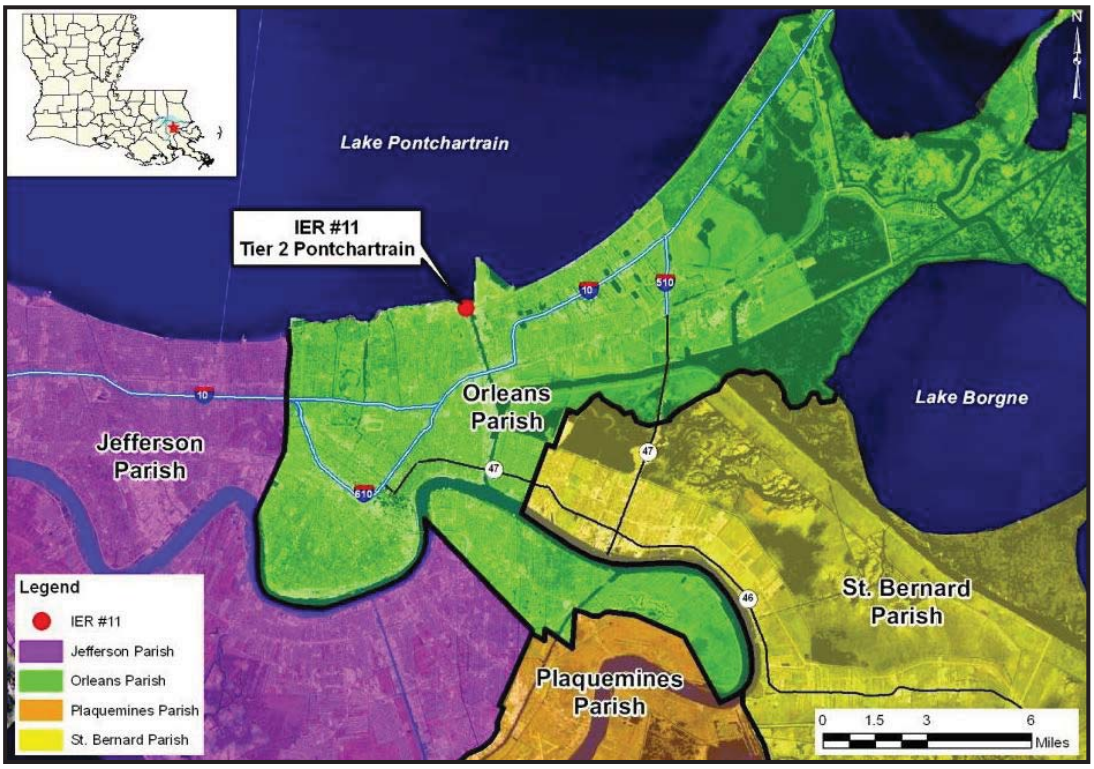
DRAFT INDIVIDUAL ENVIRONMENTAL REPORT SUPPLEMENTAL
IMPROVED PROTECTION ON THE INNER HARBOR NAVIGATION CANAL

ORLEANS AND ST. BERNARD PARISHES, LOUISIANA

IERS #11.d – TIER 2 PONTCHARTRAIN



US Army Corps of Engineers®

April 2012

TABLE OF CONTENTS

Section **Page**

1.0 INTRODUCTION **1**

1.1 BACKGROUND **2**
1.2 PURPOSE AND NEED FOR THE PROPOSED ACTION **3**
1.3 AUTHORITY FOR THE PROPOSED ACTION **3**
1.4 PRIOR REPORTS **4**
1.5 PUBLIC CONCERNS **5**

2.0 PROPOSED ACTION AND ALTERNATIVES **6**

2.1 ALTERNATIVES DEVELOPMENT AND PRELIMINARY SCREENING CRITERIA **6**
2.2 DESCRIPTION OF THE ALTERNATIVES **6**
2.3 PROPOSED ACTION **6**
2.4 NO ACTION **9**
2.5 ALTERNATIVES ELIMINATED FROM FURTHER CONSIDERATION **9**

3.0 AFFECTED ENVIRONMENT **10**

3.1 ENVIRONMENTAL SETTING **10**
3.2 SIGNIFICANT RESOURCES **10**
3.2.1 Hydrology 11
3.2.2 Water Quality 18
3.2.3 Aquatic Resources and Fisheries 27
3.2.4 Essential Fish Habitat 30
3.2.5 Threatened and Endangered Species 33
3.2.6 Recreational Resources 37
3.2.7 Transportation and Navigation 39
3.3 SOCIOECONOMIC RESOURCES **42**

4.0 CUMULATIVE IMPACTS **50**

5.0 SELECTION RATIONALE **51**

6.0 COORDINATION AND CONSULTATION **52**

6.1 AGENCY COORDINATION **52**

7.0 MITIGATION **54**

8.0 COMPLIANCE WITH ENVIRONMENTAL LAWS AND **54**

REGULATIONS **54**

9.0 CONCLUSIONS **54**

9.1 DRAFT DECISION **54**
9.2 PREPARED BY **56**
9.3 LITERATURE CITED **57**

LIST OF TABLES

Table 1: Significant Resources in the Project Study Area
Table 2: Adaptive Hydraulics (ADH) Modeling Scenarios (USACE 2009c)
Table 3: Life-Stages of Federally Managed Species that Commonly Occur within the Project Vicinity and the Associated Types of Designated EFH
Table 4: Impacts to Facilities on the IHNC in the Project Vicinity
Table 5: IERS #11.d Preparation Team

LIST OF FIGURES

Figure 1: IER #11 Tier 2 Pontchartrain Project Vicinity Map
Figure 2: Seabrook Cofferdam unwatered May 5, 2011
Figure 3: Simulated Image of the Sector and Vertical Lift Gates
Figure 4: Seabrook site flooded during Tropical Storm Lee September 3, 2011
Figure 5: IER #11 Tier 2 Pontchartrain Project Area and sub-basins
Figure 6: Water Surface Elevations South of Seabrook Structure (September)
Figure 7: Water Surface Elevations in GIWW at IHNC (September)
Figure 8: Graph comparison of velocities for a typical March and September in the GIWW Barge for the interim shown in blue (Seabrook, GIWW sector and Bayou Bienvenue gates closed) and all gates open in the final configuration shown in red (Seabrook, GIWW sector/barge, and Bayou Bienvenue) (USACE 2010a)
Figure 9: Water surface elevation south of Seabrook and in GIWW at IHNC (September).
Figure 10: USGS water quality sampling locations, GIWW w and T6 are west of the Borgne barrier and east of IHNC and the Seabrook construction.
Figure 11: Dissolved oxygen and salinity levels for Transect 6 on the IHNC from August 2008 through September 2011.
Figure 12. Dissolved oxygen and Salinity levels for GIWW west 6 on the GIWW from June 2010 through September 2011.
Figure 13. Temporary rock dike completed for the Seabrook Gate Complex completed 31 October 2010.
Figure 14. Major Roads and Highways near the Tier 2 Pontchartrain Project Area
Figure 15: Socioeconomic Resources along the IHNC. Orleans Materials and the Halliburton Plant have relocated outside of the IHNC.
Figure 16: HSDRRS Lake Pontchartrain and Vicinity and West Bank and Vicinity IER Projects

LIST OF APPENDICES

Appendix A: List of Abbreviations and Acronyms
Appendix B: Modeling Reports
Appendix C: Public Comment and Responses
Appendix D: Members of Interagency Environmental Team
Appendix E: Interagency Correspondence
Appendix F: Public Meeting Minutes

1.0 INTRODUCTION

The U.S. Army Corps of Engineers (USACE), Mississippi Valley Division, New Orleans District (CEMVN), has prepared this Individual Environmental Report Supplemental #11.d Tier 2 Pontchartrain (IERS #11.d) to evaluate the potential impacts associated with schedule delays for constructing the proposed project as described in the original IER #11 Tier 2 Pontchartrain.

On October 21, 2008, the CEMVN Commander signed the Decision Record for IER #11 Tier 2 Borgne. On December 10, 2009, the District Commander signed the Decision Record for IERS #11a Tier 2 Borgne. On April 1, 2010, the District Commander signed the Decision Record for IER #11 Tier 2 Pontchartrain. On November 29, 2010, the District Commander signed the Decision Record for IERS #11.b Tier 2 Borgne. On March 22, 2011, the District Commander signed the Decision Record for IERS 11.c Tier 2 Borgne. IER #11, IER #11 Tier 2 Borgne, IER #11 Tier 2 Pontchartrain, IERS #11.a Tier 2 Borgne, IERS #11.b Tier 2 Borgne, and IERS #11.c Tier 2 Borgne documents are hereby incorporated by reference into this IERS #11.d document. This supplemental document has been prepared to address proposed changes in the Government's approved plan. The CEMVN is releasing IERS #11.d for a 30-day public review and comment period. Copies of the original IER #11 and IER supplements as well as other supporting information are available upon request or at www.nolaenvironmental.gov.

IERS #11.d has been prepared in accordance with the National Environmental Policy Act of 1969 (NEPA) and the Council on Environmental Quality's (CEQ) Regulations (40 Code of Federal Regulations [CFR] 1500-1508), and the USACE Engineering Regulation (ER), ER 200-2-2 Environmental Quality, Procedures for Implementing NEPA (33 CFR 230). 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, Procedures for Implementing NEPA (33 CFR 230), and pursuant to the CEQ Regulations for Implementing NEPA (40 CFR 1506.11). The Alternative Arrangements can be found at www.nolaenvironmental.gov, and are herein incorporated by reference.

The CEMVN implemented Alternative Arrangements on 13 March 2007, under the provisions of the CEQ Regulations for Implementing NEPA (40 CFR 1506.11). The Alternative Arrangements were developed and implemented in the aftermath of Hurricanes Katrina and Rita in order to evaluate environmental impacts arising from hurricane and storm damage risk reduction (HSDRRS) projects in a timely manner, utilizing the NEPA emergency procedures found at 40 CFR 1506.11. The Alternative Arrangements were published on 13 March 2007 in 72 FR 11337, and are available for public review at www.nolaenvironmental.gov.

The area described in IERS #11.d is located in southeastern Louisiana and is part of the Federal effort to rebuild and complete construction of the HSDRRS in the New Orleans Metropolitan area as a result of Hurricanes Katrina and Rita. Two public meetings were held on 13 October 2011 at the Port of New Orleans and St. Gabriel the Archangel Parish Hall to discuss this project and receive comments. Another public meeting will be considered if requested during the review period. After the 30-day comment period, and public meeting, if held, the CEMVN Commander will review all comments received during the review period and determine if they rise to the level of being substantive in nature. If the comments are not considered to be substantive the District Commander may make a decision on the proposed action. If a comment(s) is determined to be substantive in nature, an addendum to the IER would be prepared and published for an additional 30-day public comment period. Once the District Commander makes a decision on the proposed action it will be documented in an IER Decision Record.

1.1 BACKGROUND

The project approved in IER #11 Tier 2 Pontchartrain consists of constructing one sector and two non-navigable vertical lift gates in the Inner Harbor Navigation Canal (IHNC) 540 feet south of the Senator Ted Hickey Bridge (also known as Seabrook Bridge) and the Bascule Railroad Bridge with floodwall tie-ins to LPV 104 to the west and LPV 105 to the east (figure 1). While officially the IHNC is a navigation channel, the use of the term "IHNC" for the purposes of this document include all of the waters and shoreline bounded on the east where the Mississippi River Gulf Outlet (MRGO) navigation channel and the Gulf Intracoastal Waterway (GIWW) diverge; to the south at the IHNC lock complex; and the north at the point where the IHNC intersects with Lake Pontchartrain. The term "100-year level of risk reduction," as it is used throughout this document, refers to a level of risk reduction which reduces the risk of hurricane surge and wave-driven flooding that the New Orleans Metropolitan Area has a 1 percent chance of experiencing each year.

The Preconstruction Services for the Seabrook Gate Complex Early Contractor Involvement (ECI) contract was awarded October 30, 2009, and the construction option was exercised in July 2010, however, actual construction did not start until September 2010. The planned construction was originally estimated to last 36 months with a channel closure on the IHNC for approximately 6 to 12 months. In addition to the delay in the construction start, there were also delays associated with the acquisition of real estate, finalizing design, weather, subsurface site conditions for driving piles, and actual construction. As a result, of these delays, it is proposed that for continued construction on the Seabrook Gate Complex, the IHNC would be closed to navigation at the Seabrook location until approximately September 2012 (12 months). The IHNC closure duration is currently 6 months into the required additional 12 month closure. This NEPA document is being prepared concurrent with the requested proposed action and provides an evaluation of the potential impacts associated with the proposed closure of the IHNC to navigation for an additional 12 months to complete construction of the Seabrook Gate Complex.

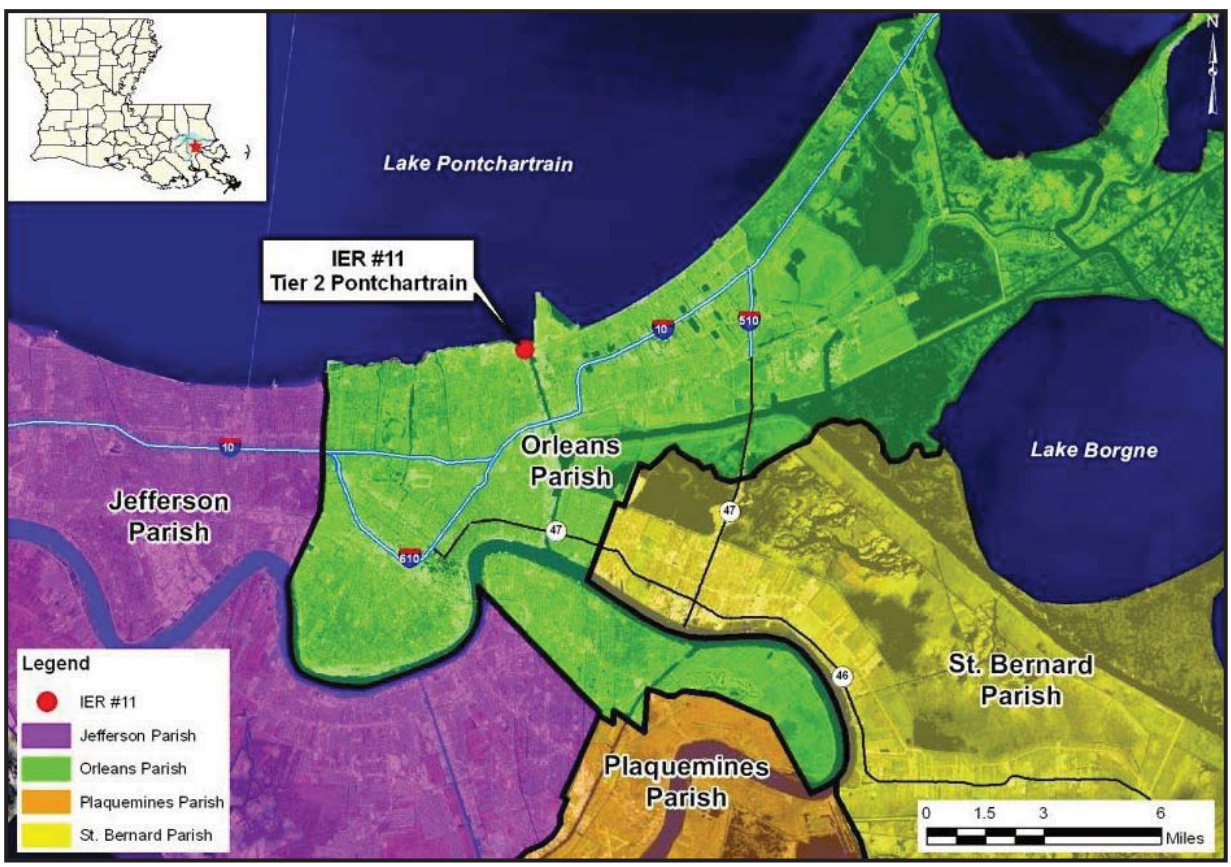


Figure 1. IER #11 Tier 2 Pontchartrain Project Vicinity Map

Construction-Related Information for Proposed Action

Construction activities are occurring in two phases. Phase 1 focused on the construction of the portion of the structure below water, fabrication of the gates, and installation of the cofferdam which was completed in May 2011. Phase 2 is ongoing and includes installation of a steel sector gate and two vertical lift gates south of the Senator Ted Hickey Bridge (also referred to as the Seabrook Bridge) in the IHNC, as well as T-wall floodwall tie-ins and a roadway gate. The following details construction milestones completed during Phase 1. On October 31, 2010, a rock dike was constructed across the IHNC to slow currents so that fill material could be placed within a scour hole. The rock dike physically closed the channel to navigation and blocked fishery access, migration, and flow through the IHNC to Lake Pontchartrain. The next steps included filling the scour hole, driving guidewall pilings, driving foundation pilings and cutoff wall pilings, constructing a temporary braced cofferdam system, installing a tremie concrete seal, a sill slab, and the lower portion of the gate bays to an elevation above normal water height. The construction of the north wall of the cofferdam was completed on February 27, 2011, and the south wall was completed on April 15, 2011. The braced cofferdam system was installed around the approximate perimeter of the sector gate, two vertical lift gates, and a pump driven dewatering system were installed to maintain the cofferdam. The cofferdam was unwatered on May 1, 2011 (figure 2).

1.2 PURPOSE AND NEED FOR THE PROPOSED ACTION

The CEMVN is concurrently preparing IERS #11.d to disclose the proposed 12 month delay in providing 100-year level of protection for Orleans Parish in completing construction of the Seabrook Floodgate Complex located where the Inner Harbor Navigation Canal (IHNC) connects to Lake Pontchartrain. Construction for this project was started in September 2010 and has been ongoing, by the time of the public release of this IERS #11.d construction will be 6 months into this 12 month delay. The purpose of the supplement is to assess additional impacts associated with an extended channel closure of the IHNC until approximately September 2012.

1.3 AUTHORITY FOR THE PROPOSED ACTION

The proposed action was authorized by the Department of Defense (DoD), Emergency Supplemental Appropriations to Address Hurricanes in the Gulf of Mexico, and Pandemic Influenza Act of 2006 (3rd Supplemental – Public Law [PL] 109-148, Chapter 3, Construction, and Flood Control and Coastal Emergencies) and the Emergency Supplemental Appropriations Act for Defense, the Global War on Terror, and Hurricane Recovery, 2006 (PL 109-234; 4th Supplemental). Additional funding was provided in the Fiscal Year 2008 Emergency Supplemental Funding, PL 110-252 (6th Supplemental).

Figure 2. Seabrook Cofferdam unwatered May 5, 2011.

1.4 PRIOR REPORTS

A number of studies and reports on water resources development in the proposed action area have been prepared by the USACE, other Federal, state, and local agencies, research institutes, and individuals and are hereby incorporated by reference. Pertinent studies, reports, and projects not previously discussed in IER #11 Tier 2 Borgne, IERS #11.a Tier 2 Borgne, IERS #11.b Tier 2 Borgne, and IERS #11.c Tier 2 Borgne are summarized below:

- On 13 January 2012, the CEMVN Commander signed a Decision Record for IERS #25.a entitled "Government Furnished Borrow Material #3, Orleans Parish, Louisiana." The document evaluates the after the fact modifications to IER #25, which include placing approximately 105,000 cubic yards of excess material, known as Recycled Embankment Material (REM), on a 22.4-acre site.
- On 11 January 2012, the CEMVN Commander signed a Decision Record on IERS #33.a entitled, "West Bank and Vicinity and Mississippi River Levee Co-Located Levees, Plaquemines Parish and Orleans Parish, Louisiana." The document was prepared to evaluate the potential impacts associated with the proposed construction and maintenance of Resilient Features in order to improve the resiliency and longevity of previously implemented Engineered Alternative Measures (EAM), addressed under IER #33, along the West Bank and Vicinity – Mississippi River Levee (WBV-MRL) Co-Located Project.
- On 19 December 2011, the CEMVN Commander signed a Decision Record on IER #35 entitled, "Contractor-Furnished Borrow Material #8, Jefferson, Terrebonne, and St. John the Baptist Parishes, Louisiana." The document was prepared to evaluate the potential impacts associated with the actions taken by commercial contractors as a result of excavating borrow areas for use in construction of the HSDRRS.

- On 7 September 2011, the CEMVN Commander signed a Decision Record on the Addendum for IERS #15.a entitled "Lake Cataouatche Levee Jefferson Parish, Louisiana." The document evaluates the horizontal direction drill relocation of a Chevron pipeline.
- On 6 July 2011, the CEMVN Commander signed a Decision Record on IERS #1b entitled "La Branche Wetlands Levee LPV 04.2B Access Road and Ditch Relocation St. Charles Parish, Louisiana." The document evaluates the potential impacts associated with relocating an access road onto Pontchartrain Levee District property and providing proper access to the levee reach.
- On April 21, 2011, the CEMVN Commander signed a Decision Record on the IERS #13a entitled "West Bank and Vicinity Hero Canal Levee and Eastern Tie-in, Plaquemines Parish, Louisiana." IERS #13a contains a modification to the original plan which includes the potential closing of Hero Canal for a maximum of approximately 60 days and a minimum of approximately 30 days within a 90 day time frame. The proposed action is located in Plaquemines Parish near New Orleans, Louisiana.
- On 22 March 2011, the CEMVN Commander signed a Decision Record on IERS #11.c entitled "Improved Protection on the Inner Harbor Navigation Canal, Orleans and St. Bernard Parishes, Louisiana." The document evaluates the potential impacts associated with the construction of those actions approved in IER #11 Tier 2 Borgne, with the exception of expanded size of the access channel due to erosion of the access channel due to erosion of the bankline.
- On February 22, 2011, the CEMVN Commander signed a Decision Record on the IERS #12.a entitled "GIWW, Harvey and Algiers Levees and Floodwalls, Jefferson, Orleans and Plaquemines Parishes, Louisiana." The document was prepared to evaluate the potential impacts associated with the construction of an access road, the use of a pontoon bridge in the V-Line Levee Canal, and the placement of riprap along an 800-foot length of the V-Line Canal.
- On February 2, 2011, the CEMVN Commander signed a Decision Record on the IERS #12/13 Waterline entitled "GIWW, Harvey and Algiers Levees and Floodwalls/Hero Canal Levee and Eastern Tie-in, Plaquemines Parish, IERS #12/13 Waterline." The document was prepared to evaluate the potential impacts associated with operations and maintenance of the Western Closure Complex.

1.5 PUBLIC CONCERNS

Throughout southern Louisiana, one of the greatest areas of public concern is reducing the risk of hurricane, storm, and flood damage for businesses and residences and providing for public safety during major storm events. Hurricane Katrina forced residents from their homes, temporarily or permanently closed businesses, and due to extensive flooding, made returning to communities in a timely manner unsafe.

In public meetings held January 10, 2009, March 3, 2009, March 5, 2009, October 27, 2009, December 3, 2009, January 27, 2010, and October 13, 2011 as well as in written comments submitted for IERs #11 Tier 2 Borgne, Tier 2 Pontchartrain, and IERS #11.b, public concerns were raised regarding improved risk reduction on the IHNC and not having a complete HSDRRS in the area. Concerns and frustrations about the delayed closure of the canal and lengthy construction timeline were expressed from citizens and representatives of businesses along the IHNC during the October 13, 2011, public meetings at the Port of New Orleans and St. Gabriel the Archangel Parish Hall. Specifically, a representative of Seabrook Marina expressed concern that "this is not a temporary inconvenience, this is life and death" for their company and this flood damage risk reduction "would be provided on the backs of Seabrook Marina". Other comments stated that businesses along the IHNC were flooded by storm surge caused by Tropical Storm Lee on Labor Day weekend (2011) and request that the gates of Seabrook Gate

Complex and the Borgne Barrier be operated for rain events and not just tropical storms. A request was also made to include the Port of New Orleans, railroad companies, and the local sponsor in the development of the water control plan for the IHNC system.

Previously, the U.S. Coast Guard (USCG) commented on the existing hazardous conditions in the mouth of the IHNC during tidal fluctuations. The addition of a cofferdam during construction of the sector gate would increase this danger. Subsequently, on September 13, 2010, the USCG closed the IHNC pass at Seabrook to all navigation during the construction period and it remains closed to date. The USCG previously relied on the Seabrook pass as a route for emergency response; however, they have been able to trailer small boats and launch at either Seabrook Marina or the USACE facility on Leake Ave, depending upon river levels. The option of transiting around the Rigolets is only used when they have long lead-time or have planned the transit into their operations. So, positioning a vessel and staff on either side of the IHNC in order to ensure the half hour response time that is required of the USCG has not been necessary. Coordination with the USCG has been ongoing and continues with this project.

Some members of the public continue to be concerned that either closure of the Seabrook gates or currents through the Seabrook pass could negatively impact migration of aquatic species, recreation, and the fishing industry.

2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 ALTERNATIVES DEVELOPMENT AND PRELIMINARY SCREENING CRITERIA

NEPA requires Federal agencies to rigorously explore and objectively evaluate all reasonable alternatives including the potential for taking “no action” in their alternatives analysis (40 CFR 1502.14(d)). 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.

2.2 DESCRIPTION OF THE ALTERNATIVES

At the time of the completion of IER #11 Tier 2 Pontchartrain, engineering designs had not been finalized for all of the actions and alternatives. Since that time, engineering details of the action have been further developed and revised. Therefore, the changes to the action that could result in further impact to the natural or human environment are being addressed in this IERS #11.d.

