SECTION 404(b)(1) EVALUATION

Upper Barataria Basin Feasibility Study - Recommended Plan

St. Charles and Lafourche Parishes, Louisiana

Programmatic Environmental Impact Statement

II. Factual Determinations

a. Physical Substrate Determinations

(1) Substrate Elevation and Slope

Programmatic Features

The project footprint consists of emergent and forested wetlands, distributary ridges, and natural and manmade waterbodies with associated levees/spoil banks. Construction of the proposed project should not heavily impact the current ecosystem in place. The Upper Barataria Basin Recommended Plan (Figure 1) is a structural alignment constructed to a 1% AEP (100-yr future design) and totaling a little over 161,300 ft (30.6 miles) in length.

Levee Reaches: As several thousand acres within the footprint of the proposed levee alignment consist of open water or wetland habitat, placement of dredged or fill material for levee construction would adjust levee levels and create new levees in the area. Table 1-1 depicts final pre-settlement levee dimensions for the proposed project. Reaches A through F will be existing levees being adjusted to new levee levels. Reaches G and H will be new levees that will be put in place.

Figure 1 Hydraulic Reaches A - H

	Existing Levee	2026 Construction		Final Lift Construction	
Reach	Levee including ROW (ft)	Toe-To-Toe (ft)	Levee including ROW (ft)	Toe-To-Toe (ft)	Levee including ROW (ft)
A, Davis Pond	285	125	190	173	238
A	100	125	190	236	301
B	100	125	190	236	301
C	100	125	190	236	301
D	100	125	190	173	238
E	75	122	187	244	309
F	130	169	234	244	309
G	0	170	250	170	250
H	0	170	250	170	250

Table 1: Earthen Levee Footprint Widths

Mitigation Site: Approximately 1,176.67 acres of wetlands, including marsh, swamp, and bottomland hardwood habitats, are to be influenced by this project. The proposed levee is designed to HSDRRS specifications with a 1V:4H and a 10 foot crown, with multiple levee lifts authorized over the initial 50 years. The first lift is projected to occur in 2026 and would raise the levee to an elevation of 14 feet except in hydraulic reaches F and H where it would be constructed to 16 feet elevation after settlement. Subsequent lifts would sustain-maintain the 1% AEP over the initial 50 years of the authorized project. Material settlement over this period has also been incorporated into the material quantities for each of the alignment's hydraulic reaches.

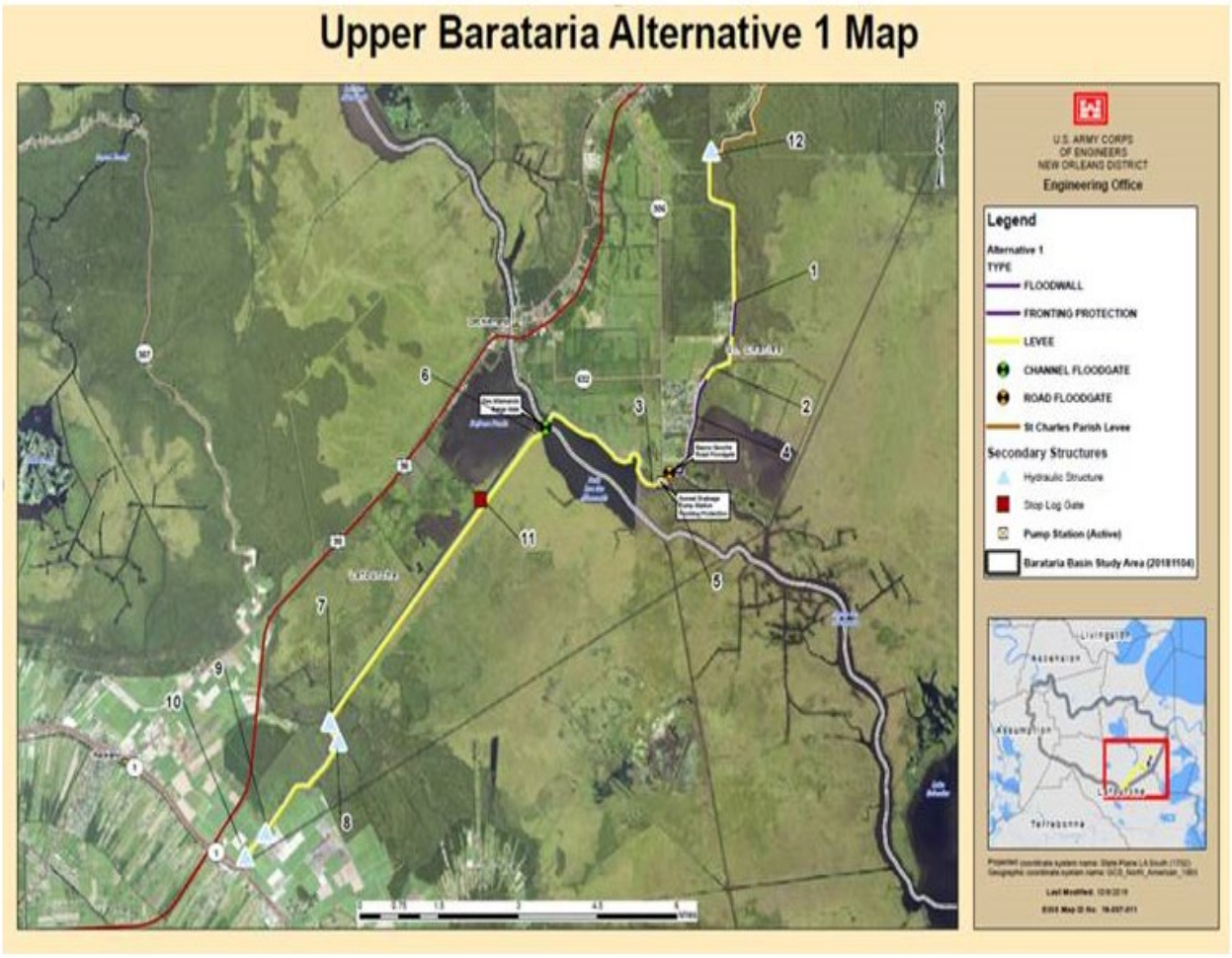

Figure 2 Priority Structures

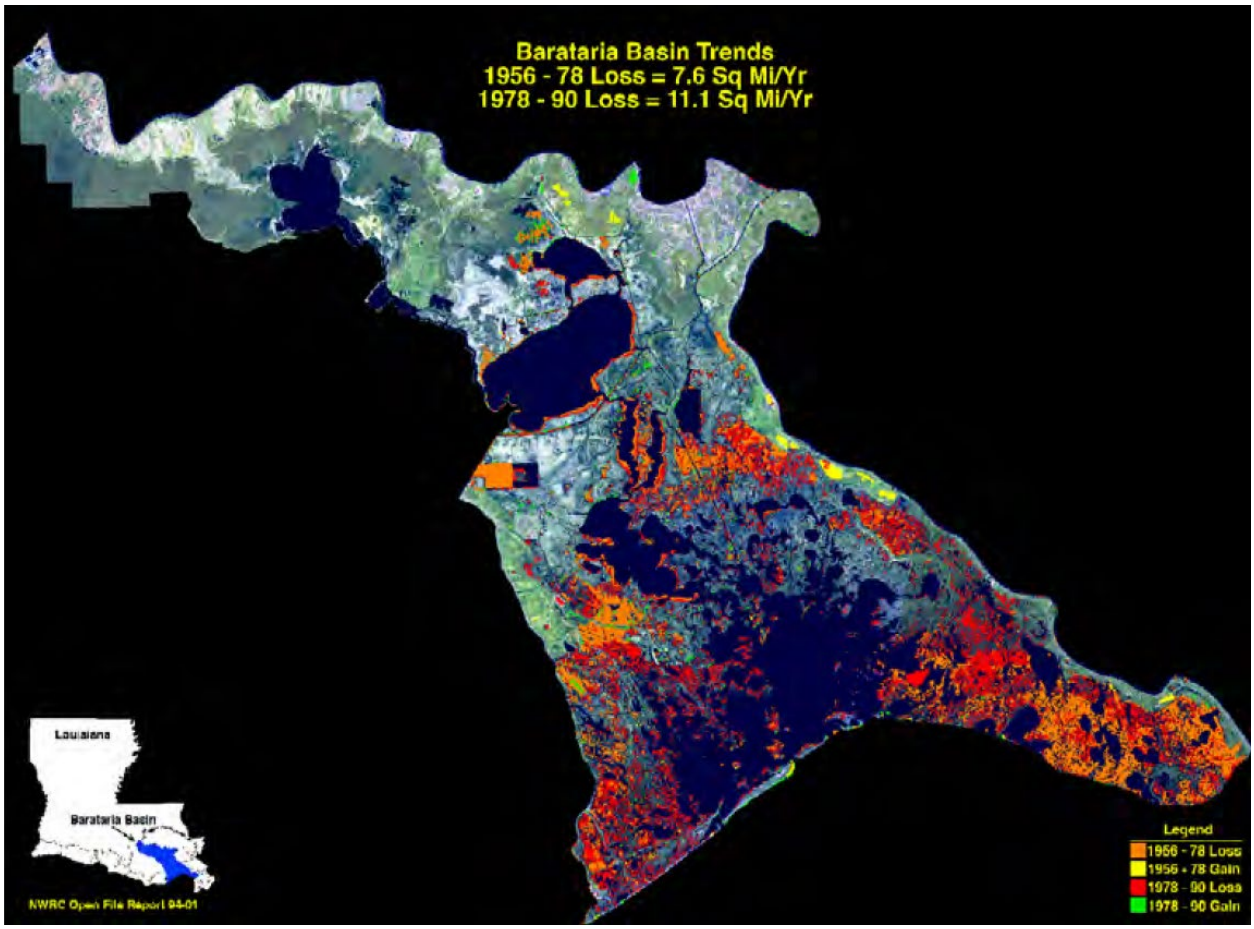

Figure 3: Barataria Basin Trends

Structures:

