identified using a sequence of letters. This labeling convention is described in Table 1. A description of each proposed construction feature, including the dimensions and purpose of each feature, is also included in Table 1.

There are two proposed water diversion-type structures at critical points in the Terrebonne Marshes: the Central Diversion Structure (CS1) involves constructing six 10' x 10' gated box culverts on Bayou Butler under Highway 57 to increase fresh water movement from the HNC to Bayou Grand Caillou/Lake Boudreaux; the Eastern Culvert #5 (EC5) is composed of a bridge with five 83-foot spans with two 68.5-foot spans accommodating Highway 24. Associated with this bridge are five 80-foot Obermeyer gated openings, for a total flow opening width of 400 feet. EC5 is intended to convey fresh water from the GIWW to Grand Bayou under Highway 24.

Other project measures in the western portion of the project area include: 51,802 feet of dredging (WD2 and WD3), which would increase delivery of fresh water from Bayou Penchant to southeast Penchant Basin marshes and eliminate a constriction in the GIWW; a soil plug (WP 1), which would be placed to retain fresher water in Bayou du Large and Lake Mechant and prevent saltwater intrusion; a rock filled sheet pile weir with boat openings, which would constrict Grand Pass by 90% to minimize water exchange between Bayou du Large and Caillou Lake.

There are several project measures in the central project area in addition to the Central Diversion Structure: a set of three measures (CC1, CC2, and CD4) which would increase water volume moving past the GIWW constriction at the twin span bridge in Houma; several project measures (CT1-8, CM2, CM3, CC3-15, CD1-2, 6, 7, CLV1, CLV2, and CP2) working in conjunction with the Central Diversion Structure to deliver and retain fresh water and to prevent greater saltwater intrusion into Lake Boudreaux; a 23,500 linear foot soil berm (CM4), which would be placed perpendicular to tidal flow to retain fresh water in marshes to the north and prevent saltwater intrusion from the south in the marshes to the west of the proposed HNC Lock; a soil plug (CP2), which would be placed in a canal near Bayou Butler to prevent “short circuiting” of fresh water through the N/S Gulf South Pipeline canal; the Central Lock Complex (CL1), which is the proposed HNC Lock that will optimize the sector gates’ operation for environmental benefits by keeping them closed more frequently. This would hold water back and move fresh water onto central Terrebonne marshes. When the sector gates are closed boat traffic would travel through the lock chambers. For vessels exceeding the lock size, an industry traffic management system will be developed to opportunistically open the sector gates to let these vessels pass.

Project measures in the eastern portion of the project area and associated with the Eastern Culvert #5 (EC5) include a soil berm, culverts and dredging. East Dredge Channel #5 (ED5) is a 1000-foot channel that would connect the GIWW to EC5. East Dredge Channel #3 (ED3) is a 16,500-foot expansion of Grand Bayou that would deliver fresh water into the Grand Bayou Basin. ED7 is a 13,000-foot extension of ED3 further into the Grand Bayou Basin. Along Grand Bayou at the point where ED3 becomes ED7, 5 5' x 5' box culverts (EC2) would convey flow to the west through an existing levee along the alignment of the existing Grand Bayou, which would be dredged (ED6) for a length of 16,800 feet to freshen Eastern Grand Bayou

marshes. Related to this a 13,000 linear foot soil berm (EM1) would be placed perpendicular to tidal flow to prevent saltwater intrusion into the Eastern Grand Bayou marshes. Below ED7 on Grand Bayou ten 5' x 5' flap-gated box culverts with variable crest outfall (EC3) would be installed to convey fresh water, prevent saltwater movement, and allow control of water levels in marshes to the northwest. Further to the south another 37,000-foot linear soil berm (EM3) would be placed perpendicular to tidal flow to slow fresh water movement to the Gulf and prevent saltwater intrusion from the south in an effort to stabilize the marshes in the lower Grand Bayou basin.

Additionally in the project's eastern area several measures would be taken to improve fresh water conveyance from the GIWW down St. Louis Canal. Two 8'x8' 8-barrel flap-gated culverts (EC6 and EC7) would allow water movement under roads that are currently constricting flow into St. Louis Canal. Planned dredging of St. Louis Canal for 56,300 feet (ED2) would allow water movement from the GIWW through EC6 and EC7 to the Grand Bayou basin. Removals of a rock weir (EX1) and of a soil plug (EX2) would increase water movement through the basin to better distribute fresh water from Grand Bayou and St. Louis Canal. Excavations of two gaps (EG1 and EG2) in canal spoil banks would facilitate better fresh water movement in the respective areas. A boat bay 20' wide with an invert of -5' (EP7) would be placed on Cutoff Canal on the north bank of Bayou Pointe au Chien to retain fresh water in marshes to the north and prevent saltwater intrusion from the south.