2.3 PROPOSED ACTION

The proposed action for this concurrent IERS #11.d would be to extend the construction end date for Phase II construction to approximately September 2012 in order to provide 100-year level of risk reduction for Orleans Parish by constructing a storm surge risk reduction structure on the IHNC near its connection to Lake Pontchartrain (figure 1). Specifically, the extension is necessary to complete construction of the approved action as identified in IER #11 Tier 2 Pontchartrain. A simulated image of the structures is shown in figure 3. The additional construction window is necessary due to delays in the acquisition of real estate, finalizing design, weather, site conditions for driving piles, and overall construction. As a result, the Seabrook Gate Complex will require closure of the IHNC to navigation at the Seabrook location until approximately September 2012.

While construction continues to be underway and the cofferdam has been in place since April 2011, the IHNC has been closed to navigation since September 2010. Closure of the IHNC was originally planned for 6 to 12 months from commencement of construction (September 2011). However, as a result of delays, the Seabrook Gate Complex will require the continued closure of the IHNC for a total of approximately 24 months, and if no other delays occur, partial flow could be restored in 21 months. The current planned opening of the IHNC for water flow only is mid-July 2012 and for navigation is September 2012.

The following outlines the delays incurred throughout the design and construction process:

- The vertical lift gate towers were originally planned as steel structures. The non-Federal sponsors expressed concerns with operation and maintenance in terms of difficulty and additional costs of maintaining steel. These concerns were evaluated during design and it was determined that the dense sand strata in the Seabrook area could support changing the steel towers to concrete with minimal impact on the foundation.

- During cofferdam construction, numerous obstructions below the channel bottom were encountered in the sheet-pile driving operation. Additionally, once the cofferdam was complete and unwatered, soils for the deep T-wall monoliths and portions of the gate foundation were found to be unsuitable and subsequently replaced.

- Design changes in the VLG wheel bearings were required as a result of the construction submittal process and increased bearing fabrication time.

- The gate superstructure was planned to have low heat concrete but other projects in the area were experiencing significantly increased cure times. This same concrete was planned for Seabrook and similar issues would have delayed the schedule by as much as 90 days. In order to avoid this risk, the contractor was directed to use a conventional concrete mix design and incorporate a cooling system.

- The spring 2011 Mississippi River floods forced the closure of navigation. This closure delayed pipe pile delivery from St. Louis for the T-wall monoliths and the gate foundation.

- Tropical Storm Lee making landfall over Labor Day, resulted in flooding the site and the cofferdam requiring cleanup, unwatering of the cofferdam, and inspections for stability and safety concerns (figure 4).

- Lastly, the sector gate requires 10 custom metal castings for the hinge and pintle. These parts are critical pieces for operating the sector gates. Four of the castings were found to be unsuitable for use in the structure and had to be recast. These custom castings take 5 to 6 months to make, which drives the construction completion date to September 2012.

Figure 3. Simulated Image of the Sector and Vertical Lift Gates

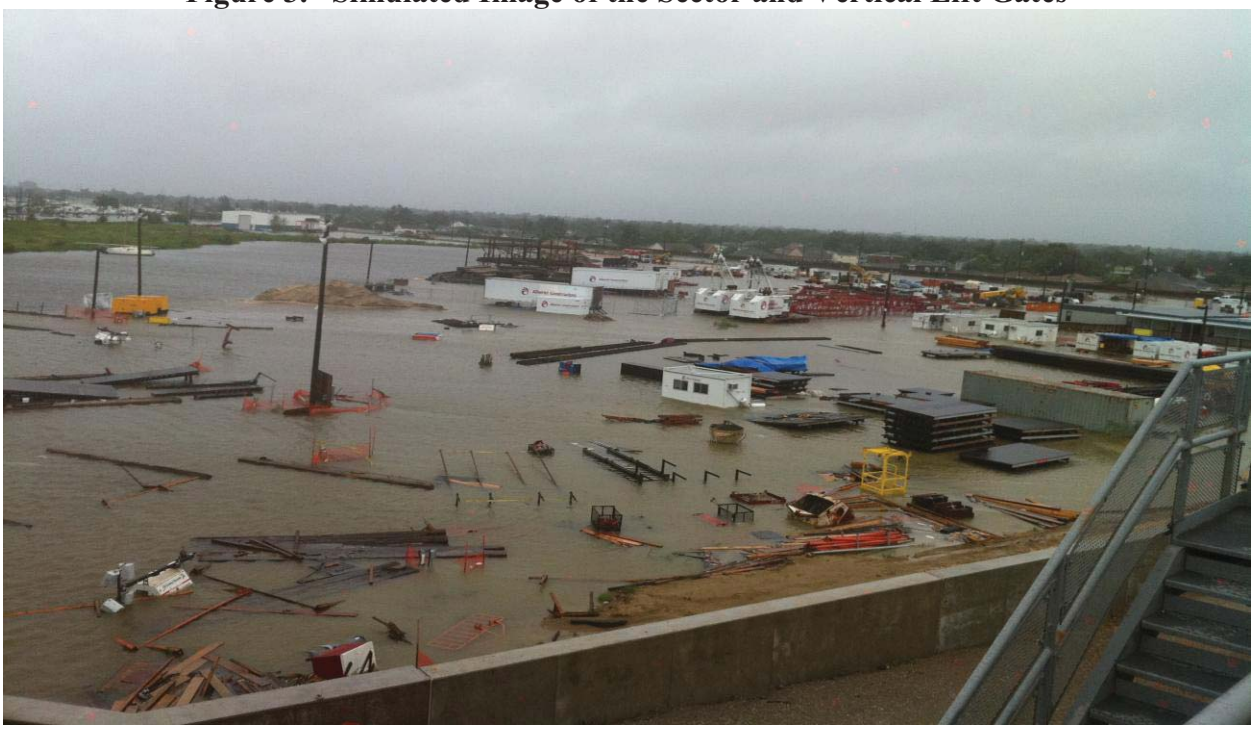


Figure 4. Seabrook site flooded during Tropical Storm Lee September 3, 2011.

2.4 NO ACTION

The no action alternative would be to maintain the status quo of the existing conditions. Under this scenario, the current construction to build the Seabrook Complex would cease, all equipment and trailers would be removed, however; the partially constructed features and cofferdam would remain in place permanently closing the hydrologic connection of the IHNC with Lake Pontchartrain. This alternative does provide the New Orleans Metropolitan area with 100-year level of risk reduction for many years until the cofferdam erodes. The no action alternative for IERS #11.d includes all features in the existing conditions of the constructed Borgne Barrier and 4.6 miles of remediated levees and floodwalls along the IHNC as described in IERs #11 Tier 2 Borgne, IERS #11.a, IERS #11.b, and IERS #11.c as well as the Seabrook Complex as described in IER #11 Tier 2 Pontchartrain, except that construction would not be completed in approximately 6 to 12 months. This time frame to construct the project is no longer attainable because of unforeseen delays associated with weather and equipment design failures. As such, the no action alternative for this IERS #11.d is to maintain the status quo of the existing conditions. Therefore the construction of the Seabrook Complex would cease, and all equipment and trailers would be removed returning the site to pre-construction conditions. However, the cofferdam would remain in place. Leaving the cofferdam in place permanently closes the hydrologic connection of the IHNC with Lake Pontchartrain and provides the New Orleans Metropolitan area a 100-year level of risk reduction.

This no action alternative is not a realistic or viable option for providing a completed HSDRRS. This "status quo" no action alternative is used as a base to compare impacts against the proposed action and the environmental effects of the proposed action to go forward. The U.S. Army Corps of Engineers has made a commitment and is obligated to provide a 100 year level HSDRRS for the Greater New Orleans Metropolitan area as authorized and funded by Congress in the aftermath of Hurricanes Katrina and Rita.

2.5 ALTERNATIVES ELIMINATED FROM FURTHER CONSIDERATION

In addition to the alternatives already eliminated from further consideration as part of the Tier 1 and Tier 2 IER #11 documents, one additional alternative was eliminated from further consideration because it did not adequately meet the screening criteria evaluation.

Restore project area to pre-construction conditions

This alternative is similar to the no action alternative evaluated in IER #11 Tier 1 in that it would require the contractor to stop all work on the project and remove all construction and equipment from the project area. This includes all completed east and west T-walls, gates, the cofferdam, all fill placed on site and within the 90 ft deep scour hole, as well as removing construction trailers and equipment. This alternative was eliminated from further consideration because of the additional expense time and effort required and because it did not provide engineering effectiveness, economic efficiency, and environmental and social acceptability, and was not within the congressional authority to provide a 100-year HSDRRS.

3.0 AFFECTED ENVIRONMENT

3.1 ENVIRONMENTAL SETTING

IER #11 Tier 2 Pontchartrain contains a complete discussion of the environmental setting for the project area and is incorporated by reference into this document. For reference, the project area is highlighted with a blue box and the surrounding sub-basins are identified in figure 5. As such, no discussion of environmental setting will be made in this document.

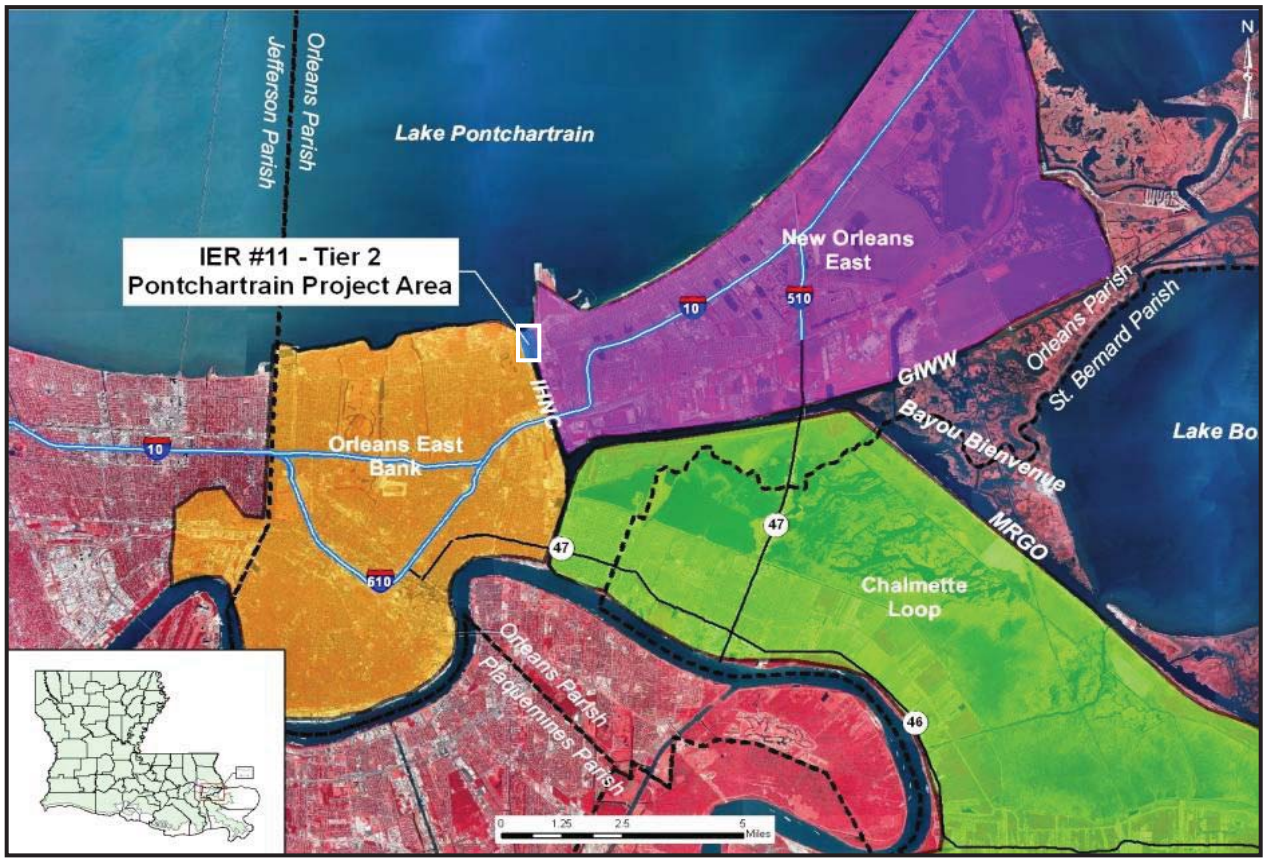


Figure 5. IER #11 Tier 2 Pontchartrain Project Area and sub-basins

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 would be caused by the action taken and occur at the same time and place (40 CFR 1508.8(a)). Indirect impacts are those that would be caused by the action and would be later in time or farther 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 National, state, or regional agencies and organizations; technical or scientific agencies, groups, or individuals; and the general public. Further detail on the significance of each of these resources can be found by contacting the CEMVN, or on www.nolaenvironmental.gov, which offers information on the ecological and human value of

these resources, as well as the laws and regulations governing each resource. Search for "Significant Resources Background Material" in the website's digital library for additional information. Table 1 shows those significant resources found within the project area, and notes whether they would be impacted by any of the alternatives analyzed in this IER.

Table 1.
Significant Resources in the Project Study Area

Significant Resource	Impacted	Not Impacted
Hydrology	X	
Water Quality	X	
Wetlands		X*
Aquatic Resource and Fisheries	X	
Essential Fish Habitat	X	
Wildlife		X*
Threatened and Endangered Species	X	
Non-wet Uplands		X*
Cultural Resources		X*
Recreational Resources	X	
Aesthetic (Visual) Resources		X*
Air Quality		X*
Noise		X*
Transportation and Navigation	X	
Socioeconomic Resources Land Use, Population, Employment	X	
Environmental Justice (EJ)		X*

*= The proposed action poses no additional impacts above those described in IER #11 Tier 2 Pontchartrain therefore these significant resources are not discussed in this document.

3.2.1 Hydrology

Existing Conditions

As described in IER #11 Tier 1 and IER #11 Tier 2 Pontchartrain, the Lake Pontchartrain Basin includes the estuarine areas of Lake Pontchartrain and Lake Borgne. The basin has been substantially altered by a system of waterways, levees, and hydraulic control structures, which range in size from the Mississippi River to oil well access canals. Navigable waterways within the basin that have been previously and continue to be periodically dredged, such as the GIWW and the IHNC, contribute to the alteration of the natural hydrology of the area.

The IHNC is hydrologically connected to the GIWW, the MRGO, and the Mississippi River, but currently not to Lake Pontchartrain because of the Seabrook Complex cofferdam. The IHNC is approximately 35 ft deep, with a minimum 150 ft bottom width and 300 ft top width. The IHNC lock is located at the southern terminus of the IHNC and allows waterborne traffic to transit to and from the Mississippi River and the GIWW. From the GIWW/MRGO confluence to the IHNC Lock is an authorized deep draft navigation channel, 36 ft deep and 500 ft wide. The GIWW west of the Michoud Canal is authorized as a 36 ft deep, 500 ft bottom wide waterway. The MRGO was deauthorized as a Federal waterway on June 5, 2008 with a rock dike closure

structure built across the channel at Bayou La Loutre. On September 10, 2010, the wall portion of the Borgne Barrier was completed and provided another closure on the MRGO just south of Bayou Bienvenue. There are currently two navigable gate structures being built on the GIWW as part of the Borgne Barrier, a 150 ft wide barge gate bypass and a 150 ft wide sector gate. The barge gate is nearly complete. The sector gate is being constructed on site within a cofferdam, so the GIWW channel is constricted at this location to only the 150 ft wide opening of the barge gate bypass. The vertical lift gate is in place on Bayou Bienvenue and the gate is lowered to 1 ft above the sill to allow some flow while the operational towers are being constructed. All three gates on the Borgne Barrier are scheduled to be fully operational and open for navigation in June 2012.

In addition to the current construction, the major influences on water levels within the basin are wind and tide. Tidal ranges average approximately 1 ft and 2 ft at Lake Pontchartrain and Lake Borgne, respectively (Westerink et al. 2006). Average flow velocity in the IHNC before construction of the Borgne Barrier and Seabrook Floodgate Complex was initiated was about 0.6 feet per second (fps); however, surface ebb and bottom velocities could exceed 2 fps (USACE 1997). Velocity modeling (USACE 2009c) predicted that closures of the MRGO at Bayou La Loutre and south of Bayou Bienvenue resulted in decreased velocities within the IHNC. The Adaptive Hydraulics (ADH) model forecasted the average flow velocity near Seabrook prior to any construction of closures (referred to as the "Base" condition) to be approximately 2.5 fps and in the location of the GIWW barge gate the average velocity was 0.16 fps (USACE 2009c). While the Seabrook connection to Lake Pontchartrain is presently closed by the cofferdam, the flow velocity in this area of the IHNC can be considered 0 fps. A velocity meter was installed on the GIWW in the vicinity of the Borgne Barrier to monitor velocity during construction while the Seabrook cofferdam and the GIWW sector gate cofferdam are in place. This meter has shown velocity readings through the barge gate bypass opening ranging from 0.7 to 1.2 fps and during tidal events flows through the barge gate bypass readings have averaged 2 fps.

The basin is susceptible to flooding from hurricane storm surge. Lake Pontchartrain levels are increased by the influx of surges from Lake Borgne and the Gulf of Mexico that accompany hurricanes from the southeast, south, and southwest, as well as from local wind setup (USACE 1967; USACE 1995; USACE 2007b; Westerink et al. 2006). As evidenced by Tropical Storm Lee (September 3, 2011), the water levels within the IHNC reached approximately 6.3 ft and overtopped the southern wall (El +5 ft NAVD 88) of the cofferdam; this flooded the Seabrook cofferdam, but water did not overtop the north wall (El +10 ft NAVD 88), which maintained the barrier to Lake Pontchartrain and provides 100-year level of risk reduction.

Discussion of Impacts

Impacts to hydrology were modeled with the ADH code utilizing 2-dimensional shallow water equations to assess changes in velocity, surface water elevation and circulation within the Lake Pontchartrain Basin. Water surface analyses examined 16 locations within the modeling domain including points within Lake Pontchartrain, Chef Menteur Pass, the Rigolets, the IHNC, Lake Borgne, the GIWW, and the MRGO. Circulation changes were assessed by determining velocity signals at two locations within the GIWW, one on the eastern side of the MRGO and one on the western side (USACE 2009c). Modeling results are reported in positive and negative numbers to demonstrate flood and ebb tidal movement. Positive velocity numbers represent directional flow to the north or east and negative numbers represent directional flow to the south and west. The ADH model was validated utilizing 2008 field data on surface water elevations, discharge, and velocity. While modeling results were closely aligned with field data, it should be noted that the modeled scenarios do not include culverts within the Borgne Barrier through Bayou Bienvenue, which allowed some flow, during construction of the Bayou Bienvenue gate structure. ADH modeling efforts included analysis of a Base condition and four plan scenarios that were simulated for two, 2-week periods. March 2008 (referred to as "spring") and

September 2007 (referred to as "fall") were selected as the simulation periods. These time periods were chosen by an interagency team to best coincide with high tide events, front passages and rain events (March 2008) and aquatic organism migration seasons with a more typical diurnal tide signal (September 2007). ADH modeling scenarios are presented in table 2. These impacts are described in detail in IER #11 Tier 2 Pontchartrain and are hereby incorporated by reference. The impacts discussed in this supplemental IER #11.d only describe the additional 12 month period that the IHNC channel is closed to construct the Seabrook Floodgate Complex.

Table 2.
Adaptive Hydraulics (ADH) Modeling Scenarios (USACE 2009c)

Scenario	MRGO at La Loutre	Borgne Barrier	Seabrook	Comments
Base	No closure	No structures	No structures	Simulates historical conditions within the Pontchartrain Basin prior to the closure of the MRGO at Bayou La Loutre and the Borgne Barrier.
Plan 1	Closure	No structures	No structures	Simulates hydrologic conditions following the MRGO closure at Bayou La Loutre.
Plan 2	Closure	Structures on Bayou Bienvenue & GIWW	No structures	Simulates existing conditions for purposes of IER #11 Tier 2 Pontchartrain, includes the Plan 1 scenario with the addition of the Borgne Barrier.
Plan 3	Closure	Structures on Bayou Bienvenue & GIWW	95 ft x 16 ft sector gate	Plan 3 includes the Plan 2 scenario with a simulated 95 ft x 16 ft gate at Seabrook.
Plan 3 Final	Closure	Structures on Bayou Bienvenue & GIWW	95 ft x 20 ft sector gate with two 50 ft x 16 ft auxiliary gates	Plan 3 Final simulates a 95 ft x 20 ft sector gate with two additional 50 ft x 16 ft auxiliary gates.

Proposed Action

Direct Impacts to Hydrology

<u>Constructed Seabrook Floodgate Complex</u>

Modeling has shown that the completed Seabrook Floodgate Complex could result in permanent velocity changes within the navigable waterways of the project area. Modeling results with the Seabrook structure in place (Plan 3 Final), based on a point located in the center of the sector gate within the IHNC, predicted average flood and ebb flows on the order of 2.13 fps to 2.24 fps during the fall and 2.33 fps to 2.63 fps during the spring; a maximum velocity of 4.97 fps was noted. These velocities are modeled to be on the order of those historically experienced (prior to the MRGO closure at Bayou La Loutre and construction of the Borgne Barrier) within the IHNC at Seabrook. This has to do with a restricted amount of flow that passes through the completed Seabrook Floodgate Complex of the IHNC. Historical average velocities (Base scenario) ranged from approximately 2.39 fps during the fall to 2.66 fps in the spring, with a maximum velocity of 4.98 fps (USACE 2009c).

With implementation of the Seabrook Floodgate Complex, changes in the tidal range elevations within the IHNC would be expected. This is partially due to the restriction of flow from placing floodgates across the IHNC. This influence extends southward within the IHNC to the point at which the IHNC and GIWW intersect. Changes in tidal range within the IHNC for September are depicted in figures 6 and 7 (USACE 2009c). The Base scenario reflects historical conditions prior to construction of any closure structures on the MRGO, GIWW, or IHNC. Future conditions with the MRGO closure structure at La Loutre, the Borgne Barrier with the GIWW sector and barge gates, and the Seabrook Floodgate Complex gates open are represented by what is referred to as the "Plan 3-Final" modeling scenario.

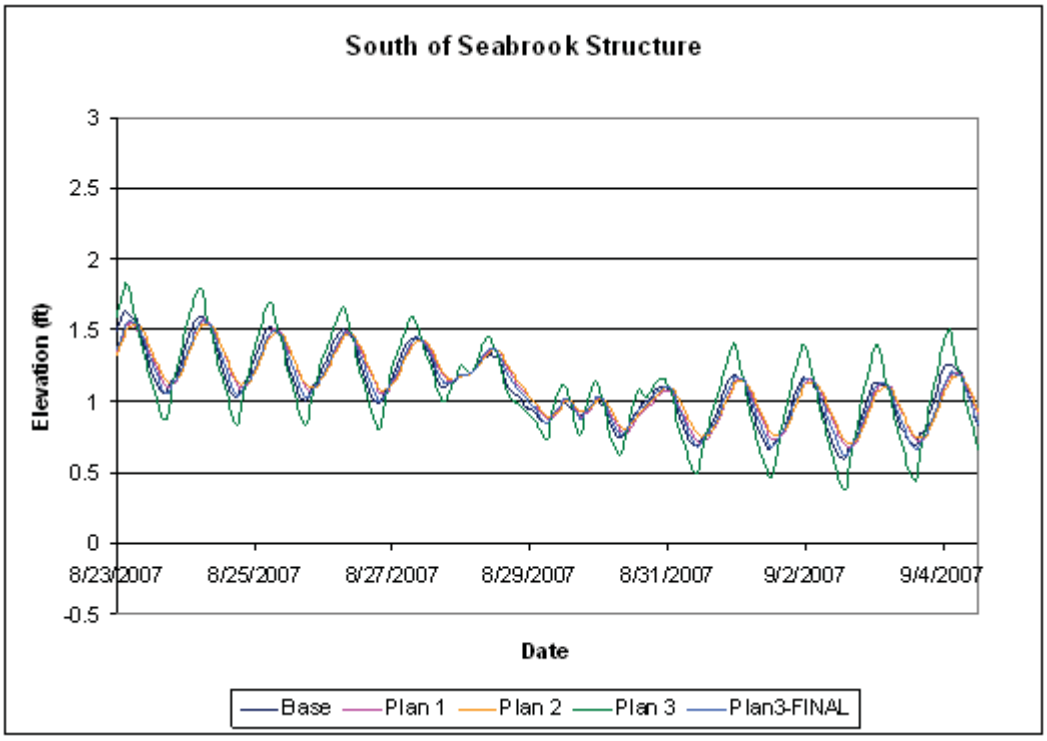


Figure 6. Water Surface Elevations South of Seabrook Structure (September)

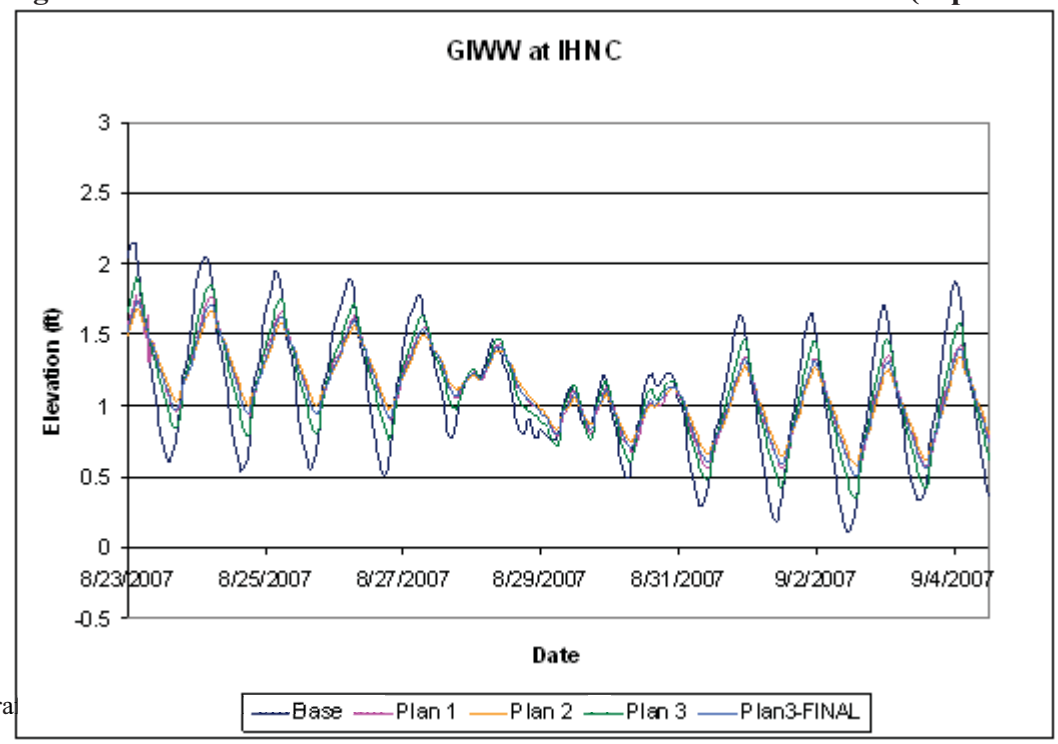


Figure 7. Water Surface Elevations in GIWW at IHNC (September).

