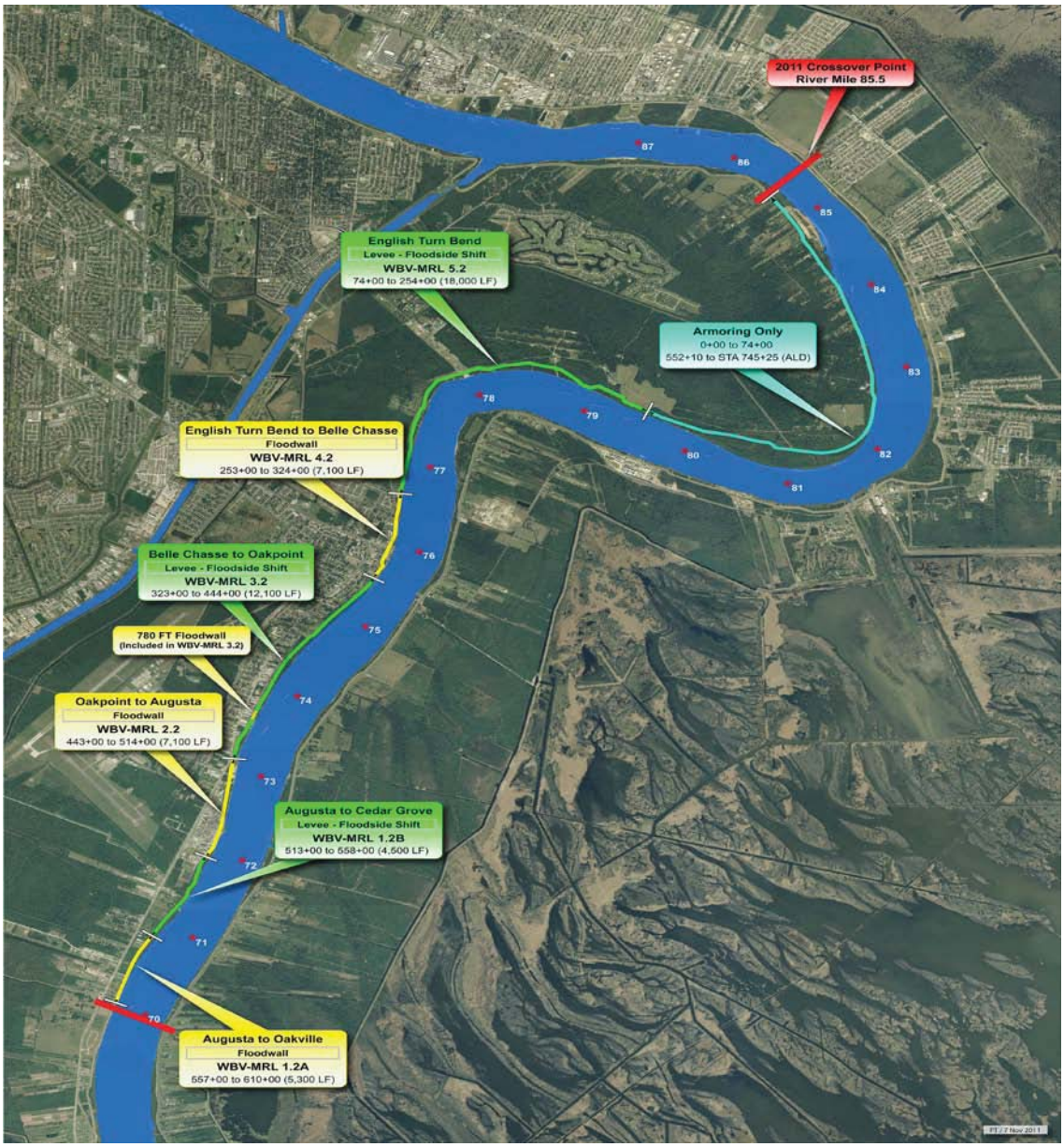
DRAFT INDIVIDUAL ENVIRONMENTAL REPORT SUPPLEMENT

WEST BANK AND VICINITY AND MISSISSIPPI RIVER LEVEE CO-LOCATED LEVEES

PLAQUEMINES PARISH AND ORLEANS PARISH, LOUISIANA
IERS # 33.a



NOVEMBER 2011

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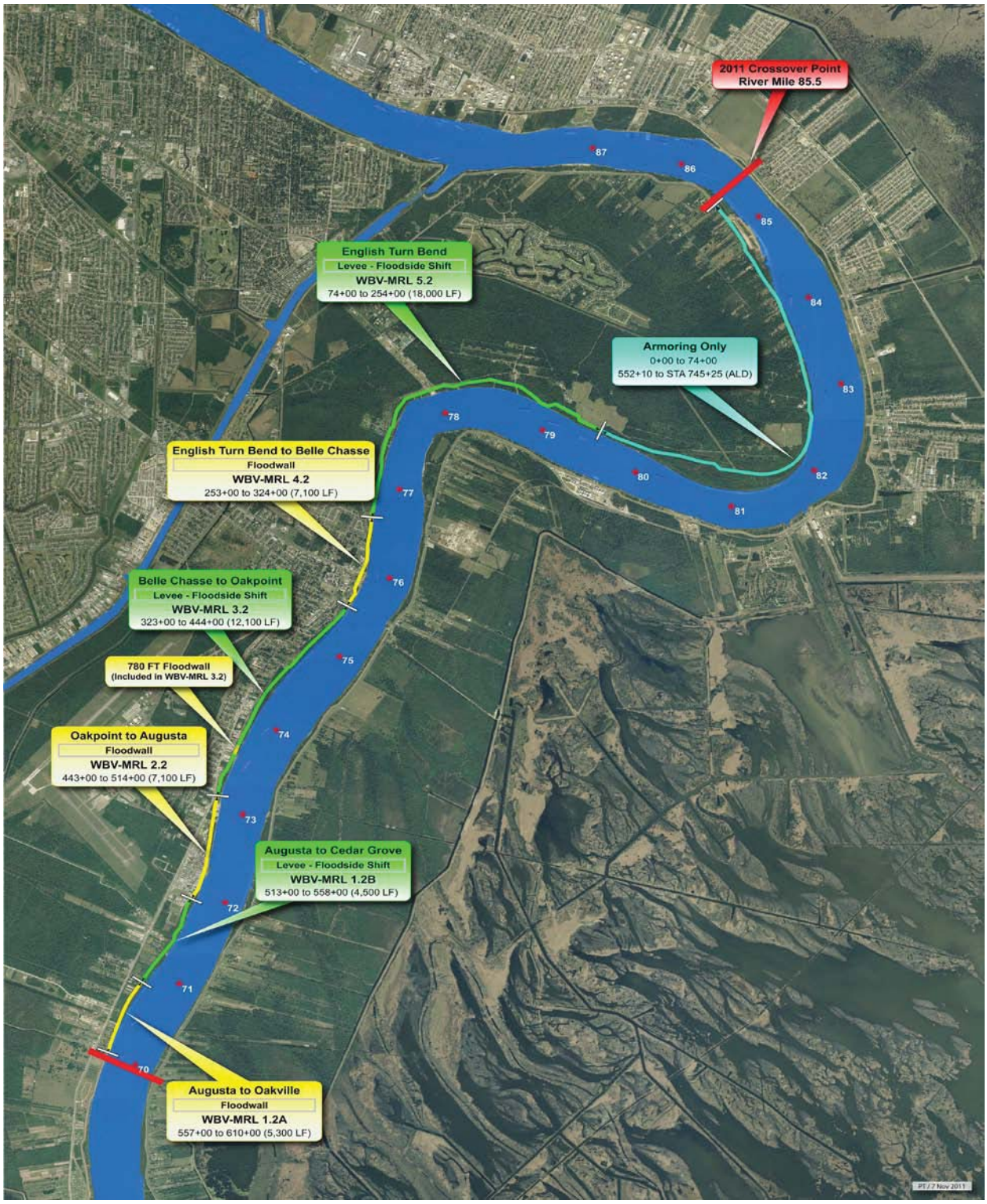
1. INTRODUCTION

The U.S. Army Corps of Engineers (USACE), Mississippi Valley Division, New Orleans District (CEMVN), has prepared this Individual Environmental Report Supplemental # 33.a (IERS # 33.a) to evaluate the potential impacts associated with the proposed construction and maintenance of Resilient Features in order to improve the resiliency and longevity of previously implemented Engineered Alternative Measures (EAM), previously addressed under IER #33, along the West Bank and Vicinity – Mississippi River Levee (WBV-MRL) Co-Located Project. The MRL on the west bank of the Mississippi River, from the Eastern Tie-in of the West Bank and Vicinity (WBV) project with the MRL at Oakville in Plaquemines Parish to a point approximately 9.5 miles upriver southeast of the Plaquemines Parish and Orleans Parish line, currently provides 1-percent hurricane and storm damage risk reduction. However, construction of Resilient Features is required to improve the resiliency and longevity of previously implemented Engineered Alternative Measures previously addressed under IER # 33. The terms "100-year level of risk reduction" and "1-percent level of risk reduction" as they are used throughout this document, refer to a level of risk reduction that reduces the risk of hurricane surge and wave-driven flooding that the New Orleans metropolitan area experiences to a 1 percent chance each year. The WBV-MRL Co-Located Project is designed to reduce risk to residents along the west bank of the MRL from hurricane-driven storm surges traveling either up or across the Mississippi River.

The proposed action is located in Plaquemines and Orleans Parishes on the west bank of the Mississippi River and is part of the WBV Belle Chasse Polder, New Orleans, Louisiana. The levee construction project area extends from river mile 79.5 to 70 Above Head of Passes (AHP). The northern end (river mile 79.5) is situated near the U.S. Coast Guard Station and Tulane University Research Laboratories and the southern end (river mile 70) is approximately 525 feet south of the intersection of East St. Peter Street and the Mississippi River Levee at Oakville. The WBV-MRL levee alignment has been divided into six contract reaches (1.2a, 1.2b, 2.2, 3.2, 4.2 and 5.2) of varying lengths; figure 1 illustrates the locations of the six contract reaches and table 1 identifies their respective lengths. Additional armoring work, described later in this IER Supplement, will be required for the entire Co-Located levee project area from river mile 85.5 to 70, and will be the only construction activity located within Orleans Parish.

IERS # 33.a 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. The execution of an IER, in lieu of a traditional Environmental Assessment (EA) or Environmental Impact Statement (EIS), is provided for in ER 200-2-2, Environmental Quality (33 CFR §230) Procedures for Implementing the NEPA and pursuant to the Council on Environmental Quality (CEQ) NEPA Implementation Regulations (40 CFR §1506.11). The Alternative Arrangements can be found at www.nolaenvironmental.gov, and are herein incorporated by reference. On December 31, 2010, the District Commander signed the Decision Record for IER # 33. IER #33 is hereby incorporated by reference into this supplemental document. Copies of the original IER and other supporting documentation are available upon request or at nolaenvironmental.gov.

Figure 1.
IERS # 33.a WBV-MRL Co-Located Project Area



The CEMVN implemented Alternative Arrangements on March 13, 2007 under the provisions of the CEQ Regulations for Implementing the NEPA (40 CFR §1506.11). This process was implemented in order to expeditiously complete environmental analysis for any changes to the authorized system and the 100-year level of the Hurricane and Storm Damage Risk Reduction System (HSDRRS), formerly known as the Hurricane Protection System (HPS) authorized and funded by Congress and the Administration. The proposed actions are located in southeastern Louisiana and are part of the Federal effort to rebuild and complete construction of the WBV HSDRRS in the New Orleans Metropolitan area.

Table 1
Contract Reaches in the WBV-MRL Co-Located Project

Contract Reaches	Length (linear feet)
WBV-MRL 1.2a	5,000
WBV-MRL 1.2b	5,000
WBV-MRL 2.2	6,700
WBV-MRL 3.2	13,000
WBV-MRL 4.2	5,400
WBV-MRL 5.2	18,500

Work to raise portions of the MRL, above the Mississippi River and Tributaries (MR&T) authorized design elevations, to the 1 percent HSDRRS elevations was anticipated to be accomplished in two phases, Engineered Alternative Measures and Resilient Features. The initial phase of the project consisted of constructing Engineered Alternative Measures (EAMs), which included an all-earthen clay cap in the original northern two contract reaches (6.1 and 7.1) and a stabilized soil clay cap in the southern three reaches (1.1, 3.1 and 4.1), both of which fit within the existing levee footprint, thereby reducing potential environmental and cultural resources impacts and minimizing the requirement to obtain additional rights-of-way. In order to remain within the existing levee footprint, steeper side slopes, 1 vertical on 2 horizontal, within contract reaches 1.1, 3.1, 4.1 and 5.1 were required to be constructed. Note that the EAM project originally was divided into seven reaches, but reaches 2.1 and 5.1 were combined into reaches 1.1 and 4.1, respectively. The EAMs were constructed to provide 1-percent level of risk reduction for the entire Co-Located Project.

In October 2010, a 700-foot long demonstration section of stabilized soil cap was constructed on top of the existing MRL near Belle Chasse, Louisiana (USACE, 2010a). Approximately 350 feet of the MRL was raised with soil stabilized by the addition of about 8 percent lime, and about 350 feet of the levee was raised with soil stabilized by the addition of about 15 percent mixture of 50 percent fly-ash and 50 percent bed-ash. Transition sections of stabilized soil extend approximately 40 feet long on each end of the stabilized sections of levee and tie into the existing levee slope and elevation. This demonstration project allowed field-testing and evaluation of an engineering technique using stabilizing agents mixed with local soils and also provided the local sponsor and the MVN the opportunity to evaluate maintenance issues and options. One of the major criteria evaluated was the degree of ductility, which is the ability of the stabilized material to flex over time without forming substantial cracks. The demonstration project, along with laboratory testing was used to assess this factor. Other major considerations included the difficulty of mixing material into soil, its shelf life after mixing but before

placement on the levee, and the toxicity of the mixed material and runoff. Literature and initial testing indicated minimal leaching of contaminants (removal of contaminants, mainly by water) from stabilized soil.

In March 2011, concerns arose with respect to the non-Federal sponsor's ability to maintain a stabilized soil levee, aesthetics, public perception, and safety, which resulted in a revised plan to eliminate the use of stabilized soil for the southern three EAM contract reaches and proceed with the use of an all clay alternative. As a result, all five EAM contract reaches (1.1, 3.1, 4.1, 6.1 and 7.1) were constructed to the required 1-percent level of risk reduction using an all-earthen clay cap. It was determined that the potential impacts as a result of shifting from stabilized soil to all-clay levee material would remain essentially unchanged or, more likely, be reduced in every resource category previously evaluated in IER # 33.

During the course of construction of the EAMs, twelve separate areas, located outside of the government furnished rights-of-way, were impacted by construction contractors. Use of these twelve separate areas by the contractors were the result of the contractor's use of additional staging, stockpile and degraded levee material (e.g., grass/clay) disposal areas. Preliminary environmental investigations were conducted within each area as they were identified in order to determine if there were any significant impacts to the natural and cultural resources categories previously evaluated under IER # 33. The investigations concluded that potential cultural resource sites located within two of the twelve areas may have been impacted, the extent of which is currently being investigated and will be completed prior to construction of Resilient Features. Upon completion of the EAM construction, it was determined that after the fact NEPA clearance would be accomplished for all twelve areas in this IER Supplement. Table 2 lists the twelve areas impacted as well as any remedial actions required to date.

Table 2
EAM Deviations from Government Furnished Right-of-Way

Contract Reach	Date Identified	Description of Action	Property Type Impacted	Potential Resource Impacted	Remedial Action Required
WBV-MRL 1.1	Apr-2011	Cleared grassy/shrub area on private property for use as staging area	Residential		None
WBV-MRL 3.1	Apr-2011	Fill material (gravel/dirt) placed on private property for use as temporary access road	Residential		None
WBV-MRL 4.1	Jul-2011	Utility relocation (power pole) in designated no work area	Residential	Cultural	Follow-up Cultural Investigations
WBV-MRL 4.1/6.1	Apr-2011	Fill material (gravel/dirt) placed on private property for use as temporary borrow stockpile area	Residential		None
WBV-MRL 4.1/6.1	Apr-2011	Fill material (gravel/dirt) placed on private property for use as work trailer site	Residential		None

WBV-MRL 4.1/6.1	Apr-2011	Fill material (gravel/dirt) placed on private property for use as staging and ingress/egress to levee area	Residential		None
WBV-MRL 6.1	Apr-2011	Disposal of degraded levee material (grass/clay) on US Coast Guard property	Federal Government		None
WBV-MRL 6.1	Jun-2011	Disposal of degraded levee material (grass/clay) on Tulane property in designated no work area	Private Facility	Cultural	Follow-up Cultural Investigations
WBV-MRL 6.1	Jun-2011	Disposal of degraded levee material (grass/clay) on Plaquemines Parish property	Parish Government		None
WBV-MRL 7.1	Apr-2011	Fill material (gravel/dirt) placed on private property for use as work trailer site	Residential		None
WBV-MRL 7.1	Apr-2011	Disposal of degraded levee material (grass/clay) on private property	Residential		None
WBV-MRL 7.1	Apr-2011	Borrow material (clay) stockpiled on private property	Residential		None

The EAMs were completed within current authorizations and requested reprogramming actions for the WBV project established through the authority of the 4th Supplemental Appropriation (see Section 1.2 for more information), as well as through project funds from the MR&T program. The MR&T program provided the funds that were necessary to raise the levees from existing grade to the MR&T authorized grade. As part of the MR&T program's cost share agreement, construction and design for the MR&T work was 100 percent Federally funded, with the non-Federal sponsors required to provide all land, easements, relocations, rights-of-way, and disposal areas (LERRDs). The WBV project provided funding for the incremental raise from the MR&T grade to the required HSDRRS grade. The WBV portion of the work was subject to the current WBV Project Partnership Agreement and cost share of 35 percent by non-Federal sponsors.

The second phase of the WBV-MRL Co-Located project will consist of construction of the Resilient Features, which is the subject of this IER Supplement. While the EAMs currently provide adequate risk reduction, several EAM contract reaches (1.1, 3.1, 4.1 and a portion of 6.1) were constructed with steep side slopes, 1 vertical on 2 horizontal, in order to remain within the existing levee footprint. These steeper side slopes presented a long term performance and operation and maintenance concern for both the non-Federal sponsor and MVN. Therefore, construction of Resilient Features is required to improve the resiliency and longevity of the EAM features implemented. Construction of Resilient Features will include earthen levees with a mix of floodside and protected side shifts and levee straddles that return to the standard levee design side slopes of 1 vertical on 3 to 5 horizontal, as well as floodwalls (T-walls) that would follow the existing MRL alignment.

For the Resilient Features, the earthen levee alignment alternative for each contract reach or sub-reach is based on the availability of right-of-way and the geotechnical stability of each possible

alignment. In locations where geotechnical stability is determined to not be sufficient for a shift in the levee centerline, a setback or floodwall (T-wall) was evaluated as an additional alternative.

Over time, the HSDRRS design grade requirements for 1-percent level of risk reduction would need to be higher in elevation due to the effects of land subsidence and sea level rise. In order to ensure that the levees are up to a sufficient grade to provide the 1-percent level of risk reduction in the future, additional levee improvements are expected to be required upriver from the proposed Resilient Features.

NEPA compliance for the Resilient Features will be achieved through the signing of a Decision Record for this IER Supplement by the New Orleans District Commander. This draft IER Supplement will be distributed for a 30-day public review and comment period. A public meeting specific to the proposed action will be held on Monday, December 12, 2011 at the Belle Chasse Auditorium, 8398 Highway 23, Belle Chasse, Louisiana. An open house to view project details will begin at 6:00pm, and the meeting will begin at 6:30pm. Any comments received during this public meeting will be considered part of the official record. After the 30-day comment period, the CEMVN District Commander will review all comments received during the review period and make a determination if they rise to the level of being substantive in nature. If comments are not considered to be substantive, the District Commander will make a decision on the proposed action. This decision will be documented in an IER Supplement Decision Record. If a comment(s) is determined to be substantive in nature and require substantial changes to the IER Supplement, an addendum to the IER Supplement would be prepared and published for an additional 30-day public review and comment period. After the expiration of the public comment period on the addendum, the District Commander would make a decision on the proposed action, documented in an IER Supplement Decision Record.

1.1. Purpose and Need for the Proposed Action

On August 29, 2005, Hurricane Katrina caused major damage to the Federal and non-Federal flood control projects in southeast Louisiana. Hurricane Rita followed this storm on September 24, 2005, and made landfall on the Louisiana-Texas state border, causing additional damage to the flood control projects in southern Louisiana. Since the storms, the USACE has been working with state and local officials to restore and improve the Federal and non-Federal flood control and HSDRRS projects and related works in the affected area.

The HSDRRS was funded in a series of appropriations by Congress after Hurricanes Katrina and Rita and consists of levees and floodwalls and related features that provide risk reduction from a hurricane event that has a 1-percent chance of being exceeded in any given year. On the West Bank of the Mississippi River, the WBV project consists of perimeter levees and floodwalls that are currently being designed and/or constructed to the required 1-percent level of risk reduction. In order to make a complete and closed system, the WBV Project ties into the west bank Mississippi River Levee at river miles 70. Therefore, the MRL serves as an integral part of the HSDRRS, reducing the risk to communities from a storm surge propagating upstream from the mouth of the Mississippi River or from unprotected reaches along the east bank of the river.

Recent hydraulic analysis indicated that the levees along the west bank of the Mississippi River needed to be raised to meet the 1-percent HSDRRS requirements (USACE, 2010f). In 2011, this was accomplished through construction of the previously described Engineered Alternative Measures between river miles 70 and 85.5. Previously, river mile 85.5 had been identified as the design grade crossover point. This is the point where the Mississippi River and Tributaries (MR&T) authorized design grade equals the 1-percent HSDRRS level of risk reduction for the year 2011. Analyses indicate that upstream of river mile 85.5, the MRL authorized design grade is greater than that needed for the 1-percent HSDRRS. Under the Resilient Features, those EAM contract reaches (1.1, 3.1, 4.1 and a portion of 6.1) that were constructed with steep side slopes, 1 vertical on 2 horizontal, would be upgraded to the standard levee side slopes of 1 vertical on 3 to 4 horizontal. The upstream terminus for the Resilient Features work is located at river mile 79.5.

The purpose and need of the proposed action is to improve the resiliency and longevity of previously implemented Engineered Alternative Measures previously addressed under IER #33.

1.2. Authority for the Proposed Action

The West Bank and Vicinity, Westwego to Harvey Canal Hurricane Protection Project was authorized by the Water Resources Development Act (WRDA) of 1986 (P.L. [Public Law] 99-662, Section 401(b)). The WRDA of 1996 modified the project and added the Lake Cataouatche Project and the East of Harvey Canal Project (P.L. 104-303, Section 101(a)(17) & P.L. 104-303, 101(b)(11)). The WRDA 1999 (P.L. 106-53, Section 328) combined the three projects into one project as the West Bank and Vicinity Hurricane Protection Project.

Department of Defense, Emergency Supplemental Appropriations to Address Hurricanes in the Gulf of Mexico, and Pandemic Influenza Act of 2006 (3rd Supplemental - P.L. 109-148, Chapter 3, Construction, and Flood Control and Coastal Emergencies) appropriated funds to accelerate the completion of the previously authorized project and to restore and repair the project at full Federal expense. The Emergency Supplemental Appropriations Act for Defense, the Global War on Terror, and Hurricane Recovery of 2006 (4th Supplemental - P.L. 109-234, Title II, Chapter 3, Construction, and Flood Control and Coastal Emergencies) appropriated funds and added authority to raise levee heights where necessary, reinforce and replace floodwalls, and otherwise enhance the project to provide the levels of protection necessary to achieve the certification required for participation in the National Flood Insurance Program. Additional Supplemental Appropriations include the U.S. Troop Readiness, Veterans' Care, Katrina Recovery, and Iraq Accountability Appropriations Act, 2007 (P.L. 110-28) Title IV, Chapter 3, Flood Control and Coastal Emergencies, Section 4302 (5th Supplemental), and the 6th Supplemental (P.L. 110-252), Title III, Chapter 3, Construction.

The Congressional authority for the construction of the Flood Control, Mississippi River and Tributaries (MR&T) project is contained in the Flood Control Acts of 1928, as amended, 1936, 1938, 1941, 1946, 1950, 1954, 1962, 1965 and 1968 and the Water Resources Development Act (WRDA) of 1986. The Flood Control Act of 1928 committed the Federal government to a definite program of flood control and authorized general and progressive channel stabilization and river regulation from Cairo, Illinois to Head of Passes, Louisiana.

1.3. Prior Reports

A number of studies and reports on water resources development in the proposed project area have been prepared by the USACE, other Federal, state, and local agencies, research institutes, and individuals. Pertinent studies, reports and projects are discussed below:

West Bank and Vicinity Relevant Reports:

- On September 7, 2011, the CEMVN Commander signed a decision record on IERS #15.a entitled, "Lake Cataouatche Levee, Jefferson Parish, Louisiana." IERS #15.a addressed the relocation of an existing 24-inch natural gas pipeline that crossed a portion of the Lake Cataouatche Levee, as well as construction of a new access road and bridge within the Lake Cataouatche project area.
- On April 21, 2011, the CEMVN Commander signed a decision record on IERS #13.a entitled, "Temporary Closure of Hero Canal, West Bank and Vicinity and Gulf Intracoastal Waterway, Harvey and Algiers Levees and Floodwalls and Hero Canal Levee and Eastern Tie-In, Plaquemines Parish, Louisiana." IERS #13.a addressed the closing of the Hero Canal to vessel traffic for an estimated maximum of 60 days and a minimum of 30 days in order to accommodate compaction of the construction schedule and simultaneous fitting of the stoplogs within the stoplog structure and construction of the adjacent floodwall across Hero Canal.
- On March 22, 2011, The CEMVN Commander signed a decision record on IERS #11.c entitled, "Improved Protection on the Inner Harbor Navigation Canal, Orleans and St. Bernard Parishes, Louisiana." IERS #11.c addressed the construction of approximately 13,000 feet (2.5 miles) of shoreline protection along the flood and protected side of an expanded construction access channel with a Toe Elevation at -5.0 feet NAVD 88. The expanded footprint included approximately 75 feet of additional right-of-way on the protected side and 150 feet of additional right-of-way on the flood side.
- On December 31, 2010, the CEMVN Commander signed a decision record on IER #33 entitled, "West Bank and Vicinity and Mississippi River Co-Located Levees, Plaquemines Parish and Orleans Parish, Louisiana." IER #33 addressed the proposed construction and maintenance of the 100-year level of hurricane damage risk reduction along the Mississippi River Levee on the west bank of the Mississippi River, from the Eastern Tie-in of the West Bank and Vicinity project with the MRL at Oakville in Plaquemines Parish to a point approximately 15.5 miles upriver southeast of the Algiers Lock in Orleans Parish.
- On November 20, 2010, the CEMVN Commander signed a decision record on IER Supplemental #12 entitled, "GIWW, Harvey, and Algiers Levees and Floodwalls, Jefferson, Orleans, and Plaquemines Parishes Louisiana." IERS #12 addressed a proposal to utilize the West Bank Site N borrow area as an alternative disposal site for levee material removed during the construction of the West Closure Complex eastern floodwall and road realignment, as well as the Hero Canal Levee. IERS #12 also addressed anticipated impacts associated with the construction of floodwalls, in addition to the relocation of the Barriere Golf Course access road in the vicinity of the Belle Chasse Tunnel, and included temporary closures of the tunnel.
- On October 29, 2010, the CEMVN Commander signed a Decision Record on IER #31 entitled, "Contractor-Furnished Borrow Material #7, East Baton Rouge, Jefferson,

Lafourche, Plaquemines, St. Bernard, and St. Tammany Parishes, Louisiana, and Hancock County, Mississippi." The document was prepared to evaluate the potential impacts associated with the actions taken by commercial contractors as a result of excavating borrow areas for use in construction of the HSDRRS.

- On 24 August 2010, the CEMVN Commander signed a Decision Record on IER Supplemental #16.a entitled "Western Tie-In, Jefferson and St. Charles Parishes, Louisiana." The document evaluates the potential impacts associated with utility relocations, replacing the Highway 90 pump station, adding bank stabilization to some areas, retaining the detour roads as permanent access for Highway 90 and the construction of a ramp at Highway 18 instead of a floodgate.
- On February 9, 2010, the CEMVN District Commander signed a Decision Record on IER Supplemental #14.a entitled "Westwego to Harvey Levee, Jefferson Parish, Louisiana." The document evaluates the potential impacts associated with constructing a larger levee footprint for the WBV-14.c.2 reach and revisions to fronting protection and floodwall construction at the Ames and Mt. Kennedy Pump Stations.
- On January 22, 2010, the CEMVN District Commander signed a Decision Record on IER #32 entitled "Contractor-Furnished Borrow Material #6, Ascension, Plaquemines, and St. Charles Parishes, Louisiana." The document evaluates the potential impacts associated with the actions taken by commercial contractors as a result of excavating contractor-furnished borrow areas for use in construction of the HSDRRS.
- On December 4, 2009, the CEMVN District Commander signed a Decision Record on IER #13 entitled "Hero Canal Levee and Eastern Tie-In, Plaquemines Parish, Louisiana." IER #13 evaluates the potential impacts associated with raising and/or constructing levees, and other structures to meet the 100-year level of risk reduction for Belle Chasse, Oakville and other unincorporated areas of Plaquemines Parish.
- On September 28, 2009, the CEMVN District Commander signed a Decision Record on IER #30 entitled, "Contractor-Furnished Borrow Material #5, St. Bernard and St. James Parishes, Louisiana and Hancock County, Mississippi." The document evaluates the potential impacts associated with the action taken by commercial contractors as a result of excavating contractor furnished borrow areas for use in construction for HSDRRS.
- On September 20, 2009, the CEMVN Commander signed a Decision Record on IER #29 entitled "Pre-Approved Contractor-Furnished Borrow Material #4, Orleans, St. John the Baptist, and St. Tammany Parishes, Louisiana." The document evaluates the potential impacts associated with the actions taken by commercial contractors as a result of excavating contractor-furnished borrow areas for use in construction of the HSDRRS.
- On July 31, 2009 the CEMVN District Commander signed a Decision Record on IER #28 entitled "Government-Furnished Borrow Material #4, Plaquemine, St. Bernard and Jefferson Parishes, Louisiana." The document evaluates the potential impacts associated with approving government-furnished borrow areas and an access route for use in construction of the HSDRRS.
- On June 12, 2009, the CEMVN Commander signed a Decision Record on IER #16, entitled "Western Tie-In, Jefferson and St. Charles Parishes, Louisiana." The document describes the potential impacts associated with constructing a new levee to provide 100-year level of risk reduction for the project vicinity.
- On February 18, 2009, the CEMVN Commander signed a Decision Record on IER #12, entitled "Gulf Intracoastal Waterway (GIWW), Harvey, and Algiers Levees and

Floodwalls, Jefferson, Orleans, and Plaquemines Parishes, Louisiana." The document describes the potential impacts associated with enlarging levees and floodwalls along the GIWW(Algiers and Harvey Canals) and construction of the Gulf Intracoastal Waterway West Closure Complex (WCC). Construction of these features would alter the original system alignment and construct a streamlined surge barrier, floodwall, and levee alignment.

- On February 3, 2009, the CEMVN District Commander signed a Decision Record on IER # 25 entitled "Government Furnished Borrow Material, Orleans, Plaquemines and Jefferson Parishes, Louisiana." The document was prepared to evaluate the potential impacts associated with the actions taken by the USACE as a result of excavating borrow areas for use in construction of the HSDRRS.
- On January 21, 2009, the CEMVN District Commander signed a Decision Record on IER # 17 entitled "Company Canal Floodwall, Jefferson Parish, Louisiana." The document was prepared to evaluate the proposed construction and maintenance of the 100-year level of hurricane and storm damage risk reduction along the Company Canal from the Bayou Segnette State Park to the New Westwego Pumping Station.
- On October 20, 2008, the CEMVN District Commander signed a Decision Record on IER # 26 entitled "Pre-Approved Contractor Furnished Borrow Material # 3, Jefferson, Plaquemines, and St. John the Baptist Parishes, Louisiana, and Hancock County, Mississippi." The document was prepared to evaluate the potential impacts associated with the actions taken by commercial contractors as a result of excavating borrow areas for use in construction of the HSDRRS.
- On August 26, 2008, the CEMVN District Commander signed a Decision Record on IER # 14, entitled "Westwego to Harvey, Levee Jefferson Parish, Louisiana." The document was prepared to examine the potential environmental impacts associated with the proposed construction and maintenance of 100-year level of hurricane and storm damage risk reduction along the WBV, Westwego to Harvey Levee project area.
- On June 12, 2008, the CEMVN District Commander signed a Decision Record on IER # 15, entitled "Lake Cataouatche Levee, Jefferson Parish, Louisiana." The proposed action includes constructing a 100-year level of risk reduction in the project area.
- On May 30, 2008, the CEMVN District Commander signed a Decision Record on IER # 22 entitled "Government Furnished Borrow Material, Plaquemines and Jefferson Parishes, Louisiana." The document was prepared to evaluate the potential impacts associated with the actions taken by the USACE as a result of excavating borrow areas for use in construction of the HSDRRS.
- On May 6, 2008, the CEMVN District Commander signed a Decision Record on IER # 23 entitled "Pre-Approved Contractor Furnished Borrow Material # 2, St. Bernard, St. Charles, Plaquemines Parishes, Louisiana, and Hancock County, Mississippi." The document was prepared to evaluate the potential impacts associated with the actions taken by commercial contractors as a result of excavating borrow areas for use in construction of the HSDRRS.
- On February 21, 2008, the CEMVN District Commander signed a Decision Record on IER # 18 entitled "Government Furnished Borrow Material, Jefferson, Orleans, Plaquemines, St. Charles, and St. Bernard Parishes, Louisiana." The document was prepared to evaluate the potential impacts associated with the actions taken by the USACE as a result of excavating borrow areas for use in construction of the HSDRRS.

- On February 14, 2008, the CEMVN District Commander signed a Decision Record on IER # 19 titled "Pre-Approved Contractor Furnished Borrow Material, Jefferson, Orleans, St. Bernard, Iberville, and Plaquemines Parishes, Louisiana, and Hancock County, Mississippi." The document was prepared to evaluate the potential impacts associated with the actions taken by commercial contractors as a result of excavating borrow areas for use in construction of the HSDRRS.
- In July 2006, the CEMVN District Commander signed a FONSI on an EA # 433 entitled, "USACE Response to Hurricanes Katrina & Rita in Louisiana." The document was prepared to evaluate the potential impacts associated with the actions taken by the USACE as a result of Hurricanes Katrina and Rita.
- On August 23, 2005, the CEMVN District Commander signed a FONSI on EA # 422 entitled "Mississippi River Levees – West Bank Gaps, Concrete Slope Pavement Borrow Area Designation, St. Charles and Jefferson Parishes, Louisiana." The report investigates the impacts of obtaining borrow material from various areas in Louisiana.
- On February 22, 2005, the CEMVN District Commander signed a FONSI on EA # 306A entitled "West Bank Hurricane Protection Project – East of the Harvey Canal, Floodwall Realignment and Change in Method of Sector Gate." The report discussed the impacts related to the relocation of a proposed floodwall moved because of the aforementioned sector gate, as authorized by the LPV Project.
- On May 5, 2003, the CEMVN District Commander signed a FONSI on EA # 337 entitled "Algiers Canal Alternative Borrow Site."
- On June 19, 2003, the CEMVN District Commander signed a FONSI on EA # 373 entitled "Lake Cataouatche Levee Enlargement." The report discusses the impacts related to improvements to a levee from Bayou Segnette State Park to Lake Cataouatche.
- On May 16, 2002, the CEMVN District Commander signed a FONSI on EA # 306 entitled "West Bank Hurricane Protection Project - Harvey Canal Sector Gate Site Relocation and Construction Method Change." The report discusses the impacts related to the relocation of a proposed sector gate within the Harvey Canal, as authorized by the LPV Project.
- On August 30, 2000, the CEMVN District Commander signed a FONSI on EA # 320 entitled "West Bank Hurricane Protection Features." The report evaluates the impacts associated with borrow sources and construction options to complete the Westwego to Harvey Canal Hurricane Protection Project.
- On August 18, 1998, the CEMVN District Commander signed a FONSI on EA # 258 entitled "Mississippi River Levee Maintenance - Plaquemines West Bank Second Lift, Fort Jackson Borrow Site."
- In July 1998, the USACE completed a Final EIS entitled, "Supplement No: 1 to the Final Environmental Impact Statement, Mississippi River and Tributaries Project, Mississippi River Levees and Channel Improvement." The record of decision was signed by the President of the Mississippi River Commission on October 5, 1998. Based on additional environmental laws and regulations enacted after 1976, information from other Federal agencies, and litigation by environmental groups, this EIS supplemented the 1976 Final EIS and addressed remaining construction of the mainline Mississippi River levees, including and seepage control features.
- In December 1996, the USACE completed a post-authorization change study entitled, "Westwego to Harvey Canal, Louisiana Hurricane Protection Project Lake Cataouatche

Area." The study investigated the feasibility of providing hurricane and storm damage risk reduction to that portion of the west bank of the Mississippi River in Jefferson Parish between Bayou Segnette and the St. Charles Parish line and included an EIS. A Standard Project Hurricane (SPH) level of risk reduction was recommended along the alignment followed by the existing non-Federal levee. The project was authorized by Section 101 (b) of the WRDA of 1996, (P. L. 104-303) subject to the completion of a final report of the Chief of Engineers, which was signed on December 23, 1996. A record of decision for the EIS was signed by the Director of Civil Works on September 28, 1998.

- On January 12, 1994, the CEMVN District Commander signed a FONSI on an EA # 198 entitled, "West Bank of the Mississippi River in the Vicinity of New Orleans, LA, Hurricane Protection Project, Westwego to Harvey Canal, Jefferson Parish, Louisiana, Proposed Alternate Borrow Sources and Construction Options." The report evaluates the impacts associated with borrow sources and construction options to complete the Westwego to Harvey Canal Hurricane Protection Levee.
- In August 1994, the CEMVN completed a feasibility report entitled "WBV (East of the Harvey Canal)." The study investigated the feasibility of providing hurricane and storm damage risk reduction to that portion of the west bank of metropolitan New Orleans from the Harvey Canal eastwards to the Mississippi River, and included an EIS. The final report recommends that the existing West Bank Hurricane Project, Jefferson Parish, Louisiana, authorized by the WRDA of 1986 (P.L. 99-662), approved November 17, 1986, be modified to provide additional hurricane and storm damage risk reduction east of the Harvey Canal. The report also recommends that the level of risk reduction for the area east of the Algiers Canal deviate from the National Economic Development Plan's level of risk reduction and provide risk reduction for the SPH. The Division Engineer's Notice was issued on September 1, 1994. The Chief of Engineer's report was issued on May 1, 1995. The WRDA of 1996 authorized the project. The record of decision for the EIS was signed by the Director of Civil Works on September 28, 1998.
- On March 20, 1992, the CEMVN District Commander signed a FONSI on EA # 165 entitled "Westwego to Harvey Canal Disposal Site."
- On June 3, 1991, the CEMVN District Commander signed a FONSI on EA # 136 entitled "West Bank Additional Borrow Site between Hwy 45 and Estelle Pump Station."
- On March 15, 1990, CEMVN District Commander signed a FONSI on EA # 121 entitled "West Bank Westwego to Harvey, Changes to EIS." The report addresses the impacts associated with the addition of the Westwego tie-in, replacing some levees with floodwalls, and expanding the width of some levees.
- In December 1986, the USACE completed a Feasibility Report and EIS entitled, "West Bank of the Mississippi River in the Vicinity of New Orleans, LA." The report investigated the feasibility of providing hurricane and storm damage risk reduction to that portion of the west bank of the Mississippi River in Jefferson Parish between the Harvey Canal and Westwego, and down to the vicinity of Crown Point, Louisiana. The report recommended implementing a plan that would provide standard project hurricane level of risk reduction to an area on the west bank between Westwego and the Harvey Canal north of Crown Point. The project was authorized by the WRDA of 1986 (P.L. 99-662). The record of decision for the EIS was signed by the Assistant Secretary of the Army, Civil Works on March 28, 1989. Construction of the project was initiated in early 1991.

- In February 1976, the USACE completed a Final EIS entitled, "Final Environmental Impact Statement, Mississippi River and Tributaries, Mississippi River Levees and Channel Improvement." The study evaluated alternatives for the Mississippi River and Channel Improvement Project and related projects on more than 900 miles of river between Cairo, Illinois and Venice, Louisiana. The projects were designed to make the Mississippi River more navigable and prevent flooding by utilizing channel training devices such as dikes and revetments, levees, and maintenance and construction dredging to maintain the existing project features and complete those previously authorized. The Statement of Findings for the EIS was signed by the Director of Civil Works on April 4, 1976.

1.4. Integration with other Individual Environmental Reports

In addition to this IER, the CEMVN is preparing a draft Comprehensive Environmental Document (CED) that will describe the work completed and the work remaining to be constructed for the entire HSDRRS. The purpose of the draft CED will be to document the work completed by the CEMVN on a system-wide scale. The draft CED will describe the integration of individual IERs into a systematic planning effort. Overall cumulative impacts and future operations and maintenance requirements will also be included. Additionally, the draft CED will contain updated information for any IER that had incomplete or unavailable data at the time it was released for public review.

The draft CED will be made available for a 60-day public review period. The document will be posted on www.nolaenvironmental.gov, or can be requested by contacting the CEMVN. A notice of availability will be mailed/e-mailed to interested parties advising them of the availability of the draft CED for review. Additionally, a notice of availability will be placed in national and local newspapers. Upon completion of the 60-day review period, all comments will be compiled and appropriately addressed. Upon resolution of any comments received, a final CED will be prepared, a Decision record will be signed by the District Commander, and both will be made available to any stakeholders requesting a copy.

Compensatory mitigation for unavoidable environmental impacts associated with this project and all HSDRRS projects will be documented in forthcoming mitigation IERs. Eighteen IERs and several supplements to the 19 IERs, plus 12 IERs addressing clay material borrow sources, have been prepared to address various features of the HSDRRS. Figure 3 depicts the various reaches and their respective IERs, but does not show borrow sources.

1.5. Public Concerns

The foremost public concern is reducing the risk of hurricane, storm, and flood damage for businesses and residences, and enhancing public safety during major storm events in the Greater New Orleans metropolitan area.

2. ALTERNATIVES

2.1. Alternatives Development and Preliminary Screening Criteria

NEPA requires that in analyzing alternatives to the proposed action, a Federal agency consider an alternative of "No Action." Likewise, Section 73 of the WRDA of 1974 (PL 93-251) requires Federal agencies to give consideration to non-structural measures to reduce or prevent flood damage. The CEMVN Project Delivery Team (PDT) considered a no action alternative and non-structural measures in this IER.

In addition to these mandated alternatives, a range of reasonable alternatives was formulated through input by the CEMVN PDT, Value Engineering Team, and engineering and design consultants for each of the contract reaches described in this IER (USACE, 2010f). As a result, the use of the described Resilient Features has been proposed to continue providing the required 1-percent level of risk reduction within the budgetary requirements (USACE, 2010f).

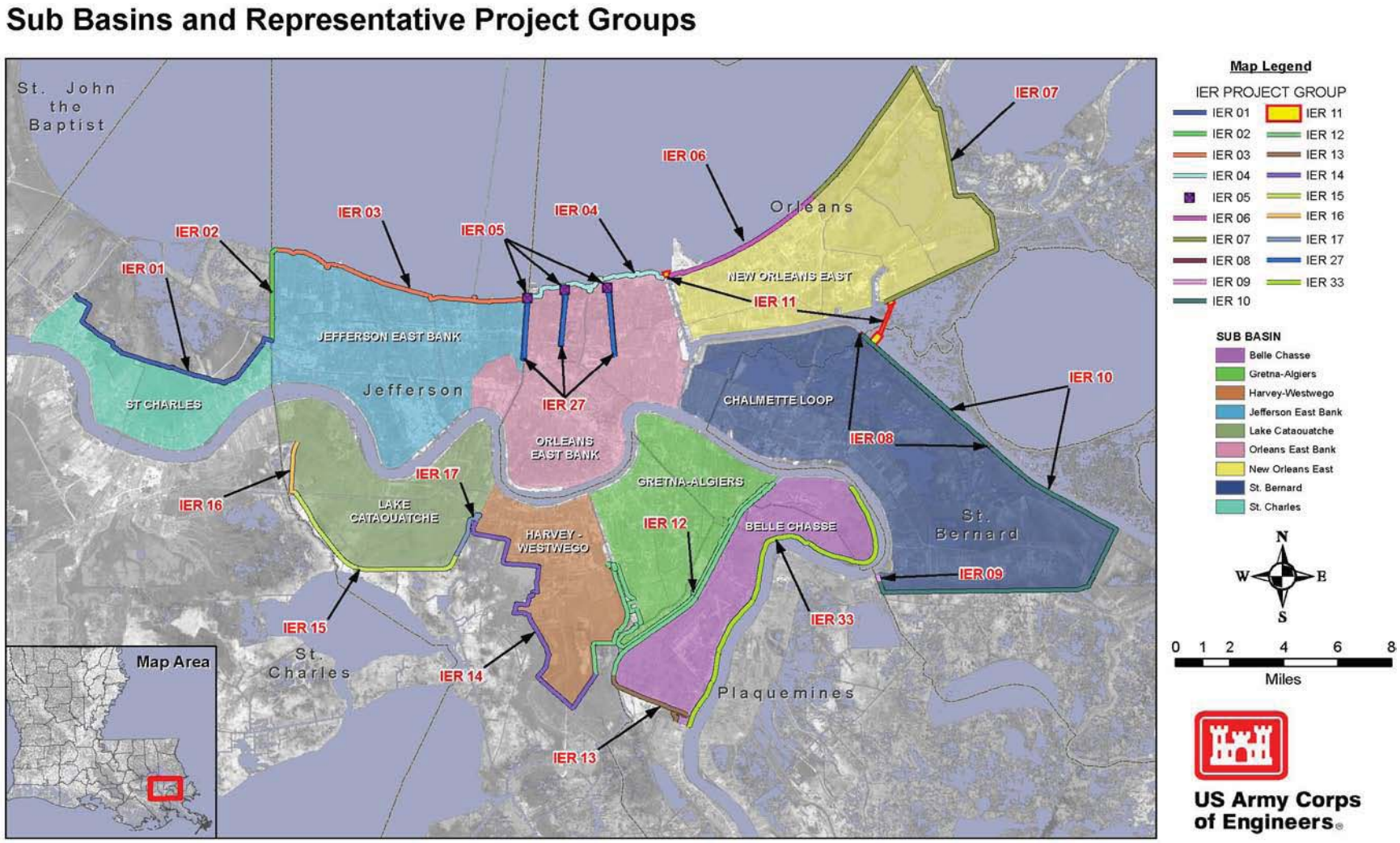
Resilient Features were examined in an Engineering Alternatives Report (USACE, 2010f) to allow the selection of the most effective and efficient method or methods. The Alternative Measures formulated included:

- All Earthen Levee,
    - Flood Side Shift
    - Straddle
    - Protected Side Shift
    - Centerline Setback
- Floodwall (T-wall),
- Geotextile Reinforced Levee,
- Slope Flattening, and
- Slope Roughening.