Reach A

Reach A begins at the Mississippi River levee and extends approximately 24,700 feet south. The proposed earthen levee, with a centerline shifted away from the canals, would build off the existing Davis Pond West Guide Levee and the existing St. Charles Levee (Refer to Engineering Appendix A for cross-sectional drawings). All of the existing levee footprints, including ROW, would be incorporated into the proposed levee design.

From the Mississippi River Levee, the alignment continues south where it crosses River Road, the Union Pacific Rail Road track, the BNSF Rail Road track, and US Highway 90. Ramps would be constructed for the River Road and US Highway crossings and 2 railway gates would be constructed where the Union Pacific Rail Road track and the BNSF Rail Road track cross the alignment. Continuing south, the existing Davis Pond pump station would receive new frontage protection. At the Willowdale Pump Station, two existing tidal exchange structures, located on either side of the structure, would need to be replaced. New T-wall sections, one measuring 152 feet and one measuring 298 feet, would be constructed to allow the Enterprise/Shell Pipeline and the Bridgeline Enlink Pipeline to pass through the levee alignment without impacting the integrity of the alignment. Approximately 11,000 feet from the Mississippi River Levee, along the Davis

Pond Diversion West Guide Levee, the alignment then turns into the St. Charles Parish Levee which would be elevated with the centerline being shifted away from the canal. Reach A would initially be constructed to a height of 14 feet in 2026, with an expected settlement of 1.5 feet by 2054. A second lift is proposed in 2054, to elevation 16 feet, in order to maintain the 1% AEP design elevation over the authorized 50 year period.

Reach A would be accessed from US Highway 90 to Willowdale Boulevard and then to Lafayette Drive. Three staging areas are proposed for use during the construction of the alignment and structures within Reach A. The first staging area is located off Willowdale Boulevard and measures approximately 0.7 acres in size. A second staging area, approximately one (1) acre in size is located along Willowdale Boulevard, and the third staging area, approximately one (1) acre in size is located next to River Road. Staging area 3 would be utilized for construction of the ramp over the levee for River Road and the 2 Railroad roller gate structures (Union Pacific to the north and the BNSF to the south).

Reach B

Reach B begins at Willowdale Pump Station and measures approximately 17,100 feet in length. The proposed new construction centerline of Reach B would be shifted away from the existing canal, similar to Reach A (Refer to Engineering Appendix A for cross-sectional drawings). All of the existing levee footprint, including ROW, has been incorporated into the proposed levee design.

Continuing southwest from the Willowdale Pump Station, along the St. Charles Parish Levee, frontage protection would be needed at the Willowridge, Kellogg and Cousins pump stations. Due to the design elevation requirements, T-wall sections would be constructed in order to accommodate both the East Gas Pipeline and the West Gas Pipeline. The T-wall would allow the gas pipelines to pass through the alignment while maintaining the integrity of the alignment.

Reach B would initially be constructed to an elevation of 14 feet in 2026, with an expected settlement of 1.5 feet by 2054. A second and final lift to 16 feet is proposed in 2054 in order to maintain the 1% AEP design elevation over the authorized 50 year period.

Reach B would be accessed from the same access route outlined in Reach A. A second access route for Reach B would be from US Highway 90 to River Ridge Drive and then to Primrose Street. There is one approximately one (1) acre staging area, located off Lafayette Drive, next to the alignment, proposed for Reach B.

Reach C

Reach C begins at the Ellington Pump Station, and measures approximately 22,600 feet in length and continues to elevate the St. Charles Levee. The proposed new centerline of Reach C would be shifted away from the existing canal similar to previously defined Reaches A and B. All of the existing levee footprint, including ROW, has been incorporated into the proposed levee design.

Continuing from the Ellington Pump Station, along the St. Charles Parish Levee footprint, the levee alignment turns back south along the St. Charles Parish Levee. Fronting protection would be placed at the Ellington Pump Station and a new T-wall section, measuring approximately, 135 feet would be constructed to allow the Magnolia pipeline to pass through the levee alignment without

impacting the integrity of the alignment. Reach C would initially be constructed to an elevation of 14 feet in 2026, with an expected settlement of 1.5 feet by 2054. A second (final) lift to elevation 16 feet proposed in 2054 in order to maintain the 1% AEP design elevation over the authorized 50 year period.

Reach C would be accessed from US Highway 90 and then to Magnolia Ridge Road. The proposed staging area for Reach C would be located off Magnolia Ridge Road and would be approximately 1.6 acres in size.

Reach D

Reach D begins just south of the Paradise Control Structure at the end of Reach C, and measures approximately 19,000 feet in length. This reach would be constructed atop the existing Sunset Levee. The proposed new centerline of Reach D continues south and would be shifted away from the existing canal similar to previously discussed reaches (Refer to Engineering Appendix A for cross-sectional drawings). All of the existing levee footprint, including ROW, has been incorporated into the proposed levee design.

Within Reach D there is one section of T-wall, measuring approximately 2,700 feet which would be constructed in order to avoid existing houses and utilities along the levee alignment. The T-wall would have a 10 feet base slab, with an 80 feet construction easement, and an elevation of 15 feet. The T-wall would be constructed via the right of way from the land side. The Reach D levee portion would initially be constructed to an elevation of 14 feet in 2026 with an expected settlement of 1.5 feet by 2056. A second (final) lift to elevation 16 feet is proposed in 2056 in order to maintain the 1% AEP design elevation over the authorized 50 year period.

Reach D would be accessed from Bayou Gauche Road (Highway 306) and then to Grand Bayou Road using a 1,527 feet long temporary access route. The 40 feet across access road would be constructed using crushed stone for the road surface that cuts across a local field to the alignment. The proposed staging area for Reach D would be located off of Grand Bayou Road and is approximately 2.2 acres in size.

Reach E

Reach E begins just south of Grand Bayou Road and is a combination of earthen levee and floodwalls which total approximately 14,600 feet. The earthen levee portion measures approximately 3,340 feet in length while the floodwall section measures approximately 11,230 feet in length. The earthen levee portion of the reach would be constructed atop the existing Sunset Levee, with a newly proposed centerline shifted away from the existing canal, similar to previously defined reaches, (Refer to Engineering Appendix A for cross-sectional drawings). All of the existing levee footprint, including ROW, have been incorporated into the proposed levee design.

Due to the minimal room for construction between the canal and the existing structures along the canal, the proposed floodwall portion (T-wall design) would be constructed to an elevation of 18.5 feet with a 10-20 feet wide concrete slab at the base. Within the T-wall section, where the alignment crosses highway 306, a roller gate would be constructed in the alignment. This roller gate would remain open during normal day to day operations and would only be closed proceeding a hurricane or tropical storm even. A 400 foot section of T-wall will also be needed for a pipeline

just west of the Crawford Canal where Reach E ties into Reach F. The small portions of earthen levee in this reach would initially be constructed to an elevation of 14 feet in 2026, with an expected settlement of 1.5 feet by 2038. A second lift to 16 feet is proposed for 2038, with an expected settlement of a foot by 2059. A third (final) lift to an elevation of 18.5 feet is proposed in 2059 to maintain the 1% AEP design elevation over the authorized 50 year period. T-wall would be designed to maintain the 1% AEP upon initial construction in 2026.

Reach E would be accessed directly from Bayou Gauche Road with a proposed, approximately 2 acre staging area also located off of Bayou Gauche Road. Reference Figure 6-8 for the access route and staging area location. A new access route would be constructed for the community outside the system at the end of Badeaux Lane because the floodwall cuts off access to the community. The permanent route would go from highway 306, just outside the T-wall, and allow access to the community with a 30 feet wide road.