The proposed action would have an initial negative direct impact on existing wetland vegetation, wildlife and fisheries resources, and essential fish habitat within the construction footprint. The dredge features WD2, CD1, CD3, CD6, ED2, ED3, ED6, and ED7 and levee features CLV1 and CLV2 (Table 2) would directly impact approximately 622 acres of shallow open water (Table 2). In addition, construction of these features would result in approximately 148 acres of swamp, 343 acres of fresh marsh, 248 acres of intermediate marsh, and 182 acres of brackish marsh being directly converted to open water (Table 2). The proposed action would also result in approximately 23 acres of swamp being converted to uplands (levee).

The proposed action would also create approximately 257 acres of brackish marsh and 72 acres of saline marsh as a result of features CM2, CM3, CM4, CT1, CT2, CT3, CT6, CT7, CT8, EM1, and EM3. Additionally, the proposed action is expected to prevent approximately 9,655 acres of emergent marsh from being converted to open water by year 50 after project implementation. These wetlands will continue to provide nesting, rearing, and foraging habitat for resident and migratory wildlife species. Preserved wetlands will also provide valuable foraging, breeding, and nursery habitat, as well as other essential fish habitat, for finfish and shellfish in the project area.

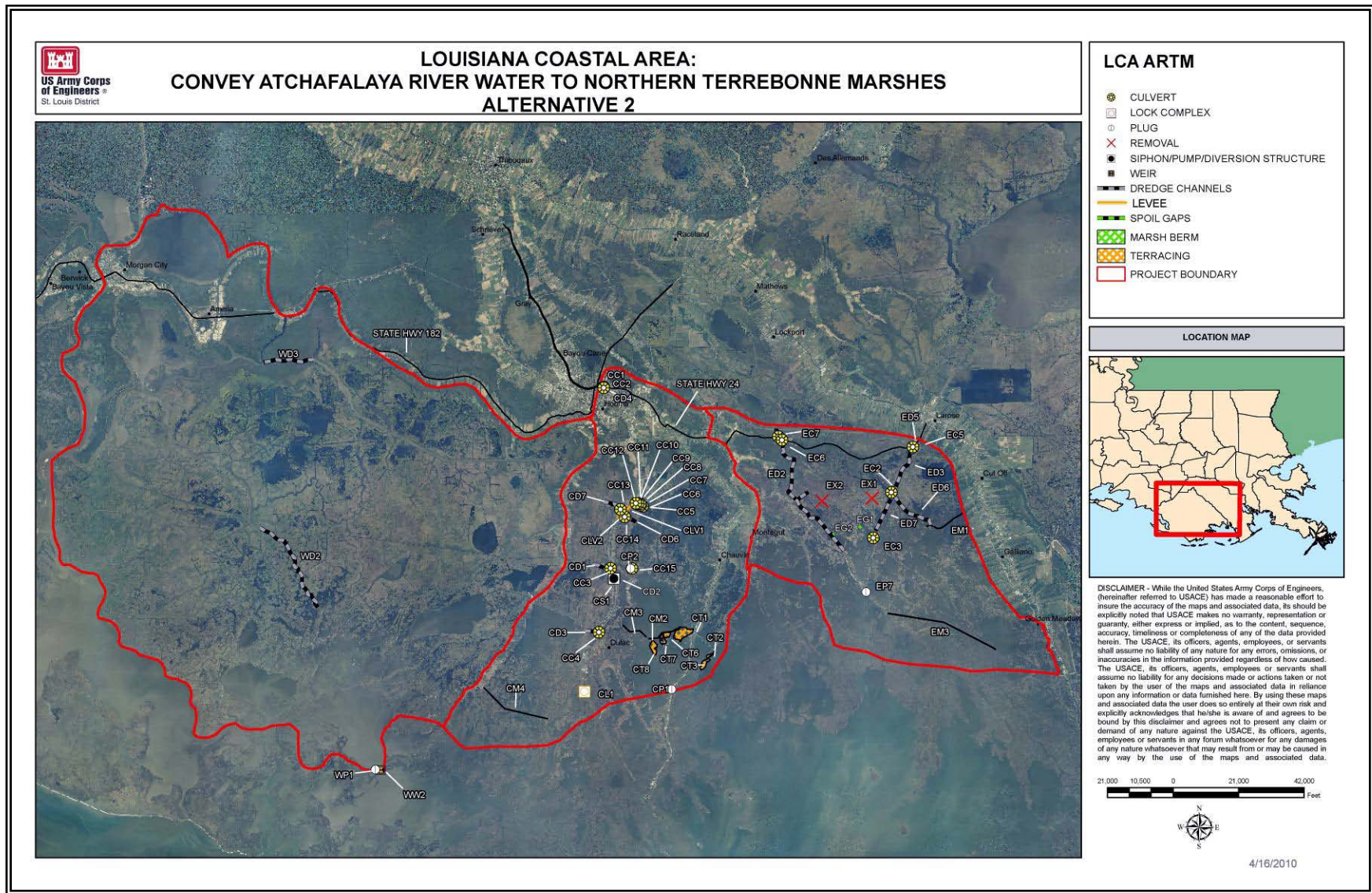


Figure 3. Map of the project area and Recommended Plan, showing the 57 structures and water management features proposed for construction for the project. Construction features, and their labeling convention, are further described in Table 1.