Additional 12-month construction for Seabrook Floodgate Complex

The impacts to hydrology in the project area with the additional 12-month closure with the cofferdam in place would be a longer duration of reduced flow velocities in the IHNC. The velocity of the flow through the Borgne Barrier GIWW sector/barge gates and Bayou Bienvenue vertical lift gate would continue to range from approximately 0.7 to 1.2 fps and average approximately 2 fps for tidal events as seen by the velocity meter. However, during construction while the channel is blocked, until September 2012, flows in the Seabrook area of the IHNC are expected to be 0 fps. An increase in velocities within the Seabrook Floodgate Complex would be expected when the connection to Lake Pontchartrain is restored relative to the existing conditions with the cofferdam in place and IHNC closed. The current configuration of the Seabrook cofferdam, GIWW sector gate cofferdam, and the Bayou Bienvenue vertical lift gate set 1 ft above the sill is not modeled. However, a graph comparison may be made for this proposed additional 12 month interim situation that exists when Seabrook is closed off and only the GIWW Barge Gate is open (March 2010) scenario with the completed Seabrook Floodgate Complex (Plan 3 Final) (figure 8, USACE 2010a). These numbers are only applicable at the structures, because within the basin velocities decrease with distance away from the structure. Alterations in tidal range to the south of the Seabrook and at the GIWW at IHNC vary, but would be no more than 1 ft difference than the constructed Seabrook Floodgate Complex (Plan 3 Final) (figure 9). Incoming tide in the IHNC Basin is not able to connect with Lake Pontchartrain. Hence, the tidal signal becomes more pronounced south of the Seabrook Floodgate Complex. While the Seabrook cofferdam is in place and the GIWW sector gate is in place the flow in the IHNC is extremely small, this is illustrated in figure 9.

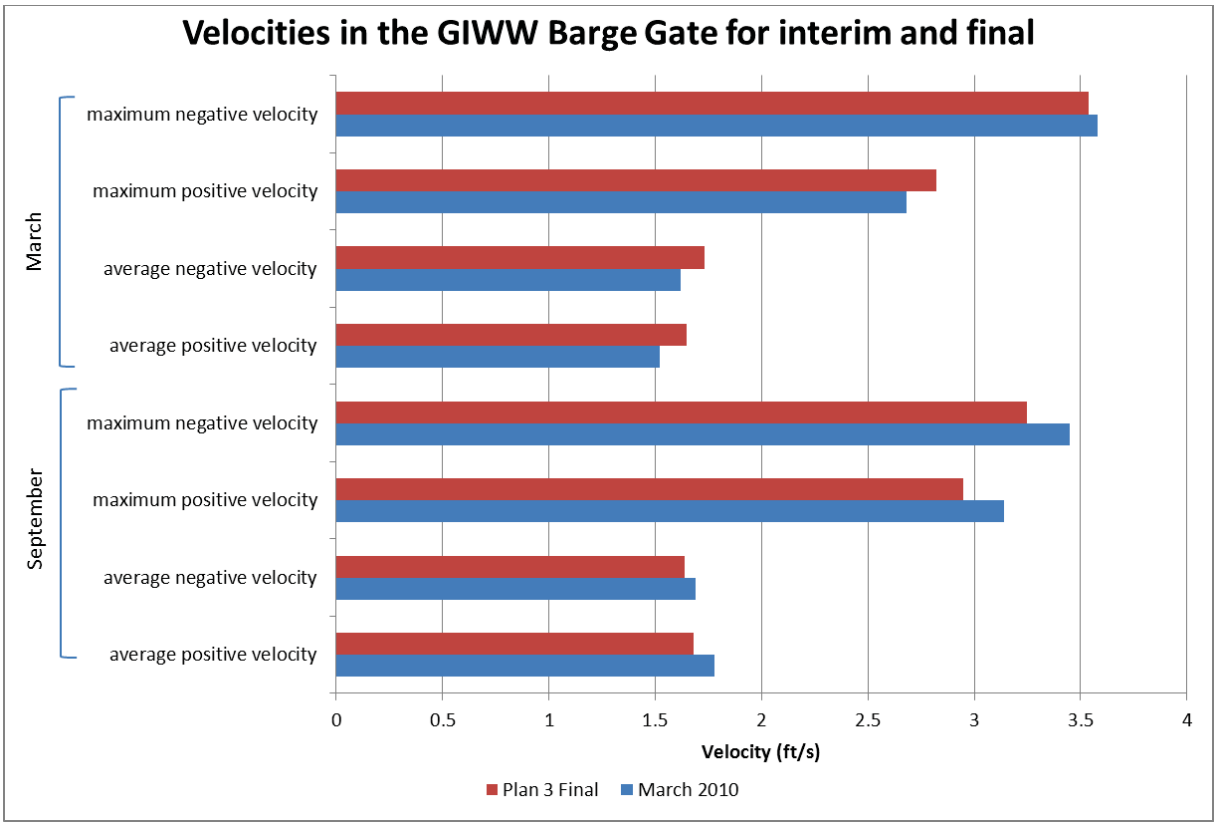


Figure 8. Graph comparison of velocities for a typical March and September in the GIWW Barge Gate for the interim shown in blue (Seabrook, GIWW sector and Bayou Bienvenue gates closed) and all gates open in the final configuration shown in red (Seabrook, GIWW sector/barge, and Bayou Bienvenue) (USACE 2010a).

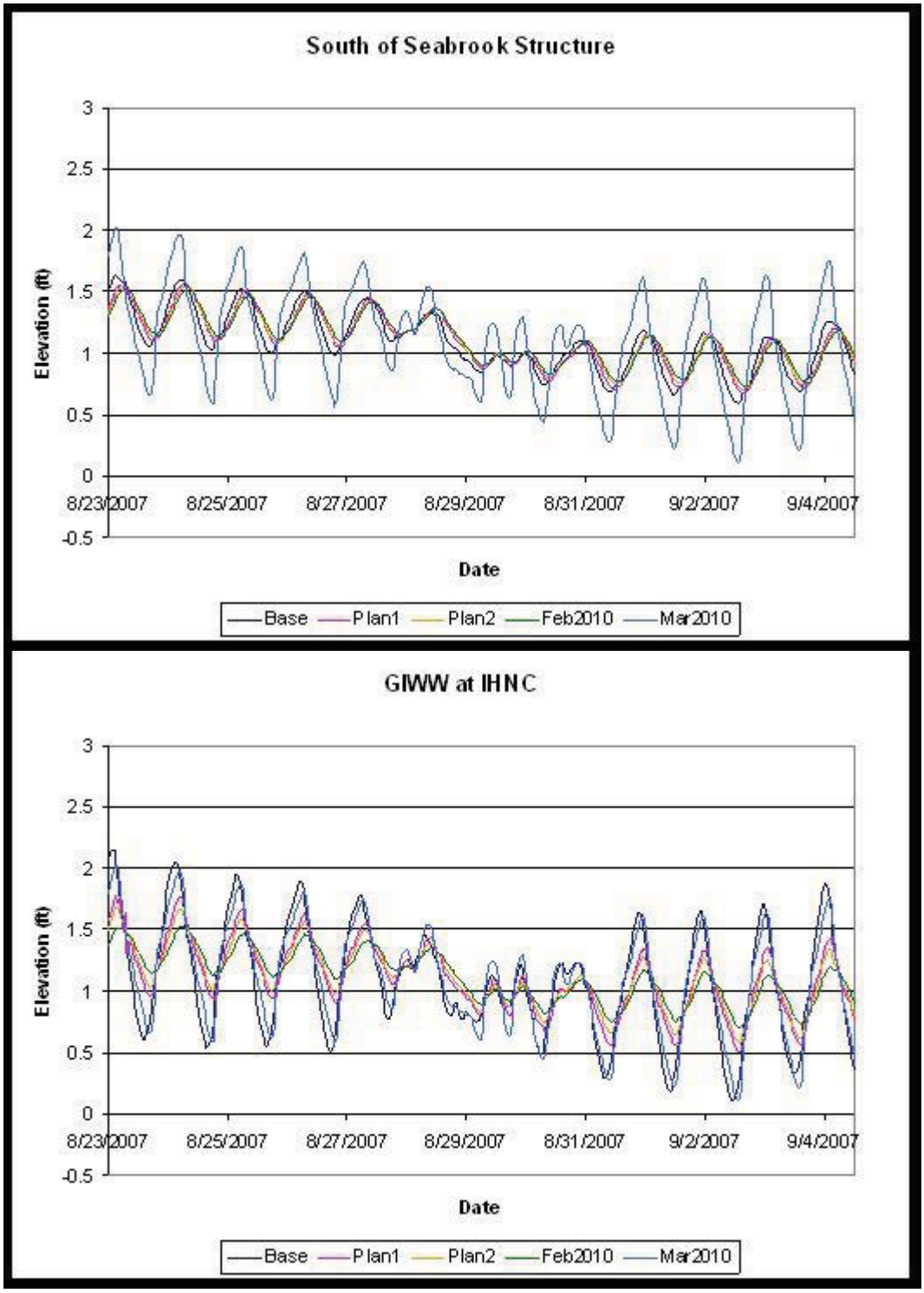


Figure 9. Water surface elevation south of Seabrook and in GIWW at IHNC (September). March 2010 shows typical tidal amplitude for interim in the GIWW barge gate (Seabrook, GIWW sector and Bayou Bienvenue gates are closed) (USACE 2009c).

The temporary direct impacts to hydrology described in IER #11 Tier 2 Pontchartrain would also be expected during construction of the gate structures for the additional 12 months (approximately September 2012). Velocity and circulation have been cut off between Lake Pontchartrain and the IHNC by the placement of a cofferdam that spans the width of the IHNC for a total of approximately 24 months. There are also some velocity changes in the GIWW Barge Gate opening compared to the final situation, however, they are considered to be minor. During this interim situation it can therefore be expected that velocities within the IHNC Basin are lower than in the final situation (Plan 3 Final). Also the further away from Seabrook Floodgate Complex, the more flow velocities would approach the velocity that is expected in the final situation.

Indirect Impacts to Hydrology

Hydrologic changes may indirectly correlate to both temporary and permanent impacts to water quality and aquatic habitat for an additional 12 months than what was disclosed in IER #11 Tier 2 Pontchatrain. According to the Orleans Levee District and the Lake Borgne Basin Levee District with the Seabrook cofferdam in place and sustained southwest winds, water that would pass from the GIWW into Lake Pontchartrain piles up in Bayou Bienvenue causing interior flooding. As a result, the Bayou Bienvenue and Dupre structures are being operated by the levee districts more frequently and for longer periods until the piled up water subsides. Therefore, upon removal of the Seabrook cofferdam, the Bayou Bienvenue andDupre structures will be operated in strict accordance with their operation manuals. These indirect impacts will continue for an additional 12 months (approximately September 2012) in the form of changes in salinity and dissolved oxygen (DO) that are heavily influenced by hydrologic changes as described in IER #11 Tier 2 Pontchartrain. These changes have the potential to impact both aquatic and terrestrial species because of reduced flow and velocity which contributes to poor water quality in the IHNC. These impacts are discussed in further detail in sections 3.2.2, 3.2.3, and 3.2.4 (water quality, aquatic resources and fisheries, and essential fish habitat (EFH)).

Cumulative Impacts to Hydrology

Cumulative impacts from the proposed action for the 12 month longer construction duration are as described in IER #11 Tier 2 Pontchartrain. The majority of the construction for the multiple HSDRRS projects in the area is complete; however, other projects are ongoing such as the Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA) projects and the Violet freshwater diversion project. The combined effects of other projects including the Borgne Barrier, the closure of the MRGO at Bayou La Loutre, and the Violet Diversion would result in varying degrees of altered hydrology throughout the project area. Direct and indirect changes to the project area were discussed previously, but the changes from the combination of IER and CWPPRA projects would lead to substantial long-term cumulative impacts to the hydrology of the Lake Pontchartrain Basin and nearby vicinity.

By providing a storm surge barrier across the IHNC, the incremental effect of the proposed action, in combination with other projects in the vicinity, would significantly reduce the effect of surges from extreme events up to the 100-year storm level. This would result in further enhancement of the entire proposed 100-year HSDRRS throughout the area (USACE 2008a), resulting in a reduced risk of property and environmental damages from flooding.

Modeled velocities at the Seabrook location, once construction is complete, would be as described in IER #11 Tier 2 Pontchartrain; velocities would be expected to increase when compared to the current condition with the cofferdam in place. However, because the design includes three gates, it is predicted to be similar to historical conditions prior to construction of the closure of the MRGO at La Loutre and the Borgne Barrier.

No Action Alternative

Direct Impacts to Hydrology

Hydrologic changes such as changes in surface water velocities and circulation patterns would be similar to those discussed for the proposed action except they would be for a longer duration or could be considered permanent impacts. Under this alternative the cofferdam would remain in place permanently blocking the connection of the IHNC with Lake Pontchartrain so the temporary continued construction impacts described for the proposed action would be for a longer or permanent duration. The flows in the vicinity of Seabrook on the IHNC would continue to be 0 fps. There would be no increase in velocities expected because the area would remain a "dead end canal." The velocity of the flow through the Borgne Barrier GIWW sector/barge gates and Bayou Bienvenue vertical lift gate will continue to range from approximately 0.7 to 1.2 fps and average approximately 2 fps for tidal events. The altered tidal range south of the Seabrook Floodgate Complex would continue to vary by approximately 1 ft as compared to the constructed Seabrook Floodgate Complex due to the water stacking up within the IHNC and not flow out into Lake Pontchartrain and the velocities would continue to resemble March 2010 through the GIWW barge and sector gates in figure 8.

Indirect Impacts to Hydrology

Under the no action alternative flow would continue to be cut off and no more construction would occur; therefore, indirect impacts to DO and salinity would be greater than the proposed action because no flushing action would occur as with a connection to Lake Pontchartrain. Water will likely continue to pile up in Bayou Bienvenue for sustained southwest wind events and increase the operation of the Bayou Bienvenue and Bayou Dupre structures. For storm and high tide events, turbid or saline water could be pushed into the canal, mixing the stratified condition and possibly causing temporary anoxic conditions throughout the IHNC. As with the proposed action, hydrologic changes resulting from implementation of the no action alternative may indirectly correlate to both temporary and permanent impacts to water quality and aquatic habitat. These impacts are discussed in further detail in sections 3.2.3 and 3.2.4.

Cumulative Impacts to Hydrology

Cumulative impacts to hydrology under the no action alternative would be similar to those described under the proposed action except that construction would cease and there would no longer be a connection to Lake Pontchartrain through the IHNC. Cumulatively this would be a third barrier in the once connected path for the Gulf of Mexico through the MRGO, through the GIWW, and through the IHNC to Lake Pontchartrain. The temporary impacts described for increased tidal amplitude for the proposed action would be permanent for the no action alternative. Direct and indirect changes to the project area as discussed previously, along with the changes from the combination of HSDRRS and CWPPRA projects, would lead to substantial long term cumulative impacts to the hydrology of the Lake Pontchartrain Basin and nearby vicinity. The implications of changes in circulation patterns, water surface elevations, and velocity to aquatic resources and fisheries, EFH, and transportation and navigation are discussed in sections 3.2.3, 3.2.4, and 3.2.7.

3.2.2 Water Quality

Existing Conditions

IER #11 Tier 2 Pontchartrain describes the existing conditions and the water quality impacts associated with the proposed action and is herein incorporated by reference. Water quality within the project area can support all primary contact, secondary contact, and fish and wildlife

propagation uses (LaDEQ 2006). However, fish kills are a common occurrence along the south shore of Lake Pontchartrain during the months of August and September, possibly due to low DO, high temperatures, and increased turbidity. Fish kills have also been reported south of the MRGO closure structure at La Loutre as recently as August 2010. The USGS has been monitoring the water quality for the MRGO channel for many years and continues to date. The USGS June 2009 monitoring data south of the MRGO closure at La Loutre revealed the channel experienced a very low DO or anoxic event (0.46-1.97 mg/l), which coincides with the construction of the "rock barrier" for the MRGO closure at Bayou La Loutre which was completed July 9, 2009 (figure 10). However, the low DO in the area of the MRGO channel could also be associated with seasonal variation. Additional descriptions of the water resources within the project area can be found within section 3.2.3, Aquatic Resources and Fisheries.

As part of the coordination with the interagency team, and in response to comments on IER #11 Tier 2 Pontchartrain, the USGS initiated monitoring water quality for this project during the summer 2010, in particular DO, temperature and salinity in various locations on the IHNC, GIWW, and MRGO (figure 10). This monitoring is being completed in order to obtain observed rather than predicted water quality data during and post construction. The water quality in the project area for the past couple years has been variable and could be linked to construction and weather events. The following describes a timeline of recent construction and water flow events that have impacted water quality in the project area.

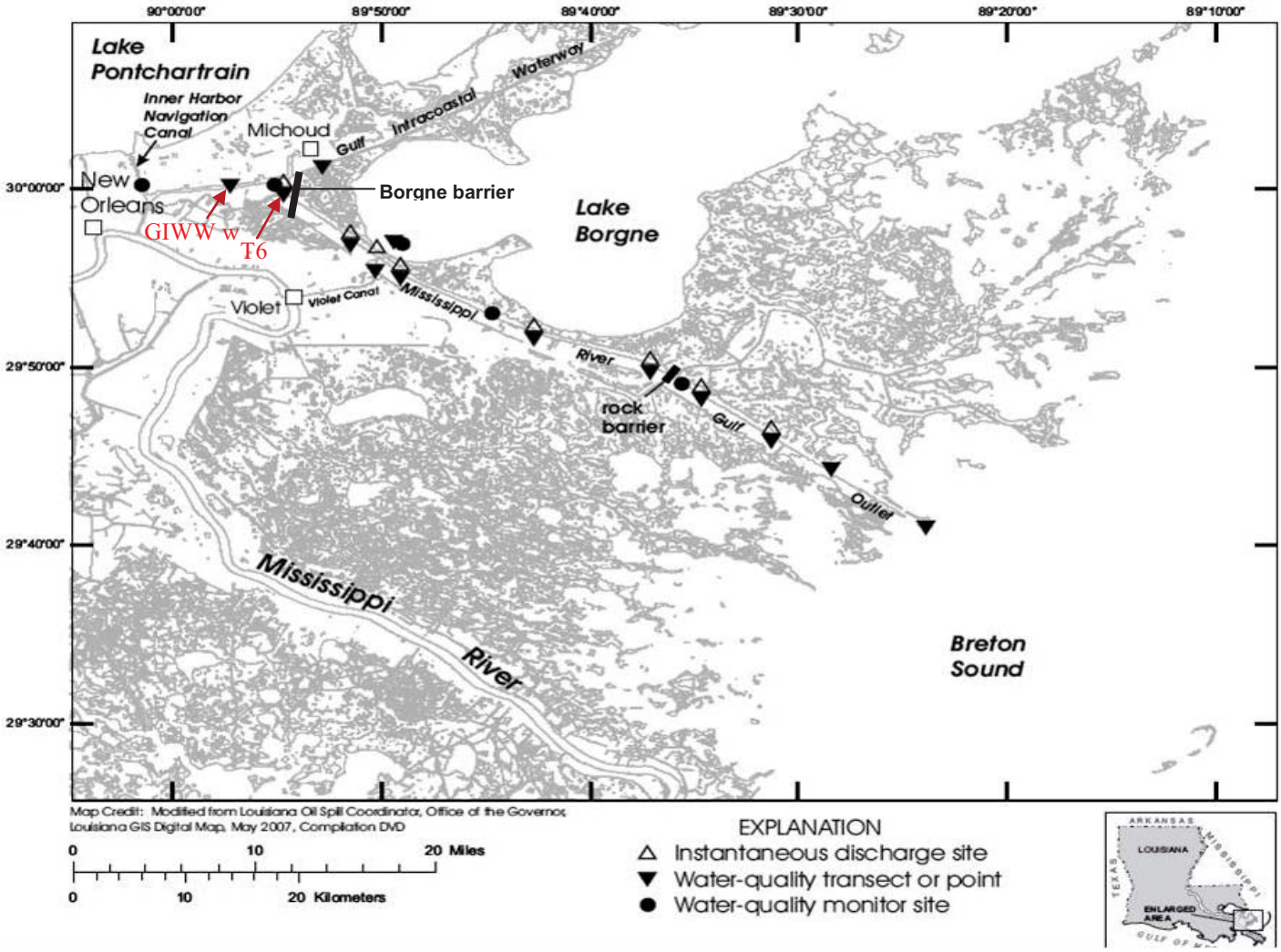


Figure 10. USGS water quality monitoring locations, GIWW w and T6 are west of the Borgne barrier and east of IHNC and the Seabrook construction. The Borgne barrier south of Bayou Bienvenue and the rock barrier south of Bayou La Loutre provide man-made closures on the Mississippi River Gulf Outlet (MRGO).

Dissolved Oxygen

Recent construction and flow event dates are labeled **(1-10)** on figures 11 and 12, which display DO (mg/l) and salinity (ppt) data for two sampling locations in the vicinity of the project area, GIWW w and Transect 6 (T6) (figure 10). On **July 12, 2010 (1)** the Bayou Bienvenue cofferdam was completed and flow-thru pipes were installed to allow some flow through the structure and minimize impacts to water quality. During this time there was low DO in the deeper water of the MRGO channel for sampling locations south of the rock barrier at La Loutre; however, sampling north of this closure on both the protected and unprotected sides of the Borgne Barrier revealed the dissolved oxygen levels were within normal ranges of 4-7 mg/l. This may be attributed to the removal of the barge gate cofferdam on the GIWW/Borgne Barrier on **July 19, 2010 (2)** so more flow and circulation was returned to this area of the channel.

Driving piles for the Borgne Barrier wall was completed in segments of large soldier piles on October 21, 2009, the 6 inch gap between them was closed by closure piles on February 11, 2010, and angled batter piles by April 10, 2010. All segments of the Borgne Barrier wall, including the parapet wall, were in place **September 13, 2010 (3)** and DO levels at the GIWW west and T6 were still ambient ranging from 4.55 to 9.17 mg/l. On **September 15, 2010 (4)** at the Seabrook site they started dumping rock to construct the dike and the connection between Lake Pontchartrain and the IHNC was completely closed October 31, 2010 (figure 13). The GIWW Sector Gate cofferdam was completed on **October 4, 2010 (5).** This essentially constricted the GIWW channel yet again to a 150 ft opening, but DO levels for T6 and GIWW west ranged from 5.52-7.68 mg/l, so there was still enough flow and circulation to prevent anoxic conditions. The sand placement to fill the 90 ft deep scour hole in the vicinity of the Seabrook Gate Complex was completed November 11, 2010, and the vibro-compaction was completed December 20, 2010.

On **February 27, 2011 (6)** the north wall of the Seabrook cofferdam was completed, and on **April 15, 2011 (7)** the south wall of the cofferdam was completed. Then on **April 29, 2011 (8)** the cofferdam was unwatered by means of pumps which discharged into the IHNC and USGS monitoring at the GIWW w and T6 site DO levels ranged from 4 to 8 mg/l saturation during this time. The bottom 40 ft DO levels did decrease after the unwatering was completed, but the high Mississippi River flood waters in late spring 2011, necessitated the opening of the Bonnet Carre Spillway. This diverted cooler freshwater into Lake Pontchartrain from **May 9, 2011 (9)** to **June 7, 2011 (10)**. The seasonal summer increase in water temperature as well as the mixing event of the September 3, 2011Tropical Storm Lee contributed to stirring up the water column in the IHNC/GIWW and coincides with the decrease in dissolved oxygen at the T6 and GIWW w site for the month of September 2011.

Salinity

The July 9, 2009 completion of the MRGO closure at Bayou La Loutre influenced salinities in the project area. This specifically can be seen in the figure 5 for T6. The salinity levels decreased from 20 to 10 ppt. From this date forward, salinity levels monitored by the USGS for locations north of the barrier have decreased. The diversion of freshwater from the Bonnet Carre Spillway opening decreased salinities as evidenced by sampling south of the MRGO closure at La Loutre, as well as the T6 and GIWW w sites which ranged from 6 to 2 ppt. However, after the Tropical Storm Lee mixing event the salinities started to increase for the month of September. The September 2011 low dissolved oxygen conditions in the canal are temporary, most likely related to recent storm events and seasonably variability; however, the continued closure of the IHNC at Seabrook prevents flushing and water exchange with Lake Pontchartrain at that location and the La Loutre rock barrier as well as the Borgne barrier prevent

direct exchange of high salinity Gulf of Mexico water. Natural mixing events such as winter storms are likely to continue to provide more mixing events in the study area as well as tidal exchange through the GIWW and Bayou Bienvenue.

