



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

REPLY TO
ATTENTION OF

Planning, Programs, and
Project Management Division
Environmental Planning
and Compliance Branch

Decision Record

Individual Environmental Report # 23
Pre-Approved Contractor Furnished Borrow Material # 2
St. Bernard, St. Charles, Plaquemines Parishes, Louisiana,
and Hancock County, Mississippi

IER # 23

Description of Proposed Action. The U.S. Army Corps of Engineers, Mississippi Valley Division, New Orleans District (CEMVN) proposes to approve five borrow sites to be used under the Pre-Approved Contractor Furnished borrow areas program to supply levee building material to the CEMVN projects in the New Orleans area. The proposed borrow areas are located in St. Bernard, St. Charles, and Plaquemines Parishes, Louisiana, and Hancock County, Mississippi. Upon approval of these five sites, any suitable materials found at the sites could be utilized by a construction contractor to complete levee or floodwall projects for the proposed Greater New Orleans Hurricane and Storm Damage Risk Reduction System (GNOHSDRRS)..

Draft IER # 23, which detailed the impacts of the proposed actions, was released for public review on 24 March 2008. Stakeholders had until 23 April 2008, to comment on the document. Comments were received from governmental agencies, and a citizen. A series of public meetings discussing proposed borrow sites has been held since March 2007.

Factors Considered in Determination. The CEMVN has assessed the impacts of the proposed action on significant resources in the proposed project area, including jurisdictional wetlands, non-wetland/upland resources, prime and unique farmland, fisheries, wildlife, threatened and endangered (T&E) species, cultural resources, recreational resources, noise quality, air quality, water quality, transportation, aesthetics, environmental justice, and socioeconomic resources. Data gaps in the transportation analysis are being addressed through a study and will be discussed in future IERs when the information becomes available.

Mitigation. It has been determined that the proposed borrow areas do not contain any wetlands or non-wet bottomland hardwoods; therefore, no mitigation is necessary.

Environmental Design Commitments. It is recommended that the proposed borrow areas be designed and constructed with gradual side slopes, irregular shapes, islands, and where practical aesthetic improvements should be made. Specific design guidelines for these types of improvements can be found in Part V of Environmental Design Considerations for Main Stem Levee Borrow Areas Along the Lower Mississippi River, Lower Mississippi River Environmental Program, Report 4, April 1986.

The CEMVN is coordinating with the U.S. Fish and Wildlife Service (USFWS) to implement the recommendations laid out in the USFWS Coordination Act Report (CAR) (letter dated 29

February 2008, appendix D). The recommendations of the USFWS, and the CEMVN responses, are found on pg. 46-47.

The Louisiana State Historic Preservation Officer (LaSHPO) requests that if any unrecorded cultural resources are determined to exist within the proposed borrow areas, then no work will proceed in the area containing these cultural resources until a CEMVN staff archeologist has been notified and final coordination with the LaSHPO and interested Tribal Historic Preservation Officers has been completed.

Agency & Public Involvement. Various governmental agencies, non-governmental organizations, and citizens were engaged throughout the preparation of IER # 23. Agency staff from the USFWS, National Marine Fisheries Service, Environmental Protection Agency, U.S. Geologic Survey, National Park Service, Louisiana Department of Environmental Quality, Louisiana Department of Natural Resources, and Louisiana Department of Wildlife and Fisheries (LaDWF) are part of an interagency team that has and will continue to have input throughout the GNOHSDRRS planning process (appendix C).

There have been over 47 public meetings since March 2007 about proposed GNOHSDRRS work. Borrow issues have been discussed at some meetings, and a “borrow handout” has been available at all meetings since July 2007. The CEMVN sends out public notices in local newspapers, news releases (routinely picked up by television and newspapers in stories and scrolls), and mail notifications to stakeholders for each public meeting. In addition, www.nolaenvironmental.gov was set up to provide information to the public regarding proposed GNOHSDRRS work. The CEMVN also maintains a list of interested stakeholders that are notified by e-mail of the meetings. Public meetings will continue throughout the planning process.

Draft IER # 23 Public Review Period

1. Agency Comments (found in appendix D)
 - a. NMFS
 1. Concurrence of no significant impact to essential fish habitat (EFH) dated 31 March 2008
 - b. LDWF: Letter of no objection, dated 21 April 2008
2. Public Comments (found in appendix B)
 - a. Mr. David Smith: Comment letter dated received 31 March 2008

Decision. The CEMVN Environmental Planning and Compliance Branch has assessed the potential environmental impacts on the human environment of the proposed action described in this IER, and has performed a review of the comments received during the public review periods for draft IER # 23. Furthermore, all practicable means to avoid or minimize adverse environmental effects have been incorporated into the recommended plan. It has been determined that the proposed borrow areas do not contain any wetlands or non-wet bottomland hardwoods; therefore, no mitigation is necessary. The public interest will be best served by implementing the selected plan as described in IER # 23 in accordance with the environmental considerations discussed previously.

The CEMVN will prepare a Comprehensive Environmental Document (CED) that may contain additional information related to IER # 23 that becomes available after the execution of the final IER. The CED will provide a final mitigation plan, a comprehensive cumulative impacts analysis, and any additional information that addresses outstanding data gaps in the IERs.

I have reviewed IER # 23, and I have considered agency recommendations and comments received from the public during the scoping phase and comment periods, and I find the

recommended plan fully addresses the objectives as set forth by the Administration and Congress in the 3rd, 4th, and 5th Supplemental Appropriations.

The plan is justified, in accordance with environmental statutes, and it is in the public interest to construct the actions as described in this document.

5-06-08
Date

Alvin B. Lee
Alvin B. Lee
Colonel, U.S. Army
District Commander

FINAL INDIVIDUAL ENVIRONMENTAL REPORT
PRE-APPROVED CONTRACTOR FURNISHED BORROW MATERIAL # 2
ST. BERNARD, ST. CHARLES, PLAQUEMINES PARISHES, LOUISIANA,
AND HANCOCK COUNTY, MISSISSIPPI

IER # 23



**US Army Corps
of Engineers®**

APRIL 2008

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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 #23 (IER #23) to evaluate the potential impacts associated with the possible excavation of five Pre-Approved Contractor Furnished borrow areas. The proposed action areas are located in southeastern Louisiana (Figures 1; 2-4) and southwest Mississippi (Figure 5). The term “borrow” is used in the fields of construction and engineering to describe material that is dug in one location for use at another location. CEMVN is proposing to use suitable borrow material for construction of the proposed Greater New Orleans Storm Damage Risk Reduction System (GNOSDRRS).

IER #23 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.

CEMVN implemented Alternative Arrangements on 13 March 2007, under the provisions of the Council on Environmental Quality 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 GNOSDRRS, 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 GNOSDRRS in the New Orleans Metropolitan Area as a result of Hurricanes Katrina and Rita.

The Draft IER was distributed for a 30-day public review and comment period on 24 March 2008. A public comment was received during the public review and comment period from a state resource agency, and another from a citizen (Appendix B and Appendix D). A public meeting discussing proposed borrow sites was held on 10 December 2007. The CEMVN District Commander reviewed public and agency comments, and interagency correspondence. The District Commander’s decision on the proposed action is documented in the IER Decision Record.

A total of five potential Pre-Approved Contractor Furnished borrow areas investigated by the CEMVN Borrow Project Delivery Team (PDT) are discussed in this IER. The goal of the PDT is to acquire suitable borrow material needed for GNOSDRRS improvements. CEMVN engineers currently estimate that over 100,000,000 cubic yards of suitable material is required to improve Federal and non-Federal levee and floodwall projects. Borrow areas investigated in this IER could potentially provide approximately 16,350,000 cubic yards of suitable material for levee and floodwall projects.

Due to the importance of providing safety to the citizens of southeastern Louisiana, and the amount of borrow needed to supply levee projects for the GNOSDRRS, multiple borrow IERs are being prepared.

1.1 Purpose and Need for the Proposed Action

The purpose of the proposed action is to identify borrow areas that contain suitable material that can be excavated to supply Federal GNOSDRRS levee and floodwall projects. The completed GNOSDRRS would lower the risk of harm to citizens and damage to infrastructure during a storm event. The safety of people in the region is the highest priority of CEMVN. The proposed action resulted from the need to provide a total of over 100,000,000 cubic yards of suitable clay for GNOSDRRS projects that include the completion and improvement of hurricane protection levees in southeastern Louisiana. Raising levee elevations and the completion of levees requires the excavation of material from borrow areas necessary for project construction to ensure authorized levels of flood protection for local communities.

The term “100-year level of protection,” as it is used throughout this document, refers to a level of protection which reduces the risk of hurricane surge and wave driven flooding that the New Orleans Metropolitan Area has a 1% chance of experiencing each year.

1.2 Authority for the Proposed Action

The authority for the proposed action was provided as part of a number of hurricane protection projects spanning southeastern Louisiana, including the Lake Pontchartrain and Vicinity (LPV) Hurricane Protection Project and the West Bank and Vicinity (WBV) Hurricane Protection Project. Congress and the Administration granted a series of supplemental appropriations acts following Hurricanes Katrina and Rita to repair and upgrade the project systems damaged by the storms. The supplemental appropriations acts gave additional authority to the USACE to construct GNOSDRRS projects.

The LPV project was authorized under the Flood Control Act of 1965 (Public Law [P.L.] 89-298, Title II, Sec. 204) which amended, authorized a “project for hurricane protection on Lake Pontchartrain, Louisiana ... substantially in accordance with the recommendations of the Chief of Engineers in House Document 231, Eighty-ninth Congress.” The original statutory authorization for the LPV Project was amended by the Water Resources Development Acts (WRDA) of 1974 (P.L. 93-251, Title I, Sec. 92); 1986 (P.L. 99-662, Title VIII, Sec. 805); 1990 (P.L. 101-640, Sec. 116); 1992 (P.L. 102-580, Sec. 102); 1996 (P.L. 104-303, Sec. 325); 1999 (P.L. 106-53, Sec. 324); and 2000 (P.L. 106-541, Sec. 432).

The WBV project was authorized under the WRDA, as cited above. The Westwego to Harvey Canal Hurricane Protection Project was authorized by the WRDA of 1986. The WRDA of 1996 modified the project and added the Lake Cataouatche Project and the East of Harvey Canal Project. The WRDA of 1999 combined the three projects into one project under the current name.

The 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) authorized accelerated completion of the project and restoration of project features to design elevations at 100% Federal cost. 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) authorizes construction of a 100-year level of protection; the replacement or reinforcement of floodwalls; the construction of permanent closures at the outfall canals; the improvement of the Inner Harbor Navigation Canal (IHNC); and the construction of levee armoring at critical locations. Additional Supplemental Appropriations include the U.S. Troop Readiness, Veterans' Care, Katrina

Recovery, and Iraq Accountability Appropriations Act, 2007 H.R. 2206 (pg. 41-44) Title IV, Chapter 3, Flood Control and Coastal Emergencies, (5th Supplemental), General Provisions, Sec. 4302.

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, and are herein incorporated by reference. Pertinent studies, reports and projects are discussed below:

Lake Pontchartrain and Vicinity Hurricane Protection Project

- On 14 March 2008, CEMVN signed a Decision Record on IER #11 (Tier 1) entitled "Improved Protection on the Inner Harbor Navigation Canal, Orleans and St. Bernard Parishes, Louisiana." The document was prepared to evaluate potential impacts associated with building navigable and structural barriers to prevent storm surge from entering the Inner Harbor Navigation Canal from Lake Pontchartrain and/or the Gulf Intracoastal Waterway-Mississippi River Gulf Outlet-Lake Borgne complex. A Tier 2 document discussing alignment alternatives and designs of the navigable and structural barriers, and the impacts associated with exact footprints, is being completed.
- On 21 February 2008, CEMVN signed a Decision Record on IER # 18 titled "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 GNOSDRRS.
- In 14 February 2008, CEMVN 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 GNOSDRRS.
- In July 2006, CEMVN signed a Finding of No Significant Impact (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 30 October 1998, CEMVN signed a FONSI on EA # 279 titled "Lake Pontchartrain Lakefront, Breakwaters, Pump Stations 2 and 3." The report evaluated the impacts associated with providing fronting protection for outfall canals and pump stations. It was determined that the action would not significantly impact resources in the immediate area.
- On 2 October 1998, CEMVN signed a FONSI on EA # 282 titled "LPV, Jefferson Parish Lakefront Levee, Landside Runoff Control: Alternate Borrow." The report investigated the impacts of obtaining borrow material from an urban area in Jefferson Parish. No significant impacts to resources in the immediate area were expected.

- On 2 July 1992, CEMVN signed a FONSI on EA # 169 titled “LPV, Hurricane Protection Project, East Jefferson Parish Levee System, Jefferson Parish, Louisiana, Gap Closure.” The report addressed the construction of a floodwall in Jefferson Parish to close a “gap” in the levee system. The area was previously levied and under forced drainage, and it was determined that the action would not significantly impact the already disturbed area.
- On 22 February 1991, CEMVN signed a FONSI on EA # 164 titled “LPV Hurricane Protection – Alternate Borrow Area for the St. Charles Parish Reach.” The report addressed the impacts associated with the use of borrow material from the Mississippi River on the left descending bank in front of the Bonnet Carré Spillway Forebay for LPV construction.
- On 30 August, 1990 CEMVN signed a FONSI on EA # 163 titled “LPV Hurricane Protection – Alternate Borrow Area for Jefferson Parish Lakefront Levee, Reach III.” The report addressed the impacts associated with the use of a borrow area in Jefferson Parish for LPV construction.
- On 2 July 1991, CEMVN signed a FONSI on EA # 133 titled “LPV Hurricane Protection – Alternate Borrow at Highway 433, Slidell, Louisiana.” The report addressed the impacts associated with the excavation of a borrow area in Slidell, Louisiana for LPV construction.
- On 12 September 1990, CEMVN signed a FONSI on EA # 105 titled “LPV Hurricane Protection – South Point to Gulf Intracoastal Waterway, A. V. Keeler and Company Alternative Borrow Site.” The report addressed the impacts associated with the excavation of a borrow area in Slidell, Louisiana for LPV construction.
- On 12 March 1990, CEMVN signed a FONSI on EA # 102 titled “LPV Hurricane Protection – 17th Street Canal Hurricane Protection.” The report addressed the use alternative methods of providing flood protection for the 17th Street Outfall Canal in association with LPV activity. Impacts to resources were found to be minimal.
- On 4 August 1989, CEMVN signed a FONSI on EA # 89 titled “LPV Hurricane Protection, High Level Plan - Alternate Borrow Site 1C-2B.” The report addressed the impacts associated with the excavation of a borrow area along Chef Menteur Highway, Orleans Parish for LPV construction. The material was used in the construction of a levee west of the Inner Harbor Navigation Canal.
- On 27 October 1988, CEMVN signed a FONSI on EA # 79 titled “LPV Hurricane Protection – London Avenue Outfall Canal.” The report investigated the impacts of strengthening existing hurricane protection at the London Avenue Outfall Canal.
- On 21 July 1988, CEMVN signed a FONSI on EA # 76 titled “LPV Hurricane Protection – Orleans Avenue Outfall Canal.” The report investigated the impacts of strengthening existing hurricane protection at the Orleans Avenue Outfall Canal.
- On 26 February 1986, CEMVN signed a FONSI on EA # 52 titled “LPV Hurricane Protection – Geohegan Canal.” The report addressed the impacts

associated with the excavation of borrow material from an extension of the Geohegan Canal for LPV construction.

- Supplemental Information Report (SIR) # 25 titled “LPV Hurricane Protection – Chalmette Area Plan, Alternate Borrow Area 1C-2A” was signed by CEMVN on 12 June, 1987. The report addressed the used of an alternate contractor furnished borrow area for LPV construction.
- SIR # 27 titled “LPV Hurricane Protection – Alternate Borrow Site for Chalmette Area Plan” was signed by CEMVN on 12 June, 1987. The report addressed the used of an alternate contractor furnished borrow area for LPV construction.
- SIR # 28 titled “LPV Hurricane Protection – Alternate Borrow Site, Mayfield Pit” was signed by CEMVN on 12 June, 1987. The report addressed the used of an alternate contractor furnished borrow area for LPV construction.
- SIR # 29 titled “LPV Hurricane Protection – South Point to GIWW Levee Enlargement” was signed by CEMVN on 12 June, 1987. The report discussed the impacts associated with the enlargement of the GIWW.
- SIR # 30 titled “LPV Hurricane Protection Project, Jefferson Lakefront Levee” was signed by CEMVN on 7 October, 1987. The report investigated impacts associated with changes in Jefferson Parish LPV levee design.
- SIR # 17 titled “LPV Hurricane Protection – New Orleans East Alternative Borrow, North of Chef Menteur Highway” was signed by CEMVN on 30 April, 1986. The report addressed the use of an alternate contractor furnished borrow area for LPV construction.
- SIR # 22 titled “LPV Hurricane Protection – Use of 17th Street Pumping Station Material for LPHP Levee” was signed by CEMVN on 5 August, 1986. The report investigated the impacts of moving suitable borrow material from a levee at the 17th Street Canal in the construction of a stretch of levee from the Inner Harbor Navigation Canal to the London Avenue Canal.
- SIR # 10 titled “LPV Hurricane Protection, Bonnet Carré Spillway Borrow” was signed by CEMVN on 3 September, 1985. The report evaluated the impacts associated with using the Bonnet Carré Spillway as a borrow source for LPV construction, and found “no significant adverse effect on the human environment.”
- In December 1984, a SIR to complement the Supplement to Final EIS on the LPV Hurricane Protection project was filed with the Environmental Protection Agency.
- The Final EIS for the LPV Hurricane Protection Project, dated August 1974. A Statement of Findings was signed by CEMVN on 2 December, 1974. Final Supplement I to the EIS, dated July 1984, was followed by a Record of Decision (ROD), signed by CEMVN on 7 February, 1985. Final Supplement II to the EIS, dated August 1994, was followed by a ROD signed by CEMVN on 3 November, 1994.
- A report titled “Flood Control, Mississippi River and Tributaries,” published as House Document No. 90, 70th Congress, 1st Session, submitted 18 December, 1927 resulted in authorization of a project by the Flood Control Act of 1928. The

project provided comprehensive flood control for the lower Mississippi Valley below Cairo, Illinois. The Flood Control Act of 1944 authorized the USACE to construct, operate, and maintain water resources development projects. The Flood Control Acts have had an important impact on water and land resources in the proposed project area.

West Bank and Vicinity Hurricane Protection Project

- On 14 March 2008, CEMVN signed a Decision Record on IER #11 (Tier 1) entitled "Improved Protection on the Inner Harbor Navigation Canal, Orleans and St. Bernard Parishes, Louisiana." The document was prepared to evaluate potential impacts associated with building navigable and structural barriers to prevent storm surge from entering the Inner Harbor Navigation Canal from Lake Pontchartrain and/or the Gulf Intracoastal Waterway-Mississippi River Gulf Outlet-Lake Borgne complex. A Tier 2 document discussing alignment alternatives and designs of the navigable and structural barriers, and the impacts associated with exact footprints, is being completed.
- On 21 February 2008, CEMVN signed a Decision Record on IER # 18 titled "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 GNOSDRRS.
- In 14 February 2008, CEMVN 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 GNOSDRRS.
- In July 2006, CEMVN signed a Finding of No Significant Impact (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 23 August 2005, CEMVN signed a FONSI on EA # 422 titled "Mississippi River Levees – West Bank Gaps, Concrete Slope Pavement Borrow Area Designation, St. Charles and Jefferson Parishes, Louisiana." The report investigated the impacts of obtaining borrow material from various areas in Louisiana.
- On 22 February 2005, CEMVN signed a FONSI on EA # 306A titled "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 5 May 2003 CEMVN signed a FONSI on EA # 337 titled "Algiers Canal Alternative Borrow Site."
- On 19 June 2003, CEMVN signed a FONSI on EA # 373 titled "Lake Cataouatche Levee Enlargement." The report discussed the impacts related to improvements to a levee from Bayou Segnette State Park to Lake Cataouatche.

- On 16 May 2002, CEMVN signed a FONSI on EA # 306 titled “West Bank Hurricane Protection Project - Harvey Canal Sector Gate Site Relocation and Construction Method Change.” The report discussed the impacts related to the relocation of a proposed sector gate within the Harvey Canal, as authorized by the LPV Project.
- On 30 August 2000, CEMVN signed a FONSI on EA # 320 titled “West Bank Hurricane Protection Features.” The report evaluated the impacts associated with borrow sources and construction options to complete the Westwego to Harvey Canal Hurricane Protection Project.
- On 18 August 1998, CEMVN signed a FONSI on EA # 258 titled “Mississippi River Levee Maintenance - Plaquemines West Bank Second Lift, Fort Jackson Borrow Site.”
- The Final EIS for the WBV, East of Harvey Canal, Hurricane Protection Project was completed in August 1994. A ROD was signed by CEMVN in September 1998.
- The Final EIS for the WBV, Lake Cataouatche, Hurricane Protection Project was completed. A ROD was signed by CEMVN in September 1998.
- In December 1996, the USACE completed a post-authorization change study titled, “Westwego to Harvey Canal, Louisiana Hurricane Protection Project Lake Cataouatche Area, EIS.” The study investigated the feasibility of providing hurricane surge protection to that portion of the west bank of the Mississippi River in Jefferson Parish between Bayou Segnette and the St. Charles Parish line. A Standard Project Hurricane (SPH) level of protection 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, Public Law 104-303, subject to the completion of a final report of the Chief of Engineers, which was signed on 23 December 1996.
- On 12 January 1994, CEMVN signed a FONSI on an EA # 198 titled, “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 evaluated the impacts associated with borrow sources and construction options to complete the Westwego to Harvey Canal Hurricane Protection Levee.
- In August 1994, CEMVN completed a feasibility report titled “WBV (East of the Harvey Canal).” The study investigated the feasibility of providing hurricane surge protection to that portion of the west bank of metropolitan New Orleans from the Harvey Canal eastwards to the Mississippi River. The final report recommended that the existing West Bank Hurricane Project, Jefferson Parish, Louisiana, authorized by the WRDA of 1986 (P.L. 99-662), approved 17 November 1986, be modified to provide additional hurricane protection east of the Harvey Canal. The report also recommended that the level of protection for the area east of the Algiers Canal deviate from the National Economic Development Plan’s level of protection and provide protection for the SPH. The Division Engineer’s Notice was issued on 1 September 1994. The Chief of Engineer’s report was issued on 1 May 1995. Preconstruction, engineering, and

design was initiated in late 1994 and is continuing. The WRDA of 1996 authorized the project.

- On 20 March 1992, CEMVN signed a FONSI on EA # 165 titled “Westwego to Harvey Canal Disposal Site.”
- In February 1992, the USACE completed a reconnaissance study titled “West Bank Hurricane Protection, Lake Cataouatche, Louisiana.” The study investigated the feasibility of providing hurricane surge protection to that portion of the west bank of the Mississippi River in Jefferson Parish, between Bayou Segnette and the St. Charles Parish line. The study found a 100-year level of protection to be economically justified based on constructing a combination levee/sheetpile wall along the alignment followed by the existing non-Federal levee. Due to potential impacts to the Westwego to Harvey Canal project, the study is proceeding as a post-authorization change.
- On 3 June 1991, CEMVN signed a FONSI on EA # 136 titled “West Bank Additional Borrow Site between Hwy 45 and Estelle PS.”
- On 15 March 1990, CEMVN signed a FONSI on EA # 121 titled “West Bank Westwego to Harvey Changes to EIS.” The report addressed the impacts associated with the use of borrow material from Fort Jackson for LPV construction. The material was used for constructing the second life for the Plaquemines West Bank levee upgrade, as part of LPV construction.
- In December 1986, the USACE completed a Feasibility Report and EIS titled, “West Bank of the Mississippi River in the Vicinity of New Orleans, La.” The report investigated the feasibility of providing hurricane surge protection 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 SPH level of protection 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). Construction of the project was initiated in early 1991.

1.4 Integration with other Interim Environmental Reports

In addition to this IER, CEMVN is preparing a draft Comprehensive Environmental Document (CED) that will describe the work completed and remaining to be constructed. 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, a finalized mitigation plan, 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 posted for public review.

The draft CED will be available for a 60-day public review period. The document will be posted on www.nolaenvironmental.gov, or can be requested by contacting 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 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, signed by the District Commander, and made available to any stakeholders requesting a copy.

1.5 Public Concerns

The public has had the opportunity to give input about proposed GNOSDRRS work throughout the planning process through a number of outlets (i.e., public meetings, written comments, www.nolaenvironmental.gov). IER # 18 and IER # 19 were the first in a series of IERs investigating the impacts of borrow excavation related to the GNOSDRRS. Final IER # 18 and Final IER # 19 contain public comments regarding borrow issues. These documents are available at www.nolaenvironmental.gov, or upon request.

According to the results of focus groups held by Unified New Orleans Plan (UNOP) the public places very high priority on storm protection. The public wants a 100-year or higher level of protection from storm events. Borrow excavation is an integral part of upgrading hurricane protection in the New Orleans Metropolitan Area. The public also feels that the remaining land left in coastal parishes should not be excavated. Some members of the public feel that the borrow areas should be backfilled; CEMVN is currently looking into the feasibility of backfilling utilized borrow areas. The public is concerned about impacting wetlands; CEMVN is currently avoiding all jurisdictional wetlands as other reasonable alternatives are being investigated (see Section 2.1). The public is concerned about truck haulers causing traffic congestion. The public is concerned about safety issues during and after the borrow area is excavated. Landowners are concerned about the free use of their privately-owned property.

1.6 Data Gaps and Uncertainties

Transportation impacts and routes for the delivery of borrow material have not been determined, as it currently is uncertain to which GNOSDRRS construction sites each proposed borrow area would provide material. Large quantities of material would be delivered to GNOSDRRS construction sites, as well as to other ongoing flood protection projects in the area. This could have localized short-term impacts to transportation corridors that can not be quantified at this time. CEMVN is completing a transportation study to determine any impacts associated with the transporting of material to construction sites. This analysis will be discussed in future IERs once it is completed.

CEMVN is studying the feasibility of backfilling Government Furnished borrow areas after excavation. Information will be discussed in future IERs once it becomes available.

Some construction schedules are changing or not known at this time.

2. Alternatives

2.1 Alternatives Development and Preliminary Screening Criteria

NEPA requires that in analyzing alternatives to a 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. Since this IER deals with Pre-Approved Contractor Furnished borrow material there are no nonstructural alternatives. Non-structural alternatives will be evaluated in the IERs dealing directly with the construction of the GNOSDRRS.

CEMVN is pursuing three avenues of obtaining the estimated amount of borrow material needed for GNOSDRRS construction. The three avenues that are being pursued by CEMVN to obtain borrow material are Government Furnished (the Government acquires rights to property), Pre-Approved Contractor Furnished (a CEMVN levee construction contractor works in partnership with a landowner to provide suitable pre-approved

borrow material from the landowner's property), and Supply Contract (a landowner or corporation delivers a pre-specified amount of suitable borrow material to a designated location for use by a CEMVN levee construction contractor). Two of the avenues being pursued (Pre-Approved Contractor Furnished and Supply Contract) allow a private individual or corporation to propose a site where borrow material could come from. It is possible that some of the Government Furnished, Contractor Furnished, and Supply Contract sources of borrow material may come from anywhere in the United States. IER # 18 discussed and # 22 will discuss Government Furnished borrow alternatives. This IER discusses potential Pre-Approved Contractor Furnished borrow areas. Approved Pre-Approved Contractor Furnished borrow areas were discussed in IER # 19. An additional IER(s) will discuss potential Supply Contract alternatives. Additional borrow IERs will be prepared as future potential Government Furnished and Pre-Approved Contractor Furnished borrow areas are identified.