Table 1. List and description of construction features (measures) proposed for the project.

ID¹	Measure Name	Description	Size/ Width²	Lgth²	Purpose
CL1	Central Lock Complex #1	Multi-purpose operation of proposed HNC ⁴ Lock Complex	N/A	N/A	Optimize operation of HNC lock for distribution of fresh water and prevention of saltwater intrusion
EC5	East Culvert #5	Bridge construction with Obermeyer gates installed between the piers	80 x 20	552	Convey fresh water from GIWW ⁵ to Grand Bayou under Hwy 24, same location as ES2
EC2³	East Culvert #2	Box culvert	5x5	26	Convey flow through existing levee from Grand Bayou to W
EC3³	East Culvert #3	Flap-gated box culverts w/variable crest outfall	5x5	75	Convey fresh water to the W through an existing levee and prevent saltwater movement from Grand Bayou to NW
EC6	East Culvert #6	Flap gated box culverts	8x8	50	Allow water movement down St. Louis Canal under Hwy 24
EC7	East Culvert #7	Flap gated box culverts	8x8	40	Allow water movement down St. Louis Canal under road
ED2	East Dredge Channel #2	Canal dredging	50	56270	Allow water movement from GIWW ⁵ through EC6 & 7 to Grand Bayou basin
ED6³	East Dredge Channel #6	Dredge a portion of Grand Bayou	290	16818	Allow water movement to E Grand Bayou marshes
ED7³	East Dredge Channel #7	Canal dredging	150	13081	Allow water movement further down Grand Bayou
EM1	East Marsh Berm #1	A linear soil berm placed perpendicular to flow	30 W	13000	To slow fresh water movement to the gulf; prevent saltwater intrusion from S
EM3	East Marsh Berm #3	A linear soil berm placed perpendicular to flow	30 W	37000	To slow fresh water movement to the gulf; prevent saltwater intrusion from S
EG1³	East Spoil Gap #1	Gap in canal spoil bank	1.7 acres	750	Allow movement of fresh water from unnamed canal to marshes to the S/SW
EG2³	East Spoil Gap #2	Gap in canal spoil bank	0.5 acres	400	Allow movement of fresh water from unnamed canal to marshes to the E
EP7	East Plug #7	Boat bay on Cutoff Canal at junction with Point au Chien	20	360	To retain fresh water to N; prevent saltwater from S
EX1³	East Removal #1	Rock weir removal	50 W	100	Increase water movement through canal - distribute fresh water from Grand Bayou
EX2³	East Removal #2	Soil plug removal	50 W	130	Increase water movement through canal - distribute fresh water from Grand Bayou/St. Louis Canal
CC3	Central Culvert #3	Gated control structure	10x10	175	Increase fresh water delivery from HNC ⁴ through Bayou Provost to Bayou Grand Caillou/Lake Boudreaux
CC4	Central Culvert #4	Gated control structure	10x10	175	Increase fresh water movement from HNC ⁴ to Bayou Grand Caillou/Lake Boudreaux
CC5³	Central Culvert #5	Aluminum flap-gated culvert	4x4	48	Convey fresh water from N to S into N Lake Boudreaux system
CC6³	Central Culvert #6	Aluminum flap-gated culvert	4x4	48	Convey fresh water from N to S into N Lake Boudreaux system
CC7³	Central Culvert #7	Aluminum flap-gated culvert	4x4	48	Convey fresh water from N to S into N Lake Boudreaux system
CC8³	Central Culvert #8	Aluminum flap-gated culvert	4x4	48	Convey fresh water from N to S into N Lake Boudreaux system

