

APPENDIX A

Public and Agency Review Comments and Responses
(will provide after public review)

APPENDIX B

Agency Coordination

Section 106 SHPO and Tribal Coordination

Coastal Zone Consistency

WQC 401



DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, NEW ORLEANS DISTRICT
7400 LEAKE AVE
NEW ORLEANS LA 70118-3651

OCT 26 2018

Regional Planning and
Environment Division, South
Environmental Planning Branch
Attn: CEMVN-PDP-CSR

Kristin Sanders, SHPO
LA State Historic Preservation Officer
P.O. Box 44247
Baton Rouge, LA 70804-4241

RE: Section 106 Review Consultation

Undertaking: Alignment of New Orleans to Venice Non-Federal Levee
Section 05a.1 (NOV-NF-W-05a.1), Plaquemines Parish,
Louisiana. (Lat. 29.657 Long. -89.985)
Determination: **No Historic Properties Affected**

Dear Ms. Sanders:

The U.S. Army Corps of Engineers, New Orleans District (CEMVN) proposes to realign the existing drainage canal and construct three (3) new floodwalls, a drainage structure, and a 6.3 mile long levee spanning from La Reussite to Myrtle Grove in Plaquemines Parish (see Figure 1). The proposed construction would also consist of associated project features, such as access ramps, canal crossings, and culverts. Authorization was granted for incorporation of replacements and modifications into the New Orleans to Venice Federal project after the NFL received extensive damage from Hurricanes Katrina and Rita. As part of CEMVN's evaluation and in partial fulfillment of responsibilities under the National Environmental Policy Act and Section 106 of the National Historic Preservation Act, CEMVN offers you the opportunity to review and comment on the potential of the proposed action described in this letter to affect historic properties.

Description of the Undertaking

The current undertaking proposes to realign the previously planned drainage canal and construct three (3) new floodwalls, a drainage structure, and a 6.3 mile long levee spanning from La Reussite to Myrtle Grove in Plaquemines Parish (see figure 2). The proposed construction would also consist of associated project features, such as access ramps, canal crossings, and culverts. Earthen material to be used for construction would come from an approved contractor furnished borrow site. There are two previously existing staging areas that would be used for storage of equipment.

Area of Potential Effects (APE)

The APE of this project has largely been previously coordinated for Section 106 (see Figures 2 and 3). The majority of all alignments for levee improvements was surveyed by New South Associates and URS from August, 2008 through September, 2009 (Valk et al. 2010). These investigations involved a Phase I Archaeological Survey of proposed alignments and Phase II evaluative testing at several sites identified in the Phase I study. No significant sites were found within the current project area for NOV-NF-W-05a.1.

The Louisiana State Historic Preservation Office (SHPO) and consulting federally recognized Tribes were informed of the CEMVN finding of no adverse effect, as a result of the 2009 study, in a letter dated April 13, 2010. The SHPO concurred with CEMVN eligibility determinations and finding of no adverse effect in a letter dated May 11, 2010. Nine federally recognized Tribes were contacted during the consultation process, including the Alabama Coushatta Tribe of Texas, the Caddo Nation of Oklahoma, the Chitimacha Tribe of Louisiana, Choctaw Nation of Oklahoma, the Coushatta Tribe of Louisiana, Mississippi Band of Choctaw Indians, Quapaw Tribe of Oklahoma, the Seminole Tribe of Florida, the Seminole Tribe of Oklahoma, and the Tunica-Biloxi Tribe of Louisiana. The Alabama-Coushatta responded by letter dated May 4, 2010, concurring with the CEMVN finding of no adverse effect, and the Choctaw Nation of Oklahoma by letter dated June 15, 2010, concurring with the CEMVN finding of no adverse effect.

In November and December 2014, and June 2015, additional cultural resources studies specifically for the PPG drainage canal relocation were conducted (Bundy 2015; Gray and Kennedy 2015). The PPG drainage canal relocations partially overlap the current NF-W-05a.1 project area. No previously undocumented cultural resources were identified within the current project area during those investigations. A report detailing the findings of the cultural resources studies was submitted to the SHPO in January 2015 with an addendum to the report provided in May 2015. SHPO concurrence of no historic properties affected by these additional drainage canal surveys was received in letters dated January 30, 2015 and July 2, 2015.

In a letter dated January 15, 2016, to SHPO, and January 22, 2016 to federally-recognized Tribes, a conclusion of no historic properties affected was made for multiple areas of non-federal levee including the current NF-W-05a.1 project area. Not all of the areas had received coordinated cultural resources surveys, but site visits by CEMVN archaeologist Dr. Paul Hughbanks had been made and photo-documented. The conclusion of these site visits was that, based upon these personal observations and on the large swaths of completed cultural resources survey in the NFL area that had not located any unknown cultural resources, there was no historic or current data to suggest that unknown historic properties existed or would be affected.

The remaining APE for the currently proposed project, is only the areas that have not been previously surveyed for cultural resources and coordinated for a conclusion of no historic properties affected.

Identification and Evaluation

The currently proposed project for NOV-NF-W-05a.1 again makes slight adjustments to the alignment of levee and associated drainage canals. And again, CEMVN archaeologist Dr. Paul Hughbanks has reviewed the existing cultural resources survey data and made personal visit to the new proposed alignments. These shifts of alignment are not extensive, and share much overlap with the previously coordinated portions.

Assessment of Effects

Based on the information presented in this letter, CEMVN has determined that realignment of the existing drainage canal and construction of three (3) new floodwalls, a drainage structure, and a 6.3 mile long levee spanning from La Reussite to Myrtle Grove will have **No Effect on Historic Properties**. Much of the current project area has been previously coordinated for no historic properties affected, and a large portion of the area intended for protection by this project has been surveyed for cultural resources with very few cultural resources located. This project will be subject to the standard change in scope of work, unexpected discovery, and unmarked human burial sites act provisions. CEMVN requests your comments within 30 days.

We look forward to your concurrence with this determination. Should you have any questions or need additional information with this undertaking, please contact Dr. Paul Hughbanks, Archaeologist; U.S. Army Corps of Engineers, New Orleans District at paul.j.hughbanks@usace.army.mil; or Jason Emery, Archaeologist and Tribal Liaison at (504) 862-2364 jason.e.emery@usace.army.mil.

Sincerely,



MARSHALL K. HARPER
Chief, Environmental Planning Branch

CC: File

LA SHPO

An electronic copy of this letter with enclosures will be provided to the Section 106 Inbox, section106@crt.la.gov.

References

Bundy, Paul D.

2015 *Addendum: A Cultural Resources Survey of the Proposed Upgrades to Existing Interior Drainage Canals in Plaquemines Parish, Louisiana*. By Cultural Resource Analysts, Inc. LDOA Report # 22-4877-1.

Gray, Jay, and Jason Kennedy

2015 *A Cultural Resources Survey of the Proposed Upgrades to Existing Interior Drainage Canals in Plaquemines Parish, Louisiana*. By Cultural Resource Analysts, Inc. LDOA Report # 22-4877.

Valk, Diane, M. Handly, K. Lockerman, B. Goodwin, L. Poche, and M. Whitehead

2010 *Cultural Resources Investigations for the Non-Federal Levees Project, West Bank of the Mississippi River, Plaquemines Parish, Louisiana*. Submitted to U.S. Army Corps of Engineers, New Orleans District, New Orleans, LA. By New South Associates and URS – Baton Rouge. LDOA Report # 22-3459.



Figure 1. This figure shows the overview of NOV-NF-W-05a.1 as it currently exists.

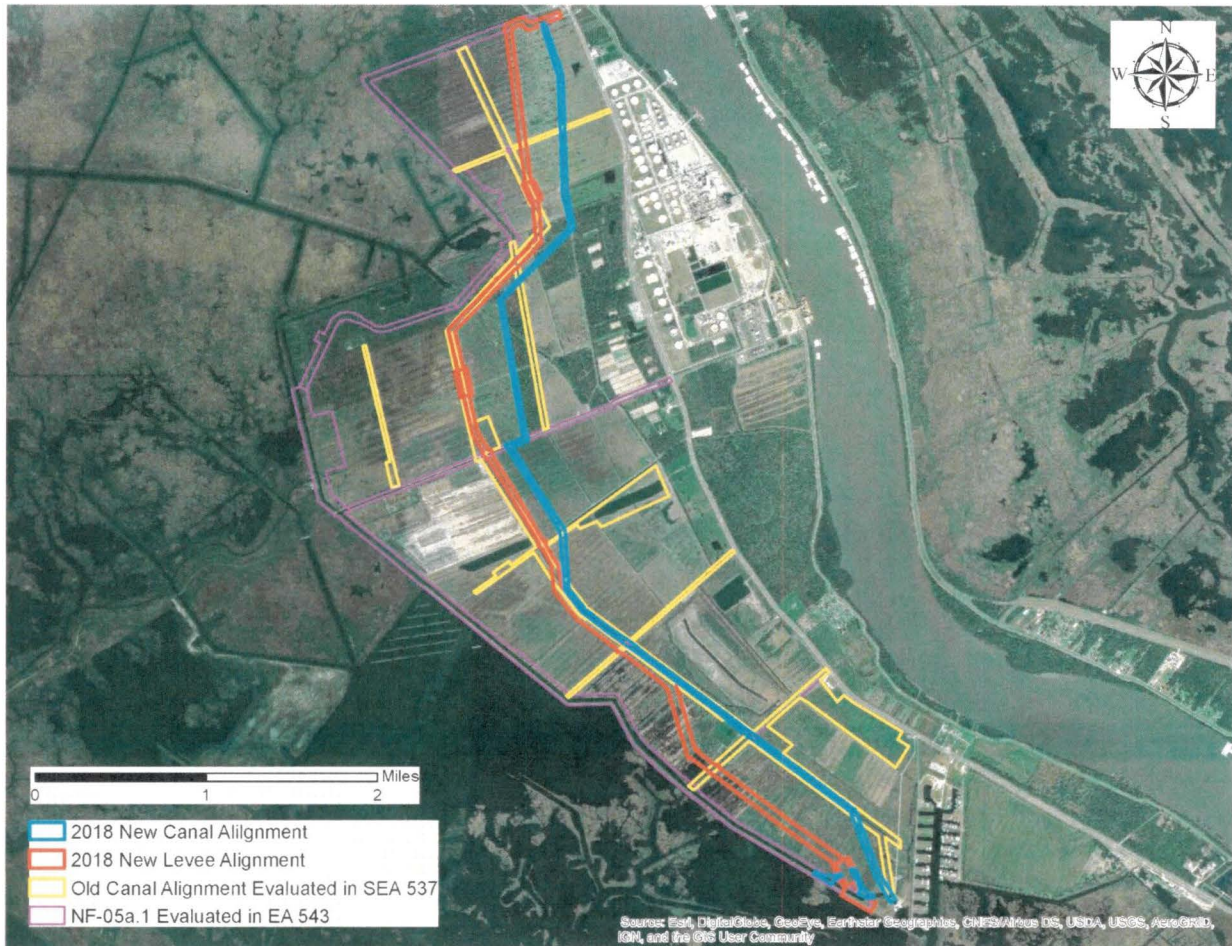
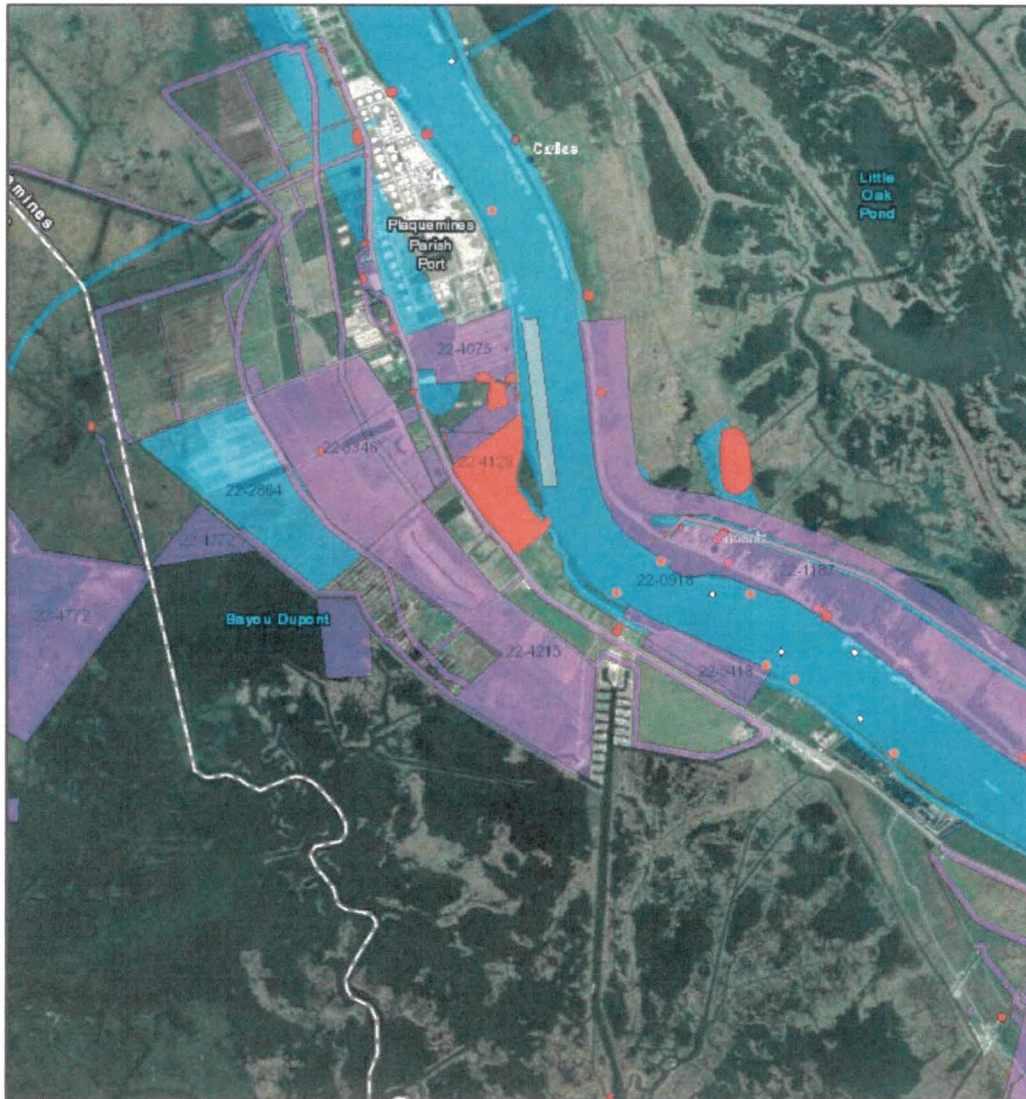