Reach F

Reach F begins just past the Crawford Canal Pump Station and measures approximately 15,400 feet in length. This reach would be constructed atop the existing Sunset Levee. The newly proposed centerline of Reach F continues south and would be shifted away from the bayou similar to previously defined reaches. All of the existing levee footprint of the Sunset Levee, including ROW, would be incorporated into the proposed levee design.

Reach F consists of mostly earthen levee and includes a 270 feet barge gate structure and culverts with sluice gates. The barge gate would be constructed across the Bayou Des Allemands crossing and would incorporate (6)15 feet X 20 feet box culverts on each side of the gate for a total of twelve culverts with sluice gates (no screens on the culverts). The channel where the structure would be placed would require dredging in order to achieve a sill depth around negative 14-19 feet. Dredge material could be disposed of downstream in potential sites stable enough for marsh. The Reach F earthen levee would initially be constructed to an elevation of 16 feet in 2026 with an expected settlement of 1.7 feet by 2044. A second (final) lift to 18.5 feet is proposed for 2044 to maintain the 1% AEP design elevation over the authorized 50 year period.

Access for Reach F would be via an approximately 4,575 linear foot temporary crushed stone access route, 40 feet wide, constructed from the end of Down The Bayou Road to the barge gate crossing on top of the existing Sunset Levee. Access to this route will be via US Highway 90 to the eastern side of Bayou Des Allemands via Down The Bayou Road near the proposed barge gate placement site. The temporary access road would be removed and the area returned to pre-construction conditions once construction has been completed.

Reach F has two proposed staging areas. The first one is located west of the Crawford Canal Pump Station with a second proposed staging area located on the east bank of Bayou Des Allemands where the alignment crosses the bayou. Both proposed staging areas are approximately 2.2 acres in size.

Reach G

Reach G begins on the southern bank of Petit Lac Des Allemands and continues parallel to US Highway 90 through the marsh. Reach G measures approximately 31,000 feet in length and there

are currently no existing levees located in this reach. Refer to Appendix A for this sections cross-sectional drawings for this new construction. Geotechnical fabric has been incorporated into the levee design to reduce the footprint in this reach.

The proposed action for Reach G includes construction of a new levee which would parallel US Highway 90 through the marsh. The newly constructed levee would incorporate five sets of culverts, 4-6 X 6 foot box culverts with sluice gates (no screens), which are needed to maintain the hydraulic flows in and out of the marsh (through small tributaries and oil and gas line canals) on the southern side of the alignment. The proposed levee for Reach G would initially be constructed to an elevation of 14 feet in 2026, with a second (final) lift to an elevation of 16 feet proposed in 2054 in order to maintain the 1% AEP design elevation over the authorized 50 year period.

Access to Reach G would be from U.S. Highway 90 via a newly constructed permanent access route just southwest of Dufrene Ponds. The new access road would measure approximately 7,925 feet in length and would be surfaced with crushed stone. The access road includes construction of a permanent bridge across the Godchaux canal in order to gain access to the alignment for construction and future operation and maintenance. The proposed staging area for Reach G, approximately 2.3 acres in size, would be located on the north-east corner of where the Godchaux Canal and the access route intersect. These structures would be constructed using the temporary access route located along the alignment within the right of way.

Reach H

Reach H begins where Gibbons Road meets the alignment and continues to parallel US Highway 90 through the marsh and follow next to Amarada Hess Rd. Reach H measures approximately 16,900 feet in length and there is currently no existing levee in place. Refer to Appendix A for this sections cross-sectional drawings for this new construction. Geotechnical fabric has been incorporated into the levee design to reduce the footprint in this reach.

The proposed construction for Reach H includes construction of a new levee which would parallel US Highway 90 through the marsh. The newly constructed levee would incorporate two sets of culverts for hydraulic exchange from the north to the south of the alignment. These are 2-84 inch in diameter culverts with sluice gates and a 1-60 inch in diameter culvert with sluice gate (no screens). The proposed levee for Reach H would be constructed with one lift to an elevation of 16 feet in 2026 in order to maintain the 1% AEP design elevation over the authorized 50 year period.

Reach H and a portion of G would be accessed using Amarada Hess Rd. For access along the project site, it is assumed access would be for the length of the reach, a 40 feet wide access road positioned at least 15 feet from the levee toe is proposed. A two acre staging area is proposed along the intersection of highway 308 and Amarada Hess Rd. These structures would be constructed using the temporary access route located along the alignment within the right of way.