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ID¹	Measure Name	Description	Size/ Width²	Lgth²	Purpose
CC9³	Central Culvert #9	Aluminum flap-gated culvert	4x4	40	Convey fresh water from N to S into N Lake Boudreaux system
CC10³	Central Culvert #10	Aluminum flap-gated culvert	4x4	40	Convey fresh water from N to S into N Lake Boudreaux system
CC11³	Central Culvert #11	Aluminum flap-gated culvert	4x4	40	Convey fresh water movement from N to S into N Lake Boudreaux system
CC12³	Central Culvert #12	Aluminum flap-gated culvert	4x4	40	Convey fresh water movement from N to S into N Lake Boudreaux system
CC13³	Central Culvert #13	Box culverts with sluice gates under Hwy 57	10x10	175	Increase fresh water movement from HNC ⁴ /Bayou Grand Caillou to N Lake Boudreaux
CC14³	Central Culvert #14	Flap-gates each with a stop log bay	4x4	45	Convey fresh water from new channel to N marshes
CC15³	Central Culvert #15	Timber weir placed at 90° to flow with boat openings	68 W	N/A	Prevent short circuiting of fresh water through the N/S Gulf S Pipeline canal
CD1	Central Dredge Channel #1	Dredge Bayou Provost	70 W	5,691	Increase fresh water delivery from HNC ⁴ through CC3 to Bayou Grand Caillou/Lake Boudreaux
CD2	Central Dredge Channel #2	Dredge part of Bayou Butler	45 W	1000	Increase fresh water movement from HNC ⁴ through CS1 to Bayou Grand Caillou/Lake Boudreaux
CD3	Central Dredge Channel #3	Dredge Falgout Canal	70 W	4426	Increase fresh water movement from HNC ⁴ through CC4 to Bayou Grand Caillou/Lake Boudreaux
CD6³	Central Dredge Channel #6	Dredge new water conveyance channel	45 W	7014	Convey fresh water from Bayou Pelton enlargement through CC14 to N Lake Boudreaux marshes
CD7³	Central Dredge Channel #7	Dredge Bayou Pelton to enlarge it	70 W	6416	Increase fresh water movement from HNC ⁴ through CC13 to Bayou Grand Caillou/N Lake Boudreaux
CLV1³	Central Levee #1	New forced drainage levee	+8 H	5173	Prevent potential flooding from proposed increase in flows to N Lake Boudreaux
CLV2³	Central Levee #2	New forced drainage levee	+8 H	1760	Prevent potential flooding from proposed increase in flows to N Lake Boudreaux
CM2	Central Marsh Berm #2	A linear soil berm placed perpendicular to flow	30 W	11255	Retain fresh water in Lake Boudreaux and marshes to N; prevent saltwater intrusion from S
CM3	Central Marsh Berm #3	A linear soil berm placed perpendicular to flow	30 W	8975	Retain fresh water in Lake Boudreaux and marshes to N; prevent saltwater intrusion from S
CM4	Central Marsh Berm #4	A linear soil berm placed perpendicular to flow	30 W	23458	Retain fresh water in marshes to N; prevent saltwater intrusion from S
CP1	Central Plug #1	Soil plug in Robinson Canal	175 W	25	Retain fresh water in Lake Boudreaux basin; prevent saltwater intrusion from Bayou Petit Caillou
CP2³	Central Plug #2	Soil plug in canal near Bayou Butler	60 W	25	Prevent short circuiting of fresh water through the N/S Gulf S Pipeline canal
CS1	Central Diversion Structure #1	Sluice gated box culverts on Bayou Butler under Hwy 57	10x10	100	Increase fresh water movement from HNC ⁴ to Bayou Grand Caillou/Lake Boudreaux
CT1³	Central Terracing #1	A grid of 10' wide berms perpendicular to surge	359 acres	N/A	Retain fresh water and prevent saltwater intrusion

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ID ¹	Measure Name	Description	Size/ Width ²	Lgth ²	Purpose
CT2³	Central Terracing #2	A grid of 10' wide berms perpendicular to surge	40 acres	N/A	Retain fresh water and prevent saltwater intrusion
CT3³	Central Terracing #3	A grid of 10' wide berms perpendicular to surge	109 acres	N/A	Retain fresh water and prevent saltwater intrusion
CT6³	Central Terracing #6	A grid of 10' wide berms perpendicular to surge	71 acres	N/A	Retain fresh water and prevent saltwater intrusion
CT7³	Central Terracing #7	A grid of 10' wide berms perpendicular to surge	83 acres	N/A	Retain fresh water and prevent saltwater intrusion
CT8³	Central Terracing #8	A grid of 10' wide berms perpendicular to surge	156 acres	N/A	Retain fresh water and prevent saltwater intrusion
WD2	West Dredge Channel #2	Dredge a part of Carencro Bayou and create new canal	200	35463	Increase delivery of fresh water from Bayou Penchant to SE Penchant Basin marshes
WD3	West Dredge Channel #3	Dredge a portion of GIWW ⁵	50	16339	Eliminate constriction in GIWW ⁵
WP1	West Plug #1	Soil plug	20	115	Retain fresher water in Bayou du Large and Lake Mechant and prevent saltwater intrusion
WW2³	West Weir #2	Rock filled sheet pile weir with boat openings	940 W	100	Constrict Grand Pass by 90% to minimize water exchange between Bayou du Large and Caillou Lake
ED3³	East Dredge Channel #3	Canal dredging	470	16483	Convey fresh water from GIWW ⁵ to Grand Bayou basin
CD4	Central Dredge Channel #4	Dredge a new secondary channel along the GIWW at Hwy 24 bridges	70	1852	Increase water volume moving past GIWW ⁵ constriction
ED5	East Dredge Channel #5	Dredge new canal	470	1000	Convey fresh water from GIWW ⁵ through ES2 or EC5 to Grand Bayou
CC1	Central Culvert #1	Box culvert in CD4 channel under Hwy 24 bridge	10x10	115	Increase water volume moving past GIWW ⁵ constriction
CC2	Central Culvert #2	Box culvert in the CD4 channel under Hwy 24 bridge	10x10	115	Increase water volume moving past GIWW ⁵ constriction