Figure 2. This figure shows the previously considered and coordinated alignment of levees and canals for the NOV-NF-W-05a.1 project.

ArcGIS Web Map



10/23/2018 8:15:52 AM

1:72,224

SurveyAreas

- Assessment or Reconnaissance
- Phase I Survey
- Hydrographic Survey
- Phase II Testing
- Phase III Data Recovery

- NOAA ENC Obstruction Area
- NOAA ENC Obstruction Line
- NOAA ENC Obstruction Pt
- AWOIS Obstruction
- NOAA ENC Wreck Area



LA Division of Archaeology and Historic Preservation, Esri, HERE, Garmin, © DeLorme, contributor(s), and the GIS user community. Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Web AppBuilder for ArcGIS
LA Division of Archaeology and Historic Preservation | Earthstar Geographics | Esri | HERE | Garmin

Figure 3. This figure created from the Louisiana SHPO Web Map showing previous cultural resources surveys in purple and blue, and recorded archaeological sites in red.

From: [Hughbanks, Paul J CIV USARMY CEMVN \(US\)](#)
To: [DCRT Section 106](#)
Subject: Section 106 Consultation: Levee Section NOV-NF-W-05a.1 (UNCLASSIFIED)
Date: Friday, October 26, 2018 10:28:03 AM
Attachments: [No Historic Properties Affected NOV-NF-W-05a1 SHPO.pdf](#)

CLASSIFICATION: UNCLASSIFIED

Attached, please find a signed consultation letter

RE: Section 106 Review Consultation
Undertaking: NOV-NF-W-05a.1
Plaquemines Parish, Louisiana
(Lat. 29.657 Long. -89.985)
Determination: No Historic Properties Affected

We look forward to your concurrence with this determination. Should you have any questions or need additional information with this undertaking, please contact Paul Hughbanks, Archaeologist at paul.j.hughbanks@usace.army.mil and (504) 862-1100, or Jason A. Emery, Tribal Liaison at (504) 862-2364 jason.a.emery@usace.army.mil.

Paul Hughbanks
Archaeologist, Natural/Cultural Resources Analysis RPEDS, New Orleans District
Office: 504-862-1100

CLASSIFICATION: UNCLASSIFIED

No known historic properties will be affected by this undertaking. Therefore, our office has no objection to the implementation of this project. This effect determination could change should new information come to our attention.



Kristin P. Sanders
State Historic Preservation Officer
Date

From: [Lindsey Bilyeu](#)
To: [Hughbanks, Paul J CIV USARMY CEMVN \(US\)](#)
Subject: [Non-DoD Source] RE: Alignment of New Orleans to Venice Non-Federal Levee Section 05a.1 (NOV-NF-W-05a.1), Plaquemines Parish, LA
Date: Monday, December 10, 2018 11:50:19 AM
Attachments: [image001.png](#)

Dr. Hughbanks,

The Choctaw Nation of Oklahoma thanks the USACE, New Orleans District, for the correspondence regarding the above referenced project. Plaquemines Parish lies in our area of historic interest. The Choctaw Nation Historic Preservation Department concurs with the finding of “no historic properties affected”. However, we ask that work be stopped and our office contacted immediately in the event that Native American artifacts or human remains are encountered.

If you have any questions, please contact me.

Thank you,

Lindsey D. Bilyeu, MS

Senior Compliance Review Officer

Historic Preservation Department

Choctaw Nation of Oklahoma

P.O. Box 1210

Durant, OK 74702

580-924-8280 ext. 2631

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State of Louisiana
DEPARTMENT OF NATURAL RESOURCES
OFFICE OF COASTAL MANAGEMENT

December 13, 2018

Marshall K. Harper
Environmental Branch
Corps of Engineers- New Orleans District
7400 Leake Avenue
New Orleans, LA 70118
Via email: Marshall.K.Harper@usace.army.mil

RE: **C20100384 Mod 12**, Coastal Zone Consistency
New Orleans District, Corps of Engineers
Direct Federal Action
NOV-NF-W-05a.1-La Reussite to Myrtle Grove Levee realignment, **Plaquemines Parish, Louisiana**

Dear Mr. Harper:

The above referenced project has been reviewed for consistency with the Louisiana Coastal Resources Program in accordance with Section 307 (c) of the Coastal Zone Management Act of 1972, as amended. The project, as proposed in this application, is consistent with the LCRP.

If you have any questions concerning this determination please contact Jeff Harris of the Consistency Section at (225) 342-7949 or jeff.harris@la.gov.

Sincerely,

/S/ Charles Reulet
Administrator
Interagency Affairs/Field Services Division

CR/SK/jdh

cc: Michael Morris, COE
Dave Butler, LDWF
Frank Cole, OCM/FI
Robert Spears, Plaquemines Parish



DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, NEW ORLEANS DISTRICT
7400 LEAKE AVE
NEW ORLEANS LA 70118-3651

REPLY TO
ATTENTION OF

Regional Planning and
Environment Division, South

Don Haydel
Administrator
Louisiana Department of Natural Resources
Interagency Affairs
& Field Services Division
P.O. Box 44487
Baton Rouge, LA 70821-4487

Dear Mr. Haydel:

The U.S. Army Corps of Engineers, New Orleans District requests your concurrence with the enclosed Modification to Coastal Zone Consistency Determination (CZD) C20100384 mod 11 which was on the actions that have occurred outside of the originally evaluated right-of-way (ROW) for NOV-05A; additional work areas that have been identified outside of the original project ROW for NOV-09, and NOV-NF-W-05a.1; and construction of the Coleman brackish marsh creation project. Environmental Assessment (EA) #543 entitled "New Right of Way and Mitigation for the New Orleans to Venice Hurricane Risk Reduction Project: Incorporation of Non-Federal Levees from Oakville to St. Jude and New Orleans to Venice Federal Hurricane Protection Levee, Plaquemines Parish, Louisiana" was signed December 12, 2017. By letter dated August 22, 2017, LDNR concluded that those actions were consistent with the Louisiana Coastal Resources Program. The requested modification addresses the applicable Louisiana Coastal Use Guidelines.

The modification to the existing CZD would include the realignment and construction of approximately 6.3 miles of levee and the associated drainage canal, construction of three (3) new floodwalls, and a drainage structure extended from La Reussite to Myrtle Grove in Plaquemines Parish. The proposed construction would also consist of associated project features, such as access ramps, canal crossings, and culverts as discussed in SEA #565.

Enclosure 1 provides a description of the proposed construction activities in SEA #565. The environmental impacts due to construction of NOV-NF-W-05a.1 have been decreased since the previously approved project. The newly proposed levee alignment would provide better underlying foundation conditions for construction of the levee, result in a shorter overall levee length which would reduce the overall construction duration and cost, reduce the real estate interest to be acquired for construction and would minimize

the overall impacts to the environment thus reducing the compensatory mitigation requirement.

Comments should be mailed to the attention of Michael Morris; U.S. Army Corps of Engineers; Regional Planning and Environment Division, South; Environmental Planning Branch; CEMVN-PDS-C; 7400 Leake Avenue; New Orleans, Louisiana 70118. Comments may also be provided by e-mail to mvnenvironmental@usace.army.mil. Mr. Morris may be contacted at (504) 862-1963.

Sincerely,



Marshall K. Harper
Chief, New Orleans District
Environmental Branch

CONSISTENCY DETERMINATION MODIFICATION

Louisiana Coastal Use Guidelines

NOV-NF-W-05a.1 – LA REUSSITE TO MYRTLE GROVE LEVEE PLAQUEMINES PARISH, LOUISIANA SEA #565

GUIDELINES APPLICABLE TO ALL USERS

Guideline 1.1 The guidelines must be read in their entirety. Any proposed use may be subject to the requirements of more than one guideline or section of guidelines and all applicable guidelines must be complied with.

Guideline 1.2 Conformance with applicable water and air quality laws, standards and regulations, and with those other laws, standards and regulations which have been incorporated into the coastal resources program shall be deemed in conformance with the program except to the extent that these guidelines would impose additional requirements.

Guideline 1.3 The guidelines include both general provisions applicable to all uses and specific provisions applicable to certain types of uses. The general guidelines apply in all situations. The specific guidelines apply only to the situations they address. Specific and general guidelines should be interpreted to be consistent with each other. In the event there is an inconsistency, the specific should prevail.

Guideline 1.4 These guidelines are not intended to nor shall they be interpreted so as to result in an involuntary acquisition or taking of property.

Guideline 1.5 No use or activity shall be carried out or conducted in such a manner as to constitute a violation of the terms of a grant or donation of any lands or waterbottoms to the State or any subdivision thereof. Revocations of such grants and donations shall be avoided.

Guideline 1.6 Information regarding the following general factors shall be utilized by the permitting authority in evaluating whether the proposed use is in compliance with the guidelines.