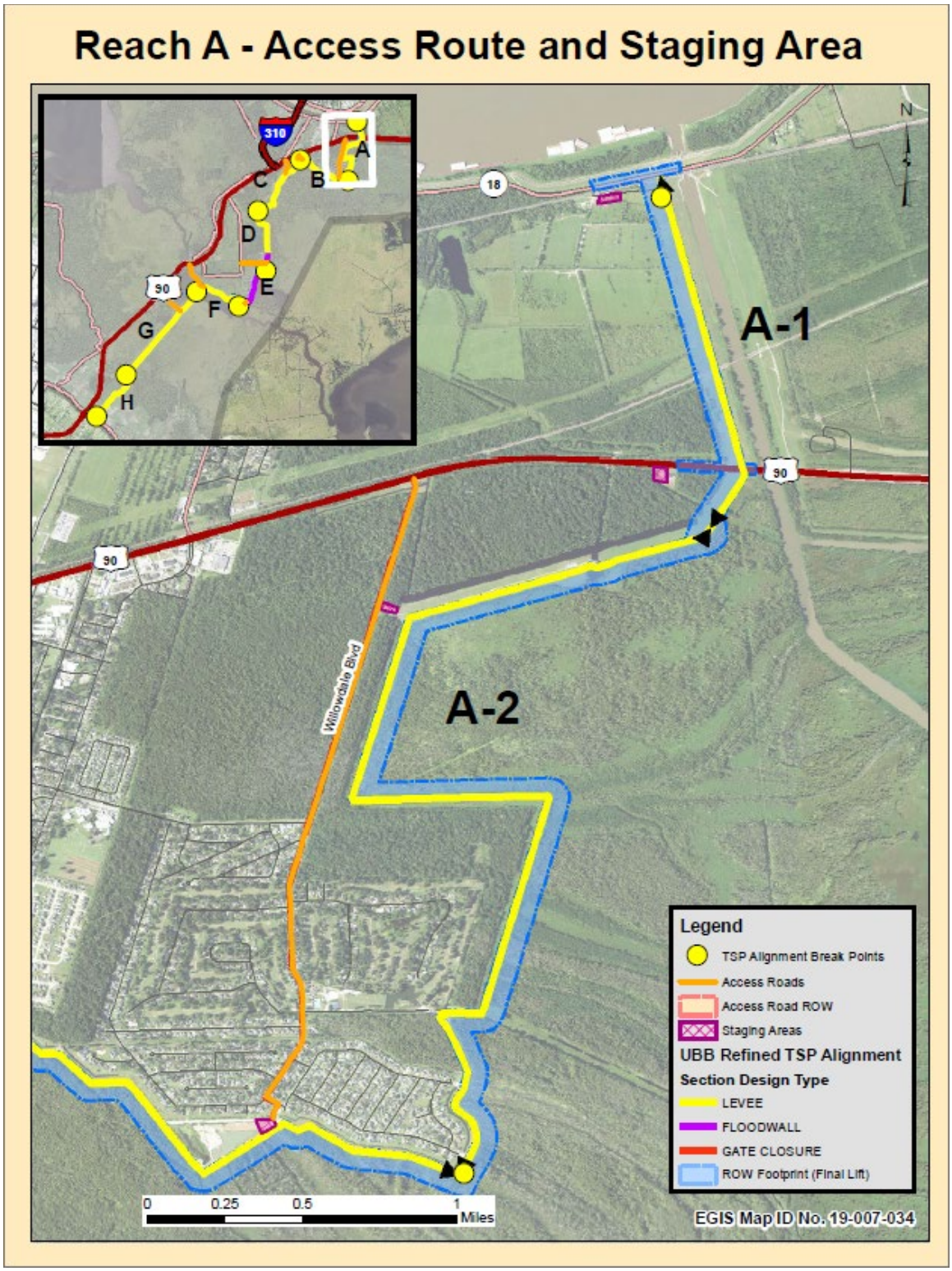

Figure 4: Reach A Access Road and Staging Area

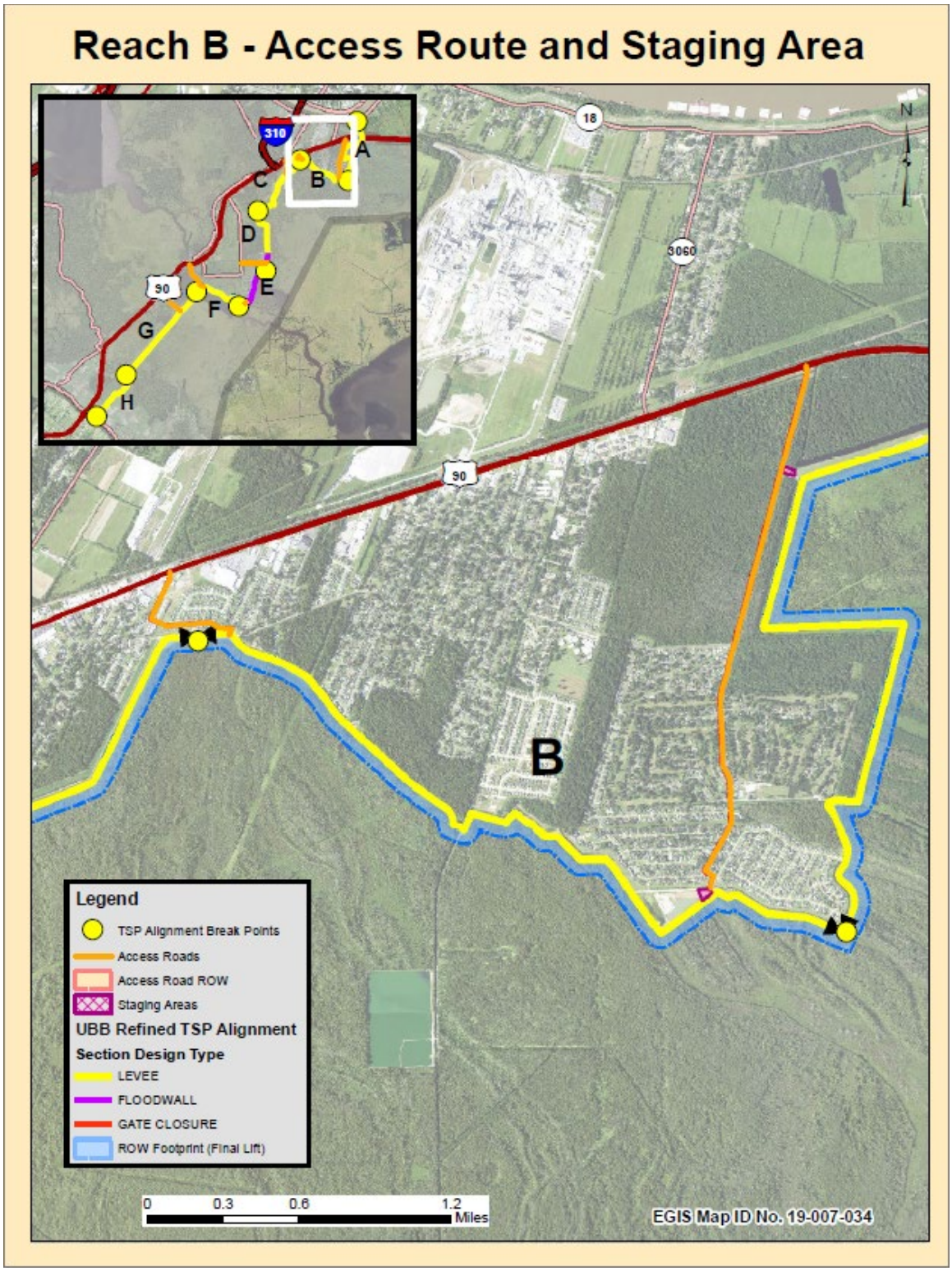

Figure 5: Reach B Access Road and Staging Area

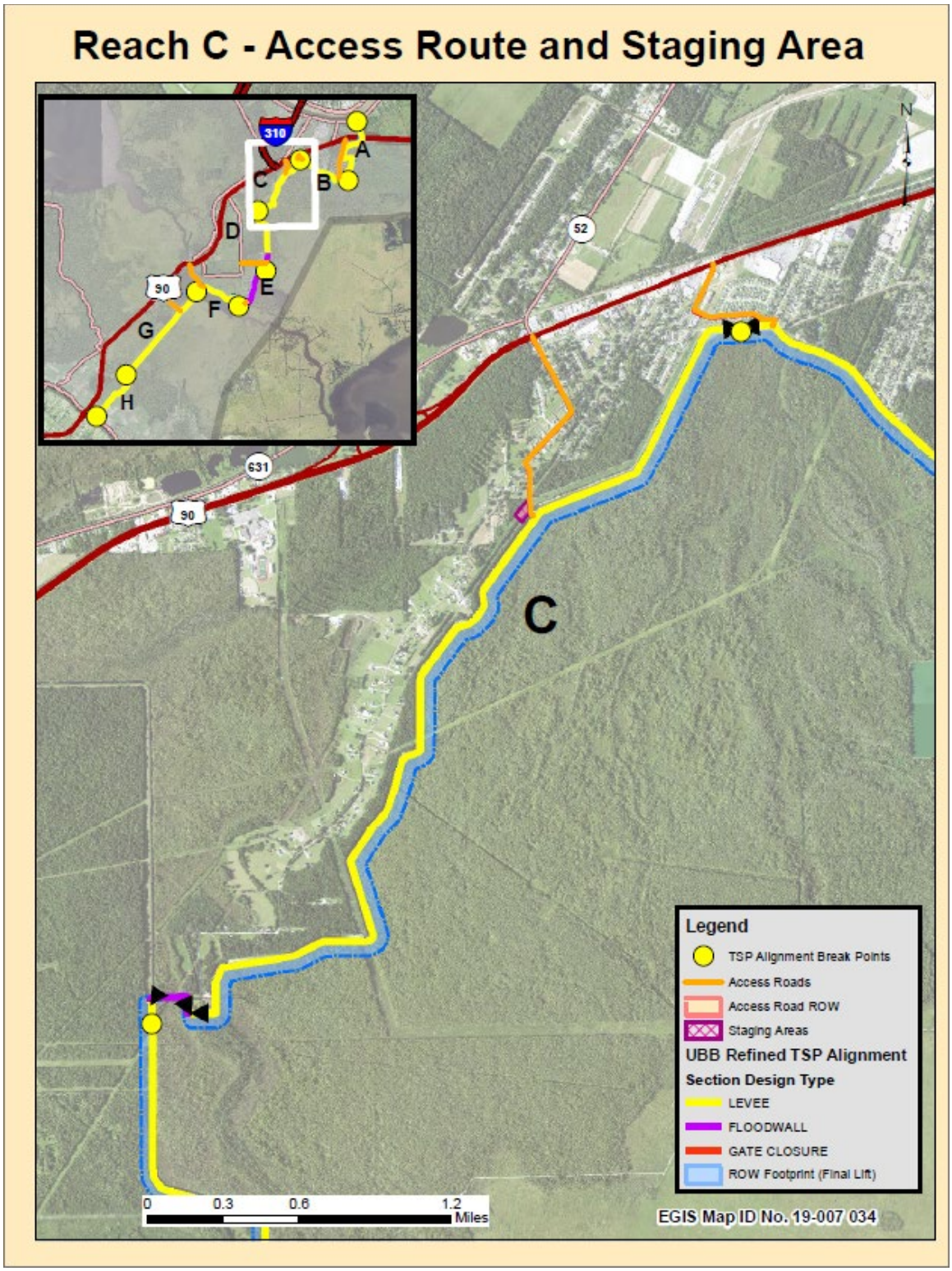

Figure 6: Reach C Access Road and Staging Area

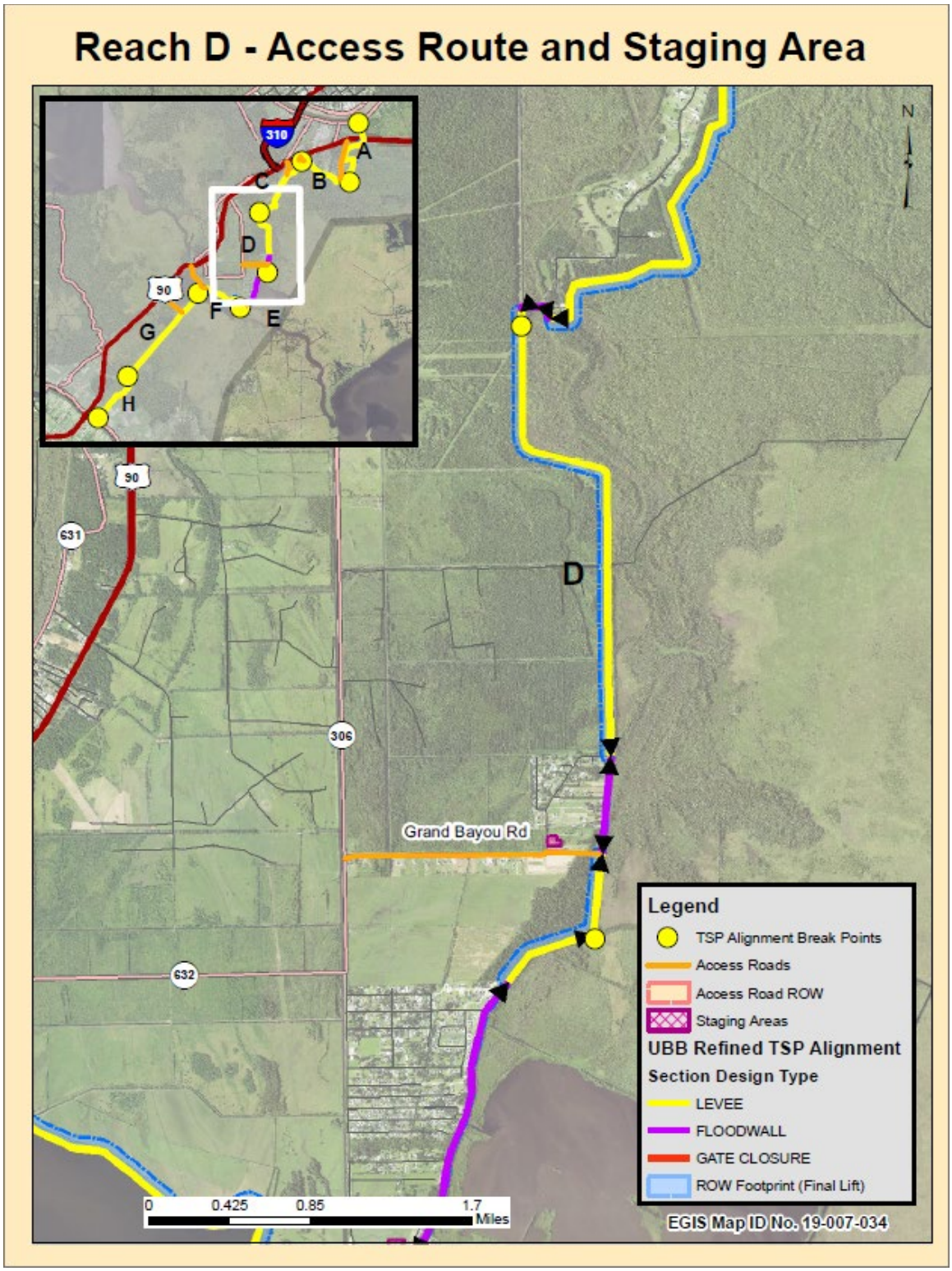

Figure 7: Reach D Access Road and Staging Area

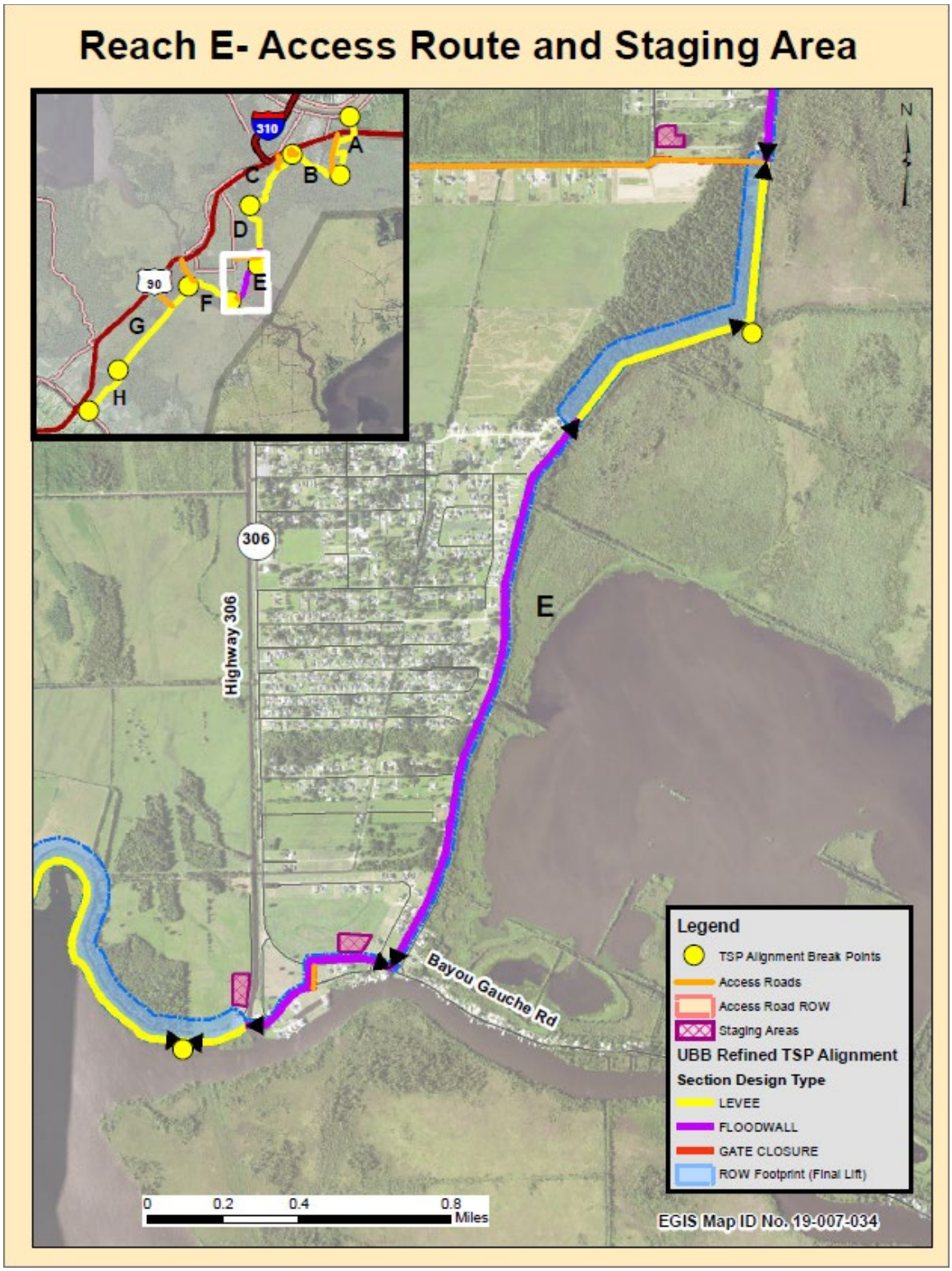

Figure 8: Reach E Access Road and Staging Area

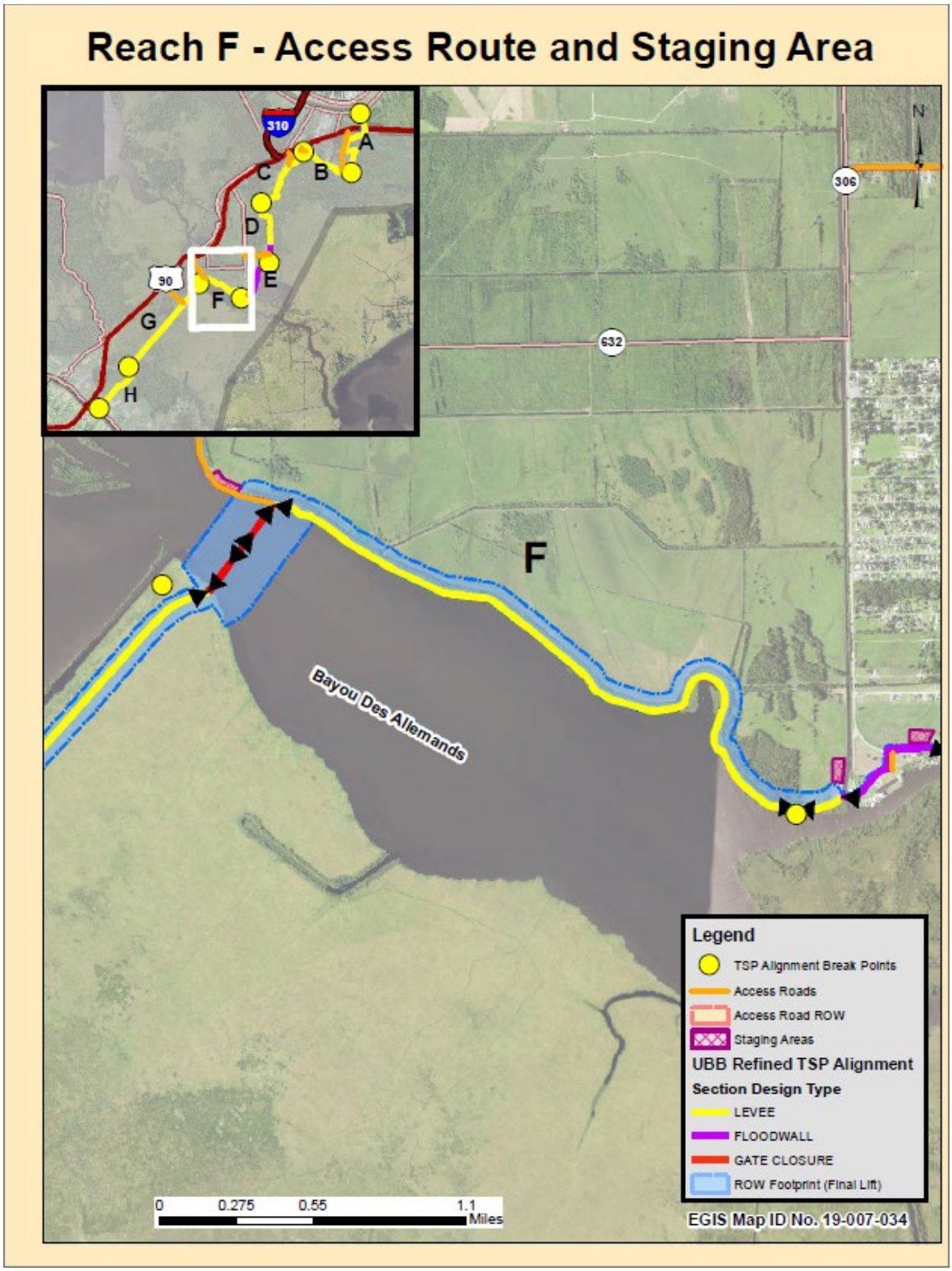

Figure 9: Reach F Access Road and Staging Area

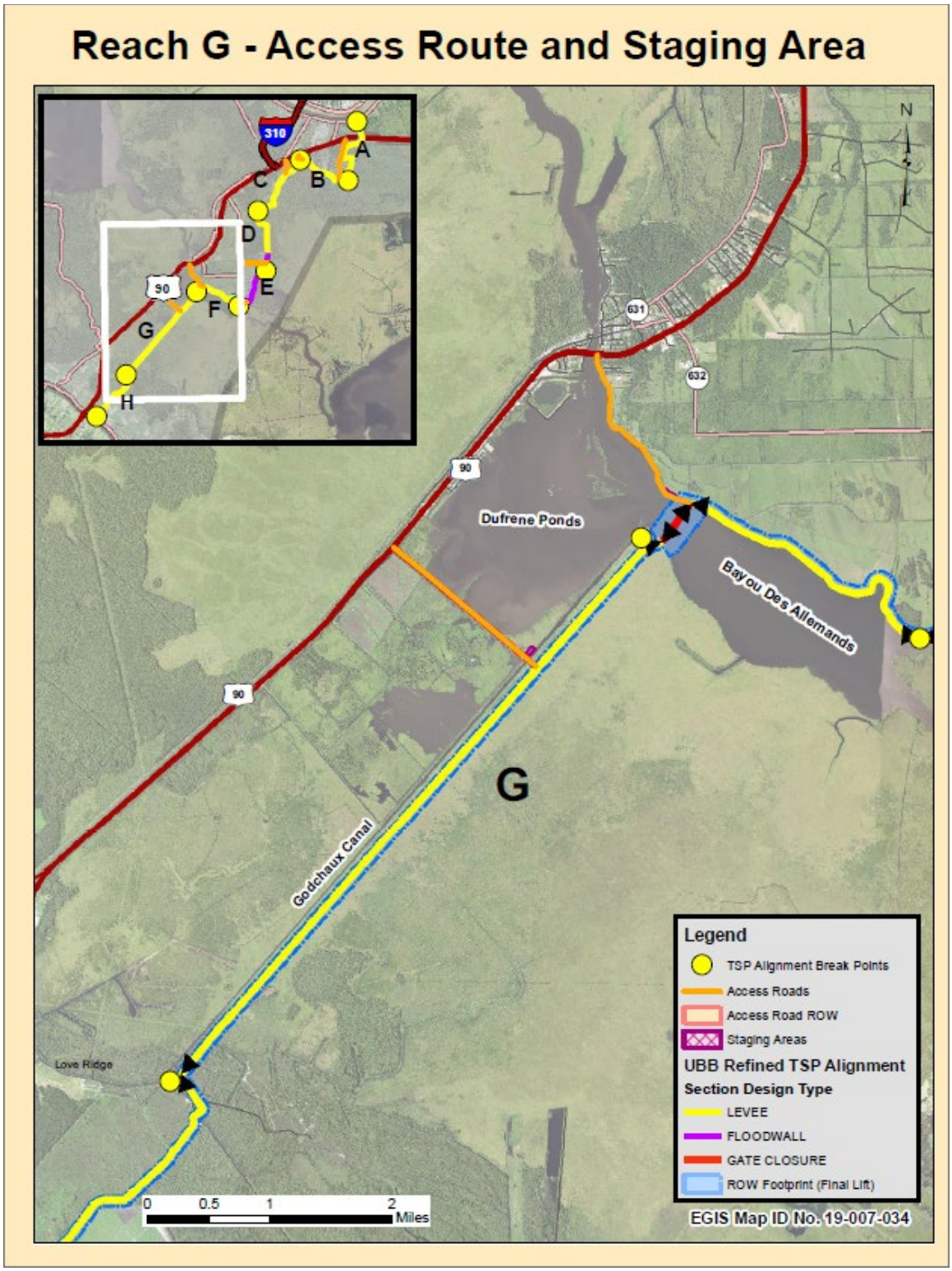

Figure 10: Reach G Access Road and Staging Area