¹ Measure ID – Measures are identified by a unique sequence such as EC5. The first letter describes the subunit location: W = Bayou Penchant, C = Lake Boudreaux, and E = Grand Bayou. The second and third letters describe the type of measure: C = culvert, D = dredge, M & MC = marsh creation, X = removal, S = structure, L = lock, G = gap, P = plug, LV = levee, T = terracing, O = shoreline protection and W = weir. The number provides a unique ID for that particular type of measure in that subunit. In some cases, measures were redesigned but the ID was retained.

² All measurements are approximate. Unless otherwise noted, all measurements are in feet.

³ Measures in bold were proposed as part of a Coastal Wetlands Planning, Protection, and Restoration Act project.

⁴ HNC – Houma Navigation Canal

⁵ GIWW – Gulf Intracoastal Waterway

Table 2. Projected disturbance area by habitat type for construction features impacting the project area.

Feature ID	Feature Name	Wetland Type	Wetland Disturbance (length x width)	Wetland Disturbance Area (acres)	Existing Channel Width (feet)	Open Water Disturbance Area (acres)
ED2	East Dredge Channel #2	Swamp/Wetland Forest	18,720 x 230	98.8	50.0	21.5
ED2	East Dredge Channel #2	Intermediate Marsh	21,600 x 230	114.0	50.0	24.8
ED2	East Dredge Channel #2	Brackish Marsh	7,680 x 230	40.5	50.0	8.8
ED3	East Dredge Channel #3	Intermediate Marsh	10,363 x 505	120.0	225.0	53.5
ED3	East Dredge Channel #3	Swamp/Wetland Forest	1,604 x 560	20.6	170.0	6.3
ED3	East Dredge Channel #3	Brackish Marsh	4,477 x 455	46.8	275.0	28.3
ED6	East Dredge Channel #6	Brackish Marsh	17,000 x 190	74.0	360.0	140.5
ED7	East Dredge Channel #7	Brackish Marsh	13,000 x 70	20.9	330.0	98.5
CD1	Central Dredge Channel #1	Intermediate Marsh	3,383 x 70	5.4	210.0	16.3
CD1	Central Dredge Channel #1	Swamp/Wetland Forest	1,602 x 70	2.6	210.0	7.7
CD3	Central Dredge Channel #3	Intermediate Marsh	3,700 x 100	8.5	120.0	10.2
CD6	Central Dredge Channel #3	Swamp/Wetland Forest	2,587 x 290	17.2	N/A	0.0
CD6	Central Dredge Channel #3	Fresh Marsh	3,562 x 290	23.7	N/A	0.0
CD7	Central Dredge Channel #7	Swamp/Wetland Forest	5,387 x 260	9.2	60.0	7.4
CLV1	Central Levee #1	Swamp/Wetland Forest	N/A	18.4	N/A	0.0
CLV2	Central Levee #2	Swamp/Wetland Forest	N/A	4.4	N/A	0.0
WD2	West Dredge Channel #2	Fresh Marsh	2,471 x 290	16.4	140.0	7.9
WD2	West Dredge Channel #2	Fresh Marsh	27,063 x 430	267.1	N/A	0.0
WD2	West Dredge Channel #2	Fresh Marsh	5,766 x 269	35.6	161.0	21.3
WD3	West Dredge Channel #3	Swamp/Wetland Forest	16,500 x 205	0.0	445.0	168.6
	Total			944 ¹		622

¹ converted to open water with the exception of 23 acres converted to uplands (levee)

4.0 GUIDELINES APPLICABLE TO ALL USES

These guidelines are acknowledged and have been addressed through the preparation of responses to the guidelines contained within the specific use categories.

Guidelines 1.1 – 1.6: The guidelines have been read in their entirety, and all applicable guidelines would be complied with. The proposed project would be in conformance with all applicable water and air quality laws, standards and regulations, and with those other laws, standards and regulations which have been incorporated into LCRP, and is deemed in conformance with the program except to the extent that these guidelines would impose additional requirements. The proposed activity shall not be carried out or conducted in such a manner as to constitute a violation of the terms of a grant or donation of any lands or water-bottoms to the State or any subdivision thereof. Information regarding potential impacts of the proposed action is provided herein and in the accompanying feasibility study and environmental impact statement.