Upon completion, Resilient Features will provide the 1 percent level of risk reduction based on HSDRRS design elevations. Floodwalls (T-walls) will be built to the 2057 HSDRRS design elevations, while construction of levees will meet the 1-percent level of risk reduction elevation, plus appropriate construction overbuild. Table 3 summarizes the HSDRRS design elevations for the years 2011, 2016, 2021 and 2057 respective to each Resilient Feature contract reach as defined by the 2009 Hydraulic report (USACE, 2009c).

For the EAM contracts WBV-MRL 7.1 and a majority of 6.1, it was determined that construction of the EAMs in these contract reaches had met all HSDRRS criteria and did not require further work under the Resilient Feature contracts. Except for approximately 10,000 linear feet in WBV-MRL 6.1, the EAMs were constructed to 1 vertical on 3 horizontal side slopes. For the approximate 10,000 linear feet in WBV-MRL 6.1, the construction of steeper levee side slopes, 1 vertical on 2 horizontal, during the EAM phase means that additional work under Resilient Features is required for that reach of levee.

Figure 2.
Sub Basins and Representative Project Groups



The approximate 10,000 linear feet (Station 74+00 to 174+00) of what would have been considered WBV-MRL 6.2 under the Resilient Features (originally WBV-MRL 6.1) will be incorporated into the WBV-MRL 5.2 contract reach (USACE, 2011a).

The tentatively selected Resilient Features alternative is comprised of a series of all earthen levee, floodside and protected side shifts and levee straddles, and floodwall (t-wall) alternatives for the six Resilient Feature contract reaches (1.2a, 1.2b, 2.2, 3.2, 4.2 and 5.2). Other alternatives that were evaluated, but eliminated, are described in Section 2.3.

Table 3
WBV-MRL Resilient Feature Contract Reaches and 1-Percent Level of Risk Reduction

Contract Reach	~River Mile(s)	2011 1-Percent Level of Risk Reduction	2016/2021 1-Percent Level of Risk Reduction	2057 1-Percent Level of Risk Reduction
WBV-MRL 1.2a & b[1]	70 - 72	+21 feet	+21.5 feet	+24.5 feet
WBV-MRL 2.2[1]	72 - 73	+21 feet	+21.5 feet	+24.5 feet
WBV-MRL 3.2[2]	73 - 75.75	+20.5 feet	+21.0 feet	+24.5 feet
WBV-MRL 4.2[3]	75.75 - 76.75	+20.5 feet	+21.0 feet	+24.5 feet
WBV-MRL 5.2[4]	76.75 - 79.5	+20.5 feet	+21.0 feet	+24.5 feet

1 - WBV-MRL EAM contract reach 1.1

2 - WBV-MRL EAM contract reach 3.1

3 - WBV-MRL EAM contract reach 4.1

4 - WBV-MRL EAM contract reach 6.1 (portion from station 74+00 to 174+00/10,000 linear feet)

2.2. Description of the Alternatives

Although it is the CEMVN's intent to employ an integrated, comprehensive, and systems-based approach to hurricane and storm damage risk reduction in raising the HSDRRS to the 100-year level of risk reduction, each reach has its own range of alternatives. This approach allows for individual reach alternative decisions to be made in a manner cognizant of unique, site-specific circumstances. At the same time, the alternatives analysis and selection remain integrated and comprehensive, considering reaches in relation to one another and other past, current, and reasonably foreseeable actions by the CEMVN and other entities within the project study area.

As such, the alternative descriptions that follow are organized by contract reach, noting those alternatives that are common among all reaches. The alternative description also states how each alternative relates to the range of alternatives for adjacent reaches, to insure awareness of the HSDRRS as a whole.

2.3. Proposed Action

Under the proposed action, as many as six contracts would be advertised for construction of the Resilient Features. The earthen material for constructing the project will be obtained from either

Government or contractor-furnished borrow areas that have been previously investigated for use in other CEQ-approved NEPA Alternative Arrangement IERs. The contractors would select the borrow sources at their discretion. New borrow sources would be evaluated by the Corps through the CEQ-approved NEPA Alternative Arrangements. All of the material could either be delivered to multiple stockpile sites designated within each respective contract reach, stockpiled at the Walker Road borrow complex (described later in this IER), or brought directly from the borrow site to the construction areas by the individual construction contractors.

Since the proposed six Resilient Feature contract reaches will be comprised of a series of all earthen levee, floodside and protected side shifts and levee straddles, and floodwall (T-wall) alternatives, the proposed action will describe the selected alternatives by contract reach (i.e., all earthen levee shifts and floodwalls) as well as transition zones that will be required to tie each contract reach together. Those construction activities common to all six contract reaches (i.e., construction of an earthen levee, protected side, floodside shift and straddle, and floodwall (T-wall)) will be described in separate sub-sections within this proposed action.

Work for each respective contract reach will be accomplished within the rights-of-way provided by the Corps to the contractor. Additional work areas for the proposed project may require additional environmental/cultural resource evaluations.

2.3.1. WBV-MRL Resilient Features Contract Reaches

WBV-MRL 1.2a – Oak Point to Oakville (a)
Contract reach 1.2a is at the southern end of the WBV-MRL co-located project. It begins just approximately a quarter of a mile downstream of river mile 71 and continues down river to river mile 70 where the WBV Eastern Tie-In project connects to the MRL. The contract reach begins in Plaquemines Parish at levee station 560+00 and extends downriver to station 610+00, consisting of 5,000 linear feet of levee. The elevation of the crown of the MR&T levee was approximately 15.5 feet. During construction of the EAMs the levee was raised to elevation 21.5 feet using clay material.

A new concrete floodwall (T-wall) will be constructed along the entire length of the reach. The EAM levee currently has a side slope of 1 vertical on 2 horizontal, which is too steep to remain in place. As a result, grass and top soil material will be removed from the top and side slopes of the existing levee and a new side slope of 1 vertical on 3 horizontal will be constructed. The new T-wall will have a final top elevation of 24.5 feet and will generally follow the centerline of the existing EAM levee. For the entire length of the contract reach, it is anticipated that an additional 15 feet of new right-of-way will be required on the protected side of the existing MRL. The new right-of-way will include some ground disturbing actions during the course of construction, but will ultimately serve as a vegetation-free corridor wherein no large vegetative growth aside from mowed grass will be allowed. Also, during the course of construction, an additional 5-foot temporary construction access easement will be required landward of the new 15-foot right-of-way for the transportation of construction equipment and materials. The existing floodside vegetation-free corridor (maintenance corridor) limits may be extended to a minimum of 40 feet from the new floodside levee toe. Roadway access for floodfighting and inspection purposes will be included and will run on top of the levee adjacent to the T-wall on

the floodside. If there is enough room a second access road will be built on the protected side of the T-wall along the crown of the levee. Three earthen ramps leading up to floodgates will be constructed along the protected and floodside slopes, two in the vicinity of Oakville Street and one approximately 733 linear feet upriver of the first two ramps. The gate widths will vary at each location, but will typically range from 24 feet to 60 feet wide. The gates will be either "swing" or "roller" type. A swing gate consists of a large fabricated steel panel, hinged on one side, and placed so that flood water pressure will push on the gate in the direction of its swing when in the closed position. A roller gate will also consist of a large fabricated steel panel placed on the flooded/river side of the wall, which slides/rolls into place. All gates will be constructed with the same general arrangement and dimensions as the T-Walls. Furthermore, all gates are equipped with rubber seals for controlling leaks. Figure 3 provides a conceptual drawing of the proposed new concrete floodwall (T-wall) near Oakville street and East St. Peter street.

Transition zones are areas between the beginning and ending of each contract reach that allow each of the various proposed alternatives (i.e., all earthen levee and floodwall (T-wall)) to tie together thereby providing a consistent level of risk reduction along the entire project length. The transition zone between WBV-MRL contract reach 1.2a and 1.2b will include an earthen levee shift from the floodwall (T-wall) towards the floodside. The tie-in detail is comprised of embedded sheetpile in the end of the T-wall reach, which will transition into the earthen levee section. This transition will be concrete armored to prevent erosion where the earthen levee begins and the new T-wall transition zone ends. The levee within the WBV-MRL 1.2a and 1.2b transition zone will slope down to the concrete armor until it is at the required design grade for the base slab cover. At the downriver end of this contract reach, the newly constructed floodwall (T-wall) will tie into the existing Eastern Tie-in floodwall that intersects the existing MRL at river mile 70.

Four staging/work areas and three construction access easements have been designated along the proposed project corridor (Figure 4). Staging/work areas 1 and 2 are approximately 2 acres and 1 acre, and are located in an existing wreckage yard and abandoned concrete slab foundation upriver and downriver of an existing unnamed dirt road, respectively. Staging/work area 3 is approximately 10 acres and is located in a heavily vegetated area slightly upriver from East Walker Road. Staging/work area 4 is approximately 2 acres and is situated in an existing grassy field slightly upriver from Oakville Street. Construction access easement 1 is located at the upriver end of the contract reach on an unnamed dirt road and is designated to provide temporary access to the levee site from LA Highway 23 (Hwy 23). Construction access easement 2 is located on Oakville Street and is also designated as a temporary access road between the proposed levee construction site and Hwy 23. The final construction access easement is located at the downriver end of the contract reach just south of the eastern tie-in floodwall that crosses Hwy 23 and will also be utilized as a temporary access road providing access to the levee from Hwy 23.

Construction of WBV-MRL 1.2a would require approximately 1 acre of new ROW, would require the clearing, grubbing, and fill of approximately 1 acre of forested wetlands and 9 acres of non-wet forested habitat, and would temporarily impact approximately 5 acres of mowed marsh vegetation.

Figure 3.
WBV-MRL 1.2a Floodwall Conceptual Drawing

WBV-MRL 1.2b – Oak Point to Oakville (b)
Contract reach 1.2b begins just downstream of the Chevron Oronite Plant at river mile 72 then continues downriver to the Oakville community ending approximately a quarter of a mile downstream of river mile 71. The contract reach begins at levee station 510+00 and extends to station 560+00, consisting of 5,000 linear feet of levee. The elevation of the crown of the MR&T levee was approximately 16.0 to 17.0 feet. During construction of the EAMs the levee was raised to elevation 21.5 feet.

An all-earthen levee alternative, consisting of floodside and protected side shift and straddle, will be constructed. Beginning from the upriver end of this contract reach near the Chevron Oronite Plant, it is expected that approximately 900 linear feet of levee will be a floodside shift, which will then transition into a straddle of the existing levee alignment for approximately 500 linear feet. The straddle will transition into a protected side shift for approximately 900 linear feet then will shift back towards the floodside for the remaining 2,200 linear feet of the contract reach. The remaining segments of the contract reach will consist of transition zones, described in the paragraph below, between the WBV-MRL 1.2a and 2.2 contract reaches. Between the straddle and protected side levee alignment lengths, there may be a need to construct a protected side stability berm in order to stabilize the newly constructed levee. The protected side stability berm would be approximately 1,400 linear feet and may require the infilling of a 1 acre borrow pond that exists adjacent the existing MRL approximately 2,000 linear feet downriver of the Chevron Oronite Plant. The EAM levee currently has a side slope of 1 vertical on 2 horizontal, which is too steep to remain in place. As a result, grass and top soil material will be added to the top and side slopes of the existing levee. The levee will likely have a 10-foot crown width and side slopes of 1 vertical on 5 horizontal on the floodside and 1 vertical on 3.5 horizontal on the protected side. The finished levee crown will be surfaced with a separator geotextile fabric and crushed limestone. The newly constructed earthen levee will have a final top elevation of 21.5 feet. For the entire length of the contract reach, it is anticipated that 15 feet of new right-of-way will be required on the protected side of the existing MRL. The new right-of-way will include some ground disturbing actions during the course of construction, but will ultimately serve as a vegetation-free corridor wherein no large vegetative overgrowth aside from mowed grass will be allowed. Also, during the course of construction, an additional 5-foot temporary construction access easement will be required landward of the new 15-foot right-of-way for the transportation of construction equipment and materials. In addition, measuring from the existing MRL centerline, it is anticipated that approximately 150 feet of new right-of-way on the protected side will be required in the location of the protected side levee shift and stability berm. Within areas where a floodside shift is required, the existing floodside vegetation-free corridor (maintenance corridor) limits may be extended to a minimum of 40 feet from the new floodside levee toe. Currently there are two earthen ramps that provide access from the crown of the levee to the floodside of the levee. The two existing ramps are located adjacent to and just downriver from the Chevron Oronite plant, approximately 600 and 2,900 linear feet, respectively. A third earthen ramp recently constructed on the floodside of the levee under the EAM contract will be maintained throughout the course of construction of the Resilient Features. The third ramp is located approximately 4,100 linear feet downriver of the Chevron Oronite plant.

Transition zones are areas between the beginning and ending of each contract reach that allow each of the various proposed alternatives (i.e., all earthen levee and floodwall (T-wall)) to tie together thereby providing a consistent level of risk reduction along the entire project length. The transition zone between WBV-MRL contract reach 1.2b and 1.2a is described above under the WBV-MRL 1.2a – Oak Point to Oakville (a) description. The transition zone between WBV-MRL 1.2b and 2.2 will include an earthen levee shift from the WBV-MRL 2.2 floodwall (T-wall) towards the floodside. The tie-in detail is comprised of embedded sheetpile in the end of the T-wall reach, which will transition into the earthen levee section. This transition will be concrete armored to prevent erosion where the earthen levee begins and the new T-wall transition zone ends. The levee within the WBV-MRL 1.2b and 2.2 transition zone will slope down to the concrete armor until it is at the required design grade for the base slab cover.

Three staging/work area easements and three temporary construction access easements have been designated along the proposed project corridor (Figure 4). Staging/work area 1 is approximately 5 acres and is located in a heavily vegetated area at the upriver end of the contract reach adjacent to the Chevron Oronite Plant and Dockside Road. Staging/work area 2 is approximately 2 acres and is also located in a heavily vegetated area adjacent to the existing MRL just downriver from staging area 1. Staging/work area 3 is approximately 11 acres and is situated in an existing grassy field slightly downriver from staging area 2. Temporary construction access easement 1 is located at the upriver end of the contract reach immediately adjacent to the Chevron Oronite Plant and is designated to provide temporary access to the levee site from Hwy 23. Temporary construction access easement 2 is located on Dockside Road and is also designated as a temporary access road between the proposed levee construction site and Hwy 23. Temporary construction access easement 3, approximately 10 acres, may be required along the protected side toe of the existing MRL for the entire length of the contract reach. It is anticipated that this linear corridor would allow construction equipment to traverse parallel to the existing levee as well as transport borrow material to the various levee segments.

Construction of WBV-MRL 1.2b would require approximately 3 acres of new ROW, would permanently fill approximately 1 acre of open water habitat, would require the clearing, grubbing, and fill of approximately 10 acres of forested wetlands and 16 acres of non-wet forested habitat, and would temporarily impact approximately 5 acres of mowed marsh vegetation.

WBV-MRL 2.2 – Oak Point (Chevron Oronite)
Contract reach 2.2 is the section of MRL adjacent to the Chevron Oronite Chemical Plant. It begins approximately at river mile 73 and continues downstream to river mile 72. The contract reach begins at station 443+00 and continues to station 510+00, consisting of 6,700 linear feet of levee. The elevation of the crown of the MR&T levee was approximately 15.5 to 17.0 feet. During construction of the EAMs the levee was raised to elevation 21.5 feet.

A new concrete floodwall (T-wall) flood protection system will be constructed. The EAM levee currently has a side slope of 1 vertical on 2 horizontal, which is too steep to remain in place. As a result, grass and top soil material will be removed from the top and side slopes of the existing levee and a new side slope of 1 vertical on 3 horizontal will be constructed. The new T-wall will have a final top elevation of 24.5 feet and will generally follow the centerline of the existing

levee. For the entire length of the contract reach, it is anticipated that an additional 15 feet of new right-of-way will be required on the protected side of the existing MRL. The new right-of-way will include some ground disturbing actions during the course of construction, but will ultimately serve as a vegetation-free corridor wherein no large vegetative overgrowth aside from mowed grass will be allowed. Also, during the course of construction, an additional 5-foot temporary construction access easement will be required landward of the new 15-foot right-of-way for the transportation of construction equipment and materials. The existing floodside vegetation-free corridor (maintenance corridor) limits may be extended to a minimum of 40 feet from the new floodside levee toe. Roadway access for floodfighting and inspection purposes will be included and will run on top of the levee adjacent to the T-wall on the floodside. If there is enough room a second access road will be built on the protected side of the T-wall along the crown of the levee. Three earthen ramps leading up to floodgates will be constructed on the floodside and protected side slopes, one directly adjacent to the Chevron Oronite Plant and two approximately 2,300 and 2,700 linear feet upriver of the plant, respectively. The gate widths will vary at each location, but will typically range from 24 feet to 60 feet wide. The gates will be either "swing" or "roller" type. A swing gate consists of a large fabricated steel panel, hinged on one side, and placed so that flood water pressure will push on the gate in the direction of its swing when in the closed position. A roller gate will also consist of a large fabricated steel panel placed on the flooded/river side of the wall, which slides/rolls into place. All gates will be constructed with the same general arrangement and dimensions as the T-Walls. Furthermore, all gates are equipped with rubber seals for controlling leaks.

Transition zones are areas between the beginning and ending of each contract reach that allow each of the various proposed alternatives (i.e., all earthen levee and floodwall (T-wall)) to tie together thereby providing a consistent level of risk reduction along the entire project length. The transition zone between WBV-MRL contract reach 1.2b and 2.2 is described above under the WBV-MRL 1.2b – Oak Point to Oakville (b) description. The transition zone between WBV-MRL 2.2 and 3.2 will include an earthen levee shift from the floodwall (T-wall) towards the floodside. The tie-in detail is comprised of embedded sheetpile in the end of the T-wall reach, which will transition into the earthen levee section. This transition will be concrete armored to prevent erosion where the earthen levee begins and the new T-wall transition zone ends. The levee within the WBV-MRL 1.2b and 2.2 transition zone will slope down to the concrete armor until it is at the required design grade for the base slab cover.

One staging/work area easement and four temporary construction access easements have been designated along the proposed project corridor (Figures 4 & 5). Staging/work area 1 is approximately 17 acres and is located within a mixed use area consisting of several storage container sites, oil and natural gas equipment areas and lightly vegetated areas immediately adjacent to the Chevron Oronite Plant at the upriver end of the contract reach. The four temporary construction access easements are located immediately adjacent to and slightly upriver of staging area 1 and were previously designated under the EAM contract WBV-MRL 2.1 to provide temporary access to the levee site from Hwy 23.

Construction of WBV-MRL 2.2 would require approximately 2 acres of new ROW, would require the clearing, grubbing, and fill of approximately 1 acre of forested wetlands and 1 acre of

Figure 4.
WBV-MRL 1.2a, 1.2b and 2.2 Staging, Stockpile and Access Locations

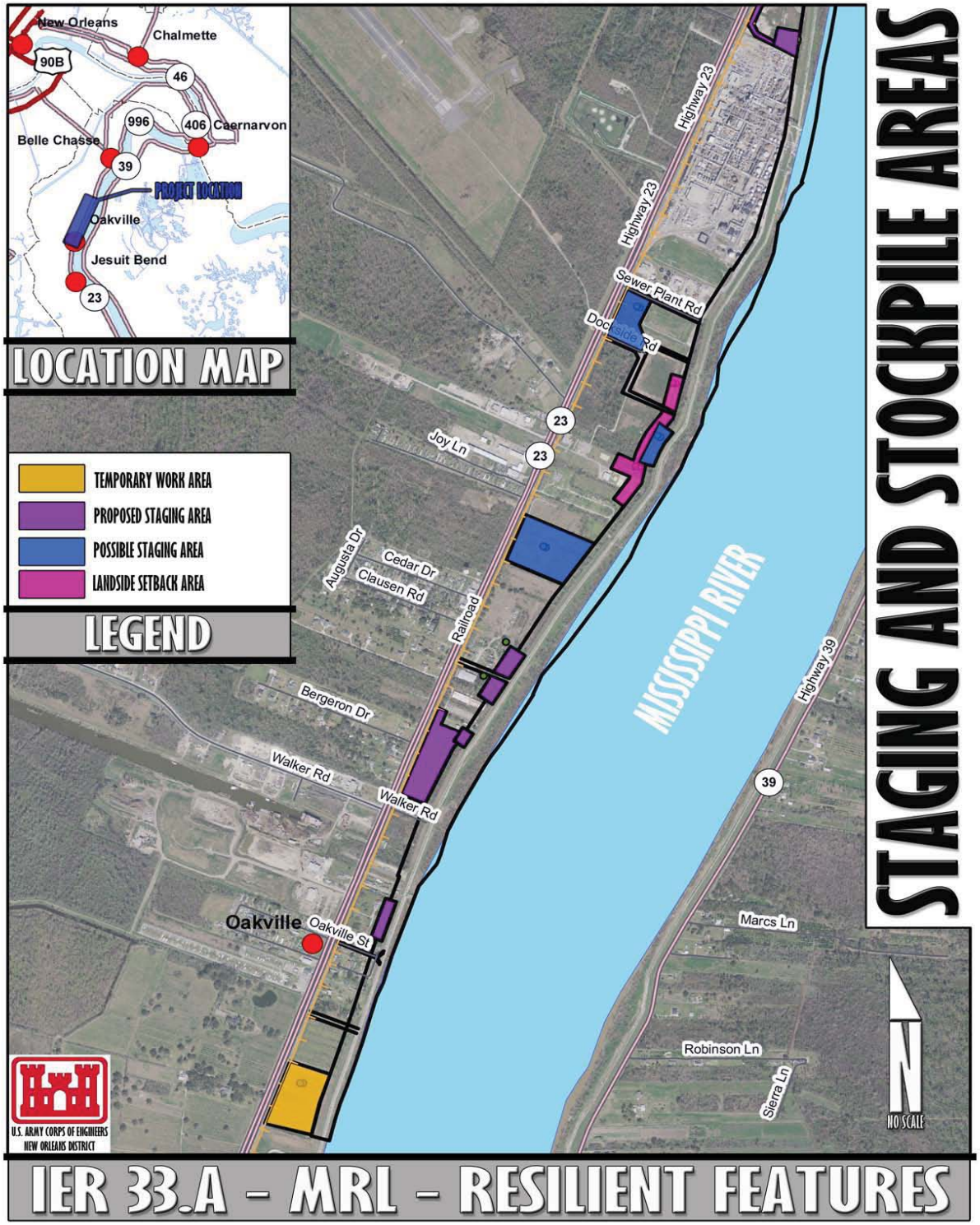
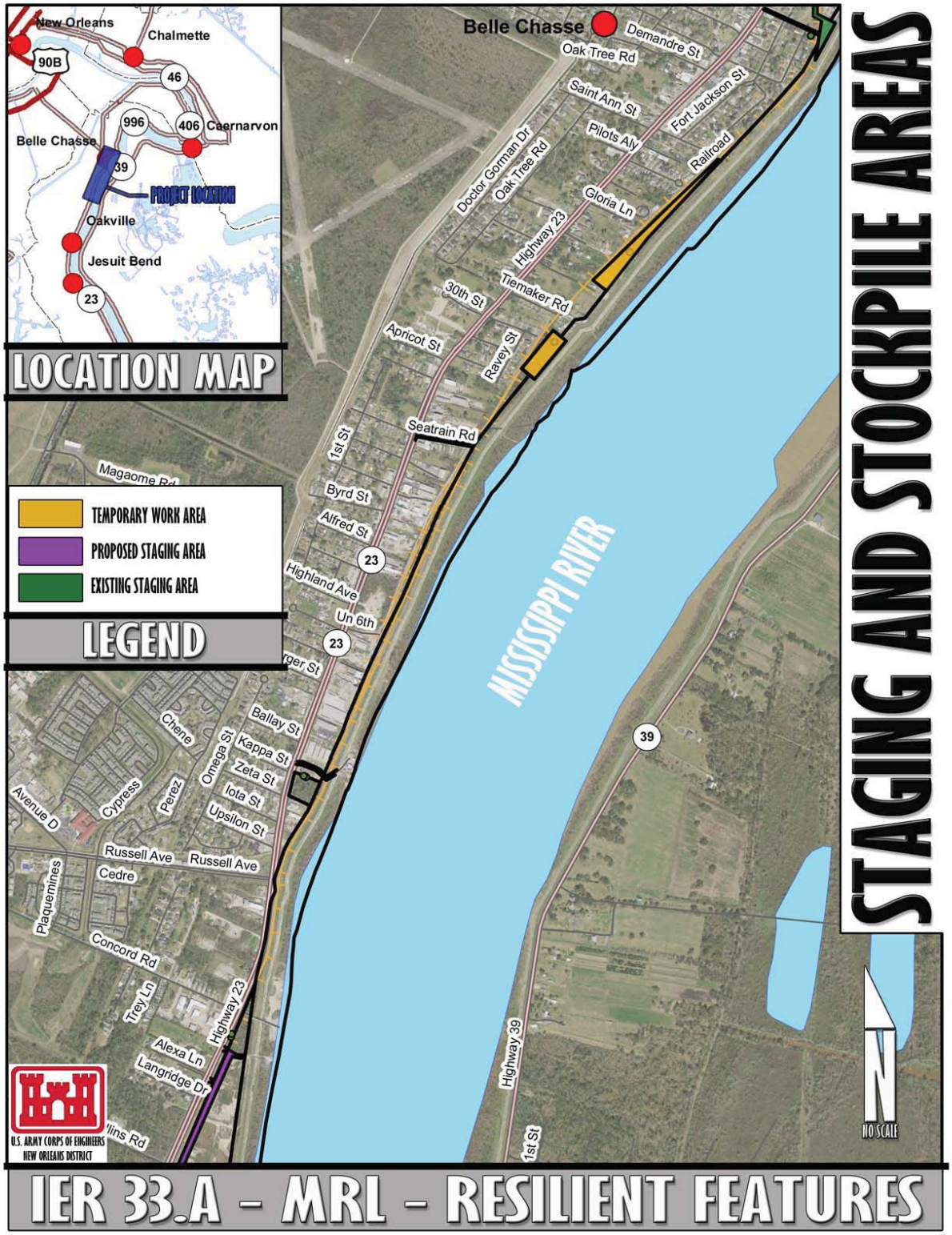


Figure 5.
WBV-MRL 2.2 and 3.2 Staging, Stockpile and Access Locations



non-wet forested habitat, and would temporarily impact approximately 6 acres of mowed marsh vegetation.

WBV-MRL 3.2 – Belle Chasse to Oak Point
Contract reach 3.2 begins approximately at river mile 75.75 just downstream of the Belle Chasse Ferry Landing and continues down river to the Chevron Oronite Plant ending at river mile 73. The contract begins at levee station 313+00 and extends to station 443+00 reach, consisting of 13,000 linear feet of levee. The elevation of the crown of the MR&T levee was approximately 17 feet. During construction of the EAMs the levee was raised to elevation 20.5 feet.

An all-earthen levee alternative, consisting of floodside and protected side shift and straddle, and a short section of T-wall will be constructed. Beginning from the upriver end of this contract reach near Belle Chasse Street, it is expected that approximately 9,500 linear feet of levee will be a floodside shift, which will then transition into a floodwall (T-wall) near Belle Chasse Launch Road and continue for approximately 600 linear feet. The floodwall (T-wall) will transition back into a floodside shift and continue for approximately 2,000 linear feet to the downriver end of the contract reach. The remaining segments of the contract reach will consist of transition zones, described in the paragraph below, between the WBV-MRL 2.2 and 4.2 contract reaches. The EAM levee currently has a side slope of 1 vertical on 2 horizontal, which is too steep to remain in place. As a result, grass and top soil material will be added to the top and side slopes of the existing levee. The levee will likely have a 10-foot crown width and side slopes of 1 vertical on 5 horizontal on the floodside and 1 vertical on 3.5 horizontal on the protected side. The finished levee crown will be surfaced with a separator geotextile fabric and crushed limestone. The newly constructed earthen levee will have a final top elevation of 21.0 feet. For the entire length of the contract reach, it is anticipated that an additional 15 feet of new right-of-way will be required on the protected side of the existing MRL. The new right-of-way will include some ground disturbing actions during the course of construction, but will ultimately serve as a vegetation-free corridor wherein no large vegetative overgrowth aside from mowed grass will be allowed. Also, during the course of construction, an additional 5-foot temporary construction access easement will be required landward of the new 15-foot right-of-way for the transportation of construction equipment and materials. Within areas where a floodside shift is required, the existing floodside vegetation-free corridor (maintenance corridor) limits may be extended to a minimum of 40 feet from the new floodside levee toe. Currently there are two earthen ramps that provide access from the crown of the levee to the floodside of the levee. The two existing ramps are located at the levee end of Sea Train Road and Belle Chasse Launch Road, respectively. These two earthen ramps will be maintained throughout the course of construction of the Resilient Features. Figures 6 and 7 provide conceptual drawings of the proposed all-earthen levee construction in the vicinity of Magnolia street and Tiemaker road.

Transition zones are areas between the beginning and ending of each contract reach that allow each of the various proposed alternatives (i.e., all earthen levee and floodwall (T-wall)) to tie together thereby providing a consistent level of risk reduction along the entire project length. The transition zone between WBV-MRL contract reach 3.2 and 2.2 is described above under the WBV-MRL 2.2 – Oak Point (Chevron Oronite) description. The transition zone between WBV-

Figure 6.
WBV-MRL 3.2 All-Earthen Levee Construction Conceptual Drawing

Figure 7.
WBV-MRL 3.2 All-Earthen Levee Construction Conceptual Drawing

MRL 3.2 and 4.2 will include an earthen levee shift from the WBV-MRL 4.2 floodwall (T-wall) towards the floodside. The tie-in detail is comprised of embedded sheetpile in the end of the T-wall reach, which will transition into the earthen levee section. This transition will be concrete armored to prevent erosion where the earthen levee begins and the new T-wall transition zone ends. The levee within the WBV-MRL 3.2 and 4.2 transition zone will slope down to the concrete armor until it is at the required design grade for the base slab cover.

Five staging/work area easements and three temporary construction access easements have been designated along the proposed project corridor (Figures 5 & 8). Staging/work area 1 is approximately 2 acres and is located in a grassy area at the upriver end of the contract reach near Belle Chasse Street immediately adjacent to the existing protected side levee toe. Staging/work area 2 is approximately 8 acres and is located in a light to moderate vegetative corridor adjacent to the existing MRL just downriver from staging/work area 1. Staging/work area 3 is approximately 5 acres and is also situated in a light to moderate vegetative corridor beginning slightly downriver from staging/work area 2 and ending approximately 1,500 linear feet upriver of Belle Chasse Launch Road. Staging/work area 4 is approximately 2 acres and is located in a heavily vegetated area immediately adjacent to Belle Chasse Launch Road. Staging/work area 5 is less than 1 acre and is situated immediately adjacent to the existing MRL protected side toe. Temporary construction access easement 1 is located on an existing gravel road at the upriver end of the contract reach and was previously designated under the EAM contract WBV-MRL 3.1 to provide temporary access to the levee site from Hwy 23. The remaining two temporary construction access easements are located on Sea Train Road and Belle Chasse Launch Road.

Construction of WBV-MRL 3.2 would require approximately 5 acres of new ROW, would permanently fill approximately 1 acre of open water habitat, would require the clearing, grubbing, and fill of approximately 22 acres of forested wetlands and 7 acres of non-wet forested habitat, and would temporarily impact approximately 12 acres of mowed marsh vegetation.

WBV-MRL 4.2 – Oak Road to Belle Chasse
Contract reach 4.2 begins approximately at river mile 76.75 and continues to downstream of the Belle Chase Ferry Landing ending at just upstream of river mile 75.75. The contract reach begins at levee station 259+00 and continues to station 313+00, consisting of 5,400 linear feet levee. The elevation of the crown of the MR&T levee was approximately 16.5 feet. During construction of the EAMs the levee was raised to 20.5 feet.

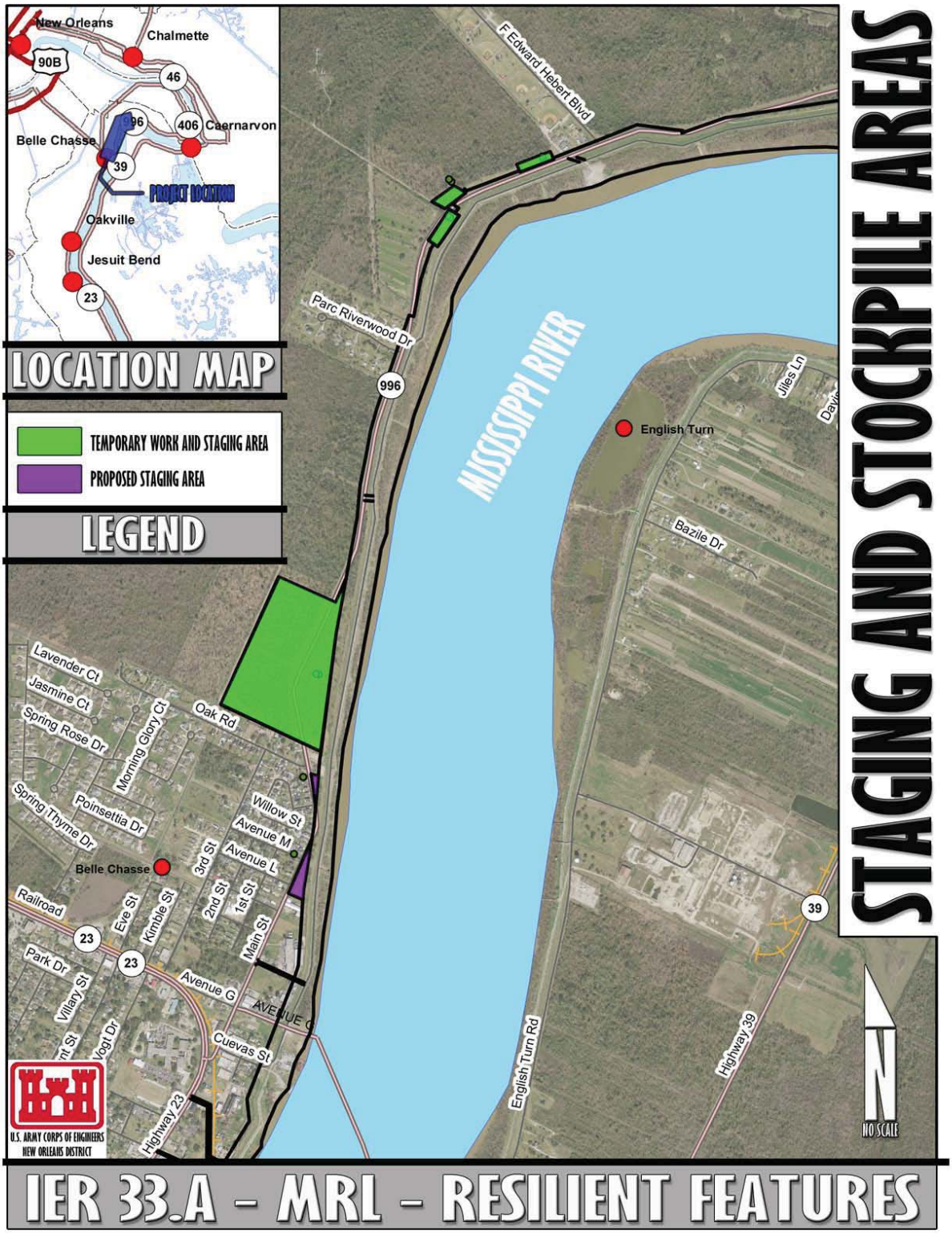
A new concrete floodwall (T-wall) flood protection system will be constructed. The EAM levee currently has a side slope of 1 vertical on 2 horizontal, which is too steep to remain in place. As a result, grass and top soil material will be removed from the top and side slopes of the existing levee and a new side slope of 1 vertical on 3 horizontal will be constructed. The new T-wall will have a final top elevation of 24.5 feet and will generally follow the centerline of the existing EAM levee. For the entire length of the contract reach, it is anticipated that an additional 15 feet of new right-of-way will be required on the protected side of the existing MRL. The new right-of-way will include some ground disturbing actions during the course of construction, but will ultimately serve as a vegetation-free corridor wherein no large vegetative overgrowth aside from mowed grass will be allowed. Also, during the course of construction, an additional 5-foot temporary construction access easement will be required landward of the new 15-foot right-of-

way for the transportation of construction equipment and materials. With areas where a protected side shift is required, right-of-way limits may be extended to a maximum of 340 feet measuring from the existing MRL centerline. In addition, the existing floodside vegetation-free corridor (maintenance corridor) limits may be extended to a minimum of 40 feet from the new floodside levee toe. Roadway access for floodfighting and inspection purposes will be included and will run on top of the levee adjacent to the T-wall on the floodside. If there is enough room a second access road will be situated on the protected side of the T-wall on the crown of the levee. Four earthen ramps leading up to floodgates will be constructed on the floodside and protected side slopes of the levee. An additional ramp, previously constructed under the EAM contract, is currently located at the Belle Chasse-Scarsdale Ferry ramp. If required, an additional floodgate may be constructed at the Belle Chasse-Scarsdale Ferry ramp, but the location will otherwise remain undisturbed during the course of construction for the Resilient Features. The first earthen ramp will be located within the vicinity of the intersection of Main Street and Avenue M. The second and third ramps will be located at the levee end of East Cuevas Street. The fourth earthen ramp will be located approximately 1,500 linear feet downriver of the Belle Chasse-Scarsdale Ferry ramp. The gate widths will vary at each location, but will typically range from 24 feet to 60 feet wide. The gates will be either "swing" or "roller" type. A swing gate consists of a large fabricated steel panel, hinged on one side, and placed so that flood water pressure will push on the gate in the direction of its swing when in the closed position. A roller gate will also consist of a large fabricated steel panel placed on the flooded/river side of the wall, which slides/rolls into place. All gates will be constructed with the same general arrangement and dimensions as the T-Walls. Furthermore, all gates are equipped with rubber seals for controlling leaks.

Transition zones are areas between the beginning and ending of each contract reach that allow each of the various proposed alternatives (i.e., all earthen levee and floodwall (T-wall)) to tie together thereby providing a consistent level of risk reduction along the entire project length. The transition zone between WBV-MRL contract reach 4.2 and 3.2 is described above under the WBV-MRL 3.2 – Belle Chasse to Oak Point description. The transition zone between WBV-MRL 4.2 and 5.2 will include an earthen levee shift from the current levee baseline towards the protected side. The tie-in detail is comprised of embedded sheetpile in the end of the T-wall reach, which will transition into the earthen levee section. This transition will be concrete armored to prevent erosion where the earthen levee begins and the new T-wall transition zone ends. The levee within the WBV-MRL 4.2 and 5.2 transition zone will slope down to the concrete armor until it is at the required design grade for the base slab cover.

Three staging/work area easements and two temporary construction access easements have been designated along the proposed project corridor (Figure 8). Staging/work area 1 is approximately 7 acres and is located within portions of lightly and heavily vegetated areas immediately upriver of Oak Road. Staging/work area 2 is approximately 4 acres is located between the protected side toe of the existing MRL and Main Street just downriver of Staging Area 1. Staging/work area 3 is less than 1 acre and is an existing staging area from the EAM contract reach WBV-MRL 4.1 located in a lightly vegetated area adjacent to the protected side toe of the MRL approximately 2,000 linear feet downriver of the Belle Chasse-Scarsdale Ferry. Temporary construction access easement 1 is located on an existing gravel road just upriver of the Plaquemines Parish Government complex near the Belle Chasse-Scarsdale Ferry and will provide temporary access

Figure 8.
WBV-MRL 3.2 and 4.2 Staging, Stockpile and Access Locations



to the levee site from Main Street. Temporary construction access easement 2 is located on an existing gravel road at the downriver end of the contract reach and was previously designated under the EAM contract WBV-MRL 3.1 to provide temporary access to the levee site from Hwy 23.

Construction of WBV-MRL 4.2 would require approximately 2 acres of new ROW, would require the clearing, grubbing, and fill of approximately 1 acre of forested wetlands and 3 acres of non-wet forested habitat, and would temporarily impact approximately 5 acres of mowed marsh vegetation.

WBV-MRL 5.2 – Coast Guard Facility to Oak Road
Contract reach 5.2 begins approximately at river mile 79.5 and continues downstream to river mile 76.75. The contract begins at levee station 74+00 and extends to station 259+00 consisting of 18,500 linear feet of levee. The elevation of the crown of the MR&T levee was approximately 17.5 to 19.0 feet. During construction of the EAMs the levee was raised to 20.5 feet.

An all-earthen levee alternative, consisting of floodside and protected side shift and straddle, will be constructed. Beginning from the upriver end of this contract reach within the Coast Guard Facility, it is expected that a straddle of the existing levee will be constructed for approximately 2,900 linear feet. Remaining within the Coast Guard Facility, the straddle will transition into a protected side shift, which will extend downriver for approximately 1,700 linear feet. After exiting the Coast Guard Facility and entering the upriver end of the Tulane University Research Laboratories property, the levee will transition from a protected side shift back into a straddle and extend approximately 6,400 linear feet downriver near F. Edward Hebert Boulevard. Just downriver of F. Edward Hebert Boulevard, the levee will then transition from a straddle into a floodside shift and extend downriver for approximately 4,200 linear feet. The levee will then transition from a floodside shift into a straddle for approximately 100 linear feet where it will then transition into a protected side shift for approximately 2,700 linear feet ending at the downriver limits of the contract reach near Oak Road. Under this contract reach, the previously described 700-foot long demonstration section of stabilized soil cap will be removed during the Resilient Features construction. The stabilized soil demonstration section will be degraded and the levee material will either be delivered to the Plaquemines Parish owned property on F. Edward Hebert Boulevard or disposed of by the contractor in a licensed landfill. The EAM levee currently has a side slope of 1 vertical on 2 horizontal, which is too steep to remain in place. As a result, grass and top soil material will be added to the top and side slopes of the existing levee. The levee will likely have a 10-foot crown width and side slopes of 1 vertical on 5 horizontal on the floodside and 1 vertical on 3.5 horizontal on the protected side. The finished levee crown will be surfaced with a separator geotextile fabric and crushed limestone. The newly constructed earthen levee will have a final top elevation of 21.0 feet. For the entire length of the contract reach, it is anticipated that an additional 15 feet of new right-of-way will be required on the protected side of the existing MRL. The new right-of-way will include some ground disturbing actions during the course of construction, but will ultimately serve as a vegetation-free corridor wherein no large vegetative overgrowth aside from mowed grass will be allowed. Also, during the course of construction, an additional 5-foot temporary construction access easement will be required landward of the new 15-foot right-of-way for the transportation of construction

equipment and materials. Measuring from the existing MRL centerline, it is anticipated that within areas where a protected side levee shift is required that new right-of-way limits on the protected side may be extended out to a maximum of 340 feet in certain locations. Additionally, within areas where a floodside shift is required, the existing floodside vegetation-free corridor (maintenance corridor) limits may be extended to a minimum of 40 feet from the new floodside levee toe. Currently there are two earthen ramps that provide access from the crown of the levee to the floodside of the levee. The two existing ramps are located within the Coast Guard facility at the upriver end of the project and near the intersection of F. Edward Hebert Boulevard and Main Street. These two earthen ramps will be maintained throughout the course of construction of the Resilient Features. Figures 9 and 10 provide conceptual drawings of the all-earthen levee construction in the vicinity of Parc Riverwood drive and F. Edward Hebert boulevard.

Transition zones are areas between the beginning and ending of each contract reach that allow each of the various proposed alternatives (i.e., all earthen levee and floodwall (T-wall)) to tie together thereby providing a consistent level of risk reduction along the entire project length. The transition zone between WBV-MRL contract reach 5.2 and 4.2 is described above under the WBV-MRL 4.2 – Oak Road to Belle Chasse description. The transition zone between WBV-MRL 5.2 and the existing MRL will include an earthen levee shift from the floodside back to the existing MRL centerline.

Four staging/work area easements and one temporary construction access easement have been designated along the proposed project corridor (Figure 11). Staging/work area 1 is approximately 16 acres and is located in both grassy and heavily vegetated areas beginning at the upriver end of the contract reach on the Coast Guard Facility traversing downriver immediately adjacent to the existing MRL protected side levee toe ending just upriver of F. Edward Hebert Boulevard. Staging/work area 2 is approximately 1 acre and is located in a grassy area adjacent to Main Street just downriver from F. Edward Hebert Boulevard. Staging/work area 3 is approximately 5 acres and is also situated in both a light to moderate vegetative corridor beginning slightly downriver from staging/work area 2 and ending just upriver of Parc Riverwoods Drive. Staging/work area 4 is approximately 37 acres and is located within portions of lightly and heavily vegetated areas immediately upriver of Oak Road. Temporary construction access easement 1 is located on F. Edward Hebert Boulevard and was previously designated under the EAM contract WBV-MRL 6.1 to provide temporary access to the levee site. Additional road access may be provided via Main Street and an existing berm at the protected side levee toe within the Coast Guard facility limits.

Construction of WBV-MRL 5.2 would require approximately 18 acres of new ROW, would require the clearing, grubbing, and fill of approximately 36 acres of forested wetlands and 35 acres of non-wet forested habitat, and would temporarily impact approximately 17 acres of mowed marsh vegetation.

2.3.2. WBV-MRL Resilient Features Construction Activities

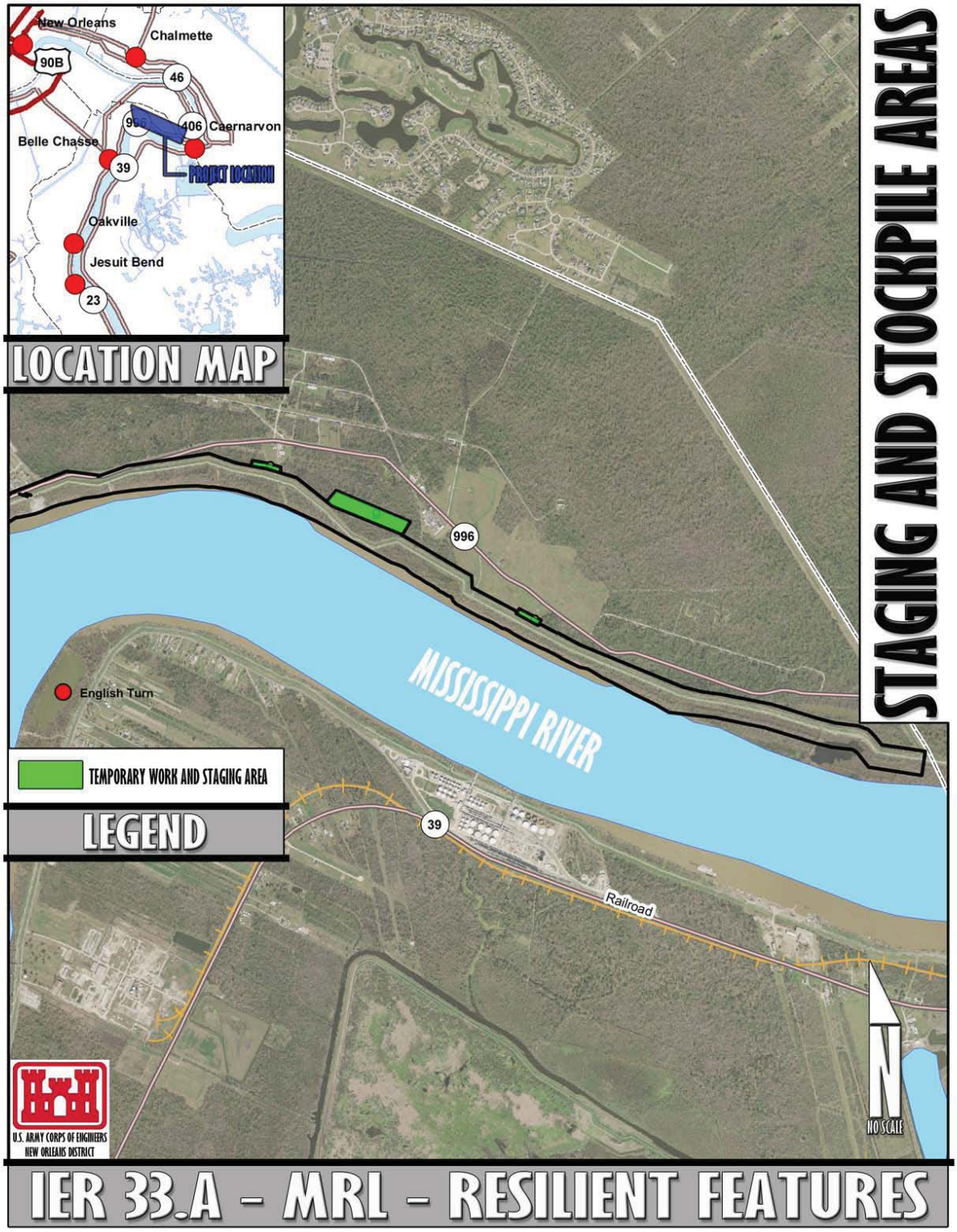
In order to construct the proposed action, five major steps would be required:

1) Site Preparation.
2) Staging/Work Area and Access Road Preparation.