Figure 11. Dissolved oxygen and salinity levels for Transect 6 on the IHNC from August 2008 through September 2011. Construction and diversion events 1-10 detailed in text above.

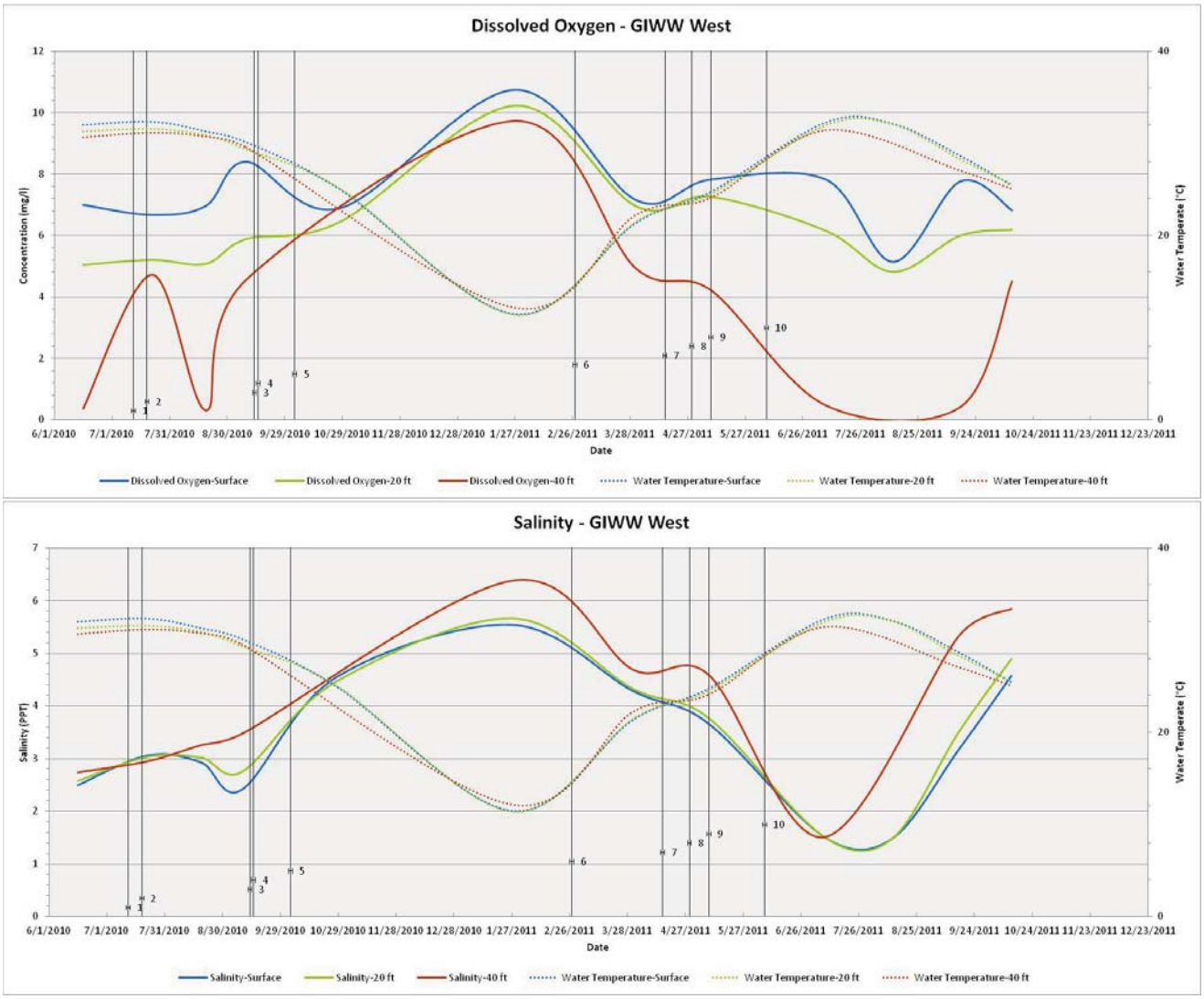


Figure 12. Dissolved oxygen and Salinity levels for GIWW west 6 on the GIWW from June 2010 through September 2011. Construction and diversion events 1-10 detailed in text above.

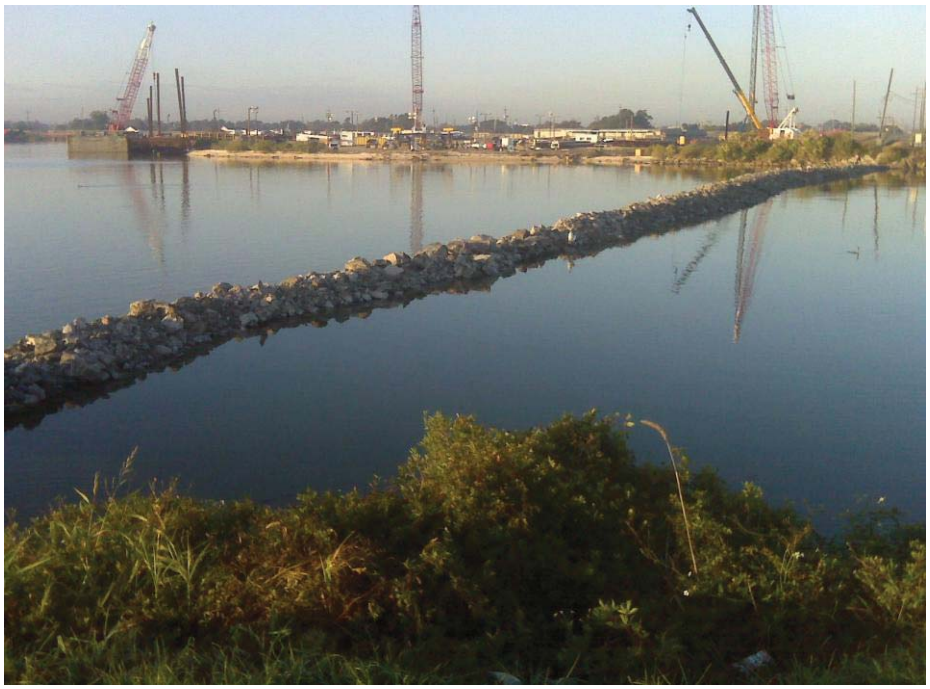


Figure 13. Temporary rock dike completed for the Seabrook Gate Complex completed 31 October 2010. This feature of the project closed the connection of the IHNC and Lake Pontchartrain in order to safely construct the project.

Discussion of Impacts

Proposed Action

Direct Impacts and Indirect Impacts to Water Quality

Construction activities will continue to impact the water quality in the project area through temporary increases in turbidity from the suspension of inorganic sediments, as described in IER #11 Tier 2 Pontchartrain. As explained in the existing conditions, there have been concurrent events such as the Mississippi River Bonnet Carre Spillway diversion **(9-10)** as well as other construction and closure events that were previously described in IER #11 Tier 2 Pontchartrain that have contributed to the water quality in the project area. In water construction that has already occurred includes the placement of fill in the scour hole and the installation of the cofferdam. However, best management practices (BMPs) were employed to minimize the suspension of sediments and turbidity effects. The BMPs included construction of a rock dike to slow currents (figure 13), placement of fill during slack tide, and monitoring turbidity levels as well as other water quality parameters such as dissolved oxygen, temperature, and salinity in various locations throughout the IHNC, GIWW, and MRGO (figure 10). The extended closure of the canal and resultant reduction of flow and tidal exchange between Lake Pontchartrain and the IHNC/GIWW will continue to temporarily impact water quality in the project area for approximately 12 more months (September 2012).

Pre-project scour holes continue to exist approximately 300 ft north of the Seabrook Bridge in Lake Pontchartrain and within the IHNC further south of the project area. These scour holes contain hypoxic water, and construction activities may cause changes in patterns of turbulence and scour and force hypoxic, relatively saline water from the scour holes into the overlying water column. The temporal and geographic extent of possible impact from disturbance of the scour

holes would depend on the degree of hypoxia and the amount of disturbance. If DO concentrations in the scour holes are near 0 mg/l, then hydrogen sulfide, which is toxic to aquatic organisms, could enter the water column along with low oxygen water. Dilution of water from the scour holes with overlying water would be expected to limit effects of these conditions to the area around the construction site. The north scour hole in Lake Pontchartrain, which was not modified as a result of this project, continues to accumulate higher salinity hypoxic water. These high salinity/low oxygen conditions continue to contribute to a hypoxic zone along the bottom of a portion of Lake Pontchartrain near the IHNC. However the extent of this high salinity/low oxygen zone would be expected to be smaller because there is now only one scour hole present in this location of Lake Pontchartrain.

DO modeling as described in detail in IER #11 Tier 2 Pontchartrain suggests that when flow through the IHNC is closed off with the cofferdam in place during construction, higher DO values on the order of 4.0 mg/L to 4.2 mg/L can be expected south of the Seabrook Gate Complex structure. North of the proposed structure, closure of the channel would result in reduced DO values that range from 5.2 mg/L to 5.3 mg/L down to 4.1 mg/L to 4.2 mg/L (USACE 2009d). Monitoring by USGS revealed low (~0 mg/l) anoxic DO at the GIWW w site in late August 2010 and late July-September 2011; however, to date there have been no reports of fish kills in Lake Pontchartrain, the IHNC and GIWW in the vicinity of the project area and these events are consistent with seasonal variability and storms.

DO levels may be affected by construction activities in other ways; suspension of organic sediments from the bottom may create relatively small regions where oxygen concentrations drop below normal. The DO levels for Transect 6 and GIWW w, when the scour hole was being filled and vibro-compacted, were within normal levels. During this time, there would have been increases in turbidity and suspension, but there seems to have been enough dilution and re-aeration occurring. This physical mixing of water prevented oxygen levels or photosynthetic production from dropping below critical levels for aquatic life because no algal blooms were reported. The reduced flows through this portion of the IHNC and the BMPs followed, reduced the distribution of organic and inorganic sediments, and concentrations of chemically reduced substances that could be stirred up in the water column by construction activities, thus further minimizing impacts of low DO and stress to aquatic life within the IHNC and GIWW.

Turbidity caused by construction may slightly increase water temperature. Suspended particles near the surface absorb more solar energy than water molecules, resulting in warmer water near the surface than in less turbid water. Temperature increases overall would be slight and localized around the construction. Current USGS monitoring indicates that temperature has followed seasonal variability with the exception of the introduction of the Mississippi River water through the Bonnet Carre Spillway that may have contributed to slightly decreasing water temperature in the project area.

As previously discussed, salinities in the project area have decreased as a result of the closure on the MRGO at La Loutre and the additional Borgne Barrier MRGO closure. Salinities in Lake Pontchartrain would be expected to continue to average 0.1 ppt to 0.3 ppt lower than if a barrier structure near Seabrook were not in place. Historical salinities in the vicinity of the IHNC/GIWW (prior to the MRGO closure at Bayou La Loutre and the Borgne Barrier) ranged from approximately 6 ppt to 8 ppt depending on the season. Current USGS sampling at Transect 6 and GIWW w indicates that salinities now range from 2 to 6 ppt in the project area, however this sampling includes the period of time that freshwater from the Mississippi River was diverted through the Bonnet Carre Spillway into Lake Pontchartrain and the project area (USACE 2009d). The ADH model predicted the MRGO closure at La Loutre would decrease salinities within the Seabrook project area on the order of 1 ppt to 3 ppt. To validate the decreases experienced as a result of the closure at La Loutre, the USGS will continue to sample water quality in the project area.

Cumulative Impacts to Water Quality

The incremental effects of the proposed action for an extended closure of the IHNC, to construct the Seabrook Gate Complex, would not be expected to have a significant long-term effect on large-scale water quality conditions in the study area since water quality would continue to be influenced by industrial and commercial uses. Concurrent construction of other 100-year HSDRRS projects could cause short-term impacts to water quality that could exceed the LaDEQ water quality standards. The cumulative construction impacts of the proposed action would be additive to similar impacts caused by other HSDRRS projects. The implementation of BMPs and Stormwater Pollution Prevention Plans (SWPPPs) would minimize cumulative impacts from construction.

Although the proposed action, when combined with the closure structures along the GIWW and Bayou Bienvenue indicate changes in DO and salinity values, the changes described would be minimal compared to the shift that has been measured due to the MRGO closure at Bayou La Loutre (USGS 2009). The MRGO closure at Bayou La Loutre could produce environmental benefits through partial restoration of estuarine salinity gradients. Modeling conducted by ERDC illustrated and water quality sampling by USGS has confirmed that the closure of the MRGO at Bayou La Loutre has had a significant effect on monthly average bottom salinity values not only in MRGO/GIWW/IHNC complex, but also in the Lake Pontchartrain area. Most areas show decreases of 3 ppt to 4 ppt, with the MRGO channel showing the highest decrease in the region just north of the La Loutre closure at approximately 10 ppt (Martin et al. 2009b).

Continued industrial activities, urban wastewater discharges, and construction activities contribute to a continued decline in water quality within the study area. However, state and Federal programs are in place to regulate and improve water quality, so the net cumulative impact over time could be improvement of water quality for the study area.

No Action Alternative

Direct Impacts and Indirect Impacts to Water Quality

Overall, direct impacts to water quality would be similar to those discussed under the proposed action except they would be for a longer duration or could be considered permanent impacts. Under this alternative the cofferdam would remain in place, permanently blocking the connection of the IHNC with Lake Pontchartrain, so the temporary continued construction impacts described for the proposed action would be for a longer or permanent duration. All other construction equipment would be removed so there would be no further disturbance to water quality with implementation of in water construction such as completing the rock work, scour protection, gate ramps, etc.

Cumulative Impacts to Water Quality

Cumulative impacts under the no action alternative would be the same as those discussed under the proposed action except that the connection to Lake Pontchartrain through the IHNC would no longer exist. Cumulatively this would be a third barrier in the once connected path for the Gulf of Mexico, through the MRGO through the GIWW, and through the IHNC to Lake Pontchartrain. As stated previously, the water quality impacts at Seabrook would be approximately a 1 ppt change in salinity but would continue to be tidally influenced through the GIWW and follow seasonal variability. The area will continue to be influenced by the industrial activities, urban wastewater discharges, construction activities along the IHNC, as well as by periodic storm events.

3.2.3 Aquatic Resources and Fisheries

IER #11 Tier 2 Pontchartrain contains a complete discussion of the aquatic resources and fisheries for the project area and is incorporated by reference into this document.

Existing Conditions for Aquatic Resources and Fisheries

From April 20, 2010 until July 15, 2010, the Deep Water Horizon oil spill contaminated thousands of square miles of the Gulf of Mexico, and hundreds of square miles of beaches, marshes, and estuaries in the states of Mississippi, Louisiana, Alabama, and Florida releasing an estimated 4.9 million barrels of crude oil. Although many areas to the south were impacted, and tarballs were reported in the Rigolets, there have been no reported signs that the project area has seen any of these impacts.

On February 27, 2011, the north wall of the Seabrook cofferdam on the IHNC was completed, on April 15, 2011 the south wall was completed, and the area was dewatered starting on April 29, 2011, discharging into the INHC and GIWW. The approximately 95,000 sq ft area inside the cofferdam was surveyed for Gulf sturgeon and any other threatened and endangered (T&E) species in April 2011, by the ERDC Fish Ecology team. Surveys were conducted before and throughout the process of dewatering this area. In doing so, many of the fishes and crabs were relocated outside of the construction area. In all, 20 species of fishes and blue crabs were documented, with Gulf menhaden and Bay anchovy being the most abundant species noted during their evaluations. No observations of Gulf sturgeon were reported.

The braced cofferdam that has been temporarily installed across the channel around the approximate perimeter of the sector gate and vertical lift gates will be in place for approximately 24 months (an addition of approximately 12 months to the original plan). As described in IER #11 Tier 2 Pontchartrain activities, associated with the cofferdam and construction in this area, could result in mortality of individuals that are considered aquatic resources and fisheries resources. While most individuals would be expected to move away from these areas, eggs, larvae, and juvenile fishes would be expected to see the most impact. During this extended phase of construction, the IHNC will be closed to flow exchange with Lake Pontchartrain. While the cofferdam is in place, movement and transport of organisms between the IHNC and Lake Pontchartrain would continue to be temporarily blocked.

Proposed Action

Direct and Indirect Impacts to Aquatic Resources and Fisheries

Closure of the IHNC during the construction phase may reduce year class strength and densities of some populations in Lake Pontchartrain and the GIWW in the vicinity of the project. This extended temporary closure may cause some increased loss of larval organisms; however, losses from this activity are not expected to measurably affect fish and crustacean populations in Lake Pontchartrain. The duration of this construction phase would impact at least two spawning seasons of most species, and therefore these organisms would most likely not recruit to central Lake Pontchartrain nursery areas through the IHNC, but rather recruit to areas of Lake Borgne and eastern Lake Pontchartrain, because of temporary canal closure and construction.

Dissolved Oxygen

A rock dike was put in place at the convergence of the IHNC and Lake Pontchartrain and the south 90ft deep scour hole was filled prior to construction of the Seabrook Complex cofferdam. This work was completed in December of 2010, and with this action there was a permanent loss of deep-water habitat, and temporary impacts to water quality in the area. Filling the scour hole south of the Seabrook Bridge may cause permanent beneficial changes to DO levels in the INHC after construction is complete and while it has the potential to ultimately improve water quality conditions in the project area and the study area, DO levels are still predicted to be less than the standard of 4.0 mg/L (Dortch and Martin 2008).

Salinity

Salinity levels have been affected from day one of closure of the MRGO in and around the project area. Because of this, density and distribution of SAV beds along the eastern shore of Lake Pontchartrain may increase as a result of lower salinity levels. Accessibility of the marsh areas, such as those near Bayou Bienvenue, contain altered salinity due to the MRGO closures at Bayou La Loutre and Bayou Bienvenue, and may be less accessible for organisms due to changes in tidal velocity and passage constraints. This has potentially made these pathways more of a direct route of travel for aquatic species, resulting in a temporary hotspot for fishing on the MRGO near the Borgne barrier.

Because of an extended closure, fish kills in the Seabrook areas could occur; however, none have been documented in the project area to date. There have been fish kills reported near the Bayou La Loutre closure in August 2010. These kills would only occur while the cofferdam is in place and would not be expected to occur after the sector gate and two vertical lift gates are in place. Much of the time frame for the extend closure will fall during winter, with colder water temperatures; the likelihood of fish kills decreases.

The Bonnet Carre' Spillway is a flood risk reduction structure that when open diverts freshwater from the Mississippi River into the Lake Pontchartrain estuary. The Lake Pontchartrain estuary is brackish, and most estuarine species are adapted to fluctuating salinities. Many estuarine species inhabit or forage in low salinity areas of estuaries during one or more life stages. On May 9, 2011, the Bonnet Carre' spillway was opened, and remained open until June 21, 2011 in order to relieve pressure on the Mississippi River and Tributaries levees south of the Bonnet Carre' Spillway. The 43 day 2011 opening diverted approximately 5.7 trillion gallons of freshwater into Lake Pontchartrain and temporarily impacted estuarine species and freshwater species. The 2011 Spillway opening was larger than many of the previous openings. The Spillway opening was also followed at the beginning of September by the passage of Tropical Storm Lee, which sent storm surges into Lake Pontchartrain and increased salinities. At the present time, the Lake Pontchartrain salinities have stabilized and fisheries are back to pre-opening conditions.

Velocity

Continued slowed velocities along the GIWW into the IHNC and changes in directional flow could increase the migratory time to enter the lake through the IHNC and reduce recruitment of larval life stages of fisheries species. Blockage of access during the extended construction phase of the project would potentially trap and separate all life stages of prey (bay anchovy, Gulf menhaden, and *Rangia* clams) and predatory species (spotted seatrout, and red drum) from the less saline waters necessary for life cycle requirements and from adequate habitat for protection and foraging, thus resulting in possible starvation or increased predation pressure for an additional 12 months. Flow in the waterways due to the temporary blind end of the IHNC

would continue to be affected by tide reversal, which would generally influence bottom waters to move into and surface waters and to move out of the INHC through the GIWW (Dortch and Martin 2008). This is expected to disrupt larval migration and any advantage that many of these organisms may have had in exiting the IHNC after arrival, depending on their migratory behavior in utilizing tidal flow. With the extended 12-month closure of the IHNC, this would have continued localized effects on population year class strength.

Once the cofferdam is removed, the obstruction created by the gate placement near the Seabrook Bridge could provide "protected" areas in the vicinity of the structure for some organisms, but could also create a trap or gyre for many organisms which do not have sufficient control to manage any resulting eddies. Food depletion and increased predation stress could result. Resulting impacts could range from changes in behavior, to slower growth rates, to starvation and death, and increased predation mortality. The Seabrook Complex gate design includes sloping the sill at a 1:5 slope, and directing the flow to the center of the channel combined with construction of a guide/training walls that is intended to decrease this impact as well as reduce bank erosion, and aid in aquatic species passage. These impacts would be minimized and possibly negated if a guide/training wall prevents eddies and gyres.

Cumulative Impacts to Aquatic Resources and Fisheries

For approximately 24 months during construction of the proposed action, a cofferdam would block flow between the IHNC and Lake Pontchartrain. Additionally, the timing of the construction sequence of the Seabrook Complex and various features of the Borgne Barrier, including the GIWW sector gate and Bayou Bienvenue gate, overlaps for more than 1 year. The GIWW would still allow flow and navigation through the gate during this phase of construction, but the channel opening would be reduced from 300 ft to 150 ft. The cofferdam at the Seabrook Complex, along with the constriction on the GIWW and at Bayou Bienvenue would restrict access of aquatic resources and fisheries species to quality habitat. Migration and recruitment to available habitats in the vicinity of the IHNC by fish and other aquatic species would continue to be blocked during construction for an additional 12 months (approximately September 2012). This restriction could cause an increase in predation of some lower trophic level species, change the prey items that are available to predators, and cause predators to travel longer distances during construction and would extend an already lengthy trip, thereby decreasing growth rates, overall health, and possibly the ability of some individual aquatic resources and fisheries to reproduce for another spawning season.

These temporary constrictions could cause fish kills due to low DO, decreased flow, and increased temperatures and turbidity. Fish kills in multiple areas within the project vicinity would impact a larger number of individuals and could cause slower growth rates in individuals subjected to this environment, and would decrease survival of some species causing changes in overall community structure near the closures. Greater impacts are expected from the MRGO closure due to the higher salinities and deeper water depth in the area as compared to the proposed action.

The cumulative effect of this extended closure indicates there may be a short-term direct effect on fish and crustacean populations; however, the long-term effects are not likely to be measurable. Possible effects are described in more detail section 3.2.4 of IER #11 Tier 2 Pontchartrain. The CEMVN is continuing to monitor water quality in the project vicinity and if the results of this monitoring demonstrate the need for modeling and/or actions to address adverse impacts, the CEMVN will coordinate with the resource agencies to complete modeling, within authorization and funding, to evaluate alternatives for providing rectification and/or mitigation to offset adverse impacts. In addition to the monitoring, the CEMVN is coordinating with other state and Federal agencies to obtain available fishery population data and if data

pinpoints a causal connection for impacts of this extended closure, the CEMVN would evaluate the information for possible future mitigation within authorization and funding. While, extended closure of the hydrologic connection between the IHNC and Lake Pontchartrain is temporary, multiple factors such and the closures on the MRGO, the high water event of 2011 and subsequent opening of the Bonnet Carre Spillway, and other HSDRRS projects as well as tropical events are influencing aquatic resources and fishery populations in Lake Pontchartrain. At the present, the full extents of the Deepwater Horizon spill's impacts are not known. There has not been any reported oil in the project area, but there have been fishery impacts reported in the vicinity of the project. The opening of the Bonnett Carre' spillway and Tropical Storm Lee have shown salinity and water temperature fluctuations for the project area and its surrounding waters. These impacts were temporary, and all areas have returned to pre-event conditions.

No Action Alternative

Direct Impacts to Aquatic Resources and Fisheries

Without further implementation of the proposed action, the site would be returned to pre-construction conditions, but the cofferdam would remain in place. Leaving the cofferdam in place would permanently close the hydrologic connection of the IHNC with Lake Pontchartrain for many years, although it would provide the New Orleans Metropolitan area a 100-year level of risk reduction.

With the hydrologic connection closed, the current aquatic conditions, discussed previously, as well as in IER #11 Tier 2 Pontchartrain, affecting the project area and its surrounding areas, would continue to persist. The long term closure of the IHNC with Lake Pontchartrain would affect the life cycles of many of the aquatic species found in this area. The closure would eliminate a quick and direct path of migration to nursery areas of central Lake Pontchartrain, causing organisms to migrate elsewhere. It is anticipated that aquatic resources and fishery populations would adapt to migrating into Lake Pontchartrain through historic routes such as the Rigolets and Chef Menteur Pass. Long term altered DO and salinity levels, as well as decreased velocity of flow, would affect organisms that are sensitive to changes in these conditions. It is also possible that commercial and recreational fishing activities would adapt with the changes in migration patterns to the surrounding areas.

3.2.4 Essential Fish Habitat

IER #11 Tier 2 Pontchartrain contains a complete discussion of the Essential Fish Habitat (EFH) for the project area and is incorporated by reference into this document. EFH in the project area has been designated for certain life stages of five managed species that commonly occur in the project area (table 3).