- a) type, nature and location of use
- b) elevation, soil and water conditions and flood and storm hazard characteristics of site
- c) techniques and materials used in construction, operation and maintenance of use

- d) existing drainage patterns and water regimes of surrounding area including flow, circulation, quality, quantity and salinity; and impacts on them
- e) availability of feasible alternative sites or methods for implementing the use
- f) designation of the area for certain uses as part of a local program
- g) economic need for use and extent of impacts of use on economy of locality
- h) extent of resulting public and private benefits
- i) extent of coastal water dependency of the use
- j) existence of necessary infrastructure to support the use and public costs resulting from use
- k) extent of impacts on existing and traditional uses of the area and on future uses for which the area is suited
- l) proximity to and extent of impacts on important natural features such as beaches, barrier islands, tidal passes, wildlife and aquatic habitats, and forests
- m) the extent to which regional, state and national interests are served including the national interest in resources and the siting of facilities in the coastal zones as identified in the coastal resources program
- n) proximity to, and extent of impacts on, special areas, particular areas, or other areas of particular concern of the state program or local programs
- o) likelihood of, and extent of impacts of, resulting secondary impacts and cumulative impacts
- p) proximity to and extent of impacts on public lands or works, or historic, recreational or cultural resources
- q) extent of impacts on navigation, fishing, public access, and recreational opportunities
- r) extent of compatibility with natural and cultural setting
- s) extent of long term benefits or adverse impacts

Response to Guideline 1.1 – 1.6 The guidelines have been read in their entirety. The proposed action would be in conformance with all applicable state laws, regulations, and standards. Therefore, the proposed action is consistent with these guidelines.

Guideline 1.7 It is the policy of the coastal resources program to avoid the following adverse impacts. To this end, all uses and activities shall be planned, sited, designed, constructed, operated and maintained to avoid to the maximum extent practicable significant:

- a) reductions in the natural supply of sediment and nutrients to the coastal system by alterations of freshwater flow

Response: The proposed NOV-NF-W-05a.1 would provide storm surge risk reduction levees and would not alter freshwater flow or the function or capacity of the existing sediment supply restoration projects in the study area.

- b) adverse economic impacts on the locality of the use and affected governmental bodies

Response: The proposed NOV-NF-W-05a.1 as part of the storm surge reduction levee would protect life and property, and improve the economic viability of the protected area.

c) detrimental discharges of inorganic nutrient compounds into coastal waters

Response: Inorganic nutrients would not be discharged into coastal waters.

d) alterations in the natural concentration of oxygen in coastal waters

Response: The proposed NOV-NF-W-05a.1 would not alter the natural concentration of oxygen in coastal waters.

e) destruction or adverse alterations of streams, wetland, tidal passes, inshore waters and waterbottoms, beaches, dunes, barrier islands, and other naturally biologically valuable areas or protective coastal features

Response: The proposed NOV-NF-W-05a.1 would convert approximately 7 acres of wet pasture to uplands due to levee construction activities.

f) adverse disruption of existing social patterns

Response: The proposed NOV-NF-W-05a.1 project would have no adverse impacts on existing social patterns.

g) alterations of natural temperature regime of coastal waters

Response: The proposed NOV-NF-W-05a.1 project would have no adverse impacts on temperature regime of coastal waters.

h) detrimental changes to existing salinity regimes

Response: The proposed NOV-NF-W-05a.1 project would have no impact on existing salinity regimes.

i) detrimental changes to littoral and sediment transport processes

Response: The proposed NOV-NF-W-05a.1 project would have no impact on littoral and sediment transport processes.

j) adverse effects of cumulative impacts

Response: The environmental effects of the proposed NOV-NF-W-05a.1 project would not contribute adverse increments to the cumulative effects of past, present, and reasonably foreseeable actions.

k) detrimental discharges of suspended solids into coastal waters, including turbidity resulting from dredging

l) Response: The proposed NOV-NF-W-05a.1 project would have no impact on detrimental discharges of suspended solids into coastal waters, including turbidity resulting from dredging.

m) reductions or blockage of water flow or natural circulation patterns within or into an estuarine system or a wetland forest

Response: The proposed NOV-NF-W-05a.1 project would not block the water flow or natural circulation patterns within an estuary or wetland forest.

n) discharges of pathogens or toxic substances into coastal waters

Response: The CEMVN is evaluating all proposed NOV-NF-W-05a.1 project activities thru Clean Water Act procedures (i.e. preparation of a 404(b)(1) evaluation).

o) adverse alteration or destruction of archaeological, historical or other cultural resources

Response: Section 106 coordination is underway but not complete. CEMVN is currently completing necessary compliance activities and will coordinate findings with the State Historic Preservation Office and Federally recognized tribes.

p) fostering of detrimental secondary impacts in undisturbed or biologically highly productive wetland areas

Response: The proposed NOV-NF-W-05a.1 project would not foster of detrimental secondary impacts to biologically productive wetland areas.

q) adverse alteration or destruction of unique or valuable habitats, critical habitat for endangered species, important wildlife or fishery breeding or nursery areas, designated wildlife management or sanctuary areas, or forestlands

Response: There are no threatened or endangered species or designated critical habitat within NOV-NF-W-05a.1 project areas. Construction of these levees would not impact nesting bald eagles, important wildlife or fishery breeding or nursery areas, designated wildlife management or sanctuary areas, or forestlands.

r) adverse alteration or destruction of public parks, shoreline access points, public works, designated recreation areas, scenic rivers, or other areas of public use and concern.

Response: No such areas would be impacted by the proposed action.

s) adverse disruptions of coastal wildlife and fishery migratory patterns

Response: No disruptions of coastal wildlife and fishery migratory patterns would occur.

t) land loss, erosion and subsidence

Response: There would be no land loss or erosion associated with the proposed NOV-NF-W-05a.1 project.

u) increases in the potential for flood, hurricane or other storm damage, or increases in the likelihood that damage will occur from such hazards

Response: The project consist of constructing a levee with the purpose of reducing the risk from hurricane storm surge.

v) reductions in the long-term biological productivity of the coastal ecosystem

Response: NOV-NF-W-05a.1 will have no impacts on the productivity of the coastal ecosystem as it is a storm risk reduction project located in a developed area and not within a coastal ecosystem.

Guideline 1.8 In those guidelines in which the modifier "maximum extent practicable" is used, the proposed use is in compliance with the guideline if the standard modified by the term is complied with. If the modified standard is not complied with, the use will be in compliance with the guideline if the permitting authority finds, after a systematic consideration of all pertinent information regarding the use, the site and the impacts of the use as set forth in guideline 1.6, and a balancing of their relative significance, that the benefits resulting from the proposed use would clearly outweigh the adverse impacts resulting from non-compliance with the modified standard and there are no feasible and practical alternative locations, methods and practices for the use that are in compliance with the modified standard and :

- a) significant public benefits will result from the use, or;
- b) the use would serve important regional, state or national interests, including the national interest in resources and the siting of facilities in the coastal zone identified in the coastal resources program, or;
- c) the use is coastal water dependent.

The systematic consideration process shall also result in a determination of those conditions necessary for the use to be in compliance with the guideline. Those conditions shall assure that the use is carried out utilizing those locations, methods and practices which maximize conformance to the modified standard; are technically, economically, environmentally, socially and legally feasible and practical; and minimize or offset those adverse impacts listed in guideline 1.7 and in the guideline at issue.

Guideline 1.9 Uses shall be to the maximum extent practicable be designed and carried out to permit multiple concurrent uses which are appropriate for the location and to avoid unnecessary conflicts with other uses of the vicinity.

Guideline 1.10 These guidelines are not intended to be, nor shall they be, interpreted to allow expansion of governmental authority beyond that established by La. R.S. 49:213.1 through 213.21, as amended; nor shall these guidelines be interpreted so as to require permits for specific uses legally commenced or established prior to the effective date of the coastal use permit program nor to normal maintenance or repair of such uses.

Response to Guideline 1.8 – 1.10: The guidelines have been read in their entirety. The proposed action is consistent with these guidelines.

GUIDELINES FOR LEVEES

Guideline 2.1 The leveeing of unmodified or biologically productive wetlands shall be avoided to the maximum extent practicable.

Response: Wetlands were avoided to the maximum extent practicable. However, approximately 7 acres of wet pasture would be permanently and adversely impacted by the proposed NOV-NF-W-05a.1 project.

Guideline 2.2 Levees shall be planned and sited to avoid segmentation of wetland areas and systems to the maximum extent practicable.

Response: The proposed levee alignment would not segment wetlands.

Guideline 2.3 Levees constructed for the purpose of developing or otherwise changing the use of a wetland area shall be avoided to the maximum extent practicable.

Response: The proposed levee alignment would not change the use of the wetlands within the area.

Guideline 2.4 Hurricane and flood protection levees shall be located at the non-wetland/wetland interface or landward to the maximum extent practicable.

Response: NOV-NFL-W-05a.1 alignment is designed to be landward. Wetlands and other habitat are avoided to the maximum extent practicable. However, approximately 7 acres of wet pasture would be permanently impacted as a result of the construction of levees with the proposed action.

Guideline 2.5 Impoundment levees shall only be constructed in wetlands as part of approved water or marsh management projects or to prevent release of pollutants.

Response: The proposed NOV-NF-W-05a.1 storm surge protection levee is not an impoundment levee.

Guideline 2.6 Hurricane or flood protection levee systems shall be designed, built and thereafter operated and maintained utilizing best practical techniques to minimize disruptions of existing hydrologic patterns, and the interchange of water, beneficial nutrients and aquatic organisms between enclosed wetlands and those outside the levee system.

Response: The proposed NOV-NF-W-05a.1 levee would not alter the existing hydrologic conditions, i.e., the wetlands on the land side of the levee would remain isolated from wetlands on the flood side until the levee is overtopped by a hurricane exceeding the Standard Project hurricane (SPH) level event.

GUIDELINES FOR LINEAR FACILITIES

The guidelines have been read in their entirety. The proposed levee project does not involve the construction of a linear facility; therefore, these guidelines are not applicable to the project.

GUIDELINES FOR DREDGED SPOIL DEPOSITION

The guidelines have been read in their entirety. The proposed levee project does not involve dredged spoil deposition; therefore, these guidelines are not applicable to the project.

GUIDELINES FOR SHORELINE MODIFICATION

The guidelines have been read in their entirety. The proposed levee project does not involve shoreline modification; therefore, these guidelines are not applicable to the project.

GUIDELINES FOR SURFACE ALTERATIONS

The guidelines have been read in their entirety and noted. The proposed action would not have adverse alternations to surfaces, with specific responses as follows:

Guideline 6.2 Public and private works projects such as levees, drainage improvements, road, airports, ports, and public utilities are necessary to protect and support needed development and shall be encouraged. Such projects shall, to the maximum extent practicable, take place only when:

- a) they protect or serve those areas suitable for development pursuant to Guideline 6.1; and
- b) they are consistent with other guidelines; and
- c) they are consistent with all relevant adopted state, local and regional plans.

Response: The proposed NOV-NF-W-05a.1 levee would provide a storm surge risk reduction levee and is consistent with this guideline. The levee would protect life,

property, and the evacuation route up to the Standard Project Hurricane (SPH) level event. The proposed levee is consistent with existing state, local, and regional plans (CWPPRA, State Master Plan, LCA, and LACPR).

Guideline 6.4 To the maximum extent practicable wetland areas shall not be drained or filled. Any approved drain or fill project shall be designed and constructed using best practical techniques to minimize present and future property damage and adverse environmental impacts.

Response: Wetlands were avoided to the maximum extent practicable. However, approximately 7 acres wet pasture would be permanently and adversely impacted by the proposed NOV-NF-W-05a.1 project.

Guideline 6.6 Areas modified by surface alteration activities shall, to the maximum extent practicable, be revegetated, refilled, cleaned and restored to their predevelopment condition upon termination of the use.

Response: The proposed NOV-NF-W-05a.1 levee project would be seeded with sod-forming grasses native to the project area. The levee would be incorporated in the federal levee system and maintained for the project life.

Guideline 6.7 Site clearing shall to the maximum extent practicable be limited to those areas immediately required for physical development.