Figure 9.
WBV-MRL 5.2 All-Earthen Levee Construction Conceptual Drawing

Figure 10.
WBV-MRL 5.2 All-Earthen Levee Construction Conceptual Drawing

Figure 11.
WBV-MRL 4.2 and 5.2 Staging, Stockpile and Access Locations



3) Construction of All-Earthen Levees and Floodwalls (T-walls)
4) Armoring
5) Fertilizing, Seeding and Mulching.

Within IER #13, West Bank and Vicinity-09a (WBV-09a), the CEMVN has evaluated the proposed construction of an emergency bypass road that would allow for authorized vehicles to bypass the Louisiana Highway 23 floodgates when closed during major storm events. The emergency bypass roadway would begin just south of the proposed vehicular gate location, proceed east along an existing private road and ramp up onto the Mississippi River Levee. The proposed emergency bypass road would continue north on top of the Mississippi River Levee for approximately 900 linear feet and ramp down onto existing East Oakville Street and then continue out to Louisiana Highway 23. Due to potential construction sequencing conflicts for work being evaluated in this IER Supplement and the WBV-09a project, there may exist a need to complete the previously described emergency bypass roadway under the contract for WBV-MRL 1.2a. As the previously described emergency bypass roadway would not be expected to result in any additional impacts to those previously covered under IER #13, all prior impact analyses, with respect to the emergency bypass roadway, contained within IER #13 are incorporated herein by reference.

2.3.2.1. Site Preparation

In order to prepare the MRL for construction, erosion protection would be installed and surficial materials from the existing levee would need to be removed. A silt fence would be constructed along the new protected side levee right-of-way, which will be 15 feet from the land-side toe of the levee, in order to minimize erosion and sediment runoff. The silt fence would be designed to retain sediment from runoff during clearing and grubbing, excavation, embankment placement, and final grading. Removal of silt fence barriers would be after construction is complete and the soil is stabilized.

The existing asphalt, crushed limestone and levee crown would be excavated from the levee surface and removed from the work site. The ultimate fate of the removed limestone cannot be described at this time. It may be reused for the Co-Located Project, used elsewhere for levee crown or levee ramp surfacing, stockpiled or buried at the Walker Road borrow pit complex (described later in this IER), disposed in a landfill, or become property of the construction contractor who may dispose of it, sell it, or utilize it as he determines appropriate. Asphalt removed from the levee crown would be disposed in a landfill or become property of the contractor for his disposal. After removal of the asphalt and crushed limestone surface, the site preparation would require stripping vegetation and topsoil from areas that will receive clay. For all contract reaches, this vegetation and topsoil would be stockpiled within the levee right-of-way and later replaced on the levee to spur the growth of new vegetation. Any excess material that cannot be reused would become property of the construction contractor who may dispose of the material in any legal manner. Conversely, the construction contracts may require this material be hauled away, probably, but not necessarily to the Walker Road borrow pit complex for disposal into an existing borrow pit or stockpiled for later use elsewhere. Some of this material may be hauled to a Plaquemines Parish property on F. Edward Hebert Boulevard for the Parish's use in filling low spots at publically-owned facilities. Where concrete slope pavement will be removed

and subsequently replaced as a result of levee construction, it is anticipated that disposal of the removed concrete slope pavement may either become property of the contractor, subject to previously described disposal conditions, hauled to the previously described Plaquemines Parish property on F. Edward Hebert Boulevard for later re-use by the Parish, or windrowed along the riverward edge of the 40-foot vegetation free corridor (maintenance corridor), as described later in this IER Supplement. Any proposals for additional uses will be evaluated for potential environmental impacts by CEMVN before approval for the proposed use is granted, although such approval may not require preparation of a supplemental IER if the environmental effects are determined to be minimal. Any disposal will comply with applicable Federal, state, and local laws.

Within IER #12 and IER Supplement (IERs) #12, the CEMVN has evaluated the potential environmental consequences associated with utilizing the Walker Road borrow pit complex and Westbank Site "N" as alternative disposal sites for earthen material that had been removed during the construction of the West Closure Complex eastern floodwall and road realignment as well as the Hero Canal Levee (USACE, 2010c). These sites could be also used for disposal of cleared and grubbed grass and topsoil and earthen material removed from the MRL during construction of this Co-Located Project. As the previously mentioned vegetation and earthen materials would not be expected to result in any additional impacts to those covered under IER #12 and IERs #12, all prior impacts analyses, with respect to disposal of this material, contained within IER #12 and IERs #12 are incorporated herein by reference.

For each contract reach, no more than 5,000 linear feet of levee would be under embankment construction at any time between the limits of the approved levee cross section and the farthest extent of levee clearing ahead of the embankment work. If embankment work is performed in multiple locations within the total contract length, the sum of the lengths of the multiple embankment construction locations allowed would not exceed the total length of 5,000 linear feet. The area of bare soil exposed at any one time by construction operations would not exceed that necessary to perform the work. Temporary fills or waste areas would be constructed by selective placement to eliminate silts or clays on the surface that could erode and runoff into adjacent waterbodies.

To reduce the risk to the construction area as well as occupational risks during the core hurricane season (1 Aug – 31 Oct) and high river season (March – May), all above-mentioned embankment work limits would be reduced to 2,000 linear feet. At such time that the river is at or above elevation +15.0 feet (North American Vertical Datum 1988 - NAVD 88) at the Carrollton gage (New Orleans District), all construction work would cease until such time as the elevation subsides below +15.0 feet.

2.3.2.2. Staging/Stockpile/Processing Areas and Access Road Preparation

Acquisition of construction easements will be required for staging/stockpile/processing areas outside of the existing right-of-way. Clearing and grubbing of vegetative material may be required within the staging/work areas. The ultimate fate of any material removed from the staging/work areas cannot be described at this time. It may be stockpiled or buried at the Walker

Road borrow pit complex (described later in this IER), disposed in a landfill, or become property of the construction contractor who may dispose of it, sell it, or utilize it as he determines appropriate, or become property of the underlying land owner. Construction equipment access ramps (to get onto the levee to conduct the work) would be constructed at a number of locations within the new levee rights-of-way, and access roads to the Walker Road soil-mixing area may need to be improved. Ramps would typically have a 14-foot crown width, 1V:10H crown slope, and 1V:3H side slopes, and be constructed by adding material to the levee crown and slopes. The ramps would typically be constructed with a topping of crushed stone; however, there may be instances where the ramp would be constructed with a topping of concrete or asphalt. In order to gain access from Highway 23 or other highways or roads to the levee site, acquisition of construction easements for access roads will be required. To the maximum extent practicable, these access roads will be established along existing roads or cleared areas. In some locations improvements to the access roads such as widening and placement of gravel may be required. Temporary staging/work area and access road locations for the six Resilient Features contract reaches are described in the previous WBV-MRL Resilient Features Contract Reaches section of this IER Supplement.

2.3.2.3. Construction of All-Earthen Levees and Floodwalls

Constructing an all-earthen levee is the engineering recommended and preferred alternative in locations where additional right-of-way is available. Several different configurations for an earthen levee were considered. These alternatives consisted of a floodside shift, protected side shift, or a straddle of the existing levee centerline. All three of these levees alternatives were considered for each contract reach. The preferred levee alternative for each contract reach was determined based on the availability of right-of-way and the geotechnical stability of each alternative.

As previously described, the EAM levee currently has a side slope of 1 vertical on 2 horizontal, which is too steep to remain in place. As a result, earthen material will be added to the top and side slopes of the existing levee. The levee will likely have a 10-foot crown width and varying side slopes of 1 vertical on 3 to 4 horizontal on the floodside and 1 vertical on 3 to 4 horizontal on the protected side. The finished levee crown will be surfaced with a separator geotextile fabric and crushed limestone. This section will detail the construction activities required for each of the all-earthen levee alternatives, for details regarding the selected alternative by contract reach please refer to *Section 2.3.1 WBV-MRL Resilient Features Contract Reaches*.

2.3.2.3.1. All-Earthen Levee – Floodside Shift

This alternative would tie into the existing protected side toe in most areas, and shift the centerline and footprint of the levee towards the floodside. In certain areas, the protected side toe would also shift landwards as a result of the need for 1 vertical on 3 to 4 horizontal on the protected side. There would also be a need for additional clearing of vegetation on the floodside in order to re-establish the 40-foot vegetation-free corridor (maintenance corridor). Further, a flood side shift will require removal and replacement of existing concrete slope pavement, which is located on the floodside of the levee. Since the existing MRL right-of-way on the protected side is the toe plus 5-feet, an additional 10-feet for the protected side toe would be required for a

total of 15-feet to establish the vegetation-free corridor only mowed grass would be allowed.

Land on the batture (An elevated part of a riverbed formed by gradual accumulation of alluvium, specifically the land between the low-water stage and the levees along the banks of the Lower Mississippi River) is typically undeveloped; therefore, this levee configuration would have the least amount of impact to residential, industrial, and commercial properties. However, construction of this levee configuration may require clearing of trees and other vegetation located on the batture. Figure 12 provides an illustration of a floodside shift of the existing levee centerline.

2.3.2.3.2. All-Earthen Levee – Straddle

This alternative extends the footprint of the levee beyond the existing toes, on both the flood and protected side. To the maximum extent practicable, design of this configuration will fit the levee footprint within the existing right-of-way limits, and minimize the requirement for new right-of-way. This alternative would require removal and replacement of the existing concrete slope pavement.

This alternative is likely to experience the least amount of the settlement of the three levee alternatives. By placing the fill on top of the existing footprint, this configuration takes advantage of the consolidated material that has been previously placed for the MRL. This alternative may require an additional 15-feet beyond the new floodside and protected side toes to establish the vegetation-free corridor. However, on the floodside this alternative may have little impact since a 40-foot vegetation free corridor (maintenance corridor) already exists under the MRL project. Since this alternative requires right-of-way on the protected and floodside it may have impacts to industrial, commercial, and residential properties. Construction of this levee configuration may also require clearing of trees located on the batture. Figure 13 provides an illustration of a floodside shift of the existing levee centerline.

2.3.2.3.3. All-Earthen Levee – Protected Side Shift

This alternative would require additional new right-of-way on the protected side of the levee. This alternative would tie into the existing floodside toe in most areas, and shift the centerline and footprint of the levee towards the protected side, resulting in the need for additional right-of-way. In certain areas, the floodside toe would also shift riverward as a result of the need for 1 vertical on 3 to 4 horizontal on the protected side.

This alternative would not require an additional 15-feet on the floodside as a 40-foot vegetation-free corridor (maintenance corridor) already exists under the MRL project. However, 15-feet would be required on the protected side beyond the new protected side toe to establish the vegetation-free corridor where only mowed grass would be allowed. Since this alternative requires right-of-way on the protected side, it is likely to have the most impacts to industrial, commercial, and residential properties. Figure 14 provides an illustration of a floodside shift of the existing levee centerline.

2.3.2.3.4. Floodwall (T-wall)

The floodwall alternative would be a T-Wall design and would be constructed to the required elevations sufficient for a 50-year project life. Therefore the proposed T-wall would be built to the projected 2057 design elevations of 24.5 feet. A floodwall alternative would follow the alignment of the existing MRL centerline and fit within the ROW of the existing levee. While the floodwall would be constructed on top of the existing levee, it is expected that the 15-foot vegetation-free corridor, where only mowed grass would be allowed, would still be required. Figure 15 provides an illustration of the floodwall (T-wall) alternative.

Construction of a floodwall will initially require degrading the existing levee to a sufficient elevation to construct the base of the T-Wall. Sequential activities required to construct the T-wall would include driving batter piles along the degraded protected and floodside slopes of the levee, driving sheetpile along the centerline of the existing levee, forming and pouring the stabilization slab and structural concrete for the T-wall, installation of floodgates, construction of access roads along the floodside and possibly the protected side crown of the T-wall, and backfilling of degraded clay material along the protected and floodside slopes of the levee. All earthwork will be performed using industry standard equipment for this purpose, such as scrapers, bulldozers, motor-graders, and front-end loaders for removing, placing, shaping, or moving earth. All piles (including sheet piles) will be driven using tracked pile driving equipment, either air actuated, drop hammer, or vibratory, depending on the particular use/application. The floodgate widths will vary at each location, but will generally range from 24 feet to 60 feet wide. The gates will be either "swing" or "roller" type. A swing gate consists of a large fabricated steel panel, hinged on one side, and placed so that flood water pressure will push on the gate in the direction of its swing when in the closed position. A roller gate will also consist of a large fabricated steel panel placed on the flooded/river side of the wall, which slides/rolls into place. All gates will be constructed with the same general arrangement and dimensions as the T-Walls. Furthermore, all gates are equipped with rubber seals for controlling leaks.

In some locations, the levee would be degraded below the hurricane still water level; however, it will not be degraded below the MRL flow line, which is the maximum still water level for a riverine event based on the 1973 project flood. During the course of construction, the contractor will be allowed to degrade no more than 5,000 consecutive linear feet of the levee at a time per a construction contract. The contractor will be required to have a plan in place to flood fight and close these opening prior to a hurricane or high water event. Since this is a requirement for both a hurricane event as well as a high water event, this limitation will be in place for the entire construction duration.

For operation and maintenance (O&M) the design of the floodwall will include vehicle access on floodside and possibly the protected side to facilitate routine inspections. O&M would also include cutting grass and removing any debris or shrubbery that may accumulate on the levee slopes and in the vegetation free corridors. It would also include weed control at the base of the floodwall.

Figure 12
All-Earthen Levee – Floodside Shift

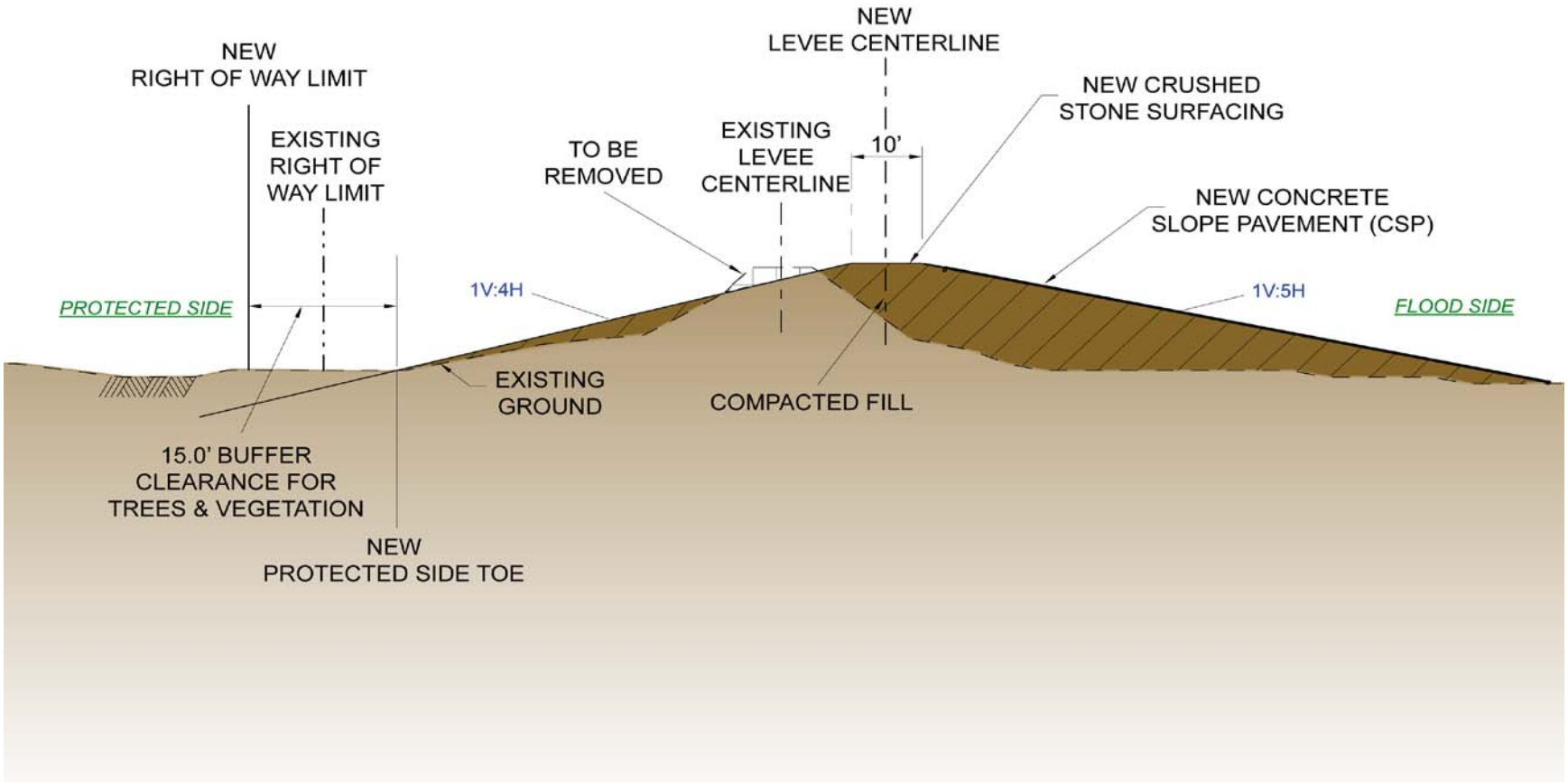


Figure 13
All-Earthen Levee - Straddle

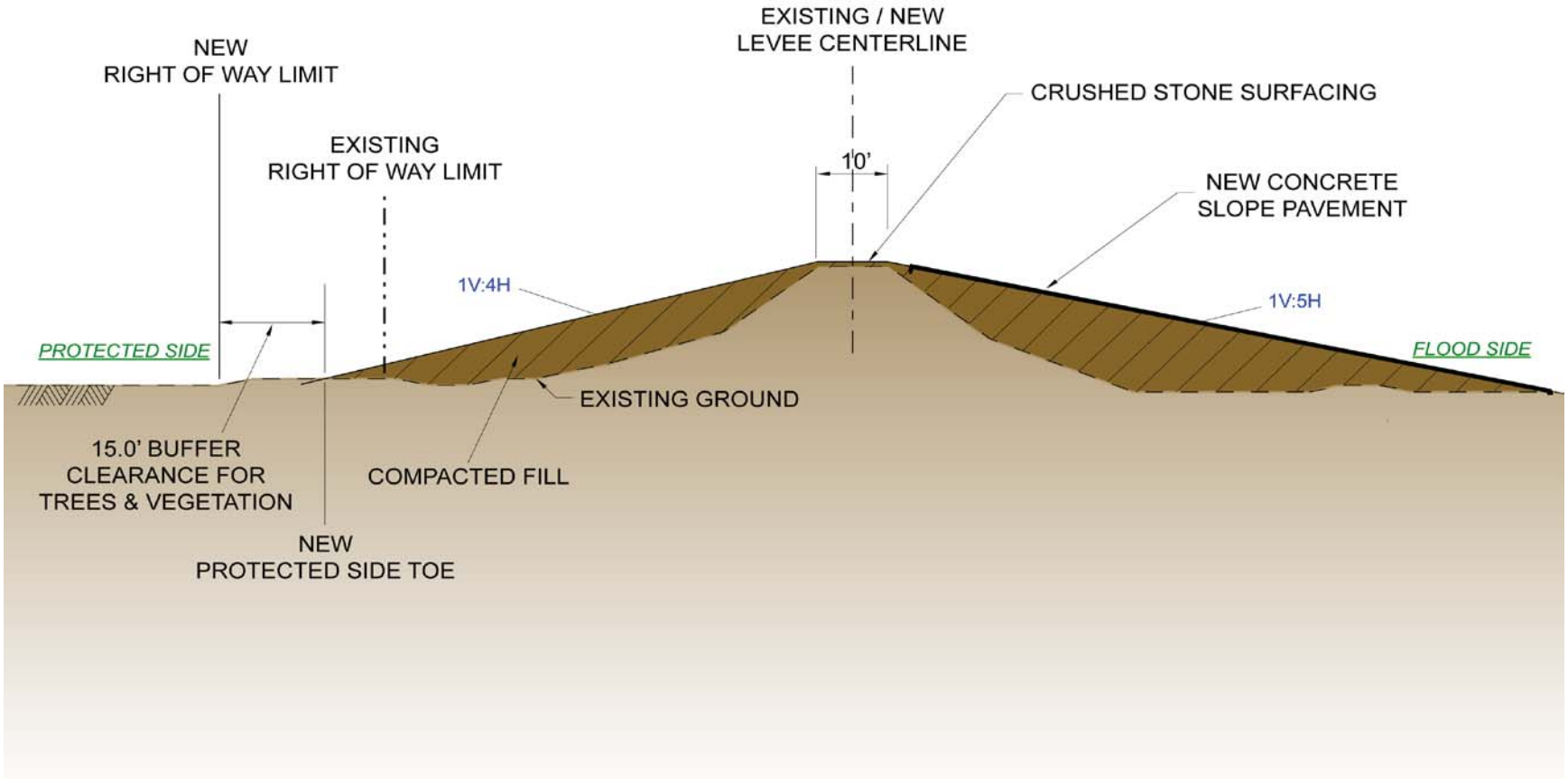


Figure 14
All-Earthen Levee – Protected Side Shift

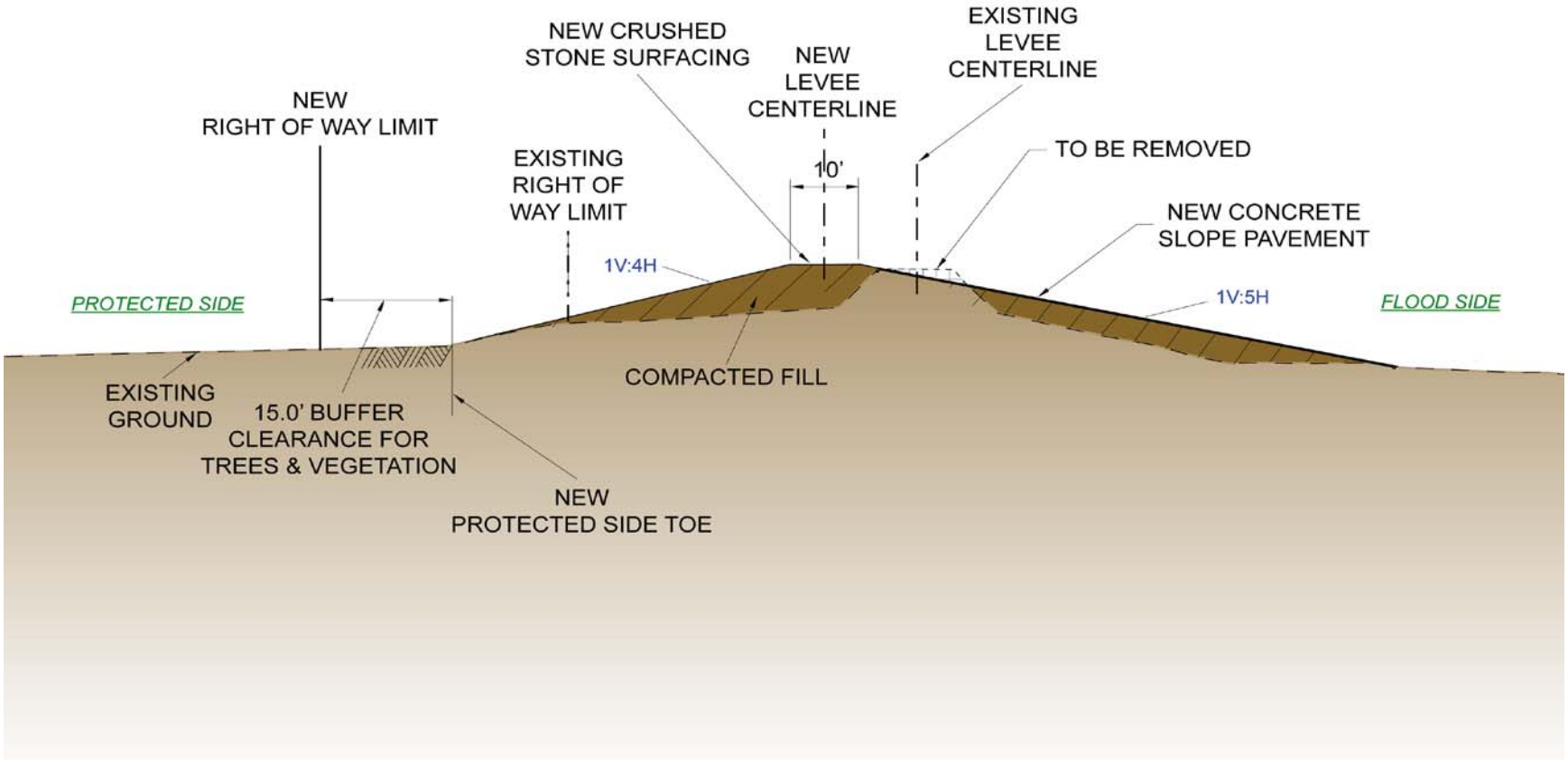
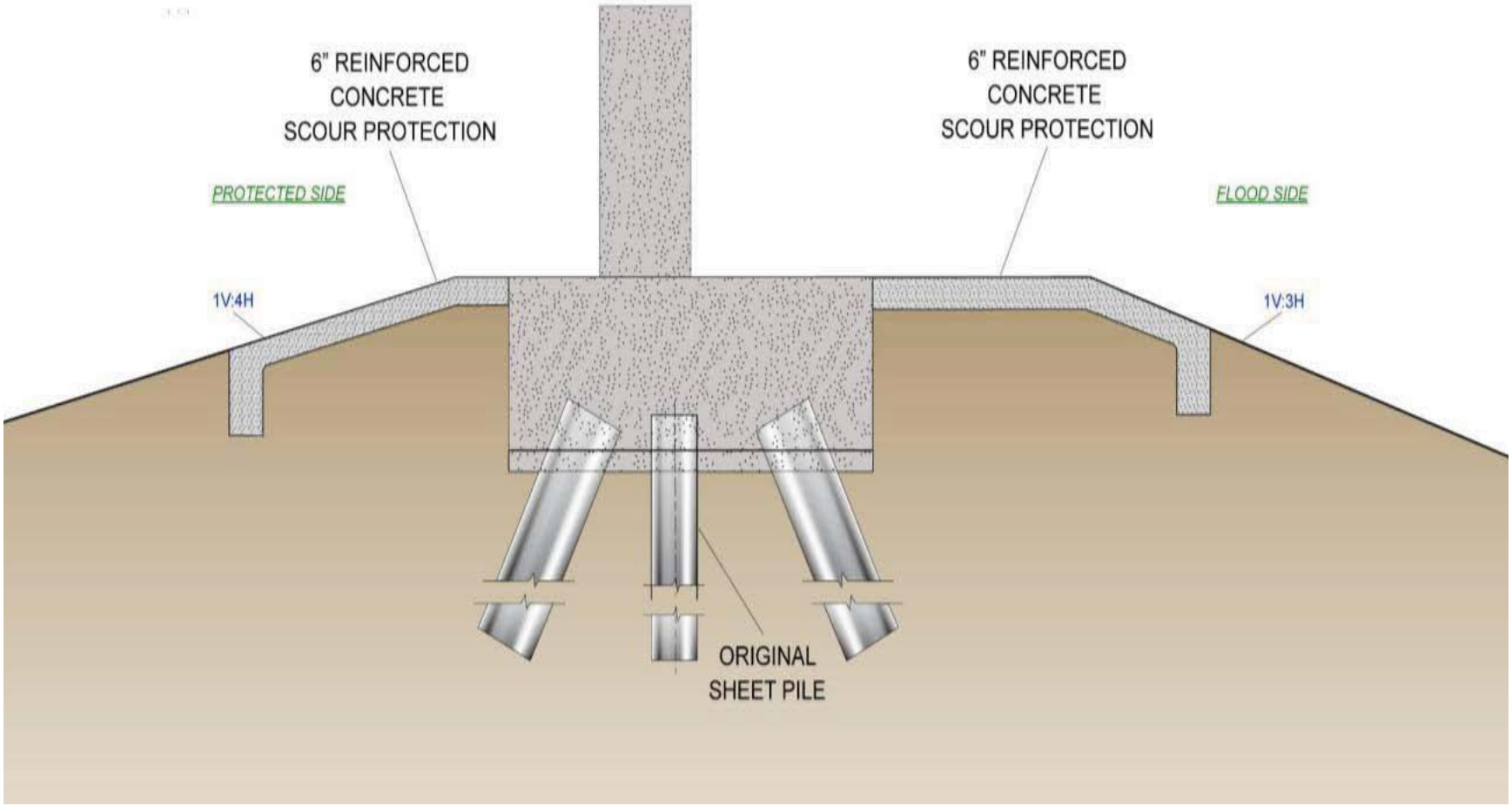


Figure 15
Floodwall (T-wall)



2.3.2.3.5. Provision of Acceptable Borrow

The earthen material for constructing the project will be obtained from either Government or contractor-furnished borrow areas that have been previously investigated for use in other IERs. Table 4 presents the contract-reach specific material quantities for the all-earthen levee alternative and floodwall reaches as well as the materials necessary to replace the concrete slope pavement and finish the crown cap. All fill material used for the construction would be free from masses of organic matter, sticks, branches, roots, and other debris including hazardous and regulated solid wastes. Not more than 1 percent (by volume) of objectionable material would be allowed in the earthen material placed in the levee section.

For those staging/stockpile areas previously described under each contract reach, the option remains for the individual contractors to haul and stockpile borrow material within those designated areas. The amount of borrow material stockpiled within any one of those respective areas would be left up to the individual contractors as each site could be utilized for either staging, stockpile or some combination of both. Additionally, for any contract reaches that require additional stockpile areas, borrow would be obtained from any previously investigated borrow area and transported to processing areas within the existing Walker Road borrow pit complex. The Walker Road borrow pit complex was selected as an additional stockpile and processing site because of the ongoing actions (e.g., borrow excavation activities and disposal of excavated materials) at this location that have been previously evaluated in the West Bank and Vicinity, East of Harvey Canal Final EIS, Environmental Assessment #433 (USACE, 2006), IER #12 and IER #33. Figures 16, 17, 18, 19 and 20 show the location of the Walker Road Borrow Pit Complex and aerial photographs taken in October 2010. These sites still remain active for HSDRRS work.

2.3.2.3.5.1. Material Transportation

All materials to be hauled to the construction sites or to be removed from the construction sites, including debris, would be hauled in trucks with secured binders on tailgates to the place of destination. The route for trucks carrying material to and from the job site, and to and from the borrow area will utilize both public and private roads and will be approved by MVN prior to use. During construction, equipment (i.e., front-end loaders and street sweepers) would be used to keep public streets used for the transport of material or for access and egress from the construction site free and clean of mud and other debris resulting from hauling operations.

The contractors would be required to provide hard-surfaced truck wash-down racks (e.g., steel grated structure, wooden timber crane mats, or equivalent) located at a point of egress from the construction site during hauling operations to minimize mud and debris transported onto public roads. All trucks utilized for hauling would be pressure washed on the wash-down rack before departing the construction site and the truck wash-down rack would be sized and located within the rights-of-way.

Table 4.
Construction Material Estimates

Contract Reach	Length of Segment (Feet)	Clay Fill Material to Construct (Cubic Yards)[2]	Concrete (T-wall Stab. Slab, Concrete Slope Pavement) (Cubic Yards)[2]	Sheet Piling (Square Feet)[2]	Pipe Pile (Linear Feet)[2]	Crushed Limestone for New Crown (Cubic Yards)[2]	Fertilize, Seeding and Mulching (Acres)[2]	Construction Duration (Calendar Days)[1]
1.2a	5,000	8,833	16,685	238,500	254,400	1,500	7	346
1.2b	5,000	149,000	24,600	N/A	N/A	1,500	8	194
2.2	6,700	11,667	22,037	315,000	336,000	1,700	12	385
3.2	13,000	378,000	68,900	N/A	N/A	4,000	22	431
4.2	5,400	11,333	21,407	306,000	326,400	1,600	9	368
5.2	18,500	212,000	40,800	N/A	N/A	2,500	12	266
Totals	48,200	770,833	194,429	859,500	916,800	12,800	70	

[1] Overall construction durations may be less as multiple areas could be constructed simultaneously.
[2] Quantities may increase/decrease as finalized designs are not complete.

Figure 16
Walker Road Borrow Pit Complex

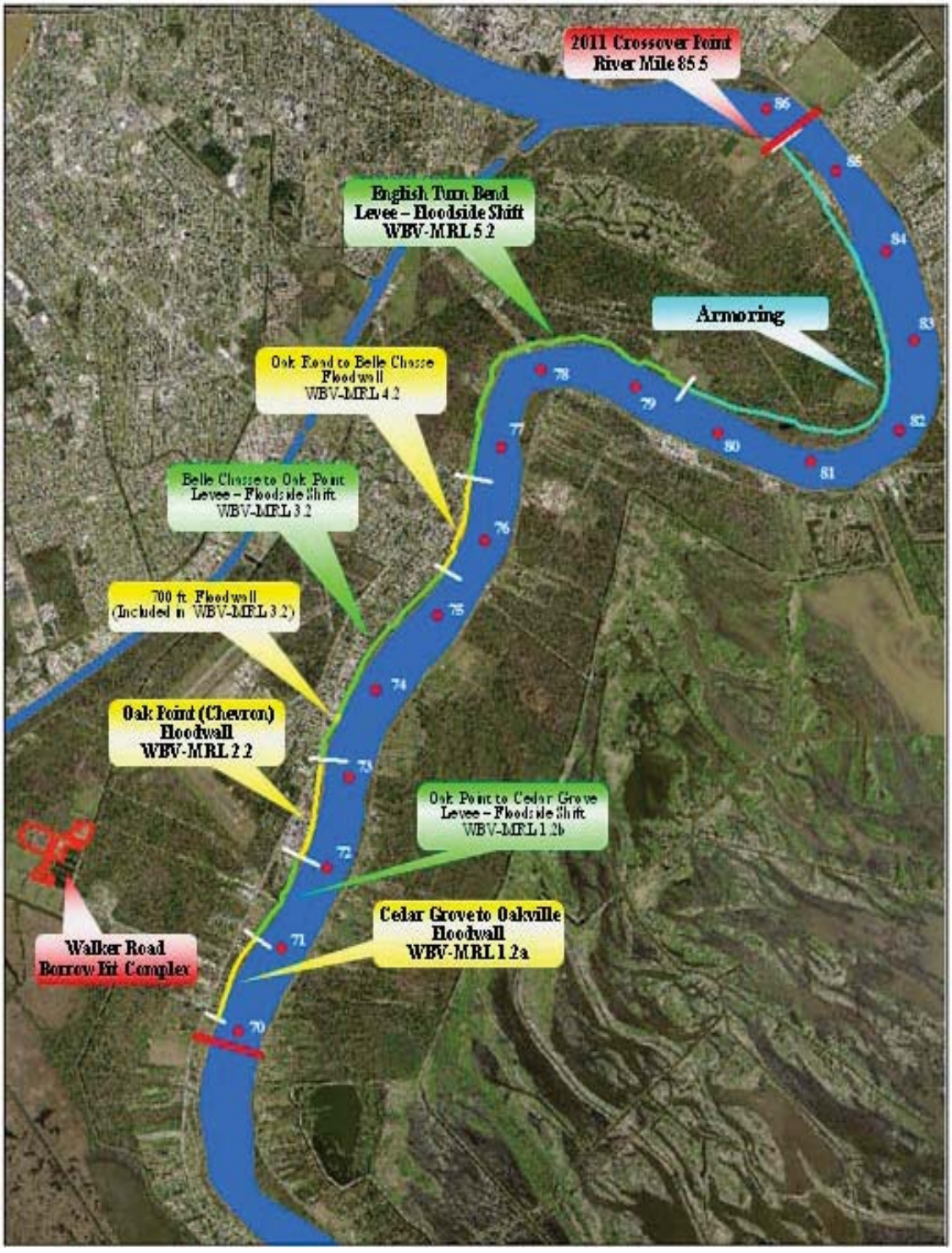
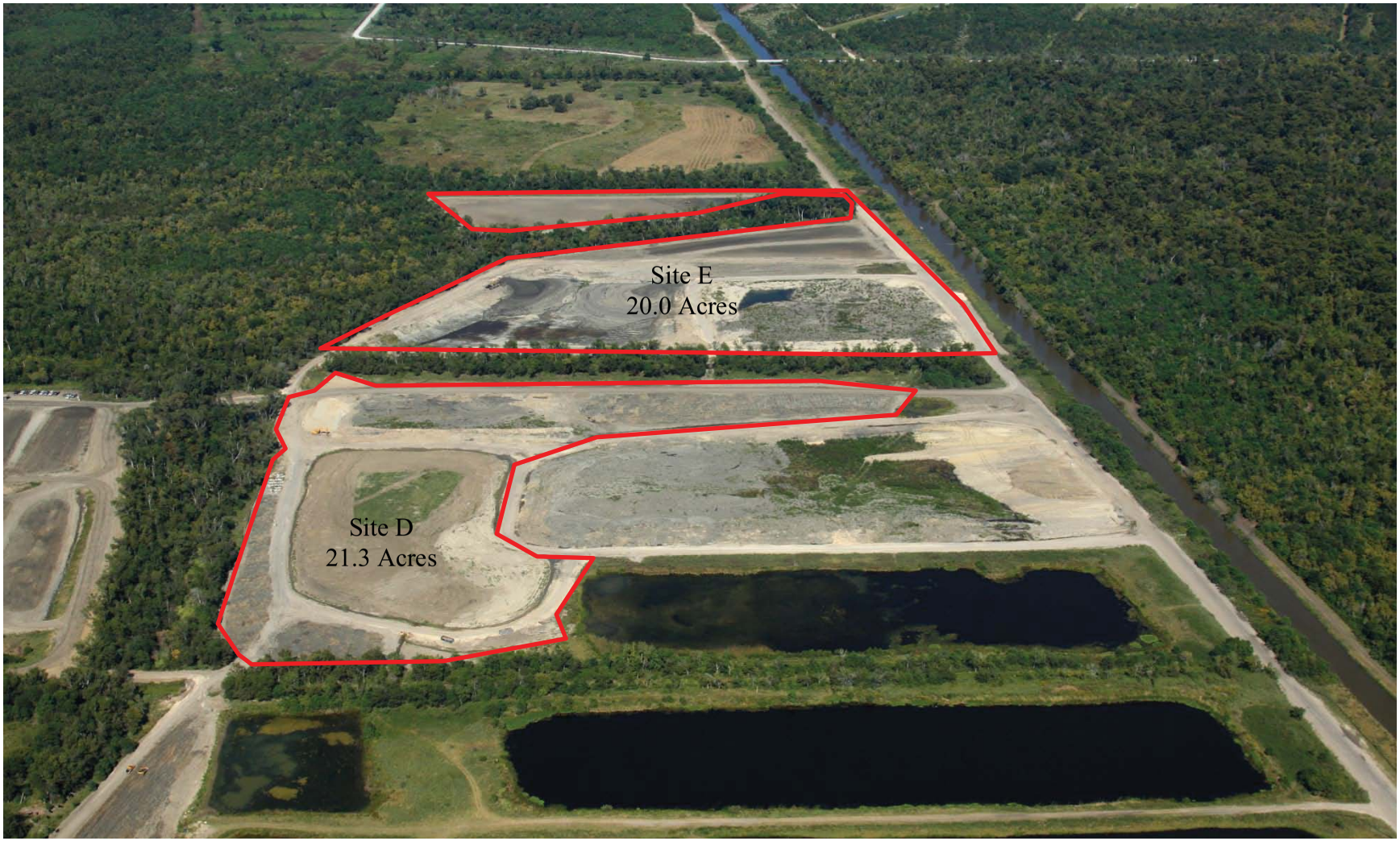


Figure 17
Walker Road Borrow Pit Complex – Sites A, B, C, D and E

Figure 18
Aerial View of Sites A and B at Walker Road Borrow Pit Complex

Figure 19
Aerial View of Site C at Walker Road Borrow Pit Complex

Figure 20
Aerial View of Sites D and E at Walker Road Borrow Pit Complex



Operation of truck wash down racks would not include use of detergents and rinse water generated would be intercepted before draining offsite. The sediments resulting from operation of truck wash down racks would be utilized in the job or disposed of as construction debris.

It is possible that contractors may elect to transport borrow material via barge from borrow sources to offload sites located along the river near the project area. It is expected that any designated offload sites would be licensed, permitted facilities approved to accept and stockpile bulk fill material. Any proposed offload sites that are not licensed, permitted facilities approved to accept and stockpile bulk fill material may require supplemental IER environmental approval and/or Corps Regulatory permit issuance. Environmental impacts and compliance for excavation, hauling to barge loading sites, loading of barges, and barging material to offload sites are addressed in separate IERs that are incorporated here by reference.

2.3.2.3.5.2. Material Placement

The existing levee would be scarified (i.e. the surface would be roughened) before placement of the new embankment material so that newly added material would bind to the clay material of the existing levee. Both the stabilized and un-stabilized soil embankment material would be placed and spread in successive lifts (before compaction). Layers would be started full, out to the slope stakes and would be carried substantially horizontal and parallel to the levee centerline with sufficient crown or slope to provide drainage during construction. Fill would not be placed upon frozen ground and the land-side side slope of the levee would be left rough or scarified to reduce the velocity of water runoff during and after construction.

2.3.2.4. Armoring

Armoring will be provided for critical areas of the Hurricane and Storm Damage Risk Reduction System (HSDRRS). An "Armoring Team" has been established of USACE employees, with the support of contractors, academic researchers, and other agencies to provide research and planning for the use of armoring against erosion and scour on the protected side of selected critical portions of levees and floodwalls in the HSDRRS. These critical areas include: transition points (where levees and floodwalls transition into any hardened feature such as other levees, floodwalls, pump stations, etc.), utility pipeline crossings, floodwall protected side slopes, and earthen levees that are exposed to wave and surge overtopping during a 500-year hurricane event. The Armoring Team will be guiding the design PDT in this process by providing an Armoring Manual for design guidance and criteria. This manual will be the basis for decisions on what should be armored and how armoring should take place. As previously stated, additional armoring work will be required for the entire Co-Located levee project area from river mile 85.5 to 70, and will be the only construction activity located within Orleans Parish.

The Armoring Team defines resiliency as the capacity of the levee/floodwall to resist, without catastrophic failure, overtopping (wave and surge) caused by a storm which is greater than the design event. A Resilience Team has been formed to validate the Armoring Team's initial focus. MVN Engineering Division is leading the Resiliency effort to certify the practicality and applicability of using the 500-year storm event for armoring. The armoring methods to be implemented in the permanent design are anticipated to provide erosion protection such that the

structure will be resilient to the 500-year event, or more defined as the ability of the structure to provide protection during events greater that the design event without catastrophic failure. The following armoring methods are under consideration and the appropriate combination of methods will be applied throughout the earthen levee projects included in the HSDRRS:

- ACB – Articulated Concrete Blocks;
- ACB/HPTRM – The physical conditions or hydraulic parameters are such that small modifications could allow a reduction to a HPTRM (High Performance Turf Reinforcement Mattress);
- HPTRM;
- HPTRM/Grass – The physical conditions or hydraulic parameters are such that small modifications could allow a reduction to a surface with good grass cover only;
- Good grass cover.

The tentatively recommended alternative selected by the Armoring Team for the all-earthen levee reaches is the High Performance Turf Reinforcement Mat (HPTRM). The HPTRM shall either consist of nondegradable synthetic fibers, monofilaments, mesh and/or other elements processed into three dimensional matrix, not greater than 1/2" thick or shall be lofty woven polypropylene geosynthetic specially designed for erosion control applications on levees, steep slope and vegetated waterways. HPTRM will only be installed in the areas where a full levee section has been constructed. Installation of this material would require that existing turf be cleared and grubbed, a small layer of soil would then be added as needed for leveling (6-inches plus or minus), the HPTRM would be laid on the bare soil and either sod will be placed directly atop the HPTRM, or a veneer of 2 to 3 inches of topsoil will be placed. All areas would be seeded, fertilized and mulched as described in the earlier sections of this IER Supplement (Figure 21).

The armoring required for floodwalls will be a hybrid of materials to accomplish the required level of armoring. For instance, the interim floodwall repairs curtailed the concrete splash pads midway down the levee slope. The Armoring Team suggests that these pads be extended down the entire slope of levee and be curtailed at the toe in order to eliminate a transition in a critical part of the levee section. Transitions have been a significant part of the Armoring Team's effort to date. The transitions from structures to floodwalls to sheet pile are being addressed with detailed design drawings and will be forwarded to the individual design PDTs to aid them in their site-specific designs. Pipeline crossings are also being identified by the Relocations Section in CEMVN. The Armoring Team is reviewing their detail drawings and requirements to include armoring features. These drawings will need additional review and will ultimately be forwarded to those utility owners that are responsible for the work.

Construction of armoring above the WBV-MRL 5.2 contract reach, from approximately river mile 79.5 to 85.5, would require approximately 6 acres of new ROW, would require the clearing, grubbing, and fill of approximately 9 acres of non-wet forested habitat, and would temporarily impact approximately 24 acres of mowed marsh vegetation.

Figure 21
High Performance Turf Reinforcement Mat

2.3.2.5. Fertilizing, Seeding and Mulching

The land resources within the project boundaries and outside the limits of permanent work performed under this project would be preserved in their present condition or be restored to a condition that would appear to be natural and not detract from the appearance of the project. The contractor would remove all signs of temporary construction facilities such as work areas, structures, foundations of temporary structures, and stockpiles of excess or waste materials upon completion of construction. The contractor would be required to restore the construction area to near natural conditions that would permit the re-growth of vegetation.