<u>Existing Conditions</u>

Two pre-construction scour holes existed within the project area, located approximately 300 ft to the north and 300 ft to the south of the Seabrook Bridge in Lake Pontchartrain and the IHNC. The southern scour hole was filled as part of the project construction. This portion of the construction process was completed in December of 2010, and no longer exists as deep-water aquatic habitat.

Two SAV beds occur along the southern shore of the New Orleans East Area floodwall in Lake Pontchartrain (approximately 4 miles away from the project area) and on the eastern side of South Point heading toward Irish Bayou and Lake St. Catherine (approximately 15 miles away from the project area). Additionally, anecdotal information indicates that an eastern oyster

population may exist at the mouth of the IHNC. These areas were inundated with a flow of fresh water with the opening of the Bonnet Carre' Spillway, during the spring flood of 2011, but conditions have returned to pre-flood levels at the present time.

A population of the *Rangia* clam covers the bottom of Lake Pontchartrain and is an integral part of the local ecosystem. Although a food source for several Pontchartrain aquatic species, its most important function is its ability to continuously siphon water, which aids in maintaining good water quality in the lake. This species was drastically affected by dredging for their shell, until 1990, when the activity was banned, but populations have been very slow to recover since. The cause of this slow recovery is due in part to saltwater intrusion via the IHNC from the MRGO. This has helped to create a 100 mi (250 km) anoxic/hypoxic zone as a result of salinity stratification in the lake (Spalding et al. 2006). It is possible that the freshening of the lake from the opening of the Bonnet Carre' could show an improvement of the recovery of populations of *Rangia* clams in the near future.

Table 3. Life-Stages of Federally Managed Species that Commonly Occur within the Project Vicinity and the Associated Types of Designated EFH

Species	Life Stage	System *	EFH Zone and Habitat Type
Brown shrimp (*Farfantepenaeus aztecus*)	Eggs (no data available)	M	sand/shell/soft bottom
	Larvae	M	planktonic, sand/shell/soft bottom, SAV, emergent marsh, oyster reef
	Juvenile (common)	E	SAV, sand/shell/soft bottom, emergent marsh, oyster reef
	Adult (rare)	M	SAV, sand/shell/soft bottom, emergent marsh, oyster reef
White shrimp (*Litopenaeus setiferus*)	Eggs (no data available)	M	Sand/shell/soft bottom
	Larvae	M	planktonic
	Juvenile (abundant)	E	SAV, soft bottom, emergent marsh
	Adult (rare)	M	Near shore and offshore sand/shell and soft bottom
Pink Shrimp (*Farfantepenaeus duorarum*)	Eggs (no data available)	M	sand/shell bottom
	Larvae (no data available)	M	planktonic, sand/shell bottom, SAV
	Juvenile (common)	E	sand/shell substrate
	Adults (rare)	M	Coarse sand/shell near SAV
Red drum (*Sciaenops ocellatus*)	Eggs (no data available)	M	Near shore pelagic
	Larvae/postlarvae (no data available)	E	all estuaries planktonic, SAV, sand/shell/soft bottom, emergent marsh
	Juvenile (common)	E/M	SAV, sand/shell/soft/hard bottom, emergent marsh, oyster reefs
	Adult (common)	M/E	SAV, pelagic, sand/shell/soft/hard bottom, emergent marsh, oyster reefs
Gulf stone crab (*Menippe adina)*	Eggs	E/M	Sand/shell/soft bottom
	Larvae/postlarvae	E/M	Planktonic/oyster reefs, soft bottom
	Juvenile	E	Sand/shell/soft bottom, oyster reefs
	Adult	E/M	Oyster reefs, sand or mud bottoms, seagrass, rocks

Source: GMFMC 2004 and NMFS 2008. * E = estuarine, M = marine.

Discussion of Impacts

Proposed Action

Direct and Indirect Impacts to EFH

The IHNC/GIWW serves as a major conduit between the Gulf of Mexico and Lake Pontchartrain for many species managed by the Magnuson-Stevens Fishery Conservation and Management Act (MSA), and is considered EFH. Significant alterations to this conduit could cause positive and negative impacts to EFH including breeding, transport/migration, and growth to maturity. The proposed action would not be expected to have any direct impacts to SAV, but the 12 month extended closure of the IHNC could show impacts to the life cycles to certain aquatic species.

Presently, large spotted seatrout are found in the Seabrook bridge area, most likely due to the presence of the scour hole. Since deep-water habitat is sparse in the project vicinity, loss of this habitat may cause changes in seasonal behavior, feeding behavior, and growth rates of larger fishes that utilize this habitat. Conversely, the cofferdam could also concentrate prey items, thus attracting larger fish/predators to the area north of the cofferdam around the remaining scour hole; however, the poor water quality in the vicinity of the cofferdam may negate fish from taking advantage of this opportunity, even with an extended closure time.

When the southern scour hole was filled as part of the project construction, deep-water aquatic habitat was lost. The permanent impacts from decreaseing the depth in the channel will likely improve water quality in the area over time once the IHNC is reopened after the extended closure. However, DO levels will be expected to stay below 4.0 mg/L (Dortch and Martin 2008).

The USGS initiated monitoring water quality for the project area and its surrounding areas, during the summer of 2010 in particular DO, temperature, and salinity in various locations on the IHNC, GIWW, and MRGO (figure 10). This monitoring is being completed in order to obtain observed rather than predicted water quality data during and post construction, as it is influential in determining effects from the original project, as well as the extended closure period.

There have been substantial salinity changes in and around the project area, throughout the constructions process, with lower salinity being the average, because of the restriction of flow through and around the project area. However, several fluctuations have been attributed to storms or flooding. Most recently fluctuations occurred during the Mississippi River spring flood of 2011. The opening of the Bonnet Carre' spillway reduced the salinity of the entire area and tropical storm Lee raised the salinity levels back to normal levels, and these seasonal spring flood salinity fluctuations have been observed throughout the project timeline (Figures 11 and 12).

During construction, velocity and circulation has been cut off between Lake Pontchartrain and the IHNC by the cofferdam that spans the width of the channel. In a December 2010 report by ERDC/CHL, the March 2010 construction scenario with the IHNC connection to Lake Pontchartrain at Seabrook closed modeled the velocity through the project area to be 0 f/s (USACE 2010a). This velocity would be expected to stay the same throughout the entire 12 month extended period of closing.

Cumulative Impacts to EFH

Cumulative impacts to EFH and EFH species from the proposed action would involve the combined effects from the multiple IER projects and CWPPRA projects throughout the area. Potential cumulative impacts to EFH and EFH species with designated EFH in the project vicinity would continue to occur from construction-related activities and from the various other

on-going, completed, and authorized projects (e.g., changes in salinity, velocity, and circulation/flow). The proposed action would result in both beneficial (improving water quality) and adverse impacts (both temporary and permanent) to EFH and EFH species and their prey. These impacts are discussed in detail in IER #11 Tier 2 Pontchartrain, and, at a minimum, would be expected to continue throughout the 12 month extended closure period for this project (approximately September 2012).

Although flow has been restricted, (both gates on the GIWW, and the partially open vertical lift gate at Bayou Bienvenue), all three gates should be completely open by June 2012. At the present, no fish kills, as previously discussed in IER #11 Tier 2 Pontchartrain, have been reported in the project area.

No Action Alternative

Direct, Indirect, and Cumulative Impacts to EFH

Without further implementation of the proposed action the site would be returned to pre-construction conditions but the cofferdam would remain in place. Leaving the cofferdam in place would permanently close the hydrologic connection of the IHNC with Lake Pontchartrain for many years, although it would provide the New Orleans Metropolitan area 100-year level of risk reduction.

With the hydrologic connection closed, the current EFH conditions, discussed above, as well as in the IER #11 Tier 2 Pontchartrain document, affecting the project area and its surrounding areas, would continue to persist. The long term closure of the IHNC with Lake Pontchartrain could have both negative and positive effects on EFH in and around the project area, including breeding, transport/migration, and growth to maturity. A long term closure could also reduce saltwater intrusion into Lake Pontchartrain, aiding in the recovery of *Rangia* clam populations.

3.2.5 Threatened and Endangered Species

Existing Conditions

In accordance with the provisions of the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 USC 1531 et seq.), the CEMVN requested information on protected, proposed, and candidate species and critical habitat that may occur in the vicinity of the Seabrook project area from the USFWS office in Lafayette, Louisiana. In response and in accordance with the provisions of the ESA and the Migratory Bird Treaty Act of 1918 (40 Stat. 755, as amended; 16 USC 703 et seq.), USFWS responded in a letter dated 2 November 2011 (appendix E). The USFWS concurred with the USACE determination that the proposed project is not likely to affect the endangered West Indian Manatee (*Trichechus manatus*).

In addition, four federally listed species that are the responsibility of the NMFS have a potential to occur in the project area: the threatened Gulf sturgeon (*Acipenser oxyrinchus desotoi*), the endangered Kemp's ridley sea turtle (*Lepidochelys kempii*), the threatened loggerhead sea turtle (*Caretta caretta*), and the threatened green sea turtle (*Chelonia mydas*). As part of its consultation regarding these species, the 31 August 09 NMFS letter concurred with the CEMVN's determination that this project individually, as well as in conjunction with other IER projects on the south shore of Lake Pontchartrain, is not likely to adversely affect (NLAA) listed sea turtle species, Gulf sturgeon, or designated Gulf sturgeon critical habitat (NMFS 2009). The same assessment that a NLAA determination is also appropriate when evaluating the scope of the newly proposed activities on these species and their critical habitat under Section 7 of the Endangered Species Act (ESA) was recoordinated with NMFS in a letter dated 21 November

2011. Upon additional coordination with the NMFS office in St. Petersburg, Florida via phone conversation and email dated 14 December 2011 a No Effect determination was discussed for the increased construction duration and that there will be no additional in-water work. However, CEMVN made a NLAA determination for the entire proposed government action as it relates to the impacts to the Gulf sturgeon, Kemp's ridley sea turtle, loggerhead sea turtle, and the green sea turtle (appendix E). Impacts to potentially affected threatened and endangered species are discussed below.

West Indian Manatee

The West Indian manatee is federally and state-listed as endangered and is also protected under the Marine Mammal Protection Act of 1972, under which it is considered depleted (USFWS 2001). It occurs in both freshwater and saltwater habitats within tropical and subtropical regions and includes two subspecies, the Florida manatee (*T. manatus latirostris*) and the Antillean manatee (*T. manatus manatus*). The primary human-related threats to the manatee include watercraft-related strikes (impacts and/or propeller strikes), crushing and/or entrapment in water control structures (flood gates, navigation locks), and entanglement in fishing gear (discarded fishing line, crab traps) (USFWS 2007a). West Indian Manatees occasionally enter Lakes Pontchartrain and Maurepas, and associated coastal waters and streams during the summer months (i.e., June through September). There were 110 reported sightings of manatees in Louisiana between 1975 and 2005 (LaDWF 2005a). Occurrences and distribution appear to be increasing and are regularly reported in the tributaries along the north shore of Lake Pontchartrain and within canals within adjacent coastal marshes. Although manatees can occur in the IHNC, preferred food sources (submerged or floating aquatic vegetation) are absent from the project area. Given the extensive areas of relatively undisturbed wetlands in the region and the frequent passage of boats and large vessels through the IHNC, it is unlikely that manatees would utilize this area as habitat or frequently occur in the project area.

Gulf Sturgeon, Kemp's Ridley, Loggerhead, and Green Sea Turtles

The Gulf sturgeon is federally listed as threatened throughout its range and is state-listed as threatened in Louisiana. In 1991, the Gulf sturgeon was listed as a threatened species under the Endangered Species Act (16 USC 1531 et seq.). The present range of the species extends from Lake Pontchartrain and the Pearl River system in Louisiana and Mississippi east to the Suwannee River in Florida (USFWS and NOAA 2003). The threatened Gulf sturgeon is known to occur in Lake Pontchartrain through the sampling efforts of Louisiana Department of Wildlife and Fisheries Inland Fisheries Division and the USFWS. Although the proposed project does not involve activities in Gulf sturgeon critical habitat, the proposed action does occur near the edge of such designated habitat.

In addition, Kemp's ridley sea turtle, loggerhead sea turtle, and green sea turtles potentially could occur in Lake Pontchartrain at the mouth of the IHNC. However, the IHNC is an artificial waterway with heavy boat traffic, a highly developed shoreline, and negligible habitat value to these sea turtle species. Thus, any presence of sea turtles in the project area would be transitory and occasional. Impacts to threatened or endangered species were further reduced by the method of construction which utilizes a cofferdam to construct the gates in the dry and the avoidance procedures implemented which included coordinating with the interagency team for the cofferdam unwatering and having Engineering Research and Development Center (ERDC) biologists on hand to relocate any entrained Gulf Sturgeon. The unwatering was initiated on April 29, 2011 and commenced on May 1, 2011 (figure 2). No Gulf Sturgeon or sea turtles were observed during the unwatering of the cofferdam.

Discussion of Impacts

Proposed Action

Direct Impacts to Threatened and Endangered Species

Manatees may occur in Lake Pontchartrain at the mouth of the IHNC and, although it is unlikely, they could enter the canal. The proposed action involves construction and operation of flood control structures within the IHNC about 600 feet south of Lake Pontchartrain. A cofferdam has been in place across the canal for a year and is proposed to be in place continuing to block flow and navigation during construction of the gate structures thru approximately September 2012. As a result, there is a small possibility that a manatee may enter the area where continued construction activities would occur. In order to minimize the potential for construction activities under the proposed action to cause impacts to the manatee, standard manatee protection measures would continue to be followed. These procedures have been recommended by USFWS (USFWS 2009) and adopted by USACE for use in situations where in-water construction activities potentially could occur where manatees may be present. These procedures include the following:

> All contract personnel associated with the project would be informed of the potential for manatees to be present and of the need to avoid collisions with manatees, which are protected under the Endangered Species Act and the Marine Mammal Protection Act of 1972. All construction personnel would be responsible for observing water-related activities for the presence of manatees. Temporary signs would be posted before and during all construction activities to remind personnel to be alert for the possible presence of manatees during active construction operations and within vessel movement zones in the work area; at least one sign would be placed where it would be visible to the vessel operator. Siltation barriers would be made of material in which manatees could not become entangled and would be properly secured and monitored if used. If a manatee were to be sighted within 100 yards of the active work zone, special operating conditions would be implemented, including: no operation of moving equipment within 50 ft of a manatee; all vessels would operate at no wake/idle speeds within 100 yards of the work area; and siltation barriers, if used, would be re-secured and monitored. Activities would not resume until the manatee has left the 100-yard buffer zone around the work area on its own accord. Then, special operating conditions would no longer be necessary, and careful observation would resume. Any sighting of a manatee would be immediately reported to the USFWS Lafayette, Louisiana field office and the Natural Heritage Program of the LaDWF.

In addition to the Standard Manatee Protection Measures for in-water work, signs will be posted within work areas associated with operation of the flood control structures to ensure that operators are aware of the potential presence of manatee during the periodic closure of the structures. To ensure the endangered West Indian manatee would not be impacted during operation of the surge barrier structures the Corps will reinitiate ESA coordination with the Service during the development of the Water Control Plan.

After construction is complete, the only anticipated risk to the manatee would be potential trapping or injury caused by the operation of the sector gate or the two vertical lift gates on the IHNC. The sector gate and vertical lift gates would be kept open except during periods when there is a risk of storm-related flooding or during periodic maintenance activities. The likelihood of a manatee swimming 600 ft into the canal from the lake is minimal, and the potential for an individual manatee to then become trapped or injured by the infrequent closure of a gate is discountable. Assuming the standard protection measures for preventing disturbance

or injury to manatees are employed during the period of construction, the direct effects of the proposed action are not likely to adversely affect the manatee.

The project area is adjacent to Gulf sturgeon critical habitat in Lake Pontchartrain. The continued work along the banks of the IHNC within the section of the channel approximately 700 feet south of Lake Pontchartrain requires temporary closure of the channel to navigation for an additional 12 months to approximately September 2012; however, some flow through the structures is anticipated mid-July 2012. Gulf sturgeon may continue to pass through or forage in the inshore waters adjacent to the project area in Lake Pontchartrain, principally during the three to four coolest, winter months and periods of migration between marine environments (Lake Borgne and the Mississippi Sound) and rivers that drain into Lake Pontchartrain. However, the area along the south shore of the lake is relatively unlikely to be used as a migratory route by Gulf sturgeon because the rivers to which they migrate are on the north shore of the lake. In addition, due to the project's location within a man made industrial canal where no sightings or captures of Gulf sturgeon have historically occurred, the CEMVN does not believe the continued construction of the proposed action would result in direct impacts to Gulf sturgeon.

Kemp's ridley, loggerhead, and green sea turtles could potentially occur in Lake Pontchartrain at the mouth of the IHNC and, although unlikely, could enter the canal. Thus, there is a small possibility that these species could enter the area where construction activities to build the sector gate would occur. Noise and activity associated with the construction would likely cause avoidance of the area and reduce the possibility that an individual of these species would be affected. In order to further minimize the potential for construction in the IHNC to impact sea turtles, which are less mobile than sturgeon, construction conditions recommended by NMFS for protection of sea turtles have been implemented for in-water construction activities on the canal and would continue for the additional time needed to complete construction.

After construction is completed, the only anticipated risk to these species would be trapping or injury caused by the operation of the sector gate on the IHNC. The sector gate would remain open to allow for navigable access between the IHNC and the lake except during periodic maintenance activities and storm events. The likelihood of a Gulf sturgeon or sea turtle entering the canal and the potential for an individual of these species to be trapped or injured by the infrequent closure of the gate resulting in a taking of the species is considered to be extremely low. Thus, the potential direct effects of construction and operation of the Seabrook gate structures are not likely to adversely affect these species.

Indirect and Cumulative Impacts to Threatened and Endangered Species

The potential for indirect impacts on manatees, gulf sturgeon, and Kemp's ridley, loggerhead, and green sea turtles due to adverse effects on the water quality of inshore areas of Lake Pontchartrain or the IHNC during the construction period would be minimized through the use of best management practices (BMPs) and adherence to regulations governing stormwater runoff at construction sites. The contractor minimized impacts during the fill of the scour hole for the sector gate and cofferdam construction by placing material during slack tide in the IHNC or when water was moving from Lake Pontchartrain into the IHNC to avoid the movement of sediments into Lake Pontchartrain and on to Gulf sturgeon critical habitat. It was not possible to use TYPE III Silt Barrier/Curtains, but the contractor monitored the turbidity during fill placement. With continued implementation of BMPs, indirect impacts from the continued construction of the proposed action on manatee, Gulf sturgeon and their critical habitat, on Kemp's ridley, loggerhead, or green sea turtles would be unlikely to adversely affect these species. Furthermore, the proposed action would have no direct or indirect impacts that would contribute to cumulative impacts on these species.

No Action Alternative

Direct Impacts to Threatened and Endangered Species

The no action alternative could temporarily impact threatened and endangered species in the form of construction noise and dust during the removal of construction equipment and permanently while the cofferdam is in place the connection of the IHNC with Lake Pontchartrain would be blocked. No threatened or endangered species may utilize the passage but could continue to utilize the natural passes of the Rigolets or Chef Pass to access designated critical habitat of Lake Pontchartrain, Lake Maurepas, and associated coastal waters and streams. These passes provide more natural shorelines and passage for manatee, Gulf sturgeon, and sea turtles than the manmade GIWW and IHNC. The procedures discussed for the proposed action would not be employed to prevent injury to manatees and sea turtles and sedimentation impacts on Gulf sturgeon critical habitat because no further in-water construction activities would take place. The direct impacts to threatened and endangered species from the no action alternative would permanently or atleast until the cofferdam erodes prevent access of threatened and endangered species through the IHNC to Lake Pontchartrain. This impact is similar to what is described for the 24-month construction of proposed action, except that it would occur for a longer duration of time.

Indirect and Cumulative Impacts to Threatened and Endangered Species

The no action alternative would be likely to adversely affect the manatee, Gulf sturgeon, or Kemp's ridley, loggerhead, or green sea turtles because access through the IHNC to Lake Pontchartrain would be permanently or for an extended period of time blocked. However, permanently closing this channel provides impacts similar to historical conditions in that the Inner Harbor Navigation Canal is a manmade canal that was dredged in 1923 and prior to this event there was no canal or connection to Lake Pontchartrain in the project area.

3.2.6 Recreational Resources

Existing Conditions

Recreational resources are broadly described in section 3.3.2.10 of ER #11 Tier 1and updated in IER #11 Tier 2 Pontchartrain are herein incorporated by reference. IER #11 Tier 2 Pontchartrain provides an analysis of the existing conditions and project impacts from the construction of the Seabrook Floodgate on recreational resources within the project area. To aid in the impact evaluation, multiple interviews were conducted with local users, tenants, and property owners along the IHNC before construction began.

Proposed Action

Direct Impacts to Recreational Resources

As described in the Tier 2 document, recreational resources would be expected to be temporarily impacted during and after the 36-month construction period. The most significantly impacted recreational resources are boating and fishing, as a result of the placement of a cofferdam structure across the entire IHNC channel. These impacts that have occurred during the 12 month period of construction are expected to continue to occur during the remaining period of construction, until summer 2012.

Overall impacts to boating have been moderate because the majority of recreational boating occurs in Lake Pontchartrain, not the IHNC. A public boat launch is provided at Seabrook

Launch and Lakeshore Park. The Seabrook floodgate construction project has not precluded access to, or use of those launches for people who wish to access Lake Pontchartrain directly. However, the project has, and will continue, to restrict boaters who wish to travel between the Lake and the IHNC. While the majority of recreational boating occurs in the lake, boaters commonly seek food and services at commercial resources along the IHNC, including the private boat launch and storage facilities. Impacts to those commercial entities are described in Section 3.3, Socioeconomics. Under the current action of extending the construction period to summer 2012, persons who frequently use the private launch facilities on the IHNC to access the lake would either need to bring their boats to public launch sites on the lake or arrive at their destination by an alternative route. Recreational boating is popular among RV park tenants on the IHNC, making the on-site public launch very active; prior to the project, busy weekends had as many as 100 launches a day. However, with the extension of the temporary 12 month closure of the IHNC at Seabrook to approximately 24 months or September 2012, access to and from Lake Pontchartrain would continue to be impeded. Recreational boating-related traffic that requires passage to the lake would continue to be impacted from the closure of the Seabrook Pass. It is anticipated that recreational boating within the project area would return to pre-construction levels following the completion of the proposed action.

Recreational fishing near the project area will continue to be affected under the proposed action. During the next 12 months of construction, the cofferdam would likely continue to reduce the quality of the local fishery as described in section 3.2.4 of IER #11 Tier 2 Pontchartrain; thereby, limiting local fishing opportunities. In addition, noise and vibration generated by construction activities may temporarily affect the quality of fishing at the popular north scour hole. Since fishing at the south scour hole is technically prohibited by the Port of New Orleans, filling it would not adversely affect a legally-designated public fishing location. However, filling this scour hole will reduce habitat and refuge sites for certain recreational fishery species and organisms they depend on (as described in section 3.2.4 of the Tier 2 study); thereby reducing their availability to recruit into nearby areas where fishing is allowed.

As discussed in Section 3.2.3, Aquatic Resources and Fisheries, closure of the IHNC during the construction phase may reduce year class strength and densities of some populations in Lake Pontchartrain and the GIWW in the vicinity of the project. The duration of the construction phase would impact at least two spawning seasons of most species, and therefore these organisms would most likely not recruit to central Lake Pontchartrain nursery areas through the IHNC, but rather recruit to areas of Lake Borgne and eastern Lake Pontchartrain, because of temporary canal closure and construction. Continued slowed velocities along the GIWW into the IHNC and changes in directional flow, could with the extension of the closure have localized effects on population year class strength. The effects of the closure and slower velocities could minimally reduce recreational fishing opportunities in the project area, which should be resolved once the cofferdam is removed.

Other recreation resources impacts as described in the IER #11 Tier 2 Pontchartrain document are expected to continue throughout the construction period through summer 2012 including impacts to passive recreation near the site such as walking around or fishing in Lake Pontchartrain.

Indirect Impacts to Recreational Resources

Indirect impacts to recreational resources as described in the IER #11 Tier 2 Pontchartrain document are expected to continue as a result of the proposed action, which is to extend the construction period to summer 2012 are herein incorporated by reference.

Cumulative Impacts to Recreational Resources

Cumulative impacts to recreational resources as described in IER #11 Tier 2 Pontchartrain document are expected to continue as a result of the proposed action, which is to extend the construction period to summer 2012 are herein incorporated by reference. The exception is that Lakeshore Drive is now open to traffic, thereby providing a second route to Seabrook Launch at the lake, Lakeshore Park and the Frank Davis Fishing Pier.

The closure of the IHNC coupled with other extenuating circumstances (e.g., the Great Flood of 2011, construction of the IHNC Borgne Barrier, and MRGO closure at Bayou La Loutre) has influenced fish assemblages within the vicinity of the Seabrook Structure over the last year. Impacts to aquatic resources can be attributed to the project construction activities, closure of the waterway, as well as hydrologic and salinity changes credited to a number of sources over the last couple of years. The cumulative effect of the extended closure indicates there may be a short-term direct effect on recreational fishing opportunities; however, the long-term effects are not likely to be measurable. Returning to a stable fish assemblage and normal recreational fishing opportunities will depend on the stability of the aquatic resources of Lake Pontchartrain and the ability of the project area to rebound to pre-project conditions after the re-opening of the IHNC.

No Action Alternative

Direct, Indirect, and Cumulative Impacts to Recreation Resources

Under the no action alternative, the cofferdam would remain in place and construction on the Seabrook Floodgate would stop. Leaving the cofferdam in place would permanently or at least for many years close the hydrologic connection of the IHNC with Lake Pontchartrain and provide the New Orleans Metropolitan area 100-year level of risk reduction. Recreational boats would no longer be able to exit or enter via the Seabrook Pass as it would be blocked by the cofferdam. The current impacts as described in the proposed action would continue indefinitely into the future.