The US Fish and Wildlife Service (USFWS) supports CEMVN's prioritization selection of potential borrow areas in the following order: existing commercial areas, upland sources, previously disturbed/manipulated wetlands within a levee system, and low-quality wetlands outside a levee system (Appendix D). USFWS recommended that prior to utilizing borrow areas, every effort should be made to reduce impacts by using sheetpile and/or floodwalls to increase levee heights wherever feasible. The USFWS also recommended the following protocol be adopted and utilized to identify borrow sources in descending order of priority:

1. "Permitted commercial sources, authorized borrow sources for which environmental clearance and mitigation have been completed, or non-functional levees after newly constructed adjacent levees are providing equal protection.
2. Areas under forced drainage that are protected from flooding by levees, and that are:
 - a) non-forested (e.g., pastures, fallow fields, abandoned orchards, former urban areas and non-wetlands;
 - b) wetland forests dominated by exotic tree species (i.e., Chinese tallow) or non-forested wetlands (e.g. wetland pastures), excluding marshes;
 - c) disturbed wetlands (e.g., hydrologically altered, artificially impounded).
3. Areas that are outside a forced drainage system and levees, and that are:
 - a) non-forested (e.g. pastures, fallow fields, abandoned orchards, former urban areas) and non-wetlands;
 - b) wetland forests dominated by exotic tree species (i.e., Chinese tallow) or non-forested wetlands (e.g. wetland pastures), excluding marshes;
 - c) disturbed wetlands (e.g., hydrologically altered, artificially impounded)."

The USFWS is currently assisting CEMVN in meeting this protocol.

The GNOSDRRS includes the completion and raising of storm protection levees in southeastern Louisiana. Raising levee elevations and completion of levees requires the excavation of material from borrow areas for use in project construction. As part of the construction, numerous utilities, including electrical services, gas lines, telephone poles and lines, storm drainpipes, subdrain lines, and storm drain catch basins, would be

avoided or relocated. The access routes and land would be cleared using bulldozers and excavators. Woody debris would be stockpiled on-site and placed in the area once excavation is completed or in some cases the material may be removed to an approved landfill. Silt fencing would be installed around the perimeter of the borrow area to control runoff, as per Best Management Practices (BMPs). Contractors would be responsible for obtaining National Pollutant Discharge Elimination System (NPDES) permits, if applicable, and implementing BMPs, including standard USACE storm water prevention requirements at all borrow area locations, as well as complying with all other Federal, State, and local laws, regulations, and ordinances. In most cases, excavation of the borrow areas would commence from the back of the areas to the access road to provide adequate space for staging haul trucks and stockpiled material. To make optimum use of available material, excavation should begin at one end of the borrow area and be made continuous across the width of the areas to the allowed borrow depths to provide surface drainage to the low side of the borrow area as excavation proceeds. During this process the overburden (topsoil that lays on top of suitable borrow material) would be stockpiled. The excavation activities shall be long enough to provide the required quantity of material, and shall be accomplished in such manner that all available material within the required width to full depth will be utilized when possible. Upon completion of excavation, site restoration will include placing the stockpiled overburden back into the area and grading the slopes to the specified cross-section figure shown in the borrow area management plan. If additional overburden is available at the areas, it would be used to create gradual side slopes, islands, and smooth out corners within the borrow area to enhance wildlife and fishery habitat. The Environmental Design Considerations for Main Stem Levee Borrow Areas Along the Lower Mississippi River Report 4: Part V, incorporated by reference, and CEMVN operating procedures will be basic guidelines referred to when designing the borrow areas. However, the full depth of the borrow area should be excavated according to the borrow area management plan for the approved borrow area depths to minimize impacts to the human and natural environment.

Some parishes have ordinances that require the backfilling of any borrow areas inside the jurisdictional limits of the parish. Sites in these areas would be backfilled in accordance with the local ordinances. Material for the backfill operation will likely be dredged from the Mississippi River.

2.2 Description of the Alternatives

Four alternatives were considered. These included the No-Action, the Proposed Action, Government Furnished Borrow Material, and Supply Contract.

2.3 Proposed Action

The proposed action (preferred alternative) consists of potentially excavating all suitable material from the proposed five borrow areas (Figure 1). In order to meet the borrow needs of the GNOSDRRS, personnel from CEMVN Project Management, Engineering, Real Estate, Office of Counsel, Relocations, and Environmental branches established a Borrow Project Delivery Team. This team worked closely with other CEMVN elements (Hurricane Protection Office, Protection and Restoration Office, and Regulatory Functions Branch) to accomplish its mission. The team's goal is to locate and procure high quality clay borrow sources suitable for levee and floodwall construction in such a way as to be least damaging to both the natural and human environments within the proposed borrow areas.



Figure 1: Proposed Borrow Areas

1: 1025 Florissant / 2: Acosta / 3: 3C Riverside / 4: Myrtle Grove / 5: Pearlington Dirt Phase 2

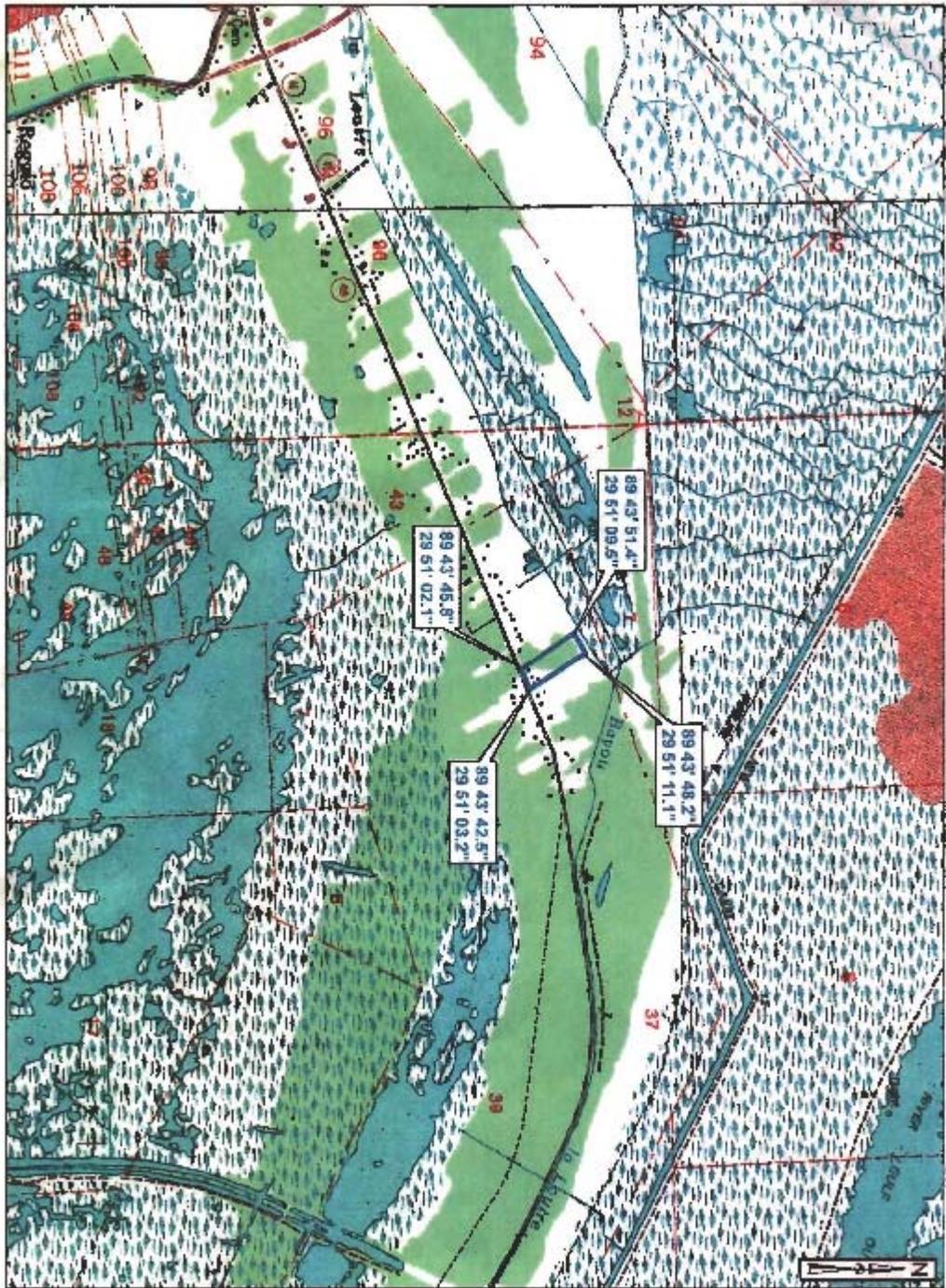
The team investigated and completed environmental coordination on the proposed borrow areas, and is currently investigating others. Pre-Approved Contractor Furnished borrow areas were initially evaluated by reviewing the contractor-provided information packet required for the use of proposed borrow areas. The contractor packet was considered approved if it consisted of the following: 1) a signed right of entry; 2) maps that showed the property boundaries and areas being proposed for use as a Pre-Approved Contractor Furnished borrow area; 3) an approved Jurisdictional Wetland Determination from the CEMVN Regulatory Functions Branch indicating no wetland impacts, or a Section 404 (of the Clean Water Act- see Appendix A) permit and proof of compensatory mitigation; 4) a Coastal Use permit or letter of no objection from the Louisiana Department of Natural Resources, Coastal Management Division (LDNR) or local parish coastal management; 5) a concurrence letter from the U.S. Department of the Interior, USFWS indicating no threatened or endangered (T&E) species or their critical habitat would be affected; 6) a cultural resources assessment; 7) a Phase 1 Environmental Site Assessment (ESA); 8) geotechnical boring logs and soil analysis identifying the suitability of potential borrow material.

The proposed action consists of removing all suitable material from the following five borrow areas. Excavation would have no effect on cultural resources, or threatened and endangered species or their critical habitat. All HTRW issues would be avoided.

- The 1025 Florissant area is located on Florissant Highway in St. Bernard Parish, Louisiana (Figure 2). The proposed borrow area is 3 acres.
- The Acosta area is located on Highway 46 in St. Bernard Parish (Figure 3). The proposed borrow area is 25 acres.

- The 3C Riverside area is located off of Highway 3127 in St. Charles Parish (Figure 4). The proposed borrow area is comprised of two sites. The first site is 118 acres and the second site is 146 acres.
- The Myrtle Grove area is located on Highway 23 in Plaquemines Parish, Louisiana (Figure 5). The proposed borrow area is 271 acres.
- The Pearlinton Dirt Phase 2 area is located on Highway 90 in Hancock County, Mississippi (Figure 6). The proposed borrow area is 110 acres.

Some of the proposed borrow areas have a designated stockpile area delineated. If additional material is needed for levee construction the stockpile areas may be utilized as a borrow source rather than impacting new areas.



1025 Florissant Borrow Pit - St. Bernard Parish

Figure 2: 1025 Florissant Proposed Borrow Area

Acosta Borrow Pit - St. Bernard Parish

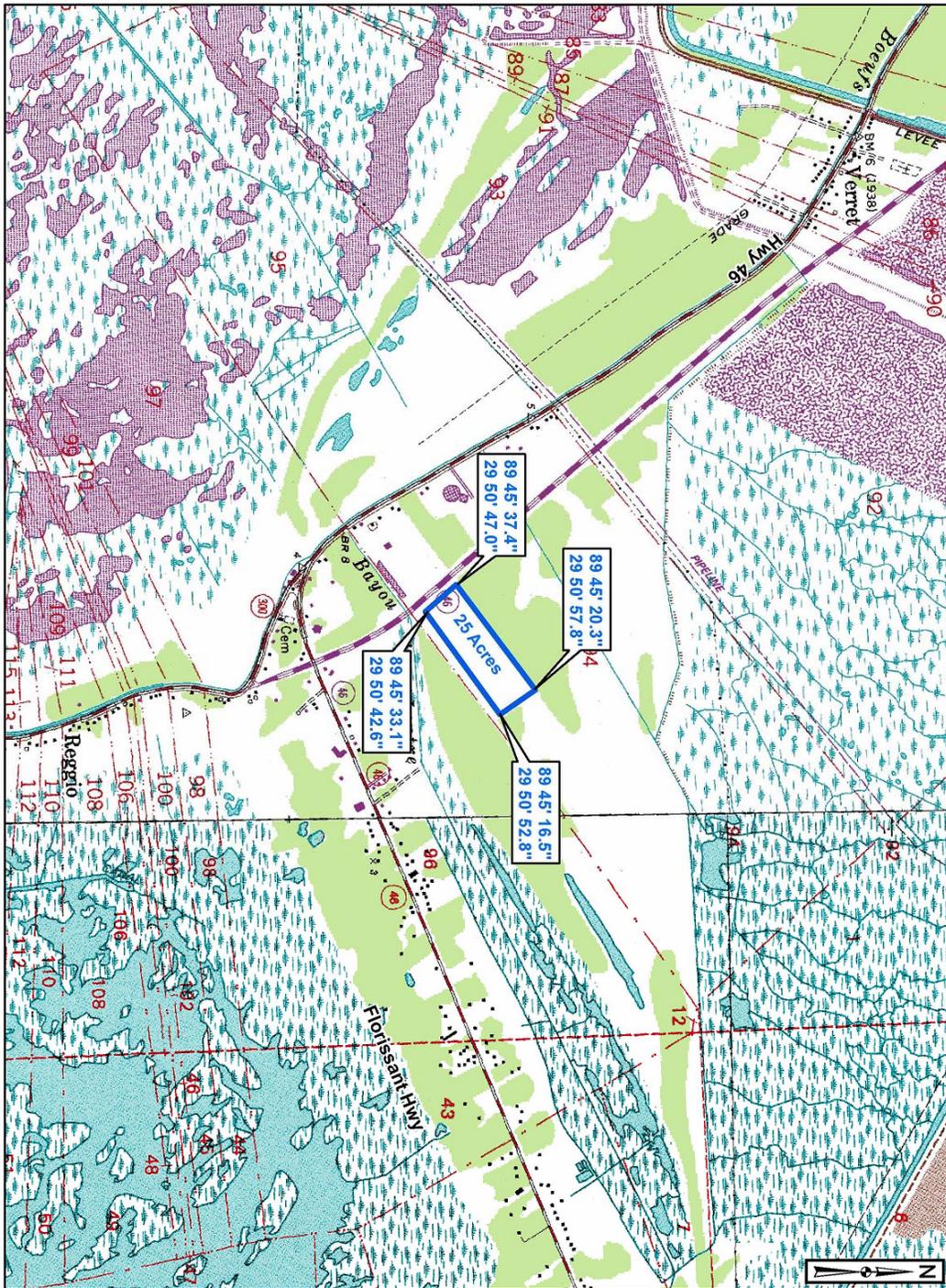


Figure 3: Acosta Proposed Borrow Area

3C Riverside Properties Borrow Pit - St. Charles Parish

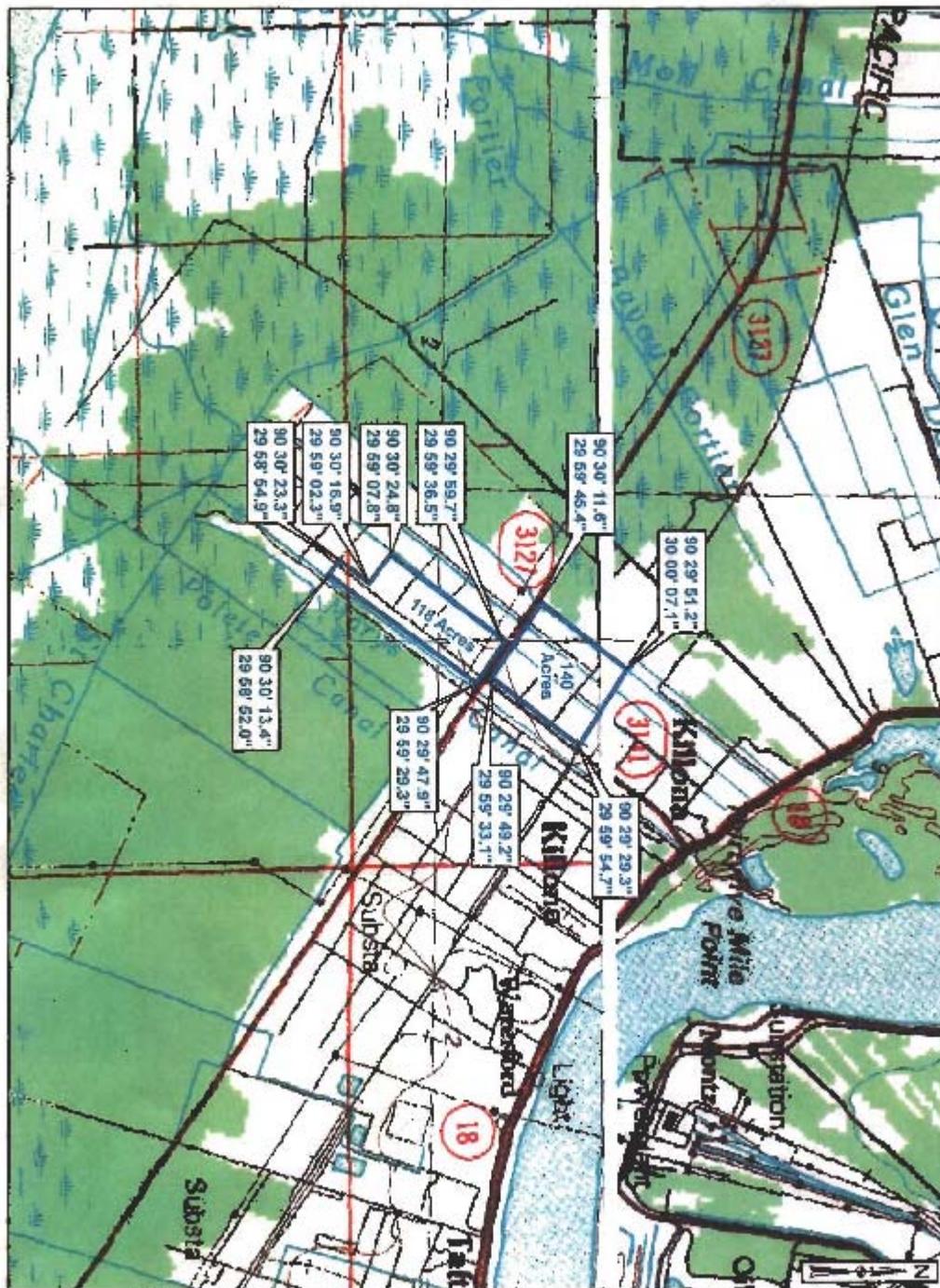
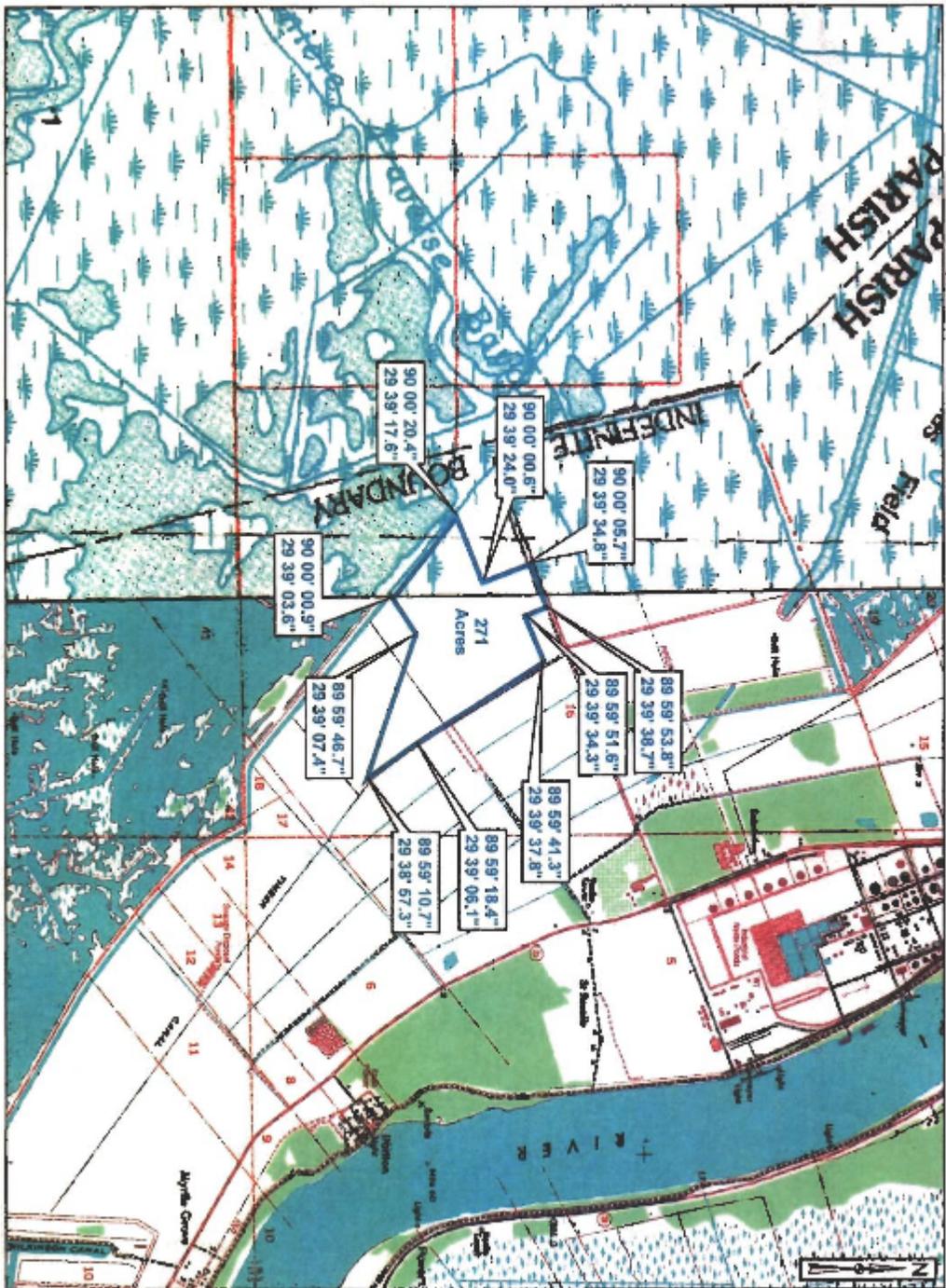


Figure 4: 3C Riverside Proposed Borrow Area



Myrtle Grove Borrow Pit - Plaquemines Parish

Figure 5: Myrtle Grove Proposed Borrow Area

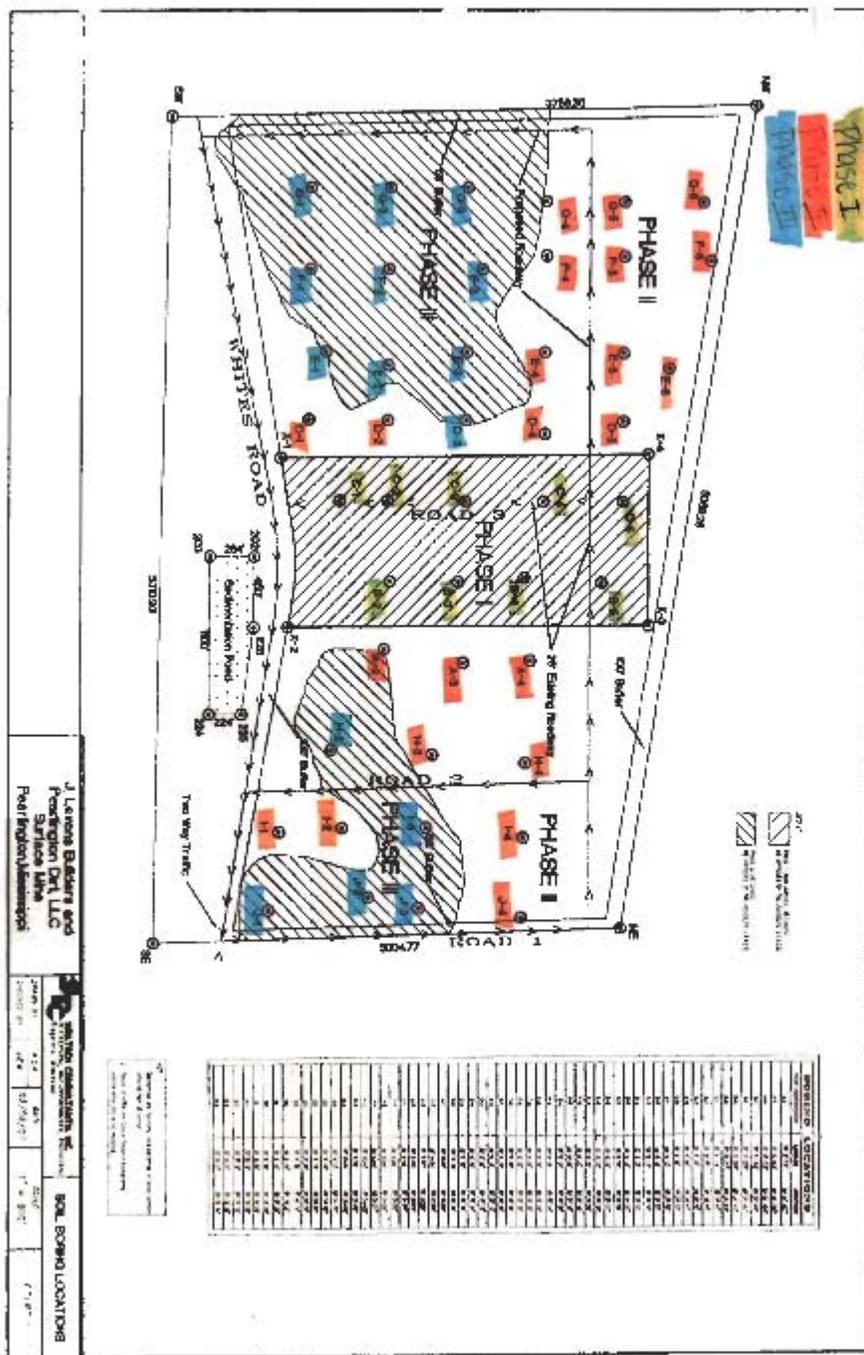


Figure 6: Pearlington Dirt Phase 2 Proposed Borrow Area

2.4 Alternatives to the Proposed Action

Other alternatives to the proposed action were considered, as described below

No Action. Under the No Action alternative, the proposed Pre-Approved Contractor Furnished borrow areas would not be used by contractors awarded a CEMVN GNOSDRRS contract. GNOSDRRS projects would be built to authorized levels using Government and/or Contractor Furnished borrow areas described in IERs # 18 and # 19, or other sources as yet to be identified (e.g., other potential Government Furnished or Pre-Approved Contractor borrow areas, Supply Contract).

Proposed Action. The proposed action consists of excavating the proposed borrow areas that are discussed in this document. The material would be transported to GNOSDRRS construction sites via truck or barge.