Response: The proposed NOV-NF-W-05a.1 levee project was reduced from the previously approved alignment which has reduced the impacts due to construction.

Guideline 6.8 Surface alterations shall, to the maximum extent practicable, be located away from critical wildlife areas and vegetation areas. Alterations in wildlife preserves and management areas shall be conducted in strict accord with the requirements of the wildlife management body.

Response: There are no critical wildlife or vegetation areas, wildlife preserves or management areas located in the project vicinity.

Guideline 6.13 Surface alteration sites and facilities shall be designed, constructed, and operated using the best practical techniques to prevent the release of pollutants or toxic substances into the environment and minimize other adverse impacts.

Response: There would be no discharge of these types of substances into the environment.

Guideline 6.14 To the maximum extent practicable only material that is free of contaminants and compatible with the environmental setting shall be used as fill.

Response: There would be no discharge of these types of substances into the environment.

GUIDELINES FOR HYDROLOGIC AND SEDIMENT TRANSPORT MODIFICATIONS

The guidelines have been read in their entirety. The proposed levee project does not involve hydrologic and sediment transport; therefore, these guidelines are not applicable to the project.

GUIDELINES FOR DISPOSAL OF WASTES

The guidelines have been read in their entirety and noted. The proposed levee project does not involve disposal of wastes; therefore, these guidelines are not applicable to the project.

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

The guidelines have been read in their entirety and are not applicable to the proposed levee project.

GUIDELINES FOR OIL, GAS, AND OTHER MINERAL ACTIVITIES

The guidelines have been read in their entirety. The proposed levee project does not involve oil, gas, and other mineral activities; therefore, these guidelines are not applicable to the project.

CONSISTENCY DETERMINATION

The purpose of the proposed action is to reduce the risk from hurricane storms and surge. The changes to the proposed action as discussed in this modification to CZD C20100384 mod 11, would provide a level of risk reduction throughout the proposed project area and would protect life and property, and improve the economic viability of the protected area. The U. S. Army Corps of Engineers, New Orleans District, has determined that the modifications to the proposed action are consistent, to the maximum extent practicable, with the State of Louisiana's Coastal Resources Program.

BOBBY JINDAL
GOVERNOR



PEGGY M. HATCH
SECRETARY

State of Louisiana

DEPARTMENT OF ENVIRONMENTAL QUALITY ENVIRONMENTAL SERVICES

JUL 06 2011

U.S. Army Corps of Engineers- Vicksburg District
4155 Clay Street
Vicksburg, MS 39180

Attention: Christopher Koepfel

RE: Water Quality Certification (WQC 110520-01/AI 101235/CER 20110002)
New Orleans to Venice Hurricane Risk Reduction Project
Incorporation of Non-Federal Levees from Oakville to St. Jude
Plaquemines Parish

10/30/18

*Per EA 537 & 543 as described
in the attached WQC 110520-01
is valid. The administrative
Record is amended to reflect
this update. No further
action required.*

EHill, ES staff

Dear Mr. Koepfel:

The Louisiana Department of Environmental Quality (the Department) has reviewed your application to excavate land and place spoil material for the improvement of hurricane protection levees, in the vicinity between Oakville & St. Jude, Louisiana.

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

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

Sincerely,

Melvin C. Mitchell, Sr.
Administrator
Water Permits Division
MCM/jjp

Elizabeth Hill

From: Gilmore, Tammy F CIV USARMY CEMVN (US) <Tammy.F.Gilmore@usace.army.mil>
Sent: Tuesday, October 23, 2018 9:55 AM
To: Elizabeth Hill
Cc: Morris, Michael A CIV USARMY CEMVD (US)
Subject: RE: NOV-NFL-W-05a.1 WQ

Elizabeth, I inadvertently left out a portion of the project description. Copy paste travesty. Please see below.

A drainage structure consisting of four (4) sluice gates and an associated floodwall would be constructed at the south end of the levee reach. The sluice gates would measure 6 feet by 6 feet each, with the entire drainage structure measuring 37 feet wide. The drainage structure would have a bottom of base slab elevation of EL -14.5 and a top of wall elevation of EL 16.0. The sluice gates would be powered by a gas powered actuator, with a manual hand crank serving as a back-up. The drainage structure is designed to prevent storm surge from entering into the protected system during tropical and hurricane storm events. The sluice gates would remain open, except during storm events. A floodwall would be constructed to tie the drainage structure into the earthen levee. The floodwall would consist of five (5) monoliths on either side of the drainage structure, each spanning 190 feet, with a bottom of base slab elevation of EL -5 and a top of wall elevation at EL 16.0.

Tammy Gilmore
Biologist/Environmental Resource Specialist US Army Corps of Engineers, New Orleans District
7400 Leake Avenue, New Orleans, LA 70118
(504)862-1002

-----Original Message-----

From: Gilmore, Tammy F CIV USARMY CEMVN (US)
Sent: Tuesday, October 23, 2018 6:58 AM
To: 'elizabeth.hill@la.gov' <elizabeth.hill@la.gov>
Cc: Morris, Michael A CIV USARMY CEMVD (US) <Michael.A.Morris@usace.army.mil>
Subject: NOV-NFL-W-05a.1 WQ

Elizabeth, please reference WQC 110520-01/AI Jan 7, 2016 and (WQC) 110520-01 June 19, 2017. The subject project is in the same exact location as the project discussed in EA 537 (the 2016 project) and falls within the additional ROW covered in EA 543 (the 2017 project). Below is the project description and attached is the location. Per our phone conversation earlier this week, a WQC is not necessary for this proposed action. I am providing you this information for your records. Thank you so much and feel free to contact me with any questions or concerns.

Project Description

The previously approve alignment was dismissed due to engineering considerations as well as other factors. The newly proposed levee alignment would provide better underlying foundation conditions for construction of the levee, result in a shorter overall levee length which would reduce the overall construction duration and cost, reduce the real estate interest to be acquired for construction and would minimize the overall impacts to the environment thus reducing the compensatory mitigation requirement.

The levee would be constructed with compacted clay embankment from an approved contractor furnished borrow source. The levee, from start to finish, has eight (8) different sections, which vary in elevation (from el 10.5 to el 14.0) and width (from 207 feet to 210 feet). Approximately 1,794,000 cubic yards of embankment would be used for

construction of the levee and ramps. The ramps would be surfaced with a separator geotextile fabric and 7 inches of crushed stone on top of the geotextile fabric. There would be eight (8) ramps, which vary in width (from 14 feet to 25 feet). See figure 2 for levee alignment and ramp locations.

The realignment of the drainage canal would run the length of the levee, totaling 6.3 miles. The canal would serve as storage for rainwater runoff while the pumps at the Wilkinson pump station are not running. The canal, from start to finish, would vary in width (from 80 feet to 113.78 feet) and depth (from el -7.0 to el -11.8). The estimated amount of material that would be excavated during construction of the new canal is approximately 53,000 cubic yards and would be used for backfilling the existing canal adjacent to the levee. The crossings and associated culverts would be constructed where the canal crosses existing access roads. Approximately 6,000 cubic yards of embankment would be used for construction of the canal crossings. The culvert requirements would vary throughout the alignment based on the canal width. The culverts would be placed on a bedding consisting of sand and crushed stone, with separator geotextile fabric separating the 2 layers. The surface of the embankment would have separator geotextile fabric and crushed stone. See figure 2 for canal alignment and crossing locations.

Two (2) floodwalls would be constructed for the utility crossing areas, with one at the north reach and one at the south reach. The north floodwall utility crossing would contain seven (7) t-wall monoliths, spanning 310 feet in length. The north floodwall would have two (2) pipelines of the same size (6 inches) running underneath the monoliths, with a bottom base slab elevation of el -6.0 and a top of wall elevation of el 13.0. The south floodwall utility crossing would contain six (6) t-wall monoliths spanning 294 feet in length. The south floodwall would have six (6) pipelines of varying size (from 8 inches to 24 inches) running underneath the monoliths, with a bottom base slab elevation of el -4.0 and a top of wall elevation of el 14.0.

There are two existing staging areas that would be used for storage of equipment. The north staging area is listed as staging area 1, which consists of 1.16 acres near access road 1. The south staging area is listed as staging area 2, which consists of 5.51 acres near the 100 feet buffer zone t-wall utility crossing. There are eight (8) existing access roads throughout the length of the levee that would be used for hauling and repairs. See figure 2 for locations of staging areas and access roads.

Tammy Gilmore
Biologist/Environmental Resource Specialist US Army Corps of Engineers, New Orleans District
7400 Leake Avenue, New Orleans, LA 70118
(504)862-1002

From: [Walther, David](#)
To: [Morris, Michael A CIV USARMY CEMVD \(US\)](#); [Behrens, Elizabeth H CIV USARMY CEMVN \(USA\)](#)
Subject: [Non-DoD Source] NOV 5a Environmental Compliance
Date: Friday, March 1, 2019 10:54:28 AM

Mr. Morris,

The Fish and Wildlife Service (Service) will not be providing a report under the authority of Section 2(b) the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.). Our current work load at our office prohibits us from fulfilling the reporting requirements of that section. However, extensive coordination on this project has been undertaken in accordance with Section 2(a) of that Act. Through that coordination during the planning phase the Service has been involved with the development of alternatives thus ensuring our agencies comments and concerns have been noted in the planning process.

If you have any questions or comments please contact me.

David Walther
Supervisory Biologist
SE Region Conservation Planning Assistance Coordinator

US Fish and Wildlife Service
Lafayette, LA 70506
Phone: 337.291.3122
Fax: 337.291.3139

NOTE: New Address
200 Dulles Drive
Lafayette LA 70506

Blocked<http://www.fws.gov/lafayette/>

Blocked<https://www.fws.gov/ecological-services/energy-development/water.html>

Like us on Facebook! <Blocked<http://www.facebook.com/Louisiana-Ecological-Services-Office-364376830424514/>>

NOTE: This email correspondence and any attachments to and from this sender is subject to the Freedom of Information Act (FOIA) and may be disclosed to third parties.

APPENDIX C

Hydrology Report

CEMVN-ED-H

MEMORANDUM FOR CHIEF, PM-OP (ATTN: Korey Clement)

SUBJECT: HH&C Analysis for NF-NOV 5a.1

1. As requested, enclosed is the completed report detailing the hydraulic and hydrologic modeling that was performed for the NOV 5a1 polder.
2. Point of contact is Maxwell Agnew/Ext. 1503

Encl

JEAN S. VOSSEN, P.E.
Chief, Engineering Division

Interior Drainage HEC-RAS Modeling - New Orleans to Venice (NOV) 5a1

New Orleans District (MVN) Authors:
Maxwell Agnew; Stacey Frost, P.E.

Technical Review:
Matthew Halso, P.E.

December 2018

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1. Introduction and Background

Supplemental authorization and appropriation after Hurricane Katrina authorized/funded the incorporation of 34 miles of existing non-Federal back levee into the NOV project from Oakville, LA to St. Jude; officially entitled Non-Federal Levee (NFL) incorporation into NOV HSDRRS project. During the course of the study, the authorized alignment for NOV-NF-W-5a.1 was altered from the original footprint of the polder. The project delivery team expressed concern that with the altered alignment, water would be trapped in the area between the old and new alignments during surge overtopping events. To evaluate the potential for induced flooding within the area of concern, HEC-RAS modeling was conducted.

The location of the NOV-NF-W-5a.1 project alignment is shown in Figure 1 in the red box. Existing local back levees range from elevation 3 ft – 5 ft NAVD88 2009.55. The project design grade for the new alignment in this area of the project is approximately 10' NAVD88 2009.55. Figure 2 displays the area of interest showing the new levee alignment and location where water may become trapped during surge overtopping events.