Guideline 1.7: Potential short- and long-term effects resulting from the proposed project include increased total suspended sediments, turbidity, and organic/nutrient enrichment of the water column; disturbance and release of possible contaminants; decrease in water temperatures; and the possible release of oxygen depleting substances as well as possibly increasing dissolved oxygen levels. Potential impacts would be minimized, as much as practicable, through the implementation of stormwater pollution prevention plans (SWPPPs) and other applicable best management practices (BMPs). Impacts associated with soil compaction, rutting, rill, and gully erosion at construction sites would be kept to a minimum by use of proper construction techniques such as silt curtains, temporary vegetative cover during construction, and regrading and permanent vegetation establishment at the end of construction.

Generally, four water quality conditions could change with implementation of the proposed project:

- 1) Fresh water would be moved throughout the entire project area;
- 2) Salinities would decrease throughout most of the project area;
- 3) Sediments in the project area would increase allowing for marsh nourishment and marsh platform development, along with accompanying minor increases in trace metals associated with bed sediments; and
- 4) Nutrients in the project area could increase.

Introduction of river water into the Terrebonne Basin would immediately change the water chemistry of receiving areas. Change may be beneficial or detrimental, depending on human perceptions and the water uses. The change from a less fresh to a fresher system could be perceived as beneficial to wetland nourishment, but detrimental to recreational use because of water color changes, and possible changes in fish species assemblages in the recreational area. However, the changes in water chemistry would mimic natural conditions prior to the Northern Terrebonne Marshes' partial separation from the influence of the Atchafalaya River. Stabilization of salinity regimes would probably aid resource managers, commercial and recreational fisheries managers, and water users in making long-term decisions. Salinity could be either beneficial or detrimental, depending on the user group. Salinity is not necessarily a pollutant in coastal waters. Fresh water marshes, however, are sensitive to salinity levels, but the

varying levels of salinity have positive impacts on various commercial and recreational fisheries. On balance, the stabilization of salinities, or the relocation of saltier water zones gulfward, would help to achieve the goals of the proposed project. The reintroduction of streambed sediments into the project area may add some contaminants; these could include primarily trace metals and hydrophobic organic compounds from the Atchafalaya and Mississippi Rivers' streambed sediments.

Cumulative impacts to water quality would primarily be related to the incremental impact of all past, present, and future actions affecting water quality within the Basin such as: increase in fresh water areas; stabilization or decrease in salinities; increase in sediment introduction to the coastal zone, with accompanying minor increases in trace metals associated with bed sediments; increased total suspended sediments; increased turbidity; increased organic/nutrient enrichment of the water column; disturbance and release of possible contaminants; decrease in water temperatures along with fewer water temperature fluctuations; and increased dissolved oxygen levels. However, the cumulative impacts to the water quality of the Terrebonne Basin resulting from this project would be a synergistic positive result over and above the additive combination of impacts and benefits of the other alternatives.

Any increases in suspended solids and turbidity levels due to dredging related activities in the immediate project area would be minor, temporary, and highly localized.

No adverse alteration or destruction of unique or valuable habitats, critical habitat for endangered species, important wildlife or fishery breeding or nursery areas, designated wildlife management or sanctuary areas, or forestlands is anticipated. No adverse cumulative or secondary impacts to the biological productivity of wetland ecosystems are anticipated. Adverse disruptions of coastal wildlife and fishery migratory patterns are not anticipated.

No adverse alteration or destruction of public parks, shoreline access points, public works, designated recreation areas, scenic rivers, or other areas of public use and concern is anticipated.

No increases in the potential for flood, hurricane or other storm damage, or increases in the likelihood that damage will occur from such hazards are anticipated.

No significant economic impacts on the locality or adverse disruptions of existing social patterns would occur due to the proposed action. No cultural, historical, or recreational resource sites would be impacted by construction. No proximal areas of special concern exist. No land loss, erosion, or subsidence would occur. This project would not result in reduced long-term biological productivity of the coastal ecosystem.

Guidelines 1.8 – 1.10: Acknowledged. Perceived adverse impacts listed above would clearly be outweighed by the human and environmental benefits the proposed project would provide through the naturalization of the distribution of fresh water and deltaic forming sediments—including those necessary for the nourishment and creation of sustainable marsh communities, improvements to hydrologic distribution of fresh water, improvements to topographic diversity, reduction in negative impacts of Gulf storm events, and the inhibition of invasive species in the Northern Terrebonne Marshes and the Terrebonne Basin.