Government Furnished Borrow Material. Due to the large quantities of suitable clay material needed for the GNOSDRRS projects, Government Furnished borrow alternatives were discussed in IER # 18, and additional areas will be discussed in IER # 22 and other future borrow IERs titled Government Furnished Borrow Material. These documents will be released independent of IER # 23, and as such no further discussion of Government Furnished Borrow Material will occur in IER # 23.

Supply Contract Borrow Material. Due to the large quantities of suitable clay material needed for the proposed GNOSDRRS projects, Supply Contract borrow alternatives may be discussed in future IERs. The Supply Contract would allow a private individual(s) or corporation(s) to deliver a pre-specified amount of suitable borrow material from an area(s) anywhere in the United States where suitable borrow material could come from. The individual(s) or corporation(s) would deliver the borrow material to a designated location for use by a CEMVN construction contractor.

Without knowing the exact location(s) of this area(s) it is impossible to know the effects excavation of this borrow material would have on significant resources discussed in this document. IER(s) relating to Supply Contract-furnished material will be released independent of IER # 23, and as such no further discussion of Supply Contract borrow material will be done in IER # 23.

2.5 Alternative Sites Eliminated from Further Consideration

The following investigated areas were deemed unsuitable by CEMVN for GNOSDRRS activities:

- Pearlinton Dirt Phase 3: The proposed area is located on Whites Road in Hancock County, Mississippi. The area consists of approximately 118.5 acres of jurisdictional pine flatwoods wetlands. CEMVN is currently avoiding potential borrow areas that would impact jurisdictional wetlands. The CEMVN may be forced to reconsider this area at some point in the future should there be an inadequate quantity of suitable borrow material for construction of the GNOSDRRS, after it has exhausted its search for reasonable and practicable non-wetland sites. Refer to CEMVN selection prioritization of potential borrow areas (Section 2.1), and USFWS guidance (Appendix D).

3. Affected Environment and Environmental Consequences

3.1 Environmental Setting

The proposed borrow areas described in this report are located in St. Bernard, St. Charles, and Plaquemines parishes, Louisiana, and Hancock County, Mississippi. The study area is bounded to the north by Lake Pontchartrain, to the west by the town of Killona, and to the east by Pearllington, Mississippi. The area is bordered to the south by an extensive marsh system that provides a barrier between the cities within these parishes and county, and the Gulf of Mexico. Louisiana's coastal plain remains the largest expanse of coastal wetlands in the contiguous United States.

The Acosta and 1025 Florissant areas are located in a rural area of St. Bernard Parish. The 3C Riverside areas are located in rural areas of St. Charles Parish. The Myrtle Grove area is located in a rural area of Plaquemines Parish. The Pearllington Dirt Phase 2 area is located in rural area of Hancock County, Mississippi.

Fauna and Flora

The Louisiana Coastal Plain area contains an extraordinary diversity of estuarine habitats that range from narrow natural levee and beach ridges to expanses of bottomland hardwood (BLH) forest, forested swamps and fresh, brackish, saline marshes, and pasture lands. The wetlands support various functions and values, including commercial fisheries, harvesting of furbearers, recreational fishing and hunting, ecotourism, critical wildlife habitat (including threatened and endangered species), water quality improvement, navigation and waterborne commerce, flood control, and buffering protection from storms.

Terrestrial animals that may inhabit some of the proposed borrow areas include nutria, muskrat, raccoon, mink, and otter, which are harvested for their furs. White-tailed deer, feral hogs, rabbits, various small mammals, and a variety of birds, reptiles, amphibians, and mosquitoes also occur in the study area. Forests, wetlands, BLH, and pastures may be found in some of the proposed borrow areas. Agricultural crops grown in the vicinity of some of the proposed borrow areas include citrus fruits and truck crops.

Soils

The term "borrow" is used in the fields of construction and engineering to describe material that is dug in one location for use at another location. The term "suitable" as it relates to borrow material discussed in this document is defined as meeting the following current criteria after placement as levee fill:

- Soils classified as clays (CH or CL) are allowed as per the Unified Soils Classification System;
- Soils with organic contents greater than 9% are not allowed;
- Soils with plasticity indices (PI) less than 10 are not allowed;
- Soils classified as Silts (ML) are not allowed;
- Clays will not have more than 35% sand content.

The USACE Hurricane and Storm Damage Reduction System Design Guidelines, of which the soil standards previously discussed are a part, are reviewed and updated as necessary to ensure that the Corps is constructing the safest levees possible. Changes to the guidelines are reviewed and approved by USACE experts at the local, regional and

headquarters level; additional reviews are completed by academia and private individuals who are recognized experts in their fields. Additionally, the guidelines being utilized by CEMVN have been reviewed by members of the Interagency Performance Evaluation Team (IPET). The design guidelines may be updated from time to time to respond to new engineering analysis of improved technology, innovative processes, or new data. An implementation plan for an external review is currently being finalized.

Geotechnical borings were collected at each area to determine the suitability of the material for levee construction use. The borings were spaced to adequately define the material in the area, but in no case spaced greater than 500 feet on center. Borings along the proposed borrow area boundary were located no further than one-half of the boring spacing in the area or 250 feet, whichever was less.

The soils were classified, logged, and recorded within seven days of obtaining the samples in the field. The Unified Soil Classification System was used in classifying the soils. A water content determination was made and recorded on all samples classified as fat clay (CH), lean clay (CL), and silt (ML) at one foot intervals (recommended) or two foot intervals (required). For (CH), (CL), and (ML) soils, Atterberg Limits and Organic Content Testing (American Society of Testing and Materials [ASTM] D 2974, Method C), was required every five feet (minimum). Samples with moisture contents at 70% or higher or having a Liquid Limit of 70 or higher were tested for organic content, as well as for a sample two feet above and two feet below that sample (2.5 feet also acceptable). Grain size distribution determinations including both sieve (#200 sieve required) and hydrometer testing was required for samples that classify as CL with a PI greater than 10 for two or more consecutive feet, but not more than one test every five feet of sampling.

The resulting classification, plasticity, water content, and organic content determinations and borrow area boring logs with GPS readings at the boring locations were analyzed for potential borrow use by CEMVN to determine the suitability of the soil. Geotechnical testing and soil analysis is ongoing at some of the areas, so it is possible that the area of suitable acreage may decrease as results are finalized.

3.2 Significant Resources

This section contains a list of the significant resources located in the vicinity of 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 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 1 shows those significant resources found within the project area, and notes whether they would be impacted by any of the alternatives.

Table 1: Significant Resources in Project Study Area

Significant Resource	Impacted	Not Impacted
Jurisdictional Wetlands/Bottomland Hardwood Forest		X
Non-Wetland Resources/Upland Resources	X	
Navigable Waters	X	
Prime and Unique Farmland	X	
Fisheries	X	
Wildlife	X	
Threatened and Endangered Species		X
Cultural Resources		X
Recreational Resources		X
Noise	X	
Air Quality	X	
Water Quality		X
Aesthetics		X
Socioeconomics	X	
Transportation	X	

3.2.1 Jurisdictional Wetlands

Existing Conditions

At this time, CEMVN is working diligently to avoid impacts to Clean Water Act Section 404 jurisdictional wetlands, associated with providing borrow material for authorized and 100-year hurricane protection construction. CEMVN selection prioritization of potential borrow areas (Section 2.1), as well as USFWS guidance (Appendix D), relating to impacts to jurisdictional wetlands are and will continue to be followed. CEMVN will coordinate with governmental agencies and the public if jurisdictional wetland may be impacted during future proposed borrow activities.

The jurisdictional wetland habitat types found near the proposed borrow areas may include pasture wetland, cypress swamps, and pine flatwoods. Jurisdictional wetlands contain hydrophytic vegetation, hydric soils, and hydrology indicators. Pasture wetlands are comprised of soft rushes, flat sedges, smartweed, alligator weed, and other wetland grasses. Cypress swamp areas are dominated by bald cypress and tupelo gum. Some understory species include dewberry, lizard's tail, and poison ivy. A variety of birds utilize these hardwoods for nesting, breeding, brooding, and as perches. Hard mast (nuts) and soft mast (samaras, berries) provide a valuable nutritional food source for birds, mammals, and other wildlife species.

During initial investigations a jurisdictional wetland determination from the CEMVN Regulatory Functions Branch was completed for each potential borrow area. The five potential areas described in this document do not contain jurisdictional wetlands.

- The CEMVN jurisdictional wetland determination MVN-2006-2017-SY dated 01 August 2006 at the proposed 1025 Florissant Highway borrow area indicated no jurisdictional wetlands are located on the site. A canal on the north side of the property is designated as a Section 404 waters of the U.S.,
- The CEMVN jurisdictional wetland determination MVN-2007-3294-SU dated 30 January 2008 at the proposed Acosta borrow area indicated no jurisdictional

wetlands are located on the site. A canal on the south side of the property is designated as a Section 10 waters of the U.S.

- The CEMVN jurisdictional wetland determination MVN-2007-760-SY dated 06 April 2007 at the proposed 3C Riverside borrow area indicated no jurisdictional wetlands are located on the 118 acre site. A canal located on the southeastern property is designated as a Section 404 waters of the U.S.. The CEMVN jurisdictional wetland determination MVN-2007-1839-SY dated 26 June 2007, indicated no jurisdictional wetlands are located on the 146 acre site.
- The CEMVN jurisdictional wetland determination MVN-2007-750-SZ dated 13 June 2007 at the proposed Myrtle Grove borrow area indicated no jurisdictional wetlands are located on the site.
- The USACE Vicksburg District (CEMVK) jurisdictional wetland determination MVK-2006-1647 dated 08 May 2007 at the proposed Pearlington Dirt Phase 2 borrow area indicated some jurisdictional wetlands are located adjacent to the site, but not within the proposed site. These adjacent wetlands would not be impacted by borrow excavation.

Discussion of Impacts

No Action

With implementation of this alternative, no direct or indirect impacts to jurisdictional wetlands through CEMVN actions would occur at the proposed borrow areas. GNOSDRRS projects would be built to authorized levels using potential Government and Contractor Furnished borrow areas described in IERs # 18, # 19, or other sources as yet to be identified.

Proposed Action

With implementation of the proposed action, no direct or indirect impacts to jurisdictional wetlands would occur since the borrow areas described in this document are non-wetland. Suitable material from the areas would be used on Federal GNOSDRRS projects. Any jurisdictional wetland areas outside of the areas would be avoided. The areas would be converted to ponds and small lakes if water is retained, or to vegetated areas if water is not retained. It is expected that either type of area would attract a variety of wildlife including birds, reptiles, amphibians, and small mammals.

The borrow area management plan of the proposed 1025 Florissant Highway borrow area would not directly impact the canal designated as Section 404 waters. BMPs would be implemented to ensure no indirect impacts to the canal.

The borrow area management plan of the proposed 3C Riverside borrow area would not impact the canal designated as Section 404 waters. BMPs would be implemented to ensure no indirect impacts to the canal.

The proposed Pearlington Dirt Phase 2 borrow area would not impact jurisdictional wetlands adjacent to it. The contractor is responsible for leaving an adequate buffer zone between the borrow area and the jurisdictional wetlands. BMPs would be implemented to ensure no indirect impacts to the wetlands.

3.2.2 Non-Wetland Resources/Upland Resources

Existing Conditions

Some species identified in the non-wet pasture areas include Johnson grass, yellow bristle grass, annual sumpweed, arrow-leaf sida, vasey grass, Brazilian vervain, and eastern false-willow. The scrub/ shrub areas are comprised of Chinese tallow tree, eastern false-willow, wax myrtle, giant ragweed, dew berry, elderberry, red mulberry, pepper vine, and dog-fennel.

The areas listed below show representative vegetation found in the pasture and scrub/ shrub areas.

- The 1025 Florissant Highway area is 3 acres of maintained and unmaintained pasture land.
- The Acosta area is 25 acres of maintained pasture land.
- The 3C Riverside area is comprised of two sites. The first site is 118 acres and the second site is 146 acres. Both parcels are currently utilized as farmland.
- The Myrtle Grove area is 271 acres of maintained pasture land.
- The Pearlinton Dirt Phase 2 area is 110 acres of loblolly pine.

Discussion of Impacts

No Action

With implementation of this alternative, no direct or indirect impacts to non-wetland resources/upland resources through CEMVN actions would occur at the proposed borrow areas. GNOSDRRS projects would be built to authorized levels using Government and Contractor Furnished borrow areas described in IERs # 18 and #19, or other sources as yet to be identified.

Proposed Action

With implementation of the proposed action, non-wetland resources/upland resources would be cleared and excavated. The areas would be converted to ponds and small lakes. The pasture areas would no longer provide grasses for herbivores such as deer, rabbits, and cattle. Some scrub/shrub areas may develop around the borrow area perimeters in time. Borrow areas that remain dry would be expected to be colonized by vegetation and woody plants, which could offset some habitat loss.

3.2.3 Prime and Unique Farmland

Existing Conditions

Three proposed borrow areas contain prime and unique soils according to the National Resources Conservation Service (NRCS) (Table 2).

Table 2: Prime and Unique Farmland Soils Present

Site Name	Parish	Soil map unit(s)	Prime Farmland	Acres of Prime and Unique Farmland
1025 Florissant Hwy	St. Bernard	Clovelly Muck	Yes	0.7
Acosta	St. Bernard	Schriever silty clay loam		

		Cancienne silty clay loam	Yes	25
		Schriever silty clay loam		
3C Riverside	St. Charles	Cancienne silt loam	Yes	264
		Cancienne silty clay loam		
		Schriever silty clay loam		
Myrtle Grove	Plaquemines	Schriever clay	No	N/A
		Harahan clay		
Pearlington Dirt Phase 2	Hancock County	Allemands muck	No	N/A
		Beauregard silt loam		
		Guyton silt loam		
		Trebloc association		

Discussion of Impacts

No Action

With implementation of this alternative, no direct or indirect impacts to prime and unique farmland through CEMVN actions would occur at the proposed borrow areas. GNOSDRRS projects would be built to authorized levels using Government and Contractor Furnished borrow areas described in IERs # 18 and # 19, or other sources as yet to be identified.

Proposed Action

With implementation of the proposed action, prime and unique farmlands would be cleared and excavated. Removing soils from these proposed borrow areas would result in a permanent loss of prime and unique farmlands, and the areas would no longer be available for farming. The proposed borrow areas would most likely fill with water and be converted to ponds or small lakes. Borrow areas that do not retain water would probably not be able to produce food and fiber crops. The land would no longer provide grasses for herbivores such as deer, rabbits, or cattle.

3.2.4 Fisheries

Existing Conditions

The proposed borrow areas at 1025 Florissant Highway and Acosta contains small ponds. They do not support viable fisheries systems. There are no known fisheries resources at the other three proposed borrow areas.

Discussion of Impacts

No Action

With implementation of this alternative, no direct or indirect impacts to fisheries through CEMVN actions would occur at the proposed borrow areas. GNOSDRRS projects would be built to authorized levels using Government and Contractor Furnished borrow areas described in IERs # 18 and # 19, or other sources as yet to be identified.

Proposed Action

With implementation of the proposed action, upland areas and existing small ponds would be excavated. Dry land sites may be converted to ponds and small lakes. The areas could provide fishery habitats if stocked by landowners, which would not be inconsistent with other land uses near the proposed project areas. Fish that may thrive in ponds include mosquitofish, killifish, shortnose and spotted gar, redbfin shad, bass, bluegill, and catfish. If overburden is sufficient, sloped and fringe shallows could be created to provide shallows for both near edge and submergent vegetative growth. Overburden material would be used, to the maximum extent practicable, to create fringe wetlands and fishery habitats.

3.2.5 Wildlife

Existing Conditions

The study area contains a great variety of mammals, birds, reptiles, and amphibians. Species inhabiting the area include nutria, muskrat, mink, otter, raccoon, white-tailed deer, skunks, rabbits, squirrels, armadillos, and a variety of smaller mammals. Wood ducks and some migratory waterfowl may be present during winter.

Non-game wading birds, shore birds, and sea birds including egrets, ibis, herons, sandpipers, willets, black-necked stilts, gulls, terns, skimmers, grebes, loons, cormorants, and white and brown pelicans are found in the project vicinity. Various raptors such as barred owls, red-shouldered hawks, northern harriers (marsh hawks), American kestrel, and red-tailed hawks may be present. Passerine birds in the areas include sparrows, vireos, warblers, mockingbirds, grackles, red-winged blackbirds, wrens, blue jays, cardinals, and crows. Many of these birds are present primarily during periods of spring and fall migrations. The areas may also provide habitat for the American alligator, salamanders, toads, frogs, turtles, and several species of poisonous and nonpoisonous snakes. The area currently provides suitable breeding habitat for various species of mosquitoes.

The bald eagle is a raptor that is found in various areas throughout the United States and Canada as well as throughout the study area. Bald eagles are Federally protected under the Bald Eagle Protection Act of 1940. The bald eagle feeds on fish, rabbits, waterfowl, seabirds, and carrion (Ehrlich et al. 1988). The main basis of the bald eagle diet is fish, but they will feed on other items such as birds and carrion depending upon availability of the various foods. Eagles require roosting and nesting habitat, which in Louisiana consists of large trees in fairly open stands (Anthony et al. 1982). Bald eagles nest in Louisiana from October through mid-May. Eagles typically nest in bald cypress trees near fresh to intermediate marshes or open water in the southeastern parishes.

Discussion of Impacts

No Action

With implementation of this alternative, no direct or indirect impacts to wildlife through CEMVN actions would occur at the proposed borrow areas. GNOSDRRS projects would be built to authorized levels using Government and Contractor Furnished borrow areas described in IERs # 18 and # 19, or other sources as yet to be identified.

Proposed Action

With implementation of the proposed action, wildlife would be displaced when the areas are excavated. The areas may be converted to ponds and small lakes. At that time, some aquatic vegetation may colonize the shallow littoral edge of the areas,

and wildlife (otters, alligators, raccoons, wading birds, and ducks) adapted to an aquatic environment would be expected to expand their range into the new waterbodies. A variety of plant species may colonize adjacent to the water that could provide important wildlife habitat utilized for nesting, feeding, and cover. Any areas that remain dry would be expected to be colonized by vegetation and woody plants, which could offset some habitat loss. The dense vegetation could attract a variety of wildlife including birds, reptiles, amphibians, and small mammals. While the borrow areas have the potential to become mosquito breeding areas, the amount of surface acres of water is considered to be small compared to surrounding wetlands. However, local parish mosquito control programs, not CEMVN, are responsible for mosquito control.

3.2.6 Threatened and Endangered Species

Existing Conditions

There are no known T&E species, or critical habitats, in the vicinity of any of the proposed borrow areas.

Discussion of Impacts

No Action

With implementation of this alternative, no direct or indirect impacts to T&E species through CEMVN actions would occur at the proposed borrow areas. GNOSDRRS projects would be built to authorized levels using Government and Contractor Furnished borrow areas described in IERs # 18 and # 19, or other sources as yet to be identified.

Proposed Action

The proposed action is not likely to adversely affect these T&E species or their critical habitats. The USFWS concurred with the CEMVN that excavation of any proposed borrow areas would not be likely to adversely affect T&E species or their critical habitat (Table 3).

Table 3: USFWS T&E Concurrence

Proposed Borrow Area	USFWS Concurrence
1025 Florissant	9 August 2007
Acosta	2 July 2007
3C Riverside	27 July 2007
Myrtle Grove	29 January 2007
Pearlington Dirt Phase 2	14 January 2008

3.2.7 Cultural Resources

Existing Conditions

Cultural resources have been considered for each proposed borrow area (Table 4). The level of investigation varied depending on the probability of cultural resources being located within the project area. Investigations were geared toward identifying known and previously unrecorded historic properties within proposed borrow areas, and the areas of potential effect (APE). Background research involving review of known resources within the area and the assessing likelihood of cultural resources based on soil and geomorphologic data was completed for all proposed borrow areas. Investigations also included reconnaissance or Phase I archaeological surveys (Lackowicz 2007; Leard and

Smith 2007; Pumphrey and Richardson Seacat 2007; and Rawls 2007). Section 106 of the National Historic Act of 1966, as amended, consultation included correspondence with the State Historic Preservation Officer (SHPO) and Federally recognized Tribes that have an interest in the region.

The results of these investigations revealed that no known listed National Register of Historic Places properties or sites eligible for listing on the National Register of Historic Places exist within the proposed project locations or will be affected by the proposed action.

Archeological surveys in the vicinity of the proposed borrow areas have identified both prehistoric and historic sites in the vicinity of the proposed action (Lackowicz 2007; Leard and Smith 2007; Pumphrey and Richardson Seacat 2007; and Rawls 2007; Wiseman et al 1979). Given the recent geologic development of the Mississippi delta and the age of deposits within the Louisiana project areas, archaeological sites are not expected to date prior to the Poverty Point Phase (1700 – 500 B.C.) (Wiseman et al 1979). Prehistoric sites, such as shell middens, hunting and gathering camps, habitation sites, villages and mounds sites, tend to be located on active and abandoned distributary channel levee complexes, major beach ridges, and on older stable portions of the delta, and in association with freshwater marshes. Similarly, historic period sites, such as forts plantations, and industrial features tend to be located on levees and waterways. The dynamic nature of flooding and sedimentation from the Mississippi River has likely buried some archeological sites, and subsidence has likely inundated others.

Three of the proposed borrow areas (Myrtle Grove, Acosta, and 1025 Florissant) are located in drained backswamps. While backswamps were utilized for resource extraction during both prehistoric and historic periods, there is little evidence of occupation in this habitat, and thus the likelihood for the presence of undiscovered cultural sits within these project areas remains low. The proposed 3C Riverside Properties borrow area lies partially within natural levee soils. Archaeological survey of this property (Lackowicz 2007) failed to identify any unrecorded sites. The proposed 3C Riverside Properties borrow is located in the vicinity the “German Coast,” the location of a short-lived eighteenth Century German settlement (Deiler 1970; Blume 1990 (translated)). Given the short-term occupation, archaeological deposits of the German Coast are expected to be ephemeral; however, intensive survey of the proposed borrow area did not identify sites within the APE (Lackowicz 2007).

The proposed Pearlington Dirt Phase 2 borrow area lies within the physiographic district Coastal Flatwoods of the Gulf Coastal Plain (Faulkner 2005). Geomorphological development of the Coastal Plain differs from the Mississippi Delta lobes of southeastern Louisiana. While the geomorphology allows for the presence of archaeological sites, survey of the proposed borrow area did not identify any cultural resources within the APE (Pumphrey and Richardson Seacat 2007: 3).

Table 4: Summary of Section 106 of NHPA correspondence

Proposed Contractor Furnished Borrow Area	Parish	CEMVN letter date	SHPO	Chitimacha Tribe of Louisiana ¹	Mississippi Band of Choctaw Indians	Choctaw Nation of Oklahoma	Alabama Coushatta Tribe of TX ¹	Caddo Nation of OK ¹	Coushatta Tribe of LA ¹	Jena Band of Choctaw Indians	Quapaw Tribe of OK ¹	Seminole Nation of OK ¹	Seminole Tribe of FL ¹	Tunica-Biloxi Tribe of LA	Chickasaw Nation ²
1025 Florissant	St. Bernard	Sept. 26, 2006 ⁴ Nov.16, 2007	Oct. 26, 2006	Dec. 21, 2007*	Dec. 21, 2007*	Dec. 21, 2007*	Dec. 21, 2007*	Dec. 21, 2007*	Dec. 21, 2007*	Dec. 21, 2007*	Dec. 21, 2007*	Dec. 21, 2007*	Dec. 21, 2007*	Dec. 21, 2007*	
3C Riverside Properties	St. Charles	Oct. 24, 2007	Dec. 6, 2007	Dec. 6, 2007*	Dec. 6, 2007*	Nov. 30, 2007	Dec. 6, 2007*	Dec. 6, 2007*	Dec. 6, 2007*	Dec. 6, 2007*	Dec. 6, 2007*	Dec. 6, 2007*	Dec. 6, 2007*	Dec. 6, 2007*	
Myrtle Grove	Plaquemines	Nov.10, 2006 ³ Nov.16, 2007	Dec. 19, 2006	Dec. 21, 2007*	Dec. 21, 2007*	Dec. 21, 2007*	Dec. 21, 2007*	Dec. 21, 2007*	Dec. 21, 2007*	Dec. 21, 2007*	Dec. 21, 2007*	Dec. 21, 2007*	Dec. 21, 2007*	Dec. 21, 2007*	
Acosta	St. Bernard	Sept. 19, 2007	Oct. 19, 2007	Oct. 22, 2007*	Oct. 22, 2007*	October 15, 2007	Oct. 22, 2007*	Oct. 22, 2007*	Oct. 22, 2007*	Oct. 22, 2007*	Oct. 22, 2007*	Oct. 22, 2007*	Oct. 22, 2007* ^v	Oct. 22, 2007*	
Pearlington Dirt	Hancock County, MS	Oct. 3, 2007 Dec. 3, 2007	Nov. 22, 2006		Nov. 5, 2007	Dec. 5, 2007				Nov. 5, 2007				Nov. 5, 2007	Nov. 5, 2007

¹ Tribe consults on projects in Louisiana only.

² Tribe consults on projects in Mississippi only.

³ Correspondence sent to SHPO by Earth Search Inc.

⁴ Correspondence sent to SHPO by David Palmer, landowner of 1025 Florissant.

* Response date reflects the end of the 30 day comment period. No response implies concurrence with Federal effect determination as per 36 CFR 800.3(c)(4).

Discussion of Impacts

No Action

Without implementation of the proposed action no direct impacts to cultural resources are anticipated. Any undiscovered or unreported cultural resources or traditional cultural properties will likely remain intact and in their current state of preservation. The burial or subsidence of historic land surfaces will continue in the current pattern. There is no reason to believe that No Action will have any direct positive or negative impacts to cultural resources. GNOSDRRS projects would be built to authorized levels using Government and Contractor Furnished borrow areas described in IERs # 18 and # 19, or other sources as yet to be identified.

Proposed Action

With implementation of the proposed action, any undiscovered cultural resources may be damaged during borrow excavation and construction operations. However, it is unlikely that such direct impacts would occur because cultural resource surveys have been completed in order to identify cultural resources within the proposed borrow areas.

3.2.8 Recreational Resources

Existing Conditions

The region in which the proposed actions are to take place is rich with recreation resources. The potential borrow areas may have some recreational potential, but contain no existing recreational infrastructure or specific features, and are privately owned and not open to public access.

Discussion of Impacts

No Action

Without the proposed action, there should be no direct or indirect impacts to recreation resources. GNOSDRRS projects would be built to authorized levels using Government and Contractor Furnished borrow areas described in IERs # 18 and # 19, or other sources as yet to be identified.

Proposed Action

The proposed actions will not directly or indirectly impact existing recreation resources in the region. In some cases depending on how the end site is left, the habitat may be suitable to support some recreational activities (i.e., wildlife viewing and fishing), but these benefits are expected to be minimal and sites would not be open to public access.

3.2.9 Noise Quality

Existing Conditions

Some of the proposed borrow areas are located near highways, interstates, and residential areas, while others are located in rural areas. Currently, sound levels in and around the proposed areas are expected to be moderate. The primary producers of sound would be from traffic, people, and, wildlife. Local traffic may have short-term sound levels that are high.

Discussion of Impacts

No Action

With implementation of this alternative, no direct or indirect impacts to noise quality through CEMVN actions would occur at the proposed borrow areas. Noise quality may be impacted by non-Federal actions if the landowner chooses to use the land as a borrow source for other purposes. GNOSDRRS projects would be built to authorized levels using Government and Contractor Furnished borrow areas described in IERs # 18 and # 19, or other sources as yet to be identified.