Fertilizing, seeding, and mulching would be performed on all disturbed areas within the construction limits. Fertilizing and seeding operations would begin immediately after the completion of embankment construction.

2.3.2.5.1. Application of Fertilizer

In disturbed areas, fertilizer would be distributed uniformly over areas to be seeded and would be incorporated into the soil to a depth of at least two inches by disking, harrowing, or other acceptable methods.

2.3.2.5.2. Seeding

After fertilizer had been applied, seed would be sown using approved mechanical power-drawn seeders, mechanical hand-seeders, broadcast-seeders, or other approved methods. When delays in operations extend the work beyond the most favorable planting season for the species designated, or when conditions are unfavorable (e.g., drought, high winds, excessive moisture), seeding would be halted and resumed only when conditions are favorable.

2.3.2.6. Windrowing – Concrete Slope Pavement

During construction of the Resilient Features, concrete slope paving material located on the existing MRL floodside slope will be demolished as a result of the proposed levee and floodwall construction activities. Windrowed concrete is typically needed to protect the bottom ribbon of new concrete slope pavement as well as newly placed fill material in the floodside toe trench from wave erosion when the river initially floods the batture during the spring high water season. The newly constructed concrete dike breaks the waves before they have a chance of eroding the fill placed in the toe trench which would lead to undermining of the newly placed slope pavement. Once the river rises and gets on the slope pavement there's little chance of waves undermining the slope pavement.

It is expected that this material would be broken into various sizes and shapes and hauled into the existing 40-foot vegetation free corridor (maintenance corridor) where it would be windrowed at the edge of the new corridor along the existing batture tree line. Construction equipment such as dozers, excavators and front end loaders would be used to push and stack

the broken concrete material against the tree line forming a mound approximately 3-feet high by 9-feet wide. The broken concrete material would be windrowed in 500-foot segments with 9-foot gaps remaining between each segment. In areas where little to no batture is available, typically within the floodwall contract reaches, the broken concrete material would not be windrowed and would likely be disposed through previously described methods.

Windrowing concrete slope paving material, for all WBV-MRL contract reaches, may require fill of approximately 11 acres of forested wetlands.

2.3.3. Relocations

Along the existing Mississippi River Levee, Department of the Army permits, where applicable, and local levee board permits grant access for facility and utility owners to locate pipelines, electrical cables, power lines, and other types of utilities to cross the levee. Due to the fact that the MRL pre-dated nearly all types of utilities, it is assumed that all facility relocations will be non-compensable and the owners will be responsible for all utility relocations. Table 5 identifies all facilities requiring relocation within the co-located area.

Table 5
Project Relocations by Contract Reach

Contract Reach	Utility Type	Owner	Orientation	Latitude	Longitude
1.2a	Pole	To be determined		29°47'28.945"N	90°1'8.891"W
	Guy Wire	Entergy	Aerial	29°47'25.79"N	90°1'11.203"W
	Guy Wire	Entergy	Aerial	29°47'22.009"N	90°1'14.154"W
	Pole	Entergy		29°47'22.009"N	90°1'14.154"W
	Ramp	To be determined		29°47'4.614"N	90°1'22.911"W
	Pipeline	Leon Duplessis and Sons, Inc.	Buried	29°47'3.569"N	90°1'23.329"W
	Ramp	To be determined		29°46'57.884"N	90°1'25.675"W
	Communications	AT&T	Aerial	29°46'57.727"N	90°1'25.739"W
	Communications	AT&T	Aerial	29°46'57.727"N	90°1'25.739"W
	Ramp	To be determined		29°46'56.218"N	90°1'26.315"W
1.2b	Communications	AT&T	Aerial	29°48'6.744"N	90°0'42.922"W
	2-Pipelines	Enterprise	Buried	29°47'46.891"N	90°0'54.48"W
	Pipeline	To be determined	Buried	29°47'45.671"N	90°0'55.559"W
2.2	Powerline OH	Entergy	Aerial	29°49'2.051"N	90°0'24.864"W
	Communications	AT&T	Aerial	29°49'2.051"N	90°0'24.864"W
	Water Line	Port Ship Service	Aerial	29°49'1.806"N	90°0'24.889"W
	Pipeline	Chevron	Aerial	29°48'34.163"N	90°0'29.918"W
	Pipelines	Chevron	Aerial	29°48'33.932"N	90°0'29.988"W
	Pipelines	Chevron	Aerial	29°48'33.605"N	90°0'30.1"W
	Pipelines	Chevron	Aerial	29°48'30.919"N	90°0'31.053"W
	Pipeline	Severn Trent Services	Aerial	29°48'12.678"N	90°0'41.095"W
3.2	Ramp	To be determined		29°50'16.597"N	89°59'50.237"W
	Communications	AT&T	Aerial	29°49'35.167"N	90°0'13.638"W
	Waterline	Belle Chasse Marine Transport	Buried	29°49'35.042"N	90°0'13.688"W
	Ramp	To be determined		29°49'35.042"N	90°0'13.688"W
	Powerline OH	Entergy	Aerial	29°49'34.848"N	90°0'13.778"W

4.2	Guy Wire	Entergy	Aerial	29°51'45.402"N	89°58'49.93"W
	Powerline	Entergy	Aerial	29°51'41.356"N	89°58'50.712"W
	Powerline	Entergy	Aerial	29°51'41.106"N	89°58'50.779"W
	Powerline	Entergy	Aerial	29°51'40.869"N	89°58'50.814"W
	Ramp	Entergy		29°51'40.424"N	89°58'50.916"W
	Powerline OH	Entergy/AT&T	Aerial	29°51'40.119"N	89°58'50.976"W
	Waterline	Sun Drilling Products	Buried	29°51'31.568"N	89°58'51.931"W
	Ramp	Belle Chasse Ferry		29°51'21.253"N	89°58'55.411"W
	Waterline	Severn Trent	Buried	29°51'21.253"N	89°58'55.411"W
	Powerline OH	Entergy	Aerial	29°51'21.191"N	89°58'55.428"W
	Communications	AT&T	Aerial	29°51'21.191"N	89°58'55.428"W
	Pole	Entergy		29°51'20.934"N	89°58'55.535"W
	Powerline OH	Entergy	Aerial	29°51'17.344"N	89°58'57.254"W
	Ramp	To be determined		29°51'17.198"N	89°58'57.304"W
	Guy Wires	Entergy	Aerial	29°51'16.081"N	89°58'57.79"W
	Ramp	To be determined		29°51'15.943"N	89°58'57.832"W
	Waterline	Severn Trent	Buried	29°51'15.867"N	89°58'57.881"W
	Waterline	Severn Trent	Buried	29°51'15.867"N	89°58'57.881"W
	Waterline	Severn Trent	Buried	29°51'15.867"N	89°58'57.881"W
	Pipeline	To be determined	Buried	29°51'13.801"N	89°58'58.868"W
	Pipeline	To be determined	Buried	29°51'7.295"N	89°59'0.849"W
	Ramp	To be determined		29°51'7.295"N	89°59'0.849"W
	Fence	To be determined		29°51'32.744"N	89°58'51.835"W
	Fence	To be determined		29°51'25.676"N	89°58'53.329"W
	Fence	To be determined		29°51'18.598"N	89°58'56.653"W
	Fence	To be determined		29°51'15.673"N	89°58'57.995"W
	Fence	To be determined		29°51'14.258"N	89°58'58.654"W
5.2	Guy Wire	Entergy	Aerial	29°53'7.074"N	89°58'2.391"W

2.3.4. Temporary Flood Risk Reduction Contractually Required During Construction

As part of the construction process, temporary flood risk reduction would be required if material has been removed from a reach of the existing levee and either high water on the Mississippi River is predicted or a tropical weather system is approaching. Typically, the contractor would provide temporary risk reduction by means of earthen fill, a cofferdam, Hesco® baskets, sheet pile, or other engineering methods that would in no way affect the stability of the existing flood risk reduction feature or flood risk reduction feature being constructed. All such temporary measures would be reviewed and approved by the CEMVN prior to placement. The type of measures proposed and implemented would be based on multiple considerations including the severity of the expected high water or storm, the degree to which the levee has been compromised, and the length of the levee needing additional measures.

The contractor would maintain all temporary flood control, including maintaining and operating drainage facilities, during the time they are required. It would be the responsibility of the contractor to provide, maintain, and operate pumps of adequate capacities, for the removal of the water that could accumulate in excavations within the construction area from whatever sources throughout the construction period. The contractor would remove all temporary flood control structures, and incidental features when no longer required. All

materials used in providing temporary flood control structures, and any debris generated during their removal would remain the property of the contractor and be removed from the job site before completion.

Before beginning work, the contractor would submit their proposed plan to accomplish the specified temporary flood risk reduction for CEMVN approval. The submittal would be in accordance with Section 01330, "Submittal Procedures" and would include, but not necessarily be limited to the following:

1. Design and layout of temporary flood risk reduction works,
2. Methods and duration of maintenance of temporary flood risk reduction,
3. Methods, sequence, and equipment and materials to be used for drainage of excavations, and
4. Method and sequence of removal, including disposal of materials.

These measures provide assurance that risk reduction would be maintained during the construction process even in the event of high water on the Mississippi River or the threat of a tropical weather system.

2.4. Alternatives Eliminated from Further Consideration

The criteria used to determine whether an alternative would be feasible included consideration of engineering effectiveness, economic efficiency, and environmental and social acceptability.

2.4.1. Non-Structural Risk Reduction Alternatives

The non-structural measures alternative includes options that might significantly reduce flood damage without the construction of major flood risk reduction structures. Such measures include raising residential and commercial structures in flood prone areas, structure relocation, and rezoning, among others. Generally, each of these potential options incurs high costs and could have high socioeconomic impacts, while providing limited and varying levels of flood damage relief.

Independently, non-structural measures cannot achieve the Federal statutory mandate of the 1-percent level of risk reduction in the project area. Non-structural measures reduce flood damages without significantly altering the nature and extent of flooding, so a gap would occur in the required 100-year level of risk reduction for the WBV if this option were pursued. Flood damage reduction is achieved from non-structural measures by changing the use of the floodplain, or by accommodating the uses there to the flood hazard. The typical non-structural measures employed to reduce flood damage risk include structure relocations, raising the elevation of structures, flood proofing, and regulation of the use of the floodplain. The screening of non-structural measures is summarized below.

2.4.1.1. Structure Relocations

One way to reduce damages from storms and hurricanes is a mandatory public acquisition of vulnerable properties in areas subject to flooding. Acquisitions would be accomplished pursuant to the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, which mandates financial assistance or compensation to owners of properties affected by Federal actions. Accordingly, a non-structural program based on acquisition of commercial and residential properties in flood-prone areas would be subject to these guidelines, including payment of just compensation for the acquired properties and payment of Uniform Relocation Assistance Benefits under Title II of the Uniform Act for the displacement of individuals, families, businesses, farms, and non-profit organizations.

Two primary options exist under this alternative: (1) relocation of the structure to a comparable site outside of the area of flooding; and (2) acquisition of the structure and site by the local sponsor for demolition of the structure. Neither of these options is considered as viable under the existing circumstances. The entire Belle Chasse polder, town of Oakville, and industry along this section of the MRL (e.g., Chevron Oronite) would require relocation if excluded from the HSDRRS. Acquisition and relocation would be prohibitively expensive--approximately 1.5 billion dollars (USACE, 2009).

2.4.1.2. Acquisition of Flood Prone Structures

Permanent evacuation of the floodplain involves acquisition of land and structures by fee purchase or by exercising powers of eminent domain. Following acquisition, all structures and improvements are demolished or relocated. Buyout costs for approximately 1,275 residential structures in the immediate vicinity could exceed $180 million (1,275 x $144,000) and relocation costs under the Uniform Relocation Assistance Act could total an additional $20 million. The cost savings in annual flood insurance premiums, assuming 100 percent flood insurance participation by every property in the flood zone would equal roughly $240,000. This is the maximum value of the potential flood damage reduction benefits of relocation plans. Relocation of the Standard Project Hurricane floodplain structures would result in a maximum savings of $240,000 in average annual flood damage reduction benefits, compared to over $200 million in average flood damage reduction costs (the total cost of acquisition and relocation). Under this alternative, the affected property owners would relinquish title to their existing lot in exchange for ownership of the property to which they were relocated.

No new use value would be attributed to the vacated lands. No value would be associated with reduced damages to public property, such as roads and utilities. Minor reduction in emergency services costs would be gained. No reduction in administrative costs of the National Flood Insurance Program (NFIP) and disaster relief programs would be anticipated.

While environmental benefits of a buyout in the study area initially appear to be attractive, more detailed analyses of the potential benefits cannot support a positive recommendation for

an acquisition/relocation plan. Restoring the ecosystem through the acquisition of flood-prone structures would generate benefits, but it is highly unlikely that these benefits would be sufficient to justify the approximate $200 million cost of the relocation of all structures in the SPH floodplain, or the scaled costs of smaller relocation efforts. Establishing Federal, state, or regional significance would be problematic because there are no designated habitats for Federal or state listed species within or near the study area. Regarding the Other Social Effects (OSE) and Regional Economic Development (RED) Accounts, the social and economic impacts resulting from the necessary displacement of 1,275 households, 20 businesses and public buildings, the demolition of an equivalent number of buildings of all types, and the removal of tens of millions of dollars in property value and tax base would have significant negative effects on the local economy. The plan would also generate significant local controversy, disrupt community cohesion, and place economic burdens on relocated families, relatives, and neighbors.

For the reasons cited previously, it is unlikely that a floodplain buyout plan would meet P&G guidelines (Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies). Additionally, the buyout plan would not provide significant offsetting environmental or economic benefits, and would have negative effects on the RED and OSE Accounts. Therefore, acquisition of flood-prone structures was eliminated from consideration as a stand-alone alternative.

2.4.1.3. Geotextile Reinforced Levee

A geotextile reinforced levee would allow construction of a levee to higher elevations without greatly increasing the footprint of the levee. It would also offer additional stability to an earthen levee. However, construction of this alternative would require degrading the existing Mississippi River Levees in order to place the geotextile fabric at the base of the levee. Since the Mississippi River Levees serve to reduce the risk of flooding from a riverine event, it would not be practical to completely degrade the levees, and expose communities to an increase risk of flooding. Therefore this alternative was eliminated from further consideration.

2.4.1.4. Slope Flattening

The existing Mississippi River Levees are constructed with a 1 vertical on 3 horizontal flood side slopes. Hydraulic analysis has indicated flattening of this slope from a 1 vertical on 3 horizontal to a 1 vertical on 4 horizontal would attenuate the waves thereby reducing the wave run up volume, and the resulting required elevation for the top of the levee. This option would only be viable in locations where sufficient batture is located on the floodside in order to accommodate the increased levee footprint. This alternative would increase the floodside footprint to equal or greater than a levee enlargement with the centerline shifted towards the floodside. Therefore, it was eliminated from further consideration since it did not afford any benefits over a levee with a floodside shift of the centerline.

2.4.1.5. Slope Roughening

The MRL Detailed Assessment document (USACE, 2010f) indicates that the design height can be reduced by 1 ft through slope roughening. An analysis was performed to determine an appropriate design for slope roughening (Wave Break Alternative Analysis). Essentially slope roughening affects the energy of the wave column thereby reducing the height of the waves. The results show that for all cases the required crest elevation for the wave break is approximately 2 feet below the mean still water elevation.

The Detailed Hydraulic Assessment MRL system report dated September 14, 2009 states: "Another option not to raise the flood defense system is considering roughening or flattening the slope to 1:4. These options can be applied to overcome 0.5– 1ft of elevation deficiency. Note that no rubble mound is necessary to gain this elevation reduction, simple small blocks over 1/9 of the surface could be sufficient. However, roughening should be viewed as an option of last resort or local measure since the system needs to be upgraded in the future which makes hardening of the outer slope a non-sustainable solution." However, the flood side slopes in the co-located work area are currently hardened. Thus the addition of slope roughening would only increase the difficulty of future work nominally. In addition, slope roughening would reduce the required design elevation by 0.5 to 1 foot. In most locations, this is not sufficient to address the required 1-percent level of risk reduction; therefore, work would still be required to raise the levee section. Therefore, this alternative does not adequately address the requirement to provide 1-percent level of risk reduction.

2.5. Summary

Table 6 summarizes the alternatives that were examined for IERS # 33.a.

Table 6.
Summary of Preliminary Alternative Screening Results

Alternative Alignments/Alternative Scales	Contract Reach Number					
	1.2a	**1.2b**	**2.2**	**3.2**	**4.2**	**5.2**
No-Action	✓	✓	✓	✓	✓	✓
Non-Structural	X	X	X	X	X	X
Existing Alignment	✓	✓	✓	✓	✓	✓
Resilient Features						
• All Earthen Levee	X	✓	X	✓	X	✓
• Flood Side Shift	X	✓	X	✓	X	✓
• Straddle	X	✓	X	X	X	✓
• Protected Side Shift	X	✓	X	X	X	✓
• Centerline Setback	X	X	X	X	X	X
• Floodwall (T-wall)	✓	X	✓	✓	✓	X

• Geotextile Reinforced Levee	X	X	X	X	X	X
• Slope Flattening	X	X	X	X	X	X
• Slope Roughening	X	X	X	X	X	X

✓: Considered in detail.
X: Eliminated from further study.

3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1. Environmental Setting

The project area is located within the Mississippi River deltaic plain, with the Mississippi River acting as the primary influence on geomorphic processes in the delta region. The Mississippi River levees are designed to protect the alluvial valley against the project flood by confining flow between the levees with the exception of areas where it enters the natural backwater areas or is diverted purposely into floodway areas. The Mississippi River Mainline Levee System consists of levees and floodwalls along the river, floodways and control structures. The levee line on the west bank begins just south of Cape Girardeau, Missouri, and extends to Venice, Louisiana.

The Co-Located Project extends from the Eastern Tie-in of the West Bank and Vicinity project with the MRL at Oakville in Plaquemines Parish to a point approximately 9.5 miles upriver southeast of the Plaquemines Parish and Orleans Parish line. In addition to the previously described MRL project area, the Walker Road borrow pit complex, located on Walker Road near Louisiana Highway 23 in Plaquemines Parish, would also be utilized for borrow stockpile and processing activities. Plaquemines Parish is located within the Central Gulf Coastal Plain in coastal southeastern Louisiana. The parish encompasses the current delta of the Mississippi River, which was built up from alluvial silt deposited over centuries when the river was levee-free and overflowed its banks. Elevations range from sea level along the gulf coast, to approximately +15 feet above sea level along natural levee ridges. The study area is located in the northern portions of Plaquemines Parish and the southernmost border of Orleans Parish within the Mississippi River Deltaic Plain of the Lower Mississippi River Ecosystem (USFWS, 2010). Higher elevations in the proposed project vicinity occur on the natural levees of the Mississippi River. Developed lands are primarily associated with those natural levees, but extensive wetlands have been leveed and drained to accommodate residential, commercial, and agricultural development (USFWS, 2010). Federal, state, and local levees have been installed for flood protection purposes, often with negative effects on adjacent wetlands. The Mississippi River is the prominent landscape feature, though residential development and bottomland hardwood forests are present throughout the project area vicinity (USFWS, 2010). Habitat types proximate to the project area include bottomland hardwood wetlands, non-wetland bottomland hardwoods, and open water (USFWS, 2010).

3.1.1. Terrain

The area has little relief and is characteristic of an alluvial plain. Land elevations slope quickly from an average elevation of about 10 feet NAVD88 along the levee of the Mississippi River to about 1 foot to 3 feet below sea level through much of the project area (USACE, 2010e). The Mississippi River levee system reduces the risk of flooding from the Mississippi River throughout the area.

3.1.2. Geology

The project area lies on Mississippi River levee (MRL), which is the land between the river and the land-side. Fluvial activity in river-side includes lateral migration and overbank deposition during flood stages. This activity is the dominant geologic process operating on the landscape in this region (USACE, 2010e).

Soils in the project vicinity typically vary from brown to grayish brown in color with textures ranging from sandy loam to silt loam. Soils on the natural levee in the vicinity of the project area consist of sediments belonging to a soil series that usually consists of dark brown to grayish brown silty loam. Sediments on the natural levee typically vary in texture between silt loams to silty clay loams and normally exhibit a dark grayish brown color. (USACE, 2010e).

Natural levee deposits are highest near the river, and they gradually diminish away from the river. These natural levee deposits consist of medium to stiff clays, silts and fine sands with low water and organic content; these deposits commonly are oxidized. Construction of artificial levees has altered the pattern of deposition and accretion. Fluvial activity now is concentrated within the river-side of the MRL. MRL river-side soils in the project area are frequently flooded, and are somewhat poorly drained silty loams and sandy loams that have developed on narrow floodplain ridges. The soils along the land-side of the levee are silt/loams, silty clay loams and clays (USACE, 2010e).

3.1.3. Climate

The study area has a subtropical marine climate. Located in a subtropical latitude, its climate is influenced by the many water surfaces of the lakes, streams, and the Gulf of Mexico. Throughout the year, these water bodies modify the relative humidity and temperature conditions decreasing the range between the extremes. When southern winds prevail, these effects are increased, thus imparting the characteristics of a marine climate.

The climate of Plaquemines and Orleans Parishes is humid subtropical. 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 parish 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 in the area is 67° (F), with monthly temperatures varying from the mid-90°'s (F) in July and August, to the mid-30°'s (F) in January and February (USACE, 2010e). Average annual precipitation is 57.0 inches, varying from a monthly average of 7.5 inches in July, to an average of 3.5 inches in October (USACE, 2010e).

3.1.4. Significant Resources

This section identifies the significant resources located near the proposed action, and describes in detail those resources that would be impacted, directly or indirectly, by the alternatives. Direct impacts are those that are caused by the action taken and occur at the same time and place (40 CFR §1508.8(a)). Indirect impacts are those that are caused by the action and are later in time or further removed in distance, but are still reasonably foreseeable (40 CFR §1508.8(b)). Cumulative impacts are discussed in section 4.

The resources described in this section are those recognized as significant by laws, executive orders, regulations, and other standards of Federal, state, or regional agencies and organizations; technical or scientific agencies, groups, or individuals; and the general public. Further detail on the significance of each of these resources can be found by contacting the CEMVN, or on www.nolaenvironmental.gov, which offers information on the ecological and human value of these resources, as well as the laws and regulations governing each resource. Search for "Significant Resources Background Material" in the website's digital library for additional information. Table 7 shows those significant resources found within the project area, and notes whether they would be impacted by the proposed action analyzed in this IER Supplement.

Table 7
Significant Resources in Project Study Area

Significant Resource	Impacted	Not Impacted
Air Quality	X	
Water Quality	X	
Terrestrial Habitat	X	
Aquatic Habitat	X	
Fish and Wildlife	X	
Wetlands	X	
Threatened and Endangered Species		X
Recreational Resources	X	
Aesthetic Resources	X	
Cultural Resources	X	
Farmland	X	

Socio-Economics		X
Environmental Justice		X
HTRW		X
Noise	X	

3.1.5. Air Quality

3.1.5.1. Existing Conditions

The U.S. Environmental Protection Agency (USEPA) Office of Air Quality Planning and Standards has set National Ambient Air Quality Standards (NAAQS) for six principal pollutants, called "criteria" pollutants. They are carbon monoxide, nitrogen dioxide, ozone, lead, particulates of 10 microns or less in size (PM-10 and PM-2.5), and sulfur dioxide. Ozone is the only parameter not directly emitted into the air but forms in the atmosphere when three atoms of oxygen (03) are combined by a chemical reaction between oxides of nitrogen (NOx) and volatile organic compounds (VOC) in the presence of sunlight. Motor vehicle exhaust and industrial emissions, gasoline vapors, and chemical solvents are some of the major sources of NOx and VOC, also known as ozone precursors. Strong sunlight and hot weather can cause ground-level ozone to form in harmful concentrations in the air. The Clean Air Act General Conformity Rule (58 FR 63214, November 30, 1993, Final Rule, Determining Conformity of General Federal Actions to State or Federal Implementation Plans) dictates that a conformity review be performed when a Federal action generates air pollutants in a region that has been designated a non-attainment or maintenance area for one or more NAAQS. A conformity assessment would require quantifying the direct and indirect emissions of criteria pollutants caused by the Federal action to determine whether the proposed action conforms to Clean Air Act requirements and any State Implementation Plan (SIP).

The general conformity rule was designed to ensure that Federal actions do not impede local efforts to control air pollution. It is called a conformity rule because Federal agencies are required to demonstrate that their actions "conform with" (i.e., do not undermine) the approved State Implementation Plan (SIP) for their geographic area. The purpose of conformity is to (1) ensure Federal activities do not interfere with the air quality budgets in the SIPs; (2) ensure actions do not cause or contribute to new violations, and (3) ensure attainment and maintenance of the NAAQS. Federal agencies make this demonstration by performing a conformity review when the actions they are planning to carry out would be conducted in an area designated as a non-attainment or maintenance area for one of the criteria pollutants.

Because Plaquemines Parish and Orleans Parish are designated as attainment areas for the designated priority pollutants, no detailed conformity is required and direct significant environmental effects to air quality are not likely.

If one or more of the priority pollutants was not in attainment, then the proposed action would be subject to detailed conformity determinations unless these actions are clearly de minimus emissions. Use of the de minimus levels assures that the conformity rule covers only major Federal actions (USEPA, 1993). A conformity review requires consideration of both direct and indirect air emissions associated with the proposed action. Sources that would contribute to direct emissions from this project would include demolition or construction activities associated with the proposed action and equipment used to facilitate the action (e.g., construction vehicles). To be counted as an indirect emission, the Federal proponent for the action must have continuing control over the source of the indirect emissions. Sources of indirect emissions include commuter activity to and from the construction site (e.g., employee vehicle emissions). Both stationary and mobile sources must be included when calculating the total of direct and indirect emissions, but this project would involve only mobile sources.

For all of Greater New Orleans, including Plaquemines Parish and Orleans Parish, all six parameters are in attainment of the air quality standards (USEPA, 2007). Because the project area is designated as an attainment area, no conformity review is required for the proposed action.

3.1.5.2. Discussion of Impacts

No Action
Direct and Indirect
Under the no action alternative, potential direct and indirect air quality impacts associated with the construction and operation of hurricane storm damage reduction measures in the Resilient Feature contract reaches would not occur. Air quality would not be predicted to change from existing conditions where periodic flooding can lead to temporary deterioration in air quality during and after flooding. Floods typically result in the contamination of surface waters with sewage and other contaminants that can contribute to poor air quality. In addition, the indirect effects to air quality from sediment clean up can lead to temporary increases in fugitive dust from street sweeping. Other impacts to air quality resulting from ongoing operation and maintenance of the EAMs would likely be minimal and confined to the existing levee and 40-foot vegetation free (maintenance) corridor.

Cumulative
The transportation of debris and rubble from clean up of storm damages contribute to the cumulative effects from local emissions and decrease air quality.

Alternative 1 (Proposed Action)
Direct
Because design reports continue to be revised, detailed quantification of the direct emissions associated with construction of the proposed action cannot be completed. Probable direct impacts to air quality would include emissions of dust and exhaust fumes from the operation of heavy construction equipment at the Walker Road borrow complex as well as at the Resilient Features construction at the levee sites. Emissions would be earthen particles (i.e., fugitive dust) associated with levee, staging/work area and armoring construction activities.

These direct impacts are anticipated to be localized and temporary and not result in any risk to humans outside of the immediate levee construction areas. Wildlife would likely avoid construction areas and therefore no risk to wildlife would be anticipated. Equipment operation, activities, or processes performed by the contractor would comply with all Federal and State air emission and performance laws and standards. Hydrocarbons and carbon monoxide emissions from equipment would be controlled to Federal, State, and/or local allowable limits at all times.

Indirect
The indirect effects to air quality of implementing the proposed action would be related to the emissions from transportation of personnel and equipment to and from the job site, the transportation of borrow material to the various staging/stockpile sites, and general project and disposal activities on a daily basis until the completion of construction.

Cumulative
The cumulative effects to air quality would be the combined emissions from the direct and indirect sources from constructing the proposed action, when added to other emissions sources within the region. These emissions and their cumulative effects are being considered separately in the CED.

3.1.6. Water Quality

3.1.6.1. Existing Conditions

Water quality in the project area is affected by both point source and non-point source discharges. Point sources include mainly industrial, municipal, and sewer discharges. Non-point sources include storm water runoff, industrial discharges, landscape maintenance activities, forestry, agriculture, and natural sources.

Section 303(d) of the Clean Water Act (CWA) requires states to identify waterbodies that are not meeting water quality standards and to develop total maximum daily loads (TMDLs) for those pollutants suspected of preventing the waterbodies from meeting their standards. TMDLs are the maximum amount of a given pollutant that can be discharged into a water body from all natural and anthropogenic sources including both point and non-point source discharges. In Louisiana, the Department of Environmental Quality (LDEQ) oversees the program.

The LDEQ surface water monitoring program is designed to measure progress towards achieving water quality goals at state and national levels, to gather baseline data used in establishing and reviewing the state water quality standards, and to provide a data base for use in determining the assimilative capacity of the waters of the state. Information is also used to establish permit limits for wastewater discharges. The program provides baseline data on a water body to monitor long-term trends in water quality.

The Louisiana Department of Environmental Quality (LDEQ) Section 305(b) and 303(d) Reports for 2006, included in the Water Quality Inventory Integrated Report, lists one

waterbody adjacent to the project area. The waterbody is in Sub-segment Code LA070301 and is described as Mississippi River – from Monte Sano Bayou to Head of Passes. Available LDEQ records indicate that prior to the 2004 Water Quality Inventory Report, suspected causes of impairment to the listed waterbody consisted of: mercury; nitrate/nitrite (nitrite + nitrate as N); pesticides; phosphorous; priority organics (including dioxin); and total fecal coliform (USACE, 2010e).

In the 2004 report, testing of the aforementioned impairments indicated a status of attainment had been achieved for the listed waterbody. The status of attainment for the subject waterbody was reported to be the same following the completion of the 2006 report. The current water quality concerns associated with Sub segment Code LA070301 is "fully supporting all standards" (LDEQ 2006). The 2006 US Environmental Protection Agency integrated report methodology guidance categories--which are used to categorize a water body / pollutant combinations--listed the LA070301 segment as an Integrated Report Category (IRC) 1. The IRC 1 description is listed as any water body impairment that was cited on a previous §303(d) list that is now in attainment of all uses and standards and fully support all designated uses (USACE, 2010e).

The following summary of the effects to water quality from Hurricane Katrina is taken from the State of Louisiana's Water Quality Management Plan Water Quality Inventory Integrated Report (LDEQ, 2006). Most water quality sampling following Hurricane Katrina was conducted at existing ambient water quality monitoring sites throughout the impacted area. This was done in order to permit comparisons with historical data and criteria for each sampled water body. Sampling at ambient monitoring sites also allowed LDEQ to determine when these water bodies had returned to pre-storm conditions.

Results of LDEQ's testing largely agreed with what is commonly expected following a hurricane. Marshes to the south and east of New Orleans, while heavily impacted by wind and storm surge, suffered lesser long-term water quality impacts to dissolved oxygen and other parameters. This was because the area is primarily marsh as opposed to forestland, resulting in less debris being deposited into the water. However, the region did suffer from extensive marsh loss as vegetation and bottom sediments were torn up and washed away and re-deposited elsewhere. This has resulted in increased saltwater intrusion, further exacerbating the destruction of fresh and brackish marsh habitat. In some cases, areas formerly consisting of solid marsh have now become open water.

Due to the counter-clockwise winds of Hurricane Katrina, areas to the southwest, west, and northwest of New Orleans received less damage during the hurricane. Limited post-hurricane monitoring in these areas revealed relatively minor, short-term water quality impacts due to debris and storm surge.

3.1.6.2. Discussion of Impacts

No Action
Direct
Implementing the no action alternative would not result in any permanent direct effects to water quality of the surface waters in the project area. Ongoing operation and maintenance activities associated with the EAMs would likely result in temporary run-off as a result of mowing and maintenance equipment at the existing levee and 40-foot vegetation free (maintenance) corridor. These impacts would not be expected to result in any negative long-term water quality impacts.

Indirect
There would not be any permanent indirect effects to water quality from changes to the existing system.

Cumulative
Failing to provide the Co-Located project area with proposed Resilient Features would predictably, and regularly, contribute to the temporary deterioration of the surface water quality in the event of large-scale flooding. Flooding in residential and commercial areas frequently results in the mixing of surface waters with sewage, contamination of drinking water supplies, and potential mobilization of hazardous, toxic, and radioactive waste. As floodwaters recede, these constituents all enter the surface waters causing temporary reductions in surface water quality.

Alternative 1 (Proposed Action)
Direct
The direct effects to water quality from the clearing, grubbing, placement of materials, replacement of the concrete slope pavement, armoring, windrowing and re-grading of the levees for the Resilient Features would likely cause some temporary, construction-related decrease in the water quality from runoff of sediment during earth moving activities.

Construction of the proposed action would take place in areas of significant previous disturbance with ongoing, active, levee maintenance activities and would not be expected to result in any long term direct effects to water quality. With best management practices (e.g., silt fence) in place during construction, the temporary effects to water quality should be isolated to the immediate footprint of construction. Earth-moving activities during construction disturb soils and can create indirect water quality effects (e.g., increased turbidity and suspended sediments) in the event of uncontrolled runoff or simply poor sediment control practices during construction.

Major impact to drinking groundwater aquifer is not anticipated as there are no groundwater aquifers underlying the Walker Road borrow complex and the Mississippi River Levee construction sites in Plaquemines Parish that are classified as drinking water aquifers by the Louisiana Department of Environmental Quality or LDEQ (see http://www.deq.louisiana.gov/portal/Portals/0/evaluation/aeps/la_aqui.gif). Boring logs describe clay layers underneath the borrow-mixing pit and the MRL also contains clay layers,

indicating minimal potential impact to any underlying non-drinking groundwater aquifer. Surface runoff from rain events during mixing should be contained within the limits of the borrow processing areas, and any leachate impact should be limited to the borrow complex drainage areas or adjacent collection ditches.

Indirect
The indirect effects to water quality from constructing the Resilient Features would be expected to be minimal. Base discharge off of the project area would remain substantially unchanged and it is likely that there would be decreases in the velocity of discharge as there would be a return to more gradual side slopes (e.g., 1 vertical on 3 to 5 horizontal) under the Resilient Features. No indirect effects to water quality for the Walker Road borrow complex are expected due to the anticipated capture of any potential runoff by adjacent ditches where water would be confined on-site.

Cumulative
Should construction of the proposed action coincide with ongoing construction activities for IER # 13 (Hero Canal Levee and Eastern Terminus, Plaquemines Parish, Louisiana), there could be construction-related water quality degradation that could have a temporary cumulative effect. Adherence to best management practices and an approved sediment control plan by the construction contractor would minimize the risk of indirect water quality effects. There would be no anticipated permanent cumulative effects to water quality.

3.1.7. Terrestrial Habitat

3.1.7.1. Existing Conditions

Habitat types in the project area can be generally classified as forested (swamps and bottomland hardwoods), scrub/shrub (early successional bottomland hardwoods), open water, and developed/commercial property. The surrounding levee and extensive forced-drainage systems have altered hydrology and the associated vegetation in all habitat types within the project area. Because of the drainage improvements and pumped drainage, few tracts of bottomland hardwood retain their natural characteristics.

Bottomland hardwood habitats include both wetlands and upland communities. The uplands developed in areas subject to intensive drainage. Dominant woody vegetation varies throughout the project corridor, but typically includes water and live oak, sugarberry, elder and green ash. Shrubby and herbaceous vegetation typically includes elderberry, rattan vine, pepper vine, Virginia creeper, poison ivy, blackberry, and nutgrass (USACE, 1996). The majority of forested areas, although under pumped drainage, are classified as wetlands. However, providing the interior drainage as part of the existing flood damage reduction has resulted in the loss of much of the wetland value and function (USACE, 1996).

Drained swamp sites in the project area typically exhibit an overstory dominated by sugarberry, green ash and American elm. The shrub layer is lightly to moderately developed, and indicates a general invasion by some species adapted to drier sites. Elderberry, box elder, and red maple are dominant, with scattered sugarberry and Chinese tallow. Ground

cover is generally sparse, and usually consists of smartweeds, nut grass, pepper vine, poison ivy, wood fern and pennyworts (USACE, 1996). The river-side side portion of the MRL typically includes sweetgum, green ash, cottonwood, American elm, water oak, hackberry, sycamore, black willow and Chinese tallow. Large amounts of sugarberry and various oak assemblages are also located throughout the surrounding area (USACE, 2010e).

Scrub/shrub habitats occur as wetlands and non-wetlands scattered throughout the area on the land-side of the MRL. Scrub/shrub communities support woody vegetation generally less than 20 feet in height and occur locally in partially drained fresh marshes where an invasion of species adapted to drier sites is occurring. The principal difference between wetland and non-wetland scrub/shrub habitats is the extent to which drainage has occurred. Typical scrub/shrub communities in the project area are vegetated with maiden cane, Chinese tallow, black willow, elderberry, blackberry, goldenrod, thistle, common reed, fall aster, and smartweed.

Developed habitats include residential, commercial, and industrial areas, as well as roads and maintained levees. These areas do not provide important wildlife habitat value. The downriver portions of the project area have been intensively developed for residential, commercial, and industrial purposes. Figure 22 is a photograph looking downstream showing a representative example of the river-side and land-side terrestrial habitat within a less developed portion of the project area. Note that the standing water located on the floodside portion of the MRL (left side) is due to seasonal high water on the Mississippi River.

3.1.7.2. Discussion of Impacts

No Action

Direct

Under the no action alternative, potential direct terrestrial habitat impacts associated with the construction and operation of the Resilient Features would not occur. Direct impacts associated with the continued operation and maintenance of the EAMs would be expected to occur. These impacts would be temporary and confined resulting mainly from mowing and maintenance operations associated with the existing levee and 40-foot vegetation free (maintenance) corridor.

Indirect

In the absence of constructing the Resilient Features for the Co-Located project, terrestrial habitat within the footprint of disturbance would be minimally affected through ongoing operation and maintenance activities. Additionally, the habitat within the existing right-of-way is significantly disturbed, of low quality, and of little value to wildlife.

Cumulative

There would be no cumulative effects to terrestrial habitat if there were no action taken to construct the Resilient Features on the Co-Located project.

Figure 22
Terrestrial Habitat adjacent to the existing MRL

Alternative 1 (Proposed Action)
Direct
Direct effects to terrestrial habitat as a result of construction the proposed action would be permanent within the construction right-of-way. The terrestrial habitat that would be permanently and temporarily impacted includes, by reach, approximately:

WBV-MRL 1.2(a)
Permanent – 1 acre of forested wetlands; and 9 acres of non-wet forested habitat.
Temporary – 5 acres of mowed marsh vegetation.

WBV-MRL 1.2(b)
Permanent – 10 acres of forested wetlands; and 16 acres of non-wet forested habitat.
Temporary – 5 acres of mowed marsh vegetation.

WBV-MRL 2.2
Permanent – 1 acre of forested wetlands; and 1 acre of non-wet forested habitat.
Temporary – 6 acres of mowed marsh vegetation.

WBV-MRL 3.2
Permanent – 22 acres of forested wetlands; and 7 acres of non-wet forested habitat.
Temporary – 12 acres of mowed marsh vegetation.

WBV-MRL 4.2
Permanent – 1 acre of forested wetlands; and 3 acres of non-wet forested habitat.
Temporary – 5 acres of mowed marsh vegetation.

WBV-MRL 5.2
Permanent – 36 acre of forested wetlands; and 35 acres of non-wet forested habitat.
Temporary – 17 acres of mowed marsh vegetation.

Armoring (above WBV-MRL 5.2 to river mile 85.5)
Permanent – 9 acres of non-wet forested habitat.
Temporary – 24 acres of mowed marsh vegetation.

Windrowing (all WBV-MRL contract reaches)
Permanent – 11 acre of forested wetlands.

In total, construction of the project would require approximately 37 acres of new right-of-way, approximately 82 acres of forested wetlands and 80 acres of non-wet forested habitat would be cleared, grubbed, and filled or converted to open water and approximately 74 acres of mowed marsh habitat would be temporarily disturbed during construction.

Indirect
The indirect effects of construction (e.g., noise, fugitive dust, etc.) would have only temporary effects to the terrestrial habitat. Another indirect effect to the terrestrial habitat

adjacent to the footprint of construction would likely include the unintended introduction of exotic plant species and creation of conditions favorable for their growth.

Cumulative
Should construction of the proposed action coincide with ongoing construction activities for IER # 13 (Hero Canal Levee and Eastern Terminus, Plaquemines Parish, Louisiana), there could be construction-related disturbance to nearby terrestrial habitat that could have a temporary cumulative effect.

3.1.8. Aquatic Habitat

3.1.8.1. Existing Conditions

Aquatic habitat in the project vicinity is provided by the Mississippi River, adjacent borrow areas, and associated wetlands. The largest aquatic resource in proximity to project area is that portion of the main stem of the Mississippi River. This vast area is inherently low in primary productivity on a per acre basis because of high turbidity and has relatively poor benthic productivity because of shifting substrates and high current velocities in the area (USACE, 2010e). The deep main river channel is the habitat of large predaceous fishes, some plankton feeders and a group of omnivorous species (USACE, 2010e).

The aquatic habitat paralleling the right descending bank of the river that averages less than five feet in depth represents a limited percentage of the river's total aquatic habitat but is importantly productive for all trophic levels (USACE, 2010e). Factors that serve to increase the productivity include reduced current velocity, increased availability of cover, and shallow substrates allowing photosynthesis to support communities of submerged aquatic vegetation and algae growth (USACE, 2010e).

Additionally, borrow pits excavated on the floodside and protected side of the existing MRL provide additional complexity of aquatic habitat for various species of wildlife, finfish, and shellfish (USACE, 2010e). These relatively stable water bodies support large populations of aquatic plants and animals. The growth of higher plants around these waters may reduce phytoplankton growth near the edges. On the floodside, the higher plants around these water bodies are also important primary producers in that a significant amount of leaf litter, branches, and other organic matter may wash into these lakes and borrow pits during high water conditions becoming a source of detritus (USACE, 2010e).

3.1.8.2. Discussion of Impacts

No Action
Direct, Indirect, and Cumulative
Under the no action alternative, no changes from the existing conditions and therefore no permanent effects to aquatic habitat adjacent to the MRL and the footprint of disturbance would occur. Ongoing operation and maintenance activities for the EAMs could potentially result in increased run-off as a result of mowing and maintenance operations for the existing

levee and 40-foot vegetation free (maintenance) corridor. These impacts would likely be temporary and confined.

During annual high river season, typically from March – May, riverine aquatic resources (fish, shellfish, etc) moved onto the flooded river bank to take forage on detritus (rotting vegetation), insects, insect larvae, worms and various other food items. Some species use this high water period to spawn in the flooding areas. These are reasons why overbank areas are so important to riverine fisheries resources. In the absence of the Resilient Features, there would be no permanent direct, indirect, or cumulative effects.

Alternative 1 (Proposed Action)
Direct
Direct and permanent effects from implementation of the proposed action would result from the placement of earthen material into approximately 1 acre of open water habitat in WBV-MRL 1.2(b) and 1 acre of open water habitat in WBV-MRL 3.2.

Clearing, grubbing, construction, placement of material for a floodside haul road in the existing 40-foot vegetation free (maintenance) corridor and re-grading for all levee reaches could cause some temporary, construction-related degradation of aquatic habitat within the adjacent river because of runoff, but would have no long-term impacts. Very limited levee surfacing material would be expected to run off of both the floodside and protected side of the levee. Additionally, best management practices (e.g., silt fencing) would be installed along the limits of construction to retain any incidental run-off as a result of construction activities.

Indirect
Indirect effects to water quality from construction (e.g., increased local turbidity, decreased dissolved oxygen, vibration, and subsurface noise) would be only temporary. With best management practices (e.g., silt fence) in place during construction, temporary indirect effects to water quality should be minimized and isolated to the immediate vicinity of active construction.

Cumulative
Potential cumulative impacts to the aquatic habitat adjacent to the MRL in the project area would be negligible given the minimal direct loss of aquatic habitat (2 acres total) associated with the proposed action. Other HSDRRS projects have had impacts on aquatic habitat. These habitats include estuarine and freshwater systems, but do not specifically include the Mississippi River.

3.1.9. Fish and Wildlife

3.1.9.1. Existing Conditions

Lakes and borrow pits in the project vicinity are relatively productive waters, but these water bodies typically do not contain as diverse amounts of fisheries as slack water areas that are situated off of the main navigational channel or as segmented water areas created artificially

on the protected side. Slack water sites behind the main navigational channel are characterized as slow-moving and shallow and provide important spawning, nursery sites and abundant food sources (in the form of benthos and plankton) for various fish species. As the water sites off of the main channel remain slack for various periods of time, they often provide valuable opportunities for both commercial and sport fishing. Prior excavated borrow pits on the floodside of the project area often provide habitat for various species of wildlife, finfish and shellfish (USACE, 2010e). Artificially excavated borrow ponds on the protected side typically do not contain large naturally occurring populations of fish species as they generally have no hydrologic connection to other water bodies. Fish stocking of these artificially created borrow ponds may occur as a result of either government or private entity natural resources management of these sites. However, biodiversity of these sites would likely be relatively low given the relative expense associated with long-term management of these areas.

Large predaceous fishes, plankton feeders and a group of omnivorous species inhabit the deep main river channel. Minnow, catfishes, carp, carpsuckers and sunfishes are some of the various types of fishes that may be found in the project area. Clams, dipterans and mayflies are some of the area's representative invertebrates (USACE, 2010e).

Mammals that adapt in varying degrees to periodically wet riparian or early successional hardwood habitats are likely to inhabit or frequent the project area. Beaver, raccoon, swamp rabbit, nutria, muskrat, gray squirrel, fox squirrel, opossum and white-tailed deer have been observed in the project vicinity (USACE, 2010e). Birds observed in the project area include cattle egret, great egret, great blue heron, little blue heron and various species of waterfowl and songbirds.

Various species of reptiles and amphibians that are known to occur within the project area include cottonmouth, rat snake, western and southern water snake, snapping turtle, eastern box turtle, eastern mud turtle, green frog, squirrel tree frog, and Gulf coast toad (USACE, 2010e).

The Gulf of Mexico Fishery Management Council lists the brown shrimp and white shrimp as being potentially found within the Mississippi River estuary downstream from, but not within the project area during their juvenile life stage (NOAA, 2009). Specific categories of Essential Fish Habitat (EFH) downstream from the project area include estuarine water column, non-vegetated, mud substrates, and intertidal wetlands.

3.1.9.2. Discussion of Impacts

No Action
Direct
Under the no action alternative, there would be no direct permanent impacts to the fisheries and wildlife adjacent to the project. Temporary impacts as result of ongoing operation and maintenance of the EAMs would likely affect any wildlife located within or adjacent to the levee and 40-foot vegetation free (maintenance) corridor. These impacts would be a direct

result of mowing and maintenance of the existing levee and vegetation free corridor and would not result in any long term impacts to either fisheries or wildlife resources.

Indirect
Failing to provide the Resilient Features risk reduction for the Co-Located project area could allow contamination of surface waters during flooding by floodwaters mobilizing contaminants from domestic, industrial/commercial, or municipal sources (e.g., sanitary sewage, chemicals from industrial facilities, etc.). Although diluted by the volume of water associated with flooding, these constituents enter the aquatic environment and food chain during floods.