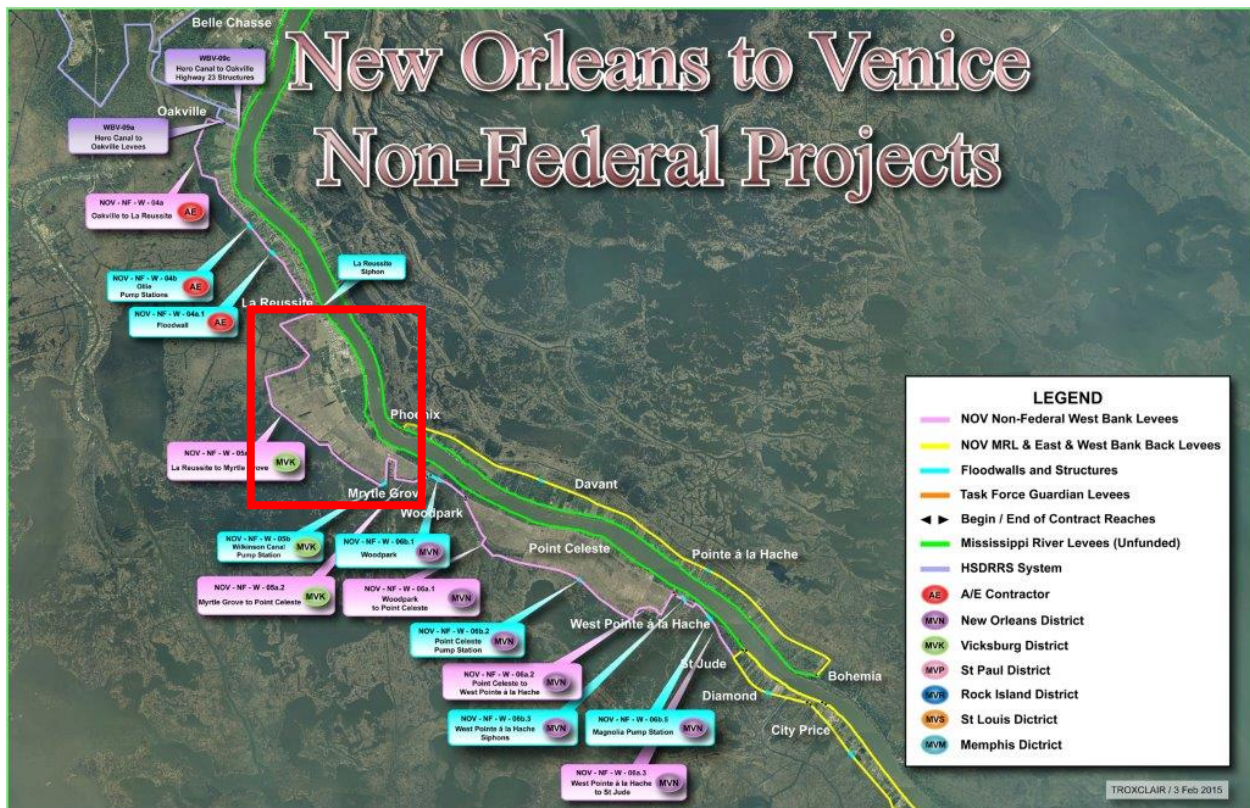


Figure 1 Vicinity Map of the New Orleans to Venice Non-Federal Projects. The red box shows the area of interest.

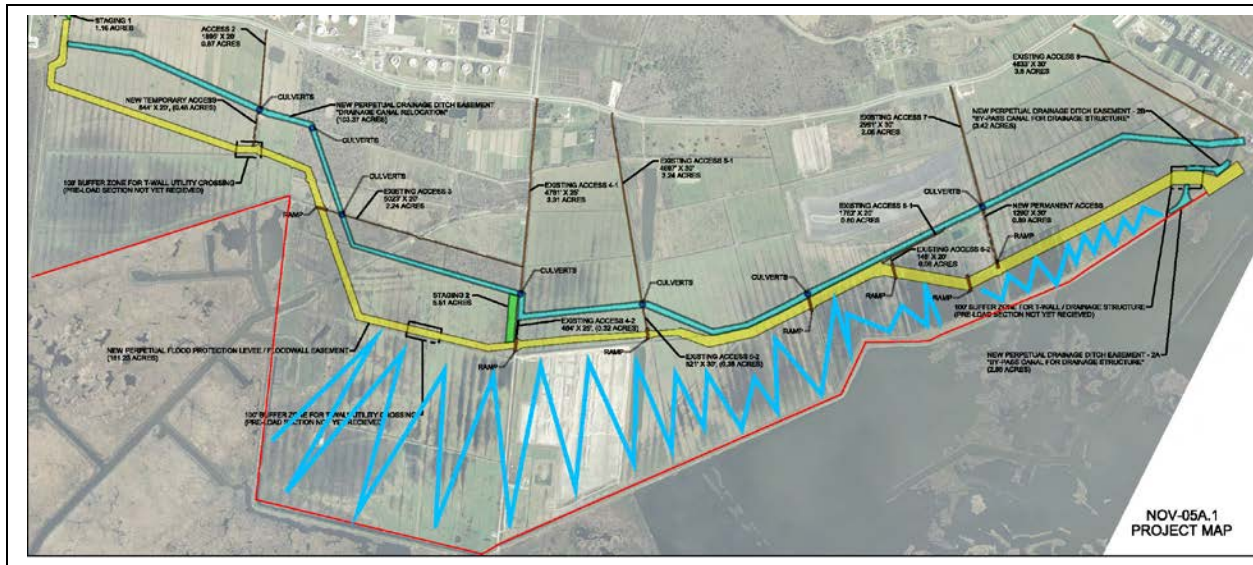


Figure 2 Zoomed view of area of interest showing location of old alignment (red line) and new alignments (yellow line), and area where flood confinement is possible (blue line).

2. Interior Drainage Analysis

2.1 HEC-RAS 1d/2d model

A 1d/2d model of the polder interior and exterior was developed using HEC-RAS 5.0.4. Figure 3 displays the HEC-RAS mesh for existing conditions. The model includes the existing NOV back levee, existing drainage ditch bathymetry, and the Wilkinson pump station, which has since been removed and replaced with a new pump station. The existing drainage canal size was estimated due to the lack of surveys and the model is not calibrated due to lack of gage or other data. The model does provide the best estimate of drainage time in the scenarios that were run.

Figure 4 displays the with-project version of the HEC-RAS geometry, which includes the new levee alignment, the new pump station, the new drainage ditch, and the smaller lateral ditches that feed the main drainage ditch. The new lateral ditches will be sloped between the levee and the drainage canal along the entire project to expedite drainage in the area. The lateral ditches will be excavated and maintained by the non-federal sponsor. The with-project model also includes the four 6x6' sluice gates that connect the area between the old levee and new levee to the pump-station sump area. The sluice gates will be closed during a storm, but opened during non-storm conditions to allow drainage of the area between the old levee and new levee. Figure 5 displays the naming conventions used in this analysis for the different polder areas.

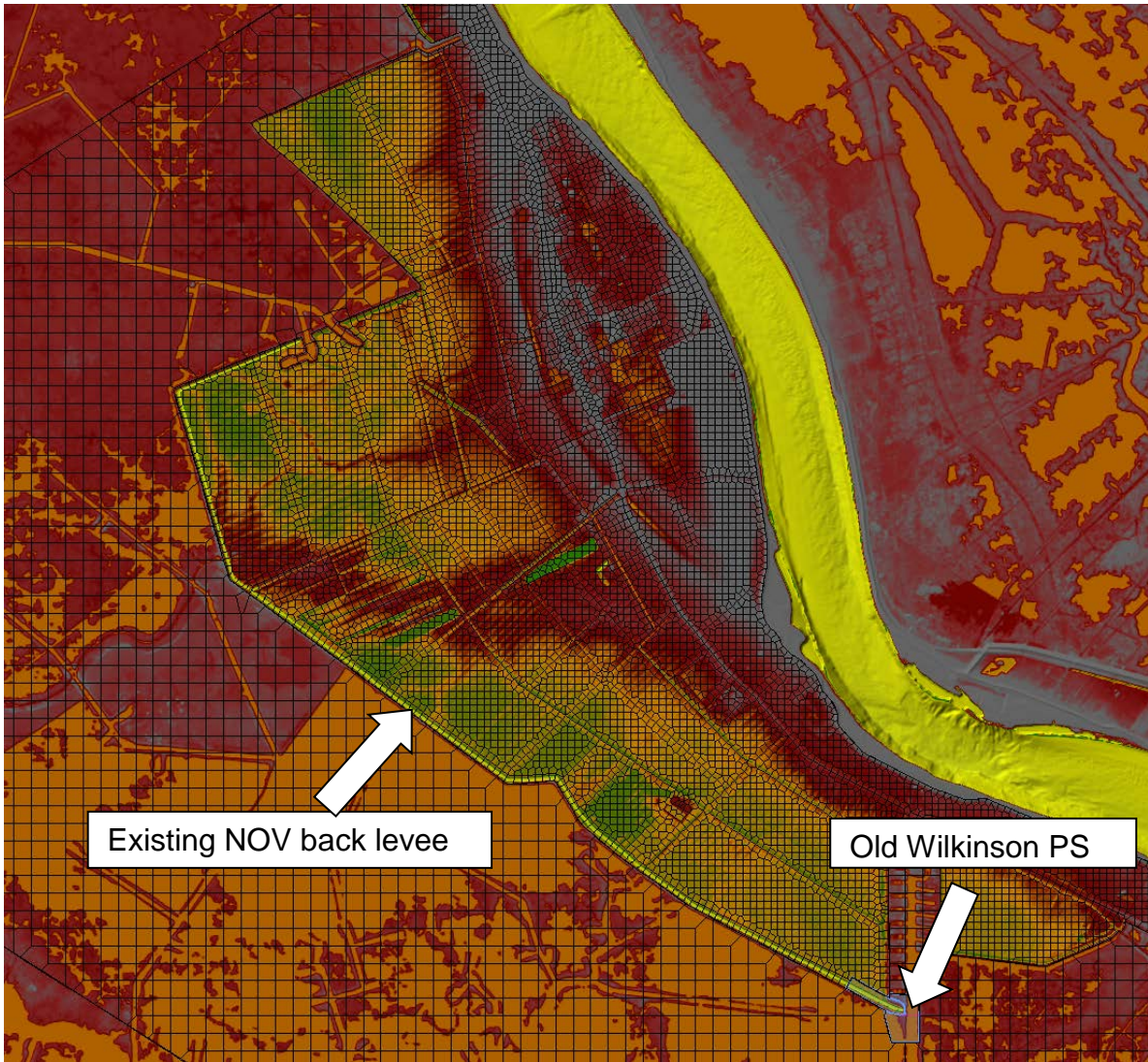


Figure 3 HEC-RAS 1d/2d model geometry for existing condition (prior to Hurricane Katrina)