5.0 GUIDELINES FOR LEVEES

Guidelines 2.1 – 2.6: Acknowledged. Approximately 5173 and 1760 linear feet of levee will be constructed for CLV1 and CLV2 features, respectively. Construction of these forced drainage levees would directly impact 23 acres of swamp through conversion to upland habitat. The proposed levees would prevent potential flooding from proposed increases in flows to Lake Boudreaux. A 23,500 linear foot soil berm (CM4) would be placed perpendicular to tidal flow to retain fresh water in marshes to the north and to prevent saltwater intrusion from the south. Two additional soil berms (CM2 and CM3) encompassing 20,230 linear feet would retain fresh water in Lake Boudreaux and marshes to the north while preventing saltwater intrusion from the south. The remaining two soil berms (EM1 and EM3) would be constructed to slow the movement of fresh water gulfward while preventing saltwater intrusion from the south.

6.0 GUIDELINES FOR LINEAR FACILITIES

Guidelines 3.1 – 3.8: Acknowledged.

Guideline 3.9: The proposed dredge channels excavated for increased fresh water conveyance would improve natural hydrologic and sediment transport patterns, sheet flow, and water quality, and will positively benefit the receiving wetlands and associated fish and wildlife habitat in the project area and elsewhere in the Terrebonne Basin.

Guideline 3.10: Linear facilities shall be planned, designed, and built using the best practical techniques to prevent bank slumping and erosion, saltwater intrusion, and to minimize the potential for inland movement of storm-generated surges. Consideration shall be given to the use of locks in navigation canals and channels which connect more saline areas with fresher areas.

The Central Lock Complex (CL1) would optimize operation of the proposed Houma Navigation Canal (HNC) Lock Complex for improved distribution of fresh water and prevention of saltwater intrusion.

Guideline 3.11: Soil plugs would be utilized in Cutoff Canal (EP7), in an opening near Bayou du Large (WP1), Robinson Canal (CP1), and in a canal near Bayou Butler (CP2). EP7 would be placed in Cutoff Canal on the north bank of Bayou Pointe au Chien to retain fresh water in marshes to the north while preventing saltwater intrusion from the south. WP1 would be placed to retain fresh water in Bayou du Large and Lake Mechant and prevent saltwater intrusion. CP1 would help to retain fresh water in the Lake Boudreaux basin and prevent saltwater intrusion from Bayou Petite Caillou. CP2 would prevent “short circuiting” of fresh water through the N/S Gulf South Pipeline canal. All plugs would be properly maintained.

Guideline 3.12: Where possible, dredge channels excavated for increased fresh water conveyance will utilize currently existing canals, which will reduce the length of newly constructed linear channel needed for the project and minimize adverse impacts to wetlands associated with channel excavation.

Guidelines 3.13 – 3.16: Acknowledged.

7.0 GUIDELINES FOR DREDGED MATERIAL DEPOSITION

Guideline 4.1: Several channels (both new and existing) are proposed for dredging in the project area (Table 1). Dredged materials removed during excavation and enlargement of conveyance channels would be deposited in a manner that would avoid disruptions of water movement, flow, circulation and quality. Dredged material deposition is not expected to result in significant or persistent water quality impacts in the vicinity of construction activities. Any minor increases in suspended sediment and turbidity levels during dredged material deposition would be temporary and highly localized. Minor reductions in dissolved oxygen levels associated with dredged material deposition would be temporary.

Guideline 4.2: Acknowledged. Dredged material shall be used beneficially to the maximum extent practicable to improve productivity or create new habitat, reduce or compensate for environmental damage done by dredging activities, or prevent environmental damage. Dredged materials would be used to create 43,688 linear feet of marsh berm, which will help to create approximately 329 acres of marsh platform, retain fresh water in Lake Boudreaux and adjacent marshes, and prevent salt water intrusion from the south. Dredged materials would be used in the construction of approximately 23 acres of uplands, which would help to prevent potential flooding from proposed increase in flows to north Lake Boudreaux, while providing new ridge habitat for wildlife.

Guideline 4.3: Dredged materials will not be disposed of in a manner which could result in the impounding or draining of wetlands or the creation of development sites.

Guidelines 4.4 - 4.6: Acknowledged.

Guideline 4.7: Not applicable.

8.0 GUIDELINES FOR SHORELINE MODIFICATIONS

Guidelines 5.1 – 5.4: Acknowledged. Shoreline modifications in the proposed project area will result from construction of several in-water culvert features, including gated openings associated with bridge construction (Table 1).

Guidelines 5.5 – 5.9: Not Applicable.

9.0 GUIDELINES FOR SURFACE ALTERATIONS

Guidelines 6.1 – 6.5: Acknowledged. Surface alterations in the proposed project's construction footprint will mainly entail the construction of culverts, excavation of new channels and old spoil bank gaps, enlargement of existing channels for improved conveyance, and placement of excavated material for the creation of new construction features, such as levees and marsh berms (Table 1).

Guideline 6.6: Acknowledged. Areas modified by surface alteration activities would, where applicable, be regraded and revegetated upon termination of the use.