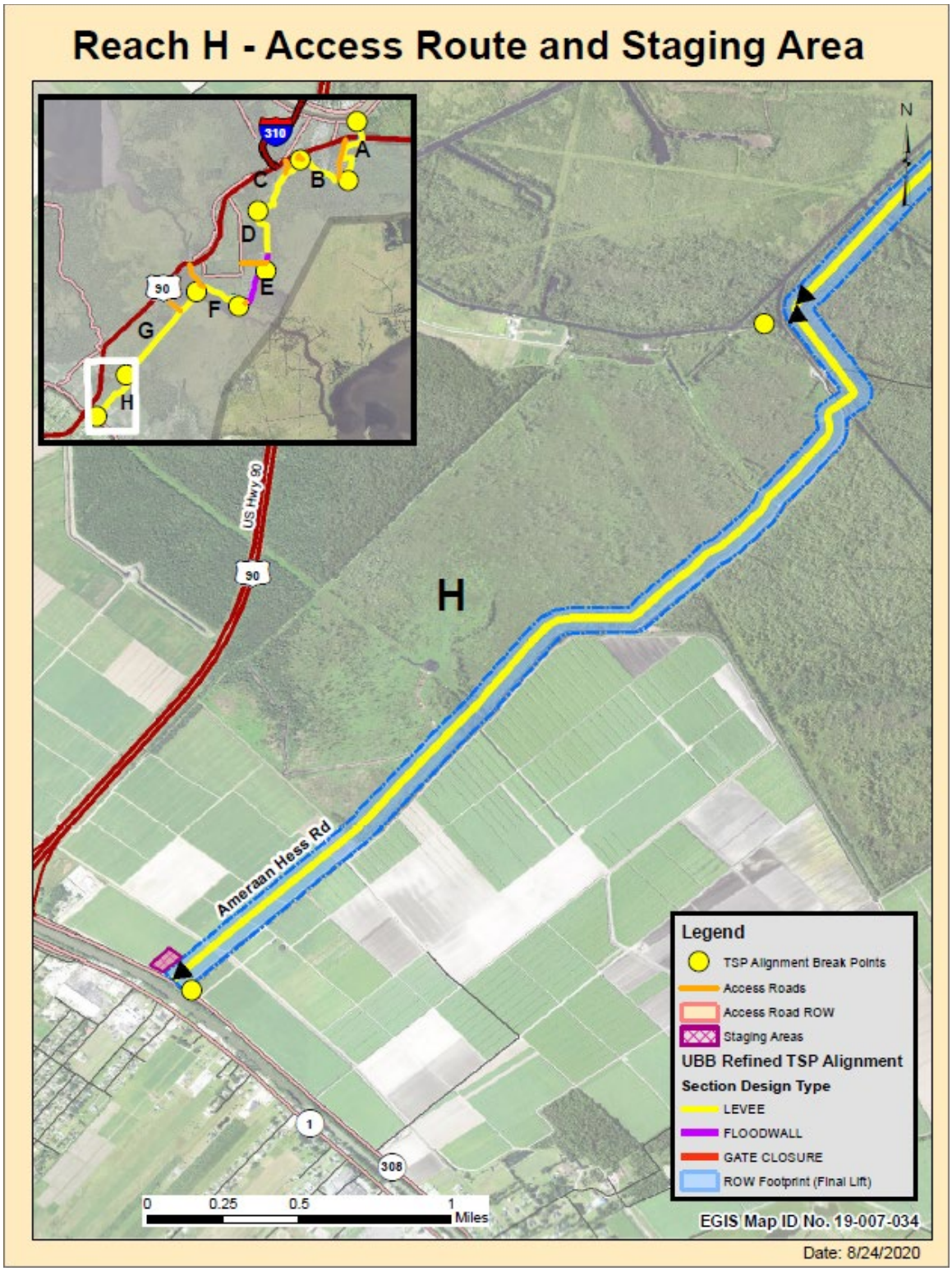

Figure 11: Reach H Access Road and Staging Area

(2) Sediment Type

Programmatic Features

The Upper Barataria Basin is mostly a coastal wetland. The surface and shallow subsurface of the project area is generally comprised of natural levee, swamp, and marsh deposits. Because of the lack of mineral sediment accretion in upper basin marshes, those marshes are characterized by highly organic substrates that in many areas are floating or semi-floating. Such marshes are vulnerable to potential catastrophic degradation and loss if exposed to brackish water conditions. Additionally, such floating marshes are more susceptible to storm surge impacts than heavier mineral soil marshes (USACE 2019). The Barataria Basin exhibits a northwest-southeast salinity gradient with fresh or low-salinity conditions toward the northwest, and more saline conditions nearer the Gulf. Given that the study area is located within the upper basin, the study area is characterized by freshwater conditions, with low- salinity brackish water occurring infrequently in the more tidally influenced southern portion of the area. As stated, existing levees will be adjusted, and two new levees will be created.