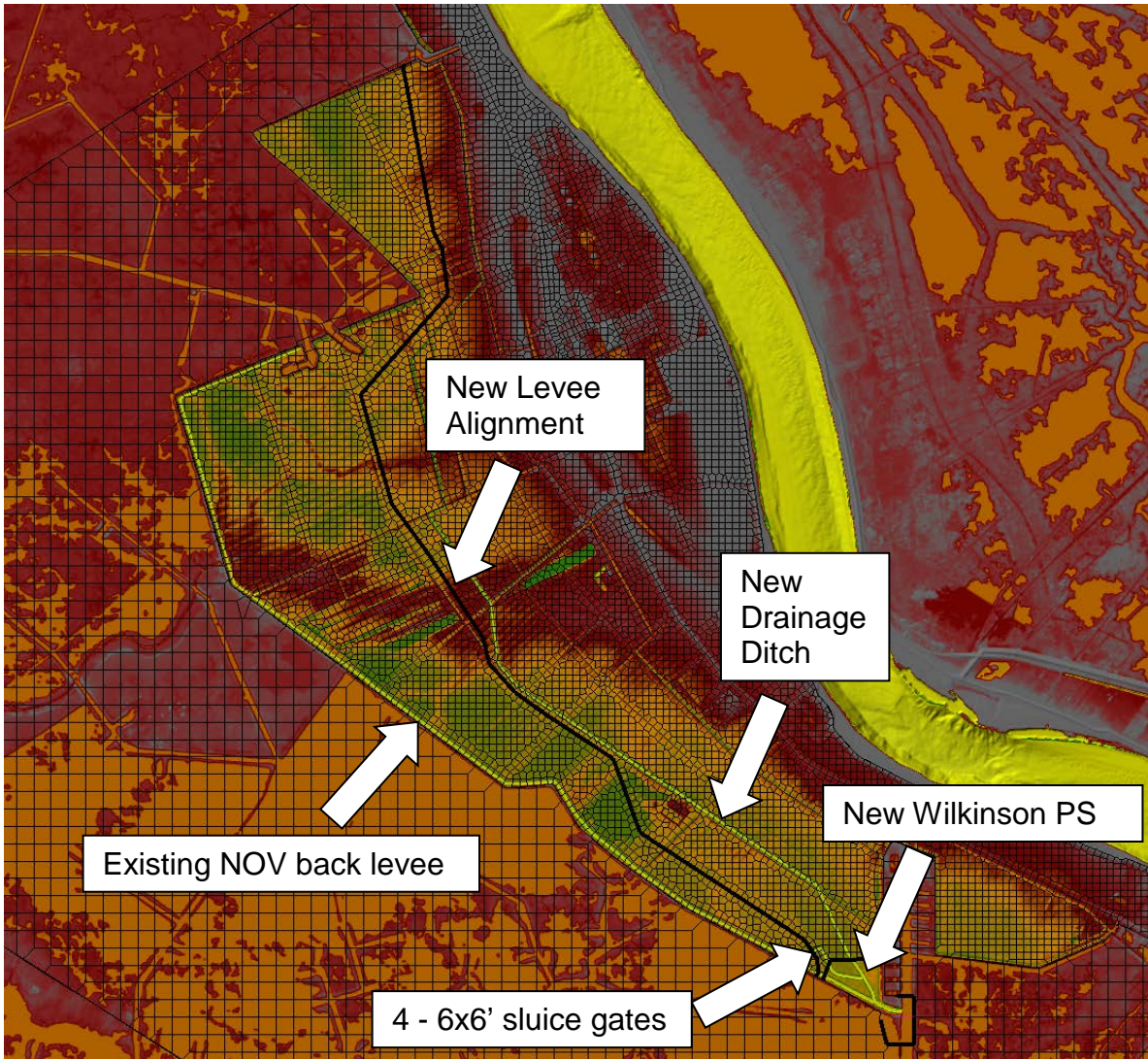


Figure 4 HEC-RAS 1d/2d model geometry for with-project conditions.

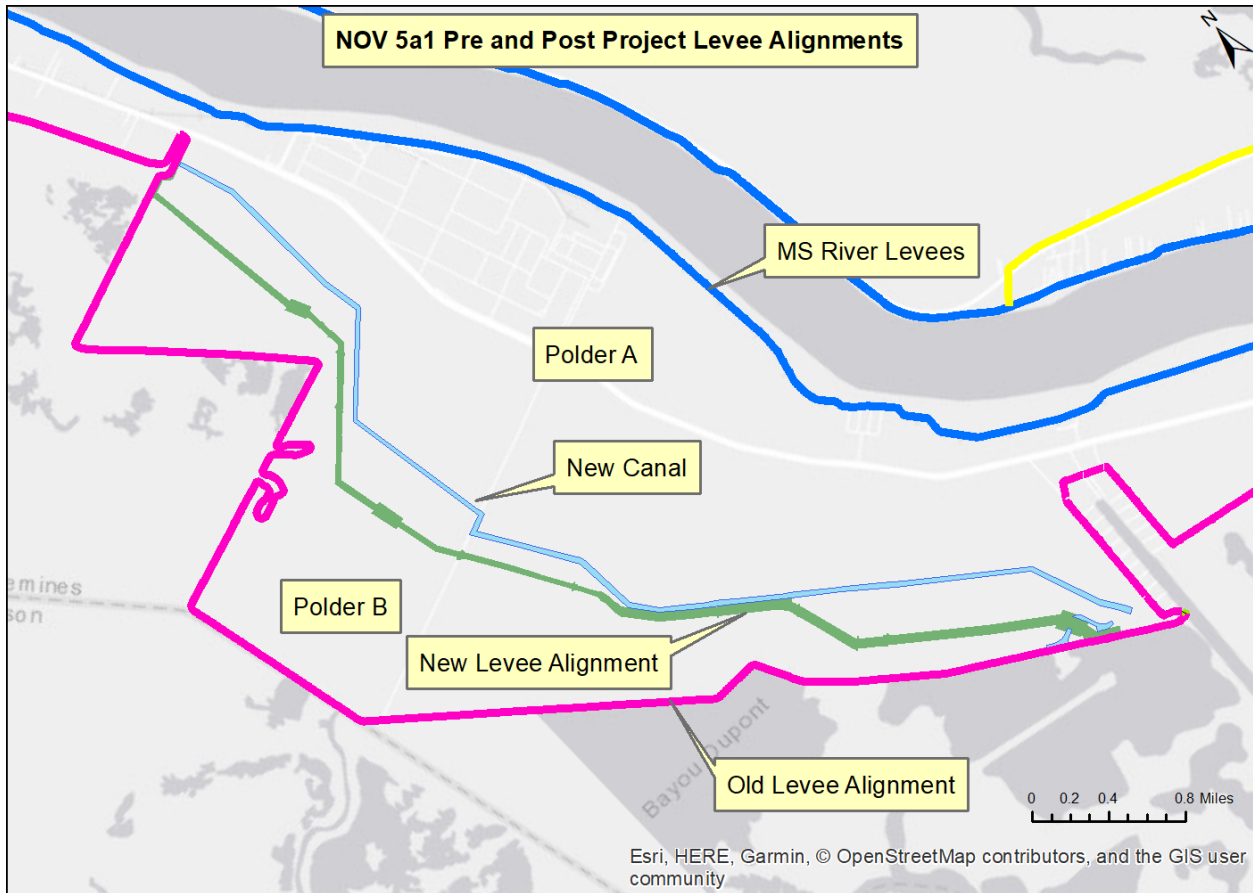


Figure 5 Map showing old and new alignments. Polder A is the area protected by the new alignment, Polder B is the area between the old and new alignment.

2.2 Storm Surge Overtopping Evaluation

In the “With Project” scenario, Polder B is connected to Polder A by the four gates in the new alignment. During a storm surge event, those gates will be closed in order to prevent water from freely flowing into Polder A. The existing back levee, between Polder B and the marsh, is ranges from about elevation 3.0 to elevation 5.0 ft NAVD88 (2009.55). Storm surge may cause water to overtop the existing back levee. Because the gates in the new alignment will be closed, the water will become confined in Polder B. For this analysis, it is assumed that Polder B is completely inundated to the top of the back levee. Water will remain in Polder B until surge has subsided, and either the sluice gates are opened, or the existing back levee is breached, allowing water to equalize with the surrounding marsh water levels.

If the sluice gates in the new alignment are opened, Polder B can drain by gravity into Polder A, and ultimately be pumped out by the new pump station. However, water in Polder A would be at elevation -6.0 NAVD88 (2009.55), and water in Polder B would be at elevation +3.0 to 5.0 NAVD88 (2009.55). This large head differential across the sluice gates would result in high velocities through the gates, and could lead to a scour issue if

the gates are operated. Opening the gates to a less than full opening may reduce scour, but will not eliminate it. Scour protection would be needed in the vicinity of the gates. If there are head-differential related limitations to the gate structure, other options for drainage would need to be explored.

If the existing back levee is breached after the storm has passed, water in Polder B will equalize with the surrounding marsh water levels. After the water is allowed to equalize, the breach would have to be sealed before the sluice gates could be operated. Once equalized, the sluice gates could then be opened, allowing Polder B to fully drain to the elevation of Polder A. In this scenario, the area between the new and old alignments will experience higher water levels for longer periods of time, due the complexity of draining or unwatering Polder B. The amount of time that Polder B will be inundated depends on many factors including, but not limited to:

- 1) The amount of time it takes for personnel to return to the site after the storm has passed to operate the gate structure or drain the polder through artificial breaching.
- 2) The possibility of partially draining Polder B by breaching, in which case the breach characteristics (depth/width) would be critical.
- 3) Head limitations of the gate structure. To avoid scour and increased water levels in Polder A, there may be a limitation on how much the gates are opened during high head scenarios.
- 4) Overtopping volume. During an overtopping event, the interior of Polder B may or may not fill completely. The amount of time required to unwater the polder depends on the overtopping volume, which is storm dependent.

Additional HEC-RAS Modeling was conducted to evaluate the period of time Polder B will be inundated after a surge event overtops and fills the polder. Four different gate opening heights were evaluated including 6ft, 4ft, 2ft and 1ft. The starting water surface of Polder B was assumed to be elevation 3.0 ft NAVD88 (2009.55), based on the approximate low elevation of the existing back levee. Table 1 contains the results of the 4 simulations for draining polder B. The time required to drain polder B from elevation 3.0 to elevation -6.0 ft NAVD88 (2009.55) depends on the gate opening height. At fully open, or 6 ft, it takes approximately 6.8 days for the pump to lower water levels in the Polder. Note that if the gate is fully open, the water level in polder A increases roughly 4 ft, possibly increasing flooding in Polder A. The velocity in the downstream reach is also the highest for the fully open condition. With a gate opening of 2 ft, Polder B is able to drain in 11 days without increasing water levels in Polder A. The goal of operating the gates is to drain Polder B quickly without overwhelming the pump-station and without increasing water levels in Polder A. High velocities can also be somewhat reduced by choosing an appropriate gate opening height. According to the RAS model results, the maximum opening height that satisfies these conditions is approximately 2 ft. With such a small opening, turbulence in the water column may increase the likelihood of scour. As general rule of thumb, the gate opening of a vertical lift gate must be set to 1/3 the water depth or greater to avoid increased turbulence. In this case, the opening height may be less than the general rule of thumb, so increased turbulence may occur.

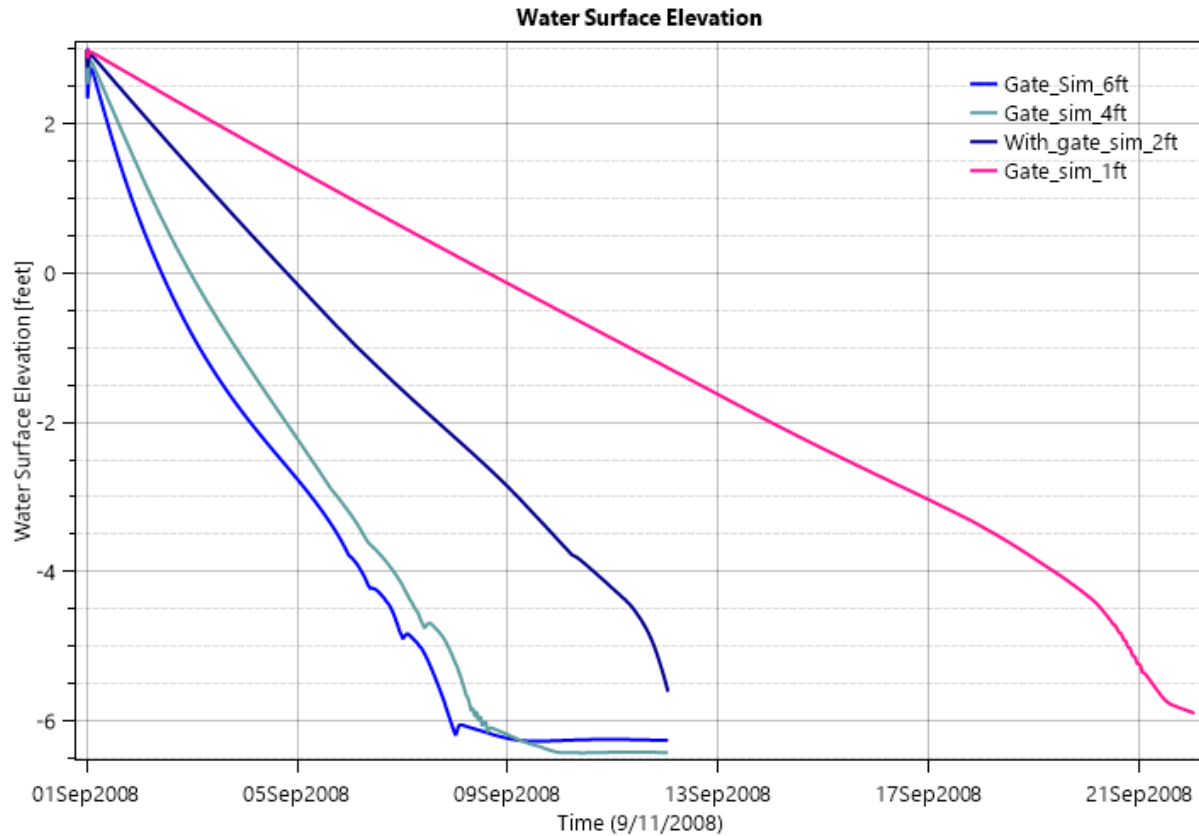


Figure 6 Water surface elevation within Polder B after storm surge overtopping event.