Proposed Action

With implementation of the proposed action there would be an elevation of noise levels during construction. This noise would be associated with construction equipment such as bulldozers, excavators, haul trucks, and/or chainsaws. Portable pumps would also be used if needed. Elevated noise levels may impact nearby residents. However, these impacts are expected to be constrained to construction hours.

3.2.10 Air Quality

Existing Conditions

As of June 15, 2005, the 1-hour ozone standard for the Metropolitan New Orleans area (Orleans, Jefferson, St. Bernard, St. Charles, and Plaquemines parishes) was revoked and replaced by an 8-hour standard. The New Orleans area is currently not subject to any conformity requirements of the Clean Air Act, or in other words, these parishes are now in attainment of the 8-hour ozone standard and all other criteria pollutant National Ambient Air Quality Standards (NAAQS). The parishes listed above are currently in attainment of all NAAQS. This classification is the result of area-wide air quality modeling studies. Hancock County, Mississippi, which is where the Pearlington Dirt Phase 2 proposed borrow area is located, is in a NAAQS attainment area.

Discussion of Impacts

No Action

With implementation of this alternative no direct or indirect impacts to air quality through CEMVN actions would occur at the proposed borrow areas. GNOSDRRS projects would be built to authorized levels using Government and Contractor Furnished borrow areas described in IERs # 18 and # 19, or other sources as yet to be identified.

Proposed Action

With implementation of the proposed action, there would be short-term impacts to air quality that would result from the construction of borrow areas in St. Bernard, St. Charles, and Plaquemines parishes, and Hancock County controlled by proper BMPs. Air quality impacts would be limited to those produced by heavy equipment, and suspended dust particles generated by bulldozing, dumping, and grading. Operation of construction equipment and support vehicles would generate volatile organic compounds (VOCs), particulate matter (PM) 10, PM 2.5, nitrogen oxides (NO_x), carbon monoxide (CO), ozone (O₃) and sulfur oxides (SO_x) emissions from diesel engine combustion. The construction equipment and haul trucks should have catalytic converters and mufflers to reduce exhaust emissions. Contractors are required to obtain appropriate air quality permits from the Louisiana Department of Environmental Quality (LDEQ) before construction.

Dust suppression methods would be implemented to minimize dust emissions. Air emissions from the proposed action would be temporary and should not significantly impair air quality in the region. Due to the short duration of excavation, any increases or impacts on ambient air quality are expected to be short-term and minor and are not expected to cause or contribute to a violation of Federal or state ambient air quality standards.

3.2.11 Water Quality

Existing Conditions

LDEQ regulates both point and nonpoint source pollution. Many of the proposed borrow areas are uplands with associated drainage features.

Discussion of Impacts

No Action

With implementation of this alternative, no direct or indirect impacts to water quality through CEMVN actions would occur at the proposed borrow areas. GNOSDRRS projects would be built to authorized levels using Government and Contractor Furnished borrow areas described in IERs # 18 and # 19, or other sources as yet to be identified.

Proposed Action

Despite the use of BMPs, with implementation of the proposed action there would be some disturbances to water quality in the immediate vicinity of the proposed borrow areas. The contractor would be required to secure all proper Federal, state, and local permits required for potentially impacting water quality. The CEMVN requires that construction BMPs be implemented and followed during the construction phase. Silt fencing and hay bales would be installed around the perimeter of the proposed borrow areas to control runoff. To make optimal use of available material, excavation would begin at one end of the borrow area and be made continuous across the width of the areas to the required borrow depths, to provide surface drainage to the low side of the borrow area as excavation proceeds. Excavation for semi-compacted fill would not be permitted in water nor shall excavated material be scraped, dragged, or otherwise moved through water. In some cases the borrow areas may need to be drained with the use of a sump pump. Upon abandonment, site restoration would include placing the stockpiled overburden back into the area and grading the slopes to the specified cross-section figures. Abrupt changes in grade should be avoided, and the bottom of the borrow area should be left relatively smooth and sloped from one end to the other. Abrupt changes in borrow area alignment shall be avoided. Disturbance of water quality would be temporary, confined, and short lived.

3.2.12 Transportation

Existing Conditions

Additional information on the potential impacts associated with transporting borrow material is being developed by CEMVN and will be discussed in future IERs. This is a known data gap (Section 1.6).

The following is a listing of each proposed borrow area by parish/county and the sites' proximity to roads and highways.

- St. Bernard Parish: The proposed 1025 Florissant Highway borrow area is located on Florissant Highway, on the north side of the Highway. The proposed Acosta borrow area is located on the north side of Highway 46.
- St. Charles Parish: The proposed 3C Riverside borrow area is located in Killona, Louisiana on Highway 3127. The 118 acre site is located across from the intersection of Highway 3127 and Highway 3141 on the south side. The 146 acre site is located north of the intersection at Highway 3127 and Highway 3141.
- Plaquemines Parish: The proposed Myrtle Grove borrow area is located at 1051 West Ravenna Road, which intersects Highway 23 on the east side of the Highway.
- Hancock County: The proposed Pearlinton Dirt Phase 2 borrow area fronts Whites Road, which leads into Highway 90 to the east and Highway 604 to the west.

Discussion of Impacts

No Action

With implementation of this alternative, no direct or indirect impacts to transportation routes through CEMVN actions would occur at the proposed borrow areas. GNOSDRRS projects

would be built to authorized levels using Government and Contractor Furnished borrow areas described in IERs # 18 and # 19, or other sources as yet to be identified.

Proposed Action

With implementation of the proposed action, construction equipment such as bulldozers and excavators would need to be delivered to the sites, and haul trucks would be entering and exiting the areas on a daily basis during the period of excavation. The truck hauling would temporarily impede vehicle traffic and result in a reduction in the level of service (LOS, a metric describing traffic volume relative to capacity) on some local road segments. Flagmen, signage, cones, barricades, and detours would be used where required to facilitate the movement of heavy equipment and local traffic on affected road segments. The proposed design of all areas would require methods to avoid exposure of adjacent traffic routes and other urban developments. Appropriate measures to ensure safety and facilitate the movement of traffic would be implemented at all approved borrow areas.

- St. Bernard Parish: The proposed 1025 Florissant and Acosta areas are located on road segments that do not presently receive heavy traffic loads. If these proposed borrow areas are used, material would more than likely be used for GNOSDRRS construction sites closest to them, minimizing the disruption of transportation through highly developed areas. Efforts to rebuild the parish are ongoing, but the reduced population has led to reduced traffic volumes. Even with use of these borrow areas road congestion is not expected to be great.
- St. Charles Parish: The proposed 3C Riverside borrow area is in a rural area, and material excavated would likely be used on GNOSDRRS construction sites within the area. However, the material from these sites could be loaded onto barge and transported south to other GNOSDRRS projects in the New Orleans Metropolitan Area.
- Plaquemines Parish: The proposed Myrtle Grove borrow area is in a rural area, and material excavated would likely be used on GNOSDRRS construction sites within 20 miles of the proposed borrow area.
- Hancock County: The Pearlinton Dirt Phase 2 area is located in a rural area. The material from this site could be loaded onto barge or truck and transported to GNOSDRRS projects in southeastern Louisiana.

Appropriate measures to ensure safety and facilitate the movement of traffic would be implemented at all potential borrow areas. The current traffic volume at these areas is unknown.

3.2.13 Aesthetic (Visual) Resources

Existing Conditions

Most of the proposed borrow areas contain similar land use patterns (i.e., former- or presently-cultivated land) in the immediate and adjacent areas and, generally, they lack distinct qualities that make them visually significant. However, the 3C Riverside and Florissant proposed borrow areas are adjacent to residential areas. Noteworthy is the physical condition of the area surrounding the proposed Florissant borrow area, as it remains scarred from the effects of Hurricane Katrina. Other proposed borrow areas are visually remote and inaccessible.

Discussion of Impacts

No Action

With implementation of this alternative, no direct or indirect impacts to visual resources through CEMVN actions would occur at the proposed borrow areas. These resources may be

impacted by non-Federal actions if the landowner chooses to use the land as a borrow source. GNOSDRRS projects would be built to authorized levels using Government and Contractor Furnished borrow areas described in IERs # 18 and # 19, or other sources as yet to be identified.

Proposed Action

It is recognized that some proposed borrow areas in St. Bernard Parish are located near the San Bernardo Scenic Byway. Current restrictions to development along Louisiana State recognized byways apply only to signage such as advertising billboards. Developmental actions such as borrow areas are not currently restricted. It is also recognized that some proposed borrow areas are adjacent to residential areas where their existence may not be considered as positive environmental features. However, the Pre-Approved Contractor Furnished borrow areas must conform to local zoning ordinances and land use regulations, and, in so doing, not violate public and local governmental expectations of private property land use norms.

3.3 Socioeconomic Resources

The focus of this section is to evaluate the relative socioeconomic impacts, if any, of construction activities associated with acquiring borrow material from five areas in the vicinity of the New Orleans Metropolitan Area. This borrow material would be used to construct Federal GNOSDRRS projects, usually in the same parish where it is acquired.

3.3.1 Population and Housing, Business and Industry, Property Values & Public Facilities & Services

Existing Conditions

Mostly located within the New Orleans Metropolitan Area, and within non-wetland areas, the proposed borrow areas have more property value than large tracts of adjacent wetlands. The areas indirectly, if not directly, contribute to the local tax base. The close proximity of the proposed borrow areas to additional urban developments adds value to the adjacent area, commercial and residential property values, public facilities and services, utilities public transit, safe highways, streets and bridges, police and fire protection facilities and services, schools and educational services, hospitals and health care services, and the many other public facilities and services of Federal, State, and local government.

Of the three parishes in Louisiana and one county in Mississippi discussed in this report, the specified median value of homes ranged from \$85,200 in St. Bernard Parish to as high as \$110,100 in Plaquemines Parish. The 'proposed action' paragraph below indicates the latest and most detailed census information available in regards to the value of residential property in related census tracts (2000 US Census), although all of the sites proposed are on currently vacant property.

Discussion of Impacts

No Action

With implementation of this alternative, Federal GNOSDRRS projects would be built to authorized levels using Government and Contractor Furnished borrow areas described in IERs # 18 and # 19, or other sources as yet to be identified. No incremental effects on population and housing, business and industry, property values, and public facilities and services relative to the proposed action are anticipated.

Proposed Action

Planning for the proposed action has attempted to balance the cost and need for storm surge risk reduction with consideration of property values, public facilities and services, and

potential impacts to the local tax base. The borrow materials are used to enhance authorized storm surge risk reduction systems, thus adding value for various purposes ranging from industrial, commercial, residential, institutional, and public.

The proposed borrow areas are privately owned parcels that could be utilized as borrow areas with or without the Federal project. While some diminution in adjacent property values may occur, the Pre-Approved Contractor Furnished borrow areas must conform to local zoning ordinances and land use regulations, and, in so doing, not violate public and local governmental expectations of private property land use norms.

The proposed 1025 Florissant and Acosta borrow areas in St. Bernard Parish cover 3 and 29 acres, respectively, within the Lake Pontchartrain and Vicinity GNOSDRRS. The sites are current uninhabited and used as pasture, and are within a sparsely populated rural area. The proposed sites are located in census group 301.01.01, with a specified median value for owner-occupied housing units of \$70,100.

The proposed 3C Riverside area consists of two sites of farmland in St. Charles Parish, totaling 264 acres. The sites are located within the Lake Pontchartrain and Vicinity hurricane protection system. These proposed areas are located in census group 627.01 with a specified median value for owner-occupied housing units of \$94,900. The area is sparsely populated, with a small development nearby.

The proposed Myrtle Grove area in Plaquemines Parish contains 271 acres. The site is located within the Plaquemines Parish West Bank Non-Federal Levee Project vicinity. It is part of census group 504.01, with specified median value for owner-occupied housing units of \$61,900. The area around the site contains some industrial facilities, but the actual site is currently uninhabited and used as pasture.

The Pearlington Dirt site is located in Hancock County, Mississippi, and contains 110 acres. The site is located in census group 304.02, with a specified median value for owner-occupied housing units of \$49,800. The site is uninhabited and relatively far from residential development.

Property values for the sites themselves may tend to decrease as their potential uses for alternative purposes are diminished in the future. For adjacent properties, the market response with respect to property values is undetermined, though there would appear to be no likelihood that property value could be enhanced.

3.3.2 Health and Safety and Flood Control & Hurricane Protection

Existing Conditions

The proposed borrow areas fall within existing storm damage risk reduction areas of St. Bernard, St. Charles, and Plaquemines parishes, in addition to one area in Hancock County, Mississippi. All parishes in the vicinity have been highly sensitive to flood and hurricane damage, requiring an extensive network of structures, pumping systems and evacuation routes. The rate of erosion in some areas appears to have declined since the 1960's, but the loss of barrier islands, erosion, and subsidence of wetlands have continued in many areas in close proximity of the proposed project areas. Hurricanes Katrina and Rita, which occurred in August and September of 2005, respectively, created heavy damage that required an immediate effort to restore protection to people and property as soon as possible.

The immediate proposed project sites do not include health and safety facilities providing related services.

Discussion of Impacts

No Action

With implementation of this alternative Federal GNOSDRRS projects would be built to authorized levels using Government and Contractor Furnished borrow areas described in IERs # 18 and # 19, or other sources as yet to be identified. Under this alternative there would be no impact to health and safety at the specified areas.

Proposed Action

With implementation of the proposed action suitable material would be excavated from the proposed borrow areas. This is the process that was historically used to create most of the storm surge reduction infrastructure for the New Orleans Metropolitan area. Implementation of the sites would be subject to Federal, state, and local safety and health regulations. There would be temporary, construction-related risks to health and safety, but no permanent impacts are expected. However, if borrow areas are not fenced in, then there would be increased adverse effects to health and safety in the vicinity, especially that of young children.

Increased vehicular traffic near the borrow areas during the excavation period may raise the likelihood of accidents. Routine measures related to traffic management at construction sites are expected to reduce this risk and ensure safety.

With implementation of this alternative, there would be minimal impacts to air and water quality, due to construction. Heavy equipment and excavation of borrow material would cause dust particles to be suspended in the air. In addition, there might be temporary adverse impacts to water quality, but the contractor would be required to follow USACE BMPs to minimize these impacts. Changes in water and air quality would last only through the period of excavation.

Whether back filled or not, altering property contours so as to flood a neighbor's property is not allowed under Louisiana law.

One potential adverse health impact due to the excavation of borrow material would be a problem with mosquitoes. If borrow areas are not backfilled, and are instead allowed to fill with water, increased breeding of mosquitoes may occur. However, mosquito control is part of the responsibilities of local parishes, not CEMVN.

No impacts to health and safety facilities are expected as a result of this alternative.

3.3.3 Employment, Income and Local Tax Base

Existing Conditions

Except for areas used as pasture or farmland, the proposed areas are not currently used for business and industrial purposes generating employment. Non-wetland areas in close proximity to urban areas, however, provide value and potential income. The project areas total almost 700 acres within close proximity to urban developments of the New Orleans Metropolitan Statistical Area (MSA).

Discussion of Impacts

No Action

With implementation of this alternative, Federal GNOSDRRS projects would be built to authorized levels using Government and Contractor Furnished borrow areas described in IERs # 18 and # 19, or other sources as yet to be identified. The collection of alternative material may be an added cost to the project that would be reflected in the project

construction cost. However, no incremental impacts on employment, income, and local tax base relative to the proposed alternative are expected.

Proposed Action

Some of the proposed sites were previously or currently used as pasture or farmland. However, if borrow material is excavated from these areas with no backfill, then this land will no longer be available for other uses, including farmland. There are no anticipated disruptions to commercial activities in the areas near the borrow sites. Therefore, no disruptions to income and public tax collections are expected. The exception to this is the possibility that tax collections based on the values of the sites themselves may decline if the values of the properties decline.

To the extent that the execution of the contract to provide borrow material provides taxable income to the property owner, Federal, state, and local tax collections may increase. In a broader sense, the construction activities themselves invariably require the hiring of labor resources that results in higher incomes, personal spending, and potential governmental tax revenues.

3.3.4 Community Growth

Existing Conditions

Desirable community and regional growth is considered growth that provides a net increase in benefits to a local or regional economy, social conditions, and the human environment, including water resource development. Similarly to other references to social and economic conditions, community and regional growth has been heavily dependent on the unique flood and hurricane protection systems created by borrow areas. The proposed project sites are planned to improve flood and hurricane protection.

Discussion of Impacts

No Action

With implementation of this alternative, Federal GNOSDRRS projects would be built to authorized levels using Government and Contractor Furnished borrow areas described in IERs # 18 and # 19, or other sources as yet to be identified. No incremental impacts with respect to the proposed action are expected.

Proposed Action

The proposed project would advance community growth by advancing the storm damage risk reduction system. Without strong storm and flood protection, a community's growth will be limited. By advancing the storm damage risk reduction system, confidence and investment in the community will increase.

Additionally, construction activities will advance community growth by increasing traffic to the areas around the borrow sites. This increased activity will likely benefit area businesses.

However, using land for borrow purposes would make that same land unavailable for other uses. This may place the communities around the borrow sites at a competitive disadvantage for increased development and growth. Adjacent property may also be less likely to be developed if land is used for borrow purposes.

3.3.5 Community Cohesion

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 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.

Discussion of Impacts

No Action

With implementation of this alternative, Federal GNOSDRRS projects would be built to authorized levels using Government and Contractor Furnished borrow areas described in IERs # 18 and # 19, or other sources as yet to be identified. No incremental impacts with respect to the proposed action are expected.

Proposed Action

The impacts of construction are typically adverse, such as noise and traffic congestion. Some effects, though, have both negative and positive impacts. Yet it is difficult to foresee any construction-related impact that enhances community cohesion; such impacts are expected to be either adverse or, at a minimum, neutral.

Impacts on community cohesion are contingent upon the degree to which project construction is expected to encroach upon the physical landscape that directly or indirectly affects the patterns of social interrelationships. In the current analysis, the borrow sites are sufficiently distant from areas of development such that no spatial element of the community is impinged upon and the shared identity of the community materially threatened. This does not mean that adverse impacts, such as degraded aesthetic qualities or foregone economic opportunities, do not occur. Rather, the adverse impacts in other resource areas are not sufficiently large to affect community cohesion. The impact on community cohesion is first demonstrated by identifying a change in the pattern of social interaction, such as diminished contact due to physical separation, impediments to contact, interference in communication, dislocation, or voluntary migration. None of these conditions are present with the current alternative.

Construction-related impacts can be distinguished from project-related outputs, that is, the economic and social consequences that are specifically intended from the project design and that make it worthwhile to pursue. An increase in community cohesion can be seen as a specifically intended output from the project, as represented by the storm damage risk reduction system. This occurs since storm surge protection measures are designed to protect the community from the catastrophic effects of flooding, preserving the physical integrity of the developed landscape that promotes patterns of social interchange. The alternative presented here increases the level of community cohesion in this instance.

Under the contractor furnished borrow program, material will only be acquired from willing sellers. Those who do not wish to have Pre-Approved Contractor Furnished borrow material removed from their properties do not have to enroll in the program. As such, there should be no adverse impact to the extent that these decisions do not create a significant and long-lasting divisiveness within community affairs that risk the patterns of existing social interaction.

While the proposed borrow areas are located on unpopulated tracts of land, there may be nearby residents or business operators who disapprove of proximate sites being used as sources of borrow materials. This would be seen as a threat to the cohesion of the local community through the adverse visual impact that would result from the activity. Within this understanding of community cohesion, however, such cohesion is linked to a direct impact on a social resource area, aesthetics, which is addressed separately and cannot be otherwise determined to materially affect the patterns of social interaction that the physical landscape and supporting human infrastructure facilitates.

Further, while the adverse impact to aesthetic values can be expected from the proposed projects, and a possible diminution in adjacent property values may occur, the Pre-Approved Contractor Furnished borrow areas must nonetheless conform to local zoning ordinances and land use regulations, and, in doing so, not violate public and local governmental expectations of private property land use norms.

3.4 Environmental Justice

Existing Conditions

- 1025 Florissant and Acosta

The proposed 1025 Florissant borrow area is approximately two miles east of the proposed Acosta borrow area. The 2000 US Census demographic and income data (based on Block level data) showed that the area was not minority, with greater than 90% of its population categorized as non-Hispanic White.

Except for the very sparsely settled area along Highway 46, areas in St. Bernard Parish within a one-mile radius of the proposed project are currently uninhabited.

- 3C Riverside

The proposed 3C Riverside borrow area consists of two sites located on Highway 3127 in St. Charles Parish. These two borrow sites are within the community of Killona, LA, a predominantly lower income, African American/Black community of nearly 800 residents on the west bank of the parish.

According to the 2000 US Census, the Killona population was approximately 93% African American, with a poverty rate of 41%. St. Charles Parish had a poverty rate of 11% and was 38% minority as of 2000. Based on 2007 estimates produced by ESRI, Inc., the demographic and economic profile of Killona has changed very little since the 2000 Census; Killona is currently a low-income and minority community.

- Myrtle Grove

The 2000 Census reported that the block, which comprises Myrtle Grove, Block 5 of Census Tract 504, Block Group 1, had only 12 residents, of which only two were minority. The Census does not report income at the block level.

The area has been developed as the Myrtle Grove Marina Estates, a higher end, waterfront residential development taking advantage of water access to inland lakes and bays through the Myrtle Grove Marina. Because the development occurred in the past few years, the census data may not reflect this change in demographics.

The community of Myrtle Grove is likely not a low-income or minority community.

- Pearlington Dirt Phase 2

According to the 2000 Census, the town of Pearlinton was not a minority or low-income community. The minority population percentage was 23.6%, compared to the Mississippi State percentage of 39.3% and the Hancock County percentage of 11.1%. The percentage of persons living below the poverty line as of 2000 was 17.6%, compared to the State percentage of 19.9% and the County percentage of 14.4%. While Pearlinton has a disproportionately higher percentage of minority and low-income persons when compared to Hancock County, it is less than State percentages.

According to recent estimates provided by ESRI, Inc., the demographic and economic background of Pearlinton, MS has changed very little since 2000. Therefore, it is unlikely that low-income and/ or minority communities have increase in Pearlinton from 2000 to 2007. The proposed borrow area is not immediately adjacent to any inhabited areas, but is within a one-mile radius of the developed northeast portion of the Pearlinton community.

Discussion of Impacts

The proposed action was evaluated for potential disproportionately high environmental effects on minority or low-income populations. Further environmental justice analysis will be included in the CED. Aerial photos were utilized to confirm the presence of habitation in the various project areas.

No Action

Under the No Action alternative, GNOSDRRS projects would be built to authorized levels using Government and Contractor Furnished borrow areas described in IERs # 18 and # 19, or other sources as yet to be identified. Not using the five proposed borrow areas would not cause disproportionate impacts on any minority or low-income population. Therefore, no environmental justice issues are anticipated for this alternative.

Proposed Action

The proposed action would benefit all residents of the New Orleans Metropolitan Area equally by providing the material necessary to construct the GNOSDRRS. Further, Pre-Approved Contractor Furnished borrow material would only be acquired from willing sellers. Those who do not wish to have borrow material removed from their properties do not have to enroll in the program. As such, there should be no adverse impacts to community growth and cohesion under the proposed action.

- 1025 Florissant and Acosta
Because this area is rural and very sparsely populated, and due to the general absence of human habitation near this area in lower St. Bernard Parish, no potential impacts to low income or minority communities have been identified.
- 3C Riverside
Killona is currently a low-income and minority community. No disproportional impacts to low income or minority communities have been identified.
- Myrtle Grove
Since the Myrtle Grove community is likely not a low-income or minority community, no potential impacts to low income or minority communities have been identified.
- Pearlington Dirt Phase 2
Pearlington is not a minority or low-income community. No potential impacts to low income or minority communities have been identified.

3.5 Hazardous, Toxic, and Radioactive Waste

USACE is obligated under Engineer Regulation 1165-2-132 to assume responsibility for the reasonable identification and evaluation of all Hazardous, Toxic, and Radioactive Waste (HTRW) contamination within the vicinity of the proposed action. ER 1165-2-132 identifies 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 ASTM E 1527-05 Phase I ESA was completed for each proposed borrow area. The Phase I ESA documented the Recognized Environmental Conditions (REC) for the proposed project areas. If a REC cannot be avoided, due to the necessity of construction requirements, the CEMVN may further investigate the REC to confirm presence or absence of contaminants, actions to avoid possible contaminants. Federal, state, or local coordination may be required. Because CEMVN plans to avoid RECs the probability of encountering HTRW in the project area is low.

A copy of the Phase I ESA referenced below will be maintained on file at CEMVN and is incorporated herein by reference. Copies of these reports are available by requesting them from CEMVN, or accessing them at www.nolaenvironmental.gov.

HTRW Land Use Histories and Phase I HTRW ESAs have been completed for all of the following proposed borrow areas:

- The Phase I ESA for 1025 Florissant was completed on 11 September 2007. No RECs were identified.
- The Phase 1 ESA for Acosta was completed on 04 July 2007. No RECs were identified.
- The Phase I ESA for 3C Riverside was completed on 23 July 2007. No RECs were identified.
- The Phase I ESA for Myrtle Grove was completed on 27 November 2007. No RECs were identified.
- The Phase I ESA for Pearlinton Dirt Phase 2 was completed on 9 November 2007. No RECs were identified.

4. Cumulative Impacts

NEPA requires a Federal agency to consider not only the direct and indirect impacts of a proposed action, but also the cumulative impacts of the action. Cumulative impact is defined as the “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.

Borrow material has been obtained in the past by CEMVN for GNOSDRRS and other projects in southeastern Louisiana. CEMVN has been working at an accelerated schedule to rehabilitate the GNOSDRRS system after Hurricanes Katrina and Rita, and has a goal of building the system to

authorized levels by June 2011. Over 100,000,000 cubic yards of borrow material is estimated to be needed to complete authorized levels of protection. Borrow material will also be needed to perform levee lifts and maintenance for at least 50 years after construction is completed. CEMVN is in the process of implementing construction projects to raise the hurricane protection levees associated with the Federal LPV, WBV, and New Orleans to Venice (NOV) Hurricane Protection projects to authorized elevations. This includes modifications to flood protection projects not covered by this IER. Levee improvements throughout the LPV and WBV projects would require substantial amounts of borrow material, and some of the borrow areas needed have been identified in this document to provide adequate material in proximity to proposed flood protection projects. In addition to modifying and raising existing structures, three new outfall canal closure structures are proposed at the 17th Street, Orleans Avenue, and London Avenue Outfall Canals in the Orleans East Bank Basin, and a new closure structure is proposed for within the IHNC area. All of these flood protection projects are currently in the planning and design stages, and impacts from these component projects will be addressed in separate IERs.

Other CEMVN projects such as Morganza to the Gulf, Donaldsonville to the Gulf, Larose to Golden Meadows, Grand Isle non-Federal levees, Plaquemines West Bank non-Federal levees, maintenance of the Mississippi River levees and other ongoing civil works investigations will require suitable borrow material. State and local levee and floodwall construction efforts will require borrow material as well. The Mississippi River and Tributaries Projects will utilize borrow material for levee repairs, replacements, lifts, and berms. Government Furnished borrow areas are also being investigated and utilized to supply large quantities of material for levee and floodwall projects.