3.2.7 Transportation and Navigation

Existing Conditions

The project area lies south of Lake Pontchartrain at the northern end of the IHNC in Orleans Parish, Louisiana. Orleans Parish is densely developed with residential, commercial, and light to medium industrial land uses. To the southwest, the Port of New Orleans is one of the world's busiest ports with many transportation modes intersecting: river and sea vessels, rail, and highway (Port of New Orleans 2009). Major highways such as I-10 and US-90 as well as streets in the project vicinity are depicted on figure 14. The major waterways utilized by navigation in the project area are the IHNC and the GIWW which connect directly to the Mississippi River and through passes to Lake Pontchartrain and Lake Borgne such as the Rigolets and Chef Menteur. A more detailed discussion of navigation transportation infrastructure can be found in IER # 11 Tier 2 Pontchartrain and is incorporated by reference.

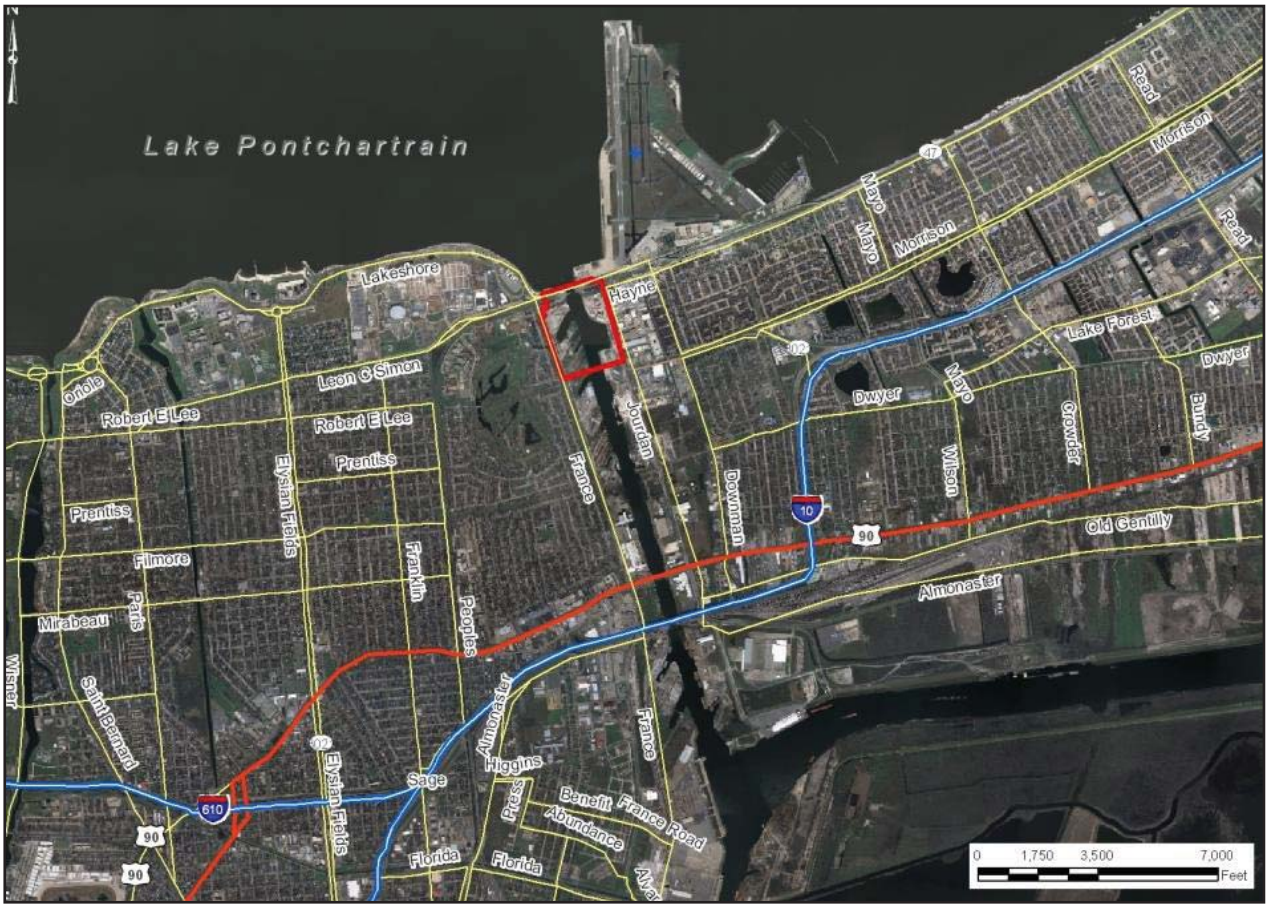


Figure 15. Major Roads and Highways near the Tier 2 Pontchartrain Project Area

Discussion of Impacts

A single primary staging area immediately west of the site and south of the Bascule Railroad Bridge, between France Road and the IHNC is being used for the project. Main road access to the site includes France Road (east side), Jourdan Road (west side), US-90, I-10, and Hayne Boulevard from the north. In addition, barges were utilized to access this site either from Lake Pontchartrain to the north or from the IHNC to the south. A portion of the staging area in Slip No. 6, which is located on the west bank of the IHNC and immediately south of the site, is used for a temporary mooring location for the unloading and offloading of construction materials. While large quantities of construction materials would be staged within the designated area, the sources for these materials such as rock, sand sheetpile, pipepile, and gates were or will be barged in from the Mississippi River through the IHNC. The following impacts to transportation are based on available information, the CEMVN completed a system-wide transportation analysis to better quantify impacts and this information is incorporated by reference and available online at http://www.nolaenvironmental.gov/nola_public_data/projects/usace_levee/docs/original/Final_Transportation_Report_for_website_3_16_2010.pdf.

Proposed Action

Direct Impacts to Transportation and Navigation

Floodgate construction equipment including generators, barges, boats, cranes, trucks, bulldozers, excavators, pile hammers, graders, tractors, and front-end loaders are delivered to the project site using two primary streets, France and Jourdan roads. Press Drive and Congress Drive, which run through the adjacent neighborhoods from US-90 (Chef Menteur Highway) were not utilized as haul routes. The main routes utilized to access the site, France and Jourdan roads, are owned and maintained by the Port of New Orleans. Prior to the start of construction, a site assessment was conducted for both roads and included representatives from USACE, the Port of New Orleans and the contractor. The contractor is responsible for maintaining both of the roads for the duration of their contract and to date has been diligent in that effort. A survey of road conditions is conducted on the first Wednesday of every month and needed repairs are documented and completed. In addition, USACE communicates weekly with the local sponsor and the Port of New Orleans. Materials such as sand, concrete, rebar, steel and some sheetpile are delivered by trucks accessing France Road or Jourdan Road from Hwy 90 or I-10. Current estimates of delivered and future material needs include four barges of rock from Kentucky, six barges from Manchac, Louisiana delivered sand that filled the scour hole, six barges from Baton Rouge delivered sheetpile, and five barges from St. Louis, Missouri, delivered pipepile and will deliver the sector and vertical lift gates.

Industrial lands on the western side of the IHNC are vacant or cleared; Pontchartrain Landing RV park, however, is located southwest of the project corridor and accessed via France Road. Recreational boating is popular among RV park tenants, making the on-site public launch very active; prior to the project busy weekends had as many as 100 launches a day. However, with the extension of the temporary 12 month closure of the IHNC at Seabrook to approximately 24 months or September 2012, access to and from Lake Pontchartrain would continue to be impeded. Recreational boating and navigation related traffic that requires passage to the lake would continue to be impacted from the closure of the Seabrook Pass. The additional construction traffic would not be expected to directly impact the traffic flow in the area because most of the materials have already been delivered to the site via truck or barge. The transportation route of France or Jourdan Roads, via the interstate, for the most part avoids residential areas; therefore, direct impacts from the continued construction traffic are not expected to occur.

Construction traffic also uses Hayne Boulevard north of the staging area, along with the IHNC, Lake Pontchartrain, I-10, and US-90. Additional materials and/or equipment delivered to the project site via the Mississippi River would be offloaded to the staging area from the mooring facility in Slip No. 6 in the IHNC. No materials or equipment were transported to the project area by rail. Most of the truck traffic associated with the proposed action use US-90 and I-10. Impacts to highway capacity were predicted using the methodology from the Highway Capacity Manual for multi-lane highways and estimated that the additional truck traffic would have a temporary impact on the level of service (LOS) for US-90.

Indirect Impacts to Transportation and Navigation

Heavy trucks are the primary loading source causing pavement degradation. The additional truck traffic resulting from the proposed action could contribute to wear-and-tear of paved roads within the project vicinity. Additionally, traffic delay and accidents may increase. The continued closure of the IHNC at Seabrook may also increase the congestion or time required to launch boats at other Lake Pontchartrain recreational boat launches in the area and could indirectly increase traffic utilizing the Rigolets and Chef Menteur Passes to access Lake Pontchartrain for an additional 12 months.

Cumulative Impacts to Transportation and Navigation

Additional wear-and-tear of paved roads within the project vicinity would continue to occur due to increased truck traffic under the proposed action. Other reconstruction projects are for the most part complete. The additive impact to wear-and-tear on the roads, congestion, and temporary road closures in particular on Lakeshore Drive and Hayne Boulevard previously described in IER #11 Tier 2 Pontchartrain has decreased. Less traffic and congestion reduces the risk of accidents in the project area. There would be no additional cumulative navigational impacts associated with the completed construction of the Seabrook Gate complex and the pass opened to allow access to Lake Pontchartrain.

No Action Alternative

Direct, Indirect, and Cumulative Impacts to Transportation and Navigation

The direct, indirect, and cumulative impacts to transportation and navigation from the no action alternative would be similar to those described under the proposed action. All equipment and trailers would be removed and the site returned to pre-construction conditions, except the cofferdam would remain in place. Once all construction equipment is removed from the site, there would be no construction traffic impacts. Leaving the cofferdam in place would permanently or at least for many years close the hydrologic connection of the IHNC with Lake Pontchartrain and provide the New Orleans Metropolitan area 100-year level of risk reduction. This would permanently halt all navigation of recreational as well as commercial vessels that access Lake Pontchartrain via the IHNC. This ultimately creates a dead end canal for the IHNC and all vessels would have to access Lake Pontchartrain via the Rigolets or Chef Menteur Pass or trailer and launch boats via the recreational boat launch at Seabrook or other boat launches along the south shore of Lake Pontchartrain to access the lake.

3.3 SOCIOECONOMIC RESOURCES

Existing Conditions

The socioeconomic conditions of the project area are broadly described in section 3.3 of the IER #11 Tier 1 are herein incorporated by reference. Additionally, updated socioeconomic data, including existing conditions, are provided in IER #11 Tier 2 Borgne and IER #11 Tier 2 Pontchartrain. These data are not repeated in this document. The socioeconomic descriptions that follow update the socio-economic analysis provided in IER #11 Tier 2 Pontchartrain, which focused on the immediate project area to the east and west of the IHNC at Seabrook. IER #11 Tier 2 Pontchartrain documented the existing conditions and potential impacts to socioeconomic resources associated with particular businesses, which was gathered largely through interviews with business owners near the project area. This supplement provides an update of 1) the impacts that have actually occurred to businesses and the surrounding neighborhoods from the Seabrook floodgate construction and 2) impacts that are anticipated to occur to businesses and the surrounding neighborhoods from the extension of the Seabrook floodgate construction period to summer 2012.

Table 4 is a summary of the degree of impact to IHNC facilities as identified through a questionnaire that was sent by the USACE to potentially affected businesses along the canal to assess their daily operations and the impacts that are anticipated to occur from the extension of the construction period through summer 2012. A more detailed description of the socioeconomics impacts from the construction of the Seabrook Floodgate and closure of the Seabrook Pass on IHNC facilities for businesses and residents in the project area is provided in

the proposed action analysis section. Industrial and commercial resources identified within the project vicinity or known to use the project vicinity are listed below in table 4 and shown in figure 15.

Table 4
Impacts to Facilities on the IHNC in the Project Vicinity
As Declared by Facilities

Facility	In Immediate Project Area	Impact
U.S. Coast Guard	No	Minor
Port of New Orleans	Yes	Minor
N.O. Public Belt	No	None
Cat5 Composites	Yes	Moderate
Halliburton	Yes	Moderate
Holcim Cement	No	No Reply*
RV Park and Marina	Yes	Major
Seabrook Marine	No	Major
Orleans Materials	N/A	N/A
Trinity Yachts	No	Moderate
Trinity (Madisonville)	No	Moderate
U.S. Gypsum	No	None

N/A: No longer located on the IHNC.
**Holcim Cement did not reply to survey of impacts.*

Proposed Action

Direct Impacts to Socioeconomics

Residential

The proposed action has temporarily affected the residential areas surrounding the IHNC, particularly Pontilly and Pontchartrain Park. Under the proposed action, construction would continue on the floodgates through summer 2012. Neighborhood Associations in the vicinity of the IHNC were contacted via telephone and email and asked to respond to a survey regarding construction impacts. Through phone interviews, it was determined that impacts to the residential areas during the construction was limited to noise which is further discussed in section 3.2.14 of IER #11 Tier 2 Pontchartrain and will continue to be the main issue to the neighborhoods. Noise will continue to be regulated in accordance with the City of New Orleans Ordinance 23263, Chapter 66, Article IV. There would be no direct impacts to residential neighborhoods following completion of the proposed action.

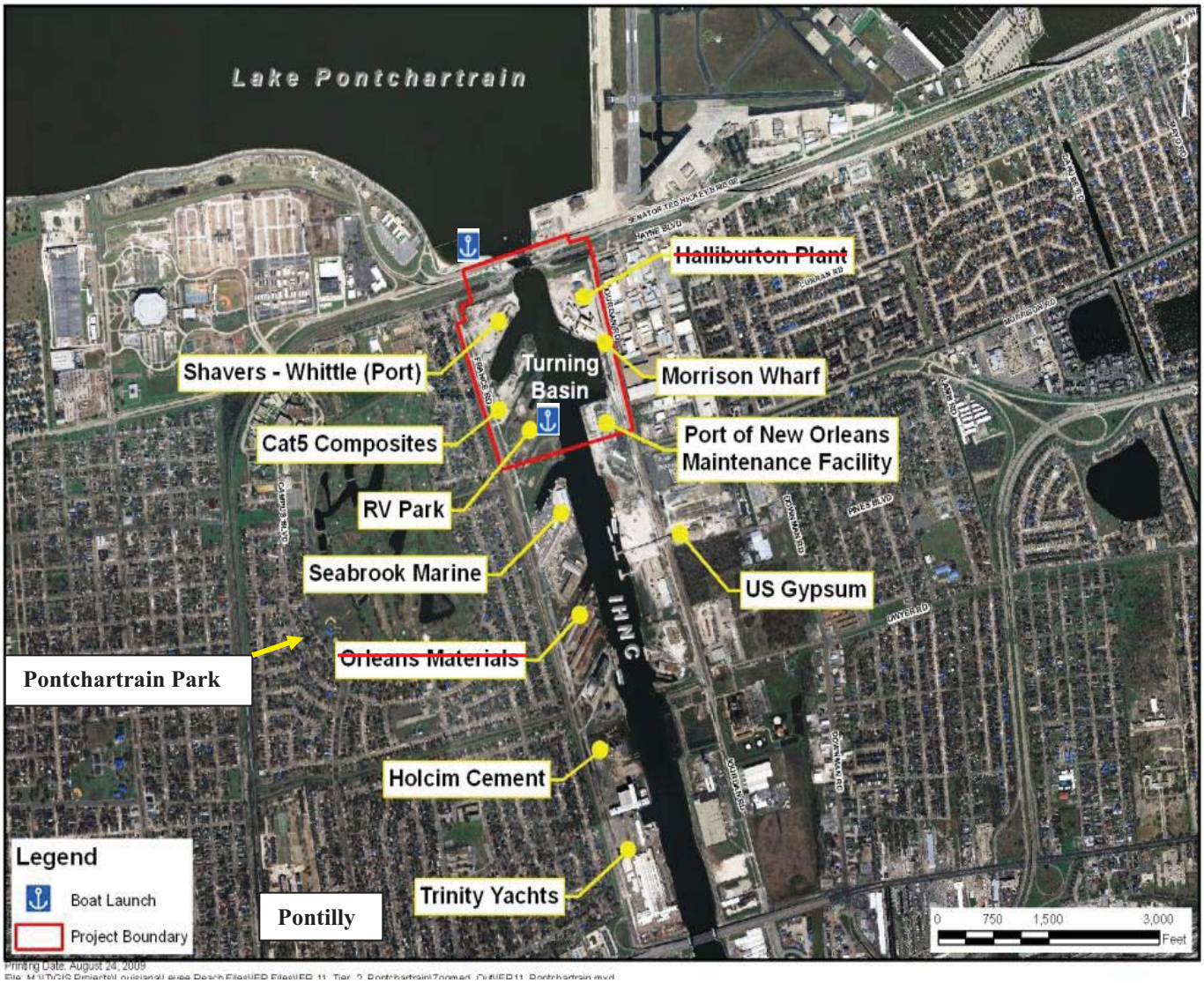


Figure 15. Socioeconomic Resources along the IHNC. Orleans Materials and the Halliburton Plant have relocated outside of the IHNC.

U.S. Coast Guard (USCG)

To help assess actual and future impacts to the USCG, a survey was emailed to the Chief of Waterways Management Branch, Eighth District USCG, during October 2011 and returned promptly. Initially, the USCG had two primary concerns with respect to this project and the closure of the IHNC Seabrook Pass: (1) emergency readiness and response time; and (2) hazard to navigation. According to the Chief of Waterway Management Branch, the Coast Guard has experienced longer transit times between Station New Orleans, located on Lake Pontchartrain, and the Mississippi River as result of the closure at Seabrook. The Chief of Waterways said, when they trailer their small boats, they launch at either Seabrook Marina or the USACE facility on Leake Ave, depending upon river levels. The option of transiting around the Rigolets is only used when they have long lead time or have planned the transit into their operations. The actual

transit time to use the Rigolets, he said, is closer to 4.5 hrs. It was also reported that the USCG has not had to permanently moor a response boat on the south side of the closure and do not intend to if the duration of the closure goes beyond 1 June 2012. The USCG Eighth District Chief of Waterways said they have not experienced any other impacts related to the closure and do not anticipate any additional impacts from the closure extending to summer 2012.

Port of New Orleans

To help assess impacts to the Port of New Orleans, a survey was given to the Director of Business Development at a public meeting at the Port of New Orleans during October 2011 and returned a few weeks later. During construction of the Seabrook Floodgate, the former Shavers-Whittle Yard (Port of New Orleans property) is being used as the lay down/construction area. The Port, therefore, has lost the financial benefits of this property during its use as a construction yard. In addition, the Port had plans to use this parcel for approximately 4 to 6 months beginning in spring 2010 to build a dredge barge. The Port of New Orleans said it moved their dredge construction project to another location at no additional cost. The Port of New Orleans said the action's new permanent easement on the Shavers-Whittle Yard will have an effect on the future revenue of the site. Other impacts, as reported by the Port of New Orleans, include temporary reduced revenue from two of their tenants due to disruption in business from the surge gate construction. Finally, the Port of New Orleans anticipates the closure of the IHNC will have continued negative effect on the two tenants alluded to above, Seabrook Marine and the RV park, revenue will stay reduced for both until the project is completed.

New Orleans Public Belt Railroad (N.O.P.B.R.)

To aid the evaluation of impacts to this operation, the Chief Engineering Officer (CEO) of New Orleans Public Belt Railroad responded to a survey sent via email during October 2011. The CEO responded that there have been no negative impacts to the New Orleans Public Belt Railroad from the construction of the Seabrook floodgate. He also said there are no negative impacts anticipated from the continued closure of the IHNC to summer 2012. In addition, the N.O.P.B.R. said there are positive benefits resulting from the construction of the Seabrook floodgate. Because vessels cannot pass through the Seabrook Pass while the cofferdam is in place, the railroad drawbridge is always in the down position allowing for continuous use which results in time savings. This condition will continue to occur until the construction of the gate is completed.

Orleans Levee District (OLD)

Flood Protection Authority
To help assess impacts of the Seabrook Pass floodgate construction, an email was sent to the Executive Director of the flood protection side of the OLD, which was returned promptly. The director said that there are no adverse affects to the OLD Seabrook Fender System as a result of the Seabrook Pass flood protection project. However, according to the director, "unexpected impacts are being realized in that sustained southwest winds are causing coastal flooding that is not being relieved by passage of GIWW water to enter Lake Pontchartrain and is piling up water into Bayou Bienvenue. As a result, the Bayou Bienvenue Structure is being closed more frequently and for longer periods until the piled up water can subside through a falling GIWW water surface elevation." The director anticipates this condition will continue until the Seabrook cofferdams are removed.

Non-Flood Protection Asset Management Authority
An email requesting information regarding impacts of the Seabrook Pass floodgate construction to the OLD assets was sent to the Director of Marinas and returned promptly. According to the director, The Seabrook Pass floodgate construction has and is affecting the transient boat slip

rental at both South Shore Harbor (SSH) Marina and Orleans Marina. The transient boater is bypassing New Orleans completely whether they are coming from the east or west. Boaters are either adjusting their fuel and stores purchasing to either Gulfport or Mobile to the east and Grand Isle to the west. The OLD believes that the closure has impacted the recovery of SSH regarding yearly leases since its reconstruction after Hurricane Katrina.

Cat5 Composites

To help assess impacts to this operation, a survey was sent to and returned via email from the President of Cat5 Composites during October 2011. According the President of Cat5 Composites, CAT 5 Composites relocated to Jourdan Road across the canal in November of 2009. During construction, Cat5 experienced impacts associated with construction dust and the restriction of navigational access to the lake via the IHNC. As their facility is not equipped with filtration, the vehicular traffic and associated canal construction, he believes, resulted in dust contamination on their coatings; however, it did not seriously affect the outcome of the coatings job.

The President of Cat5 Composites believes closure of the pass at Seabrook has had a substantial effect on his business as overall sales declined from Oct 2009-Oct 2010 to Oct 2010-Oct 2011. The President said, "The closure of the canal and access to Lake Pontchartrain equals less boat traffic on the canal and at Seabrook Marina which has definitely affected the boats that see our company and need boat repairs".

Finally, in regards to potential future impacts from the closure extension through summer 2012, Cat5 Composites predicts less boat traffic, which will continue to affect sales. He hopes that once the gate is operational, boat traffic and sales will increase back to or exceed the levels prior to construction of the gate.

Halliburton/Baroid/Dresser

To help assess impacts to this operation, a survey was sent to the regional Location Manager and returned via email. Because of the construction of the Seabrook floodgate, Halliburton said it had been unable to use the Turning Basin for its operations. The distance between the Seabrook floodgate structure and the east bank of the IHNC was believed to not be sufficient to allow unloading on the IHNC bank on the north end of the facility's lease. Halliburton did not hold a lease on the Morrison Warf dock in the Turning Basin, although at least one of their vendors obtained approval on a ship-by-ship basis to unload in the Turning Basin. Following discussions with the Port of New Orleans and by the end of December 2011, they relocated their facility to Larose, La to better serve their customers and eliminate disruption of service or potentially delay the USACE's construction timelines. The easement requested by the USACE impacted their barite (barge unloading) and bentonite (rail spur unloading) capabilities. According to the Location Manager, Halliburton and the USACE worked together to relocate excess inventory off the site so that construction could begin as scheduled.

Halliburton reported that it has one remaining issue with the continued construction. There are two rail spur unloading sumps that the Port of N.O. would like removed. The sumps are located under or near the USACE's fence that was put in place as a construction easement. Halliburton says it will work with their contractor to remove the sumps once the floodgate construction is complete.

Holcim Cement

Several attempts to speak with a Holcim Cement representative about how the continued closure will affect their business operations were unsuccessful. According to information obtained

during an interview with representatives from Holcim before floodgate construction began, Holcim reported that it expected to not experience any direct impacts from the construction of the Seabrook floodgate.

Orleans Materials

Orleans Materials relocated its operations before construction on the Seabrook floodgate began to a facility outside of the study area. Attempts to contact them via phone were unsuccessful. When initial interviews were conducted with businesses along the IHNC before floodgate construction began, Orleans Materials said that their facility would not experience any direct impacts, either during or after construction of the proposed action.

Lake Pontchartrain Properties (Recreational Vehicle (RV) Park and Marina)

To help assess impacts to this operation, a survey was handed to the managing partner of Lake Pontchartrain Properties, LLC during a public meeting in October 2011 who returned the survey via email on 27 October 2011. According to the managing partner, this commercial resource is substantially impacted from the construction of the Seabrook floodgate due to the restriction of navigation from the RV park to the lake and from construction-related noise. The Pontchartrain Landing Marina is designed for smaller pleasure-craft which according to the managing partner, totally depends on immediate access to the lake for recreation. Alternative routes to the lake are available through the Rigolets and Chef Menteur Pass. The Rigolets detour, however, requires an 11–hour round trip and is not a viable option for this resource's clientele (day-fishermen). The Chef Menteur Pass is considered by many boaters to be unreliable for navigation and is also a longer route to the lake. He believes not having direct access to Lake Pontchartrain has resulted in a consistently very high marina vacancy rate. According to Pontchartrain Properties, only 2 slips out of 40 are currently rented. The inability to lease rental slips resulted in substantial loss of revenues over the past year and they expect a continued loss of revenue through the remaining period of closure.