Gate opening height (ft)	Time to drain Polder B (days)	Maximum water level in polder A (NAVD 88)	Peak flow through gate (cfs)	Peak depth averaged velocity downstream of structure (ft/s)
6	6.8	-2.3	2,610	9.9
4	7.2	-3.1	1,740	8.6
2	11.0	-5	870	7.7
1	21.0	-5.5	435	6.2

Table 1 Polder B drainage parameters from HEC-RAS simulations

3. Conclusions and Discussion

- For storm surge events that overtop the existing back levee, a scenario is possible where Polder B will be completely inundated, requiring unwatering. If the sluice gates can be operated to drain Polder B, the area will still be subject to higher water levels for an extended period of time. HEC-RAS simulations of this overtopping scenario show it will take approximately 1 to 3 weeks to drain Polder B if all water is routed through the pump-station.

APPENDIX D

HES

MEMORANDUM

DATE: 1 February 2019

TO: File: \\IF:\Digital_Records\Fed_Projects\NOD\Non Federal Levees - Plaquemines Parish West\Post-FEIS work\2018 change levee NF-05a.1

FROM: USFWS, Louisiana Ecological Services Office

SUBJECT: HES AAHU calculation for NOV5a1 wet pasture impacts

Overview: In order to assess wet pasture (formerly marsh or swamp soils that have been leveed and dewatered but still retain some wildlife value) the Service used the Corps' Habitat Evaluation System (HES 1980) for open lands to quantify impacts to that habitat type. The lack of fully suitable Habitat Evaluation Procedures (HEP) species models and time requirements for that analysis technique resulted in a mutual agreement that the HES community models would provide a better analysis of impacts to this habitat type.

HES uses functional curves for several variables to determine a Habitat Quality Index (HQI) or the value for the impacted area. Those variables include; land use type, diversity of land use, distance to cover, distance to wooded areas, frequency of flooding, tract size, and the perimeter development index. Those variable values are entered into a formula that assigns a weight to each variable; those weighted values are then combined to produce the HQI for each target year. The HQIs are annualized over the period of analysis to produce Average Annual Habitat Units (AAHUs). A Geographic Information System (GIS) was used to determine variable values for diversity of land use, distance to cover and wooded areas, tract size and the perimeter development index. Site visits, aerial photography, soils maps, and water level gauge data (if available) were used to determine remaining variable values. Previous wet pasture impacts have been analyzed in other environmental documents, i.e., the Supplemental Environmental Impact Statement (EIS) for the New Orleans to Venice, the EIS for the Plaquemine Non-Federal Levees (NFL) (Table 1) and Supplemental Environmental Assessment (SEA 537) (Table 2).

Table 1.

HABITAT TYPES	LEVEE REACHES OF THE PREFERRED ALTERNATIVE									
	SECTION 1		SECTION 2		SECTIONS 3 AND 4		SECTION 5		TOTALS	
	Acres	AAHUs	Acres	AAHUs	Acres	AAHUs	Acres	AAHUs	Acres	AAHUs
Wetland Pasture (PEM1CdR)	0	N/A ^c	73.6	-25.7	71.4	-24.9	0	N/A ^c	145	-50.6

Table
2.

TABLE 9. COMPARATIVE IMPACTS OF ALTERNATIVES.

(Wetland Value Assessments were calculated to 57 years to account for temporal lag between start of construction activities and implementation of mitigation)

No Action (EIS ROD Action)	BLH Wet		BLH Dry (includes Subsidied Ridge)*		Wet Pasture (includes Relict Fresh Marsh)**		Swamp		Scrub Shrub		Intermediate Marsh***		Freshwater Marsh		Brackish Marsh***		Open Water****		Total All Habitats	
	Acres	AAHUs	Acres	AAHUs	Acres	AAHUs	Acres	AAHUs	Acres	AAHUs	Acres	AAHUs	Acres	AAHUs	Acres	AAHUs	Acres	AAHUs	Acres	AAHUs
NFL Section 1	14.6	10.3	9.0	5.7	0.0	0.0	24.9	21.1	0.0	0.0	0.0	0.0	10.4	6.8	0.0	0.0	0.0	0.0	59.9	43.9
NFL Section 2	0.1	0.1	0.0	0.0	73.6	25.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	73.7	25.8
NFL Section 3	12.6	8.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.0	5.3	0.0	0.0	21.6	14.2
Total	27.3	19.3	9.0	5.7	73.6	25.7	24.9	21.1	0.0	0.0	0.0	0.0	10.4	6.8	9.0	5.3	0.0	0.0	154.2	83.9
Proposed Action (SEA #537)	BLH Wet		BLH Dry (includes Subsidied Ridge)*		Wet Pasture (includes Relict Fresh Marsh)**		Swamp		Scrub Shrub		Intermediate Marsh***		Freshwater Marsh		Brackish Marsh***		Open Water****		Total All Habitats	
	Acres	AAHUs	Acres	AAHUs	Acres	AAHUs	Acres	AAHUs	Acres	AAHUs	Acres	AAHUs	Acres	AAHUs	Acres	AAHUs	Acres	AAHUs	Acres	AAHUs
NFL Section 1	15.3	13.8	12.0	7.7	0.0	0.0	39.1	33.5	0.0	0.0	0.0	0.0	18.7	12.4	0.0	0.0	0.2	0.0	89.2	67.4
NFL Section 2	0.0	0.0	0.0	0.0	43.3	14.1	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	43.6	14.4
NFL Section 3	5.7	4.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.6	3.2	0.4	0.0	13.7	7.3
NFL Section 4	9.4	6.7	20.0	13.0	70.0	22.8	0.0	0.0	1.5	1.0	0.6	0.0	0.0	0.0	5.1	4.6	10.4	0.0	117.0	48.1
Section 2+4 Canals	2.5	1.8	0.0	0.0	59.7	19.5	0.0	0.0	9.0	5.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	71.2	27.1
NFL Section 5	66.0	47.1	11.3	7.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0	3.4	4.3	0.0	87.5	57.7
Total	102.8	73.4	43.3	28.9	113.3	36.9	39.4	33.8	10.5 *	6.6 **	0.6 **	0.0	18.7	12.4	18.7	10.5	15.3 ***	0.0	422.1	221.9

*BLH Dry includes Subsidied Ridge habitat and Scrub Shrub impacts are combined.

**Wet Pasture and Relict Fresh Marsh were combined.

***Intermediate Marsh impacts are combined with Brackish Marsh impacts.

****Open Water (EFH) habitat impacts are captured in all Marsh Model AAHUs.

Wet pasture impacts associated with Section 2 and 4 Canals are considered temporary and would re-establish or self-mitigate within one year.

Because of time and work load constraints the Service utilized the latest AAHUs calculations for wet pasture in SEA 537 to determine a ratio needed to calculate AAHUs lost due to project changes in the NOV5a1 levee segment. Approximately 7 acres of wet pasture were impacted by the project changes. In SEA 537 approximately 113.3 acres were impacted resulting in the loss of 36.9 AAHUs; that results in a ratio of 0.325 AAHUs lost per impacted acre. Using that ratio, the Service determined that from the proposed modification approximately 2.3 AAHUs would be lost and would require mitigation.

Literature Cited

U.S. Army Corps of Engineers. 1980. HES A Habitat Evaluation System for Water Resources Planning. Lower Mississippi Valley Division. Vicksburg, Mississippi. 89 pages.

U.S. Fish and Wildlife Service. 1980. Habitat Evaluation Procedures (HEP). ESM 102. Division of Ecological Services. Washington, D.C.



APPENDIX E

Referenced NEPA Documents

SEA #537 and EA #543

FEIS 2011 Final Environmental Impact Statement New Orleans to Venice, Louisiana
Hurricane Risk Reduction Project: Incorporation of Non-Federal Levees from Oakville to
St. Jude, Plaquemines Parish, Louisiana

SEA #537 New Orleans to Venice Hurricane Risk Reduction Project: Changes to the
Non-Federal Levees Project, Oakville to St. Jude, Plaquemines Parish, Louisiana

EA #543 New right of Way and Mitigation for the New Orleans to Venice Hurricane Risk
Reduction Project: Incorporation of Non-Federal Levees from Oakville to St. Jude and
New Orleans to Venice Federal Hurricane Protection Levee, Plaquemines Parish,
Louisiana

The referenced documents can be found at the following link

<https://www.mvn.usace.army.mil/Environmental/NEPA/>

APPENDIX F

Clean Water Act Section 404(b)(1)

CEMVN-EDH

MEMORANDUM FOR Chief, Environmental Branch (CEMVN-PDS-C/Michael Morris)

SUBJECT: Request for Water Quality Input for 404(b)(1) Evaluation for New Orleans to Venice (NOV) Hurricane Risk Reduction Project: Realignment of Non-Federal Hurricane Protection Levees (NFL) reach NOV-NF-W-05a.1 Drainage Canal Relocation from La Reussite to Myrtle Grove in Plaquemines Parish, Louisiana.

1. As requested, enclosed are the completed sections of the 404(b)(1) evaluation relating to impacts to water quality from New Orleans to Venice (NOV) Non-Federal Levees (NFL) Project (Encl 1). Also included is a memorandum of explanation for these completed sections (Encl 2).
2. An electronic copy is available in Microsoft Word.
3. Point of contact is Whitney Hickerson, x-2607.

2 Encls

JEAN S. VOSSEN, P.E.
Chief, Engineering Division

SHIH
ED-H_____

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*The following short form 404(b)(1) evaluation follows the format designed by the Office of the Chief of Engineers, (OCE). As a measure to avoid unnecessary paperwork and to streamline regulation procedures while fulfilling the spirit and intent of environmental statutes, the New Orleans District is using this format for all proposed project elements requiring 404 evaluation, but involving no significant adverse impacts.

PROJECT TITLE. New Orleans to Venice (NOV) Hurricane Risk Reduction Project: Realignment of Non-Federal Hurricane Protection Levees (NFL) reach NOV-NF-05a.1 Drainage Canal Relocation from La Reussite to Myrtle Grove in Plaquemines Parish, Louisiana.