Cumulative
Under the no action alternative, there would be no cumulative changes to fish and wildlife abundance and diversity and the area would remain substantially unchanged.

Alternative 1 (Proposed Action)
Direct
Direct and permanent effects to wildlife habitat would result from the clearing, grubbing and placement of earthen material activities. Construction of the proposed project would require approximately 37 acres of new right-of-way, approximately 82 acres of forested wetlands and 80 acres of non-wet forested habitat would be cleared, grubbed, and filled or converted to open water and approximately 74 acres of mowed marsh habitat would be temporarily disturbed during construction.

Direct and permanent effects to fisheries resources from implementation of the proposed action would result from the placement of earthen material into approximately 1 acre of open water habitat in WBV-MRL 1.2(b) and 1 acre of open water habitat in WBV-MRL 3.2.

Clearing, grubbing, construction, and re-grading for all levee reaches could cause some temporary, construction-related degradation of fish and wildlife habitat within the adjacent river because of runoff, but would have no long-term impacts. Temporary direct effects to wildlife that may forage in areas where material would be placed in the 40-foot vegetation free (maintenance) corridor for either truck hauling or protection of cultural resources could occur.

Direct permanent impacts to essential fish habitat, non-vegetated mud substrates, within WBV-MRL 3.2 would be expected as result of placement of earthen fill material into approximately 1 acre of open water habitat located along the Mississippi River. Given the adjacent abundance of similar non-vegetated mud substrate, it is expected that there would be no long-term adverse impact to essential fish habitat as a result of the proposed project.

Indirect
Indirect effects to fish and wildlife species due to construction activities (e.g., noise, vibration) within adjacent wetlands or aquatic habitat would be short term and temporary. However, the area of disturbance is a relatively small part of the local aquatic ecosystem and mobile species could find refuge in other areas until the construction disturbance is over.

Adjacent fish and wildlife resources, including EFH adjacent to the existing MRL, could be temporarily indirectly affected as a result of the construction activities if sediment-laden runoff from active construction areas flowed into adjacent habitat.

With best management practices (e.g., silt fencing) in place during construction, the indirect effects fish and wildlife should be isolated to the immediate vicinity of active construction and would be of short duration. No indirect impacts to EFH resources are expected as a result of the construction activities at the Walker Road borrow complex or staging/work areas.

CEMVN has complied with executive order 13186 which establishes coordination requirements with the USFWS if an agency's actions are likely to have a measurable adverse effect on migratory bird populations. The USFWS has provided a draft Coordination Act Report, as required by the Fish and Wildlife Coordination Act, which is included in Appendix D. No coordination or consultation has been undertaken with the National Oceanographic and Atmospheric Administration, National Marine Fisheries Service (NMFS) prior to public distribution of this draft IER Supplement due to the lack of estuarine and marine habitats in the project area. No effects to NMFS trust resources are expected from construction of the EAMs.

Cumulative
Should construction of the proposed action coincide with ongoing construction activities for IER # 13 (Hero Canal Levee and Eastern Terminus, Plaquemines Parish, Louisiana), there could be construction-related disturbance to nearby terrestrial habitat that could have a temporary cumulative effect. The cumulative effects to fish and wildlife from all of the WBV and LPV projects will be fully characterized in the CED.

3.1.10. Wetlands

3.1.10.1. Existing Conditions

Nearly 25 percent (140,000 acres) of Barataria Basin wetlands have been lost over the past 30 years via conversion to open-water areas or uplands (USACE, 1996). Contributing factors responsible for those wetland losses include subsidence, saltwater intrusion, sea level rise, canal and levee construction, urban expansion, and navigation and flood-control projects. Such wetland losses have resulted in serious biological and socioeconomic impacts. Aquatic species, while gaining newly available open water habitat, are adversely affected by decreases in productivity, nursery habitat, and detrital export associated with wetland loss. All terrestrial or semi-aquatic animals are adversely affected by the loss of cover, nesting, and feeding habitat. Even relatively small or localized wetland losses can, when combined with other such events, have significant, long-term impacts to fish and wildlife resources on a regional scale.

Swamp habitat features semi-permanent inundation of large areas of land by shallow bodies of water, generally with a substantial number of dry-land protrusions. The vegetation composition of swamps typically includes bald cypress, tupelo, black willow, green ash,

buttonbush, water lily (*Nymphaea odorata*), pickerelweed (*Pontederia cordata*), smartweed (*Polygonum punctatum*), alligator weed (*Alternanthera philoxeroides*), and duckweed (*Lemna minor*). Typical marsh species observed in the project area include soft rush (*Juncus effusus*), spikerush (*Eleochoris spp*.), sedges (*Cyperus spp*.), bulltongue (*Sagittaria falcata*), pickerelweed, smartweed, alligatorweed, water hyacinth (*Eichhornia crassipes*), and deer pea (*Vigna luteola*).

Bottomland forest habitat exists adjacent to the project area. In the bottomland hardwood forested potential wetlands, typical species include black willow, bald cypress (*Taxodium distichum*), green ash (*Fraxinus pennsylvanica*), tupelo (*Nyssa aquatica*), nuttall oak (*Quercus nuttallii*), water oak (*Quercus nigra*), American elm (*Ulmus americana*), red maple (*Acer rubrum*), elderberry (*Sambucus canadensis*), palmetto (*Sabal minor*), lizards tail (*Saururus cernuus*), trumpet creeper (*Campsis radicans*), cinnamon fern (*Osmunda cinnamomea*), poison ivy (*Toxicodendron radicans*), and sawgrass (*Cladium jamaicense*). The adjacent marshlands, forested wetlands, and river-side wetlands provide feeding, resting, nesting, hunting, and escape habitat to numerous species of game and non-game mammals and commercially important furbearers, as well as songbirds, raptors, migratory and resident waterfowl, wading birds, woodpeckers, and many species of amphibians and reptiles.

3.1.10.2. Discussion of Impacts

No Action
Direct
Temporary impacts as result of ongoing operation and maintenance of the EAMs would likely continue to affect approximately 50 acres of mowed marsh vegetation located within the 40-foot vegetation free (maintenance) corridor. These impacts would be a direct result of mowing and maintenance of the existing levee and vegetation free corridor and would not result in any long term impacts to wetland resources as this area has been historically maintained by the local federal sponsor.

Indirect
In the absence of the Resilient Features, the wetlands adjacent to the project area would continue to be influenced by the changes in water surface elevation and sediment deposition associated with the flow regime of the Mississippi River. Taking no action to provide the 100-year project would likely not affect these.

Cumulative
Under the no action alternative, there would be no cumulative changes to wetlands and the area would remain substantially unchanged.

Alternative 1 (Proposed Action)
Direct
Direct effects to wetland resources located primarily on the floodside of the existing MRL, as a result of construction of the proposed action, would be permanent and temporary within the construction right-of-way. Permanent impacts would be from mechanically clearing, grubbing, and filling the area to construct the project features. Temporary impacts would

result from the movement of construction equipment and materials within the existing 40-foot vegetation free (maintenance) corridor located on the floodside of the existing MRL. The wetland resources that would be permanently and temporarily impacted includes, by reach, approximately:

WBV-MRL 1.2(a)
Permanent – 1 acre of forested wetlands.
Temporary – 5 acres of mowed marsh vegetation.

WBV-MRL 1.2(b)
Permanent – 10 acres of forested wetlands.
Temporary – 5 acres of mowed marsh vegetation.

WBV-MRL 2.2
Permanent – 1 acre of forested wetlands.
Temporary – 6 acres of mowed marsh vegetation.

WBV-MRL 3.2
Permanent – 22 acres of forested wetlands.
Temporary – 12 acres of mowed marsh vegetation.

WBV-MRL 4.2
Permanent – 1 acre of forested wetlands.
Temporary – 5 acres of mowed marsh vegetation.

WBV-MRL 5.2
Permanent – 36 acre of forested wetlands.
Temporary – 17 acres of mowed marsh vegetation.

Armoring (above WBV-MRL 5.2 to river mile 85.5)
Temporary – 24 acres of mowed marsh vegetation.

Windrowing (all WBV-MRL contract reaches)
Permanent – 11 acre of forested wetlands.

In total, approximately 82 acres of forested wetlands and 74 acres of mowed marsh vegetation would be permanently and temporarily impacted by construction of the proposed action, respectively. Compensatory mitigation for unavoidable environmental impacts associated with all HSDRRS projects will be documented in forthcoming mitigation IERs.

Indirect
Indirect effects of implementing the proposed action on wetlands would include the relocation of motile organisms to nearby habitats along with the localized noise, vibration, and deterioration in water quality associated with construction.

Cumulative
Potential cumulative impacts on wetlands from construction of the proposed action would involve the combined effects from construction of the entire WBV and LPV projects as well as other CEMVN, federal, state, parish, and private citizen projects that effect wetlands in the greater New Orleans area. The cumulative effects to wetlands from all of the WBV and LPV projects will be fully characterized in the CED.

3.1.11. Threatened and Endangered Species

3.1.11.1. Existing Conditions

Four Federally threatened (T) or endangered (E) species are either known to or may possibly occur within the boundaries of Plaquemines Parish and Orleans Parish, Louisiana: West Indian manatee (*Trichechus manatus*) (E); pallid sturgeon (*Scaphirynchus albus*) (E); piping plover (*Charadrius melodus*) (T); and Gulf sturgeon (*Acipenser oxyrhynchus desotoi*).

In addition to the aforementioned listed species, five sea turtle species under the purview of the National Oceanic and Atmospheric Administration National Marine Fisheries Service (NOAA NMFS), Protected Resources Division, are recorded in Louisiana (green sea turtle (*Chelonia mydas*) (T); hawksbill sea turtle (*Eretmochelys imbricata*) (E); Kemp's ridley sea turtle (*Lepidochelys kempii*) (E); leatherback sea turtle (*Dermochelys coriacea*) (E); and loggerhead sea turtle (*Caretta caretta*) (T)). However, CEMVN has concluded that no critical habitat for any of the listed sea turtle species are designated within the proposed project area and that the project would have no effect on these species.

Except for the occasional transient species, no Federally listed endangered, threatened, or candidate species under USFWS jurisdiction are known to exist in the project area (USFWS, 2010a). However, the American alligator is common in canals. This species is listed as threatened under the Similarity of Appearance clause of the Endangered Species Act (Federal Register 1981, Vol. 46, pp. 40664-40669), but is not biologically threatened or endangered. Therefore, no Biological Assessment or further Section 7 consultation under the Endangered Species Act is required with the USFWS.

The USFWS also indicated that requirements under the Fish and Wildlife Coordination Act (FWCA) would be met upon completion of a final programmatic FWCA report and a project-specific FWCA report (USFWS, 2010). The Fish and Wildlife Coordination Act provides that whenever the waters or channel of a body of water are modified by a department or agency of the U.S., the department or agency first shall consult with the USFWS and with the head of the agency exercising administration over the wildlife resources of the state where construction would occur, with a view to the conservation of wildlife resources.

In accordance with Section 7 of the Endangered Species Act, CEMVN examined the proposed action and determined that the proposed project is not likely to jeopardize the continued existence of any threatened or endangered species, or result in the destruction or adverse modification of critical habitat of such species in the project area. The USFWS concurred with CEMVN's determination that the proposed project is not likely to adversely affect any threatened or endangered species or critical habitat in their correspondence dated

November 8, 2011. The National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service (NMFS) Protected Resources Division has previously provided a list of threatened and endangered species under their jurisdiction in Louisiana. Based on that information, the CEMVN made a determination of no effect for species under NMFS jurisdiction. Review of Draft IER Supplement #33.a by NMFS will provide an additional opportunity to coordinate with the NMFS, Protected Resources Division.

3.1.11.2. Discussion of Impacts

No Action
Direct, Indirect, and Cumulative
Taking no action would not have any effect on protected species as none have been identified proximate to the project area.

Alternative 1 (Proposed Action)
Direct, Indirect, and Cumulative
Consultation with appropriate resource agencies (USFWS, NMFS) indicates that no listed endangered, threatened, or candidate species are known to exist in the potential project impact areas. Therefore, no direct, indirect, or cumulative effects would be predicted to protected species as a result of implementing the proposed action.

3.1.12. Recreational Resources

3.1.12.1. Existing Conditions

Throughout the project, the existing MRL proceeds through residential, commercial, and industrial areas. Recreation is not expected within commercial or industrial areas, but within residential areas, residents may walk on the levee or bank fish along the Mississippi River. Within one mile of the project area are Plaquemines Parish Community Center and Cypress Park, Woodlands Trail and Park, Belle Chasse High School Alwyn-Herbert Baseball Field, and Plantation Athletic Club. Cypress Park is a recreation complex with nine baseball fields. Woodlands Trail and Park is a nonprofit organization with the mission to establish and embellish an educational, historical and recreational greenway, designed as a nature trail; jogging, hiking and bicycle pathway; and equestrian trail. It would establish a natural area and park with amenities within the Lower Coast Algiers and Belle Chasse areas.[1] Currently, there are 13 miles of constructed greenways and trails and an interpretive center is planned for the future. Within construction reach 7 (upstream-most) there is no public access to the project area; the Coast Guard and the Audubon Center for Research control access. Plantation Athletic Club is located approximately one mile up river from the project area. It provides soccer, football, baseball, T-ball and softball fields.

Within the Walker Road stabilized soil mixing area, there is no recreation use occurring because of the ongoing use as a borrow site and soil mixing area. Approximately ½ mile east of the project site is an undeveloped all-terrain vehicle play area located on parish land.

[1] www.woodlandtrail.bizland.com

3.1.12.2. Discussion of Impacts

No Action
Direct, Indirect, and Cumulative
Without implementation of the proposed action, the conditions within the recreational environment would continue as they have in the past and would be dictated by the natural land use patterns and processes that have dominated the area in the past. Direct and indirect impacts would be negligible.

Plaquemines Parish Government has expressed a desire to cost share with the USACE to construct a bicycle path from Belle Chasse to Venice, Louisiana. However, USACE does not currently have either authority or appropriations for a bicycle path. A portion of the proposed bike path would be located within Reach 4.1. The Plaquemines Parish Government desired bicycle path, if accomplished, would have a beneficial cumulative impact for recreation by providing additional bicycling/walking opportunities.

Plaquemines Parish Government has expressed interest in utilizing the ponds adjacent to the Stabilized Soil Mixing Areas for recreation use in the future. There are no plans or designs yet. The development of an additional recreation site would have a beneficial cumulative impact for recreation.

Alternative 1 (Proposed Action)
Direct
Residents that recreate (e.g., walk, bike, and run) on the top of the levee or use the banks for access to the Mississippi River for fishing would be temporarily displaced during construction activities. After construction, floodwalls built on top of the levee may deter users for visual, accessibility, and safety reasons. Visually, the floodwall would replace the view of either the river/batture or the view of the neighborhood. Access to the river would be available, but through floodgates only. People may be unwilling to walk the extra distance. People may feel more isolated and less safe by walking behind a floodwall than walking in a more open area visible to others.

Dust and noise from construction activities may affect activities at Cypress Park. Noise from the transportation of construction equipment/materials may affect activities at River Road Plantation Athletic Club. Impacts to Cypress Park and Plantation Athletic Club would be temporary.

Indirect
The recreation facilities and infrastructure within the area would benefit from increased hurricane risk reduction. No impacts to the existing ponds that the Parish wants to use for recreation would occur.

Cumulative
The all-terrain vehicle play area in proximity to the Walker Road soil mixing area is far enough away that no impacts would be expected. Plaquemines Parish Government has

expressed interest in utilizing the ponds adjacent to the Walker Road soil mixing area for recreation use in the future. However, there are no plans or designs yet. Those existing ponds (borrow pits) that the Parish wants to develop for recreation are sufficiently isolated from the soil mixing area that no adverse effects would occur.

3.1.13. Aesthetic (Visual) Resources

3.1.13.1. Existing Conditions

Based on available aerial photography (namely, comparisons between 2008 photography and 1992 photography), the visual conditions of the MRL Co-Located Work Study Area (found in Orleans, St. Bernard, and Plaquemines Parishes) have seen little in the way of change over the past twenty years as it pertains to aesthetic (visual) resources. The levees that are present today were present twenty years ago. Urban development on the protected side of the levee has grown denser and view sheds across the protected side have changed with the times. View sheds of the river have remained primarily unchanged.

Comparisons between the two sets of photography show that the same public thoroughfares that are in place today were in place then; however, the scenery has changed from a natural to a more developed state with residential, commercial and industrial. Primary view sheds then, as they are today, were best taken from the local road system, and, in some instances, the Mississippi River Levee. Without older aerial photography, ground photographs of the site, or other visual data, further analysis of the historic aesthetic (visual) conditions will not be possible.

This resource is institutionally important because of the laws and policies that affect visual resources, most notably the 1969 National Environmental Policy Act. Visual resources are publicly and technically important because of the high value placed on the preservation of unique natural and culture landscapes.

Water: The Louisiana Scenic Rivers Act of 1988 was established to preserve, protect, and enhance the wilderness qualities, scenic beauties, and ecological regimes of rivers and streams in the state.

There are no designated Scenic Streams located either in or near the project study area. The nearest Scenic Streams are located on the east bank near the community of Violet and include Violet Canal and several other water bodies moving east toward Lake Borgne. These Scenic Streams will not be affected by any of the proposed work.

Other major water resources include the Mississippi River, located to the east (and on occasion, the south) of the project area, numerous canals, streams and creeks that crisscross the native habitat on the protected side of the Mississippi River Levee and the developed areas along the river.

Landform and Vegetation: The surrounding habitat is composed of deep, wooded areas, open crop fields, wetlands and marsh with Spanish moss draped bald cypress, oak and water

tupelo being some of the more dominant plant species. The habitat exhibits moderate plant species diversity and moderately high animal diversity. Natural levees and spoil banks provide the only upland habitat available near the river.

Landform in the developed regions is somewhat similar to that in the undeveloped. However, loss of vegetation to urban development merely accentuates the flatness of the land. Any upland areas or small rolling hills are lost in the distant void that was once vegetated form, texture and color.

Vegetation in the project area is a mixture of native grasses, water tolerant trees (including Bald Cypress and Water Tupelo), and other water tolerant plant materials (that include a variety of scrub shrub such as Southern Wax Myrtle). The few ridges that stretch across the landscape offer places for different and more abundant species of large trees to grow which may include a variety of oaks and Bald Cypress. The existing Mississippi River Levees are currently stripped of tree like vegetation and planted with Augustine, Bermuda and other native grasses that are relatively easy to maintain and yet provide a carpet like texture to the landscape that contrasts with the darker tree and shrub-like vegetation.

Land Use: The dominant eco-region (according to the State of Louisiana Eco-Region Map, ref. "Louisiana Speaks") is "Coastal Marshes" which is a part of the Mississippi Alluvial Plain. The immediate project area is characteristic of the Coastal Marshes with relatively flat terrain mixed with a variety of water resources.

Land use in the area is an even mix of developed, rural and agricultural lands to the west of State Highway 23 and developed, urban lands to the east of and directly adjacent to State Highway 23 and the Mississippi River Levee.

Access: Access to the sites is primarily taken from State Highway 23; however, there are other thoroughfares in abundance crisscrossing the entire project area along with local streets and neighborhoods. Visual access, to coin a phrase, is also in abundance and the potential areas for project implementation could quite literally be viewed from the kitchen windows and back patios of nearby residential areas.

Access to the northern portion of the study area (those areas designated as reaches 6.1 and 7.1) is practically non-existent. Much of this area is undeveloped and rural, and with the Coast Guard presence there, the area is not open to public access.

Other Factors that Affect Visual Resources: User activity is extremely high in this region, especially in terms of access to residential and industrial development, and recreational features. Average Daily Traffic Counts (ADTC) provided by the Louisiana Department of Transportation and Development (LDOTD) show an average daily traffic count in this region ranging from approximately 15,000 cars per day (Jesuit Bend) to almost 32,000 cars per day (Belle Chasse) along the Highway 23 corridor. Access to forested lands and water resources provide excellent opportunities for hunting, fishing and/ or boating (as a few examples). Litter appears to be minimal along the corridors that traverse the project area. Regular highway maintenance keeps this factor at a minimum. Noise consists of a standard, almost

background hum, created from traffic and other sounds derived from an urban/ suburban environment. Foul odors were not persistent throughout the project area; however, could prove to be a problem depending on weather conditions and proximity to the variety of industrial projects throughout the region.

3.1.13.2. Discussion of Impacts

No Action
Direct
Under the no action alternative, no direct impacts to aesthetic (visual) resources would occur at the proposed project site(s). Aesthetic (visual) resources would most likely evolve from existing conditions in a natural process, or change as dictated by future land use maintenance practices.

Indirect
Under the no action alternative, no indirect impacts to aesthetic (visual) resources would occur at the proposed project site(s).

Cumulative
With the no action alternative, there are no foreseen cumulative impacts to aesthetic (visual) resources in the project area. View sheds from surrounding neighborhoods and from public thoroughfares will not be altered in any way. Existing built and natural levee systems would continue to provide protection and variety, as landscape features, to the region. These existing landscape features would not change. Any future changes or alterations to the project site(s) would evolve in a natural process over the course of time or by local land use patterns and maintenance practices.

Alternative 1 (Proposed Action)
General
For the purposes of this impact assessment, visual resources will be lumped into two categories: All-Earthen Levee Alternative and Floodwall (T-wall) Alternative.

All-Earthen Levee Alternative (WBV-MRL 1.2b, 3.2 and 5.2)
Direct
The visual resources of the project corridor would be temporarily impacted by construction activities related to implementing the proposed action and by transport activities needed to move equipment and materials to and from the site(s). This temporary impact would most likely affect visual resources from both vehicular traffic and residential development (on the protected side) and boating and other water traffic (on the flood side).

Long term direct impacts to visual resources are negligible. The levees have been and will continue to be a persistent presence throughout the project area. The view shed to the river has been non-existent for many years. The increase in levee height will not affect this in anyway.

Indirect
With the implementation of the proposed action, there are no foreseeable indirect impacts to aesthetic (visual) resources.

Cumulative
Long term negative impacts to the aesthetic (visual) resources are negligible. Landscapes converted or reorganized into natural or, in some cases, semi-natural visual conditions similar to the proposed project may be considered as visually superior. The addition of levee height will allow for turf development and therefore aid in blending the levee reaches into the background as a part of the scenery. As a cumulative impact, the proposed scenario is desirable throughout the hydrologic basin, LA and the US for maintaining river levee systems and protecting from flood damage.

Floodwall (T-wall) Alternative (WBV-MRL 1.2a, 2.2, and 4.2)
Direct
The visual resources of the project corridor would be temporarily impacted by construction activities related to implementing the proposed action and by transport activities needed to move equipment and materials to and from the site(s). This temporary impact would most likely affect visual resources from both vehicular traffic and residential development (on the protected side) and boating and other water traffic (on the flood side).

The creation of artificial, manmade features could decrease the natural, scenic quality in the area. In the case of the proposed action, the concrete T-wall is an un-natural element that could work to decrease the scenic quality in the area. Unlike the expanded crown cap, covered in turf, that is to be implemented on reaches 1.2b, 3.2, and 5.2, the exposed concrete will provide a negative visual focal point in areas that are filled with low and medium density residential uses. The people that live in these areas will have a view of a concrete wall from their kitchen windows, rather than the grass covered, gently sloping earthen levees that they have become accustomed to over the years. Where once, view sheds encompassed a grassy vista that blended in with the natural vegetation and different hues of greens, blues and other soft, natural colors; now the view will consist of a large, white to light gray feature that will starkly contrast the surrounding vegetation and landforms.

It is important to note that the potential benefits of improved flooding, hurricane and storm protection may outweigh the visual impacts of using this type of construction.

Indirect
With the implementation of the proposed action, there are no foreseeable indirect impacts to aesthetic (visual) resources.

Cumulative
Long term negative impacts to the aesthetic (visual) resources, in this instance, will be moderate to high. Landscapes converted or reorganized into un-natural, visual conditions similar to the proposed project may be considered as visually inferior. As a cumulative impact to visual resources, the proposed scenario is not desirable throughout the hydrologic basin, LA and the US for maintaining river levee systems in terms of aesthetic resources.

3.1.14. Cultural Resources

3.1.14.1. Existing Conditions

Cultural resources investigations were conducted for the IER #33.a study area encompassing approximately 9.5 miles of Mississippi River Levee system (MRL). The right-of-entry for cultural resources investigations and the area of potential effect (APE) was larger than the footprint for the proposed action. The APE for IER 33.a includes the WBV-MRL Co-Located Resilient Features project corridor, proposed access road and levee access ramp locations, construction easements, stockpile and staging locations, borrow sources, and the West Walker Road Borrow Pit Complex. The Phase I cultural resources survey of the WBV-MRL Co-Located Resilient Features corridor examined an area that varied in distance from the existing levee toe on both the protected and flood sides of the existing levee from approximate river mile 79.5 to river mile 70, in Plaquemines Parish, Louisiana.

The CEMVN contracted R. Christopher Goodwin and Associates to conduct a Phase I cultural resources survey of the APE to identify and assess (preliminarily) any historic properties that are considered significant and potentially eligible for listing to the National Register of Historic Places (NRHP) that exist within or adjacent to the WBV-MRL Co-Located Resilient Features project corridor. The Phase I surveys are currently on-going and a management summary detailing the findings of the surveys is due by January 31, 2012. Additionally, Phase II testing and evaluation is currently being conducted at five archaeological sites (16PL115, 16PL155, 16PL202, 16PL204, and RF-BEL-04A-01) to assess whether or not the sites possess qualities of significance as defined by the NRHP Criteria for Evaluation (36 CFR 60.4 [a-d]). Site RF-BEL-04A-01 may be part of site 16PL196 (Belle Chasse Plantation), and additional investigations are on-going to determine significance and if the two sites can be combined. An NRHP evaluation of the Seatrain Terminal (16PL878) Elevated Trestle was conducted to determine significance and eligibility. The archaeological (buried) portion of the site 16PL87 was previously evaluated as not significant. Additional trenching is being carried out in the vicinity of the Rockville cemetery in order to identify any burial shafts (i.e., grave sites) that may exist within the project right-of-way.

Extensive research, including reviews of previous cultural resources investigations and previously recorded archeological sites, historic standing structures, and NRHP properties and districts; examination of historic maps, aerial photography and geomorphologic studies; and intensive field reconnaissance of the IER 33.a study area was completed in 2009 to identify high and low probability areas for containing significant cultural resources.

The results of this research effort were presented to the Louisiana Division of Archaeology on December 9, 2009, and were used to develop field investigation strategies and methodology within the WBV-MRL Co-Located Resilient Features project corridor. The study recognized that there is little documented evidence for the presence of prehistoric or historic Native American settlements within the immediate project area; furthermore, the study elaborated on extensive documentation for the presence of large numbers of plantations

and other historic settlements situated along the current stretch of the Mississippi River during the eighteenth, nineteenth, and early twentieth centuries.

Historic research documented numerous historic plantations, as well as one historic fort, one historic river transportation facility, and small communities within the project area. Furthermore, it was recognized that most historic settlement of the area was situated in close proximity to the Mississippi River, which was the primary avenue for transportation and commerce throughout the historic period.

The study concluded that all areas adjacent to the extant MRL system possessed high potential for the presence of significant cultural resources, with the exception of recently accreted or eroded river banks, or areas that have been disturbed by historic or modern development. Therefore, the portion of the APE located on the protected side of the existing levee and not currently covered by modern buildings or roads was assessed as having a high probability for the presence of significant cultural resources. High probability areas on the flood side represented areas that remained following the exclusion of batture that exhibited evidence for historic or modern borrow pits, containing previous levee alignments or other recent construction features, consisted of recently accreted land, or that have eroded to within 82 feet of the existing levee. All batture areas that met the preceding criteria for exclusion were assessed as having little or no potential for the presence of undisturbed cultural resources. The only exception to these criteria were locations where the batture measured 82 feet or less in width, but that were in the vicinity of previously reported archeological sites.

Researchers identified fifteen cultural resources investigations previously conducted in the vicinity of the APE, which is within 0.8 km (0.5 mi) of the WBV-MRL Co-Located Resilient Features project area. These investigations included eight completed on behalf of the CEMVN for the construction of levee projects. The seven remaining investigations were completed on behalf of various private and federal entities, including work performed for the United States Coast Guard for the installation of a communications tower, examination of a proposed solid waste landfill conducted for Chevron Chemical Company, a survey of a proposed road extension performed for Burk-Kleinpeter, Inc., compilation of an integrated cultural resources management plan for the Naval Facilities Engineering Command, examination of a proposed borrow site as a source of clay for use in levee improvement and coastal restoration efforts for White Oak Realty, and two surveys performed for The Audubon Institute Survival and Research Center and Wilderness Park.

Examination of the Louisiana Division of Archaeology site files identified 10 previously recorded archaeological sites within 0.5 miles of the APE. Six of the previously recorded sites (16PL35, 16PL087, 16PL115, 16PL120, 16PL155, 16PL169) fall directly within the existing right-of-way. The remaining four sites (16PL119, 16PL161, 16PL168, 16PL170) are located outside of the WBV-MRL Co-Located Resilient Features project area. Research conducted in the historic standing structure files at the Louisiana State Library identified only a single historic standing structure (Structure 38-0008) located within 0.5 mile of the APE, but it is located outside of the project right-of-way. This structure was previously assessed as eligible for listing on the NRHP. No NRHP historic districts or properties listed on the NRHP were identified within the APE.

A field investigation of the project corridor was completed between July 2 and November 12, 2010 for the WBV-MRL Co-Located Engineered Alternative Measures. High probability areas were surveyed to locate and define the boundaries of archaeological sites and to report standing structures within the project area. Phase 1 survey of high probability areas was conducted from approximate river mile 85.5 to mile 70 above Head of Passes, extending 30 feet from the existing levee toe on both the protected and flood sides of the existing levee in Orleans and Plaquemines Parishes, Louisiana. Proposed access roads, ramps and staging areas were also investigated. Additionally, mechanical trenching was conducted near the Rockville Cemetery, but failed to produce any evidence of human burials or other cultural resources within the APE.

The investigations conducted between July 2 and November 12, 2010, identified 16 archeological sites and 12 non-site archeological loci. Twenty-three of the twenty-eight archaeological sites and non-site archeological loci identified are located within the APE for the WBV-MRL Co-Located Resilient Features project area (Table 7). During this effort, Phase II testing and evaluation was conducted at five of the identified archeological sites that are located within the current project area (16PL155, 16PL169, 16PL196, 16PL198, 16PL202) to assess whether or not the sites possessed qualities of significance as defined by the NRHP Criteria for Evaluation (36 CFR 60.4 [a-d]).

Site 16PL196 (Belle Chasse Plantation) was evaluated and assessed as possessing those qualities of significance. Avoidance or further testing was recommended to evaluate the significance of two additional sites, 16PL155 (Rockville, Little Rock) and 16PL120 (Upper Magnolia Plantation). Archeological remains within the right-of-way associated with Site 16PL87 (Seatrain Terminal) were evaluated and assessed as not significant, but the elevated railroad trestle and platforms located outside of the right-of-way were not evaluated during these investigations. Evaluation of the elevated trestle and platforms is currently being carried out as part of field investigations for the proposed action.

The remaining archeological sites (16PL169, 16PL198, 16PL199, 16PL200, 16PL201, 16PL202, 16PL203, 16PL204) and non-site archeological loci (BWB-03-01, BWB-08A-01, BWB-08D-01, BWB-09-01, BWB-12-01, OAK-02A-01, OAK-02A-02, OAK-02A-04, OAK-02A-05, TUL-03A-01, TUL-03B-01) identified or relocated within the APE were assessed as not significant applying the NRHP Criteria for Evaluation (36 CFR 60.4 [a-d]). No additional work was recommended within the right-of-way at any of these sites, and non-site loci.

An architectural survey was completed, and no historic standing structures were identified within the APE. To assess potential adverse visual effects, attempts were made to identify historic properties with viewsheds that extend to the WBV-MRL. The viewshed analysis was limited to a distance of 1.6 km (1.0 mi). Both architectural survey efforts focused on the identification of listed or potentially eligible NRHP properties or districts. The visual impact assessment of the project area indicated that there will be no adverse visual effects to historic properties, whether on the east or west bank.

Table 8
Archaeological Sites and Loci within the Project Corridor

Site Number (Locus Number)	Site Name	Levee Reach	Site Type	Significance	Recommendation
16PL115	Idlewild Plantation	WBV-MRL 1.2a	19th century plantation	Previously determined significant and eligible for listing to the NRHP. Site is currently being reevaluated to determine if it still retains qualities of significance.	Site must be avoided. If the site cannot be avoided, then additional consultation shall be conducted with the LA SHPO in accordance with 36 CFR 800.5[a] (Criteria of Adverse Effect) to mitigate any adverse effect.
16PL169 (OAK-02B-01)	Mahoney-Crouere	WBV-MRL 1.2a	19th to 20th century historic	Not significant	No additional cultural resources investigation required.
16PL202 (OAK-02A-03)	Hygiene Plantation	WBV-MRL 1.2a	19th century plantation	An evaluation of the site is currently being conducted to determine significance and eligibility for listing to the NRHP.	Recommendation pending completion of evaluation and eligibility determination.
(OAK-02A-05)	n/a	WBV-MRL 1.2a	Modern	Not significant	No additional cultural resources investigation required.
(OAK-02A-04)	n/a	WBV-MRL 1.2a	Modern	Not significant	No additional cultural resources investigation required.
(OAK-02A-02)	n/a	WBV-MRL 1.2a	Isolate (Historic)	Not significant	No additional cultural resources investigation required.
(OAK-02A-01)	n/a	WBV-MRL 1.2a	20th century historic/modern	Not significant	No additional cultural resources investigation required.
(BWB-12-01)	n/a	WBV-MRL 1.2b	20th century historic/modern	Not significant	No additional cultural resources investigation required.
16PL201 (BWB-11-01)	Sewer Plant Road	WBV-MRL 1.2b	Late 19th-20th century historic	Not significant	No additional cultural resources investigation required.
(BWB-09-01)	n/a	WBV-MRL 2.2	20th century historic/modern	Not significant	No additional cultural resources investigation required.
16PL87 (Sea Train, BWB-08A-03, BWB-08C-01)	Sea Train Terminal	WBV-MRL 3.2	20th century historic/modern	Historic railroad trestle is currently being evaluated for significance and eligibility for listing to the NRHP; archeological component not significant	If site is determined to be significant, avoidance is recommended. If the site cannot be avoided, then additional consultation shall be conducted with the LA SHPO in accordance with 36 CFR 800.5[a] (Criteria of Adverse Effect) to mitigate any adverse effect.

Site Number (Locus Number)	Site Name	Levee Reach	Site Type	Significance	Recommendation
(BWB-08D-01)	n/a	WBV-MRL 3.2	20th century historic/modern	Not significant	No additional cultural resources investigation required.
16PL200 (BWB-08A-02)	Tiemaker Road	WBV-MRL 3.2	20th century historic/modern	Not significant	No additional cultural resources investigation required.
(BWB-08A-01)	n/a	WBV-MRL 3.2	Late 19th-20th century historic	Not significant	No additional cultural resources investigation required.
16PL199 (BWB-08-01)	Lejeune Road	WBV-MRL 3.2	Late 19th-20th century historic	Not significant	No additional cultural resources investigation required.
16PL198 (BEL-05A-01)	Baker Road	WBV-MRL 3.2	Late 19th-20th century historic	Not significant	No additional cultural resources investigation required.
16PL196 (BEL-04-01)	Belle Chasse Plantation	WBV-MRL 4.2	19th century plantation	The portion of the site on the protected side of the levee has been determined significant.	The portion of the site on the protected side of the levee should be avoided. If the site cannot be avoided, then additional consultation shall be conducted with the LA SHPO in accordance with 36 CFR 800.5[a] (Criteria of Adverse Effect) to mitigate any adverse effect.
RF-BEL-04A-01	May be part of Belle Chasse Plantation	WBV-MRL 4.2	19th century plantation and Colonial period	Undetermined. Currently being evaluated for significance and possible association with Site 16PL196.	If site is determined to be significant, avoidance is recommended. If the site cannot be avoided, then additional consultation shall be conducted with the LA SHPO in accordance with 36 CFR 800.5[a] (Criteria of Adverse Effect) to mitigate any adverse effect.
16PL35 (BWB-07-A-B-C)	Ft. St. Leon	WBV-MRL 5.2	18th - 19th century fort	Portion of site has been previously assessed as eligible for listing to the NRHP.	Phase I survey is currently being conducted on the flood side of the levee to relocate and identify significant portions of the site. If intact features associated with the sites are identified and are determined to be significant, then the site should be avoided during construction. If the site cannot be avoided, then additional consultation shall be conducted with the LA SHPO in accordance with 36 CFR 800.5[a] (Criteria of Adverse Effect) to mitigate any adverse effect.
(TUL-03A-01)	n/a	WBV-MRL 5.2	Isolate (Historic)	Not significant	No additional cultural resources investigation required.
(TUL-03B-01)	n/a	WBV-MRL 5.2	Isolate (Historic)	Not significant	No additional cultural resources investigation required.
16PL203 (BWB-06-01)	Tulane 1	WBV-MRL 5.2	Historic Unknown	Not significant	No additional cultural resources investigation required.

Site Number (Locus Number)	Site Name	Levee Reach	Site Type	Significance	Recommendation
16PL204 (TUL-01-01/TUL-02-01/BWB-06A-01)	Ft. St. Leon Plantation, Levee Area	WBV-MRL 5.2	19th century plantation, 20th century military	The site is currently being evaluated for significance and eligibility for listing to the NRHP.	If site is determined to be significant, avoidance is recommended. If the site cannot be avoided, then additional consultation shall be conducted with the LA SHPO in accordance with 36 CFR 800.5[a] (Criteria of Adverse Effect) to mitigate any adverse effect.
16PL155	Rockville, Little Rock	WBV-MRL 5.2	Late 19th-20th century African American community	Potentially significant. The site is currently being evaluated for significance and eligibility for listing to the NRHP.	If site is determined to be significant, avoidance is recommended. If the site cannot be avoided, then additional consultation shall be conducted with the LA SHPO in accordance with 36 CFR 800.5[a] (Criteria of Adverse Effect) to mitigate any adverse effect.
16PL120	Upper Magnolia Plantation	WBV-MRL 5.2	18th - 20th century plantation	Potentially significant and eligible for listing to the NRHP.	Site should be avoided. If the site cannot be avoided, then additional consultation shall be conducted with the LA SHPO in accordance with 36 CFR 800.5[a] (Criteria of Adverse Effect) to mitigate any adverse effect.

The earthen material for constructing the WBV-MRL HSDDRS Co-located Resilient Features will be obtained from either government or contractor-furnished borrow areas that have been previously investigated for use in other IERs, and no borrow areas were investigated for IER 33.a. Section 106 consultation for borrow areas that may be used for this project has been concluded.

The Walker Road Borrow Pit Complex was previously investigated for the 1994 Final EIS "West Bank of the Mississippi River in the Vicinity of New Orleans, La. (East of the Harvey Canal)" and the 2005 EA "U.S. Army Corps of Engineers Response to Hurricanes Katrina and Rita in Louisiana." The area was surveyed and the results presented in the 1991 report prepared by R. Christopher Goodwin and Associates (Hinks et al. 1991). This heavily disturbed complex has been in use since the 1980s, and the potential for historic properties is extremely low; therefore, no field investigations of the complex were conducted for IER 33.a. Section 106 consultation for the Walker Road Borrow Pit Complex has been concluded.

Any required cultural resource investigations for proposed utilities or other facilities relocations would be conducted prior to relocation activities.

The CEMVN has elected to fulfill its obligations under Section 106 of the National Historic Preservation Act of 1966, as amended through the execution and implementation of a Programmatic Agreement (PA). The PA is being developed in consultation with the Advisory Council on Historic Preservation, the Louisiana State Historic Preservation Officer (LA SHPO), and federally recognized Indian Tribes that have indicated an interest in participating in the development of the PA. The Phase I cultural resources surveys and Phase

II investigations are on-going for the WBV-MRL Co-Located Resilient Features project, and will be completed prior to the start of construction activities for the proposed action. A management summary detailing the findings of the surveys and investigations is due by January 31, 2012. Once completed, the results of the Phase I surveys and Phase II investigations will be provided to the LA SHPO and federally recognized Indian Tribes for review in accordance with the stipulations of the PA.

The following Federally recognized Indian tribes were invited to participate in the development of the PA: Alabama-Coushatta Tribe of Texas, Caddo Nation of Oklahoma, Chitimacha Tribe of Louisiana, Choctaw Nation of Oklahoma, Coushatta Tribe of Louisiana, Jena Band of Choctaw Indians, Mississippi Band of Choctaw Indians, Quapaw Tribe of Oklahoma, Seminole Nation of Oklahoma, Seminole Tribe of Florida, and the Tunica-Biloxi Tribe of Louisiana to consult in the development of the PA. The Caddo Nation of Oklahoma (email dated 8/11/2011) and the Choctaw Nation of Oklahoma (email dated 10/3/2011) indicated an interest in continuing to participate in the development of the PA.

The CEMVN, in coordination with the LA SHPO, has taken measures to identify other interested parties and organizations to participate in the development and execution of the PA. The CEMVN notified the local government and identified interested parties of the development of the PA through mailings and the National Environmental Policy Act process. The PA will be executed in December 2011, at which time Section 106 consultation will be concluded for this project.

3.1.14.2. Discussion of Impacts

Cultural resource investigations indicate that there are significant and potentially significant historic properties that have been identified within and adjacent to the project area. The significant archaeological sites (16PL35, 16PL87, 16PL115, 16PL120, 16PL155, 16PL196, 16PL202, and 16PL204) located within the existing right-of-way extend outside of the right-of-way.

Sites 16PL35 and 16PL115 have been determined to be eligible for listing to the NRHP, and Sites 16PL120 and 16PL196 have been determined to be significant and identified as potentially eligible for listing to the NRHP. Structure 38-0008 (Rene Sarpy House), which has been determined to be NRHP eligible is located in the vicinity, but should not be impacted by construction activities.

No Action
Direct, Indirect, and Cumulative
Under the no action alternative, not constructing the proposed Resilient Features and failing to improve the resiliency and longevity of the previously constructed WBV-MRL Co-Located Engineered Alternative Measures in the IER 33.a study area would have no direct impacts to historic properties. The proposed action would not be built and historic properties located within and adjacent to the right-of-way for the proposed action would not be directly impacted. Historic properties adjacent to the proposed action could be indirectly and cumulatively impacted under the no action alternative by damage caused over time as a result

of flood events that may have been prevented by improving the resiliency and longevity of the WBV-MRL levee system.

Alternative 1 (Proposed Action)
Direct
The proposed action, construction of the WBV-MRL Co-Located Resilient Features, including an all earthen levee (with alternative flood side and protected side straddle, shifts, and realignments), a floodwall (T-wall), armoring, windrowing, and other activities associated with construction has the potential to directly impact significant historic properties that may be eligible for listing to the NRHP. Although construction of the existing MRL system has severely modified the existing right-of-way, cultural resource investigations indicate that there are significant historic properties within and adjacent to the existing right-of-way. Appropriate measures will be initiated in accordance with the Programmatic Agreement to ensure that adverse impacts to significant historic properties are minimized or mitigated before construction of the Resilient Features. If a significant historic property cannot be avoided during construction, then additional consultation will be conducted with the LA SHPO in accordance with 36 CFR 800.5[a] (Criteria of Adverse Effect) and strategies will be developed to mitigate adverse effects.

Indirect
Construction of the proposed Resilient Features would provide an added level of flood risk reduction to known and unknown historic properties and structures located on the protected side of the existing levee by increasing the resiliency and longevity of the WBV-MRL Co-Located Engineered Alternative Measures and reducing the risk of damage to historic properties caused by flood events.

Access to the project area, the use of stockpile and staging areas adjacent to the project right-of-way, and activities required to maintain the WBV-MRL Co-Located Resilient Features after completion of construction have the potential to indirectly impact significant historic properties that may be located within or adjacent to the project corridor. Prior to and during construction of the Resilient Features, appropriate measures will be initiated in accordance with the Programmatic Agreement to ensure that adverse impacts to significant historic properties are minimized or mitigated. If a significant historic property cannot be avoided during construction, then additional consultation will be conducted with the LA SHPO in accordance with 36 CFR 800.5[a] (Criteria of Adverse Effect) and strategies will be developed to mitigate adverse effects.

Cumulative
In general, construction of the WBV-MRL Co-Located Resilient Features would have beneficial cumulative impacts on historic properties in the West Bank area that are located outside of the project right-of-way and limits of construction. The proposed action is part of the ongoing federal effort to reduce the threat to property posed by flooding. The combined effects from construction of the WBV-MRL Co-Located Engineered Alternative Measures and the Resilient Features would reduce flood risk and storm damage to significant archaeological sites, individual historic properties, engineering structures and historic districts.

3.1.15. Farmland

3.1.15.1. Existing Conditions

Within NEPA evaluations, the USACE must consider the protection of the nations' significant/important agricultural lands from irreversible conversion to uses that result in their loss as an environmental or essential food production resource. The Farmland Protection Policy Act (FPPA), 7 USC 4201 et seq., and the U.S. Department of Agriculture's (USDA) implementing procedures (7 CFR § 658) require Federal agencies to evaluate the adverse effects of their actions on prime and unique farmland, including farmland of statewide and local importance.

Based on aerial photography and field investigations along the entire length of the co-located levee project, there does not appear to be any active farming occurring near the levee alignment. There is some cattle grazing occurring in the lands adjacent to the Resilient Features contract reaches as well as the Walker Road borrow complex. Additional land uses located adjacent to the project area consist of a mix of industrial/commercial, urban/housing, pasture and non-wet forested lands. A farmland conversion impact rating form was developed and sent to the Natural Resources Conservation Service containing information on those lands to be converted by the proposed action.

3.1.15.2. Discussion of Impacts

No Action
Direct, Indirect, and Cumulative
Without the Federal action, levee construction for all contract reaches would not occur. Therefore, it is expected there would be no direct, indirect or cumulative impacts to farmland resources.

Alternative 1 (Proposed Action)
Direct, Indirect, and Cumulative
The actions necessary to implement the proposed action may involve the direct conversion of potential prime, unique, or important U.S. farmland. It is expected that construction of the proposed project would impact approximately 117 acres of land on the protected side of the existing Mississippi River Levee from river mile 70 to 85.5. Impacts to lands located on the floodside of the existing Mississippi River Levee were evaluated, but did not appear to contain the necessary elements for classification as prime and/or unique farmland. No impacts to cattle grazing near the Walker Road borrow complex site are expected. Direct impacts to cattle grazing areas as well as any sites designated by NRCS as prime and/or unique farmland would occur as result of placement of fill material, construction material stockpiling and construction equipment transportation to and from the levee sites. Temporary relocation of cattle grazing activities to surrounding suitable areas would be expected to occur during the course of construction.

Cumulatively, additional flood risk reduction afforded by the implementation of WBV HSDRRS projects could potentially decrease silt deposition and increase drying and subsidence in areas that are currently unprotected, thereby, potentially changing soils properties over the long term. These changes would result from future hydrological shifts due to any flood risk reduction structures associated with the HSDRRS. Therefore, soil properties could be indirectly altered due to the implementation of the proposed action, or due to the greater overall hydrological regime resulting from the overall HSDRRS system. These impacts have historically been common, and are not unexpected.