The managing partner believes, in addition to the impact of lack of direct access to the lake, noise from the construction site played a critical role in their RV sites' vacancy rate. According to the managing partner, noise from the Seabrook floodgate construction site, especially the 24-hour pile driving that took place early in the construction period, played a huge role in their inability to rent the RV pads to nightly visitors. Currently, he believes rent of the RV spaces is affected by continued noise from "night pours and concrete trucks moving up and down France road during the night". He believes noise is affecting their ability to attract visitors, which will continue through the duration of the construction of the Seabrook floodgate.

Seabrook Marine

Although not in the immediate project area, Seabrook Marine, responded to the survey and said that it is severely impacted from the floodgate construction due to the disruption of navigation through the Seabrook Pass (IHNC). According to Seabrook Marine, the majority of their clientele (boaters from Lake Pontchartrain) no longer are able to readily access the goods and services available at Seabrook Marine and many of these customers have been lost. Boaters may use the alternative passage through the Rigolets as a detour but because of the substantial additional time requirements as described previously for the RV park, they believes many of their customers go elsewhere. In addition to the longer transit time, this alternate route has very shallow passes and height restrictions that preclude many common taller boats that use Seabrook Marine. The same restrictions are true to an even greater extent through the Chef Menteur pass. Some boaters may still use the launch and services provided by Seabrook Marine and change their destination to accessible areas such as Lake Borgne.

According to Seabrook Marine, even following construction, the action would have detrimental impacts on Seabrook Marine. Unlike the RV park, the loss of business following completion of the construction phase would not be readily reparable; impacts could be felt up to 3 years in rebuilding the customer base. The reason for this is that much of the customer base is from the approximately 200 boats in dry storage. This accounts for approximately one-third of their operational revenue (whereas about two-thirds of their revenue is from repair of larger vessels). These day-trip customers are not able to access the lake from this location during construction, and some would likely relocate to another facility that would meet their needs for daytrip access to the lake and the popular fishing locations. After relocating, they would be less likely to return. Based on industry standards, it is estimated it would take 2 to 3 years to re-populate the 200 boats in dry storage (assuming there was sufficient demand from the area population). Impacts could include closure of Seabrook Marine, and the subsequent loss of 45 to 50 jobs. Thus far, according to Seabrook Marine, they have lost 27 employees and have cut their existing employee hours.

In addition, the proposed action may have long-term impacts on the local fishery (as discussed in sections 3.2.4 and 3.2.10 of IER #11 Tier 2 Pontchartrain), which may take years to recover from and in turn, could reduce the number of people fishing in the area and using Seabrook Marine. Boats that are housed at Seabrook Marine with their trailers could be towed a short distance over land to the public boat launch at Seabrook Boat Launch on the lake. This option provides boaters with easy access to nearby popular fishing sites in the lake but requires additional coordination to arrange for drop-off and pick-up. In addition, Seabrook clients could change their destinations to areas that will remain accessible during the construction such as Lake Borgne and the Golden Triangle.

Trinity Yachts

To help assess actual and future impacts to this operation, a survey was completed by the Facility Engineer and returned to USACE during October 2011. Although not in the immediate project area, Trinity Yachts is affected by the action. During construction, Trinity Yachts has experienced operational impacts due to the closure of the IHNC leading to Lake Pontchartrain for the past 12 months. Trinity Yachts conducts sea trials on their vessels prior to delivery to the customer. They previously used both the MRGO and the IHNC for their sea trials. With the closure of the MRGO, they now rely on access to Lake Pontchartrain. At any given time, they typically have about five yachts in the production process. Approximately every 90 days, a yacht comes off the production line; they run sea trials about four times a year. They have had to detour their sea trials from the lake to the Gulf by way of the GIWW. According to Trinity Yachts, their cost is considerably higher in taking this route. Longer transit times for sea trials will continue to take place over the remaining period of construction and their costs will be higher as a result. Following construction, Trinity Yachts would not experience further operational impacts.

Trinity Yachts ability to use the alternative route to the Gulf of Mexico for the sea trials could be further complicated by future work by the Louisiana Department of Transportation and Development (LADOTD) who stated that maintenance work on the Danziger Bridge will close marine traffic for a period of 30 days between April and July 2012. Trinity Yachts is aware of this future closure which, according to LADOTD, will only affect marine vessels above 50 ft in height. This action coupled with the continued IHNC Seabrook closure through September 2012 could cause the Trinity facility to be in a lock down if the vessels needing testing are higher than 50 feet. Should Trinity need to sea test such a vessel, they will not be able to transit north through the IHNC nor south passing under the Danziger Bridge and down the GIWW. Continued coordination with DOTD, the USACE and Trinity Yachts could reduce possible impacts during the period of the Danziger Bridge closure.

Trinity Marine Products (Madisonville)

To help assess actual and future impacts to the Trinity Marine Products Inland Barge Group operation, a survey was completed by a company representative in reference to impacts from the IHNC Seabrook Floodgate construction. Trinity Marine Products has experienced moderate operational impacts as barge customers have re-routed delivery through the Rigolets. The Rigolets would be the preferred detour over the Chef Menteur Pass for navigating large barges. Barges will continue to use the Rigolets Pass to reach the GIWW as construction continues on the Seabrook Floodgate through September 2012. Although a slightly longer distance, the Seabrook pass is a more favorable navigational route for their barges. Following construction, operations would return to pre-construction conditions for Trinity Marine and no further impacts would be anticipated.

US Gypsum

To help assess actual and future impacts to this operation, a phone interview was conducted with the facility Engineering/Maintenance Manager. The plant does not utilize the IHNC for access to Lake Pontchartrain. The Seabrook floodgate project has not had adverse effects on their facility or operations during construction nor will it have an effect over the remaining period of construction or once construction is complete.

Indirect Impacts to Socioeconomics

Moderate indirect impacts to socioeconomics as described in the IER #11 Tier 2 Pontchartrain document are expected to continue under the current action which is extending the Seabrook floodgate construction period through summer 2012. Indirect impacts to the local economy are expected to continue to be beneficial in terms of use of local materials and human resources as is identified in the Tier 2 document. The Seabrook floodgate is a $151 million project; about 27 percent of this amount was paid to 121 local businesses that provided construction materials and services. Nearly 2,500 hotel nights were generated by construction staff, some have stayed at the RV Park and numerous permanent ACI staff has secured housing from apartment agencies or privately-owned rentals. Other additional monies have been spent by construction workers on food and other miscellaneous expenditures related to working and staying in the area. This local economic impact will continue as the project construction date is extended.

No further ROW acquisitions are necessary due to the construction extension and utility relocations as a result of the extension of the construction period are not expected.

Cumulative Impacts to Socioeconomics

Cumulative impacts to socioeconomics as described in the IER #11 Tier 2 Pontchartrain are expected to continue due to the current action, which is extending the construction period through summer 2012 and are herein incorporated by reference. In addition to the cumulative impacts addressed in the Tier 2 document, the closure of the Danziger Bridge during a period of 30 days between April and July 2012 could further affect vessel traffic in the IHNC. Vessels less than 50 feet in height will not be affected by the maintenance work scheduled by LADOTD. However, facilities located between the IHNC and the Danziger Bridge on the IHNC with vessels in transit during the maintenance period of greater than 50 feet could be unable to transit during the period. However, completion of the 100 year flood level risk reduction HSDRRS project will provide increased protection from property damage arising from floodwaters within the IHNC as well as the Greater New Orleans Area.

No Action Alternative

Direct, Indirect, and Cumulative Impacts to Socioeconomics

Under the no action alternative, the cofferdam would remain in place and construction on the Seabrook Floodgate would stop. Leaving the cofferdam in place would permanently or at least for many years close the hydrologic connection of the IHNC with Lake Pontchartrain and provide the New Orleans Metropolitan area 100-year level of risk reduction. Businesses along the IHNC would continue to indefinitely be unable to enter Lake Pontchartrain via the IHNC as it would be blocked by the cofferdam. The current impacts that are described for the proposed action alternative would continue indefinitely into the future; many if not all of the businesses that require passage through Seabrook, which connects the IHNC to Lake Pontchartrain, would be forced to relocate or take the longer navigation route through the Chef pass or the Rigolets.

4.0 CUMULATIVE IMPACTS

Cumulative impacts from the proposed action would be of the nature described in IER #11 Tier 2 Pontchartrain. Although IER #11 Tier 2 Pontchartrain disclosed impacts associated with the closure of the Seabrook Pass with cofferdam would block flow between the IHNC and Lake Pontchartrain, additional impacts could be expected due to the with the additional 12 months of closure (approximately September 2012). This increased construction duration and channel closure adds to the overall cumulative impact of all past, present, and future projects within the project area. The majority of the construction for the multiple HSDRRS projects in the area is complete; however other projects are still in planning or construction, such as CWPPRA projects, MRGO restoration projects and the Violet freshwater diversion. The combined effects of other projects such as the Borgne Barrier and the closure of the MRGO at Bayou La Loutre would result in varying degrees of altered hydrology throughout the project area. The full extent of the Deepwater Horizon spill's impact is not currently known, but could have impacts on water quality, aquatic resources and fishery populations in the project area. Other environmental factors such as the opening of the Bonnet Carre' spillway and Tropical Storm Lee have influenced salinity, dissolved oxygen, and water temperature in the project area and its surrounding waters. Adherence to SWPPPs as well as BMPs implemented during construction minimizes construction impacts to water quality and aquatic resources in the project area. Continued industrial activities, urban wastewater discharges, and construction activities contribute to a continued decline in water quality within the study area. However, state and Federal programs are in place to regulate and improve water quality, so the net cumulative impact over time could be improvement of water quality for the study area.

The cumulative effect of this extended closure may be a short-term direct effect on fish and crustacean populations; however, the long-term effects are not likely to be measurable. Migration and recruitment to available habitats and EFH in the vicinity of the IHNC by fish, threatened and endangered species, and other aquatic species would continue to be temporarily blocked for 12 additional months (approximately September 2012). This restriction could cause an increase in predation of some lower trophic level species and cause predators to travel longer distances, thereby decreasing growth rates, overall health, and possibly the ability of some individual aquatic resources and fisheries to reproduce for another spawning season.

While extended closure of the hydrologic connection between the IHNC and Lake Pontchartrain is temporary, multiple factors such and the closures on the MRGO, the high water event of 2011 and subsequent opening of the Bonnet Carre Spillway, and other HSDRRS projects as well as tropical events are influencing aquatic resources and fishery populations in Lake Pontchartrain making a direct causal connection between the Seabrook closure and lake effects difficult to discern.

The CEMVN is continuing to monitor water quality in the project vicinity and if the results of this monitoring demonstrate the need for modeling and/or actions to address adverse impacts, the CEMVN will coordinate with the resource agencies to complete modeling, within authorization and funding, to evaluate alternatives for providing rectification and/or mitigation to offset adverse impacts. In addition to the monitoring, the CEMVN is coordinating with other state and Federal agencies to obtain available fishery population data and if data pinpoints a causal connection between aquatic impacts and this extended closure, the CEMVN would evaluate the information for possible future mitigation within authorization and funding.

Cumulative impacts to recreation, transportation, navigation and socioeconomics as described in the IER #11 Tier 2 Pontchartrain would be expected to continue due to the current action. Additional wear-and-tear of paved roads within the project vicinity would continue to occur due to increased truck traffic under the proposed action. However, because the majority of the reconstruction projects are complete and temporary road closures have re-opened, including Lakeshore Drive and the Seabrook boat launch. The cumulative traffic and congestion impacts are reduced as compared to the height of the LPV HSDRRS construction. In addition, the closure of the Danziger Bridge by LADOTD for repairs during a period of 30 days between April and July 2012 could further affect vessel traffic in the IHNC. Once construction is complete, there would be no additional cumulative adverse recreation, transportation, navigational and socioeconomic impacts associated with the completed construction of the Seabrook Gate complex as the pass allowing access to Lake Pontchartrain would be reopened.

The cumulative effects of the many projects in the area could provide long-term and sustainable beneficial impacts to the communities and businesses within the study area by reducing the risk of damage within flood-prone areas and by generating economic growth. Economic growth could attract displaced residents and new workers and encourage repopulation within the New Orleans Metropolitan area. Although a few businesses would be negatively impacted during construction, the proposed action would have cumulative beneficial impacts to socioeconomic resources in the New Orleans Metropolitan Area.

In addition to this IERS 11.d and the monitoring, the CEMVN is preparing a draft CED that will describe the work completed and the work remaining to be constructed. The purpose of the draft CED will be to document the work completed by the USACE on a system-wide scale. The draft CED will describe the integration of individual IERs into a systematic planning effort. Overall cumulative impacts, a finalized mitigation plan, and future OMRR&R requirements will also be included.

5.0 SELECTION RATIONALE

The Preconstruction Services for the Seabrook Gate Complex Early Contractor Involvement (ECI) contract was awarded October 30, 2009, and the construction option was exercised in July 2010, however, actual construction did not start until September 2010. The planned construction was originally estimated to last 36 months with a channel closure on the IHNC for approximately 6 to 12 months. In addition to the delay in the construction start, there were also delays associated with the acquisition of real estate, finalizing design, weather, site conditions for driving piles, and construction. As result, the Seabrook Gate Complex will require closure of

the IHNC to navigation at the Seabrook location until approximately September 2012. This document provides an evaluation of the potential impacts associated with the approximate 12 month additional delay in the proposed construction.

6.0 COORDINATION AND CONSULTATION

6.1 AGENCY COORDINATION

Preparation of this IER Supplemental has been coordinated with appropriate 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). 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 IER projects. The following agencies, as well as other interested parties, received copies of the draft IER:

U.S. Coast Guard
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, NOAA National Marine Fisheries Service
U.S. Natural Resources Conservation Service
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
Orleans Levee District
Coastal Protection and Restoration Authority of Louisiana

The USCG provided input during the early stages of project planning on 13 February 2009 and by email dated 24 October 2011in response to socioeconomic impact survey questions. The USCG determined that the proposed action would not experience any additional impacts if the closure extends to summer 2012.

The Orleans Levee District provided input on the project in that there are no adverse affects to the OLD Seabrook Fender System as a result of the Seabrook Pass flood protection project.

The USFWS reviewed the proposed action to determine if it would affect any threatened or endangered species or critical habitat under their jurisdiction. The USFWS concurred with the CEMVN in a letter dated 2 November 2011, that the proposed action would not have adverse impacts on threatened or endangered species (appendix E).

The NMFS reviewed the proposed action to see if it would affect any threatened or endangered species or critical habitat under their jurisdiction. The NMFS concurred with the CEMVN in a letter dated 31 August 2009 that the proposed action would not have adverse impacts on threatened or endangered species or their critical habitat.

The LaDNR reviewed the negative consistency determination of the proposed action for consistency with the Louisiana Coastal Resources Program (LaCRP) and concurred with the

negative determination because the protect does not demonstrate and reasonable forseeable effects on coastal uses or resources, as per a letter dated 9 December 2011 (appendix E).

Water Quality Certification (WQC 091102-02/AI 158513/CER 20090001) was received from LaDEQ on 28 December 2009.

Section 106 of the National Historic Preservation Act, as amended, requires consultation with the Louisiana SHPO and Native American tribes. Eleven federally recognized tribes that have an interest in the region were given the opportunity to review the proposed action. The SHPO concurred with the CEMVN's "no adverse effect" finding in a letter dated 20 February 2009. The Choctaw Nation of Oklahoma and the Alabama-Coushatta Tribe of Texas concurred with the CEMVN's effect determination in letters dated 19 February 2009 and 3 March 2009, respectively. No other Indian Tribes responded to the request for comments.

The CEMVN coordination with the USFWS on the use of NEPA Emergency Alternative Arrangements process was initiated by letter on 13 March 2007, and concluded on 6 August 2007. The CEMVN received a draft programmatic Coordination Act Report (CAR) on the use of NEPA Emergency Alternative Arrangements from the USFWS on 26 November 2007. A draft CAR was provided by the USFWS on 20 December 2011 for IERS #11.d. This report's recommendations are addressed below. A copy of the draft CAR IERS #11.d is provided in appendix E.

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

> Recommendation 1: Further detailed planning and design of project features (e.g. Design Documentation Report, Engineering Documentation Report, Plans and Specifications, Water Control Plans or other similar documents) should be coordinated with the Service, NMFS, LDWF, EPA and LDNR. The service shall be provided with an opportunity to review and submit recommendations on all work addressed in those reports.
>
> CEMVN Response 1: Concur. The Service will continue to be provided such an opportunity.
>
> Recommendation 2: We recommend that water quality monitoring currently being conducted be extended through the construction time period to ensure a more robust data sample be obtained. Further the Corps should coordinate with LDWF, Marine Fisheries Office (985/882-0027), to analyze baseline data and data collected during the period of closure to determine the level of impacts to aquatic resources in the project area.
>
> CEMVN Response 2: The CEMVN will continue to conduct monitoring to obtain observed rather than predicted dissolved oxygen data during construction. The CEMVN will continue to coordinate with natural resource agencies including LDWF.
>
> Recommendation 3: Should on-going monitoring efforts and/or sampling data reveal adverse impacts to aquatic resources (i.e., water quality parameters or fishery population level impacts), the Service recommends that the Corps coordinate with the natural resource agencies to develop and evaluate alternatives to mitigate those impacts. It is the Services's mitigation policy to mitigate impacts to fish and wildlife, their habitat, and uses thereof. If mitigation of habitat value occurs, then loses of human use are also considered to be minimized.

CEMVN Response 3: If the results of this monitoring demonstrate the need for modeling and/or actions to address adverse impacts, the CEMVN will coordinate with the resource agencies to complete modeling, within authorization and funding to evaluate alternatives for providing rectification and/or mitigation to offset adverse impacts. The outcomes of the monitoring and modeling will be disclosed in the future CED and Final mitigation IER which will include overall cumulative impacts, including those associated with project operations and maintenance.

Recommendation 4: Financial assurances should be procured from the project construction cost to ensure monitoring, and mitigation is provided for, if necessary. The Service therefore, recommends that a tentative scope for additional monitoring, sampling analysis, and mitigation to analyze and offset impacts to aquatic resources be developed prior to construction close out and finalizing the mitigation IER and cumulative environmental document.

CEMVN Response 4: Please see response to comment #3.

7.0 MITIGATION

Mitigation for unavoidable impacts to the human and natural environment described in this and other IERs will be addressed in separate mitigation IERs. No new wetland impacts are anticipated from the proposed action. The compensatory mitigation discussed in IER #11 Tier 2 Pontchartrain remains valid. All mitigation activities would be consistent with standards and policies established in appropriate Federal and state laws and USACE policies and regulations.

8.0 COMPLIANCE WITH ENVIRONMENTAL LAWS AND REGULATIONS

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. This includes USFWS and NMFS confirmation that the proposed action would not be likely to adversely affect any endangered or threatened species, or completion of ESA section 7 consultation (appendix E); LaDNR concurrence with the determination that the proposed action is consistent, to the maximum extent practicable, with the LaCRP (appendix E); receipt of a Water Quality Certificate from the State of Louisiana was received on 28 December 2009; public review of the Section 404(b)(1) Public Notice and signature of the Section 404(b)(1) Evaluation was completed on 6 April 2010; coordination with the Louisiana SHPO on 20 February 2009; receipt and acceptance or resolution of all USFWS Coordination Act recommendations (appendix E); receipt and acceptance or resolution of all LaDEQ comments on the air quality impact analysis documented in the IER; and receipt and acceptance or resolution of all EFH recommendations.

9.0 CONCLUSIONS

9.1 DRAFT DECISION

The proposed action would be to extend the construction end date for Phase II construction to approximately September 2012 in order to provide 100-year level of risk reduction for Orleans Parish by constructing a storm surge risk reduction structure on the IHNC near its connection to Lake Pontchartrain (figure 1). Specifically, the extension is necessary to complete construction of a steel sector gate and two vertical lift gates south of the Senator Ted Hickey Bridge (also

referred to as the Seabrook Bridge) in the IHNC. The extension also includes construction of T-wall floodwall tie-ins and a roadway gate. The additional construction window is necessary due to delays in the acquisition of real estate, finalizing design, weather, site conditions for driving piles, and overall construction. As result, the Seabrook Gate Complex will require closure of the IHNC to navigation at the Seabrook location until approximately September 2012. The CEMVN has assessed the environmental impacts of the proposed action and has determined that the proposed action would have the following impacts:

- **Hydrology –** The impacts to hydrology in the project area with the additional 12 month closure with the cofferdam in place would be a longer duration of reduced flow velocities in the IHNC and the incoming tide would not be able to connect with Lake Pontchartrain. During construction, while the channel is blocked until September 2012, flows in the Seabrook area of the IHNC are expected to be 0 fps. Alterations in tidal range to the south of the Seabrook and at the GIWW at IHNC vary, but would be no more than 1 ft difference than the constructed Seabrook Floodgate Complex.

- **Water Quality –**The extended closure of the canal and resultant reduction of flow and tidal exchange between Lake Pontchartrain and the IHNC/GIWW will continue to temporarily impact water quality in the project area for approximately 12 additional months. The incremental effects of the proposed action would not have a significant long-term effect on large-scale water quality conditions in the study area since water quality would continue to be influenced by industrial and commercial uses. The implementation of BMPs and Stormwater Pollution Prevention Plans (SWPPPs) would minimize cumulative impacts from construction.

- **Aquatic Resources and Fisheries** –Closure of the IHNC during the construction phase may reduce year class strength and densities of some populations in Lake Pontchartrain and the GIWW in the vicinity of the project for an additional 12 months. This extended temporary closure may cause some increased loss of larval organisms; however, losses from this activity are not expected to measurably affect fish and crustacean populations in Lake Pontchartrain. The duration of this construction phase would impact at least two spawning seasons of most species, and therefore these organisms would most likely not recruit to central Lake Pontchartrain nursery areas through the IHNC, but rather recruit to areas of Lake Borgne and eastern Lake Pontchartrain.

- **Essential Fish Habitat** – The extended closure of the IHNC conduit to Lake Pontchartrain could cause positive and negative impacts to EFH including breeding, transport/migration, and growth to maturity. The proposed action would not be expected to have any direct impacts to SAV, but the 12 month extended closure of the IHNC could show impacts to the life cycles to certain aquatic species for an additional breeding season.

- **Threatened and Endangered Species** – The proposed action would have no direct or indirect impacts that would contribute to cumulative impacts on threatened or endangered species. USFWS concurrence on 2 November 2011 with the CEMVN finding of not likely to adversely affect the West Indian manatee, provided that standard manatee protection measures would be followed. NMFS concurrence on 31 August 2009 with the finding of not likely to adversely affect the Gulf sturgeon or its designated critical habitat, or Kemp's Ridley, loggerhead, and green sea turtles, provided that standard measures to protect these turtles would be followed.

- **Recreational Resources** – Impacts to recreational resources include moderate impacts to recreational boating as a result of the closure at Seabrook Pass and possible minimal

affects on recreational fishing opportunities resulting from the potential impact to at least two spawning seasons of most species.

- **Transportation and Navigation**– Waterborne transportation and worker/truck traffic resulting from the project would continue temporarily impact traffic on local waterways and roads within the vicinity of the project area. Industries currently using the IHNC to connect to Lake Pontchartrain would continue to be impacted due to the complete closure for an additional 12 months (approximately September 2012).

- **Socioeconomic Resources** – Beneficial impacts on population, land use, and employment due to heightened flood risk reduction and construction-generated employment. Temporary significant impacts to businesses operating in the IHNC that use the Seabrook passage to gain access to Lake Pontchartrain during the additional 12 month closure (approximately September 2012).

9.2 PREPARED BY

The point of contact for this IER is Laura Lee Wilkinson, USACE, New Orleans District. Table 8 lists the preparers of relevant sections of this report. Ms. Wilkinson can be reached at the U.S. Army Corps of Engineers, New Orleans District; P.O. Box 60267; New Orleans, Louisiana 70160-0267.

Table 8.
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Project Manager	Eric Stricklin, USACE
Legal Review	Robert Northey, USACE
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APPENDIX A

LIST OF ABBREVIATIONS AND ACRONYMS

ADH	Adaptive Hydraulics
BMP	best management practices
CAR	Coordination Act Report
CED	Comprehensive Environmental Document
CEMVN	Corps of Engineers, Mississippi Valley Division, New Orleans District
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CWPPRA	Coastal Wetlands Planning, Protection, and Restoration Act
DO	dissolved oxygen
EA	Environmental Assessment
EFH	essential fish habitat
EIS	Environmental Impact Statement
ERDC	Engineering Research and Development Center
FEMA	Federal Emergency Management Agency
FMC	Fishery Management Council
FMP	Fishery Management Plan
FR	Federal Register
ft	feet
fps	ft per second
GIWW	Gulf Intracoastal Waterway
GMFMC	Gulf of Mexico Fishery Management Council
GSMFC	Gulf States Marine Fisheries Commission
HPS	Hurricane Protection System
HSDRRS	Hurricane and Storm Damage Risk Reduction System
HTRW	hazardous, toxic, and radioactive waste
I – 10	Interstate 10
IER	Individual Environmental Report
IERS	Individual Environmental Report Supplemental
IHNC	Inner Harbor Navigation Canal
LADOTD	Louisiana Department of Transportation and Development
LaDEQ	Louisiana Department of Environmental Quality
LaDNR	Louisiana Department of Natural Resources
LaDWF	Louisiana Department of Wildlife and Fisheries
LF	linear feet
LPV	Lake Pontchartrain and Vicinity
mg/L	milligram per liter
MRGO	Mississippi River Gulf Outlet
MSA	Magnuson-Stevens Fishery Conservation and Management Act
n/a	information not available
NAVD88	North American Vertical Datum of 1988
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service

No.	number
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NTU	nephelometric turbidity unit
NWR	National Wildlife Refuge
OCPR	Office of Coastal Protection and Restoration
OMRR&R	operation, maintenance, repair, replacement, and rehabilitation
PDT	Project Delivery Team
P.E.	Professional Engineer
PL	Public Law
ppm	parts per million
PPNA	Pontchartrain Park Neighborhood Association
PTM	particle tracking modeling
ppt	parts per thousand
ROW	right-of-way
SAV	submerged aquatic vegetation
SWPPP	Stormwater Pollution Prevention Plan
U.S.	United States
USACE	U.S. Army Corps of Engineers
USCG	U.S. Coast Guard
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WBV	West Bank and Vicinity
WQC	water quality certification
WRDA	Water Resources Development Act

APPENDIX B

MODELING REPORTS

- **Lake Borgne Surge Barrier Study, ERDC/CHL TR-08-X, (pending external review)**
- **Seabrook Fish Larval Transport Study, ERDC/CHL TR-10-12**
- **Seabrook and Borgne Alignment Construction Sequence Hydrodynamic Study, ERDC/CHL TR-10-11**
- **Seabrook and Borgne Alignment Construction Sequence Hydrodynamic Study, ERDC/CHL TR-08-X**
- **Estimation of Dissolved Oxygen Concentrations of Two New Scenarios for Seabrook Conditions, ERDC/CHL TR-08-X**

To access these studies electronically, go to http://www.nolaenvironmental.gov.