The construction of the proposed borrow areas would have short-term cumulative affects on transportation. It is anticipated that over 100,000,000 cubic yards of material would be needed to raise levee elevations regionally to meet the needs of the GNOSDRRS. The total number of truck trips required or haul routes for the movement of this quantity of material is currently unknown, but cumulative short-term impacts to transportation are expected to occur. Additional information related to transportation impacts is being collected and will be discussed in future IERs.

Details on cumulative environmental justice impacts will be analyzed at the conclusion of environmental justice small-group meetings and will be included in the CED.

The extent of land directly and indirectly affected by previous development activities, in combination with the excavation and use of the proposed borrow material for GNOSDRRS construction, would contribute cumulatively to land alteration and loss in southeastern Louisiana/southwestern Mississippi (Proposed Action). After borrow area excavation, the land may be converted to ponds and small lakes if not backfilled, which may be required per local ordinances. If not backfilled, the land would be made unsuitable for farming, forestry, or urban development in the reasonably foreseeable future. Habitat would be changed to favor aquatic and semi-aquatic species over the terrestrial ones that now occupy the areas. Borrow areas that do not retain water would be colonized by vegetation and woody plants, which would favor terrestrial species. This would attract the same species that are currently found in the areas.

Based on historical human activities and land use trends in southeastern Louisiana/southwestern Mississippi, it is reasonable to anticipate that future activities would further contribute to cumulative degradation of land resources. It is anticipated that through the efforts taken to avoid and minimize effects on the project area and the mandatory implementation of a mitigation plan that functionally compensates unavoidable remaining impacts, the proposed borrow areas would not result in substantial direct, secondary or cumulative adverse impact on the environment. The mitigation plan is discussed in Section 7.

5. Selection Rationale

The proposed action consists of excavating the proposed Pre-Approved Contractor Furnished borrow areas in the New Orleans Metropolitan Area that would have no impact on cultural resources and T&E species. This report investigated the potential impacts of this action these resources, and jurisdictional wetlands, BLH, upland resources, fisheries, wildlife, recreational resources, aesthetics, noise, air quality, prime and unique farmland, water quality, transportation, socioeconomics, and environmental justice. There is an identified need for over 100,000,000 cubic yards of borrow material to complete the GNOSDRRS, and the proposed action meets approximately 10% of this demand. Because of this need, CEMVN will need to investigate acquiring all potentially viable areas for the next few years. Government Furnished borrow is an option that was explored in IER # 18, and more potential areas may be discussed in IER # 22 and future IERs. Other Pre-Approved Contractor Furnished borrow areas were investigated in IER # 19, and more potential sites may be discussed in future IERs. Supply Contract borrow options may also be discussed in future IERs. All of this borrow material would be used to complete the GNOSDRRS, which would lower the risk of harm to citizens and damage to infrastructure during a storm event.

6. Coordination and Consultation

6.1 Public Involvement

Extensive public involvement has been sought in preparing this IER. The GNOSDRRS projects, including the proposed borrow areas analyzed in this IER, were publicly disclosed and described in the Federal Register on 13 March 2007 and on the website www.nolaenvironmental.gov. Scoping for GNOSDRRS projects were initiated on 12 March 2007, through placing advertisements and public notices in *USA Today* and *The New Orleans Times-Picayune*. Nine public scoping meetings were held throughout the New Orleans Metropolitan Area to explain the scope and process of the Alternative Arrangements for implementing NEPA between 27 March and 12 April 2007, after which a 30-day scoping period was open for public comment submission. Additionally, CEMVN is hosting monthly public meetings to keep the stakeholders advised of project status. Public input will be provided in Appendix B.

6.2 Agency Coordination

Preparation of this IER has been 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 C, and correspondence between governmental agencies and CEMVN is found in Appendix D. This interagency environmental team was integrated with the CEMVN PDT 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 final 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
- Louisiana 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

LDWF reviewed the proposed action, and determined that it would have minimal to no long-term adverse impacts to wetland functions (Appendix D). LDWF had no objection to the proposed action.

NMFS reviewed the proposed action, and agreed that none of the proposed borrow areas are located in areas classified as essential fish habitat (Appendix D).

LDNR reviewed the proposed action for consistency with the Louisiana Coastal Resource Program (LCRP). All proposed borrow activities discussed in this document were found by LDNR to be consistent with the LCRP (Table 5).

Table 5: LDNR Coastal Zone Consistency Determination Concurrence

Proposed Borrow Area	LDNR LCRP Consistency Permit Number
1025 Florissant	P20060763
Acosta	P20070851
3C Riverside	P20070558
Myrtle Grove	N/A
Pearlington Dirt Phase 2	DMR-070125

CEMVN received a draft Coordination Act Report (CAR) from the USFWS on 30 January 2008, and an Appendix to the CAR on 29 February 2008 (Appendix D). Recommendations of the USFWS, in accordance with the Fish and Wildlife Coordination Act, include:

Recommendation 1: “[CEMVN] to provide [USFWS] verification that wetland impacts and impacts to non-wet bottomland hardwoods, present and future, have been mitigated.”

CEMVN Response 1: CEMVN will provide verification of mitigation.

Recommendation 2: “[CEMVN] to provide to the [USFWS] maps, descriptions of habitats and impacts for all future contractor-furnished borrow sites.”

CEMVN Response 2: CEMVN will provide maps, etc. to USFWS.

Recommendation 3: “The protocol to identify and prioritize borrow sources provided in our August 7, 2006, Planning-aid letter... should be utilized as a guide for contractors locating future borrow-sites.”

CEMVN Response 3: Concur.

Recommendation 4: “Any proposed change in borrow site features, locations or plans shall be coordinated in advance with [USFWS], NMFS, LDWF, and LDNR.”

CEMVN Response 4: CEMVN will coordinate with these agencies.

Recommendation 5: “Forest clearing associated with borrow site preparation should be conducted during the fall or winter to minimize impacts to nesting migratory birds, when practicable.”

CEMVN Response 5: Concur.

Recommendation 6: “If a proposed borrow site is changed significantly or excavation is not implemented within one year, we recommend that [CEMVN] notify the contractor to reinitiate coordination with... this office to ensure that the proposed project would not adversely affect any federally listed threatened or endangered species or their habitat.”

CEMVN Response 6: Concur.

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.

All potential areas described in this IER were assessed by the USFWS and CEMVN under NEPA, the Fish and Wildlife Coordination Act, and under Section 906 (b) WRDA 1986 requirements. It has been determined that the proposed borrow areas do not contain any wetlands or non-wet bottomland hardwoods; therefore, no mitigation is necessary.

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 will be achieved upon coordination of this IER with appropriate agencies, organizations, and individuals for their review and comments; USFWS and National Marine Fisheries Service confirmation that the proposed action would not adversely affect any T&E species or completion of Endangered Species Act Section 7 consultation (Table 3); Louisiana Department of Natural Resources concurrence with the determination that the proposed action is consistent, to the maximum extent practicable, with the LCRP (Table 5); coordination with the SHPO (Table 4); receipt and acceptance or resolution of all Fish and Wildlife Coordination Act recommendations; and receipt and acceptance or resolution of all Louisiana Department of Environmental Quality comments on the air quality impact analysis documented in the IER. USFWS has determined that no T&E species, or their habitat, would be adversely affected by the proposed action. SHPO has determined that cultural resources would not be adversely impacted by the proposed action.

9. Conclusions

9.1 Interim Decision

The proposed action consists of excavating five borrow areas located in non-jurisdictional wetland areas that would have no significant effect on cultural resources or threatened and endangered species. This office has assessed the environmental impacts of the proposed action

upon jurisdictional wetlands, non-wetland/upland resources, fisheries, wildlife, recreational resources, aesthetics, noise, air quality, prime and unique farmland, water quality, environmental and socioeconomic resources.

9.2 Prepared By

IER # 23 was prepared by Michael Brown, Biologist, NEPA Compliance, with relevant sections prepared by: Danielle Tommaso - Environmental Resources Specialist; J. Christopher Brown, Ph.D. - HTRW; Valerie J. McCormack, Ph.D. - Cultural Resources; Hope Pollmann - Recreational Resources; Richard Radford - Aesthetics; Laura Singer - Socioeconomics; Ed Lyon, Ph.D. - Environmental Justice; Gib Owen - Environmental Team Leader; and Soheila Holley - Senior Project Manager. The address of the preparers is: U.S. Army Corps of Engineers, New Orleans District; Planning, Programs, and Project Management Division, CEMVN-PM; P.O. Box 60267; New Orleans, Louisiana 70160-0267.

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Appendices

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Appendix A: List of Acronyms and Definitions of Common Terms

APE: Areas of potential effect
ASTM: American Society of Testing and Materials
BLH: Bottomland Hardwood (Forest)
BMP: Best Management Practices
CAR: Coordination Act Report
CED: Comprehensive Environmental Document
CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act
CEQ: Council on Environmental Quality
Clay Classifications
 CH: Fat clay
 CL: lean clay
 ML: Silt
CO: Carbon monoxide
EA: Environmental Assessment
EIS: Environmental Impact Statement
ESA: Environmental Site Assessment
FONSI: Finding of No Significant Impact
GNOSDRRS: Hurricane and Storm Damage Reduction System (aka, Hurricane Protection System)
HPS: See GNOSDRRS
HTRW: Hazardous, Toxic, and Radioactive Waste
IER: Individual Environmental Report
IHNC: Inner Harbor Navigation Canal
IPET: Interagency Performance Evaluation Team
LCRP: Louisiana Coastal Resource Program
LDEQ: Louisiana Department of Environmental Quality
LDNR: Louisiana Department of Natural Resources
LDWF: Louisiana Department of Wildlife and Fisheries
LOS: Level of service
LPV: Lake Pontchartrain and Vicinity Hurricane Protection Project
MSA: Metropolitan Statistical Area
NAAQS: National Ambient Air Quality Standards
NEPA: National Environmental Policy Act
NO_x: Nitrogen oxides
NOV: New Orleans to Venice Hurricane Protection Project
NPDES: National Pollutant Discharge Elimination System
O₃: ozone
PDT: Project Delivery Team
PI: Plasticity index
PL: Public Law
PM: Particulate matter
P.L.: Public law
RCRA: Resource Conservation and Recovery Act
REC: Recognized environmental condition

ROD: Record of Decision

Section 404 (of the Clean Water Act): The Section 404 program for the evaluation of permits for the discharge of dredged or fill material was originally enacted as part of the Federal Water Pollution Amendments of 1972. The Secretary of Army acting through the Chief of Engineers may issue permits, after notice and opportunity for public hearings for the discharge of dredged or fill material into the navigable waters at specified disposal sites.

SHPO: State Historic Preservation Officer

SIR: Supplemental Information Report

SPH: Standard Project Hurricane

SO_x: Sulfur oxides

T&E: Threatened or Endangered Species

UNOP: Unified New Orleans Plan

USACE: U.S. Army Corps of Engineers

CEMVN: Mississippi Valley Division, New Orleans District

CEMVK: Mississippi Valley Division, Vicksburg District

USDA: U.S. Department of Agriculture

NRCS: Natural Resources Conservation Service

USFWS: U.S. Fish and Wildlife Service

VOC: Volatile organic compound

WBV: West Bank and Vicinity Hurricane Protection Project

WRDA: Water Resources Development Acts

Appendix B: Public Comments



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southeast Regional Office
263 13th Avenue South
St. Petersburg, Florida 33701

March 31, 2008 F/SER46/RH:jk
225/389-0508

Mr. Gib Owen
Environmental Planning and Compliance Branch
Planning, Programs, and Management Division
New Orleans District, U.S. Army Corps of Engineers
Post Office Box 60267
New Orleans, Louisiana 70160-0267

Dear Mr. Owen:

NOAA's National Marine Fisheries Service (NMFS) has reviewed the draft **Individual Environmental Report (IER) #23** titled "Pre-Approved Contractor Furnished Borrow Material #2; St. Bernard, St. Charles, Plaquemines Parishes, Louisiana, and Hancock County, Mississippi." The draft IER evaluates and quantifies the impacts associated with the use of five contractor-furnished borrow sites to restore levees to the 100-year level of hurricane protection.

NMFS has reviewed the draft IER and agrees that none of the borrow sites are located in areas classified as essential fish habitat or supportive of marine fishery resources. As such, we have no comments to provide on the draft IER.

We appreciate the opportunity to review and comment on the draft IER.

Sincerely,

♫ Miles M. Croom
Assistant Regional Administrator
Habitat Conservation Division

c:
FWS, Lafayette
EPA, Dallas
LA DNR, Consistency
F/SER46, Swafford
Files





BOBBY JINDAL
GOVERNOR

State of Louisiana
DEPARTMENT OF WILDLIFE & FISHERIES

ROBERT J. BARHAM
SECRETARY

April 21, 2008

Ms. Elizabeth Wiggins, Chief
Planning, Programs, & Project Management Division
Environmental Planning & Compliance Branch
United States Army Corps of Engineers
P. O. Box 60267
New Orleans, LA 70160-0267

RE: *Application: IER #23*
Applicant: U.S. Army Corps of Engineers, New Orleans District
Public Notice Date: March 21, 2008

Dear Mr. Serio:

The professional staff of the Louisiana Department of Wildlife and Fisheries, Office of Wildlife, has reviewed the above referenced Public Notice. Based upon this review the following has been determined:

It is anticipated that the proposed activity will have minimal to no long-term adverse impacts to wetland functions; therefore, Ecological Studies has no objection.

The Louisiana Department of Wildlife and Fisheries appreciates the opportunity to review and provide recommendations to you regarding the proposed activity. Please do not hesitate to contact Chris Davis (225-765-2642) of our Habitat Section should you need further assistance.

Sincerely,

Venise Ortego, Permits Coordinator

cd

c: Chris Davis, Biologist

USFWS Ecological Services

Howdy

I FEEL YOU HAVE DONE A
GOOD JOB ON FINDING FILL DIRT
FOR NEW LEVEE. IN MY
VIEW, IT DOES NOT MAKE
SENSE REBUILDING A CITY
UNDER SEA LEVEL. THIS COULD
BE FROM GULFERN FINDING AGAIN BY
BIG STRONG

THANKS
David B Smith

DAVID B Smith
#1 FIRST 400 SMITH
IN PT 4 B
SSLE 400
84121

Appendix C: Members of Interagency Environmental Team

Kyle Balkum	Louisiana Dept. of Wildlife and Fisheries
Agaha Brass	Louisiana Department of Natural Resources
Catherine Breaux	U.S. Fish and Wildlife Service
David Castellanos	U.S. Fish and Wildlife Service
Frank Cole	Louisiana Department of Natural Resources
John Ettinger	U.S. Environmental Protection Agency
Jeffrey Harris	Louisiana Department of Natural Resources
Richard Hartman	NOAA National Marine Fisheries Service
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
David Muth	U.S. National Park Service
Clint Padgett	U.S. Geologic Survey
Jamie Phillippe	Louisiana Dept. of Environmental Quality
Manuel Ruiz	Louisiana Dept. of Wildlife and Fisheries
Angela Trahan	U.S. Fish and Wildlife Service
David Walther	U.S. Fish and Wildlife Service
Patrick Williams	NOAA National Marine Fisheries Service

Appendix D: Interagency Correspondence



United States Department of the Interior

FISH AND WILDLIFE SERVICE

646 Cajundome Blvd.

Suite 400

Lafayette, Louisiana 70506

August 7, 2006

Colonel Richard P. Wagenaar
District Commander
U.S. Army Corps of Engineers
Post Office Box 60267
New Orleans, Louisiana 70160-0267

Dear Colonel Wagenaar:

As you know, the U.S. Fish and Wildlife Service (Service) is assisting the U.S. Army Corps of Engineers (Corps) in assessing impacts of, and mitigation requirements for, borrow sites which are needed to complete authorized improvements, and to construct Federal and non-Federal hurricane/flood protection levees in southern Louisiana. Those improvements to hurricane and flood control projects are authorized by the Emergency Supplemental Appropriations to Address Hurricanes in the Gulf of Mexico (Public Laws 109-148, PL 84-99 and PL 109 234 (4th supplemental)). This letter is provided in accordance with the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.), Fish and Wildlife Coordination Act (FWCA, 48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), and the Migratory Bird Treaty Act (40 Stat. 755, as amended; 16 U.S.C. 703 et seq.), but it does not constitute the final report of the Secretary of the Interior as required by Section 2(b) of the Fish and Wildlife Coordination Act.

Through the efforts of Task Force Guardian, the Corps has restored Hurricane Katrina-damaged hurricane/flood protection projects to their authorized or previously permitted/constructed protection levels. Identification of borrow areas needed to complete those repairs utilized a protocol that prioritized selection of those sites in the following order: existing commercial pits, upland sources, previously disturbed/manipulated wetlands within a levee system, and low-quality wetlands outside a levee system. The Service supports the use of such protocols to avoid and minimize impacts to wetlands and bottomland hardwoods within project areas. Avoidance and minimization of those impacts helps to provide consistency with restoration strategies and compliments the authorized hurricane protection efforts. Such consistency is also required by Section 303(d)(1) of the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA).

Accordingly, the Service recommends that prior to utilizing borrow sites every effort should be made to reduce impacts by using sheetpile and/or floodwalls to increase levee heights wherever feasible. In addition, the Service recommends that the following protocol be adopted and utilized to identify borrow sources in descending order of priority:

1. Permitted commercial sources, authorized borrow sources for which environmental clearance and mitigation have been completed, or non-functional levees after newly constructed adjacent levees are providing equal protection.
2. Areas under forced drainage that are protected from flooding by levees, and that are:
 - a) non-forested (e.g., pastures, fallow fields, abandoned orchards, former urban areas) and non-wetlands;
 - b) wetland forests dominated by exotic tree species (i.e., Chinese tallow-trees) or non-forested wetlands(e.g., wet pastures), excluding marshes;
 - c) disturbed wetlands (e.g., hydrologically altered, artificially impounded).
3. Sites that are outside a forced drainage system and levees, and that are:
 - a) non-forested (e.g., pastures fallow fields, abandoned orchards, former urban areas) and non-wetlands;
 - b) wetland forests dominated by exotic tree species (i.e., Chinese tallow-trees) or non-forested wetlands(e.g., wet pastures), excluding marshes;
 - c) disturbed wetlands (e.g., hydrologically altered, artificially impounded).

Notwithstanding this protocol, the location, size and configuration of borrow sites within the landscape is also critically important. Coastal ridges, natural levee flanks and other geographic features that provide forested/wetland habitats and/or potential barriers to hurricane surges should not be utilized as borrow sources, especially where such uses would diminish the natural functions and values of those landscape features.

To assist in expediting the identification of borrow sites, the Service recommends that immediately after the initial identification of a new borrow site the Corps should initiate informal consultation with the Service regarding potential impacts to federally listed threatened or endangered species. To aid you in complying with those proactive consultation responsibilities, the Service has enclosed a list of threatened and endangered species and their critical habitats within the coastal parishes of the New Orleans District.

The Service offers the following additional recommendations for reducing borrow site impacts on fish and wildlife resources and, where feasible, enhancing those resources. However, these additional recommendations should not be implemented if they would result in the expansion of existing borrow pits or construction of new borrow pits in wetlands or bottomland hardwoods.

1. A minimum of 30 percent of the borrow pits' edge should slope no greater than 5 horizontal (H):1 vertical (V), starting from the water line down to a depth of approximately 5 feet.

2. Most of the woody vegetation removed during clearing and grubbing should be placed into the deepest parts of the borrow pits and the remaining debris should be placed in the water along the borrow pit shorelines, excluding those areas where the 5H:1V slope, per recommendation 1, have been constructed.
3. Following construction, perimeter levees (if constructed) around each borrow pit should be gapped at 25-foot intervals with an 8-foot-wide breach, the bottom elevation of which should be level with the adjacent natural ground elevation.

When avoidance and minimization of bottomland hardwood and wetland impacts is not practicable, all unavoidable net losses of those habitats should be fully offset via compensatory mitigation. Such compensatory mitigation should be sited within the watershed and/or hydrologic unit where the impact occurred, and should be completed concurrently with borrow operations, or as soon thereafter as possible.

The combined need for borrow necessary to complete authorized improvements to and construction of Federal and non-Federal hurricane/flood protection levees, and the potential construction of levees capable of withstanding a category 5 hurricane, will require substantial amounts of borrow. It is highly likely such amounts would exceed local availability. In the case of ongoing hurricane/flood protection projects (e.g., Morganza to the Gulf) the search for levee-building material has been conducted primarily on project-by-project basis. In the context of such project-by-project searches for borrow material, the least-expensive and easiest sources of borrow material are usually located within wetlands and/or bottomland hardwoods, adjacent to the proposed levee. Such on-site sources, however, often involve adverse impacts to wetlands, thus exacerbating the overall wetland loss problem in all coastal basins, especially those in the deltaic plain of southeast Louisiana. In short, while such on-site sources are relatively inexpensive, they will frequently be inconsistent with coastal restoration efforts and, to the extent that wetlands will be adversely impacted, use of those sites will be counterproductive with respect to minimizing wetland impacts and attaining the goal of increasing non-structural hurricane protection within a sustainable ecosystem.

Large-scale, off-site borrow sources could have the potential to reduce environmental impacts from levees and expedite project-by-project environmental review. Such potential "programmatic" borrow sources could include uplands along the Mississippi River, beneficial use of sediments dredged for navigation purposes (including the mining of disposal sites), the Mississippi River, and offshore deposits (e.g., Ship Shoal). As part of the planning process, we recommend that the Corps begin investigating the practicability of various large-scale, off-site borrow sources and actively involve all resource agencies with the Protection and Restoration Office's Borrow Team efforts.

Programmatic planning would be essential to identify borrow sites of acceptable quantity and quality, while avoiding and/or minimizing adverse environmental impacts. We therefore recommend that a plan be developed that integrates borrow resources, uses, and needs for various programs and activities. Guiding principles should be developed to identify borrow resources, borrow-site designs, and prioritize uses to avoid competing for resources, maximize benefits with those resources, and avoid adverse environmental impacts.

We appreciate the opportunity to provide this planning-aid letter and would be pleased to assist your agency in further identification of potential borrow sources. Should you or your staff have any questions regarding this letter, please contact David Walther (337/291-3122) of this office.

Sincerely,

A handwritten signature in black ink, appearing to read "Russell C. Watson", with a large, stylized initial "R" and a long horizontal flourish extending to the right.

Russell C. Watson
Supervisor
Louisiana Field Office

Enclosure

cc: National Marine Fisheries Service, Baton Rouge, LA
EPA, Dallas, TX
LA Dept. of Wildlife and Fisheries, Baton Rouge, LA
LA Dept. of Natural Resources, CMD, Baton Rouge, LA
LA Dept. of Natural Resources, CRD, Baton Rouge, LA

Threatened and Endangered Species in Coastal Louisiana – FWS Responsibility

MAMMALS

Bear, Louisiana*
(*Ursus americanus luteolus*)
Manatee, West Indian
(*Trichechus manatus*)

GENERAL DISTRIBUTION IN LOUISIANA

T Entire state
E Lake Pontchartrain & tributaries on North shore;
rare along Gulf coast

BIRDS

Eagle, bald
(*Haliaeetus leucocephalus*)
Pelican, brown
(*Pelecanus occidentalis*)
Plover, piping**
(*Charadrius melodus*)

Woodpecker, red-cockaded
(*Campephilus principalis*)

T Entire state
E Coast
T Coast

E Entire state except Delta

REPTILES

Tortoise, gopher
(*Gopherus polyphemus*)
Turtle, ringed map (=sawback)
(*Graptemys oculifera*)
Turtle, loggerhead sea
(*Caretta caretta*)

T Washington, St. Tammany, and Tangipahoa
Parishes
T Pearl and Bogue Chitto Rivers
T Potential Nesting on Chandeleuer Is.

FISH

Sturgeon, Gulf**
(*Acipenser oxyrinchus desotoi*)
Sturgeon, pallid
(*Scaphirhynchus albus*)

T Pearl River & Lake Pontchartrain tributaries
E Mississippi River & tributaries

INVERTEBRATES

Mussel, inflated heelsplitter
(*Potamilus inflatus*)

T Amite River

PLANTS

Louisiana quillwort
(*Isoetes louisianensis*)

E Washington and St. Tammany Parishes

*Indicates proposed critical habitat

**Indicates designated critical habitat

Enclosure



United States Department of the Interior

FISH AND WILDLIFE SERVICE

646 Cajundome Blvd.

Suite 400

Lafayette, Louisiana 70506

February 29, 2008

Colonel Alvin B. Lee
 District Engineer
 U.S. Army Corps of Engineers
 Post Office Box 60267
 New Orleans, Louisiana 70160-0267

OPTIONAL FORM 99 (7-80)

FAX TRANSMITTAL

of pages ▶ 2

To <i>Mike Brown</i>	From <i>David Castellanos</i>
Dept./Agency <i>COE</i>	Phone # <i>FW S Lafayette</i>
Fax # <i>504-862-2088</i>	Fax # <i>337-291-3139</i>

NSN 7540-01-317-7388

5099-101

GENERAL SERVICES ADMINISTRATION

Dear Colonel Lee:

Please reference the Individual Environmental Report (IER) 23, entitled Pre-Approved Contractor Furnished Borrow Material #2 St. Bernard, St. Charles, and Plaquemines Parishes, Louisiana, and Hancock County, Mississippi. That IER addresses impacts resulting from the excavation of contractor-furnished borrow sites which will be used to increase hurricane protection within the Greater New Orleans area. In an electronic mail message dated February 25, 2008, the Service was requested by the Corps of Engineers (Corps) to evaluate an additional borrow site (i.e., Acosta) for inclusion in IER 23. The Service has agreed to supplement its original completed report with this information.

Work associated with IER 23 is being conducted in response to Public Law 109-234, Emergency Supplemental Appropriations Act for Defense, the Global War on Terror, and Hurricane Recovery, 2006 (Supplemental 4). That law authorized the Corps to upgrade some existing hurricane protection projects to provide protection against a 100-year hurricane event. The United States Fish and Wildlife Service (Service) provided a Fish and Wildlife Coordination Act (FWCA) draft report dated January 30, 2008, that contains an analysis of the impacts on fish and wildlife resources that would result from excavation of those borrow sites and provides recommendations to minimize and/or mitigate project impacts on those resources. This letter, submitted in accordance with provisions of the Fish and Wildlife Coordination Act (FWCA; 48 Stat. 401, as amended; 16 U.S.C 661 et seq.), supplements that FWCA Report and our August 7, 2006, Planning-aid Letter to the Corps providing recommendations for minimizing impacts to fish and wildlife resources from borrow site selection and use. This letter, however, does not constitute the report of the Secretary of the Interior as required by Section 2(b) of the FWCA. This letter has been provided to the Louisiana Department of Wildlife and Fisheries and the National Marine Fisheries Service; their comments will be incorporated into our final report.

Excavation of the Acosta and other borrow sites will result in the conversion of terrestrial habitat into open-water. Because pasture, open water, cleared land and pine plantation habitats have a reduced value to fish and wildlife resources and are not a declining or limited habitat type, impacts associated with conversion of those habitats to open-water were identified by land type, and quantified only by acreage (Table 1).