3.1.16. Socioeconomics

The focus of this section is to evaluate the relative socioeconomic impacts, if any, associated with the proposed construction and maintenance of Resilient Features in order to continue providing the 100-year level of hurricane damage risk reduction along the West Bank and Vicinity – Mississippi River Levee (WBV-MRL) Co-Located Project. The MRL on the west bank of the Mississippi River, from the Eastern Tie-in of the West Bank and Vicinity (WBV) project with the MRL at Oakville in Plaquemines Parish to a point approximately 9.5 miles upriver southeast of the Plaquemines Parish and Orleans Parish line, currently provides 1-percent hurricane and storm damage risk reduction. However, construction of Resilient Features is required to improve the resiliency and longevity of previously implemented Engineered Alternative Measures previously addressed under IER # 33. The WBV-MRL Co-Located Project is designed to reduce risk to residents along the west bank of the MRL from hurricane-driven storm surges traveling either up or across the Mississippi River.

3.1.16.1. Population and Housing

3.1.16.1.1. Existing Conditions

There are five census block groups in Plaquemines Parish that would potentially be impacted by the proposed actions. These include Block Group 1, Census Tract 502; Block Group 4, Census Tract 502; Block Group 5, Census Tract 502; Block Group 2, Census Tract 503; and Block Group 3, Census Tract 503. According to U.S. Census data, this area had 7,689 residents and 2,925 housing units in 2010.

3.1.16.1.2. Discussion of Impacts

No Action
Direct, Indirect, and Cumulative
Under the no action alternative, flood protection in the study area would not be raised to the 100-year level of risk reduction. There would be no direct impacts to population and housing under this alternative; however, the existing flood risk would persist. Indirect impacts under this alternative would include the costs incurred for evacuation, clean-up, debris removal, residential repair, damaged vehicles, and reoccupation of homes as a result of flood events. This alternative would contribute to adverse cumulative impacts on population and housing as residents would be more vulnerable to displacement and disruption of economic activity.

Alternative 1 (Proposed Action)
Direct, Indirect, and Cumulative
Under the proposed action, there may be temporary, construction-related impacts to residents in the immediate vicinity of the proposed actions. These may include increased noise levels, degraded air quality, increased congestion on neighborhood roadways, and a higher risk of vehicular accidents due to the additional volume of traffic and congestion.

No adverse, indirect or cumulative impacts to population and housing are anticipated under the proposed action. Residents would be at a reduced risk of permanent displacement due to the lowered risk of flooding as compared to the No Action alternative.

3.1.16.2. Impacts to Employment, Business, and Industrial Activity

3.1.16.2.1. Existing Conditions

The northern reach in Plaquemines Parish includes the Coast Guard Facility and the Tulane University Research Laboratories property. The central reaches include Belle Chasse which contains mixed retail and light industry. In the Belle Chase area several businesses are located adjacent to the levee. These include petroleum service companies, river services companies, and a boat storage complex adjacent to the levee with a launch that crosses the levee. The southern reaches include the Belle Chasse Naval Air Station and the Chevron refinery, which is adjacent to the project site.

3.1.16.2.2. Discussion of Impacts

No Action
Direct, Indirect, and Cumulative
Under the no action alternative, flood protection in the study area would not be raised to the 100-year level of risk reduction. There would be no direct impacts to employment, businesses, and industrial activity under this alternative; however, the existing flood risk would persist. Indirect impacts under this alternative would include the costs incurred for employee evacuation, clean-up, debris removal, building and infrastructure repair, damaged vehicles, and reoccupation of businesses as a result of flood events. This alternative would contribute to adverse cumulative impacts on employment, businesses, and industrial activity as the area would be more vulnerable to displacement of population and disruption of economic activity.

Alternative 1 (Proposed Action)
Direct, Indirect, and Cumulative
Temporary, direct impacts may occur to area businesses near the construction sites due to delays caused by increased traffic congestion. Customer avoidance may occur within the project vicinity due to congestion. These impacts would be expected to be moderate, but temporary, lasting only as long as required to complete construction of the project. Those businesses related to river services would most likely be most affected because their activity occurs on both sides of the levee. There may be a temporary, minor increase in employment as a result of construction activity. No adverse, indirect or cumulative impacts to

employment, businesses, or industrial activity would be expected to occur as a result of the project. Employees, businesses and industry would be at a reduced risk of permanent displacement due to the lowered risk of flooding as compared to the No Action alternative.

3.1.16.3. Public Facilities and Services

3.1.16.3.1. Existing Conditions

There are a few public facilities within the study area, primarily located in the Belle Chasse polder. There are 2 police stations, 3 fire stations, 5 school buildings, 2 veterinary clinics, 6 utilities facilities, and 1 electrical facility. A Plaquemines Parish municipal complex is located within the study area, adjacent to the project site, near the ferry landing. Additionally, a Coast Guard Facility and Tulane University Research Laboratory are located within the study area.

3.1.16.3.2. Discussion of Impacts

No Action
Direct, Indirect, and Cumulative
Under the no action alternative, flood protection in the study area would not be raised to the 100-year level of risk reduction. There would be no direct impacts to public facilities and services under this alternative; however, the existing flood risk would persist. Indirect impacts under this alternative would include the costs incurred for evacuation, clean-up, debris removal, building and infrastructure repair, damaged vehicles, and increased demand for public assistance as a result of flood events. This alternative would contribute to adverse cumulative impacts on public facilities and services as residents and infrastructure would remain vulnerable to flood events.

Alternative 1 (Proposed Action)
Direct, Indirect, and Cumulative
Under the proposed action, there may be temporary, construction-related impacts to public facilities in the immediate vicinity of the proposed actions. These may include increased noise levels, degraded air quality, increased congestion on neighborhood roadways, and a higher risk of vehicular accidents due to the additional volume of traffic and congestion. These impacts are likely to be concentrated in the Belle Chasse polder where the majority of the public facilities within the study are located. No adverse, indirect or cumulative impacts would be expected to occur under the proposed project.

3.1.16.4. Transportation

3.1.16.4.1. Existing Conditions

CEMVN has published an analysis of the effects on transportation from construction of the HSDRRS (USACE, 2009b). The report provides estimates on the numbers of truckloads necessary to complete construction of the HSDRRS and the effects of transporting these materials. A road runs along the protected side toe of the levee that is known as River Road

and Hwy 11. Access to the mixing site would be from LA 23. Access to the levee site would be provided from River Road and Hwy 11. The route for trucks carrying material to and from the job site, and to and from the borrow area will utilize both public and private roads and will be approved by MVN prior to use. During construction, equipment (i.e., front-end loaders and street sweepers) would be used to keep public streets used for the transport of material or for access and egress from the construction site free and clean of mud and other debris resulting from hauling operations.

3.1.16.4.2. Discussion of Impacts

No Action
Direct, Indirect, and Cumulative
Under the no action alternative, flood protection in the study area would not be raised to the 100-year level of risk reduction. There would be no direct impacts to transportation under this alternative; however, the existing flood risk would persist. Indirect impacts under this alternative would include the costs incurred for infrastructure repairs as a result of ongoing flooding in the area. Evacuation during flood events would also be slower under this alternative as a result of standing water and the need for motorists to seek out alternate routes. This alternative would contribute to adverse cumulative impacts on transportation due to the ongoing costs associated with repairing the transportation infrastructure as a result of continued flooding in the area.

Alternative 1 (Proposed Action)
Direct, Indirect, and Cumulative
The proposed actions would have direct, temporary effects on transportation including increased vehicular congestion along collector and local roads leading to and from the construction sites. The increased congestion would result in a reduction in the level of service (LOS, a metric describing traffic volume relative to capacity) on some local road segments. Indirect effects including vehicle emissions, decreases in level of service (e.g., longer waits at intersections), and decreases in road surface quality on other major and local roads in the study area would be expected. These impacts would be expected to be moderate, but temporary, lasting only as long as required to complete construction of the project. The majority of the project construction will occur adjacent to residential/commercial/industrial areas that already contain developed roadway infrastructure. The remaining project construction will occur, for the most part, adjacent to agricultural/grazing areas that have also altered pre-existing natural environments. Therefore, minimal, if any primal environmental resources will be impacted by transportation impacts and impacts to the natural, physical environment are therefore expected to be minor and temporary. Cumulative impacts under the proposed project would include moderate to severe degradation of infrastructure as a result of wear and tear from transporting construction materials. These impacts would likely be greatest on local and feeder roads. Higher design characteristics for high capacity roads such as Interstate Highways are able to withstand wear much better than for lesser roads.

3.1.16.5. Community and Regional Growth

3.1.16.5.1. Existing Conditions

Community and regional growth are generally influenced by national trends, but otherwise depend significantly upon relatively local attributes that allow it to be evaluated apart from the national economy. Growth has also historically been heavily dependent on reliable flood protection. The proposed project is planned with the result being improved flood and hurricane risk reduction. For the purposes of socioeconomic impact analysis, the project area is first described in summary terms with respect to prevailing trends in the growth of population, housing, income, and employment. Against this baseline, the relative effects of the proposed and alternative actions are evaluated.

According to U.S. Census data from 2000 to the 2005-2009 period, the following trends were observed in Plaquemines Parish: population decreased from 26,757 to 21,494, per capita personal income increased from $21,494 to $45,688, and employment declined from 21,304 to 19,349.

3.1.16.5.2. Discussion of Impacts

No Action
Direct, Indirect, and Cumulative
Under the no action alternative, flood protection in the study area would not be raised to the 100-year level of risk reduction. There would be no direct impacts to community and regional growth under this alternative; however, the existing flood risk would persist. Indirect impacts under this alternative would include the costs incurred for evacuation, clean-up, debris removal, building and infrastructure repair, damaged vehicles, and reoccupation of homes and businesses as a result of flood events. This alternative would contribute to adverse cumulative impacts on community and regional growth as the area would be more vulnerable to displacement of population and disruption of economic activity.

Alternative 1 (Proposed Action)
Direct, Indirect, and Cumulative
The proposed actions would have no direct, indirect, or cumulative adverse effect on community and regional growth. Increased protection from flooding would preserve and enhance community and regional growth.

3.1.16.6. Tax Revenues and Property Values

3.1.16.6.1. Existing Conditions

The study area is located in Plaquemines Parish. According to U.S. Census data, the average median value for specified owner-occupied housing units in Plaquemines Parish in the 2005-2009 period was $176,800.

3.1.16.6.2. Discussion of Impacts

No Action
Direct, Indirect, and Cumulative
Under the no action alternative, flood protection in the study area would not be raised to the 100-year level of risk reduction. There would be no direct impacts to tax revenues and property values under this alternative; however, the existing flood risk would persist. Indirect impacts under this alternative would include decreased tax revenues if displacement of population or businesses occurs as well as a decrease in property values if property is damaged as a result of flood events. This alternative would contribute to adverse cumulative impacts on tax revenues and property values as residents would be more vulnerable to displacement and disruption of economic activity.

Alternative 1 (Proposed Action)
Direct, Indirect, and Cumulative
Property values near the construction site itself may decrease temporarily due to the added traffic congestion and construction noise and dust. The impact, however, would be temporary, lasting only as long as the construction. There would be no significant indirect or cumulative impacts on tax revenues or property values as a result of the proposed action. The lower incidence of flooding that the HSDRRS is designed to achieve would have the effect of preserving, if not enhancing, property values within the protected areas.

3.1.16.7. Community Cohesion

3.1.16.7.1. Existing Conditions

Community cohesion refers to the common vision and sense of belonging within a community that is created and sustained by the extensive development of individual relationships that are social, economic, cultural, and historical in nature. The degree to which these relationships are facilitated and made effective is contingent upon the physical and spatial configuration of the community itself. The functionality of the community owes much to the physical landscape within which it is set. The viability of community cohesion is compromised to the extent to which these physical features are exposed to interference from outside sources.

The areas of the proposed sites are currently settled communities with stable complements of churches, schools, businesses, and community interaction.

3.1.16.7.2. Discussion of Impacts

No Action
Direct, Indirect, and Cumulative
Under the no action alternative, flood protection in the study area would not be raised to the 100-year level of risk reduction. There would be no direct impacts to community cohesion under this alternative; however, the existing flood risk would persist. Indirect impacts under this alternative would include the strain placed on communities to assist residents with

evacuation, clean-up, debris removal, building and infrastructure repair, damaged vehicles, and reoccupation of homes and businesses as a result of flood events. This alternative would contribute to adverse cumulative impacts on community cohesion as residents would be more vulnerable to displacement and disruption of economic activity.

Alternative 1 (Proposed Action)
Direct, Indirect, and Cumulative
The proposed action would have no direct, indirect, or cumulative adverse effect on community cohesion in the study area. Increased protection from flooding would preserve and enhance the potential for community cohesion.

3.1.17. Environmental Justice

Environmental Justice (EJ) is institutionally significant because of Executive Order 12898 of 1994 (E.O. 12898) and the Department of Defense's Strategy on Environmental Justice of 1995, which direct Federal agencies to identify and address any disproportionately high adverse human health or environmental effects of Federal actions to minority and/or low-income populations. Minority populations are those persons who identify themselves as Black, Hispanic, Asian American, American Indian/Alaskan Native, and Pacific Islander. A minority population exists where the percentage of minorities in an affected area either exceeds 50 percent or is meaningfully greater than in the general population. Low-income populations as of 2010 are those whose income are $22,050.00 for a family of four and are identified using the Census Bureau's statistical poverty threshold. The Census Bureau defines a "poverty area" as a Census tract with 20 percent or more of its residents below the poverty threshold and an "extreme poverty area" as one with 40 percent or more below the poverty level. This resource is technically significant because the social and economic welfare of minority and low-income populations may be positively or disproportionately impacted by the proposed actions. This resource is publicly significant because of public concerns about the fair and equitable treatment (fair treatment and meaningful involvement) of all people with respect to environmental and human health consequences of Federal laws, regulations, policies, and actions.

A potential disproportionate impact may occur when the percent minority in the study area exceeds 50 percent and/or the percent low-income exceeds 20 percent of the population. Additionally, a disproportionate impact may occur when the percent minority and/or low-income in the study area are meaningfully greater than those in the reference community. For purposes of this analysis, the Census Block Groups within which the study area is located are defined as the EJ study area. For the purposes of this analysis, Plaquemines Parish is considered the reference community of comparison.

The methodology, consistent with E.O. 12898, to accomplish this EJ analysis includes identifying low-income and minority populations within the study area using up-to-date economic statistics, aerial photographs, 2010 U.S. Census records, the 2005-2009 U.S. Census Bureau's American Community Survey (ACS) estimates, as well as conducting community outreach activities such as public meetings.

The 2010 U.S. decennial Census data will be used in the current analysis as the primary deciding variable to determine whether the study area exceeds the minority threshold and therefore potentially disproportionately impacts minority population groups. The U.S. Census Bureau is now only providing population (including minority status) and housing characteristics in the decennial censuses. Other social characteristics (e.g., low-income) will now be provided in the U.S. Census Bureau's American Community Survey (ACS). The ACS provides estimates of social characteristics based on data collected over five years. The 2005-2009 estimates represent the average characteristics over the 5-year period of time. For this reason, the current analysis uses the 2005-2009 ACS data to determine whether the study area exceeds the low-income threshold and therefore potentially disproportionately impacts low-income populations.

3.1.17.1. Existing Conditions

According to the 2010 decennial Census, Plaquemines Parish had a minority population of 32.2 percent in 2010. The 2005-2009 ACS data indicate that Plaquemines Parish had a low-income population of 10.6 percent during that period. Data from the 2010 decennial Census indicate that the minority population within proximity to the proposed actions was 14.2 percent, and according to the 2005-2009 ACS, the low-income population in the area was 11.4 percent.

Analyses of the above information show that the study area exceeds neither the 50 percent minority threshold nor the 20 percent low-income threshold and is therefore not considered an EJ study area.

3.1.17.2. Discussion of Impacts

No Action
Direct, Indirect, and Cumulative
The study area does not qualify as an EJ study area and therefore minority and/or low-income populations would not experience disproportionate adverse impacts under this alternative.

Alternative 1 (Proposed Action)
Direct, Indirect, and Cumulative
The study area does not qualify as an EJ study area and therefore minority and/or low-income populations would not experience disproportionate adverse impacts under this alternative.

3.1.18. Hazardous, Toxic, and Radioactive Waste

3.1.18.1. Existing Conditions

There must be reasonable identification and evaluation of all HTRW contamination within the vicinity of the proposed action. Under Engineer Regulation (ER) 1165-2-132, the reasonable identification and evaluation of Hazardous, Toxic, and Radioactive Waste

(HTRW) contamination within a proposed area of construction is required. ER 1165-2-132 identifies the CEMVN HTRW policy to avoid the use of project funds for HTRW removal and remediation activities. Costs for necessary special handling or remediation of wastes (e.g., Resource Conservation and Recovery Act [RCRA] regulated), pollutants and other contaminants, which are not regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), will be treated as project costs if the requirement is the result of a validly promulgated Federal, state or local regulation.

An American Society of Testing Materials (ASTM) E 1527-05 Phase I Environmental Site Assessment (ESA) entitled IER Supplement 33.a, West Bank and Vicinity and Mississippi River Levee Co-Located Levees Resilient Features, Plaquemines Parish, Louisiana dated November 15, 2011 was completed by USACE personnel for the proposed action and is on file in the Regional Planning and Environment Division, South, of USACE-MVN.

An American Society of Testing Materials (ASTM) E 1527-05 Phase I Environmental Site Assessment (ESA) entitled Plaquemines Parish Soil Mixing Site, Walker Road, Belle Chasse, Plaquemines Parish, Louisiana was completed November 3, 2010 for the proposed action and is on file in the Regional Planning and Environment Division, South, of USACE-MVN.

3.1.18.2. Discussion of Impacts

No Action
Direct, Indirect, and Cumulative
Although no Recognized Environmental Conditions were identified in the project area, there are several industries within the levee reach that could potentially be a source of HTRW or petroleum products. Potential flooding as a result of not providing the 100-year elevation could indirectly contribute to the dispersion of HTRW materials and environmental damage to local communities. Significant flooding can result in the mobilization and dispersion of HTRW from commercial, municipal, and residential sources. Hurricane damage clean-up experience has shown that vast quantities of debris and increasingly hazardous materials are dispersed into the terrestrial and aquatic environments when large-scale flooding occurs.

Alternative 1 (Proposed Action)
Direct
The proposed Right of Way expansion and addition of staging areas to complete planned levee work would have a low probability of increasing exposure to Hazardous, Toxic, or Radioactive Waste (HTRW). However, the potential to release HTRW materials or petroleum products during the construction process remains an environmental concern. Storage, fueling, and lubrication of equipment and motor vehicles associated with the construction process would be conducted in a manner that affords the maximum protection against spills and evaporation. Fuels, lubricants, oils, and other materials would be managed and stored in accordance with all Federal, state, and local laws and regulations. Used lubricants, used oil, and other fluids would be stored in marked corrosion-resistant containers and recycled or disposed of in accordance with appropriate requirements. Contract specifications would require the construction contractor to develop a spill control plan as

well as require the contractor to be in full compliance with all Federal, state and local laws and regulations, including those laws and regulations pertaining to HTRW.

Indirect
The proposed project would provide a greater level of risk reduction from storm-induced flooding than is available at present; therefore, the likelihood of floodwater dispersing HTRW would be reduced.

Cumulative
The cumulative impacts of the proposed action would be positive: improved protection from storm-induced flooding would reduce the likelihood of flood water dispersing HTRW.

3.1.19. Noise

3.1.19.1. Existing Conditions

The project area includes residential, commercial, and recreational areas with varying degrees of associated noise. Changes in noise are typically measured and reported in units of dBA, a weighted measure of sound level. The primary sources of noise within the area include everyday vehicular traffic along nearby roadways (typically between 50 and 60 dBA at 100 feet), maintenance of roadways, bridges, and the other structures (typically between 80 and 100 dBA at 50 feet), and the ongoing construction of various components of the existing floodwalls, pumping stations, and closure structures.

Noise effects to the residences and businesses within the project area are dominated by transportation sources such as trains, garbage and construction trucks, private vehicles, and emergency vehicles. Noise from occasional commercial aircraft crossing at high altitudes is typically indistinguishable from the natural background noise of the area. Noise ranging from about 10 dBA for the rustling of leaves to as much as 115 dBA (the upper limit for unprotected hearing exposure established by the Occupational Safety and Health Administration) is common in areas where there are sources of industrial operations, construction activities, and vehicular traffic.

The U.S. Federal Transit Administration (FTA) has established noise impact criteria founded on well-documented research on community reaction to noise based on change in noise exposure using a sliding scale (USFTA, 1995). The FTA Noise Impact Criteria groups noise sensitive land uses into the following three categories:

- Category 1: Buildings or parks where quiet is an essential element of their purpose,
- Category 2: Residences and buildings where people normally sleep (e.g., residences, hospitals, and hotels with high nighttime sensitivity), and
- Category 3: Institutional buildings with primarily daytime and evening use (e.g., schools, libraries, and churches).

The only Category 1 property in proximity to the alignment would be Tulane University's A Studio in the Woods at 13401 Patterson Road[2]. The facility is "a peaceful retreat where visual, literary, and performing artists can work uninterrupted" and is approximately 450 feet from the construction right-of-way.

Throughout the entire project area, many residences (Category 2) are in close proximity (less than 300 feet) to the existing MRL and proposed action. The density of residences is greatest in Oakville and Belle Chasse, LA. Category 3 buildings in proximity to the existing MRL include:

- Embry-Riddle Aeronautical University (approximately 1,000 feet),
- Belle Chasse Middle School (approximately 1,400 feet),
- Our Lady of Perpetual Help School (approximately 1,000 feet),
- The First Baptist Church in Belle Chasse (approximately 1,000 feet),
- The Belle Chasse Independent Church (approximately 1,000 feet),
- The Belle Chasse United Methodist Church (approximately 800 feet), and
- The Tulane University Museum of Natural History (approximately 300 feet).

3.1.19.2. Discussion of Impacts

No Action
Direct
Without construction of the Resilient Features for the Co-Located area, noise within the area would remain unchanged from current conditions where the largest source of noise is vehicle traffic and industrial activity along Louisiana Highway 23 paralleling the MRL.

Indirect
In the event of significant hurricane flooding, noise would be generated associated with the clean up after floodwaters had receded from the heavy equipment used for cleanup and reconstruction. Under the no action alternative, this cleanup and reconstruction noise would occur more frequently than if one of the action alternatives would be implemented.

Cumulative
There would be no cumulative effects associated with noise from selecting the no action alternative.

Alternative 1 (Proposed Action)
Direct, Indirect, and Cumulative
With the construction of the proposed action, noise would be created from high-powered machinery (Table 9) and human activities within the project right-of-way and emanate various distances beyond the construction site until the noise energy dissipated. The distance between the construction right-of-way and the Category 1 facility is approximately 450 feet from the existing right-of-way through a wooded lot. There are many Category 2

[2] www.astudiointhewoods.org/sitw/

(residences) within 100-300 feet from the toe of the existing levee and four residences less than 100 feet from the existing levee toe in Oakville. Seven Category 3 facilities are in proximity to the proposed action, but none are closer than 300 feet and most would be greater than 1,000 feet away. Table 8 is a listing of noise generating equipment typically used for construction of levees, using data from the Federal Highway Administration (FHWA).

Table 9
FHWA Noise Levels at Distance from the Source (dBA)

Noise Generator	**50 feet***	**100 feet***	**200 feet***	**500 feet***	**1000 feet***
Dump Truck	76	70	64	56	50
Backhoe	78	72	68	58	52
Front End Loader	79	73	67	59	53
Concrete Mixer	79	73	67	59	53
Crane	81	75	69	61	55
Bull Dozer	82	76	70	62	56
Auger Drill	84	78	72	64	58
Pile Driver	91	85	79	71	65

* Distance from receptor. Source: FHWA 2007. The dBA at 50 feet is measured; the others are model estimates.

Construction activity, and the associated noise, can be quite annoying and disruptive during leisure hours, during sleep hours, and any time when loud continuous noises may affect receptors. Time constraints and use of equipment regulations can be effective in reducing the effects caused during these hours of the day. The basis for the noise control strategy is to limit the times that certain construction activities may be conducted. Generally, this can be accomplished by requiring contractors to perform such work during daylight hours when the majority of individuals who would ordinarily be affected by the noise are either not present or are engaged in less noise-sensitive activities.

4. CUMULATIVE IMPACTS

NEPA requires Federal agencies to consider not only the direct and indirect impacts of a proposed action, but also the cumulative impact of the action. A cumulative impact is defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions (40 CFR§1508.7)." Cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time. These actions include on- or off-site projects conducted by government agencies, businesses, or individuals that are within the spatial and temporal boundaries of the actions considered in this IER Supplement.

As indicated previously, in addition to this IER Supplement, the CEMVN is preparing a draft CED that would describe the work completed and the work remaining to be constructed. The purpose of the draft CED will be to document the work completed by the USACE on a system-wide scale. The draft CED will describe the integration of individual IERs into a systematic planning effort. Additionally, the draft CED will contain updated information for any IER that had incomplete or unavailable data at the time it was posted for public review. Overall cumulative impacts and future operation maintenance, repair, replacement and rehabilitation requirements will also be included. The discussion provided below describes an overview of other actions, projects, and occurrences that may contribute to the cumulative impacts previously discussed.

Providing the area enclosed by the Co-Located Project with the 100-year level of risk reduction would contribute to the protection of life and to the reduction of physical and environmental damage. Significant flooding often results in contamination of drinking water supplies, dispersion of HTRW, and dispersion of large quantities of solid waste that require clean up and disposal. Experience has shown that vast quantities of debris (e.g., homes, vehicles, mobile homes, etc.) and sediment must be collected and hauled away after a flooding event. Hauling the collected debris to a local municipal landfill requires significant transportation and involves large quantities of solid waste that fill available landfill space. Providing the 100-year level of risk reduction reduces the probability that these environmental consequences of flooding would be incurred.

Negative effects associated with implementation of the proposed action that could contribute cumulatively with the effects of other projects include temporary construction-related increases in truck traffic, noise and vibration, vehicle and equipment emissions, and minor localized degradation of water quality. There would be permanent loss of aquatic habitat, wetlands and terrestrial habitat. It is expected that approximately 2 acres of open water habitat would be permanently filled, approximately 82 acres of forested wetlands and 80 acres of non-wet forested habitat would be cleared, grubbed, and filled or converted to open water, and approximately 74 acres of mowed marsh habitat would be temporarily disturbed during construction. The total loss of habitat related to the implementation of all actions under all of the IERs has not yet been compiled, but the current totals are presented in Table 10. The positive cumulative effects of implementing the proposed action include the

temporary expansion of the local economy through the influx of construction-related expenditures.

Currently, the WBV project extends approximately 66 miles in length from the Western Tie-in in St. Charles Parish to the Hero Canal Levee and Eastern Terminus in Belle Chasse (IER # 13) (USACE, 2007). Upon completion of the WBV-MRL Co-located work, the WBV project would subsequently be increased from approximately 66 miles to approximately 81.6 miles ending at the upper limit of the proposed action under IER #33, or around river mile 85.5 of the westbank MRL. The LPV Project (IERs # 1-11) extends an even larger distance protecting the East Bank of New Orleans. The construction-related negative effects as well as the positive consequences (e.g., spending in the local economy) resulting from providing the 100-year level of hurricane damage risk reduction for these projects may potentially represent the largest cumulative environmental consequences in the New Orleans region for the next 4 years to 7 years.

Table 10
HSDRRS Impacts and Compensatory Mitigation to be completed

IER	Parish	Levee Side	Non-wet BLH		Fresh Marsh		Swamp		BLH-Wet		Open Water
			Acres	*AAHUs*	*Acres*	*AAHUs*	*Acres*	*AAHUs*	*Acres*	*AAHUs*	*Acres*
1 LaBranche Levee	St. Charles	Protected	-	-	-	-	137.50	73.99	-	-	-
		Flood	-	-	-	-	143.57	110.97	11.33	8.09	
1.a Supp. LaBranche Levee	St. Charles	Protected	-	-	-	-	-	-	-	-	-
		Flood	-	-	-	-	-	-	-	-	
1.b Supp. LaBranche Levee	St. Charles	Protected	-	-	-	-	-	-	-	-	-
		Flood	-	-	-	-	-	-	-	-	
2 West Return Floodwall	St. Charles, Jefferson	Protected	-	-	-	-	-	-	-	-	75.00
		Flood	-	-	17.00	9.00	-	-	-	-	
2.a Supp. West Return Floodwall	St. Charles, Jefferson	Protected	-	-	-	-	-	-	-	-	-
		Flood	-	-	14.50	11.60	2.00	1.55	-	-	
3 Jefferson Lakefront Levee	Jefferson	Protected	-	-	-	-	-	-	-	-	26.40
		Flood	-	-	-	-	-	-	-	-	
3.a Supp. Jefferson Lakefront Levee	Jefferson	Protected	-	-	-	-	-	-	-	-	275.00
		Flood	-	-	-	-	-	-	-	-	
4 Orleans Lakefront Levee	Orleans	Protected	-	-	-	-	-	-	-	-	-
		Flood	-	-	-	-	-	-	-	-	
5 Lakefront Pump Stations	Jefferson, Orleans	Protected	-	-	-	-	-	-	-	-	3.60
		Flood	-	-	-	-	-	-	-	-	
6 Citrus Lands Levee	Orleans	Protected	-	-	-	-	-	-	-	-	68.00
		Flood	-	-	-	-	-	-	-	-	
6.a Supp. Citrus Lands Levee	Orleans	Protected	-	-	-	-	-	-	-	-	-
		Flood	-	-	-	-	-	-	-	-	
7	Orleans	Protected	-	-	100.40	36.80	-	-	151.70	79.30	106.00

IER	Parish	Levee Side	Non-wet BLH		Fresh Marsh		Swamp		BLH-Wet		Open Water
			Acres	*AAHUs*	*Acres*	*AAHUs*	*Acres*	*AAHUs*	*Acres*	*AAHUs*	*Acres*
Lakefront Levee		Flood	-	-	70.00	37.20	-	-	30.00	11.90	
7.a Supp. Lakefront Levee	Orleans	Protected	-	-	18.60	6.10	-	-	17.30	9.90	12.49
		Flood	-	-	56.00	30.20	-	-	2.80	0.30	
8 Bayou Bienvenue/Dupre	St. Bernard	Protected	-	-	-	-	-	-	-	-	0.30
		Flood	-	-	-	-	-	-	-	-	
9 Caenarvon Floodwall	St. Bernard	Protected	-	-	-	-	-	-	-	-	0.30
		Flood	10.00	4.65	1.90	1.20	-	-	1.20	0.66	
10 Chalmette Loop	St. Bernard	Protected	-	-	106.55	57.31	-	-	38.32	16.44	50.00
		Flood	-	-	323.04	209.94	-	-	35.31	15.22	
11 Tier 2Supp. Borgne IHNC	Orleans, St. Bernard	Protected	-	-	-	-	-	-	-	-	-
		Flood	-	-	122.00	23.33	-	-	15.00	2.59	
11 Tier 2 Pontchartrain IHNC	Orleans, St. Bernard	Protected	-	-	-	-	-	-	-	-	7.00
		Flood	-	-	-	-	-	-	-	-	
11 Tier 2 Pontch. Supp. IHNC	Orleans, St. Bernard	Protected	-	-	-	-	-	-	-	-	-
		Flood	-	-	-	-	-	-	-	-	
12 GIWW, Harvey, Algiers	Jefferson, Orleans, Plaquemines	Protected	-	-	-	-	-	-	251.70	175.10	-
		Flood	-	-	-	-	74.70	38.40	2.40	2.00	
12 Supp. Site N/Belle Chasse Tunnel	Jefferson, Orleans, Plaquemines	Protected	-	-	-	-	-	-	-	-	-
		Flood	-	-	-	-	-	-	-	-	
12.a Supp. WBV-14.e.2 Access Road	Jefferson, Orleans, Plaquemines	Protected	-	-	-	-	-	-	-	-	-
		Flood	-	-	-	-	-	-	-	-	
12/13 Supp. GIWW, Harvey, Algiers -	Jefferson, Orleans, Plaquemines	Protected	0.34	0.12	-	-	-	-	-	-	-
		Flood	-	-	-	-	-	-	-	-	
13 Hero Canal, East. Terminus	Plaquemines	Protected	-	-	-	-	-	-	13.00	7.80	-
		Flood	-	-	-	-	39.00	28.87	19.00	10.59	
13.a Supp.	Plaquemines	Protected	-	-	-	-	-	-	-	-	-

IER	Parish	Levee Side	Non-wet BLH		Fresh Marsh		Swamp		BLH-Wet		Open Water
			Acres	*AAHUs*	*Acres*	*AAHUs*	*Acres*	*AAHUs*	*Acres*	*AAHUs*	*Acres*
Hero Canal, East. Terminus		Flood	-	-	-	-	-	-	-	-	
14 Westwego to Harvey Levee	Jefferson	Protected	-	-	-	-	-	-	44.50	29.67	-
		Flood	-	-	-	-	29.75	17.02	45.50	37.17	
14 Supp. Westwego to Harvey Levee	Jefferson	Protected	-	-	-	-	-	-	-	-	-
		Flood	-	-	-	-	42.00	24.00	-	-	
15 Lake Cataouatche	Jefferson	Protected	-	-	-	-	-	-	23.50	6.12	-
		Flood	-	-	-	-	-	-	3.60	1.35	
15.a Supp. Lake Cataouatche	Jefferson	Protected	8.0	0.82	-	-	-	-	-	-	13.1
		Flood	-	-	14.5	3.20	-	-	-	-	
16 Western Tie-in	Jefferson, St. Charles	Protected	-	-	-	-	-	-	-	-	-
		Flood	-	-	134.10	65.50	-	-	78.60	36.20	
16 Supp. Western Tie-in	Jefferson, St. Charles	Protected	-	-	-	-	-	-	-	-	-
		Flood	-	-	14.10	9.00	-	-	79.10	37.26	
17 Company Canal Floodwall	Jefferson	Protected	-	-	-	-	-	-	5.50	2.69	-
		Flood	-	-	-	-	19.00	17.09	-	-	
18 GFBM	Jefferson, Orleans, Plaquemines, St. Bernard,	Protected	276.90	89.29	-	-	-	-	-	-	-
		Flood	-	-	-	-	-	-	-	-	
19 CFBM	Hancock County, MS; Iberville, Jefferson, Orleans, Plaquemines,	Protected	-	-	-	-	-	-	-	-	-
		Flood	-	-	-	-	-	-	-	-	
22 GFBM	Jefferson, Plaquemines	Protected	86.93	28.90	-	-	-	-	-	-	-
		Flood	-	-	-	-	-	-	-	-	
23 CFBM	Hancock County, MS; Plaquemines, St. Bernard,	Protected	-	-	-	-	-	-	-	-	-

IER	Parish	Levee Side	Non-wet BLH		Fresh Marsh		Swamp		BLH-Wet		Open Water
			Acres	*AAHUs*	*Acres*	*AAHUs*	*Acres*	*AAHUs*	*Acres*	*AAHUs*	*Acres*
	St. Charles	Flood	-	-	-	-	-	-	-	-	
25 GFBM	Jefferson, Orleans, Plaquemines	Protected	854.70	243.10	-	-	-	-	-	-	-
		Flood	-	-	-	-	-	-	-	-	
26 CFBM	Jefferson, Plaquemines, St. John the Baptist; Hancock, MS	Protected	-	-	-	-	-	-	-	-	-
		Flood	-	-	-	-	-	-	-	-	
27 Lakefront Pump Stations	Orleans	Protected	-	-	-	-	-	-	-	-	-
		Flood	-	-	-	-	-	-	-	-	
27 Lakefront Pump Stations	Orleans	Protected	-	-	-	-	-	-	-	-	-
		Flood	-	-	-	-	-	-	-	-	
28 GFBM	Jefferson, Plaquemines, St. Bernard	Protected	19.10	11.60	-	-	-	-	-	-	-
		Flood	-	-	-	-	-	-	-	-	
29 CFBM	Orleans, St. Tammany, St. John the Baptist	Protected	107.30	48.60	-	-	-	-	-	-	-
		Flood	-	-	-	-	-	-	-	-	
30 CFBM	St. Bernard and St. James; Hancock, MS	Protected	225.00	189.40	-	-	-	-	-	-	-
		Flood	-	-	-	-	-	-	-	-	
31 CFBM	E.Baton Rouge, Jeff, Lafourche, Plaquem,	Protected	965.3	-	-	-	-	-	-	-	-

IER	Parish	Levee Side	Non-wet BLH		Fresh Marsh		Swamp		BLH-Wet		Open Water
			Acres	*AAHUs*	*Acres*	*AAHUs*	*Acres*	*AAHUs*	*Acres*	*AAHUs*	*Acres*
	St. Bern, St. Tam; Hancock, MS	Flood	-	-	-	-	-	-	-	-	
32 CFBM	Ascension, Plaquemines, St. Charles	Protected	202.10	97.43	-	-	-	-	-	-	-
		Flood	-	-	-	-	-	-	-	-	
Totals		Protected	2738.57	1280.23	240.05	103.41	137.50	73.99	624.12	363.22	637.19
		Flood	10.00	4.65	752.64	397.97	350.02	237.90	245.24	127.13	
		Both	2748.57	1284.88	978.19	498.18	487.52	311.89	869.36	490.35	637.19

BLH – Bottomland Hardwood
AAHUs – Annual average habitat units are the total number of habitat units gained or lost as a result of a proposed action, divided by the life of the action
- Not applicable to the IER or number impacted is 0
GFBM: Government Furnished Borrow Material
CFBM: Contractor Furnished Borrow Material

5. SELECTION RATIONALE

On the basis of the assessment of potential environmental impacts presented in this IER Supplement and the evaluation of feasibility based on the engineering effectiveness, economic efficiency, and environmental and social acceptability criteria, the proposed action is selected and is environmentally preferred.

The CEQ regulations for implementing NEPA require that the Record of Decision (ROD) for an environmental impact statement specify "the alternative or alternatives which were considered to be environmentally preferable" (40 CFR §1505.2(b)). This alternative has generally been interpreted to mean the alternative that would promote the national environmental policy as expressed in NEPA's Section 101 (CEQ's "Forty Most-Asked Questions," 46 Federal Register, 18026, March 23, 1981). Ordinarily, this means the alternative that causes the least damage to the biological and physical environment; it also means the alternative that best protects, preserves, and enhances historic, cultural, and natural resources.

The proposed action for IER Supplement #33.a presents an engineering-effective, cost-efficient, environmentally-preferable selection to other alternatives. Taking no action, although avoiding the direct effects from construction of the 100-year level of risk reduction Resilient Features, may lead to indirect effects from large-scale flooding to area residences and businesses, and associated costs for clean up.

Failing to provide residents with flood damage risk reduction measures could, in the predictable occurrence of a significant flood, contribute to the loss of life and physical as well as environmental damage to Plaquemines Parish and Orleans Parish. Significant flooding can result in the overtopping of water and sewage treatment works, contamination of drinking water supplies, dispersion of HTRW and dispersion of large quantities of solid waste that need clean up from the floodplain when the storm surge subsides. Substantial quantities of debris (e.g., homes, vehicles, mobile homes, etc.) and sediment must be removed from the area after a flooding event. The physical removal of the debris from the damaged area typically involves large, heavy equipment and requires the removal of trees and vegetation to provide points of ingress and egress for the cleanup equipment. Hauling the collected debris to a local municipal landfill requires significant transportation, construction-type noise during cleanup, and involves huge quantities of solid waste that fill available landfill space.

Debris generated as a result of hurricane damages to Louisiana in 2005 has been estimated at 26.5 million cubic yards; all of this debris needed to be removed for appropriate disposal (USACE, 2007). Assuming the clean up was performed using dump trucks that could haul 40 CY of debris, the debris removal alone would require more than 1 million truckloads and tens of millions of miles traveled (USACE, 2007). Failing to provide the Greater New Orleans Area with appropriate hurricane risk reduction would eventually result in a damaging storm causing substantial quantities of debris requiring extraction, transportation, and disposal.

6. COORDINATION AND CONSULTATION

Preparation of this Draft IER Supplement is being coordinated with appropriate Congressional, Federal, state, and local interests, as well as environmental groups and other interested parties. An interagency environmental team was established for this project in which Federal and state agency staff played an integral part in the project planning and alternative analysis phases of the project (members of this team are listed in appendix D). This interagency environmental team was integrated with the CEMVN Project Delivery Team to assist in the planning of this project and to complete a mitigation determination of the potential direct and indirect impacts of the proposed action. Monthly meetings with resource agencies were also held concerning this and other CEMVN IER projects. The following agencies, as well as other interested parties, are receiving copies of this draft IER:

U.S. Department of the Interior, Fish and Wildlife Service
U.S. Department of the Interior, National Park 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

The USFWS has reviewed the proposed action and in their correspondence dated November 8, 2011 concurred with CEMVN's determination that the proposed project is not likely to adversely affect any threatened or endangered species or critical habitat.

In their November 8, 2007 correspondence, the NMFS Protected Resources Division provided a list of threatened and endangered species under their jurisdiction in Louisiana. Based on that information, the CEMVN made a determination of no effect for species under NMFS jurisdiction.

The National Oceanic and Atmospheric Administration National Marine Fisheries Service will review the proposed action during the 30-day review and comment period to ensure compliance with Section 305 of the Magnuson-Stevens Fishery Conservation and Management Act and the Fish and Wildlife Coordination Act.

In compliance with the Coastal Zone Management Act, the CEMVN has determined that construction and maintenance of 1-percent level of risk reduction along the WBV-MRL Co-Located Project is consistent, to the maximum extent practicable, with the guidelines of the State of Louisiana's approved Coastal Zone Management Program. A Coastal Zone consistency determination was prepared and provided to the Louisiana Department of Natural Resources by letter dated November 2, 2011.

A Louisiana Department of Environmental Quality Water Quality Certification letter, WQC 101109-03/AI 101235/CER 20110001, dated November 7, 2011, stated that the requirements for Water Quality Certification have been met and that the placement of fill material will not violate water quality standards of Louisiana as provided for in LAC 33:IX Chapter 11.

Section 106 of the National Historic Preservation Act, as amended, requires consultation with SHPO and Native American tribes. The CEMVN has elected to fulfill its obligations under Section 106 of the National Historic Preservation Act of 1966, as amended, through the execution and implementation of a Programmatic Agreement (PA). The PA is being developed in consultation with the Advisory Council on Historic Preservation, the Louisiana State Historic Preservation Officer (LA SHPO), and federally recognized Indian Tribes. The following Federally recognized Indian tribes were invited to participate in the development of the PA: Alabama-Coushatta Tribe of Texas, Caddo Nation of Oklahoma, Chitimacha Tribe of Louisiana, Choctaw Nation of Oklahoma, Coushatta Tribe of Louisiana, Jena Band of Choctaw Indians, Mississippi Band of Choctaw Indians, Quapaw Tribe of Oklahoma, Seminole Nation of Oklahoma, Seminole Tribe of Florida, and the Tunica-Biloxi Tribe of Louisiana to consult in the development of the PA. The Caddo Nation of Oklahoma (email dated 8/11/2011) and the Choctaw Nation of Oklahoma (email dated 10/3/2011) indicated an interest in continuing to participate in the development of the PA. The PA will be executed in December 2011, at which time Section 106 consultation will be concluded for this project.

The USFWS reviewed the proposed action in accordance with the Fish and Wildlife Coordination Act and have provided a draft Coordination Act Report for IER Supplement #33.a dated November 22, 2011. A final report would be prepared after the 30-day public review of IER Supplement #33.a.

Programmatic Recommendations of the U.S. Fish and Wildlife Service
In November 2007, the USFWS provided programmatic recommendations, in the "Draft Fish and Wildlife Coordination Act Report for the Individual Environmental Reports (IER), Public Law 109-234, Emergency Supplemental Appropriations Act for Defense, the Global War on Terror, and Hurricane Recovery, 2006 (Supplemental 4)". The uncertainties in the design of several projects prohibited a complete evaluation of the impacts to fish and wildlife species and the reporting responsibilities under Section 2(b) of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended: 16 U.S.C. 661 et seq.). Therefore, a subsequent final supplemental report will be provided by the USFWS at a later date. The draft (programmatic) Fish and Wildlife Coordination Act Report for the IERs dated November 2007, can be accessed through the www.nolaenvironmental.gov website.

The USFWS' programmatic recommendations applicable to this project will be incorporated into project design studies to the extent practicable, consistent with engineering and public safety requirements. The USFWS' programmatic recommendations, and the CEMVN's response to them, are listed below:

Recommendation 1: To the greatest extent possible, situate flood risk reduction so that destruction of wetlands and non-wet bottomland hardwoods are avoided or minimized.

CEMVN Response 1: The project would utilize the authorized level of risk reduction footprint to avoid and minimize impacts to wetlands.

Recommendation 2: Minimize enclosure of wetlands with new levee alignments. When enclosing wetlands is unavoidable, acquire non-development easements on those wetlands, or maintain hydrologic connections with adjacent, un-enclosed wetlands to minimize secondary impacts from development and hydrologic alteration.

CEMVN Response 2: Not applicable.

Recommendation 3: Avoid adverse impacts to bald eagle nesting locations and wading bird colonies through careful design project features and timing of construction.

CEMVN Response 3: No known bald eagle nesting locations or wading bird colonies exist within the scope of this project.

Recommendation 4: Forest clearing associated with project features should be conducted during the fall or winter to minimize impacts to nesting migratory birds, when practicable.

CEMVN Response 4: This recommendation will be considered in the design and implementation of the project to the greatest extent practicable.

Recommendation 5: The project's first Project Cooperation Agreement (or similar document) should include language that includes the responsibility of the local-cost sharer to provide operational, monitoring, and maintenance funds for mitigation features.

CEMVN Response 5: USACE Project Partnering Agreements (PPA) do not contain language mandating the availability of funds for specific project features, but require the non-Federal sponsor to provide certification of sufficient funding for the entire project.
Further, mitigation components are considered a feature of the entire project. The non-Federal sponsor is responsible for Operation, Maintenance, Repair, Replacement and Rehabilitation (OMRR&R) of all project features in accordance with the OMRR&R manual that the USACE provides upon completion of the project.

Recommendation 6: Further detailed planning of project features (e.g., Design Documentation Report, Engineering Documentation Report, Plans and Specifications, or other similar documents) should be coordinated with the USFWS, NMFS, LDWF, USEPA, and LDNR. The USFWS shall be provided an opportunity to review and submit recommendations on all the work addressed in those reports.

CEMVN Response 6: Concur.

Recommendation 7: The CEMVN should avoid impacts to public lands, if feasible. If not feasible, the CEMVN should establish and continue coordination with agencies managing public lands that may be impacted by a project feature until construction of that feature is

complete and prior to any subsequent maintenance. Points of contacts for the agencies overseeing public lands potentially impacted by project features are: Kenneth Litzenberger, Project Leader for the USFWS' Southeast National Wildlife Refuges, and Jack Bohannan (985)822-2000, Refuge Manager for the Bayou Sauvage National Wildlife Refuge (NWR), Office of State Parks contact Mr. John Lavin at (888)677-1400, National Park Service (NPS) contact Superintendent David Luchsinger, (504)589-3882, extension 137 (david_luchsinger@nps.gov), or Chief of Resource Management David Muth (504)589-3882, extension 128 (david_muth@nps.gov) and for the 404(c) area contact the previously mentioned NPS personnel and Ms. Barbara Keeler (214)665-6698 with the USEPA.