APPENDIX C

PUBLIC COMMENT AND RESPONSES

APPENDIX D

MEMBERS OF INTERAGENCY ENVIRONMENTAL TEAM

Kyle Balkum	Louisiana Dept. of Wildlife and Fisheries
Brian Marcks	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
Jeff Harris	Louisiana Department of Natural Resources
Richard Hartman	NOAA National Marine Fisheries Service
Christina Hunnicutt	U.S. Geological 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 Department of Wildlife and Fisheries
Dusty Pate	U.S. National Park Service
Jamie Phillippe	Louisiana Department of Environmental Quality
Manuel Ruiz	Louisiana Department of Wildlife and Fisheries
Reneé Sanders	Louisiana Department of Natural Resources
Angela Trahan	U.S. Fish and Wildlife Service
David Walther	U.S. Fish and Wildlife Service
Patrick Williams	NOAA National Marine Fisheries Service

APPENDIX E

INTERAGENCY CORRESPONDENCE

United States Department of the Interior

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

November 2, 2011

Ms. Joan Exnicios
Chief, New Orleans Environmental Planning Branch
Attention: Ms. Laura Lee Wilkinson
U.S. Army Corps of Engineers
Post Office Box 60267
New Orleans, Louisiana 70160-0267

Dear Ms. Exnicios:

Please reference the U.S. Army Corps of Engineers (Corps) October 20, 2011, letter regarding supplemental Individual Environmental Report # 11.d Tier 2 Pontchartrain for the "Improved Protection on the Inner Harbor Navigation Canal (IHNC), Orleans and St. Bernard Parish, Louisiana" project. That letter requested our concurrence with the Corps' determination that proposed project features and extended project schedules associated with the Seabrook Gate Complex are not likely to adversely affect the West Indian manatee. We have reviewed the information provided, and offer the following comments in accordance with provisions of the National Environmental Policy Act (NEPA) of 1969 (83 Stat. 852; 42 U.S.C. 4321 et seq.), and the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.).

In order to provide 100-year level of protection for Orleans Parish the Corps is constructing the Seabrook floodgate structure on the IHNC near its confluence with Lake Pontchartrain. On October 31, 2010, a rock dike was constructed across the IHNC to slow currents so that fill material could be placed within the scour hole. At that time the IHNC was physically closed to navigation, and fishery access and flow was disrupted. Closure of the IHNC due to construction of the Seabrook Gate Complex was originally estimated to last 6-12 months (i.e., until October 31, 2011). However, due to design, construction, and weather delays, the closure of the IHNC has been extended to approximately 23 months. Provided no other unexpected delays occur, the IHNC could be opened to allow water flow in mid-July 2012, and opened to navigation in September 2012.

West Indian manatees, federally listed as an endangered species, occasionally enter Lakes Pontchartrain and Maurepas, and associated coastal waters and streams during the summer months (i.e., June through September). Manatee occurrences and their distribution appear to be increasing, as they have been regularly reported in the Amite, Blind, Tchefuncte, and Tickfaw

TAKE PRIDE IN AMERICA

Rivers, and in canals within the adjacent coastal marshes of Louisiana. They have also been occasionally observed elsewhere along the Louisiana Gulf coast and infrequently observed along the Texas Gulf coast. The manatee has declined in numbers due to collisions with boats and barges, entrapment in flood control structures, poaching, habitat loss, and pollution. Cold weather and outbreaks of red tide may also adversely affect these animals.

The Corps' concurrence request further ensures that standard manatee protection measures will continue to be included in the Corps' construction contracts and during operation of the flood control structures. ESA coordination will be conducted during the development of the Water Control Plan. The Service, therefore, concurs that the proposed project is not likely to adversely affect the West Indian manatee. No further endangered species consultation will be required for work that is included in the Individual Environmental Report # 11.d Tier 2 Pontchartrain unless there are changes in the scope or location of project features. Should the scope or location of the proposed project change, consultation with the Service should be conducted as soon as such changes are made.

We look forward to working with the Corps to evaluate impacts and provide recommendations during the development of the supplemental IER. Should you have any questions regarding our comments, please contact Angela Trahan (337/291-3137) of this office.

Sincerely,

Darryl Clark
Acting Supervisor
Louisiana Field Office

cc: LDWF, Natural Heritage Program, Baton Rouge, LA

BOBBY JINDAL
GOVERNOR

SCOTT A. ANGELLE
SECRETARY

State of Louisiana

DEPARTMENT OF NATURAL RESOURCES

OFFICE OF COASTAL MANAGEMENT

December 9, 2011

Joan Exnicios
Chief, New Orleans Environmental Branch
U.S. Army Corps of Engineers, New Orleans District
PO Box 60267
New Orleans, Louisiana 70160-0267

RE: **C20090495 Mod 1,** Coastal Zone Consistency
U.S. Army Corps of Engineers, New Orleans District
Direct Federal Action
Supplemental IER #11.d for proposed 12 month delay in channel closure of the IHNC for the construction of the Seabrook Gate Complex at the entrance from Lake Pontchartrain, New Orleans, **Orleans Parish, Louisiana**

Dear Ms. Exnicios:

This office has received the above referenced negative consistency determination, in accordance with Section 307(c) of the Federal Coastal Zone Management Act of 1972, as amended. After careful review we have determined that the project does not demonstrate any reasonably foreseeable effects on coastal uses or resources. Therefore we concur with your negative determination, as described by NOAA regulations on federal consistency at 15 CFR §930.35.

Please refer to the above Consistency number when corresponding on this matter. If you have any questions please call Brian Marcks of the Consistency Section at (225) 342-7939.

Sincerely,

Keith Lovell
Administrator
Interagency Affairs/Field Services Division

KOL/JDH/bgm
cc: David Butler, LDWF
Charles Allen, Orleans Parish
Tim Killeen, OCM FI

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United States Department of the Interior

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

December 20, 2011

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

Dear Colonel Flemming:

Please reference the U.S Army Corps of Engineers (Corps) October 20, 2011, letter providing supplemental information regarding the "Improved Protection on the Inner Harbor Navigation Canal (IHNC), Orleans and St. Bernard Parish, Louisiana" project. The Corps is preparing a supplemental to Individual Environmental Report #11 Tier 2 Pontchartrain (IER #11 Tier 2 Pontchartrain) to address potential impacts associated with the extended channel closure of the IHNC until approximately September 2012. The supplemental will be titled "IERS #11.d Tier 2 Pontchartrain." IERs are being prepared under the approval of the Council on Environmental Quality (CEQ) to obtain compliance with the National Environmental Policy Act of 1969 (83 Stat. 852, as amended; 42 U.S.C. 4321- 4347) and is authorized by Public Law 109-234, Emergency Supplemental Appropriations Act for Defense, the Global War on Terror, and Hurricane Recovery, 2006 (Supplemental 4), and Public Law 110-28, U.S. Troop Readiness, Veterans' Care, Katrina Recovery, and Iraq Accountability Appropriations Act, 2007 (5th Supplemental). Those laws authorized the Corps to upgrade two existing hurricane protection projects (i.e., Westbank and Vicinity of New Orleans and Lake Pontchartrain and Vicinity) in the Greater New Orleans area in southeast Louisiana to provide 100-year hurricane protection. This draft report provides planning objectives and recommendations to minimize project impacts to fish and wildlife resources resources.

The U.S. Fish and Wildlife Service (Service) provided the following Fish and Wildlife Coordination Act (FWCA; 48 Stat. 401, as amended; 16 U.S.C. 661 et seq.) reports to address impacts associated with hurricane protection improvements in the vicinity of the IHNC authorized in Supplemental 4 and to provide specific recommendations:

- November 26, 2007, Draft Programmatic FWCA report,
- October 9, 2008, FWCA report for IER #11 Tier 2 Borgne,
- March 29, 2010, FWCA report for IER# 11 Tier 2 Pontchartrain,
- November 17, 2010, FWCA report for IER#11.b Tier 2 Borgne; and,

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- March 11, 2011, FWCA Report for IER# 11.c Tier 2 Borgne.

This letter supplements our previous reports and addresses the unanticipated impacts associated with extending the period of time the IHNC will be closed due to construction thereby interrupting access through the IHNC into Lake Pontchartrain for a longer period of time. 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 been provided to the Louisiana Department of Wildlife and Fisheries (LDWF) and the National Marine Fisheries Service (NMFS); their comments will be incorporated into our final report.

The study area is located within Orleans and St. Bernard Parishes within the Mississippi River Deltaic Plain of the Lower Mississippi River Ecosystem. 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. The Mississippi River, the Gulf Intracoastal Waterway, and IHNC are 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, and Lakes Pontchartrain and Borgne are two major estuarine water bodies located within the study area.

Habitat types in the study area include forested wetlands (i.e., bottomland hardwoods in varying succesional stages and/or swamps), non-wet bottomland hardwoods, marsh, open water, and developed areas. Due to development and a forced-drainage system, the hydrology of most of the forested habitat within the levee system 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. They 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 and sediment input and loss of coastal wetlands. Regardless of which of the above factors ultimately has the greatest influence, emergent wetlands within, and adjacent to, the project area will probably experience losses due to subsidence, erosion, and relative sea-level rise.

As previously mentioned, the Service has provided FWCA Reports for the authorized hurricane protection project. Those reports contain a thorough discussion of the significant fish and wildlife resources (including habitats) that occur within the study area. For brevity, that discussion is incorporated by reference herein but the following information is provided to supplement the previously mentioned reports and provide specific recommendations regarding

the proposed change in plans.

The following is provided in accordance with the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.). On November 2, 2011, the Service concurred with the Corps' determination that the proposed hurricane protection improvement project along the IHNC is not likely to adversely affect federally listed threatened and endangered species within our jurisdiction, including the West Indian manatee (*Trichechus manatus*). That concurrence was based on information provided to the Service in an October 20, 2011, letter which included the incorporation of the standard manatee protective measures into the Corps' construction contracts.

West Indian manatees, federally listed as an endangered species, occasionally enter Lakes Pontchartrain and Maurepas, and associated coastal waters and streams during the summer months (i.e., June through September). Please be aware that occurrences and the distribution of the endangered West Indian manatee appear to be increasing as they have been regularly reported in the Lake Pontchartrain Basin. In addition to the Standard Manatee Protection Measures for in-water work, the Corps' concurrence request further ensured that standard manatee protection measures will continue to be included in the Corps' construction contracts and during operation of the flood control structures. Additional ESA consultation will be conducted during the development of the Water Control Plan.

Potential changes in the status of federally listed threatened and endangered species, and possible additions to the Federal endangered species list are likely to occur. We recommend that the Corps' include in the operation and maintenance plan provided to the local sponsor a measure that will inform them of the need to coordinate with the Service and NMFS on an annual basis and when operational plans are revised, as those revisions may affect federally listed threatened and endangered species.

The threatened Gulf sturgeon (Acipenser oxyrhynchus desotoi), is known to occur in the study area. As you are aware, the NMFS in St. Petersburg, Florida is responsible for consultations regarding impacts to the Gulf sturgeon and its critical habitat with the Corps in estuarine habitats, and as we understand the Corps is coordinating with that office in regards to the increased closure time.

Estuarine emergent wetlands, estuarine water column, and estuarine water bottoms 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. Commercially important estuarine and marine species such as red drum, spotted seatrout, Gulf menhaden, brown shrimp, and white shrimp are found in the project area. EFH requirements vary depending upon species and life stage.

The 1996 amendments to the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act; P.L. 104-297) set forth a new mandate for NOAA's NMFS, regional fishery management councils (FMC), and other federal agencies to identify and protect important

marine and anadromous fish habitat. The EFH provisions of the Magnuson-Stevens Act support one of the nation's overall marine resource management goals of maintaining sustainable fisheries. Essential to achieving this goal is the maintenance of suitable marine fishery habitat quality and quantity. Detailed information on Federally-managed fisheries and their EFH is provided in the 1999 generic amendment of the Fishery Management Plans (FMP) for the Gulf of Mexico prepared by the Gulf of Mexico FMC (GMFMC). The generic FMP subsequently was updated and revised in 2005 and became effective in January 2006 (70 FR 76216). NMFS administers EFH regulations. Categories of EFH in the project area include the estuarine waters and substrates of the MRGO channel. Estuarine categories include estuarine emergent wetlands and estuarine water column, mud, sand, and shell water bottoms, and rock substrates.

Coastal wetlands also provide nursery and foraging habitat that supports economically important marine fishery species such as spotted seatrout, sand seatrout, southern flounder, Atlantic croaker, spot, gulf menhaden, striped mullet, white mullet , killifish, kingfish, pompano, anchovies, and blue crab. Some of these species serve as prey for other fish species managed under the Magnuson-Stevens Act by the GMFMC (e.g., mackerels, snappers, and groupers) and highly migratory species managed by NMFS (e.g., billfishes and sharks). Under future without project conditions there would be no change to EFH.

DESCRIPTION OF SELECTED PLAN

In order to provide 100-year level of protection for Orleans Parish the Corps is constructing the Seabrook floodgate structure on the IHNC near its confluence with Lake Pontchartrain. On October 31, 2010, a rock dike was constructed across the IHNC to slow currents so that fill material could be placed within a scour hole. Construction of the rock dike physically closed the IHNC to navigation, and disrupted fishery access and water flow. Closure of the IHNC due to construction of the Seabrook Gate Complex was originally estimated to last 6-12 months (i.e., until October 31, 2011). However, due to design, construction, and weather delays, the closure of the IHNC has been extended to approximately 23 months. Provided no other unexpected delays occur, the IHNC could be opened to allow water flow in mid-July 2012, and opened to navigation in September 2012.

The no-action alternative for this supplemental IER is to maintain the status quo of the existing conditions. Construction would cease, and the action as described in IER #11 Tier 2 Pontchartrain would not be completed. Under the no action alternative all equipment and trailers would be removed returning the site to pre-construction conditions except for the cofferdam which would remain in place. Leaving the cofferdam in place would permanently or at least for many years close the hydrologic connection of the IHNC with Lake Pontchartrain and provide the New Orleans Metropolitan area 100-year-level of risk reduction.

POTENTIAL SIGNIFICANT IMPACTS

Direct and indirect impacts associated with construction design and gate closure procedures were

addressed in previous FWCA Reports and are incorporated herein by reference. For 23 months (originally 12 months) during construction a cofferdam will block flow between the IHNC and Lake Pontchartrain. Due to these extended closure times, movement and transport of aquatic organisms between the IHNC and Lake Pontchartrain would be impeded for longer periods potentially impacting two life cycles of aquatic organisms that have become dependent on that pass to reach lower salinity waters of Lake Pontchartrain. As a result, prey and predatory species using the IHNC as an access to the less saline estuarine habitats will be disrupted resulting in possible increased stress on individuals (e.g., starvation or increased predation pressure). The immediate project area, at a minimum, would experience a short-term reduction of prey species, changes in behavior, a decrease in growth rates, and a shift in species composition. This would affect populations of bait fishes (e.g., bay anchovy, Gulf menhaden and Atlantic croaker) and other commercially important species, such as blue crabs and shrimp species, which migrate inshore utilizing this passage.

Although the Chef Menteur and the Rigolets Passes would remain open as access points for aquatic organisms to reach nursery areas in the lake, many individuals that reach the IHNC would most likely not recruit to the lake due to poor water conditions in the IHNC during construction and the extended distance and time required to travel to an alternative access point. The Corps' investigations determined that population-level impacts may be experienced if closure of the channel exceeds the previous maximum anticipated construction duration of up to 12 months (Corps 2009). Commercial and recreational fishing activities would be significantly altered (e.g., displaced or discontinued) with possible economic affects during the 23 months the cofferdam is in place.

While blocked flow between the IHNC and Lake Pontchartrain may impact fish passage and tidal transport, salinities to the north and south of the project area would also change significantly during construction, potentially benefiting water quality parameters and benthic habitat. These alterations would include potential benefits to benthic communities in the southeastern portion of the lake, known as the benthic dead zone, and the temporary restoration of a natural salinity gradient in that area. If organisms are capable of transitioning to the alternate routes (i.e., the Rigolets and Chef Menteur Passes) they could enter and settle out in the eastern portion of Lake Pontchartrain, which contains more abundant high quality habitat, including natural shorelines bordered with complex habitat mosaics (submerged aquatic vegetation, Rangia clams and oyster shells). Recruiting into these higher-quality habitats could result in higher growth rates, less predation, and a greater chance of individuals successfully growing to maturity and spawning. Such benefits would only occur if carrying capacity in those areas has not been reached resulting in additional pressure on resources due to competition and overuse.

Blocking an established access point to the less saline waters of Lake Pontchartrain could cause an increase in predation of some lower trophic level species and change available prey items to predators. This blockage along with the Borgne Barrier and the Mississippi River Gulf Outlet (MRGO) closure at Bayou La Loutre may require predators that have become dependent on that tidal passage to travel longer distances during construction and extend an already lengthy trip thereby decreasing growth rates, overall health, and possibly the ability of some individual fisheries resources to reproduce. Additionally, fish kills documented in the MRGO at the Bayou

La Loutre closure coupled with potential fish kills at the Bienvenue closure and the IHNC during this period would impact a larger number of individuals. In addition to fish kills, poor water quality in these areas could cause slower growth rates, and could decrease survival of some species causing changes in overall community structure near the closures. Greater impacts are expected to be associated with the MRGO closures due to the higher salinities and deeper water depth in the area as compared to the proposed action.

CONSERVATION MEASURES

The Corps has provided valuable insight into the potential impacts associated with the proposed project through their extensive modeling and investigations which have also benefited other proposed projects in the basin. However, there continues to be some unknowns and uncertainties due to the limitations of certain models (e.g., impacts to dissolved oxygen) and due to the level of engineering, design, and development of the operation plan. To further evaluate and disclose direct and cumulative impacts associated with the construction and operation of the IHNC hurricane protection project along with several other hurricane protection and restoration projects, the Corps has been acquiring additional water quality monitoring data to obtain a more accurate picture of conditions within the project area. Preliminary data has revealed that occasional hypoxic conditions have been documented in the vicinity of the MRGO and the project area. However, since monitoring has been initiated no fish kills have been observed (personal communication with Chris Swarzenski, USGS). It may be that hydrologic conditions are dynamic enough to allow aquatic organisms to avoid low dissolved oxygen conditions. Monitoring efforts are ongoing and should continue throughout construction phase of the project.

At a minimum, the Cumulative Environmental Document (CED) should fully describe the cumulative impacts of the IHNC hurricane protection project structures, including the construction and the operation of those structures. Cumulative impacts should address impacts to water quality, aquatic organism access, and how those impacts relate to current and foreseeable projects in the area. Furthermore, monitoring results should be provided to the natural resource agencies and the public as soon as they are available and prior to finalizing the mitigation IER. Should monitoring results demonstrate that water quality conditions were significantly reduced during the construction, mitigation necessary to fully offset unavoidable impacts to fish and wildlife resources should be addressed during the development of the mitigation IERs and the CED. The following options have been previously recommended to offset impacts to water quality and still remain valid:

<u>Impacts to Water Quality</u>

1) Structure operation: modify the water control plan/ operation of the structures, particularly the Seabrook Structure, to allow some flow during periodic velocity closures thereby minimizing reduced dissolved oxygen conditions;

2) Design and place aeration structures in areas experiencing lower dissolved oxygen conditions indicated by the monitoring data;

3) Backfill portions of MRGO to reduce depth and salinity stratification resulting in reduced dissolved oxygen.

The closure of the IHNC coupled with other extenuating circumstances (e.g., the Great Flood of 2011, construction of the IHNC Borgne Barrier, and MRGO closure at Bayou La Loutre) has influenced fish assemblages within the vicinity of the Seabrook Structure over the last year. As a result, commercial and recreational use near the Seabrook structure has also seen a decline (personal communication with LDWF personnel). Impacts to aquatic resources can be attributed to the project construction activities, closure of the waterway, as well as hydrologic and salinity changes credited to a number of sources over the last couple of years. Returning to a stable fish assemblage will depend on the stability of the aquatic resources of Lake Pontchartrain and the ability of the project area to rebound to pre-project conditions after the re-opening of the IHNC.

Quantifying short-term and long-term impacts associated with the closure of the IHNC has proven to be challenging. With the closure time extended to potentially 23 months, the temporary loss of commercial and recreational use (i.e., human consumptive and non-consumptive uses) is inevitable, and long-term impacts are likely. Fisheries sampling data has been obtained by University of New Orleans (Dr. Martin O'Connell) over the last eleven years, and that sampling effort was taken over by LDWF, Marine Fisheries Office, Area 1 (985/882-0027) in June of 2011. To understand and quantify impacts baseline data and data collected during the period of closure should be analyzed in coordination with LDWF and the natural resource agencies.

It is the Service's mitigation policy to mitigate impacts to fish and wildlife, their habitat, and uses thereof. However, if mitigation of habitat value occurs, then loses of human use are also considered to be minimized. Because of the numerous influences previously addressed on aquatic resources in the project area, the level of impacts to aquatic resources associated with the closure of the IHNC cannot be quantified with confidence at this time. However, comparing baseline fishery sampling data with data collected over the construction period may reveal some level of impacts to aquatic resources. Should analysis of that data reveal a discernible level of impacts, we recommend that the Corps coordinate with the natural resource agencies to develop a restoration project that would help to alleviate impacts to aquatic resources and ensure commercial and recreation use in the area returns to pre-project conditions after construction is complete. Some examples of aquatic resource restoration projects that would also benefit human consumptive and non-consumptive uses in the area include the following:

1) Construction of reef balls or a similar structure north of the Seabrook structure in Lake Pontchartrain.

2) Seagrass plantings along areas of the Lake Pontchartrain shoreline historically colonized by submerged aquatic vegetation, and/or,

3) Marsh restoration focusing around the areas that would experience increased usage (tidal passes).

SERVICE POSITION AND RECOMMENDATIONS

The Corps is currently conducting water quality monitoring and that monitoring effort should continue throughout project construction duration. Should monitoring results demonstrate that water quality conditions were significantly reduced during the construction, mitigation necessary to fully offset unavoidable impacts to fish and wildlife resources should be addressed during the development of the mitigation IERs and the CED. Provided that the following fish and wildlife conservation recommendations are implemented concurrently with project implementation the Service does not object to the construction of the proposed project:

1. Further detailed planning and design of project features (e.g., Design Documentation Report, Engineering Documentation Report, Plans and Specifications, Water Control Plans 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 all work addressed in those reports.

2. We recommend that water quality monitoring currently being conducted be extended through the construction time period to ensure a more robust data sample is obtained. Further, the Corps should coordinate with LDWF, Marine Fisheries Office (985/882-0027), to analysis baseline data and data collected during the period of closure to determine the level of impacts to aquatic resources in the project area.

3. Should on-going monitoring efforts and/or sampling data reveal adverse impacts to aquatic resources (i.e., water quality parameters or fishery population level impacts), the Service recommends that the Corps coordinate with the natural resource agencies to develop and evaluate alternatives to mitigate those impacts. It is the Service's mitigation policy to mitigate impacts to fish and wildlife, their habitat, and uses thereof. If mitigation of habitat value occurs, then loses of human use are also considered to be minimized.

4. Financial assurances should be procured from the project construction cost to ensure monitoring, and mitigation is provided for, if necessary. The Service therefore, recommends that a tentative scope for additional monitoring, sampling analyses, and mitigation to analyze and offset impacts to aquatic resources be developed prior to construction close out and finalizing the mitigation IER and cumulative environmental document.

Should you or your staff have any questions regarding this letter and our attached report, please contact Angela Trahan (337/291-3137) of this office.

Sincerely,

David Walther
Acting Supervisor
Louisiana Field Office

cc: NMFS, Baton Rouge, LA
EPA, Dallas, TX
LDWF, Baton Rouge, LA
LDWF, Marine Fisheries Office, Area 1, Lacombe, LA
LDNR, CMD, Baton Rouge, LA
OCPR, Baton Rouge, LA

Literature Cited

U.S. Army Corps of Engineers (Corps). 2009. Draft Individual Environmental Report #11-Tier 2 Pontchartrain - Improved Protection on the Inner Harbor Navigation Canal, Orleans Parish, Louisiana. December.

APPENDIX F

PUBLIC MEETING MINUTES

Meeting minutes and presentations can be accessed at:
http://www.nolaenvironmental.gov/projects/usace_levee/IER.aspx?IERID=11

To request hardcopies of public meeting presentations and/or transcripts,
Please contact Patricia Leroux at 504-862-1544.