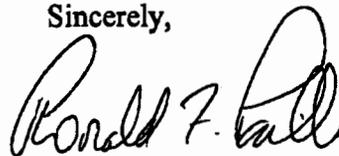
Table 1: Contractor-furnished Borrow Sites, IER 23

Site	Parish/ County	Acres	Habitat
Myrtle Grove	Plaquemines	271	Agriculture
1025 Florissant	St. Bernard	3	Scrub-Shrub, with some live oaks
3C Riverside	St. Charles	264	Agriculture
Pearlington Dirt II	Hancock	110	Cutover Loblolly Pine silviculture
*Acosta	St. Bernard	25	Pasture

*Additional borrow source

It was previously determined that the original borrow sites of IER 23 did not contain any wetlands or non-wet bottomland hardwood. The proposed Acosta site (located in St. Bernard Parish) evaluated for this supplement also contains no wetlands or non-wet bottomland hardwood; therefore, the Service maintains its determination that mitigation is not required for the borrow activity proposed in IER 23.

Sincerely,



for James F. Boggs
Supervisor
Louisiana Field Office

cc: EPA, Dallas, TX
NMFS, Baton Rouge, LA
USFWS, Jackson, MS, ES
LA Dept. of Wildlife and Fisheries, Baton Rouge, LA
LA Dept. of Natural Resources (CMD/CRD), Baton Rouge, LA



United States Department of the Interior

FISH AND WILDLIFE SERVICE

646 Cajundome Blvd.
Suite 400
Lafayette, Louisiana 70506

November 26, 2007

Colonel Alvin B. Lee
District Engineer
U.S. Army Corps of Engineers
Post Office Box 60267
New Orleans, Louisiana 70160-0267

Dear Colonel Lee

Please reference the Individual Environmental Reports (IER) being prepared under the approval of the Council on Environmental Quality (CEQ) that will partially fulfill the U.S. Army Corps of Engineers (Corps) compliance with the National Environmental Policy Act of 1969 (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 those 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). That law authorized the Corps to upgrade two existing hurricane protection projects (i.e., Westbank and Vicinity of New Orleans and Lake Pontchartrain and Vicinity) in the Greater New Orleans area in southeast Louisiana. This draft report contains a description of resources in the project area and provides planning objectives and recommendations to minimize project impacts on those resources.

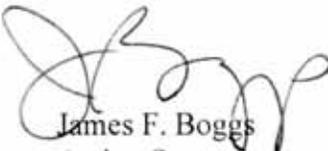
The proposed protection was authorized by Supplemental 4 which directed the Corps to proceed with engineering, design, modification, and construction, where necessary, of the Lake Pontchartrain and Vicinity and the West Bank and Vicinity Hurricane Protection Projects so those projects would provide 100-year hurricane protection. Procedurally, project construction has been authorized in the absence of the report of the Secretary of the Interior that is required by Section 2(b) of the Fish and Wildlife Coordination Act (FWCA) (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.). In this case, the authorization process has prevented our agencies from following the normal procedures for fully complying with the FWCA. The FWCA requires that our Section 2(b) report be made an integral part of any report supporting further project authorization or administrative approval.

Because of the uncertainties regarding the project design, the project's impacts are undetermined at the current stage of planning, therefore, we cannot complete our evaluation of the IER's effects on fish and wildlife resources and cannot entirely fulfill our 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.). Accordingly, extensive additional Service involvement during subsequent detailed planning, engineering, design, and construction phase of each IER, along with more-definitive

project information that will be available during those planning phases, will be required so that we can fulfill our responsibilities under that Act. Therefore, to fulfill the coordination and reporting requirements of the FWCA, the Service will be providing post-authorization draft and final supplemental 2(b) reports to this programmatic report for each IER. Therefore, this report does not constitute the report of the Secretary of the Interior as required by Section 2(b) of the FWCA. This report has not been reviewed by the Louisiana Department of Wildlife and Fisheries (LDWF) or the National Marine Fisheries Service (NMFS) but their comments on this report will be provided under separate cover.

Should you or your staff have any questions regarding this letter and our attached report, please contact David Walther (337/291-3122) of this office.

Sincerely,



James F. Boggs
Acting Supervisor
Louisiana Field Office

Attachment

cc: National Marine Fisheries Service, Baton Rouge, LA
EPA, Dallas, TX
LA Dept. of Wildlife and Fisheries, Baton Rouge, LA
LA Dept. of Natural Resources, CMD, Baton Rouge, LA
LA Dept. of Natural Resources, CRD, Baton Rouge, LA

**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)



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

PREPARED BY
DAVID WALTHER
FISH AND WILDLIFE BIOLOGIST

U.S. FISH AND WILDLIFE SERVICE
ECOLOGICAL SERVICES
LAFAYETTE, LOUISIANA
NOVEMBER 2007

U.S. FISH AND WILDLIFE SERVICE – SOUTHEAST REGION

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EXECUTIVE SUMMARY

The Corps of Engineers New Orleans District (Corps) is preparing Individual Environmental Reports (IER) 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 (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 those 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). That law authorized the Corps to upgrade two existing hurricane protection projects (i.e., Westbank and Vicinity of New Orleans and Lake Pontchartrain and Vicinity) in the Greater New Orleans area in southeast Louisiana. This draft report contains a description of resources in the project area and provides planning objectives and recommendations to minimize project impacts on those resources.

The proposed protection was authorized by Supplemental 4 which directed the Corps to proceed with engineering, design, modification, and construction, where necessary, of the Lake Pontchartrain and Vicinity and the West Bank and Vicinity Hurricane Protection Projects so those projects would provide 100-year hurricane protection. Procedurally, project construction has been authorized in the absence of the report of the Secretary of the Interior that is required by Section 2(b) of the Fish and Wildlife Coordination Act (FWCA) (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.). In this case, the authorization process has prevented our agencies from following the normal procedures for fully complying with the FWCA. The FWCA requires that our Section 2(b) report be made an integral part of any report supporting further project authorization or administrative approval.

Because of the uncertainties regarding the project design, the project's impacts are undetermined at the current stage of planning, therefore, we cannot complete our evaluation of the IER's effects on fish and wildlife resources and cannot entirely fulfill our 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.). Accordingly, extensive additional Service involvement during subsequent detailed planning, engineering, design, and construction phased of each IER, along with more-definitive project information that will be available during those planning phases, will be required so that we can fulfill our responsibilities under that Act. Therefore, to fulfill the coordination and reporting requirements of the FWCA, the Service will be providing post-authorization draft and final supplemental 2(b) reports to this programmatic report for each IER. Therefore, this report does not constitute the report of the Secretary of the Interior as required by Section 2(b) of the FWCA. This report has not been reviewed by the Louisiana Department of Wildlife and Fisheries (LDWF) or the National Marine Fisheries Service (NMFS) but their comments on this report will be provided under separate cover.

This report incorporates and supplements our 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 Lake Pontchartrain and Vicinity Hurricane (dated July 25, 1984, and January 17, 1992) Protection projects. Impacts and

mitigation needs resulting from government and contractor provided borrow areas have been addressed in an October 25, 2007, and a November 1, 2007, FWCA reports, respectively. Therefore, this report will not address those borrow impacts and future impacts will be addressed in FWCA supplements to those FWCA reports. In addition, specific recommendations for mitigation will be addressed in separate FWCA reports because mitigation is still within early planning phases and lacks sufficient details to be adequately addressed.

Construction of the increased flood protection would result in un-quantified habitat losses. 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. To the greatest extent possible, situate flood protection features so that destruction of wetlands and non-wet bottomland hardwoods are avoided or minimized.
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.
3. Avoid adverse impacts to bald eagle nesting locations and wading bird colonies through careful design project features and timing of construction.
4. Forest clearing associated with project features should be conducted during the fall or winter to minimize impacts to nesting migratory birds, when practicable.
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.
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 Service, NMFS, LDWF, Environmental Protection Agency (EPA) and Louisiana Department of Natural Resources (LDNR). The Service shall be provided an opportunity to review and submit recommendations on the all work addressed in those reports.
7. The Corps should avoid impacts to public lands, if feasible. If not feasible the Corps 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 potentially impacted by project features are: Kenneth Litzenberger, Project Leader for the Service's Southeast National Wildlife Refuges and Jack Bohannon (985) 822-2000, Refuge Manager for the Bayou Sauvage National Wildlife Refuge (NWR), Office of State Parks contact Mr. John Lavin at 1-888-677-1400, 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 EPA.

8. If applicable, a General Plan should be developed by the Corps, the Service, and the managing natural resource agency in accordance with Section 3(b) of the FWCA for mitigation lands.
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. 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.
10. If a proposed project feature is changed significantly or is not implemented within one year of the date of our Endangered Species Act consultation letter, we recommend that the Corps reinitiate coordination with this office to ensure that the proposed project would not adversely affect any federally listed threatened or endangered species or their habitat.
11. In general, larger and more numerous openings in a protection levee better maintain estuarine dependent fishery migration. Therefore, as much opening as practicable, in number, size, and diversity of locations should be incorporated into project levees.
12. Flood protection water control structures in any watercourse should maintain pre-project cross section in width and depth to the maximum extent practicable, especially structures located in tidal passes.
13. Flood protection water control structures should remain completely open except during storm events. Management of those structures should be developed in coordination with the Service, NMFS, LDWF, and LDNR.
14. Any flood protection water control structure sited in canals, bayous, or navigation channels that 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.
15. The number and siting of openings in flood protection levees should be optimized to minimize the migratory distance from the opening to enclosed wetland habitats.
16. Flood protection 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.
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 feet

per second. However, this may not necessarily be applicable to tidal passes or other similar major exchange points.

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 should be selected that would maintain sufficient flow to prevent siltation.

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 feet 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 isolated without that culvert.

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.

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.

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.

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

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

25. Any proposed change in mitigation features or plans should be coordinated in advance with the Service, NMFS, LDWF, EPA and LDNR.

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 Corps, the Service, NMFS, EPA, LDNR and LDWF. That report should also describe future management activities, and identify any proposed changes to the existing management plan.

INTRODUCTION

The Corps of Engineers New Orleans District (Corps) is preparing Individual Environmental Reports (IER) 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 (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 those 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). That law authorized the Corps to upgrade two existing hurricane protection projects (i.e., Westbank and Vicinity of New Orleans and Lake Pontchartrain and Vicinity) in the Greater New Orleans area in southeast Louisiana. This draft report contains a description of resources in the project area and provides planning objectives and recommendations to minimize project impacts on those resources.

Because of the uncertainties regarding the project design, the project's impacts are undetermined at the current stage of planning, therefore, we cannot complete our evaluation of the IER's effects on fish and wildlife resources and cannot entirely fulfill our 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, extensive additional Service involvement during subsequent detailed planning, engineering, design, and construction phases of each IER, along with more-definitive project information that will be available during those planning phases, will be required so that we can fulfill our responsibilities under that Act. Therefore, to fulfill the coordination and reporting requirements of the FWCA, the Service will be providing post-authorization draft and final supplemental 2(b) reports to this programmatic report for each IER.

This report incorporates and supplements our 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 Lake Pontchartrain and Vicinity Hurricane (dated July 25, 1984, and January 17, 1992) Protection projects. Impacts and mitigation needs resulting from government and contractor provided borrow areas have been addressed in an October 25, 2007, and a November 1, 2007, FWCA reports, respectively, therefore this report will not address those project features. This report does not constitute the report of the Secretary of the Interior as required by Section 2(b) of the FWCA. It has not been reviewed by the Louisiana Department of Wildlife and Fisheries (LDWF) and the National Marine Fisheries Service (NMFS), but their comments on this report will be forwarded under separate cover.

DESCRIPTION OF THE STUDY AREA

The study area is located within the Mississippi River Deltaic Plain of the Lower Mississippi River Ecosystem. Portions of Jefferson, Orleans, St. Charles, St. Bernard and Plaquemines Parishes are included in the study area. Higher elevations occur on the natural levees of the

Mississippi River and its distributaries. Developed lands are primarily associated with 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. Navigation channels such as the Gulf Intracoastal Waterway and the Mississippi River – Gulf Outlet are also prominent landscape features, as are extensive oil and gas industry access channels and pipeline canals. Extensive wetlands and associated shallow open waters dominate the landscape outside the flood control levees. Major waterbodies include Lake Pontchartrain located north of the project area, the Mississippi River which bisects the project area, and Lake Borgne which is located on the eastern edge of the project area.

FISH AND WILDLIFE RESOURCES

Description of Habitats

Habitat types in the project area include forested wetlands (i.e., bottomland hardwoods and/or swamps), non-wet bottomland hardwoods, marsh, open water, and developed areas. Due to urban development and a forced-drainage system, the hydrology of most of the forested habitat has been altered. The forced-drainage system has been in operation for many years, and subsidence is evident throughout the areas enclosed by levees.

Wetlands (forested, marsh, and scrub-shrub) within the study area provide plant detritus to adjacent coastal waters and thereby contribute to the production of commercially and recreationally important fishes and shellfishes. Wetlands in the project area also provide valuable water quality functions such as reduction of excessive dissolved nutrient levels, filtering of waterborne contaminants, and removal of suspended sediment. In addition, coastal wetlands buffer storm surges reducing their damaging effect to man-made infrastructure within the coastal area.

Factors that will strongly influence future fish and wildlife resource conditions outside of the protection levees include freshwater input and loss of coastal wetlands. Depending upon the deterioration rate of marshes, the frequency of occasional short-term saltwater events may increase. Under that scenario, tidal action in the project area may increase gradually as the buffering effect of marshes is lost, and use of that area by estuarine-dependent fishes and shellfish tolerant of saltwater conditions would likely increase. Regardless of which of the above factors ultimately has the greatest influence, freshwater wetlands within and adjacent to the project area will probably experience losses due to development, subsidence, and erosion.

The ongoing loss of coastal Louisiana wetlands (approximately 1,149 square miles between 1956 and 2004; average loss rate of 24 square miles per year) was recently exacerbated by Hurricanes Katrina and Rita in 2005. Those hurricanes caused an initial loss of wetlands equivalent to 9 years (approximately 217 square miles) of mean annual losses. Louisiana wetlands provide 26 percent of the seafood landed in the conterminous United States and over 5 million migratory waterfowl utilize those wetlands every year. In addition, those wetlands provide protection to coastal towns, cities and their infrastructure, as well as important infrastructure for the nation's

oil and gas industry.

Non-wet bottomland hardwoods within the project area also provide habitat for wildlife resources. Between 1932 and 1984, the acreage of bottomland hardwoods in Louisiana declined by 45 percent (Rudis and Birdsey 1986). By 1970, Jefferson Parish was classified as entirely urban or nonforested in the U.S. Forest Service's forest inventory with most of this loss resulting from development within non-wet areas inside the hurricane protection levees. A large percentage of the original bottomland hardwoods within the Mississippi River floodplain in the Deltaic Plain are located within levees. However, losses of that habitat type are not regulated or mitigated with the exception of impacts resulting from Corps projects as required by Section 906(b) of the Water Resources Development Act of 1986.

As previously mentioned, the Service has provided FWCA Reports for the two-subject protection projects. Those reports contain a thorough discussion of the significant fish and wildlife resources (including those habitats) that occur within the study area. For brevity, that discussion is incorporated by reference herein but the following brief descriptions are provided to update the previously mentioned information.

Forested Habitats

Forested habitats in the study area are divided into two major types; bottomland hardwood forests and cypress-tupelo swamps. Bottomland hardwood forests found in the project area occur primarily on the natural levees of the Mississippi River or former distributary channels. Dominant vegetation may include sugarberry, water oak, live oak, bitter pecan, black willow, American elm, Drummond red maple, Chinese tallow-tree, boxelder, green ash and elderberry. Most bottomland hardwoods that are located within the constructed hurricane protection projects have been degraded by forced drainage and resultant subsidence. Those areas are also often fragmented by development. Conversely, those bottomland hardwoods located outside the protection levees or in areas where structures through the levees maintain a hydrologic connection, still retain many wetland functions and values.

Cypress-tupelo swamps are located along the flanks of larger distributary ridges as a transition zone between bottomland hardwoods and lower-elevation marsh or scrub-shrub habitats. Cypress-tupelo swamps exist where there is little or no salinity, usually minimal daily tidal action and are usually flooded throughout most of the growing season. Bald cypress-tupelugum are the dominant vegetation within this habitat type, however, Drummond red maple, green ash, and black willow are also common. Cypress swamps that are within the levee system and under forced drainage are often dominated by bald cypress, but vegetative species more typical of bottomland hardwoods will dominate the under- and mid-story vegetation. These sites will often have ecological functions closer to those of a bottomland hardwood. Because of their altered hydrology, these areas can potentially convert to sites dominated by bottomland hardwood species.

Marshes

Marsh types within the project area include fresh, intermediate, brackish, and saline. Fresh marshes occur at the upper ends of intertributary basins and are often characterized by floating or semi-floating organic soils and minimal daily tidal action. Vegetation may include maidencane, bulltongue, cattail, California bulrush, pennywort, giant cutgrass, American cupscale, spikerushes, bacopa, and alligatorweed. Associated open water habitats may often support extensive beds of floating-leafed and submerged aquatic vegetation including water hyacinth, Salvinia, duckweeds, American lotus, white water lily, water lettuce, coontail, Eurasian milfoil, hydrilla, pondweeds, naiads, fanwort, wild celery, water stargrass, elodea, and others.

Intermediate marshes are a transitional zone between fresh and brackish marshes and are often characterized by organic, semi-floating soils. Typically, intermediate marshes experience low levels of daily tidal action. Salinities are negligible or low throughout much of the year, with salinity peaks occurring during late summer and fall. Vegetation includes saltmeadow cordgrass, deer pea, three-cornered grass, cattail, bulltongue, seashore paspalum, wild millet, fall panicum, and bacopa. Ponds and lakes within the intermediate marsh zone often support extensive submerged aquatic vegetation including southern naiad, Eurasian milfoil, and wigeongrass.

Brackish marshes are characterized by low to moderate daily tidal energy and by soils ranging from firm mineral soils to organic semi-floating soils. Freshwater conditions may prevail for several months during early spring; however, low to moderate salinities occur during much of the year, with peak salinities in the late summer or fall. Vegetation is usually dominated by saltmeadow cordgrass, but also includes saltgrass, three-cornered grass, leafy three-square, and deer pea. Shallow brackish marsh ponds occasionally support abundant beds of wigeongrass.

Saline marshes occur along the fringe of the coastal wetlands. Those marshes usually exhibit fairly firm mineral soils and experience moderate to high daily tidal energy. Vegetation is dominated by saltmarsh cordgrass but may also include saltgrass, saltmeadow cordgrass, black needlerush, and leafy three-square. Submerged aquatic vegetation is rare. Within the study area, intertidal mud flats are most common in saline marshes.

Scrub-Shrub Habitats

Scrub-shrub habitat is often found along the flanks of distributary ridges and in marshes altered by spoil deposition or drainage projects. Typically it is bordered by marsh at lower elevations and by developed areas, cypress-tupelo swamp, or bottomland hardwoods at higher elevations. Typical scrub-shrub vegetation includes elderberry, wax myrtle, buttonbush, black willow, Drummond red maple, Chinese tallow-tree, and groundselbush. Some scrub-shrub habitat is an early successional stage of bottomland hardwood forests.

Open-Water Habitats

Open-water habitat within the project area consists of ponds, lakes, canals, bays, and bayous. Natural marsh ponds and lakes are typically shallow, ranging in depth from 6 inches to over 2

feet. Typically, the smaller ponds are shallow and the larger lakes and bays are deeper. In fresh and low-salinity areas, ponds and lakes may support varying amounts of submerged and/or floating-leaved aquatic vegetation. Brackish and, much less frequently, saline marsh ponds and lakes may support wigeongrass beds.

Canals and larger bayous typically range in depth from 4 or 5 feet, to over 15 feet. Strong tidal flows may occur at times through those waterways, especially where they provide hydrologic connections to other large waterbodies. Such canals and bayous may have mud or clay bottoms that range from soft to firm. Dead-end canals and small bayous are typically shallow and their bottoms may be filled in to varying degrees with semi-fluid organic material. Erosion due to wave action and boat wakes, together with shading from overhanging woody vegetation, tends to retard the amount of intertidal marsh vegetation growing along the edges of those waterways.

Drainage canals enclosed within the hurricane protection project are stagnant except when pumps are operating to remove water. Runoff from developed areas has likely reduced the habitat value of that aquatic habitat by introducing various urban pollutants, such as oil, grease, and excessive nutrients. Clearing and development has eliminated much of the riparian habitat that would normally provide shade and structure for many aquatic species.

Developed Areas

Developed habitats in the study area include residential and commercial areas, as well as roads and existing levees. Those habitats do not support significant wildlife use. Most of the development is located on higher elevations of the Mississippi River natural levees and former distributary channels; however, vast acreages of swamp and marsh have been placed under forced drainage systems and developed. Limited amounts of agricultural lands occur through out the area; agriculture includes sugarcane farming, cattle production, and haying. Some development in wetlands is also occurring as result of permitted fill activities.

Fishery/Aquatic Resources

Drainage canals in the study area do not support significant fishery resources because of dense vegetation, poor water quality, and inadequate depth. Freshwater sport fishes present in the project area, but outside of the levees, include largemouth bass, crappie, bluegill, redear sunfish, warmouth, channel catfish, and blue catfish. Other fishes likely to be present include yellow bullhead, freshwater drum, bowfin, carp, buffalo, and gar. Estuarine-dependent fishes and shellfishes such as Atlantic croaker, red drum, spot, sand seatrout, spotted seatrout, southern flounder, Gulf menhaden, striped mullet, brown shrimp, white shrimp, and blue crab are found in the intermediate to saline marshes.

Some of the waterbodies in the project area meet criteria for primary and secondary contact recreation and partially meets criteria for fish and wildlife propagation, while others do not meet the criteria for fish and wildlife propagation. Causes for not fully meeting fish and wildlife propagation criteria include excessive nutrients, organic enrichment, low dissolved oxygen levels, flow and habitat alteration, pathogens and noxious aquatic plants. Indicated sources of

those problems include hydromodification, habitat modification, recreational activities, and unspecified upstream sources. Municipal point sources, urban runoff, storm sewers, and onsite wastewater treatment systems are also known contributors to poor water quality in the area.

Deteriorating water quality in the Barataria Basin, at least partially correlated to wetlands loss and a commensurate reduction in the area's waste assimilation capacity, is a major problem affecting fish and wildlife in that portion of the study area. According to Bahr et al. (1983), factors that currently adversely affect water quality in the Barataria Basin are those generally related to urban development and associated urban pollution, altered land-use patterns, and hydrologic modifications (drainage, etc.) within the watershed. Two major human-related causes of water quality degradation include eutrophication and increased levels of toxic substances.

Essential Fish Habitat

Estuarine wetlands and associated shallow waters within the project area have been identified as Essential Fish Habitat (EFH) for both postlarval, juvenile and sub-adult stages of brown shrimp, white shrimp, and red drum, as well as the adult stages of those species in the nearshore and offshore reaches. EFH has also been designated for various life stages of Spanish mackerel, bluefish, cobia, and mangrove snapper in the nearshore, marine-portion of the project area and in the lower portions of the estuary. EFH requirements vary depending upon species and life stage.

Categories of EFH in the project area include estuarine emergent wetlands, estuarine water column, submerged aquatic vegetation, and estuarine water bottoms. Detailed information on Federally managed fisheries and their EFH is provided in the 1998 generic amendment of the Fishery Management Plans for the Gulf of Mexico, prepared by the Gulf of Mexico Fishery Management Council (GMFMC). That generic amendment was prepared in accordance with the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA); (P.L. 104-297). Estuarine-dependent species such as those listed above also serve as prey for other species managed under the MSFCMA by the GMFMC (e.g., red drum, mackerels, snappers, and groupers) and highly migratory species (e.g., billfishes and sharks) managed by the NMFS. Recommendations to minimize and/or avoid impacts to estuarine fishery species were developed by NMFS along with supporting literature and are included in Appendix B.

Wildlife Resources

Mammals known to occur in the project-area bottomland hardwoods and marshes include mink, raccoon, swamp rabbit, nutria, river otter, and muskrat. Those habitats also support a variety of birds including herons, egrets, ibises, least bittern, rails, gallinules, olivaceous cormorant, white pelican, pied-billed grebe, black-necked stilt, sandpipers, gulls, and terns. Forested and scrub-shrub habitats within the study area also provide habitat for many resident passerine birds and essential resting areas for many migratory songbirds including warblers, orioles, thrushes, vireos, tanagers, grosbeaks, buntings, flycatchers, and cuckoos. Many of these and other passerine birds have undergone a decline in population primarily due to habitat loss.

Given the extent of development and drainage, waterfowl use within the hurricane protection system is likely minimal, except in the adjacent wetlands outside the levees. Swamps, fresh and

intermediate marshes usually receive greater waterfowl utilization than brackish and saline marshes because they generally provide more waterfowl food. Migratory species expected to occur in the project area include gadwall, green-winged teal, blue-winged teal, northern shoveler, mallard, pintail, American widgeon, lesser scaup, ring-necked duck, redhead, and canvasback. Resident species expected to occur in that area include mottled duck and wood duck.

The study area also supports resident hawks and owls including the red-shouldered hawk, barn owl, common screech owl, great horned owl, and barred owl. The red-tailed hawk, marsh hawk, and American kestrel are seasonal residents which utilize habitats within the study area.

Amphibians such as the pig frog, bullfrog, leopard frog, cricket frog, and Gulf coast toad are expected to occur in the fresh and low salinity wetlands of the project area. Reptiles such as the American alligator, snapping turtle, softshell turtle, red-eared turtle, and diamond backed terrapin are also expected to occur in the project-area wetlands and waterbodies.

Endangered and Threatened Species

To aid the Corps in complying with their proactive consultation responsibilities under the Endangered Species Act (ESA), the Service provided a list of threatened and endangered species and their critical habitats within the coastal parishes of the New Orleans District in an August 7, 2006, letter to the Corps. The Service recommends that the Corps conduct ESA consultation on each IER as soon as plans are developed and impact locations are identified. If the plans are changed significantly or relocated, or work is not implemented within 1 year following that coordination, we recommend that the Corps reinstate coordination with this office to ensure that the proposed project would not adversely affect any Federally listed threatened or endangered species or their habitat.

Protected Species

The Migratory Bird Treaty Act (MBTA) (40 Stat. 755, as amended; 16 U.S.C. 703 et seq.) and the Bald and Golden Eagle Protection Act (BGEPA) (54 Stat. 250, as amended, 16 U.S.C. 668a-d) offer additional protection to many bird species within the project area including colonial nesting birds and the bald eagle (*Haliaeetus leucocephalus*).

The project area is located where colonial nesting waterbirds may be present. LDWF currently maintains a database of these colonies locations. That database is updated primarily by monitoring the colony sites that were previously surveyed during the 1980s. Until a new, comprehensive coast-wide survey is conducted to determine the location of newly-established nesting colonies, we recommend that a qualified biologist inspect the proposed work sites for the presence of undocumented nesting colonies during the nesting season (e.g. February through September depending on the species). If colonies exist work should not be conducted within 1,000 feet of the colony during the nesting season

Forested habitat in the project-area may provide nesting habitat for the bald eagle, which has officially been removed from the List of Endangered and Threatened Species as of August 8,

2007. Although the bald eagle has been removed from the threatened and endangered species list, it continues to be protected under the MBTA and the BGEPA. The Service developed the National Bald Eagle Management (NBEM) Guidelines to provide landowners, land managers, and others with information and recommendations regarding how to minimize potential project impacts to bald eagles, particularly where such impacts may constitute "disturbance," which is prohibited by the BGEPA. Those guidelines recommend maintaining: (1) a specified distance between the activity and the nest (buffer area); (2) natural areas (preferably forested) between the activity and nest trees (landscape buffers); and (3) avoiding certain activities during the breeding season. The buffer areas serve to minimize visual and auditory impacts associated with human activities near nest sites. Ideally, buffers would be large enough to protect existing nest trees and provide for alternative or replacement nest trees. On-site personnel should be informed of the possible presence of nesting bald eagles within the project boundary, and should identify, avoid, and immediately report any such nests to this office. A copy of the NBEM Guidelines is available at:

<http://www.fws.gov/migratorybirds/issues/BaldEagle/NationalBaldEagleManagementGuidelines.pdf>. If after consulting those guidelines you need further assistance in determining the appropriate size and configuration of buffers or the timing of activities in the vicinity of a bald eagle nest, the please contact this office.