CEMVN Response 7: Concur.

Recommendation 8: If applicable, a General Plan should be developed by the CEMVN, the USFWS, and the managing natural resource agency in accordance with Section 3(b) of the FWCA for mitigation lands.

CEMVN Response 8: Concur.

Recommendation 9: If mitigation lands are purchased for inclusion within a NWR, those lands must meet certain requirements; a summary of some of those requirements is provided in Appendix A (to the Draft Fish and Wildlife Coordination Act Report.) Other land-managing natural resource agencies may have similar requirements that must be met prior to accepting mitigation lands; therefore, if they are proposed as a manager of a mitigation site, they should be contacted early in the planning phase regarding such requirements.

CEMVN Response 9: Concur.

Recommendation 10: If a proposed project feature is changed significantly or is not implemented within one year of the date of the Endangered Species Act consultation letter, the USFWS recommended that the Corps reinitiate coordination to ensure that the proposed project would not adversely affect any Federally-listed threatened or endangered species or their habitat.

CEMVN Response 10: Concur.

Recommendation 11: In general, larger and more numerous openings in a risk reduction levee better maintain estuarine-dependent fishery migration. Therefore, as many openings as practicable, in number, size, and diversity of locations should be incorporated into project levees.

CEMVN Response 11: Not applicable.

Recommendation 12: Flood risk reduction water control structures in any watercourse should maintain pre-project cross-sections in width and depth to the maximum extent practicable, especially structures located in tidal passes.

CEMVN Response 12: Not applicable.

Recommendation 13: Flood risk reduction water control structures should remain completely open except during storm events. Management of those structures should be developed in coordination with the USFWS, NMFS, LDWF, and LDNR.

CEMVN Response 13: Not applicable.

Recommendation 14: Any flood risk reduction water control structure sited in canals, bayous, or a navigation channel which does not maintain the pre-project cross-section should be designed and operated with multiple openings within the structure. This should include openings near both sides of the channel as well as an opening in the center of the channel that extends to the bottom.

CEMVN Response 14: Not applicable.

Recommendation 15: The number and siting of openings in flood risk reduction levees should be optimized to minimize the migratory distance from the opening to enclosed wetland habitats.

CEMVN Response 15: Not applicable.

Recommendation 16: Flood risk reduction structures within a waterway should include shoreline baffles and/or ramps (e.g., rock rubble, articulated concrete mat) that slope up to the structure invert to enhance organism passage. Various ramp designs should be considered.

CEMVN Response 16: Not applicable.

Recommendation 17: To the maximum extent practicable, structures should be designed and/or selected and installed such that average flow velocities during peak flood or ebb tides do not exceed 2.6 ft per second. However, this may not necessarily be applicable to tidal passes or other similar major exchange points.

CEMVN Response 17: Not applicable.

Recommendation 18: To the maximum extent practicable, culverts (round or box) should be designed, selected, and installed such that the invert elevation is equal to the existing water depth. The size of the culverts selected should maintain sufficient flow to prevent siltation.

CEMVN Response 18: Concur.

Recommendation 19: Culverts should be installed in construction access roads unless otherwise recommended by the natural resource agencies. At a minimum, there should be one 24-inch culvert placed every 500 ft and one at natural stream crossings. If the depth of water crossings allow, larger-sized culverts should be used. Culvert spacing should be

optimized on a case-by-case basis. A culvert may be necessary if the road is less than 500 feet long and an area would hydrologically be isolated without that culvert.

CEMVN Response 19: Concur.

Recommendation 20: Water control structures should be designed to allow rapid opening in the absence of an offsite power source after a storm passes and water levels return to normal.

CEMVN Response 20: Not applicable.

Recommendation 21: Levee alignments and water control structure alternatives should be selected to avoid the need for fishery organisms to pass through multiple structures (i.e., structures behind structures) to access an area.

CEMVN Response 21: Not applicable.

Recommendation 22: Operational plans for water control structures should be developed to maximize the cross-sectional area open for as long as possible. Operations to maximize freshwater retention or redirect freshwater flows could be considered if hydraulic modeling demonstrates that is possible and such actions are recommended by the natural resource agencies.

CEMVN Response 22: Concur.

Recommendation 23: The CEMVN shall fully compensate for any unavoidable losses of wetland habitat or non-wet bottomland hardwoods caused by project features.

CEMVN Response 23: Concur.

Recommendation 24: Acquisition, habitat development, maintenance and management of mitigation lands should be allocated as first-cost expenses of the project, and the local project-sponsor should be responsible for operational costs. If the local project-sponsor is unable to fulfill the financial mitigation requirements for operation, then the CEMVN shall provide the necessary funding to ensure mitigation obligations are met on behalf of the public interest.

CEMVN Response 24: Construction of the project features are cost shared between the Government and the non-Federal sponsor. However, costs for operation, maintenance, repair, replacement, and rehabilitation would be the responsibility of the non-Federal sponsor.

Recommendation 25: Any proposed change in mitigation features or plans should be coordinated in advance with the USFWS, NMFS, LDWF, USEPA, and LDNR.

CEMVN Response 25: Mitigation for the impacts caused by this project will be coordinated through a mitigation IER. Any changes to the mitigation plan in this IER would be coordinated in advance.

Recommendation 26: A report documenting the status of mitigation implementation and maintenance should be prepared every three years by the managing agency and provided to the CEMVN, USFWS, NMFS, USEPA, LDNR, and LDWF. That report should also describe future management activities, and identify any proposed changes to the existing management plan.

CEMVN Response 26: Concur.

Project-Specific Recommendations of the U.S. Fish and Wildlife Service
The USFWS' project-specific recommendations in their Draft Coordination Act Report dated November 22, 2011, and the CEMVN's response to the recommendations are listed below:

USFWS Recommendation 1: The Corps shall fully compensate for any unavoidable losses to wetland (50.13 AAHUs) and non-wetland (48.93 AAHUs) bottomland hardwood habitat caused by project implementation.

CEMVN Response 1: Pursuant to CEQ-approved NEPA Alternative Arrangements, a number of comprehensive mitigation IER or IERs will be prepared documenting and compiling these unavoidable impacts and those for all other proposed actions within the HSDRRS that are being analyzed through other IERs. Mitigation planning is being carried out for groups of IERs, rather than within each IER, so that large mitigation efforts could be taken rather than several smaller efforts, increasing the relative economic and ecological benefits of the mitigation effort. This forthcoming mitigation IER will implement compensatory mitigation as early as possible. All mitigation activities will be consistent with standards and policies established in appropriate Federal and state laws and USACE policies and regulations.

USFWS Recommendation 2: If any feature of the proposed project is changed significantly or not implemented within one year of the November 8, 2011, Endangered Species Act signed-stamp concurrence with your "not likely to adversely affect" determination, we recommend that the Corps reinitiate coordination with our office to ensure that the proposed project would not adversely affect any Federally listed threatened or endangered species or their habitat.

CEMVN Response 2: CEMVN will advise USFWS of any project changes to the proposed action that could potentially adversely affect any Federally listed threatened or endangered species or their habitat.

USFWS Recommendation 3: Our records indicate that project-associated impacts to bald eagles and colonial nesting waterbirds are unlikely because of the distance between existing known colonies and nest sites and the proposed project activities. Such nest sites and colonies may be present, however, that are not currently listed in our database. We,

therefore, recommend that on-site contract personnel be informed of the need to identify bald eagle nest sites and waterbird nesting colonies, and to avoid affecting them during the breeding season.

a. To minimize disturbance to 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).
b. If a bald eagle nest is discovered within or adjacent to the proposed project area, then an evaluation must be performed to determine whether the project is likely to disturb nesting bald eagles. That evaluation may be conducted on-line at: http://www.fws.gov/southeast/es/baldeagle. Following completion of the evaluation, that website will provide a determination of whether additional consultation is necessary and those results should be forwarded to this office.

CEMVN Response 3: The construction contracts will contain language requiring the contractor to identify and avoid disturbing such nesting sites. In addition, CEMVN personnel will inspect the areas near construction activities, during the nesting season, to identify and make provisions to avoid any such nesting sites.

USFWS Recommendation 4: Forest clearing associated with project features shall be conducted during the fall or winter, when practicable, to minimize impacts to nesting migratory birds.

CEMVN Response 4: To the maximum extent practicable, all attempts will be made to proceed with forest clearing activities during the fall or winter seasons.

USFWS Recommendation 5: Acquisition, habitat development, maintenance and management of mitigation lands shall be allocated as first-cost expenses of the project, and the local project-sponsor shall be responsible for operational costs. If the local project-sponsor is unable to fulfill the financial mitigation requirements for operation, then the Corps shall provide the necessary funding to ensure mitigation obligations are met on behalf of the public interest.

CEMVN Response 5: Construction of the project features are cost shared between the Government and the non-Federal sponsor. However, costs for operation, maintenance, repair, replacement, and rehabilitation would be the responsibility of the non-Federal sponsor.

USFWS Recommendation 6: Further detailed planning of project features (e.g., Design Documentation Report, Engineering Documentation Report, Plans and Specifications, or other similar documents) shall be coordinated with the Service and other State and Federal natural resource agencies, and all such agencies shall be provided an opportunity to review and submit recommendations on the work addressed in those reports.

CEMVN Response 6: Concur.

USFWS Recommendation 7: If mitigation lands are purchased for inclusion within a Federal or State managed property, the land manager of the respective property shall be contacted early in the planning phase regarding any requirements to which the proposed mitigation parcel must adhere or conform. If applicable, a site-specific plan shall be developed by the Corps, the Service, and the pertinent natural resource management agency (that would accept ownership and/or responsibility for the mitigation parcel), in accordance with Section 3(b) of the FWCA for mitigation lands.

CEMVN Response 7: Concur.

USFWS Recommendation 8: A report documenting the status of mitigation implementation and maintenance should be prepared every three years by the managing agency and provided to the Corps, the Service, National Marine Fisheries Service, U.S. Environmental Protection Agency, Louisiana Department of Natural Resources, and Louisiana Department of Wildlife and Fisheries. That report should also describe future management activities, and identify any proposed changes to the existing management plan.

CEMVN Response 8: Acknowledged.

7. MITIGATION

Mitigation for unavoidable impacts to the human and natural environment described in this and other IERs will be addressed in separate mitigation IERs. CEMVN has partnered with Federal and state resource agencies to form an interagency mitigation team that is working to assess and verify these impacts, and to look for potential mitigation sites in the appropriate hydrologic basin. This effort is occurring concurrently with the IER planning process in an effort to complete mitigation work and construct mitigation projects expeditiously. As with the planning process of all other IERs, the public will have the opportunity to give input about the proposed work. These mitigation IERs will, as described in Section 1 of this IER, be available for a 30-day public review and comment period.

Permanent and temporary impacts to wetland resources located primarily on the floodside of the existing MRL, would occur as a result of construction of the proposed action. Permanent impacts would be from mechanically clearing, grubbing, and filling the area to construct the project features. Temporary impacts would result from the movement of construction equipment and materials within the existing 40-foot vegetation free (maintenance) corridor located on the floodside of the existing MRL. The wetland resources that would be permanently and temporarily impacted includes, by reach, approximately:

WBV-MRL 1.2(a)
Permanent – 1 acre of forested wetlands.
Temporary – 5 acres of mowed marsh vegetation.

WBV-MRL 1.2(b)
Permanent – 10 acres of forested wetlands.
Temporary – 5 acres of mowed marsh vegetation.

WBV-MRL 2.2
Permanent – 1 acre of forested wetlands.
Temporary – 6 acres of mowed marsh vegetation.

WBV-MRL 3.2
Permanent – 22 acres of forested wetlands.
Temporary – 12 acres of mowed marsh vegetation.

WBV-MRL 4.2
Permanent – 1 acre of forested wetlands.
Temporary – 5 acres of mowed marsh vegetation.

WBV-MRL 5.2
Permanent – 36 acre of forested wetlands.
Temporary – 17 acres of mowed marsh vegetation.

Armoring (above WBV-MRL 5.2 to river mile 85.5)
Temporary – 24 acres of mowed marsh vegetation.

Windrowing (all WBV-MRL contract reaches)
Permanent – 11 acre of forested wetlands.

In total, approximately 82 acres of forested wetlands and 74 acres of mowed marsh vegetation would be permanently and temporarily impacted by construction of the proposed action, respectively.

7.1. Wetlands Value Assessment and Impacts of the Proposed Action

Evaluation of project related impacts on fish and wildlife resources was conducted by the USFWS and CEMVN and aided by use of the Wetlands Value Assessment (WVA) methodology developed for the evaluation of proposed Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) projects. The WVA methodology is similar to the USFWS Habitat Evaluation Procedures (HEP), in that habitat quality and quantity are measured for baseline conditions and predicted for Future Without Project (FWOP) and Future With Project (FWP) conditions. Instead of the species based approach of HEP, the WVA model utilizes an assemblage of variables considered important to the suitability of a given habitat type for supporting a diversity of fish and wildlife species. As with HEP, these models allow a numeric comparison of each future condition and provide a combined quantitative and qualitative estimate of project related impacts to fish and wildlife resources. For those bottomland hardwood areas that would be permanently impacted by construction of the proposed project, the habitat assessment model for bottomland hardwoods was used. For those sites classified as marsh habitat, it was determined that since these areas are located in the existing 40-foot vegetation free (maintenance) corridor and would only be temporarily impacted as a result of construction that no mitigation would be required given the historical maintenance of these areas by the non federal sponsor. It is expected that the frequently mowed marsh habitat within the historical maintenance corridor would return to pre-existing conditions within one to two growing seasons.

The WVA models operate under the assumption that optimal conditions for fish and wildlife habitat within a given coastal wetland type can be characterized, and that existing or predicted conditions can be compared to that optimum to provide an index of habitat quality. Habitat quality is estimated and expressed through the use of a mathematical model developed specifically for each habitat type. Each model consists of:

- A list of variables that are considered important in characterizing fish and wildlife habitat;
- A suitability index graph for each variable, which defines the assumed relationship between habitat quality (suitability indices) and different variable values; and
- A mathematical formula that combines the suitability indices for each variable into a single value for wetland habitat quality, termed the Habitat Suitability Index (HSI).

The WVA models assess the suitability of each habitat type for providing resting, foraging, breeding, and nursery habitat to a diverse assemblage of fish and wildlife species. This standardized, multi-species, habitat based methodology facilitates the assessment of project

induced impacts on fish and wildlife resources. The bottomland hardwood WVA model consists of seven variables:

- Tree species composition;
- Stand maturity;
- Understory/Midstory;
- Hydrology;
- Size of contiguous forested area;
- Disturbance.

The product of an HSI and the acreage of available habitat for a given target year is known as the Habitat Unit (HU). The HU is the basic unit for measuring project effects on fish and wildlife habitat. Future HUs change according to changes in habitat quality and/or quantity. Results are annualized over the project life (i.e., 50 years) to determine the Average Annual Habitat Units (AAHUs) available for each habitat type. The change in AAHUs for the FWP scenario, compared to FWOP project conditions, provides a measure of anticipated impacts. A net gain in AAHUs indicates that the project is beneficial to the habitat being evaluated; a net loss of AAHUs indicates that the project is damaging to that habitat type. Values for model variables were obtained from site visits to the area, other wetland assessments in similar habitats, communication with personnel knowledgeable about the study area, and review of aerial photographs and reports documenting fish and wildlife habitat conditions in the study area and similar habitats. In determining FWP conditions, all project related direct (construction) impacts were assumed to occur in Target Year (TY) 1. An explanation of the assumptions affecting HIS values for each target year is available for review at the Fish and Wildlife Service's (Service) Lafayette, Louisiana, field office.

On October 25 and 26, 2011, personnel from the USFWS and CEMVN performed site visits to the proposed project area to obtain the raw field data used to conduct the wetland value assessment (WVA). Utilizing the field data, USFWS personnel conducted a WVA for the proposed project area over a 50-year period of analysis. The WVA model concluded that mitigation for a net loss of 99.06 AAHUs would be required for those areas of bottomland hardwood habitat directly impacted by the proposed project construction.

Pursuant to CEQ-approved NEPA Alternative Arrangements, a number of comprehensive mitigation IER or IERs will be prepared documenting and compiling these unavoidable impacts and those for all other proposed actions within the HSDRRS that are being analyzed through other IERs. Mitigation planning is being carried out for groups of IERs, rather than within each IER, so that large mitigation efforts could be taken rather than several smaller efforts, increasing the relative economic and ecological benefits of the mitigation effort. This forthcoming mitigation IER will implement compensatory mitigation as early as possible. All mitigation activities will be consistent with standards and policies established in appropriate Federal and state laws and USACE policies and regulations.

8. COMPLIANCE WITH ENVIRONMENTAL LAWS AND REGULATIONS

Construction of the proposed action would not commence until the proposed action achieves environmental compliance with all applicable laws and regulations, as described below.

Environmental compliance for the proposed action would be achieved upon coordination of this IER with appropriate agencies, organizations, and individuals for their review and comments; USFWS and NMFS confirmation that the proposed action would not adversely affect any threatened or endangered species or require completion of Endangered Species Act Section 7 consultation; LDNR concurrence with the determination that the proposed action is consistent, to the maximum extent practicable, with the LCRP; receipt of a Water Quality Certification from the State of Louisiana; public review of the Section 404(b)(1) Public Notice and signature of the Section 404(b)(1) Evaluation; coordination with the Louisiana SHPO; receipt and acceptance or resolution of all Fish and Wildlife Coordination Act recommendations; and receipt and acceptance or resolution of all Essential Fish Habitat recommendations.

Executive Order (E.O.) 11988. E.O. 11988, Floodplain Management, addresses minimizing or avoiding adverse impacts associated with the base floodplain unless there are no practicable alternatives. It also involves giving public notice of proposed actions that may affect the base floodplain. The proposed action would not accelerate development of the floodplain for the following reasons: development of the study area is more closely related to access routes and the need for affordable housing space than flooding potential and conditions conducive for development were established initially when the area was levied and forced drainage was initiated in the middle 1960s.

Executive Order 11990. E.O. 11990, Protection of Wetlands, has been important in project planning. It is acknowledged that much of the area being enclosed by the proposed alignment consists of wetlands, but other linear features have previously enclosed these wetlands.

Consistency with Coastal Zone Management (CZM) Program. The CEMVN has determined that construction and maintenance of 100-year level of risk reduction along the WBV/MRL Co-Located Project is consistent, to the maximum extent practicable, with the guidelines of the State of Louisiana's approved Coastal Zone Management Program. A CZM consistency determination was prepared and provided to the LDNR by latter dated November 2, 2011.

Clean Air Act. The original 1970 Clean Air Act (CAA) authorized the USEPA to establish National Ambient Air Quality Standards (NAAQS) to limit levels of pollutants in the air. USEPA has promulgated NAAQS for six criteria pollutants: sulfur dioxide (SO2), nitrogen dioxide (NO2), carbon monoxide (CO), ozone, lead, and particulate matter (PM-10). All areas of the United States must maintain ambient levels of these pollutants below the ceilings established by the NAAQS; any area that does not meet these standards is considered a "non-attainment" area (NAA). The 1990 Amendments require that the boundaries of serious, severe, or extreme ozone or CO non-attainment areas located within Metropolitan Statistical

Areas (MSAs) or Consolidated Metropolitan Statistical Areas (CMSAs) be expanded to include the entire MSA or CMSA unless the governor makes certain findings and the Administrator of the USEPA concurs. Consequently, all urban counties included in an affected MSA or CMSA, regardless of their attainment status, will become part of the NAA. The project is located in Plaquemines and Orleans Parishes, which are both classified as attainment areas; therefore NAAQS are not applicable to this project.

Clean Water Act. The Clean Water Act (CWA; 33 U.S.C. 1251-1387; Act of June 30, 1948, as amended) is a very broad statute with the goal of maintaining and restoring waters of the United States. The CWA authorizes water quality and pollution research, provides grants for sewage treatment facilities, sets pollution discharge and water quality standards, addresses oil and hazardous substances liability, and establishes permit programs for water quality, point source pollutant discharges, ocean pollution discharges, and dredging or filling of wetlands. The intent of the CWA's §404 program and it's §404(b)(1) "Guidelines" is to prevent destruction of aquatic ecosystems including wetlands, unless the action will not individually or cumulatively adversely affect the ecosystem.

Section 404(b)(1) guidelines were used to evaluate the discharge of dredged or fill material for adverse impacts to the aquatic ecosystem. The following actions would be taken to minimize the potential for adverse environmental impacts. The selected alternatives for each WBV-MRL contract reach represent the least environmentally damaging alternative. An Alternatives Evaluation Process was completed for each contract reach wherein the Project Delivery Team selected each alternative based on various weighted factors including environmental considerations. Overall environmental impacts were reduced in WBV-MRL contract reaches 1.2b, 2.2 and 4.2 through the selection of the floodwall (T-wall) alternative that utilized the existing levee ROW. Additional staging/work, stockpile, and construction access easements were, to the maximum extent practicable, designed to remain in previously developed areas. Non-forested wetlands, consisting of mown levee grasses or grazed pasture, were not mitigated because of their low value to fish and wildlife resources. Any disturbance to the mowed wetlands within the levee maintenance corridor would be temporary and the area would be restored to its pre-project condition, as part of the construction contract, after the need for using the area has passed. A Section 404(b)(1) public notice will be released for 30 day public review and comment on November, 29 2011. The proposed project complies with the requirements of the guidelines.

A Louisiana Department of Environmental Quality Water Quality Certification letter, WQC 101109-03/AI 101235/CER 20110001, dated November 7, 2011, stated that the requirements for Water Quality Certification have been met and that the placement of fill material will not violate water quality standards of Louisiana as provided for in LAC 33:IX Chapter 11.

Endangered Species Act. The Endangered Species Act (16 U.S.C. 1531-1543; P.L. 93-205, as amended) was enacted in 1973 to provide for the conservation of species that are in danger of extinction throughout all or a significant portion of their range. "Species" is defined by the Act to mean either a species, a subspecies, or, for vertebrates (i.e., fish, reptiles, mammals, etc.) only, a distinct population. No threatened or endangered species or their critical habitat would be impacted by the proposed action. An Endangered Species Act

determination documenting that the proposed Federal action is not likely to adversely affect any threatened or endangered species or proposed critical habitat within the project area was sent to the USFWS for review by letter dated November 2, 2011.

Fish and Wildlife Coordination Act. The Fish and Wildlife Coordination Act (16 U.S.C. 661-666c; Act of March 10, 1934, as amended) requires that wildlife, including fish, receive equal consideration and be coordinated with other aspects of water resource development. This is accomplished by requiring consultation with the USFWS and NMFS whenever modifications are proposed to a body of water and a Federal permit or license is required. This consultation determines the possible harm to fish and wildlife resources, and the measures that are needed to both prevent the damage to and loss of these resources, and to develop and improve the resources, in connection with water resource development. NMFS submits comments and recommendations to Federal licensing and permitting agencies, and to Federal agencies conducting construction projects on the potential harm to living marine resources caused by proposed water development projects, and suggests recommendations to prevent harm. The USFWS provided the "Draft Fish and Wildlife Coordination Act Report for the Individual Environmental Reports (IER), Public Law 109-234, Emergency Supplemental Appropriations Act for Defense, the Global War on Terror, and Hurricane Recovery, 2006 (Supplemental 4)" in November 2007 (USFWS, 2007).

To fulfill the responsibilities of the Fish and Wildlife Coordination Act, the USFWS will provide a post-authorization final supplemental 2(b) report to the draft programmatic report. A draft project-specific Coordination Act Report was received from USFWS by letter dated November 2, 2010. A draft project-specific Coordination Act Report was received from the USFWS in a letter dated November 22, 2011. A final report would be prepared after the 30-day public review period and all comments regarding USFWS trust resources have been resolved, and before a final IER has been completed.

Migratory Bird Treaty Act. The Migratory Bird Treaty Act of 1918 (MBTA) is the domestic law that affirms, or implements, the United States' commitment to four international conventions with Canada, Japan, Mexico, and Russia for the protection of shared migratory bird resources. The MBTA governs the taking, killing, possessing, transporting, and importing of migratory birds, their eggs, parts, and nests. The take of all migratory birds is governed by the MBTA's regulation of taking migratory birds for educational, scientific, and recreational purposes and requiring harvest to be limited to levels that prevent over-utilization. Section 704 of the MBTA states that the Secretary of the Interior is authorized and directed to determine if, and by what means, the take of migratory birds should be allowed and to adopt suitable regulations permitting and governing take. The MBTA prohibits the take, possession, import, export, transport, selling, purchase, barter, or offering for sale, purchase or barter, of any migratory bird, their eggs, parts, and nests, except as authorized under a valid permit (50 CFR §21.11). The USFWS addressed compliance with this Act in the "Draft Fish and Wildlife Coordination Act Report for the IER, Public Law 109-234, Emergency Supplemental Appropriations Act for Defense, the Global War on Terror, and Hurricane Recovery, 2006 (Supplemental 4)" in November 2007 (USFWS, 2007). To fulfill the responsibilities of the Fish and Wildlife Coordination Act, the USFWS

will provide a post-authorization final supplemental 2(b) report to the draft programmatic report.

National Environmental Policy Act. The National Environmental Policy Act (NEPA; 42 U.S.C. 4321-4347; Pub. L. 91-190, as amended) requires Federal agencies to analyze the potential effects of a proposed Federal action that would significantly affect historical, cultural, or natural aspects of the environment. It specifically requires agencies to use a systematic, interdisciplinary approach in planning and decision-making, to insure that environmental values may be given appropriate consideration, and to provide detailed statements on the environmental impacts of proposed actions including: (1) any adverse impacts; (2) alternatives to the proposed action; and (3) the relationship between short-term uses and long-term productivity. The agencies use the results of this analysis decision-making. The preparation of this IER Supplement is a part of compliance with NEPA.

National Historic Preservation Act. Congress established the most comprehensive national policy on historic preservation with the passage of the National Historic Preservation Act of 1966 (NHPA). In this Act, historic preservation was defined to include "the protection, rehabilitation, restoration and reconstruction of districts, sites, buildings, structures, and objects significant in American history, architecture, archaeology, or culture." The Act led to the creation of the National Register of Historic Places, a file of cultural resources of national, regional, state, and local significance. The act also established the Advisory Council on Historic Preservation (the Council), an independent Federal agency responsible for administering the protective provisions of the act. The major provisions of the NHPA are Sections 106 and 110. Both sections aim to ensure that historic properties are appropriately considered in planning Federal initiatives and actions. Section 106 is a specific, issue-related mandate to which Federal agencies must adhere. It is a reactive mechanism that is driven by a Federal action. Section 110, in contrast, sets out broad Federal agency responsibilities with respect to historic properties. It is a proactive mechanism with emphasis on ongoing management of historic preservation sites and activities at Federal facilities. The CEMVN has elected to fulfill its obligations under Section 106 of the National Historic Preservation Act of 1966, as amended through the execution and implementation of a Programmatic Agreement (PA). The PA is being developed in consultation with the Advisory Council on Historic Preservation, the Louisiana State Historic Preservation Officer (LA SHPO), and federally recognized Indian Tribes. The following Federally recognized Indian tribes were invited to participate in the development of the PA: Alabama-Coushatta Tribe of Texas, Caddo Nation of Oklahoma, Chitimacha Tribe of Louisiana, Choctaw Nation of Oklahoma, Coushatta Tribe of Louisiana, Jena Band of Choctaw Indians, Mississippi Band of Choctaw Indians, Quapaw Tribe of Oklahoma, Seminole Nation of Oklahoma, Seminole Tribe of Florida, and the Tunica-Biloxi Tribe of Louisiana to consult in the development of the PA. The Caddo Nation of Oklahoma (email dated 8/11/2011) and the Choctaw Nation of Oklahoma (email dated 10/3/2011) indicated an interest in continuing to participate in the development of the PA. The PA will be executed in December 2011, at which time Section 106 consultation will be concluded for this project.

9. CONCLUSION

The primary elements of the proposed action consist of:

1. Advertisement of as many as six contracts for construction of the Resilient Features (WBV-MRL 1.2a, 1.2b, 2.2, 3.2, 4.2 and 5.2).

2. *WBV-MRL 1.2a – Oak Point to Oakville (a)* – Construction of approximately 5,000 linear feet of new concrete floodwall (T-wall).

3. *WBV-MRL 1.2b – Oak Point to Oakville (b)* – Construction of approximately 3,100 linear feet of earthen levee floodside shift, 500 linear feet of earthen levee straddle, 900 linear feet of earthen levee protected side shift and 1,400 linear feet of earthen protected side stability berm.

4. *WBV-MRL 2.2 – Oak Point (Chevron Oronite)* – Construction of approximately 6,700 linear feet of new concrete floodwall (T-wall).

5. *WBV-MRL 3.2 – Belle Chasse to Oak Point* – Construction of approximately 11,500 linear feet of earthen levee floodside shift and 600 linear feet of new concrete floodwall (T-wall).

6. *WBV-MRL 4.2 – Oak Road to Belle Chasse* – Construction of approximately 5,400 linear feet of new concrete floodwall (T-wall).

7. *WBV-MRL 5.2 – Coast Guard Facility to Oak Road* – Construction of approximately 9,400 linear feet of earthen levee straddle, 4,400 linear feet of earthen levee protected side shift and 4,200 linear feet of earthen levee floodside shift.

8. Designation of a total of approximately 140 acres of staging/work areas located throughout the 9.5 mile levee construction corridor.

9. Construction of approximately 15.5 miles of levee armoring (High Performance Turf Reinforcement Mattress), including the 6 miles required in Orleans Parish.

The CEMVN has assessed the environmental impacts of the proposed action and has determined that the proposed action would have the following impacts:

1. Air Quality: Minor and temporary air quality impacts would occur during construction.

2. Water Quality: Except for temporary sediment impacts during construction, it is expected that there would no long-term impacts to water quality.

3. Terrestrial Habitat: Construction of the project would require approximately 37 acres of new right-of-way, approximately 82 acres of forested wetlands and 80 acres of non-wet forested habitat would be cleared, grubbed, and filled or converted to open water and approximately 74 acres of mowed marsh habitat would be temporarily disturbed during construction.

4. Aquatic Habitat: Direct and permanent effects from implementation of the proposed action would result from the placement of earthen material into approximately 2 acres of open water habitat. Temporary effects to adjacent aquatic habitat from sediment runoff could occur during the course of construction.

5. Fish and Wildlife: Direct and permanent effects to wildlife habitat would result from the clearing, grubbing and placement of earthen material activities. Approximately 82 acres of forested wetlands and 80 acres of non-wet forested habitat would be cleared, grubbed, and filled or converted to open water and approximately 74 acres of mowed marsh habitat would be temporarily disturbed during construction.

6. Wetlands: Direct effects to wetland resources located primarily on the floodside of the existing MRL, as a result of construction of the proposed action, would be permanent and temporary within the construction right-of-way. Permanent impacts would be from mechanically clearing, grubbing, and filling the area to construct the project features and would impact approximately 82 acres of forested wetlands. Temporary impacts would result from the movement of construction equipment and materials within the existing 40-foot vegetation free (maintenance) corridor located on the floodside of the existing MRL and would impact approximately 74 acres of mowed marsh vegetation.

7. Threatened and Endangered Species: The proposed action is not likely to adversely affect any threatened or endangered species or critical habitat according to the USFWS.

8. Recreational Resources: No recreational land would be lost, but, floodwalls built on top of the levee may deter users for visual, accessibility, and safety reasons

9. Aesthetic Resources: Permanent impacts to aesthetics and viewsheds would occur to the project area as a result of the new concrete floodwall (T-wall).

10. Cultural Resources: The proposed action has the potential to directly impact significant historic properties that may be eligible for listing to the NRHP. The CEMVN has elected to fulfill its obligations under Section 106 of the National Historic Preservation Act of 1966, as amended through the execution and implementation of a Programmatic Agreement (PA). The PA is being developed in consultation with the Advisory Council on Historic Preservation, the Louisiana State Historic Preservation Officer (LA SHPO), and federally recognized Indian Tribes. The PA will be executed in December 2011, at which time Section 106 consultation will be concluded for this project.

11. Farmland: It is expected that construction of the proposed project would impact approximately 117 acres of land on the protected side of the existing Mississippi River Levee from river mile 70 to 85.5. A farmland conversion impact rating form was developed and sent to the Natural Resources Conservation Service containing information on those lands to be converted by the proposed action

12. Socio-economics: Under the proposed action, there may be temporary, construction-related impacts to residents in the immediate vicinity of the proposed actions. Residents would be at a reduced risk of permanent displacement due to the lowered risk of flooding as compared to the No Action alternative.

13. Environmental Justice: No disproportionate impacts to low income or minority populations were identified.

14. Hazardous, Toxic and Radioactive Waste: No direct impacts would be expected based on a Phase I ESA for the proposed project area.

15. Noise: Minor and temporary localized impacts to ambient noise would occur during the construction phase due to heavy equipment use and transport of materials.

16. Cumulative Impacts: The construction-related negative effects as well as the positive consequences (e.g., spending in the local economy) resulting from providing the 100-year level of hurricane damage risk reduction for the entire West Bank and Vicinity project may potentially represent the largest cumulative environmental consequences in the New Orleans region for the next 4 years to 7 years.

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Table 11.
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10. APPENDICES

10.1. Appendix A – List of Acronyms and Definitions of Common Terms

AAHUs	Annual Average Habitat Units
APE	Area of Potential Effect
ASTM	American Society for Testing and Materials
BLH	Bottomland Hardwood Forest
BOD	Biological Oxygen Demand
CED	Comprehensive Environmental Document
CEMVN	Corps of Engineers, Mississippi Valley Division, New Orleans District
CEMVS	Corps of Engineers, Mississippi Valley Division, St. Lewis District
CEQ	The President's Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFBM	Contractor Furnished Borrow Material
CFR	Code of Federal Regulations
CSMA	Consolidated Metropolitan Statistical Area
CW	Civil Works Program
CWA	Clean Water Act
CY	Cubic Yard
CZM	Coastal Zone Management
dBA	Decibels
EA	Environmental Assessment
EAMs	Engineered Alternative Measures
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EJ	Environmental Justice
EM	Engineering Manual
EO	Executive Order
ER	Engineering Regulation
ESA	Environmental Site Assessment
ESRI	Environmental Systems Research Institute
FCU	Functional Capacity Units
FCI	Functional Capacity Index
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FONSI	Finding of No Significant Impact
FPPA	Farmland Protection Policy Act
FTA	Federal Transit Administration
FWCA	Fish and Wildlife Coordination Act
GFBM	Government Furnished Borrow Material
HPS	Hurricane Protection System
HSDRRS	Hurricane and Storm Damage Risk Reduction System
HTRW	Hazardous, Toxic, and Radioactive Waste
IER	Individual Environmental Report
IRC	Integrated Report Category
LCRP	Louisiana Coastal Resources Program
LDEQ	Louisiana Department of Environmental Quality
LDNR	Louisiana Department of Natural Resources
LDWF	Louisiana Department of Wildlife and Fisheries
LERRDs	Lands, Easements, Relocations, Rights-of-Way, and Disposal Areas
LPV	Lake Pontchartrain and Vicinity

MBTA	Migratory Bird Treaty Act
MPH	Miles per Hour
MRL	Mississippi River Levee
MR&T	Mississippi River and Tributaries
MSA	Metropolitan Statistical Area
NAA	Non Attainment Area
NAAQS	National Ambient Air Quality Standards
NAVD	North American Vertical Datum of 1988
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NHP	Natural Heritage Program
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOx	Oxides of Nitrogen
NPS	National Park Service
NRCS	National Resources Conservation Service
NRHP	National Register of Historic Places
NWR	National Wildlife Refuge
O&M	Operations And Maintenance
OMRR&R	Operations, Maintenance, Repair, Replacement, & Rehabilitation
OSE	Other Social Effects
PA	Programmatic Agreement
PDT	Project Delivery Team
pH	Unit of Measure for acids/bases
PL	Public Law
PM	Particulate Materials
PPA	Project Partnership Agreement
PSI	Pounds Per Square Inch
P&G	Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies
RCRA	Resource Conservation and Recovery Act
REC	Recognized Environmental Condition
RED	Regional Economic Development
RM	River Mile
ROD	Record of Decision
ROW	Right(s)-of-Way
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SO_2	Sulphur Dioxide
SPH	Standard Project Hurricane
TMDL	Total Maximum Daily Load
USACE	United States Army Corps Of Engineers
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFWS	United States Fish And Wildlife Service
USGS	United States Geological Survey
VOC	Volatile Organic Compounds
WBV	West Bank and Vicinity
WRDA	Water Resources Development Act

10.2. Appendix B – Institutional, Ecological, and Public Significance of Resources

SIGNIFICANCE OF RESOURCES

The National Environmental Policy Act (NEPA) requires Federal agencies to analyze the impacts of proposed actions on those resources that are considered "significant." Table 12 provides a list of resources that are commonly found in the vicinity of the MRL Co-Located Project (IERS # 33.a). In providing a list of some of the key laws and regulations governing these resources, as well as a short description of some of their ecological and human environment value, this table offers a rationale for why these resources are considered significant for the purposes of NEPA analysis.

Table 12

Institutional, Ecological, and Public Significance of Resources

	GOVERNING LAWS AND REGULATIONS	ECOLOGICAL and HUMAN ENVIRONMENT VALUE
Agriculture	Farmland Protection Policy Act of 1981; Food Security Act of 1985; Prime and Unique Farmlands, 1980 CEQ Memorandum	Provision or potential for provision of forest products and human and livestock food products
Air	Clean Air Act of 1963, as amended; Deepwater Port Act of 1974 Louisiana Air Control Act; Louisiana Environmental Quality Act of 1983 National Ambient Air Quality Standards (NAAQS)	Clean air is important for human health and safety
Coastal Zones	Coastal Barrier Resources Act of 1982, 1990, as amended; Coastal Zone Management Act of 1972; Coastal Zone Protection Act of 1996; Deepwater Port Act of 1974 Federal Water Project Recreation Act of 1965; Outer Continental Shelf Lands Act of 1953; Submerged Land Act of 1953	Barrier islands: Protect mainland and associated fish, wildlife, and other natural resources. Coastal zones: Protect wetlands*, floodplains*, estuaries*, beaches, dunes, barrier islands, reefs, bays, ponds, bayous, dunes, and fish and wildlife* and their habitats *See specific resources for additional regulations
Cultural and Historic	Abandoned Shipwreck Act of 1987; American Folklife Preservation Act of 1976; American Indian Religious Freedom Act of 1978; Antiquities Act of 1906 Archaeological Resources Protection Act of 1979; Archaeological and Historical Preservation Act of 1974; Consultation and Coordination with Indian Tribal Governments (EO 13175) of 2000; Historic Sites Act of 1935; Historic and Archaeological Data-Preservation of 1974; Indian Sacred Sites (EO 13007) of 1996 National Historic Preservation Act of 1966; Native American Graves Protection and Repatriation Act of 1990; Protection and Enhancement of the Cultural Environment (EO 11593) of 1971; Protection of Cultural Property (EO 12555) of 1986; Reclamation Projects Authorization and Adjustments Act of 1992	Their association or linkage to past events, to historically important persons, and to design and/or construction values Their ability to yield important information about prehistory and history

	GOVERNING LAWS AND REGULATIONS	ECOLOGICAL and HUMAN ENVIRONMENT VALUE
Economic Resources	Deepwater Port Act of 1974; Environmental Review of Trade Agreements (EO 13141) of 1999	Strong economies enhance human standards of living and can allow for greater expendability of funds for the protection and enhancement of ecological resources Trade agreements and international trade can have both positive and negative environmental effects Positive effects can include greater cooperation between nation states in preserving species which cross political boundaries
Endangered/Threatened Species	Bald Eagle Protection Act of 1940; Endangered Species Act of 1973; Marine Mammal Protection Act of 1972	The status of such species provides an indication of the overall health of an ecosystem. US Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), Louisiana Department of Wildlife and Fisheries (LDWF), and USACE cooperate to protect endangered and threatened species; Audubon Blue List recognizes rare species
Environmental Justice	American Indian Religious Freedom Act of 1978; Civil Rights Act of 1964; Consultation and Coordination with Indian Tribal Governments (EO 13175) of 2000; Executive Order 12898 of 1994; Federal Actions to Address Environmental Justice in Minority Populations & Low-Income Populations (EO 12898, 12948) of 1994, as amended	Ensuring the rights of minority and low-income populations can lead to greater sustainability through less burden on the environment in which these populations live, including better treatment of wastes and building processes
Essential Fish Habitat	Coastal Zone Management Act of 1972; Marine Protected Areas (EO 13158) of 2000; Magnuson-Stevens Fishery Conservation and Management Act of 1976	Shallow intertidal waters provide essential fish habitat in the form of nursery, foraging, and grow out areas. National Marine Fisheries Service recognizes value of essential fish habitat as necessary for continued survival of fisheries resources
Estuaries	Coastal Zone Management Act of 1972; Deepwater Port Act of 1974; Estuaries and Clean Waters Act of 2000; Estuary Protection Act of 1968; Estuary Restoration Act of 2000	Shallow intertidal waters provide essential fish habitat in the form of nursery, foraging, and grow out areas. Protect aquatic nurseries and oyster beds

	GOVERNING LAWS AND REGULATIONS	ECOLOGICAL and HUMAN ENVIRONMENT VALUE
Fisheries (Commercial and Recreational)	Anadromous Fish Conservation Act of 1965; Coastal Zone Management Act of 1972; Fish and Wildlife Conservation Act of 1980; Magnuson-Stevens Fishery Conservation and Management Act of 1976; Endangered Species Act of 1973 Federal Water Project Recreation Act of 1965; Fish and Wildlife Coordination Act of 1958; Recreational Fisheries (EO 12962) of 1995; Sustainable Fisheries Act of 1996	Critical element of many valuable freshwater and marine habitats. Indicator of the health of various freshwater and marine habitats USFWS, NMFS, LDWF, Louisiana Department of Natural Resources (LDNR), and USACE recognize value of fisheries and good water quality.
Flood Control/ Hurricane Risk Reduction Levees	Floodplain Management (EO 11988) of 1977; River and Harbor and Flood Control Act of 1970; Watershed Protection & Flood Prevention Act of 1954	Dewatering activities associated with urban floods result in discharge of floodwater potentially containing pollutants associated with residential, commercial, and industrial facilities
Floodplains	Coastal Zone Management Act of 1972; Floodplain Management (EO 11988) of 1977; River and Harbor and Flood Control Act of 1970	Floodplains provide storage of floodwaters and habitat for forest-dwelling wildlife and plant species. The typically linear aspect of floodplains provide important travel routes for wildlife (including insects) and plant species
Forestry	Reservoir Areas – Forest Cover Act of 1960	Managed forests provide cover and travel routes for forest-dwelling wildlife
Habitat (General)	Marine Protected Areas (EO 13158) of 2000; Oil Pollution Act of 1990	Habitat provided for open, forest-dwelling, and aquatic wildlife. Provision or potential for provision of forest products and human and livestock food products
Hazards/ Wastes	Clean Air Act of 1963, as amended; Comprehensive Environmental Response, Compensation, and Liability Act of 1980; Emergency Planning and Community Right-to-Know Act of 1986; Federal Compliance with Pollution Control Standards (EO 12088) of 1978; Federal Facilities Compliance Act of 1992; Federal Insecticide, Fungicide, and Rodenticide Act of 1996; Oil Pollution Act of 1990; Pollution Prevention Act of 1990; Resource Conservation and Recovery Act of 1976; Toxic Substances Control Act of 1976	Pollutants directly affect the health and viability of ecological habitats and all organisms living within them. Laws and regulations such as the Clean Air Act address problems such as acid rain, ground-level ozone, stratospheric ozone depletion, and air toxics. Laws such as the Pollution Prevention Act allow the government to focus on the sources of pollution rather than after-the-fact treatment

	GOVERNING LAWS AND REGULATIONS	ECOLOGICAL and HUMAN ENVIRONMENT VALUE
Invasive Species	Exotic Organisms (EO 11987) of 1977; Invasive Species (EO 13112) of 1999; National Invasive Species Act of 1996; Non-indigenous Aquatic Nuisance Prevention and Control Act of 1996	Invasive species alter interactive relationships of plants and wildlife that have developed over long periods of time and can completely alter natural habitats. Control of the introduction of invasive species protects habitats by preserving these relationships.
Lake Pontchartrain	Clean Water Act of 1977; Federal Water Project Recreation Act of 1965	Provides habitat for various species of wildlife, finfish, and shellfish.
Marine Areas	Abandoned Shipwreck Act of 1987; Coastal Zone Management Act of 1972; Federal Water Project Recreation Act of 1965; Marine Protected Areas (EO 13158) of 2000; Marine, Protection, Research, and Sanctuaries Act of 1972	Provides habitat for aquatic plant and wildlife.
Navigable Waters	Clean Water Act of 1977; Federal Water Project Recreation Act of 1965; Rivers and Harbors Acts of 1899, 1956 (Sec. 10); Outer Continental Shelf Lands Act of 1953; Rivers and Harbors Acts of 1899, 1956; River and Harbor and Flood Control Act of 1970; Submerged Land Act of 1953	Regulations and laws allow for protection of aquatic habitats from pollution and development. Regulations and laws maintain habitat for aquatic and water-dependent plants and wildlife. Maintained navigable waterways provide routes for shipping and recreational activity, protecting natural habitat from harmful intrusion.
Noise	Noise Control Act of 1972	High levels can affect the quality of habitat for wildlife and humans.
Oil, Gas, and Utilities Pipelines/ Activities	Deepwater Port Act of 1974	Regulations protects aquatic from pollution and development, including limiting turbidity which decreases aquatic plant growth.
Real Estate	Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646)	Regulations and laws assist in the acquisition of lands for conservation and preservation.
Recreation	Abandoned Shipwreck Act of 1987; Federal Water Project Recreation Act of 1965; Flood Control Act of 1944; Land and Water Conservation Fund Act of 1965; National Trails System Act of 1968; Reclamation Projects Authorization and Adjustments Act of 1992; Wild and Scenic River Act of 1968; Wilderness Act of 1964	Potential for interacting with the natural world. High economic value of recreational activities and their contribution to local, state, and national economies. Many fishing and hunting person-days are logged. Various existing facilities satisfy numerous user-days of recreation annually

	GOVERNING LAWS AND REGULATIONS	ECOLOGICAL and HUMAN ENVIRONMENT VALUE
Soils	Watershed Protection & Flood Prevention Act of 1954	Provide the building blocks for habitat for plants and wildlife, including invertebrate species Regulation provides technical and financial assistance for watershed protection, flood mitigation, flood prevention, water quality improvement, soil erosion reduction, sediment control, fish and wildlife habitat enhancement, and wetland and wetland function creation and restoration
Water	Clean Water Act of 1977; Deepwater Port Act of 1974; Estuaries and Clean Waters Act of 2000; Federal Water Pollution Control Act of 1972; Federal Water Project Recreation Act of 1965; Flood Control Act of 1944; Safe Drinking Water Act of 1974; Water Resources Development Acts of 1976, 1986, 1990, and 1992; Water Resources Planning Act of 1965; Watershed Protection & Flood Prevention Act of 1954	Allows for protection of aquatic habitats from pollution and development. Maintains habitat for aquatic and water-dependent plants and wildlife. Provides technical and financial assistance for watershed protection, flood mitigation, flood prevention, water quality improvement, soil erosion reduction, sediment control, fish and wildlife habitat enhancement, and wetland and wetland function creation and restoration
Wetlands	Coastal Wetlands Planning, Protection, and Restoration Act of 1990; Coastal Zone Management Act of 1972; Clean Water Act of 1977; Deepwater Port Act of 1974; Emergency Wetlands Restoration Act of 1986; Estuaries and Clean Waters Act of 2000; Estuary Protection Act of 1968; Estuary Restoration Act of 2000; Floodplain Management (EO 11988) of 1977; Louisiana State and Local Coastal Resources Management Act of 1978; "No Net Loss" Policy of 1988; North American Wetlands Conservation Act of 1989; Protection of Wetlands (EO 11990) of 1977; Rivers and Harbors Acts of 1899, 1956 (Sec. 10); Water Resources Development Acts of 1976, 1986, 1990, and 1992 (Sec. 906); *Wetland Value Assessment (WVA); *Habitat Suitability Index (HSI)	Provide habitat for a number of species of special emphasis (USFWS). Louisiana loses 30 square miles of wetland per year. Provide necessary habitat for various species of plants, fish, and wildlife, many of them commercially important. Serve as ground water recharge areas. Provide storage areas for storm and flood waters. Serve as natural water filtration areas. Provide protection from wave action, erosion, and storm damage. Important source of lumber and other commercial forest products (Bottomland Hardwood Forest).