Levee Reaches: Borrow material for construction is proposed to come from sites estimated to be within 15 miles of where US Highway 90 crosses Bayou Des Allemands. Existing Government borrow sites were not available within the designated distance. Potential borrow sites on farm lands (avoiding swamp and marsh lands) were identified in Raceland.

Material used for levee construction will be levee grade material meeting HSDRRS Guidelines. Levee grade material is currently defined and specified as follows: earth materials naturally occurring or contractor blended materials that are classified in accordance with ASTM D2487 as clay (CL) or high plasticity, fat clay (CH) with less than 35% sand content are suitable for use as embankment fill (Materials classified as silt [ML] are suitable if blended to produce a material that classifies as CH or CL according to ASTM D 2487). Materials shall be free from masses of organic matter, sticks, branches, roots, and other debris including hazardous and regulated solid wastes. Isolated pieces of wood will not be considered objectionable in the embankment provided their length does not exceed 1 foot, their cross-sectional area is less than 4 square inches, and they are distributed throughout the fill. Not more than 1 percent (by volume) of objectionable material shall be contained in the earthen material placed in each cubic yard of the levee section. Pockets and/or zones of wood shall not be placed in the embankment. Materials placed in the section must be at or above the Plasticity Index of 10. Materials placed in the section must be at or below organic content of 9 percent by weight, as determined by ASTM D 2974, Method C.

Mitigation Sites: A total of 5,200,400 cubic yards of soil is needed for the first lift in 2026 and a grand total of 8,812,700 cubic yards is needed over the entire authorized 50 year period to sustain the 1% AEP design elevations out to year 2076. It was assumed that 10-15 feet of usable material could be found in these sites. The borrow pit needed for the quantity of soil would be approximately 500 acres.

Structures: Fill material used in construction of structures would either consist of backfill from adjacent areas, or offsite borrow. Adjacent backfill characteristics would be dependent on location and depth; however, as described earlier, a majority of soils within the footprint of the

proposed alternative are considered to be very poorly drained, flooded soils with a mucky or loamy surface layer and clayey subsoil. Both adjacent and offsite borrow material may be required to meet HSDRRS guidelines for levee grade material.

(3) Dredged/Fill Material Movement

Levee: Material placed for levee construction would be contained within the levee right of way with berms or small dikes. Movement of material beyond the levee right of way is not anticipated.

Structures: Structure materials, including any associated cofferdams, would not be expected to move or shift after final material placement.

Nonstructural Features: Fill material placed for berm construction is not expected to move after final material placement.

b. Water Circulation, Fluctuation, and Salinity Determinations

(1) Water

(a) Salinity

The impact of this project will influence changes in flow of water. Levee creation will create flood control which influence the pattern of water during storms. The levees are put in place to limit the impact of storms on water flow. Most of this project deals with existing levees which will limit the impact of the project on the existing ecosystem. Without implementation of the proposed action, the existing marsh has little protection and is subject to winds, subsidence, and sea level rise. Study-area fresh marshes will likely remain relatively healthy provided salinities do not increase and provided that sea level rise remains relatively low. Increases in salinity or rapid sea level rise will likely result in gradually increasing marsh loss. Continued operation of the Davis Pond Freshwater Diversion should help to preclude detrimental salinity increases. However, under the higher sea level rise scenarios, continued loss of middle and lower basin marshes would allow tidal exchange to increase project area salinities despite Davis Pond Diversion freshwater inputs (USACE 2019).

With the increase in sea-level rise, it is anticipated that the local sponsor may desire more frequent closure of gravity drainage structures to reduce damages from higher stages unrelated to storm events. If this change in operation were authorized, further changes in salinity levels within the study area may occur.

(b) Water Chemistry (pH, etc.)

Programmatic Features

Placement of dredged and fill materials can result in short term effects on pH. Factors typically associated with dredged and fill material placement activities may cause pH in receiving area

waters to shift toward more acidic conditions. These factors include increased turbidity, organic enrichment, chemical leaching, reduced dissolved oxygen, and elevated carbon dioxide levels, among others.

With the increase in sea-level rise, it is anticipated that the local sponsor may desire more frequent closure of environmental control structures to reduce damages from higher stages unrelated to storm events. If this change in operation were authorized, changes in pH levels within the study area may become significant.

Levee Reaches: Material proposed as levee fill would be confined by berms. Therefore, only minimal amounts of fill material (primarily material associated with berm construction) would directly impact adjacent waterbodies. Associated impacts to the water column from placement of levee fill material would therefore be localized and temporary.

Mitigation Sites: Effluent discharges from mitigation sites would result in a temporary reduction in pH for adjacent waters. The tidal action in the vicinity of mitigation sites would help to reduce pH effects by dispersing and diluting mitigation site effluent waters. As emergent wetland vegetation establishes at sites, pH levels would return to normal.

Structures: Minor and localized impacts to pH levels in adjacent waters may occur during placement of cofferdam, construction, and backfill materials. These impacts would be expected to last the duration of construction activities. Cofferdams, if implemented, would have the potential to temporarily alter pH levels, by restricting or eliminating surface water flows during construction activities. Upon removal of cofferdams, changes in pH associated with cofferdams would diminish.

(c) Clarity

General: Placement of dredged and fill material is expected to result in localized turbidity plumes, which could affect water clarity and color. Following completion of construction activities and vegetation of constructed project features, the occurrence of these turbidity plumes would no longer occur.

(d) Color

Placement of dredged or and fill material is expected to result in localized turbidity plumes, which would affect water color. Following completion of construction activities, the occurrence of these turbidity plumes would no longer occur.

(e) Odor

General: No significant odors are anticipated to be associated with dewatered borrow material.

(f) Taste

The nearest surface drinking water intakes to the study area are located on the Mississippi River,

which is generally hydrologically isolated from the study area by the Mississippi River levees. The proposed projects are therefore not expected to affect area drinking water resources.

(g) Dissolved Gas Levels

(All Features)

Short-term decreases in dissolved oxygen could occur due to introduction of organics from the sediment into the water column, as well as the release of nutrients. Turbidity affects water quality in several ways, one which may markedly affect dissolved oxygen levels. The introduction of nutrients and organic material to the water column as a result of the discharge can lead to a high biochemical oxygen demand (BOD), which in turn can lead to reduced dissolved oxygen, thereby potentially affecting the survival of aquatic organisms. Adjacent borrow area sediment is highly organic, and therefore there is potential for temporarily lowering dissolved oxygen levels at mitigation sites.

Levee Reaches: Material proposed as levee fill would be confined by berms. Therefore, only minimal amounts of fill material (primarily material associated with berm construction) would directly impact adjacent waterbodies. Associated impacts to the water column from placement of levee fill material would therefore be localized and temporary.

Structures: Minor, localized impacts to dissolved oxygen levels in adjacent waters may occur during placement of cofferdam, construction, and backfill materials. These impacts would be expected to last the duration of construction activities.

(h) Nutrients

The proposed levee alignment would put in place new hydrologic barrier along some reaches, the proposed project has the potential to induce changes to water circulation and water level patterns in the study area. Localized changes in water circulation may occur within the project area. These localized changes in water circulation may induce localized changes in the distribution of nutrients within the study area.

With the increase in sea-level rise, it is anticipated that the local sponsor may desire more frequent closure of environmental control structures to reduce damages from higher stages unrelated to storm events. If this change in operation were authorized, changes to nutrient levels within the study area may be more significant.

Levee Reaches: Material proposed as levee fill would be confined by berms. Therefore, only minimal amounts of fill material (primarily material associated with berm construction) would directly impact adjacent waterbodies. Associated impacts to the water column from placement of levee fill material would therefore be localized and temporary.