National Wildlife Refuges, Parks, 404(c) area

Located within the study area are the Bayou Segnette and the St. Bernard State Parks, which are operated by the Louisiana Department of Culture, Recreation and Tourism, Office of State Parks. Please contact Mr. John Lavin at 1-888-677-1400 regarding work on those areas.

The Barataria Preserve unit of Jean Lafitte National Historical Park and Preserve (JLNHPP) is located on the west bank of the Mississippi River and managed by the National Park Service (NPS). NPS has no authority to enter into agreements with others to allow uses which adversely affect park lands. Therefore, NPS lands cannot be directly utilized or adversely impacted by any flood control project feature unless authorized explicitly by congress. For additional information concerning NPS lands within the area please 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).

An area adjacent to the Jean Lafitte National Historic Park and Preserve (JLNHPP) was subject to an Environmental Protection Agency (EPA) Final Determination under the Clean Water Act (CWA) Section 404(c) in 1985. According to the EPA Final Determination, the discharge of any dredged or fill material within the approximately 3200 acre site, referred to as the Bayou aux Carpes 404(c) area, is restricted. The EPA action allowed for three specific exceptions, none of which appears to apply to the Corps' current hurricane protection proposal. Previous requests which have fallen outside those exceptions have been denied by EPA as being contrary to the CWA 404(c) determination. One such categorical denial prohibited the Corps from altering the alignment of the West Bank Hurricane Protection Levee such that it would encroach upon the Bayou aux Carpes 404(c) area.

The EPA 404(c) action was intended as an advance notification to the public and agencies of the government's determination under the CWA Section 404 for the area, in the sense of planning aid coordination. In light of this existing determination, we would expect the NEPA work on the portion of the levee forming the 404(c) boundary to thoroughly evaluate the range of feasible alternatives and their environmental impacts, as well as documenting the Corps' legal and regulatory authority for any alternative that would entail impacts to the Bayou aux Carpes 404(c) area.

The Bayou aux Carpes 404(c) is one of only 11 such actions ever completed by EPA. Approximately 2,800 acres within the site are in Federal ownership and Congress is considering legislation to adjust the boundary of the Barataria Preserve to include the Bayou aux Carpes within the JLNHPP. In the meantime, the National Park Service (NPS) has constructive possession of the area. Therefore, the Corps should contact both the NPS (see contacts above) and EPA (Ms. Barbara Keeler, 214/665-6698) regarding any proposed project feature that may impact that area.

The NPS also has constructive possession of additional Federal lands located adjacent to WBV14c. Congress is considering legislation to adjust the boundary of the Barataria Preserve to also include those lands (i.e., CIT tract) within the JLNHPP.

The Service's Bayou Sauvage National Wildlife Refuge is located in the eastern portion of the project area. The National Wildlife Refuge System Improvement Act of 1997 authorized that no new or expanded use of a refuge may be allowed unless it is first determined to be compatible. A compatibility determination is a written determination signed and dated by the Refuge Manager and Regional Refuge Chief, signifying that a proposed or existing use of a national wildlife refuge is a compatible use or is not a compatible use. A compatible use is defined as a proposed or existing wildlife-dependent recreational use or any other use of a national wildlife refuge that, based on sound professional judgment, will not materially interfere with or detract from the fulfillment of the National Wildlife Refuge System mission or the purposes of the national wildlife refuge. A compatibility determination is only required when the Service has jurisdiction over the use. For example, proposed uses that deal exclusively with air space, navigable waters or overly refuges where another Federal agency has primary jurisdiction over the area, would not be subject to compatibility.

Federal agencies proposing a project that includes features on a national wildlife refuge are encouraged to contact the Refuge Manager early in the planning process. The Refuge Manager will work with the project proponent to determine if the proposed project constitutes a "refuge use" subject to a compatibility determination. If the proposed project requires a compatibility determination, a concise description of the project (refuge use) including who, what, where, when, how and why will be needed to prepare the compatibility determination. In order to determine the anticipated impacts of use, the project proponent may be required to provide sufficient data and information sources to document any short-term, long-term, direct, indirect or cumulative impacts on refuge resources. Compatibility determinations will include a public review and comment before issuing a final determination.

All construction or maintenance activities (e.g., surveys, land clearing, etc.) on a National Wildlife Refuge (NWR) will require the Corps to obtain a Special Use Permit from the Refuge Manager; furthermore, all activities on that NWR must be coordinated with the Refuge Manager. Therefore, we recommend that the Corps request issuance of a Special Use Permit well in advance of conducting any work on the refuge. Please contact Kenneth Litzenberger, Project Leader for the Service's Southeast National Wildlife Refuges and Jack Bohannon (985) 822-2000, Refuge Manager for the Bayou Sauvage National Wildlife Refuge for further information on compatibility of flood control features, and for assistance in obtaining a Special Use Permit. Close coordination by both the Corps and its contractor must be maintained with the Refuge Manager to ensure that construction and maintenance activities are carried out in accordance with provisions of any Special Use Permit issued by the NWR.

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. 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.

Future Fish and Wildlife Resources

The combination of subsidence and sea level rise is called submergence or land sinking. As the land sinks the wetlands become inundated with higher water levels, stressing most non-fresh marsh plants, bottomland hardwood plants and even cypress-tupelo swamps leading to plant death and conversion to open water. Other major causes of wetland losses within the study area include altered hydrology, storms, saltwater intrusion (caused by marine processes invading fresher wetlands), shoreline erosion, herbivory, and development activities including the direct and indirect impacts of dredge and fill (Louisiana Coastal Wetlands Conservation and Restoration Task Force and the Wetlands Conservation and Restoration Authority 1998). The continued conversion of wetlands and forested habitat to open water or developed land represent the most serious fish and wildlife-related problems in the study area. Those losses could be expected to cause significant declines in coastal fish and shellfish production and in the study area's carrying capacity for numerous migratory waterfowl, wading birds, other migratory birds, alligators, furbearers, and game mammals. Wetland losses will also reduce storm surge protection of developed lands, and will likely contribute to water quality degradation associated with excessive nutrient inputs.

ALTERNATIVES UNDER CONSIDERATION

The proposed plan involves upgrading the existing flood protection levees, floodwalls, and floodgates around the Greater New Orleans area. Most improvements will be constructed partially, sometimes entirely, within the existing right-of-way (ROW). However, some proposed closures, i.e., the Inner Harbor Navigation Canal and the Gulf Intracoastal Waterway, would require new construction ROWs and may impact high quality habitats. Some alternatives that have been examined include expanding ROWs into the lower quality habitat side of a levee, utilizing floodwalls so that minimal expansion of ROWs would occur and incorporating subsoil

mixing that would also reduce the expansion of a levee ROW.

PROJECT IMPACTS

The Corps has not yet selected a recommended plan but is continuing to evaluate plans at several levels of protection for each IER. Although some construction will occur in developed areas and on existing levees, project implementation will also directly impact marshes, bottomland hardwoods, swamps, and shrub-scrub areas that provide low to high habitat values for diverse fish and wildlife resources. Project impacts would result primarily from levee rights-of-way (ROW) expansion and construction of levees, borrow pits, floodwalls, navigable floodgates, and associated features.

Development is ongoing within the hurricane protection levees; therefore, the Service has assumed that, for this specific project, project-induced development within enclosed wetlands will be insignificant. However, project impacts to non-wet bottomland hardwoods as a result of flood protection improvements should be mitigated.

To quantify anticipated project impacts to fish and wildlife resources, the Service will use the Wetland Value Assessment (WVA) methodology. The WVA was developed to evaluate restoration projects proposed for funding under Section 303 of the Coastal Wetlands Planning, Protection and Restoration Act. The WVA version utilized in this evaluation was modified by the Louisiana Department of Natural Resources to better determine impacts and mitigation needs in forested wetlands. Further explanation of how impacts/benefits are assessed with WVA and an explanation of the assumptions affecting HSI values for each target year will be available for review at the Fish and Wildlife Service's (Service) Lafayette, Louisiana, field office. For tidally influenced marshes the National Marine Fisheries Service will have copies of those WVAs at their Baton Rouge, Louisiana office.

FISH AND WILDLIFE CONSERVATION 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 high value of forested wetlands and marsh for fish and wildlife and the relative scarcity of that habitat type, those wetlands are usually designated as Resource Category 2 habitats, the mitigation goal for which is no net loss of in-kind habitat value. The degraded (i.e., non-wet) bottomland hardwood forest and any wet pastures that may be impacted, however, are placed in 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. Project impacts to wetlands will be minimized to some extent by hauling in material for the levee. Because the project is already, avoiding the project impacts altogether (i.e., the "no action" alternative) is not feasible. Therefore, remaining project impacts should be mitigated via compensatory replacement of the habitat values lost.

Toward that end, the Service recommends that the following planning objectives be adopted to guide future project studies.

1. Conserve important fish and wildlife habitat (i.e., bottomland hardwoods, cypress swamps, fresh and estuarine marsh and associated shallow open water habitats) by minimizing the acreage of those habitats directly affected by flood control features.
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.
3. Operate water control structures in levees to allow for (or maintain) fish and shellfish access into enclosed wetland areas.
4. Avoid adverse impacts to bald eagle nesting locations and wading bird colonies through careful design of levees, other project features and timing of construction.
5. Fully compensate for any unavoidable losses of wetland habitat or non-wet bottomland hardwoods caused by project features.

SERVICE POSITION AND RECOMMENDATIONS

Construction of the increased flood protection would result in un-quantified habitat losses. 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. To the greatest extent possible, situate flood protection features so that destruction of

wetlands and non-wet bottomland hardwoods are avoided or minimized.

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.
3. Avoid adverse impacts to bald eagle nesting locations and wading bird colonies through careful design project features and timing of construction.
4. Forest clearing associated with project features should be conducted during the fall or winter to minimize impacts to nesting migratory birds, when practicable.
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.
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 Service, NMFS, LDWF, Environmental Protection Agency (EPA) and Louisiana Department of Natural Resources (LDNR). The Service shall be provided an opportunity to review and submit recommendations on the all work addressed in those reports.
7. The Corps should avoid impacts to public lands, if feasible. If not feasible the Corps 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 potentially impacted by project features are: Kenneth Litzenberger, Project Leader for the Service's Southeast National Wildlife Refuges and Jack Bohannon (985) 822-2000, Refuge Manager for the Bayou Sauvage National Wildlife Refuge (NWR), Office of State Parks contact Mr. John Lavin at 1-888-677-1400, 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 EPA.
8. If applicable, a General Plan should be developed by the Corps, the Service, and the managing natural resource agency in accordance with Section 3(b) of the FWCA for mitigation lands.
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. 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.

10. If a proposed project feature is changed significantly or is not implemented within one year of the date of our Endangered Species Act consultation letter, we recommend that the Corps reinitiate coordination with this office to ensure that the proposed project would not adversely affect any federally listed threatened or endangered species or their habitat.
11. In general, larger and more numerous openings in a protection levee better maintain estuarine dependent fishery migration. Therefore, as much opening as practicable, in number, size, and diversity of locations should be incorporated into project levees.
12. Flood protection water control structures in any watercourse should maintain pre-project cross section in width and depth to the maximum extent practicable, especially structures located in tidal passes.
13. Flood protection water control structures should remain completely open except during storm events. Management of those structures should be developed in coordination with the Service, NMFS, LDWF, and LDNR.
14. Any flood protection water control structure sited in canals, bayous, or navigation channels that 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.
15. The number and siting of openings in flood protection levees should be optimized to minimize the migratory distance from the opening to enclosed wetland habitats.
16. Flood protection 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.
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 feet per second. However, this may not necessarily be applicable to tidal passes or other similar major exchange points.
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 should be selected that would maintain sufficient flow to prevent siltation.
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 feet 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 isolated without that culvert.

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.
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.
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.
23. The Corps shall fully compensate for any unavoidable losses of wetland habitat or non-wet bottomland hardwoods caused by project features.
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 Corps should provide the necessary funding to ensure mitigation obligations are met on behalf of the public interest.
25. Any proposed change in mitigation features or plans should be coordinated in advance with the Service, NMFS, LDWF, EPA and LDNR.
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 Corps, the Service, NMFS, EPA, LDNR and LDWF. That report should also describe future management activities, and identify any proposed changes to the existing management plan.

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APPENDIX A

Summary of basic mitigation land requirements before land is transferred to the U.S. Fish and Wildlife Service

SUBJECT: Revised Summary of basic mitigation land requirements before land is transferred over to the Service.

The following represents a summary of basic mitigation land requirements before land is transferred over to the Service. This does not necessarily represent a comprehensive list, but does represent our best effort to identify all land requirements within reason.

1. For inclusion into the National Wildlife Refuge (NWR) system the lands must be located within a refuge's acquisition boundary.
2. The Service must be provided copies of any easements/agreements for right-of-way on the property especially as it pertains to maintenance of such right-of-way, frequency of maintenance and costs associated with that maintenance if the maintenance is to be preformed by the landowner.
3. The area must be surveyed prior to acquisition by the United States or transfer to the Fish and Wildlife Service. The survey will be conducted by the Corps of Engineers (Corps) or an approved contractor. Boundaries must be marked and permanent monuments set at all corners. Copies of the surveyor notes, plats, etc. resulting from such survey must be provided to Service.
4. Language must be placed in the deed dedicating the mitigation land to fish and wildlife conservation in perpetuity.
5. When possible any restrictive covenants or liens shall be removed, especially if they could interfere with mitigation implementation, operation and/or maintenance.
6. Completion of a Level 1 survey for hazardous, toxic, and/or radioactive wastes with a copy being provided to the Service. If the Level 1 survey indicates the need for further investigations/surveys, those investigations/surveys must be completed and a copy provided to the Service. Lands having unremediated hazardous, toxic, and/or radioactive wastes present may not be accepted into a NWR. Remediated sites will be assessed for inclusion on a case-by-case basis. Documentation of the level of remediation is to be provided to the Service.
7. Funding mechanism for operation and maintenance of the mitigation lands and mitigation features (e.g., water control structures, timber stand improvements, etc.).
8. Documentation must be provided to the Service describing the mitigation goals and objectives in addition to a description of necessary operation and maintenance activities needed to accomplish the stated goals and objectives.

9. Mineral rights should be purchased. If it is not possible to purchase, then protection of surface rights via the following language:

"The vendors reserve for themselves, their successors and assigns, the right to explore, for, operate, produce, remove and transport, oil and gas from the lands herein described. The vendors reserve unto themselves, their successors and assigns, the right of ingress and egress over the said lands in pursuance of the reservations set forth above.

The land is now subject to oil and gas lease in favor of _____, as per lease of record in the records of _____, _____, pages _____ of Book _____, and the conveyance is subject to the rights of the lessee in said lease.

The oil and gas reservations made by the vendors herein in favor of themselves, their successors and assigns, shall be subject to the following stipulations, and any lease made by the vendors, their successors or assigns, subsequent to the date of this deed, shall contain the following stipulations for the protection of the vendee.

The vendors, their successors and assigns, agree that prior to entry upon the land for purposes of exploration, development or production of, oil and/or gas, they shall obtain a Special Use Permit from the U.S. Fish and Wildlife Service, which permit is for the purpose of providing for access and protecting the natural resources of the area for which the land was acquired, and whose terms and conditions will not unreasonably restrain the activities of the vendors, and their successors and assigns.

It is mutually understood between the parties that the intention of the Government in acquiring this area is to create a refuge for, and the protection of, wildlife in the area herein acquired, and the vendors will conform to, and be governed by, and the vendors herein bind themselves, their successors and assigns, agents and employees, to conform to, and be governed by, the rules and regulations pertaining to the protection of wildlife and refuge administration prescribed from time to time by the Secretary of the Interior or his/her authorized agent, the Director of Fish and Wildlife Service, except that such regulations shall not unreasonably restrain the exercise and use by the vendors, their successors and assigns, of the reservation set out in this agreement."

10. The Service would need a title commitment and policy in favor of United States of America that is in the American Land Title Association (ALTA) U.S. Policy 9/28/91 format as provided in Title Standards 2001.

If the title remains with the local-sharer or the Corps a General Plan as provided for under Section 3 of the Fish and Wildlife Coordination Act (48 Stat. 401; 16 U.S.C. 661 et seq.) must be written. However, the Service may chose to not manage lands for which it does not have title.

APPENDIX B

National Marine Fisheries Service Baton Rouge Field Office

Recommendations for Fisheries Friendly Design and Operation of Hurricane and Flood Protection Water Control Structures and Supporting Appendices

SUMMARY

The purpose of this document is to: 1) identify design and operational guiding principles that would optimize passage of estuarine dependent marine fisheries species, or at least, minimize adverse impacts to their passage through hurricane and flood protection water control structures planned for the New Orleans District of the U.S. Army Corps of Engineers; and, 2) provide background literature for environmental justification and documentation. Specific projects for which this guidance should be considered include the Mississippi River and Tributaries, Morganza to the Gulf of Mexico Hurricane Protection Project; Donaldsonville to the Gulf Project; Supplemental Appropriations Projects, and the Louisiana Coastal Protection and Restoration Project (LACPR). However, these guiding principles would also pertain to any civil works projects that could include combinations of levees and/or water control structures. Project delivery teams should remain flexible to adapt these design principles on a case-by-case basis as new fishery resource information and project-specific hydraulics data become available.

In general, the ability of estuarine dependent marine fishery organisms to migrate to and from coastal habitats decreases as structural restrictions increase, thereby reducing fishery production. The physical ability (i.e., swimming speed) to navigate through a structure is not the only factor influencing fish passage. Both behavioral and physical responses govern migration and affect passage of fishery organisms through structures. These responses may vary by species and life stage. In addition, most marine fishery species are relatively planktonic in early life stages and are dependent on tidal movement to access coastal marsh nursery areas. For this reason, in general, the greater the flow through a structure into a hydrologically affected wetland area, the greater the marine fishery production functions provided by that area.

Data on marine fishery species migrations in the Gulf of Mexico are too limited to allow the development of definitive design and operational considerations for water control structures that would guarantee the protection of marine fishery production. Anecdotal comparisons can be made with data from water intake and fish passage studies from the west and east coasts. It should not be assumed that structures that have been determined to provide sufficient drainage capacity also optimize or provide adequate fishery passage. More investigation is warranted to refine and adaptively manage water control structure design and operations to minimize adverse impacts to fishery passage. Case specific recommendations for some features under the Mississippi Tributaries, Morganza to the Gulf of Mexico Hurricane Protection Project and LACPR are provided in the appendices. In addition, biological background information is provided in the appendices to assist in preparation of environmental documents required by the National Environmental Policy Act (NEPA).

Summary of guiding principles for designing and operating flood protection water control structures to maintain marine fishery passage:

- Generally, bigger and more numerous openings in hurricane and flood protection levees better maintain estuarine dependent fishery migration. As much opening as practicable, in number, size, and diversity of location should be considered.
- Flood protection water control structures in any watercourse should maintain pre-project cross section in width and depth to the maximum extent practicable, especially structures located in tidal passes.
- Flood protection water control structures should remain completely open except during storm events.
- Any flood protection water control structure sited in canals, bayous, or navigation channels that do 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.
- The number and siting of openings in flood protection levees should be optimized to minimize the migratory distance from the opening to enclosed wetland habitats.
- Structures 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.
- To the maximum extent practicable, structures should be designed and/or culverts selected such that average flow velocities during peak flood or ebb tides do not exceed 2.6 feet/second. This may not necessarily be applicable to tidal passes or other similar major exchange points.
- 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 should be selected that would maintain sufficient flow to prevent siltation.
- 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 feet and 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 isolated without that culvert.
- 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.
- 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.
- Operational plans 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.

INTRODUCTION

Various flood protection and environmental water control structures in hurricane protection levees are being designed and considered for inclusion with ongoing local and federal civil works projects within the boundaries of the New Orleans District. Design purposes of the structures vary and may include maintaining safe navigation and optimizing drainage and passage of fishery organisms. For the Morganza to the Gulf of Mexico hurricane protection project, an interagency Habitat Evaluation Team (HET) and NOAA's National Marine Fisheries Service (NMFS) identified economically important fishery species that should be considered when assessing structure impacts on estuarine fisheries migration. Both the federal and state governments manage some of these species. Primary species that could be affected by flood protection structures in Louisiana include brown shrimp, white shrimp, blue crab, red drum, black drum, spotted seatrout, sand seatrout, southern flounder, and gulf menhaden. Some information is included herein on forage species, the production of which is important to maintain as they serve as important links of the aquatic food web for many of the managed fishery species.

The Baton Rouge office of NMFS has developed preliminary design principles for hurricane and flood protection water control structures to reduce impacts to living marine resources, especially related to migrations of estuarine dependent species. The basis for the following recommended guiding principles is briefly discussed where supporting literature is available. Case specific examples for some features under the Mississippi River and Tributaries, Morganza to the Gulf of Mexico hurricane protection project and the Louisiana Coastal Protection and Restoration Project are provided in the appendices. Basic behavior and physiology effects on the passage of fishery organisms are discussed in detail in appendices C and D, to aid federal agencies in environmental evaluations and descriptions under NEPA.

This document has been developed in consideration of input from the interagency HET, university faculty, fish passage staff of various agencies, and cursory literature reviews. These design considerations are intended to address potential impacts to living marine resources pursuant to the Fish and Wildlife Coordination Act and the Magnuson-Stevens Fishery Conservation and Management Act. Impacts to resources managed under other authorities, such as the Endangered Species Act or the Marine Mammal Protection Act, are not addressed in this document.

GUIDING PRINCIPLES FOR DESIGNING FISHERIES FRIENDLY FLOOD PROTECTION WATER CONTROL STRUCTURES

1. Generally, bigger and more numerous openings in hurricane and flood protection levees better maintain estuarine dependent fishery migration. As much opening as practicable, in number, size, and diversity of location should be considered.

Most of Louisiana's commercial and recreational fishery species must have access to estuarine marshes to successfully complete some part of their life cycle (i.e., they are estuarine-dependent). Estuarine-dependent fishery productivity is a measure of standing crop (the number of fishery organisms present at a point in time) and the turnover rate (the rate at which the population is

replaced). All things being equal, fishery production would be lower following levee and water control construction if structures retard turnover rate. This would be the case even while standing crop may appear normal. Restrictions in tidal movement caused by water control structures and levees would result in degraded or substantially changed species composition, which could alter fishery production and/or displace fisheries.

Marine transient species emigrate (i.e., move from coastal marshes towards Gulf waters) towards higher salinity water; therefore, a structure that maintains the greatest degree of opening while allowing the project objectives to be met would be desirable (Rogers et al. 1992).

2. Flood protection water control structures in any watercourse should maintain pre-project cross section in width and depth to the maximum extent practicable, especially structures located in tidal passes.

Water control structures should be designed to have a water flow capacity (and similar dimensions where possible) comparable to the waterway before construction. Restricted water exchange in marshes enclosed by levees and water control structures diminishes recruitment and standing stocks of species that must migrate from coastal spawning sites to marsh nurseries (Rogers et al. 1994). As the amount of hydrologic control increases, the effect on migration and production of marine transients and residents increases. Greater restriction decreases turn over rate of estuarine-dependent fishery organisms, which decreases their production (Rogers et al. 1992). Slotted and fixed crest weirs have been found to delay immigration. As the degree of restriction increased from slotted weirs, to low elevation weir, and to fixed crest weirs, greater impacts to different fisheries species and their emigration were observed.

Design considerations for hurricane and flood protection water control structures should include features to accommodate vertical and horizontal fishery distribution patterns within interior marsh tidal pathways and coastal passes. Fishery organisms exhibit preferences by species, life stage, and in some cases tide cycle, for vertical and horizontal distribution within smaller or interior marsh tidal connections (Table 1). Behavioral and physiological responses, such as diel vertical migration, affect these preferred distribution patterns.

Study of Keith Lake Pass in Texas revealed that all portions of the water column, both vertically and horizontally, are used by fishery organisms (Hartman et al. 1987). Most estuarine-dependent fishery species preferred the bottom or shore zones during flood tides, but were much denser near the shores of the pass, in slower moving water, on ebb tide. This lateral movement on slack to ebb tides appears to be a behavioral action to prevent displacement from the pass during ebb tide to accelerate movement to marsh nursery areas. The study identified the response to light cycles with midday densities greatest at bottom and densities greatest at surface during dawn to dusk. Similar within pass distribution patterns were reported by Sabins and Truesdale at Grand Isle, Louisiana (1974).

Table 1. Table on fishery preference within the water column (Marotz et al. 1990; Herke and Rogers 1985; Hartman et al. 1987; Sabins and Truesdale 1974). "a" denotes juveniles; "b" denotes immigrating; "c" denotes emigrating; "e" denotes ebb tide; "f" denotes flood tide.

Species	Vertical Distribution			Horizontal Distribution
	Surface	Mid-depth	Bottom	Shore/Nearshore
brown shrimp ^b	X	X		X ^c
white shrimp ^b	X	X		
white shrimp ^c		X		X ^c
blue crab	X			X ^e
red drum ^a				X ^c
red drum ^b		X	X	
red drum ^c			X	
bay anchovy	X			
striped mullet	X			
Atlantic croaker ^a	X	X		X ^c
Atlantic croaker		X	X	X ^c
spotted seatrout		X	X	
sand seatrout		X	X	X ^c
gulf menhaden	X	X		
southern flounder				X ^f
black drum				X ^c

3. Flood protection water control structures should remain completely open except during storm events.

Fish passage should be optimized by the duration that structures remain fully open. Rozas and Minello (1999) reported that even when water-control structures were open, the densities of transient species were low inside areas enclosed by levees and water control structures as compared to natural areas.

Fisheries migration that temporarily may be impacted with storm related closures are listed in Table 2. The degree of impact would be influenced by the timing and duration of a structure closure relative to peak migration.

Table 2. Migration of economically important fisheries in Louisiana that temporarily may be impacted with storm related closures.

Species	Migration Period Overlapping with Hurricane Season
brown shrimp	April - mid July
white shrimp	July - November
blue crab	June - September
spotted seatrout	April - October
sand seatrout	April - October
red drum	August - December
black drum	March - July
southern flounder	September - October

4. Any flood protection water control structures sited in canals, bayous, or navigation channels that do 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.

Hartman et al. (1987) recommended structures not be constructed in a tidal pass. If a structure was constructed, they recommended the incorporation of several gates at several vertical and horizontal locations, with baffles near shore. Baffles near shore are to direct shore or near shore fish passage on ebb tides through the available structure opening(s) (e.g., gates in wing walls).

Structures should be designed and operated with multiple openings if the pre-project water depth and widths of a channel are not maintained. Multiple openings are necessary to optimize passage of fishery organisms that prefer to migrate along the sides, bottom, and top of channels. For example, Rogers et al. (1992^a) recommended opening some vertical slots and top, middle, and bottom gates in a structure with multiple slots and gates.

5. The number and siting of openings in flood protection levees should be optimized to minimize the migratory distance from the opening to enclosed wetland habitats.