Guidelines 6.7 - 6.13: Potential impacts associated with surface alteration sites would be minimized, as much as practicable, through the implementation of stormwater pollution prevention plans (SWPPPs) and other applicable best management practices (BMPs). Impacts associated with soil compaction, rutting, rill, and gully erosion at surface alteration construction sites would be kept to a minimum by use of proper construction techniques such as silt curtains, temporary vegetative cover during construction, and regrading and permanent vegetation establishment at the end of construction. The occurrence of low dissolved oxygen conditions in the proposed project area waters would be temporary and minor. No heavy metal traps would be created.

Guideline 6.14: Fill materials used in the construction of levees (CLV1 and CLV2) and marsh berms (CM2-4) for the proposed action would be, to the maximum extent practicable, free of known contaminants and compatible with the environmental setting.

10.0 GUIDELINES FOR HYDROLOGIC AND SEDIMENT TRANSPORT MODIFICATIONS

Guidelines 7.1-7.9: Acknowledged. Numerous construction features (e.g., operation of proposed HNC lock complex, conveyance channels, plug removal and construction, terracing, spoil gaps, weir removal and construction, Obermeyer gates, berms, and culverts) (Table 1) associated with the proposed action would modify hydrologic and sediment transport processes. The proposed project is designed to introduce and/or divert fresh water to control salinities. Construction of the proposed structures and other water management features would also convey sediment and nutrients to the Northern Terrebonne Marshes and elsewhere in the Terrebonne Basin to enhance fish and wildlife habitat and productivity, and offset land loss.

11.0 GUIDELINES FOR DISPOSAL OF WASTES

Guidelines 8.1 – 8.9: The proposed action would not involve the disposal of wastes; therefore, these guidelines are not applicable.

12.0 GUIDELINES FOR USES THAT RESULT IN THE ALTERATION OF WATERS DRAINING INTO COASTAL WATERS

Guideline 9.1: The proposed action will minimally affect water quality and flows in the Atchafalaya River, while providing benefits to the environment of the Terrebonne Basin through the diversion of fresh water, sediments, and nutrient inputs that should enhance fish and wildlife habitat and productivity, and reduce land loss.

Guidelines 9.2 - 9.3: Not applicable.

13.0 GUIDELINES FOR OIL, GAS, AND OTHER MINERAL ACTIVITIES

Guidelines 10.1 – 10.14: The proposed action would not involve oil, gas, and other mineral

activities; therefore, these guidelines are not applicable.

14.0 CONSISTENCY DETERMINATION

The proposed conveyance of Atchafalaya River water to the Northern Terrebonne Marshes will provide additional fresh water, nutrients, and fine sediments to the Barataria-Terrebonne estuary in southeast Louisiana. The proposed action will restore and maintain ecological integrity, including habitats, communities, and populations of native species, and the processes that sustain them by reversing the trend of degradation and deterioration in the project area, so as to contribute towards achieving and sustaining a larger coastal ecosystem that can support and protect the environment, economy, and culture of southern Louisiana and thus contribute to the economy and well-being of the Nation. Based on this evaluation, the U. S. Army Corps of Engineers, New Orleans District, has determined that the proposed action is consistent, to the maximum extent practicable, with the State of Louisiana's Coastal Resources Program.

BOBBY JINDAL
GOVERNOR



ROBERT D. HARPER
SECRETARY

State of Louisiana
DEPARTMENT OF NATURAL RESOURCES
OFFICE OF COASTAL MANAGEMENT

July 30, 2010

Joan Exnicios
Chief, Environmental Branch
Corps of Engineers- New Orleans District
P.O. Box 60267
New Orleans, LA 70160-0267

RE: **C20100166, Coastal Zone Consistency**
New Orleans District, Corps of Engineers
Direct Federal Action
LCA Project to Convey Atchafalaya River Water to Northern Terrebonne Marshes and
Multipurpose Operation of Houma Navigation Lock, **Terrebonne Parish, Louisiana**

Dear Ms. Exnicios:

The above referenced project has been reviewed for consistency with the Louisiana Coastal Resources Program in accordance with Section 307 (c) of the Coastal Zone Management Act of 1972, as amended. The project, as proposed in this application, is consistent with the LCRP, provided the Corps complies with LDWF stipulations and Terrebonne Levee and Conservation District stipulations that the Corps concurred with in email of July 28, 2010.

If you have any questions concerning this determination please contact Brian Marcks of the Consistency Section at (225) 342-7939 or 1-800-267-4019.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Gregory J. DuCote".

Gregory J. DuCote
Administrator
Interagency Affairs/Field Services Division

GJD/JDH/bgm

cc: Nathan Dayan, COE-NOD
Bren Haase, OCPR
Dave Butler, LDWF
Rod Pierce, OCM FI
James Miller, Terrebonne Parish

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