Mitigation Sites: Sediments proposed as borrow material for mitigation sites are expected to contain variable levels of organic material, which may release elevated concentrations of ammonia during construction activities related to marsh restoration and nourishment.

Testing Area	pH	Specific Conductance uS/cm @ 25deg C	Temp. C	Dissolved Oxygen mg/L	Salinity, unfltrd ppth
Southwestern Louisiana Canal E of Leeville, LA		29,880	19		18
Caminada Pass NW of Grand Isle, LA					23
Barataria Bay N of Grand Isle, LA	7.6	740	19	8.1	0.4
Barataria Waterway at Mud Lake S of Lafitte, LA		26,700	18.8		16
Hackberry Bay NW of Grand Isle, LA	8.2	30,200	19.1	8.1	19
Bayou Dupont nr Round Lake S of Myrtle Grove, LA	7.7		25.1	5.8	

Table 2: Water Quality within the Barataria Basin

(i) Eutrophication

Citation of nutrients, total phosphorus, nitrate/nitrite, and non-native aquatic plants as a suspected cause of impairment occurred disproportionally on the protected side of the proposed levee alignment. Because of the river water contains elevated nutrient (particularly nitrate) levels, nutrient concentrations in this area may increase directly, leading to an increase in the frequency and distribution of eutrophic conditions.

(2) Current Patterns and Circulation

(a) Current Patterns and Flow
The system starts in Luling where it connects the Mississippi River Levee through the Davis Pond Diversion Structure West Guide Levee. Continuing south, the Recommended Plan improves upon and updates deficiencies in the St. Charles Parish Levee, crosses Bayou Des Allemands with a 270 feet barge gate structure, and continues parallel to US Highway 90 before it ties into high ground across the Barataria Basin near Raceland.

(b) Velocity

(All Features)
See II.b.2(a) (Current Patterns and Flow)

(c) Stratification

No significant stratification is anticipated as a result of the implementation.

(d) Hydrologic Regime.

(All Features)
See II.b.2(a) (Current Patterns and Flow **)**

(3) Normal Water Level Fluctuations/Hydroperiod.

(All Features)
See II.b.2(a) Current Patterns and Flow

(4) Salinity Gradients.

(All Features)
See II.b.1.(a) (Salinity)

(5) Actions That Would Be Taken to Minimize Impacts.
A major component of the proposed project includes the construction on 8 levees. The purpose is a structural alignment constructed to a 1% AEP (100-yr future design).

Levees: Material obtained from adjacent borrow areas for initial levee lifts would be dewatered prior to placement, and material will be placed between levee berms, minimizing water column impacts associated with levee construction.

c. Suspended Particulate/Turbidity Determinations

(1) Expected Changes in Suspended Particulates and Turbidity Levels in Vicinity of Disposal Site.

Levee Reaches: Material proposed as levee fill would be confined by berms. Therefore, only minimal amounts of fill material (primarily material associated with berm construction) would directly impact adjacent waterbodies. Associated impacts to the water column from placement of levee fill material would therefore be localized and temporary.

Mitigation Sites: Use of confinement dikes would allow for clarification of effluent waters prior to discharge into receiving waterbodies, and would minimize any suspended particulates and turbidity associated with effluent discharge.

Structures: Minor, localized impacts to turbidity levels and water clarity in adjacent waters may occur during placement of cofferdam, construction, and backfill materials. These impacts would be expected to last the duration of construction activities.

(2) Effects on Chemical and Physical Properties of the Water Column.

(a) Light penetration

(All Features)
See II.c.1 Expected Changes in Suspended Particulates and Turbidity Levels in Vicinity of Disposal Site.

(b) Dissolved oxygen

(All Features)
See section II.b.1(g) (Dissolved Gas Levels)

(c) Toxic metals and organics

See section II.d (Contaminant Determinations)

(d) Pathogens

The proposed project will have an impact on water circulation. The levee alignment will create a hydraulic barrier that will change the water patterns of the system. This project will not have long term effects on pathogen distribution within the system. There will be localized changes in water circulation and water level patterns may induce localized changes in the distribution of waterborne pathogens within the study area.

d. Contaminant Determinations.

There shouldn't be any major contaminations because of the borrow material has been cleared. The U.S. Army Corps of Engineers approved the borrow site that are to be used in this project. Test have been done to make sure the material is not contaminated. As stated earlier, Material borrowed from the spillway would be required to meet HSDRRS guidelines for levee grade material, which includes the specification that it should be free of hazardous and regulated solid wastes.

HWY 90 LEVEE ALIGNMENT

Reach	Lift	0 Design EL	Length Miles	Length Feet	Cross Area less Exist. Levee**** SF	Levee Deficiency**	Total CY***	Footprint Toe-to-Toe	Surface Area*	C&G and F&S Acres	Silt Fence LF	Reinforcement Geotextile SY	Access Road Miles	Levee Crown Surfacing Tons	COMMENTS:
A1	1	Protected Side	14	1.19	6283	688	0	176,110	125	190	27	15708				
	2	Protected Side	16	1.19	6283	594	0	152,049	173	238	34	15708				
A2	1	Flood Side	14	3.49	18432	688	0	516,642	125	190	80	46080				
	2	Flood Side	16	3.49	18432	877	0	658,569	236	301	127	46080				
B	1	Flood Side	14	3.25	17136	688	0	480,316	125	190	75	42840				
	2	Flood Side	16	3.25	17136	877	0	612,263	236	301	118	42840				
C	1	Flood Side	14	3.81	20117	688	0	563,866	125	190	88	50292				
	2	Flood Side	16	3.81	20117	877	0	718,766	236	301	139	50292				
D	1	Flood Side	14	3.09	16335	688	0	457,864	125	190	71	40838				
	2	Flood Side	16	3.09	16335	594	0	395,307	173	238	108	40838				
E	1	Protected Side	14	0.71	3745	585	0	89,256	122	187	16	9362				
	2	Protected Side	16	0.71	3745	584	0	89,103	170	235	20	9362				
	3	Protected Side	18.5	0.71	3745	948	0	144,640	244	309	27	9362				
F	1	Protected Side	16	2.53	13351	960	0	522,172	169	234	72	33377				
	2	Protected Side	18.5	2.53	13351	1070	0	582,005	244	309	95	33377				
G	1	N/A	14	5.87	31003	1097	0	1,385,604	170	250	178	77508	435160	5.87		
	2	N/A	16	5.87	31003	125	0	157,886	170	250	178	77508		5.87		
H	1	N/A	16	3.19	16857	1296	0	890,050	170	250	97	42143	215395	3.19		
G Road	1	N/A	7.5	1.45	7656	380	0	118,526	78	158	28	19140			4167	
	2	N/A	7.5	1.45	7656	326	0	101,683	78	158	28	19140			4167	
								8,812,677			1,606	721,796	650,555	15	8,334	

*Surface Area for offset levees = footprint toe to toe + 15 ft veg. freezone one side +25 construction easement +25 on the existing levee side.
*Surface Area for new levees = footprint toe to toe + 15 ft veg. freezone each side +25 construction easement each side.
** Levee Deficiency to bring levee back to EL. 7.0 between Stn.xx to xx
*** Added 10% to quantity.
****Existing Levee Reaches A thru F to built on.

Table 3: Levee Fill Quantities

f. Proposed Disposal Site Determinations

(1) Mixing Zone Determination.

For the fill material that is being used there was no contamination to be found. Because there are no known contamination issues in the vicinity of proposed borrow areas for mitigation project, there does not appear to be a reason to believe that material placement activities will exceed water quality criteria outside of the proposed mixing zone.

(2) Determination of Compliance with Applicable Water Quality Standards.

There does not appear to be a reason to believe that material placement activities will exceed water quality criteria outside of the proposed mixing zone; therefore, based on best available information, direct impacts from construction of the proposed project are expected to be in compliance with applicable water quality standards

(3) Potential Effects on Human Use Characteristics.

(a) Municipal and private water supply.

There is no significant effect to municipal and private water supply to be found.

h. Appropriate and Practicable Steps Taken to Minimize Potential Adverse Impacts of the Discharge on the Aquatic Ecosystem. The formulation of project plans and designs, evaluation of alternative plans, and development of operational scenarios for the tentatively selected plan, have all been conducted with the objective of minimizing potential negative impacts to the aquatic ecosystem. Placement of material excavated for construction of project features was designed in the context best management practices to reduce impacts also mitigation for any loss of functions and values of wetlands are part of the plans.

IV. Evaluation Responsibility

a. Water Quality Input Prepared by: Ventress Bolden

b. Project Description and Biological Input Prepared by:

Review Responsibility

a. Water Quality Input reviewed by: Whitney Hickerson

b. Project Description and Biological Input reviewed by:

_____ _____

Date

Joan M. Exnicios
Chief, Environmental Planning
Branch

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