The location and number of structures likely affects the abundance and distribution of estuarine fishery species within habitats that would be located on the protected side of levees and water control structures. Rogers et al. (1992^c) determined that marine transient species were most numerous nearest the structures, partially due to the proximity of the openings with respect to the area enclosed. Similarly, other studies have shown there is a decrease in fishery species abundance and diversity the greater the distance from the access point (Peterson and Turner 1994). This can become more pronounced if an environmental gradient (e.g., salinity) exists between an access point and the interior habitat located on the protected side of structures (Cashner 1994).

6. Structures 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.

Study of Keith Lake Pass in Texas revealed vertical and horizontal distribution patterns of fishery organisms in the pass (Hartman et al. 1987). Estuarine-dependent fishery organisms preferred the bottom or near shore zones on flood tides. Most organisms appeared near shores of the pass on ebb tide in slower moving water. Baffles near shore are to direct shore or near shore fish passage through the structure.

Many fish migrate along the water bottom. Water control structures with crests or inverts higher than the lower portion of a channel could impede migration through the deep-water portions of channels. Ramps can provide a means to guide organisms over and through structures and increase access of fisheries organisms to enclosed habitat (Lafleur 1994). Various ramp designs

need to be investigated.

7. To the maximum extent practicable, structures should be designed and/or culverts selected such that average flow velocities during peak flood or ebb tides do not exceed 2.6 feet/second.

In this preliminary investigation, no studies were located that evaluated the impacts of swimming speeds for the fishery species and life stages of concern in Louisiana. To avoid preventing or reducing ingress or egress of fishery organisms, preliminary guidance on water velocities through structures in Louisiana could be based on anecdotal comparisons with data available on general swimming speeds from studies on the west and east coasts (Tables 3 and 4).

Swimming speeds of estuarine and marine fish and crustaceans is a function of shape, stage of development, length, ambient temperature, light, and duration required for swimming performance. For most species, absolute speed increases as size increases. Generally, fish swimming speeds range from 2-4 body lengths/second with burst speeds up to 5 body lengths/second (Meyers et al. 1986).

Water intake studies have shown that maintaining water velocities less than 0.5 ft/sec would protect most fish and their life stages from being adversely affected by those flows (USEPA 2004). The species and life stages of fish for that study could not be located at this time and further investigation for Gulf of Mexico species is warranted. They also recommended creating horizontal velocity fields to avoid adverse affects on fish because fish are better able to orient to horizontal verses vertical flow. This could allow selective avoidance of water flows not preferred by fish or minimize disorientation or mortality rates caused by flows.

Eberhardt (personal communication) reported velocities exceeding 0.82 feet/second began to impede fish passage. Fish passage was decreased by 50% for velocities exceeding 2.6 feet/second. Based on evaluation of freshwater species, Gardner (2006) recommends keeping velocities through round culverts less than 1.8 ft/sec during 90% of the fish migration season. To improve fish passage through culverts, installing baffles within culverts should be considered to reduce flow velocity barriers for fish (Pacific Watershed Associates 1994).

Table 3. Water flow velocity thresholds for affecting fish passage or avoiding impingement within flows or on screens.

Source	Water Flow Velocity (ft/sec)	
Alyson Eberhardt, personal communication	0.82	Begin to impede
	2.62	Decreased fish passage by 50%
Gardner 2006	1.8	Critical velocity (freshwater fish)
Meyers et al. 1986	<0.49	To avoid impingement

USEPA 2004	<0.50	Protected 96% of the fish tested from impingement
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Table 4. Sustained fish swimming speeds. Adapted from Meyers et al. (1986). Note that no data was located for the fisheries species and life stages for the Gulf of Mexico.

Fish/life stage	Swimming Speeds (ft/sec)
Atlantic herring	0.19 – 0.3
Mullet	4.19
Horse mackerel	4.46
Sole	0.19 - 0.3
most larvae	0.82 – 0.98

Based on these limited data, larval fish could be adversely impacted by water flow rates exceeding 0.82 feet/second. Post-larval and juvenile stages of flounders could be impacted by flow rates around 1.0 ft/sec. Other species or larger life stages likely would not be adversely impacted until flow rates exceed 2.62 feet/second based on inferences from these data. Water flow velocity monitoring in the Terrebonne Basin by the U.S. Fish and Wildlife Service has found maximum flows through existing open channels exceeding 1.0 feet /second and in larger saline marsh channels and passes exceeding 2.0 feet/second.

If the spatial extent of flow velocity fields exceed the distance that can be traveled with sustained or burst swimming speeds of fishery organisms, those flows could prevent or reduce ingress or egress during the time which those flows exist. However, the degree of mortality from not being able to access nursery and foraging habitat is not known. High flow rates may aid passage of larval fish that primarily depend on passive transport for migratory distribution and access to estuarine habitat on the protected side of levees, if the high flows do not induce mortality from injury or fatigue. Water flow could exceed the fish swimming rates for short periods and still provide passage during low flows or during still water.

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

Design considerations should include installing baffles within culverts to reduce flow velocity barriers (Pacific Watershed Associates 1994). Passage of salmon and herring species has been shown to be impaired by culverts. With baffles or other similar features, still water areas could be created to enhance fish passage.

If water control structures include plunge pools, the invert elevation of the structure could be equal to the depth of the plunge pool if the plunge pool is deeper than the pre-project water depth. This deeper invert would optimize passage of fisheries species, in particular bottom dweller species.

Fish often require visual cues for orientation and exhibit faster swimming speeds at increased

light levels. Herring type fish (e.g., gulf menhaden) are particularly sensitive to light levels. However, although herring exhibited a preference for unshaded portions of treatments during both day and night periods, as little as 1.4% of the ambient light was necessary for their passage through a culvert (Mosser and Terra 1999).

9. Culverts should be installed in construction access roads unless otherwise recommended by the resource agencies. At a minimum, there should be one, 24-inch culvert placed every 500 feet and at all water 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, even if the road is less than 500 feet long, if an area would be hydrologically isolated without that culvert.

10. Water control structures should be designed to allow rapid opening in the absence of an offsite power source after storm passage and return of normal water levels.

Regardless of structure size, designs and contingency plans should include means to rapidly open the water control structures when flooding risks subside after a storm. Designs and plans should include infrastructure, equipment, and staff necessary to open the structures even if offsite electricity is not available. Design safeguards should be developed to protect the structures from being damaged rendering them inoperable and locked in a closed configuration after passage of a storm.

11. Levee alignment 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.

12. Operational plans 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.

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APPENDIX C

BEHAVIOR

The physical ability (i.e., swimming speed) to navigate a structure is not the only factor influencing fish passage, especially for small structures. Behavioral responses to stimuli individually or interactively affect passage with physiological constraints or responses. Behavior generally can be categorized as schooling and non-schooling behavior.

SCHOOLING BEHAVIOR

Schooling behavior consists of strategies that provide hydrodynamic efficiency, reduced predation, increased efficiency in finding food, and increased reproductive success. Water control structures for flood protection impact large numbers of fishery organisms due to this group response. This could be because fish exhibit the tendency to approach and orient to other members of the species (i.e., biotaxis). This orientation confers a hydrodynamic advantage that is more efficient than individuals due primarily to vortices setup by lead fish. Schools function as a living organism where the group reacts to stimuli as an individual. It is this group reaction

that influences greater affect on passage through water control structures.

NON-SCHOOLING BEHAVIOR

Agonistic, territorial, and hierarchical behaviors are examples of non-schooling behavior exhibited by fish. Agonistic and territorial behaviors are largely unknown for the listed estuarine and marine fishery species of concern and their life stages. Structures that create physically taxing water flow velocities and some low flow areas may encourage these behaviors as fish compete for resting areas similar to competition seen with fish competing for resting areas within shrimp trawls or behind rocks in river riffle/pool habitat. It is possible these behavioral responses overall may not be that influential on fish passage through a structure, but may come more into play during low flow conditions such as lower tides or slack tide. Hierarchical behavior can often be driven by a combination of physiological responses and will be discussed in that section. Overall, investigation on behavioral responses to water control structures is needed to avoid and minimize adversely impacting fishery passage if not optimizing it.

APPENDIX D

PHYSIOLOGICAL

Fishery species and life stages react differently to a current of water (i.e., rheotaxis). Generally, fish are better able to orient to horizontal versus vertical flow (Meyers et al. 1986).

Locomotion

There are two means for migratory transport of estuarine and marine fish and crustaceans: passive and active transport. Passive transport is drift of organisms carried by the tides and currents. Larval and post-larval fish and crustacean life stages are predominately transported passively by tides and currents. Passive transport via tidal forcing can play a strong role in migration of sub-adult and adult brown shrimp, white shrimp, and blue crabs. Active transport is movement by swimming, which is the primary means of locomotion for sub-adults and adult fish.

SWIMMING SPEED

Refer to guiding principles number 7 for details on swimming speeds relative to impacts on fish passage.

BEHAVIORAL/PHYSIOLOGY INTERACTION

Many fishery organisms exhibit hierarchical behavior. This is a direct response to stimuli, such as astronomical (e.g., tidal rhythm) or meteorological driven flows. For example, brown shrimp mediate transport by circadian or diel vertical migration. Brown shrimp move down in the water column or cease activity as they become negatively buoyant when low salinity and temperature water develop in estuaries with north winds associated with spring fronts. Brown shrimp activity resumes with their movement up in the water column with increasing water temperature, salinity, and hydrostatic pressure associated with the southerly gulf return following after a cold front (Rogers et al. 1993). Similar selective tidal stream transport was reported by Hartman et al. (1987). Fishery organisms identify tide changes by detecting altered velocity, salinity,

temperature, all of which can cue staging for immigration with an incoming tide. Future tidal pass or inlet studies are needed for better information on vertical distribution, depth preferences, and changes in buoyancy or behavior to evaluate active and passive transport of fishery organisms.

APPENDIX E

Reference Websites, Fish Passage Agency Representatives, and University Faculty

Baker, C. and J. Boubee. 2003. Using ramps for fish passage past small barriers. *Water and Atmosphere* 11(2). June.

<http://www.niwascience.co.nz/pubs/wa/11-2/passage>

USACE Portland District, Fish Passage Team

http://www.nwp.usace.army.mil/pm/e/en_fish.asp

USACE, ERDC, Coastal Hydraulics Lab

<http://chl.erdc.usace.army.mil/CHL.aspx?p=s&a=ResearchAreas;22>

USFWS Fish Passage Decision Support System

<http://fpdss.fws.gov/index.jsp>

NC State's Center for Transportation and the Environment website:

<http://www.itre.ncsu.edu/>

[http://itre.ncsu.edu/CTE/gateway/downloads/Culvert%20Impact%20Study\(December2002\).pdf](http://itre.ncsu.edu/CTE/gateway/downloads/Culvert%20Impact%20Study(December2002).pdf)

<http://itre.ncsu.edu/CTE/gateway/downloads/FishPassage.pdf>

FishXing software and learning systems for fish passage through culverts. This software is intended to assist engineers, hydrologists, and fish biologists in the evaluation and design of culverts for fish passage. It is free and available for download.

<http://stream.fs.fed.us/fishxing/>

- Allows for comparison of multiple culverts designs within a single project.
- Calculates hydraulic conditions within circular, box, pipe-arch, open-bottom arch, and embedded culverts.
- Contains default swimming abilities for numerous North American fish species.
- Contains three different options for defining tailwater elevations.
- Calculates water surface profiles through the culvert using gradually varied flow equations, including hydraulic jumps.

- Outputs tables and graphs summarizing the water velocities, water depths, outlet conditions, and lists the limiting fish passage conditions for each culvert.

USFWS Fish Passage National Coordinator
thomas_sinclair@fws.gov

NOAA, NMFS
Eric.Hutchins@noaa.gov
James.G.Turek@noaa.gov
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Louisiana State University Coastal Fisheries Institute
Jim Cowan; jhcowan@lsu.edu
Bruce Thompson; coetho@lsu.edu

University of Texas Marine Science Institute
Lee Fuiman; lee@utmsi.utexas.edu

APPENDIX C
LATIN NAMES FOR SOME SPECIES DISCUSSED IN THE REPORT
AND/OR FOUND IN THE PROJECT AREA

PLANTS

American sycamore	<i>Platanus occidentalis</i>
Black willow	<i>Salix nigra</i>
Box elder	<i>Acer negundo</i>
Chinese tallow-tree	<i>Triadica sebifera</i>
Cypress	<i>Taxodium distichum</i>
Eastern cottonwood	<i>Populus deltoides</i>
Green ash	<i>Fraxinus pennsylvanica</i>
Overcup oak	<i>Quercus lyrata</i>
Red maple	<i>Acer rubrum</i>
Red mulberry	<i>Morus rubra</i>
Roughleaf dogwood	<i>Cornus drummondii</i>
Sugarberry	<i>Celtis laevigata</i>
Sweet pecan	<i>Carya illinoensis</i>
Water oak	<i>Quercus nigra</i>
Willow oak	<i>Quercus phellos</i>

FISH

Banded pygmy sunfish	<i>Elassoma zonatum</i>
Bigmouth buffalo	<i>Ictiobus cyprinellus</i>
Black crappie	<i>Pomoxis nigromaculatus</i>
Blue catfish	<i>Ictalurus furcatus</i>
Bluegill	<i>Lepomis macrochirus</i>
Blue sucker	<i>Cycleptus elongates</i>
Brook silverside	<i>Labidesthes sicculus</i>
Bullhead minnow	<i>Pimephales vigilax</i>
Channel catfish	<i>Ictalurus punctatus</i>
Chub shiner	<i>Notropis potteri</i>
Common carp	<i>Cyprinus carpio</i>
Dollar sunfish	<i>Lepomis marginatus</i>
Dusky darter	<i>Percina sciera</i>
Emerald shiner	<i>Notropis atherinoides</i>
Flathead catfish	<i>Pylodictis olivaris</i>
Freshwater drum	<i>Aplodinotus grunniens</i>
Ghost shiner	<i>Notropis buchanani</i>
Gizzard shad	<i>Dorosoma cepedianum</i>
Golden shiner	<i>Notemigonus crysoleucas</i>
Golden topminnow	<i>Fundulus chrysotus</i>

Goldeye	<i>Hiodon alosoides</i>
Grass carp	<i>Ctenopharyngodon idella</i>
Green sunfish	<i>Lepomis cyanellus</i>
Inland silverside	<i>Menidia beryllina</i>
Largemouth bass	<i>Micropterus salmoides</i>
Logperch	<i>Percina caprodes</i>
Longear	<i>Lepomis megalotis</i>
Longnose gar	<i>Lepisosteus osseus</i>
Mimic shiner	<i>Notropis volucellus</i>
Mississippi silvery minnow	<i>Hybognathus nuchalis</i>
Orangespotted sunfish	<i>Lepomis humilis</i>
Pallid sturgeon	<i>Scaphirhynchus albus</i>
Paddlefish	<i>Polyodon spathula</i>
Pugnose minnow	<i>Opsopoeodus emiliae</i>
Redear	<i>Lepomis microlophus</i>
Red shiner	<i>Cyprinella lutrensis</i>
Redspotted sunfish	<i>Lepomis miniatus</i>
River carpsucker	<i>Carpodes carpio</i>
River darter	<i>Percina shumardi</i>
Shortnose gar	<i>Lepisosteus platostomus</i>
Shovelnose sturgeon	<i>Scaphirhynchus platyrhynchus</i>
Silverband shiner	<i>Notropis shumardi</i>
Silver chub	<i>Macrhybopsis storeriana</i>
Skipjack	<i>Alosa chrysochloris</i>
Slough darter	<i>Etheostoma gracile</i>
Smallmouth buffalo	<i>Ictiobus bubalus</i>
Spotted bass	<i>Micropterus punctulatus</i>
Spotted gar	<i>Lepisosteus oculatus</i>
Striped bass	<i>Morone saxatilis</i>
Threadfin shad	<i>Dorosoma petenense</i>
Warmouth	<i>Lepomis gulosus</i>
Western mosquitofish	<i>Gambusia affinis</i>
White bass	<i>Morone chrysops</i>
White crappie	<i>Pomoxis annularis</i>
White-striped bass hybrid	<i>Morone saxatilis x Morone chrysops</i>
Yellow bass	<i>Morone mississippiensis</i>
Yellow bullhead	<i>Ameiurus natalis</i>

AMPHIBIANS

American bullfrog	<i>Rana catesbeiana</i>
Cope's gray treefrog	<i>Hyla chrysoscelis</i>
Dwarf salamander	<i>Eurycea quadridigitata</i>
Eastern narrow-mouthed toad	<i>Gastrophryne carolinensis</i>

Fowler's toad	<i>Bufo fowleri</i>
Green treefrog	<i>Hyla cinerea</i>
Northern cricket frog	<i>Acris crepitans</i>
Pig frog	<i>Rana grylio</i>
Small mouth salamander	<i>Ambystoma texanum</i>
Southern leopard frog	<i>Rana sphenocephala</i>
Spring peeper	<i>Pseudacris crucifer</i>
Western chorus frog	<i>Pseudacris triseriata</i>
Gulf coast toad	<i>Bufo vallicipes</i>

REPTILES

American Alligator	<i>Alligator mississippiensis</i>
Cooter	<i>Pseudemys floridana</i>
Copperhead	<i>Agkistrodon contortrix</i>
Cottonmouth	<i>Agkistrodon piscivorus</i>
Diamondback terapin	<i>Malaclemys terepin</i>
Eastern stinkpot turtle	<i>Sternotherus odoratus</i>
False map turtle	<i>Graptemys pseudogeographica</i>
Five-lined skink	<i>Eumeces fasciatus</i>
Racer	<i>Coluber constrictor</i>
Red eared turtle	<i>Pseudemys scripta</i>
Ring-necked snake	<i>Diadophis punctatus</i>
Smooth softshell turtle	<i>Trionyx muticus</i>
Snapping turtle	<i>Chelydra serpentina</i>
Watersnake	<i>Nerodia fasciata</i>

BIRDS

American wigeon	<i>Anas americana</i>
Anhinga	<i>Anhinga anhinga</i>
Bald eagle	<i>Haliaeetus leucocephalus</i>
Barred owl	<i>Strix varia</i>
Belted kingfisher	<i>Ceryle alcyon</i>
Black-necked stilt	<i>Himantopus mexicanus</i>
Blue-winged teal	<i>Anas discors</i>
Carolina chickadee	<i>Poecile carolinensis</i>
Double-crested cormorant	<i>Phalacrocorax auritus</i>
Eastern meadowlark	<i>Sturnella magna</i>
Gadwall	<i>Anas strepera</i>
Great blue heron	<i>Ardea herodias</i>
Great egret	<i>Ardea alba</i>
Greater white-fronted goose	<i>Anser albifrons</i>

Green heron	<i>Butorides virescens</i>
Green-winged teal	<i>Anas crecca</i>
Interior least tern	<i>Sterna antillarum athalassos</i>
Mallard	<i>Anas platyrhynchos</i>
Mourning dove	<i>Zenaida macroura</i>
Northern cardinal	<i>Cardinalis cardinalis</i>
Northern pintail	<i>Anas acuta</i>
Osprey	<i>Pandion haliaetus</i>
Pied-billed grebe	<i>Podilymbus podiceps</i>
Red-bellied woodpecker	<i>Melanerpes carolinus</i>
Red-headed woodpecker	<i>Melanerpes erythrocephalus</i>
Red-shouldered hawk	<i>Buteo lineatus</i>
Red-winged blackbird	<i>Agelaius phoeniceus</i>
Snow goose	<i>Chen caerulescens</i>
Solitary sandpiper	<i>Tringa solitaria</i>
Spotted sandpiper	<i>Actitis macularia</i>
White-eyed vireo	<i>Vireo griseus</i>
Wood duck	<i>Aix sponsa</i>

MAMMALS

Bobcat	<i>Lynx rufus</i>
Cotton mouse	<i>Peromyscus gossypinus</i>
Coyote	<i>Canis latrans</i>
Eastern cottontail rabbit	<i>Sylvilagus floridanus</i>
Fox	<i>Vulpes vulpes</i>
	<i>Urocyon cinereoargenteus</i>
Fox squirrel	<i>Sciurus niger</i>
Hispid cotton rat	<i>Sigmodon hispidus</i>
Mink	<i>Mustela vison</i>
Nutria	<i>Myocaster coypus</i>
Muskrat	<i>Ondatra zibethicus</i>
Northern raccoon	<i>Procyon lotor</i>
Swamp rabbit	<i>Sylvaligus aquaticus</i>
Virginia opossum	<i>Didelphis virginiana</i>
White-tailed deer	<i>Odocoileus virginianus</i>



**UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration**

NATIONAL MARINE FISHERIES SERVICE
Southeast Regional Office
263 13th Avenue South
St. Petersburg, Florida 33701

March 31, 2008

F/SER46/RH:jk
225/389-0508

Mr. Gib Owen
Environmental Planning and Compliance Branch
Planning, Programs, and Management Division
New Orleans District, U.S. Army Corps of Engineers
Post Office Box 60267
New Orleans, Louisiana 70160-0267

Dear Mr. Owen:

NOAA's National Marine Fisheries Service (NMFS) has reviewed the draft **Individual Environmental Report (IER) #23** titled "Pre-Approved Contractor Furnished Borrow Material #2; St. Bernard, St. Charles, Plaquemines Parishes, Louisiana, and Hancock County, Mississippi." The draft IER evaluates and quantifies the impacts associated with the use of five contractor-furnished borrow sites to restore levees to the 100-year level of hurricane protection.

NMFS has reviewed the draft IER and agrees that none of the borrow sites are located in areas classified as essential fish habitat or supportive of marine fishery resources. As such, we have no comments to provide on the draft IER.

We appreciate the opportunity to review and comment on the draft IER.

Sincerely,

Miles M. Croom
Assistant Regional Administrator
Habitat Conservation Division

c:
FWS, Lafayette
EPA, Dallas
LA DNR, Consistency
F/SER46, Swafford
Files





United States Department of the Interior

FISH AND WILDLIFE SERVICE

646 Cajundome Blvd.

Suite 400

Lafayette, Louisiana 70506

February 29, 2008

Colonel Alvin B. Lee
 District Engineer
 U.S. Army Corps of Engineers
 Post Office Box 60267
 New Orleans, Louisiana 70160-0267

OPTIONAL FORM 88 (7-80)

FAX TRANSMITTAL

of pages ▶ 2

To <i>Mike Brown</i>	From <i>David Castellanos</i>
Dept./Agency <i>COE</i>	Phone # <i>FW S Lafayette</i>
Fax # <i>504-862-2088</i>	Fax # <i>337-291-3139</i>

NSN 7540-01-317-7388

5099-101

GENERAL SERVICES ADMINISTRATION

Dear Colonel Lee:

Please reference the Individual Environmental Report (IER) 23, entitled Pre-Approved Contractor Furnished Borrow Material #2 St. Bernard, St. Charles, and Plaquemines Parishes, Louisiana, and Hancock County, Mississippi. That IER addresses impacts resulting from the excavation of contractor-furnished borrow sites which will be used to increase hurricane protection within the Greater New Orleans area. In an electronic mail message dated February 25, 2008, the Service was requested by the Corps of Engineers (Corps) to evaluate an additional borrow site (i.e., Acosta) for inclusion in IER 23. The Service has agreed to supplement its original completed report with this information.

Work associated with IER 23 is being conducted in response to Public Law 109-234, Emergency Supplemental Appropriations Act for Defense, the Global War on Terror, and Hurricane Recovery, 2006 (Supplemental 4). That law authorized the Corps to upgrade some existing hurricane protection projects to provide protection against a 100-year hurricane event. The United States Fish and Wildlife Service (Service) provided a Fish and Wildlife Coordination Act (FWCA) draft report dated January 30, 2008, that contains an analysis of the impacts on fish and wildlife resources that would result from excavation of those borrow sites and provides recommendations to minimize and/or mitigate project impacts on those resources. This letter, submitted in accordance with provisions of the Fish and Wildlife Coordination Act (FWCA; 48 Stat. 401, as amended; 16 U.S.C 661 et seq.), supplements that FWCA Report and our August 7, 2006, Planning-aid Letter to the Corps providing recommendations for minimizing impacts to fish and wildlife resources from borrow site selection and use. This letter, however, does not constitute the report of the Secretary of the Interior as required by Section 2(b) of the FWCA. This letter has been provided to the Louisiana Department of Wildlife and Fisheries and the National Marine Fisheries Service; their comments will be incorporated into our final report.

Excavation of the Acosta and other borrow sites will result in the conversion of terrestrial habitat into open-water. Because pasture, open water, cleared land and pine plantation habitats have a reduced value to fish and wildlife resources and are not a declining or limited habitat type, impacts associated with conversion of those habitats to open-water were identified by land type, and quantified only by acreage (Table 1).

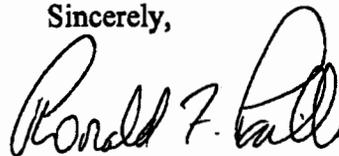
Table 1: Contractor-furnished Borrow Sites, IER 23

Site	Parish/ County	Acres	Habitat
Myrtle Grove	Plaquemines	271	Agriculture
1025 Florissant	St. Bernard	3	Scrub-Shrub, with some live oaks
3C Riverside	St. Charles	264	Agriculture
Pearlington Dirt II	Hancock	110	Cutover Loblolly Pine silviculture
*Acosta	St. Bernard	25	Pasture

*Additional borrow source

It was previously determined that the original borrow sites of IER 23 did not contain any wetlands or non-wet bottomland hardwood. The proposed Acosta site (located in St. Bernard Parish) evaluated for this supplement also contains no wetlands or non-wet bottomland hardwood; therefore, the Service maintains its determination that mitigation is not required for the borrow activity proposed in IER 23.

Sincerely,



for James F. Boggs
Supervisor
Louisiana Field Office

cc: EPA, Dallas, TX
NMFS, Baton Rouge, LA
USFWS, Jackson, MS, ES
LA Dept. of Wildlife and Fisheries, Baton Rouge, LA
LA Dept. of Natural Resources (CMD/CRD), Baton Rouge, LA



BOBBY JINDAL
GOVERNOR

State of Louisiana
DEPARTMENT OF WILDLIFE & FISHERIES

ROBERT J. BARHAM
SECRETARY

April 21, 2008

Ms. Elizabeth Wiggins, Chief
Planning, Programs, & Project Management Division
Environmental Planning & Compliance Branch
United States Army Corps of Engineers
P. O. Box 60267
New Orleans, LA 70160-0267

RE: *Application: IER #23*
Applicant: U.S. Army Corps of Engineers, New Orleans District
Public Notice Date: March 21, 2008

Dear Mr. Serio:

The professional staff of the Louisiana Department of Wildlife and Fisheries, Office of Wildlife, has reviewed the above referenced Public Notice. Based upon this review the following has been determined:

It is anticipated that the proposed activity will have minimal to no long-term adverse impacts to wetland functions; therefore, Ecological Studies has no objection.

The Louisiana Department of Wildlife and Fisheries appreciates the opportunity to review and provide recommendations to you regarding the proposed activity. Please do not hesitate to contact Chris Davis (225-765-2642) of our Habitat Section should you need further assistance.

Sincerely,

Venise Ortego, Permits Coordinator

cd

c: Chris Davis, Biologist

USFWS Ecological Services

Appendix E: CEMVN Borrow Area Index Map

The most up to date version of this and other borrow maps can be found at www.nolaenvironmental.gov.