	GOVERNING LAWS AND REGULATIONS	ECOLOGICAL and HUMAN ENVIRONMENT VALUE
Wildlife & Fish	Endangered Species Act of 1973; Federal Water Project Recreation Act of 1965; Fish and Wildlife Conservation Act of 1980; Fish and Wildlife Coordination Act of 1958; Fish and Wildlife Programs and Improvement and National Wildlife Refuge System Centennial Act of 2000; Migratory Bird Conservation Act of 1929; Migratory Bird Treaty Act of 1918; Migratory Bird Habitat Protection (EO 13186) of 2001; Neotropical Migratory Bird Conservation Act of 2000; Outer Continental Shelf Lands Act of 1953; Reclamation Projects Authorization and Adjustments Act of 1992 Submerged Land Act of 1953; Responsibilities of Federal Agencies to Protect Migratory Birds (EO 13186) of 2001; Wild and Scenic River Act of 1968; *Also see Endangered and Threatened Species, habitats	Habitat for a number of species of special emphasis (USFWS). Critical element of many valuable aquatic and terrestrial habitats. Indicator of the health of various aquatic and terrestrial habitats. Many species are important commercial resources. USFWS, NMFS, LDWF, LDNR, and USACE recognize value of wildlife.

10.3. Appendix C – Members of the Interagency Environmental Team

Kyle Balkum	Louisiana Dept. of Wildlife and Fisheries
Catherine Breaux	U.S. Fish and Wildlife Service
Mike Carloss	Louisiana Dept. of Wildlife and Fisheries
David Castellanos	U.S. Fish and Wildlife Service
Frank Cole	Louisiana Department of Natural Resources
Greg Ducote	Louisiana Department of Natural Resources
John Ettinger	U.S. Environmental Protection Agency
David Felder	U.S. Fish and Wildlife Service
Michelle Fischer	U.S. Geologic Survey
Deborah Fuller	U.S. Fish and Wildlife Service
Mandy Green	Louisiana Department of Natural Resources
Jeffrey Harris	Louisiana Department of Natural Resources
Richard Hartman	NOAA National Marine Fisheries Service
Brian Heimann	Louisiana Dept. of Wildlife and Fisheries
Jeffrey Hill	NOAA National Marine Fisheries Service
Christina Hunnicutt	U.S. Geologic Survey
Barbara Keeler	U.S. Environmental Protection Agency
Kirk Kilgen	Louisiana Department of Natural Resources
Tim Killeen	Louisiana Department of Natural Resources
Brian Lezina	Louisiana Dept. of Wildlife and Fisheries
Brian Marks	Louisiana Dept. of Wildlife and Fisheries
Ismail Merhi	Louisiana Department of Natural Resources
David Muth	U.S. National Park Service
Clint Padgett	U.S. Geologic Survey
Jamie Phillippe	Louisiana Dept. of Environmental Quality
Molly Reif	U.S. Geologic Survey
Kevin Roy	U.S. Fish and Wildlife Service
Manuel Ruiz	Louisiana Dept. of Wildlife and Fisheries
Reneé Sanders	Louisiana Department of Natural Resources
Angela Trahan	U.S. Fish and Wildlife Service
Nancy Walters	U.S. Fish and Wildlife Service
David Walther	U.S. Fish and Wildlife Service
Patrick Williams	NOAA National Marine Fisheries Service

10.4. Appendix D – Interagency Correspondence

BOBBY JINDAL
GOVERNOR

PEGGY M. HATCH
SECRETARY

State of Louisiana

DEPARTMENT OF ENVIRONMENTAL QUALITY
ENVIRONMENTAL SERVICES

NOV 7 2011

U.S. Army Corps of Engineers- New Orleans District
P.O. Box 60267
New Orleans, LA 70160-0267

Attention: Mark LaHare

RE: Water Quality Certification (WQC 101109-03/AI 101235/CER 20110001)
Individual Environmental Report (IER) #33 supplemental
Orleans & Plaquemines Parishes

Dear Mr. LaHare:

The Louisiana Department of Environmental Quality (the Department) has reviewed your revised application to improve the Mississippi River levee, in the vicinity between Algiers and Oakville, Louisiana. This revision concerns additional armoring, alignment shifts, & other associated work.

Based on the information provided in the application, the Department made a determination that the requirements for a Water Quality Certification have been met and concludes that the placement of the fill material will not violate water quality standards of Louisiana as provided for in LAC 33:IX.Chapter 11. Therefore, the Department hereby issues a Water Quality Certification to the U.S. Army Corps of Engineers- New Orleans District.

If you have any questions, please call Jamie Phillippe at 225-219-3225.

Sincerely,

Melvin C. Mitchell, Sr.
Administrator
Water Permits Division

MCM/jjp

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

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

REPLY TO
ATTENTION OF:

NOV 0 2 2011

Regional Planning and
Environment Division, South
Environmental Compliance Branch

Mr. Brad Rieck
Acting Field Supervisor
U.S. Fish and Wildlife Service
Ecological Services
646 Cajundome Blvd., Suite 400
Lafayette, LA 70506
Attn: Mr. David Soileau

This project has been reviewed for effects to Federal trust resources under our jurisdiction and currently protected by the Endangered Species Act of 1973 (Act). The project, as proposed,
( ) Will have no effect on those resources
(✓) Is not likely to adversely affect those resources.
This finding fulfills the requirements under Section 7(a)(2) of the Act.

8 Nov 2011
Acting Supervisor — Date
Louisiana Field Office
U.S. Fish and Wildlife Service

Dear Mr. Rieck:

The US Army Corps of Engineers, New Orleans District (CEMVN) has prepared an Endangered Species Act (ESA) determination for Individual Environmental Report Supplement #33.a (IERS #33.a), "*West Bank and Vicinity and Mississippi River Levee Co-Located Levees, Plaquemines Parish and Orleans Parish, Louisiana*".

The Mississippi River Levee (MRL) on the west bank of the Mississippi River, from the Eastern Tie-in of the West Bank and Vicinity (WBV) project with the MRL at Oakville in Plaquemines Parish to a point approximately 9.5 miles upriver southeast of the Plaquemines Parish and Orleans Parish line, currently provides 1-percent hurricane and storm damage risk reduction. However, construction of Resilient Features is required to improve the resiliency and longevity of previously implemented Engineered Alternative Measures previously addressed under Individual Environmental Report #33. The WBV-MRL Co-Located Project is designed to reduce risk to residents along the west bank of the MRL from hurricane-driven storm surges traveling either up or across the Mississippi River. The environmental effects of raising the west bank Mississippi River Levee from River Mile 79.5 to 70 to the 1-percent level of risk reduction are currently being addressed in IERS #33.a, which is scheduled to be available for review and comment in November 2011.

Five Federally threatened (T) or endangered (E) species are either known to or may possibly occur within the boundaries of Plaquemines and Orleans Parishes, Louisiana: West Indian manatee (*Trichechus manatus*) (E); pallid sturgeon (*Scaphirynchus albus*) (E); piping plover (*Charadrius melodus*) (T); Gulf sturgeon (*Acipenser oxyrhynchus desotoi*); and brown pelican (*Pelecanus occidentalis*).

In addition to the aforementioned listed species, five sea turtle species under the purview of the National Marine Fisheries Service (NOAA NMFS), Protected Resources Division, are

recorded in Louisiana (green sea turtle (*Chelonia mydas*) (T); hawksbill sea turtle (*Eretmochelys imbricata*) (E); Kemp's ridley sea turtle (*Lepidochelys kempii*) (E); leatherback sea turtle (*Dermochelys coriacea*) (E); and loggerhead sea turtle (*Caretta caretta*) (T)). However, CEMVN has concluded that no critical habitat for any of the listed sea turtle species are designated within the proposed project area and that the project would have no affect on these species or their habitat.

In accordance with Section 7 of the ESA, CEMVN has determined that the proposed Federal action is not likely to adversely affect any threatened or endangered species or proposed critical habitat within the project area. We request you review the enclosed information and advise us of your determination. Responses should be mailed to Mr. Mark Lahare at: U.S. Army Corps of Engineers, CEMVN-PDC-CEC, P.O. Box 60267, New Orleans, Louisiana, 70160-0267. Responses may also be provided by E-mail to: mark.h.lahare@usace.army.mil, or by FAX to (504) 862-2088. Mr. Lahare may be contacted at (504) 862-1344.

Sincerely,

Joan M Exnicios

Joan M. Exnicios
Chief, Environmental Planning Branch

Enclosure

United States Department of the Interior

FISH AND WILDLIFE SERVICE
646 Cajundome Blvd.
Suite 400
Lafayette, Louisiana 70506

November 22, 2011

Colonel Edward R. Fleming
District Commander
U.S. Army Corps of Engineers
Post Office Box 60267
New Orleans, Louisiana 70160-0267

Dear Colonel Fleming:

Enclosed is the draft Fish and Wildlife Coordination Act Report for the proposed resilient features of the West Bank and Vicinity – Mississippi River Levee (WBV-MRL) Co-Located Project, river mile 79.5 to river mile 70, Above Head of Passes, in Plaquemines and Orleans Parish, Individual Environmental Report Supplement 33a (IER 33a). This draft report is transmitted under the authority of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 United States Code (U.S.C.) 661 et seq.). It is concurrently being coordinated with the Louisiana Department of Wildlife and Fisheries and National Marine Fisheries Service, whose comments will be incorporated into the final report.

Should your staff have any questions regarding the enclosed report, please have them contact Mr. David Soileau, Jr. of this office at 337/291-3109.

Sincerely,

David A. Walther
Acting Supervisor
Louisiana Field Office

Enclosures

cc: EPA, Dallas, TX
NMFS, Baton Rouge, LA
LDWF, Baton Rouge, LA
LDNR, CMD, Baton Rouge, LA
OCPR, Baton Rouge, LA

Draft

Fish and Wildlife Coordination Act Report

West Bank and Vicinity
and
Mississippi River Levee
Co-Located Levees, Plaquemines Parish and Orleans Parish
River Mile 79.5 to River Mile 70, Above Head of Passes
Individual Environmental Report Supplement 33a

PROVIDED TO
NEW ORLEANS DISTRICT
U.S. ARMY CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA

PREPARED BY
DAVID SOILEAU, JR.
FISH AND WILDLIFE BIOLOGIST

U.S. FISH AND WILDLIFE SERVICE
ECOLOGICAL SERVICES
LAFAYETTE, LOUISIANA

NOVEMBER 2011

U.S. FISH AND WILDLIFE SERVICE – SOUTHEAST REGION

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Executive Summary

The U.S. Fish and Wildlife Service (Service) has prepared this draft Fish and Wildlife Coordination Act Report (FWCAR) for the proposed resilient features of the West Bank and Vicinity – Mississippi River Levee (WBV-MRL) Co-Located Project, river mile 79.5 to river mile 70, Above Head of Passes, Individual Environmental Report Supplement 33a (IER 33a). The Corps of Engineers, New Orleans District (Corps) is preparing IERs under the approval of the Council on Environmental Quality (CEQ). Those IERs will partially fulfill the Corps compliance with the National Environmental Policy Act of 1969 (NEPA; 83 Stat. 852, as amended; 42 U.S.C. 4321- 4347). IERs are a CEQ-approved alternative arrangement for compliance with NEPA that would allow expedited implementation of improved hurricane protection measures. Work proposed in IERs would be conducted under the authority of Public Law 109-234, Emergency Supplemental Appropriations Act for Defense, the Global War on Terror, and Hurricane Recovery, 2006 (Supplemental 4) and Public Law 110-28, U.S. Troop Readiness, Veterans' Care, Katrina Recovery, and Iraq Accountability Appropriations Act, 2007 (5th Supplemental). Those laws authorized the Corps to upgrade two existing hurricane protection projects [i.e., WBV and Lake Pontchartrain and Vicinity (LPV)] in the Greater New Orleans area in southeast Louisiana.

This report contains a description of the existing fish and wildlife resources of the project area, discusses future with- and without-project habitat conditions, identifies fish and wildlife-related impacts of the proposed project, and provides recommendations for the proposed project. This report incorporates and supplements our FWCA Reports that addressed impacts and mitigation features for the WBV Hurricane Protection project (dated November 10, 1986, August 22, 1994, November 15, 1996, and June 20, 2005), and the November 26, 2007, Draft Programmatic FWCA Report that addresses the hurricane protection improvements authorized in Supplemental 4. Impacts and mitigation needs resulting from government and contractor provided borrow areas have been evaluated in an October 25, 2007 and a November 1, 2007, FWCA report, respectively, therefore this report will not address those project features. This draft document does not constitute the report of the Secretary of the Interior as required by Section 2(b) of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.). This draft report has been provided to the Louisiana Department of Wildlife and Fisheries (LDWF) and the National Oceanic and Atmospheric Administration's, National Marine Fisheries Service (NOAA's NMFS), and their comments will be incorporated in the final report.

The IER 33a project area is located in the northern portions of Plaquemines Parish and the southern portions of Orleans Parish within the Mississippi River Deltaic Plain of the Lower Mississippi River Ecosystem. It encompasses the MRL on the west bank of the Mississippi River, from the eastern tie-in of the WBV project with the MRL at Oakville in Plaquemines Parish, to a point approximately 9.5 miles upriver (southeast of the Plaquemines/Orleans Parish lines). The northern terminus of the project area (river mile 79.5) is in the vicinity of a U.S. Coast Guard facility and Tulane University Research Laboratories; the southern terminus of the project area (river mile 70) is approximately 525 feet south of the intersection of East Saint Peter Street and the MRL at Oakville. Project-area habitats that would be impacted by the proposed project consist primarily of bottomland hardwood forests (both wetland and non-wetland) that vary in age, species composition, and value to Federal trust fish and wildlife resources.

During the alternatives analysis, the no-action alternative and the alternative to raise the existing hurricane protection system to a 100-year level of protection (i.e., reducing risk from a storm surge that has a 1% chance of being equaled or exceeded in any given year) were considered. The no-action alternative would not be implemented because it fails to provide the authorized level of protection.

Construction of an all-earthen levee is the engineering-recommended and preferred alternative in locations where additional right-of-way (ROW) is available. Floodside shifts, protected side shifts, straddling of the existing levee centerline, and installation of concrete floodwalls (T-walls; in areas of insufficient ROW for earthen levee construction) were considered for each of the six contract reaches. The preferred alternative includes a combination of earthen levees and T-walls.

Implementation of the preferred alternative would directly impact 82 and 80 acres of wetland and hydrologically-altered (i.e., non-wetland) bottomland hardwood habitat, respectively. According to our Wetland Value Assessment (WVA) analyses, the preferred alternative would result in the direct loss of 50.13 and 48.93 average annual habitat units (AAHUs), of wetland and non-wetland bottomland hardwood forest, respectively. Details of our field data collection, bottomland hardwood growth projections, and WVA impact calculations and associated assumptions are available for review at the Service's Louisiana Field Office, or can be sent to your agency upon request. Mitigation for unavoidable habitat losses caused by project features will be evaluated through a complementary comprehensive mitigation IER.

The Service does not object to providing improved hurricane protection to the greater New Orleans area provided the following fish and wildlife conservation recommendations are incorporated into future project planning and implementation:

1. The Corps shall fully compensate for any unavoidable losses to wetland (50.13 AAHUs) and non-wetland (48.93 AAHUs) bottomland hardwood habitat caused by project implementation.

2. If any feature of the proposed project is changed significantly or not implemented within one year of the November 8, 2011, Endangered Species Act signed-stamp concurrence with your "not likely to adversely affect" determination, we recommend that the Corps reinitiate coordination with our office to ensure that the proposed project would not adversely affect any Federally listed threatened or endangered species or their habitat.

3. Our records indicate that project-associated impacts to bald eagles and colonial nesting waterbirds are unlikely because of the distance between existing known colonies and nest sites and the proposed project activities. Such nest sites and colonies may be present, however, that are not currently listed in our database. We, therefore, recommend that on-site contract personnel be informed of the need to identify bald eagle nest sites and waterbird nesting colonies, and to avoid affecting them during the breeding season.

    a. To minimize disturbance to 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).

b. If a bald eagle nest is discovered within or adjacent to the proposed project area, then an evaluation must be performed to determine whether the project is likely to disturb nesting bald eagles. That evaluation may be conducted on-line at: http://www.fws.gov/southeast/es/baldeagle. Following completion of the evaluation, that website will provide a determination of whether additional consultation is necessary and those results should be forwarded to this office.

4. Forest clearing associated with project features shall be conducted during the fall or winter, when practicable, to minimize impacts to nesting migratory birds.

5. Acquisition, habitat development, maintenance, and management of mitigation lands shall be allocated as first-cost expenses of the project, and the local project-sponsor shall be responsible for operational costs. If the local project-sponsor is unable to fulfill the financial mitigation requirements for operation, then the Corps shall provide the necessary funding to ensure mitigation obligations are met on behalf of the public interest.

6. Further detailed planning of project features (e.g., Design Documentation Report, Engineering Documentation Report, Plans and Specifications, or other similar documents) shall be coordinated with the Service and other State and Federal natural resource agencies, and all such agencies shall be provided an opportunity to review and submit recommendations on the work addressed in those reports.

7. If mitigation lands are purchased for inclusion within a Federal of State managed property, the land manger of the respective property shall be contacted early in the planning phase regarding any requirements to which the proposed mitigation parcel must adhere or conform. If applicable, a site-specific plan shall be developed by the Corps, the Service, and the pertinent natural resource management agency (that would accept ownership and/or responsibility for the mitigation parcel), in accordance with Section 3(b) of the FWCA for mitigation lands.

8. A report documenting the status of mitigation implementation and maintenance should be prepared every three years by the managing agency and provided to the Corps, the Service, NMFS, U.S. Environmental Protection Agency (EPA), Louisiana Department of Natural Resources (LDNR), and LDWF. That report should also describe future management activities, and identify any proposed changes to the existing management plan.

INTRODUCTION

The U.S. Army Corps of Engineers, New Orleans District (Corps) is preparing Individual Environmental Report 33a (IER 33a) for the proposed resilient features of the West Bank and Vicinity – Mississippi River Levee (WBV-MRL) Co-Located Project, in Plaquemines and Orleans Parishes, Louisiana. This section of the Greater New Orleans Hurricane and Storm Damage Risk Reduction System (GNOHSDRRS) would also tie into, and be co-located with, the Mississippi River and Tributaries (MRT) levee system. IER 33a is being prepared under the approval of the Council on Environmental Quality (CEQ) that will partially fulfill the Corps compliance with the National Environmental Policy Act of 1969 (NEPA; 83 Stat. 852, as amended; 42 U.S.C. 4321- 4347). IERs are a CEQ approved alternative arrangement for compliance with NEPA that would allow expedited implementation of improved hurricane protection measures. Work proposed in IERs would be conducted under the authority of Public Law 109-234, Emergency Supplemental Appropriations Act for Defense, the Global War on Terror, and Hurricane Recovery, 2006 (Supplemental 4) and Public Law 110-28, U.S. Troop Readiness, Veterans' Care, Katrina Recovery, and Iraq Accountability Appropriations Act, 2007 (5th Supplemental). Those laws authorized the Corps to upgrade two existing hurricane protection projects [i.e., WBV and Lake Pontchartrain and Vicinity (LPV)] in the Greater New Orleans area in southeast Louisiana.

This report contains a description of the existing fish and wildlife resources of the project area, discusses future with- and without-project habitat conditions, identifies fish and wildlife-related impacts of the proposed project, and provides recommendations for the proposed project. This report incorporates and supplements our Fish and Wildlife Coordination Act (FWCA) Reports that addressed impacts and mitigation features for the Westbank and Vicinity of New Orleans (dated November 10, 1986, August 22, 1994, November 15, 1996, and June 20, 2005), and the November 26, 2007, Draft Programmatic FWCA Report that addresses the hurricane protection improvements authorized in Supplementals 4 and 5. Impacts and mitigation needs resulting from government and contractor provided borrow areas have been evaluated in an October 25, 2007, and a November 1, 2007, FWCA report, respectively, therefore this report will not address those project features. This draft document does not constitute the report of the Secretary of the Interior as required by Section 2(b) of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.). This draft report has been provided to the Louisiana Department of Wildlife and Fisheries (LDWF) and the National Oceanic and Atmospheric Administration's, National Marine Fisheries Service (NMFS), and their comments will be incorporated in the final report.

DESCRIPTION OF THE STUDY AREA

The IER 33a project area is located in the northern portions of Plaquemines Parish and the southern portions of Orleans Parish within the Mississippi River Deltaic Plain of the Lower Mississippi River Ecosystem. It encompasses the MRL on the west bank of the Mississippi River, from the eastern tie-in of the WBV project with the MRL at Oakville in Plaquemines Parish, to a point approximately 9.5 miles upriver (southeast of the Plaquemines/Orleans Parish lines). The northern terminus of the project area (river mile 79.5) is in the vicinity of a U.S.

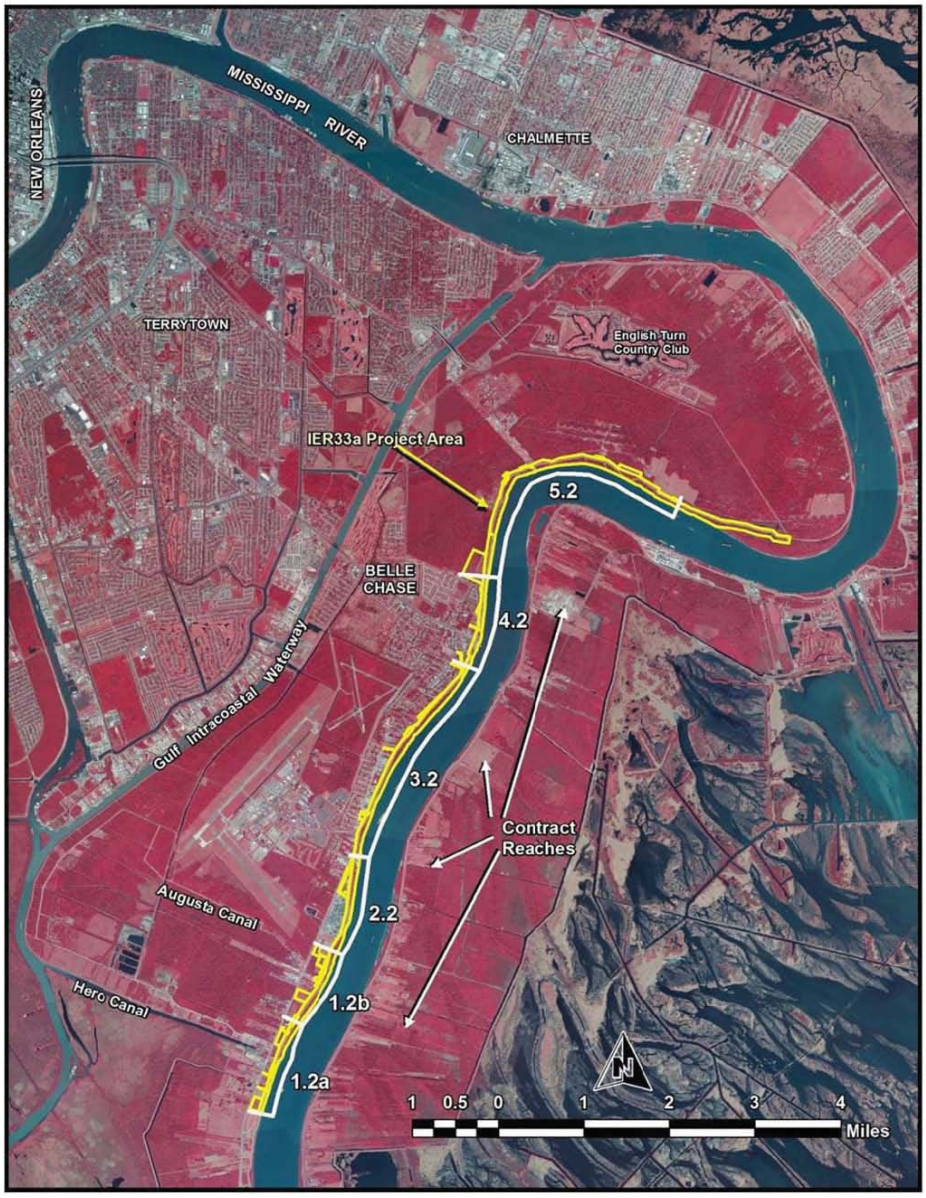

Figure 1. IER 33a Study Area, WBV-MRL Co-Located Project, Plaquemines and Orleans Parishes, Louisiana.

Coast Guard facility and Tulane University Research Laboratories; the southern terminus of the project area (river mile 70) is approximately 525 feet south of the intersection of East Saint Peter Street and the MRL at Oakville. Higher elevations in the proposed project area vicinity occur on the natural levees of the Mississippi River. Developed lands are primarily associated with those natural levees, but extensive wetlands have been leveed and drained to accommodate residential, commercial, and agricultural development. Federal, State, and local levees have been installed for flood protection purposes, often with negative effects on adjacent wetlands. The Mississippi River is the prominent landscape feature, though residential development and bottomland hardwood forests are present throughout the project area vicinity.

FISH AND WILDLIFE RESOURCES

Habitat types in the study area include primarily wetland and non-wetland bottomland hardwood habitat, open water, and developed areas. The project-area wetland and non-wetland bottomland hardwood forests provide habitat for a variety of migratory game and non-game birds such as wood duck, little blue heron, snowy egret, great egret, prothonotary warbler, and Louisiana waterthrush. Those forests also support mammals such as mink, raccoon, opossum, fox squirrel, grey squirrel, swamp rabbit, and white-tailed deer; and, portions of the project area that are frequently flooded during high river stages provide foraging and spawning habitat for various freshwater fishes and shellfishes (e.g., mosquito fish, spotted gar, bowfin, green sunfish, blue catfish, black bullhead, and red swamp crawfish). The study-area bottomland hardwood wetlands provide plant detritus to downstream coastal waters, thereby contributing to the production of commercially and recreationally important fishes and shellfishes. They also provide valuable water quality functions such as reduction of excessive dissolved nutrient levels, filtering of waterborne contaminants, and removal of suspended sediment.

Detailed habitat descriptions and their associated values for Federal trust fish and wildlife were provided in our November 26, 2007, Draft Programmatic FWCA Report that addressed the hurricane protection improvements authorized in Supplementals 4 and 5. For brevity, that discussion is incorporated by reference herein, and we offer the following information as an update to the previously mentioned reports and to provide IER-specific recommendations.

On November 8, 2011, the Service concurred (via a signed stamp) with the Corps' determination that the proposed activities are not likely to adversely affect listed or proposed threatened or endangered species. Our concurrence is based on information that indicates no known threatened or endangered species or their critical habitat occur within the study area. Therefore, no further consultation will be required unless there are changes in the scope or location of the project, or construction has not been initiated within one year. If the project has not been initiated within one year, follow-up consultation should be accomplished with this office prior to making expenditures for construction. If the scope or location of the proposed work is changed, consultation should occur as soon as such changes are made.

Based on our records, project-associated impacts to bald eagles and colonial nesting waterbirds are unlikely because of the distance between existing known colonies and nest sites and the proposed project activities. Such nest sites and colonies may be present, however, that are not currently listed in our database. We, therefore, recommend that on-site contract personnel be

informed of the need to identify bald eagle nest sites and waterbird nesting colonies, and to avoid affecting them during the breeding season. To minimize disturbance to 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). If a bald eagle nest is discovered within or adjacent to the proposed project area, then an evaluation must be performed to determine whether the project is likely to disturb nesting bald eagles. That evaluation may be conducted on-line at: http://www.fws.gov/southeast/es/baldeagle. Following completion of the evaluation, that website will provide a determination of whether additional consultation is necessary and those results should be forwarded to this office.

Future Fish and Wildlife Resources

Major causes of bottomland hardwood forest losses within the study area include altered hydrology, storm damage, competition from invasive/exotic vegetation, and development activities. The continued conversion forested habitat to developed land represents the most serious fish and wildlife-related problems in the study area. Those losses may cause declines in coastal fish and shellfish production (through the reduction in detrital input) and in the study area's carrying capacity for various species of migratory waterfowl, wading birds, other migratory birds, alligators, furbearers, and game mammals. Bottomland hardwood forest losses may also reduce storm wind and surge protection of developed lands, and may contribute to water quality degradation associated with excessive nutrient inputs.

ALTERNATIVES UNDER CONSIDERATION

During the alternatives analysis, the no-action alternative and the alternative to construct a more resilient hurricane protection system, capable of providing a 100-year level of protection (i.e., reducing risk from a storm surge that has a 1% chance of being equaled or exceeded in any given year), were considered. The no-action alternative would not be implemented because it fails to provide the authorized level of protection. Floodside shifts, protected side shifts, straddling of the existing levee centerline, and installation of T-walls (in areas of insufficient ROW for earthen levee construction) were considered for each of the six contract reaches.

Proposed Action

The preferred alternative includes a combination of earthen levee construction and T-wall installation. Common to all alternatives is the construction of a new, permanent, 15-foot-wide, protected-side ROW and the reduction in levee side-slope angles which are too steep (typically 1 vertical on 2 horizontal) for regular maintenance (e.g., mowing) as a result of an expedited and temporary heightening to meet GNOHSDRRS construction timelines. Also, the removal, or addition, of grass and top soil will be required to adjust the angle of the levee side slopes. The details for each alternative, by contract reach, are as follows:

Contract Reach WBV-MRL 1.2a – Oak Point to Oakville (a)
The preferred alternative would include the construction of a new T-wall along the entire length of the reach (5,000 linear feet of levee). A new side slope of 1 vertical on 3 horizontal would be constructed. The new T-wall would have a final top elevation of 24.5 feet and would generally follow the centerline of the existing levee. Four staging/work areas and three temporary construction access easements would be established along the proposed project corridor.

Contract Reach WBV-MRL 1.2b – Oak Point to Oakville (b)
The preferred alternative would include an all-earthen levee upgrade, consisting of a floodside shift (for 3,100 linear feet of levee), a protected shift (for 900 linear feet of levee), as well as a straddle of the existing levee (for 500 linear feet of levee). The remaining length of this contract reach would consist of transition zones between the adjoining contract reaches. New side slopes of 1 vertical on 5 horizontal on the floodside and 1 vertical on 3.5 horizontal on the protected side would be constructed. The new earthen levee would have a final top elevation of 21.5 feet. Three staging/work areas and three temporary construction access easements would be established along the proposed project corridor.

Contract Reach WBV-MRL 2.2 – Oak Point (Chevron Oronite)
The preferred alternative would include the construction of a new T-wall along the entire length of the reach (6,700 linear feet of levee). A new side slope of 1 vertical on 3 horizontal would be constructed. The new T-wall would have a final top elevation of 24.5 feet and would generally follow the centerline of the existing levee. One staging/work area and four temporary construction access easements would be established along the proposed project corridor.

Contract Reach WBV-MRL 3.2 – Belle Chase to Oak Point
The preferred alternative would include a floodside shift (for 11,500 linear feet of levee) and the construction of a new T-wall (600 linear feet of levee). The remaining length of this contract reach would consist of transition zones between the adjoining contract reaches. New side slopes of 1 vertical on 5 horizontal on the floodside and 1 vertical on 3.5 horizontal on the protected side would be constructed. The new earthen levee would have a final top elevation of 21.0 feet. Five staging/work areas and three temporary construction access easements would be established along the proposed project corridor.

Contract Reach WBV-MRL 4.2 – Oak Road to Belle Chase
The preferred alternative would include the construction of a new T-wall along the entire length of the reach (5,400 linear feet of levee). A new side slope of 1 vertical on 3 horizontal would be constructed. The new T-wall would have a final top elevation of 24.5 feet and would generally follow the centerline of the existing levee. Three staging/work areas and two temporary construction access easements would be established along the proposed project corridor.

Contract Reach WBV-MRL 5.2 – Coast Guard Facility to Oak Road
The preferred alternative would include an all-earthen levee upgrade, consisting of a floodside shift (for 4,200 linear feet of levee), a protected shift (for 4,400 linear feet of levee), as well as a straddle of the existing levee (for 9,400 linear feet of levee). The remaining length of this contract reach would consist of transition zones between the adjoining contract reaches. New side slopes of 1 vertical on 5 horizontal on the floodside and 1 vertical on 3.5 horizontal on the

protected side would be constructed. The new earthen levee would have a final top elevation of 21.0 feet. Four staging/work areas and one temporary construction access easement would be established along the proposed project corridor.

EVALUATION METHOD

Direct impacts to bottomland hardwood habitat were quantified by acreage and habitat quality (i.e., average annual habitat units or AAHUs) by the Service and are presented in Table 1. The Service used the newly certified Bottomland Hardwood Community Model - Wetland Value Assessment Methodology (WVA) to quantify the impacts of proposed project features on non-wet and wet bottomland hardwood habitat. For each habitat type, this model defines an assemblage of variables considered important to the suitability of an area to support a diversity of fish and wildlife species. The WVA is similar to the Service's Habitat Evaluation Procedures (HEP) in that habitat quality and quantity (acreage) are measured for baseline conditions and predicted for future without-project and future with-project conditions. As with HEP, the WVA provides a quantitative estimate of project-related impacts to fish and wildlife resources; however, the WVA is based on separate models for different habitat types. Further explanation of how impacts/benefits are assessed with the WVA and an explanation of the assumptions affecting habitat suitability (i.e., quality) index (HSI) values for each target year are available for review at the Service's Lafayette, Louisiana, Field Office, along with the details of our field data collection.

PROJECT IMPACTS

Proposed project impacts associated with the preferred alternative would result primarily from the construction of new levee features, the expansion of the levee right-of-way, and the establishment of work spaces needed to facilitate project construction. Although some construction will occur in cleared areas and on existing levees, project implementation will directly impact wetland and non-wetland bottomland hardwood forests that provide a varying degree of habitat value for fish and wildlife resources in the area (e.g., refugia, food resources, and nesting habitat). As indicated in Table 1, project implementation would result in the direct loss of 82 and 80 acres, and 50.13 and 48.93 AAHUs, of wetland and non-wetland bottomland hardwood forest, respectively.

Direct impacts to the 80 acres (48.93 AAHUs) of hydrologically-altered (i.e., non-wetland) bottomland hardwood habitat would occur as a result of the preferred alternative. Impacts to this habitat type would be associated with the construction of numerous work spaces and the expansion the existing levee toward the protected side of the project area. Both small (less than 2 acres) and large (more than 1,000 acres) forested tracts of varying age, species composition, and quality would be impacted.

Direct impacts to the 82 acres (50.13 AAHUs) of seasonally flooded (i.e., wetland) bottomland hardwood habitat would occur as a result of the preferred alternative. Impacts to this habitat type would be associated with general project construction and the expansion the existing levee toward the floodside of the project area. The forested corridor between the Mississippi River and

the existing levee (i.e., the Mississippi River batture) would be impacted for construction of the proposed project. Those batture lands provide habitat value in the form of transition zones between aquatic and forested habitats, detrital input, shade, and in-stream cover as well as storm buffering and water quality benefits. Though most batture along this levee segment consists of a relatively low-quality bottomland hardwood forest (i.e, relatively young-aged black willow, box elder, and Chinese tallow-tree), during our WVA field data collection we did observe intermittent patches of higher-quality bottomland hardwood forests (with both hard and soft mast components) within certain contract reaches.

Table 1: Estimated Impacts of the Preferred Alternative

CONTRACT REACH	IMPACTS BY HABITAT TYPE					
	Partially Drained/Ditched Non-Wetland BLH[b] (PFO1d)[a]		Seasonally Flooded/Saturated Wetland BLH[b] (PFO1E)[a]		TOTALS BY CONTRACT REACH	
	Acres	AAHUs	Acres	AAHUs	Acres	AAHUs
WBV-MRL 1.2a	9	5.12	1	0.74	**10**	**5.86**
WBV-MRL 1.2b	16	9.33	10	6.91	**26**	**16.24**
WBV-MRL 2.2	1	0.56	1	0.64	**2**	**1.20**
WBV-MRL 3.2	7	4.17	22	14.56	**29**	**18.73**
WBV-MRL 4.2	3	1.79	1	0.55	**4**	**2.34**
WBV-MRL 5.2	35	22.11	36	19.58	**71**	**41.69**
Armoring (Above WBV-MRL 5.2)	9	5.85	N/A	N/A	**9**	**5.85**
Windrowing (On Floodside)	N/A	N/A	11	7.15	**11**	**7.15**
TOTALS BY HABITAT TYPE	**80**	**48.93**	**82**	**50.13**	**162**	**99.06**

[a] National Wetlands Inventory (NWI) Classifications derived from the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin 1979); [b] BLH = Bottomland Hardwoods.

FISH AND WILDLIFE CONSERVATION AND MITIGATION MEASURES

The President's Council on Environmental Quality defined the term "mitigation" in the National Environmental Policy Act regulations to include:

(a) avoiding the impact altogether by not taking a certain action or parts of an action;

(b) minimizing impacts by limiting the degree or magnitude of the action and its implementation;
(c) rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
(d) reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and
(e) compensating for the impact by replacing or providing substitute resources or environments.

The Service supports and adopts this definition of mitigation and considers its specific elements to represent the desirable sequence of steps in the mitigation planning process. Based on current and expected future without-project conditions, the planning goal of the Service is to develop a balanced project (i.e., one that is responsive to demonstrated hurricane protection needs while addressing the co-equal need for fish and wildlife resource conservation).

The Service's Mitigation Policy (Federal Register, Volume 46, No. 15, January 23, 1981) identifies four resource categories that are used to ensure that the level of mitigation recommended by Service biologists will be consistent with the fish and wildlife resource values involved. Considering the value of the bottomland hardwood wetlands of the proposed project area and their relative scarcity, the Service typically designates them as Resource Category 2 habitats, the mitigation for which is no net loss of in-kind habitat value. Hydrologically altered and degraded (i.e., non-wetland) bottomland hardwood forests that may be impacted, however, are designated as Resource Category 3 due to their reduced value to wildlife, fisheries, and lost/degraded wetland functions. The mitigation goal for Resource Category 3 habitats is no net loss of habitat value with in-kind mitigation preferred. Project impacts to wetlands will be minimized to some extent by hauling in material for the levee upgrade rather than establishing borrow sites adjacent to the levee ROW. Although direct and indirect impacts would be minimized by using the existing levee alignment to the maximum extent practicable, the proposed project continues to impact wetland and non-wetland bottomland hardwoods. Remaining direct and indirect project impacts to forested habitats should be mitigated via compensatory replacement of the habitat values lost (which should be "in-kind" for impacts to wetland forests).

On April 10, 2008, the U.S. Army Corps of Engineers (Corps) and the Environmental Protection Agency (EPA) issued regulations governing compensatory mitigation for activities authorized by Department of the Army permits (Federal Register, Vol. 73, No. 70). Those regulations identified a 12-step process for developing a mitigation plan. That 12-step process and the Service's specific guidance and recommendations regarding mitigation planning can be found in the appendix to this document. The Corps' selection of specific mitigation sites and all aspects of mitigation planning, including an alternatives analysis for techniques, locations, design, and means to comply with the 12-step planning process, is currently being, and should continue to be, coordinated with the Service and all interested Federal and State natural resource agencies. Mitigation to compensate for unavoidable losses of fish and wildlife habitat caused by project features will be evaluated through a complementary comprehensive mitigation IER.

SERVICE POSITION AND RECOMMENDATIONS

Construction of the WBV-MRL Co-Located hurricane protection system (IER 33a) would result in direct impacts to 50.13 and 48.93 AAHUs, of wetland and non-wetland bottomland hardwood forest, respectively. The Service does not object to providing improved hurricane protection to the greater New Orleans area provided the following fish and wildlife conservation recommendations are incorporated into future project planning and implementation:

1. The Corps shall fully compensate for any unavoidable losses to wetland (50.13 AAHUs) and non-wetland (48.93 AAHUs) bottomland hardwood habitat caused by project implementation.

2. If any feature of the proposed project is changed significantly or not implemented within one year of the November 8, 2011, Endangered Species Act signed-stamp concurrence with your "not likely to adversely affect" determination, we recommend that the Corps reinitiate coordination with our office to ensure that the proposed project would not adversely affect any Federally listed threatened or endangered species or their habitat.

3. Our records indicate that project-associated impacts to bald eagles and colonial nesting waterbirds are unlikely because of the distance between existing known colonies and nest sites and the proposed project activities. Such nest sites and colonies may be present, however, that are not currently listed in our database. We, therefore, recommend that on-site contract personnel be informed of the need to identify bald eagle nest sites and waterbird nesting colonies, and to avoid affecting them during the breeding season.

    a. To minimize disturbance to 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).

    b. If a bald eagle nest is discovered within or adjacent to the proposed project area, then an evaluation must be performed to determine whether the project is likely to disturb nesting bald eagles. That evaluation may be conducted on-line at: http://www.fws.gov/southeast/es/baldeagle. Following completion of the evaluation, that website will provide a determination of whether additional consultation is necessary and those results should be forwarded to this office.

4. Forest clearing associated with project features shall be conducted during the fall or winter, when practicable, to minimize impacts to nesting migratory birds.

5. Acquisition, habitat development, maintenance and management of mitigation lands shall be allocated as first-cost expenses of the project, and the local project-sponsor shall be responsible for operational costs. If the local project-sponsor is unable to fulfill the financial mitigation requirements for operation, then the Corps shall provide the

necessary funding to ensure mitigation obligations are met on behalf of the public interest.

6. Further detailed planning of project features (e.g., Design Documentation Report, Engineering Documentation Report, Plans and Specifications, or other similar documents) shall be coordinated with the Service and other State and Federal natural resource agencies, and all such agencies shall be provided an opportunity to review and submit recommendations on the work addressed in those reports.

7. If mitigation lands are purchased for inclusion within a Federal of State managed property, the land manger of the respective property shall be contacted early in the planning phase regarding any requirements to which the proposed mitigation parcel must adhere or conform. If applicable, a site-specific plan shall be developed by the Corps, the Service, and the pertinent natural resource management agency (that would accept ownership and/or responsibility for the mitigation parcel), in accordance with Section 3(b) of the FWCA for mitigation lands.

8. A report documenting the status of mitigation implementation and maintenance should be prepared every three years by the managing agency and provided to the Corps, the Service, NMFS, U.S. Environmental Protection Agency (EPA), Louisiana Department of Natural Resources (LDNR), and LDWF. That report should also describe future management activities, and identify any proposed changes to the existing management plan.

Appendix

MITIGATION GUIDANCE AND RECOMMENDATIONS

On April 10, 2008, the U.S. Army Corps of Engineers (Corps) and the Environmental Protection Agency (EPA) issued regulations governing compensatory mitigation for activities authorized by Department of the Army permits (Federal Register, Vol. 73, No. 70). According to the Federal Register, those regulations establish performance standards and criteria for the use of permittee-responsible compensatory mitigation, mitigation banks, and in-lieu programs to improve the quality and success of compensatory mitigation projects. The following summary outline generally describes the process of developing a mitigation plan as outlined in those regulations (see the Federal Register for a detailed description of each step).

1. Objectives: a description of the resource type(s) and amount(s) that would be provided as mitigation, the method of compensation, and the manner in which the resource functions of the compensatory mitigation project would address the needs of the geographic area of interest.
2. Site Selection: a description of the factors considered during the site selection process.
3. Site Protection Instrument: a description of the legal arrangements and instrument that would be used to ensure long-term protection of the compensatory mitigation project site.
4. Baseline Information: a description of the ecological characteristics of the proposed compensatory mitigation project site.
5. Determination of Credits: a description of the number of credits to be provided, including a rationale for that determination.
6. Mitigation Work Plan: detailed written specifications and work descriptions for the compensatory mitigation project.
7. Maintenance Plan: a description and schedule of maintenance requirements to ensure the continued viability of the resource once initial construction is completed.
8. Performance Standards: ecologically based standards that will be used to determine whether the compensatory mitigation project is achieving its objective.
9. Monitoring Requirements: a description of parameters to be monitored in order to determine if the mitigation project is on track for achieving its performance standards and if adaptive management is needed.
10. Long-term Management Plan: a description of the manner in which the compensatory mitigation project will be managed after the performance standards have been achieved to ensure the long-term sustainability of the resource.
11. Adaptive Management Plan: a management strategy to address unforeseen changes in site conditions or other mitigation project components.
12. Financial Assurances: a description of the financial assurances that would be provided and how they are sufficient to ensure a high level of confidence that the mitigation project will be successfully completed in accordance with its performance standards.

In addition to mitigating by Resource Category, the Service encourages mitigating for impacts to wetlands within the same watershed as the impacts occurred. The Service recommends that impacts associated with the proposed IER33a project that are located on the protected side of the MRL be mitigated west of the Mississippi River. Impacts located on the floodside of the MRL

are within the boundaries of both watersheds used for GNOHSDRRS mitigation; while siting a mitigation project in the Mississippi River floodplain is preferred, locating the mitigation project in either of the watersheds would be acceptable.

The goal of the mitigation plan is to provide for equal replacement of the habitat units lost due to re-construction of the hurricane/flood protection projects. The equal replacement compensation goal specifies that the gain of one habitat unit can be used to offset the loss of one habitat unit. Achieving this goal would re-establish, maintain, and protect bottomland hardwood habitats (wet and non-wet) as species diverse, sustainable habitats by restoring/maintaining unique functions, values, and services. For example, the objectives of the mitigation measures for bottomland hardwood forest would be to establish and maintain a high diversity of native mast- and fruit-producing trees and shrubs, maximize herbaceous and shrub-layer canopy cover, while maintaining a semi-mature to mature forest.

Mitigation development would also include activities designed to protect the mitigation lands and to provide features necessary for adequate management. Such activities would include but are not limited to controlling access, defining boundaries, protection of surface rights, and stewardship. Access to the mitigation site should be restricted to ensure that the development of the mitigation site is successful. In order to post the property and control access, surveying and establishing property boundaries would be required. This information would be used for the location and posting of perimeter boundary signs. Fencing along with gates could be employed to control access. Stewardship would include surveillance to protect the area from vandalism and other disturbances by maintaining a regularly seen, physical presence by staff in the area. All of the above tasks are considered to be a single management increment. The above measures (e.g. fence/signage repair and replacement, stewardship) would also be included as operational and maintenance measures over the project life.