PROJECT DESCRIPTION. The previously approved NOV-NF-05a.1 alignment was dismissed due to engineering considerations as well as other factors. The newly proposed levee alignment would provide better underlying foundation conditions for construction of the levee, result in a shorter overall levee length which would reduce the overall construction duration and cost, reduce the real estate interest to be acquired for construction and would minimize the overall impacts to the environment thus reducing the compensatory mitigation requirement. An integral part of this project is the maintenance of the existing lateral ditches connecting the proposed levee and the canal in order to encourage water drainage. The non-federal sponsor (NFS), Plaquemines Parish, has agreed to the responsibility for clearing, grubbing and re-grading the lateral ditches. See Figure 1 for levee and canal alignment.

The levee would be constructed with compacted clay embankment from an approved contractor furnished borrow source. The levee, from start to finish, has eight (8) different sections, which vary in elevation (from el 10.5 to el 14.0 NAVD88(2009.55)) and width (from 207 feet to 210 feet). Approximately 1,794,000 cubic yards of embankment would be used for construction of the levee and ramps. The ramps would be surfaced with a separator geotextile fabric and 7 inches of crushed stone on top of the geotextile fabric. There would be eight (8) ramps, which vary in width (from 14 feet to 25 feet). See Figure 2 for levee alignment and ramp locations.

The realignment of the drainage canal would run the length of the levee, totaling 6.3 miles. The canal would convey rainwater runoff to the Wilkinson Pump Station. The canal would also serve as storage for rainwater runoff while the pumps at the Wilkinson Pump Station are not running. The canal, from start to finish, would vary in width (from 80 feet to 113.78 feet) and depth (from el -7.0 to el -11.8 NAVD88(2009.55)). The estimated amount of material that would be excavated during construction of the new canal is approximately 53,000 cubic yards and would be used for backfilling the existing canal adjacent to the levee. The crossings and associated culverts would be constructed where the canal crosses existing access roads. Approximately 6,000 cubic yards of embankment would be used for construction of the canal crossings. The culvert requirements would vary throughout the alignment based on the canal width. The culverts would be placed on a bedding consisting of sand and crushed stone, with separator geotextile fabric separating the 2 layers. The surface of the embankment

would have separator geotextile fabric and crushed stone. See Figure 2 for canal alignment and crossing locations.

A Bypass Canal will be excavated to connect the existing back drainage canal to the new drainage structure and the Wilkinson P.S. Canal. The eastern side of the bypass canal would connect to the Wilkinson Pump station Canal to the Drainage Structure and the western side of the bypass canal would connect from the Drainage Structure to the existing back drainage canal. The Bypass Canal will vary in width (from approximately 70 feet to 100 feet) and a depth (from EL. -11.42 to EL. -11.73 NAVD88(2009.55)). The total length of the Bypass canal is 1,835 feet and excavation is estimated to generate 21,270 cubic yards of material. Suitable excavated material would be used for the levee construction and to backfill the existing canal and ditches adjacent to the levee.

A drainage structure consisting of four (4) sluice gates and an associated floodwall would be constructed at the south end of the levee reach. The sluice gates would measure 6 feet by 6 feet each, with the entire drainage structure measuring 37 feet wide. The drainage structure would have a bottom of base slab elevation of EL -14.5 and a top of wall elevation of EL 16.0 NAVD88(2009.55). The sluice gates would be powered by a gas powered actuator, with a manual hand crank serving as a back-up. The drainage structure is designed to prevent storm surge from entering into the protected system during tropical and hurricane storm events. The sluice gates would remain open, except during storm events. A floodwall would be constructed to tie the drainage structure into the earthen levee. The floodwall would consist of five (5) monoliths on either side of the drainage structure, each spanning 190 feet, with a bottom of base slab elevation of EL -5 and a top of wall elevation at EL 16.0 NAVD88(2009.55).

Two (2) floodwalls would be constructed for the utility crossing areas, with one at the north reach and one at the south reach. The north floodwall utility crossing would contain seven (7) t-wall monoliths, spanning 310 feet in length. The north floodwall would have two (2) pipelines of the same size (6 inches) running underneath the monoliths, with a bottom base slab elevation of el -6.0 and a top of wall elevation of el 13.0. The south floodwall utility crossing would contain six (6) t-wall monoliths spanning 294 feet in length. The south floodwall would have six (6) pipelines of varying size (from 8 inches to 24 inches) running underneath the monoliths, with a bottom base slab elevation of el -4.0 and a top of wall elevation of el 14.0 NAVD88(2009.55).

There are two existing staging areas that would be used for storage of equipment. The north staging area is listed as staging area 1, which consists of 1.16 acres near access road 1. The south staging area is listed as staging area 2, which consists of 5.51 acres near the 100 foot buffer zone t-wall utility crossing. There are eight (8) existing access roads throughout the length of the levee that would be used for hauling and repairs. See Figure 3 for locations of staging areas and access roads.

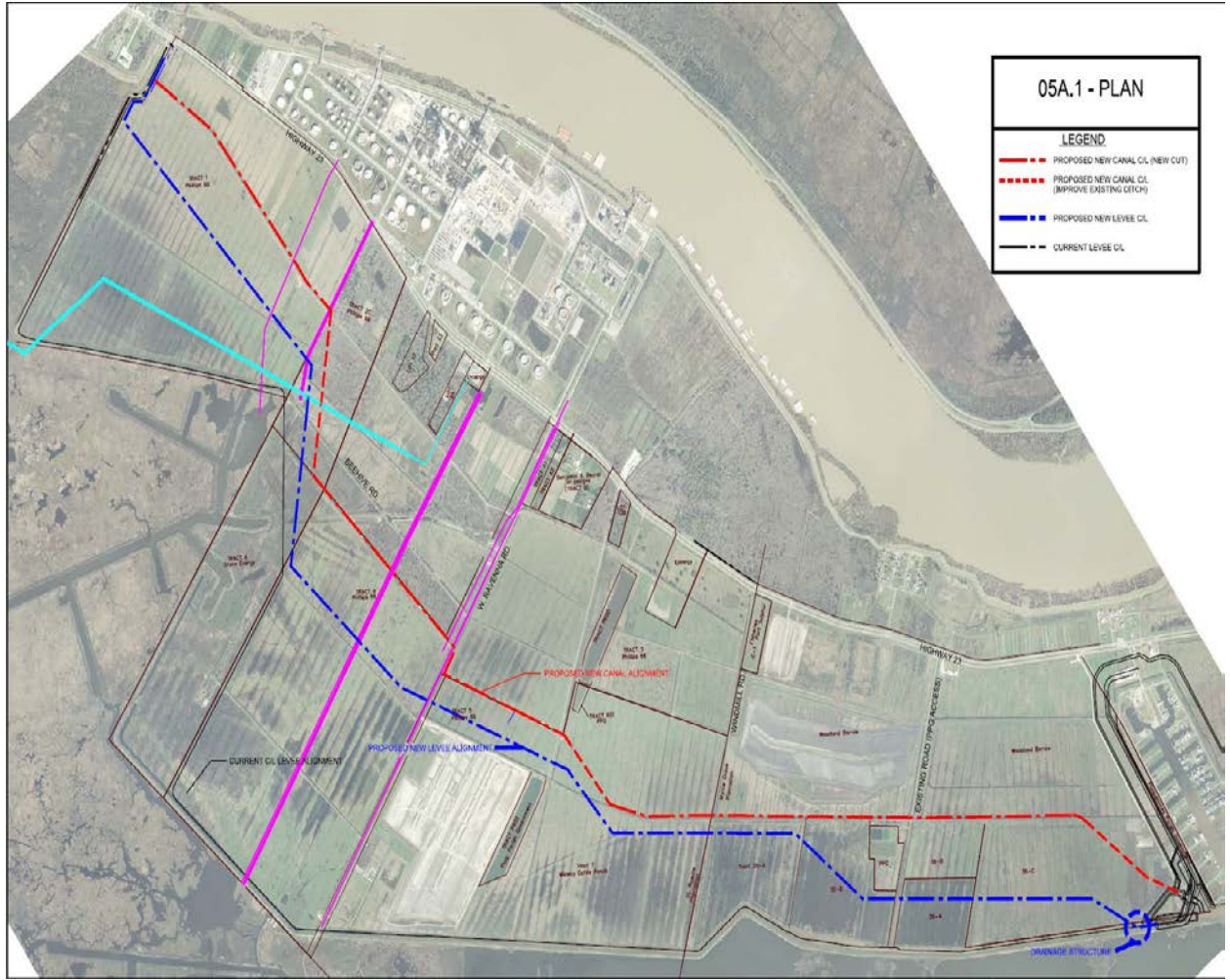


Figure 1. Proposed New Canal and Levee Alignment

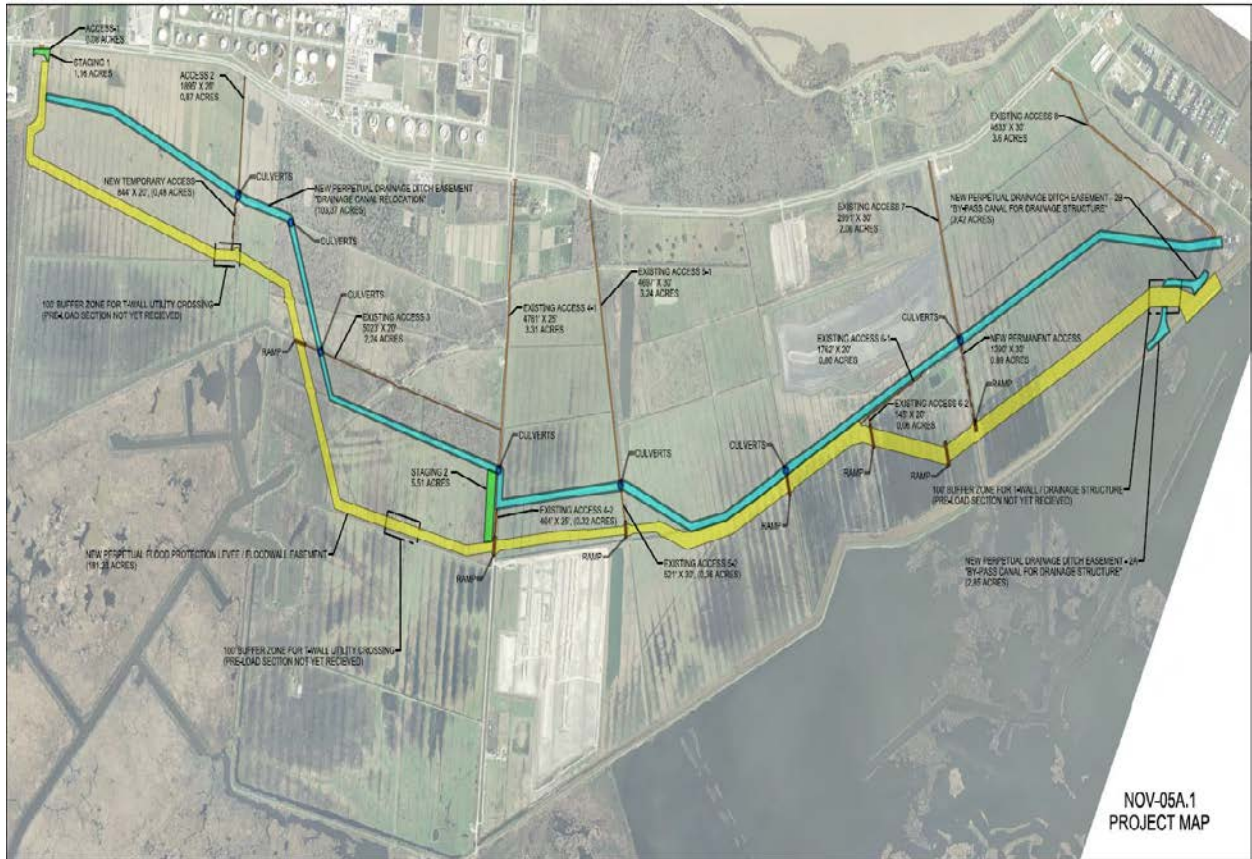
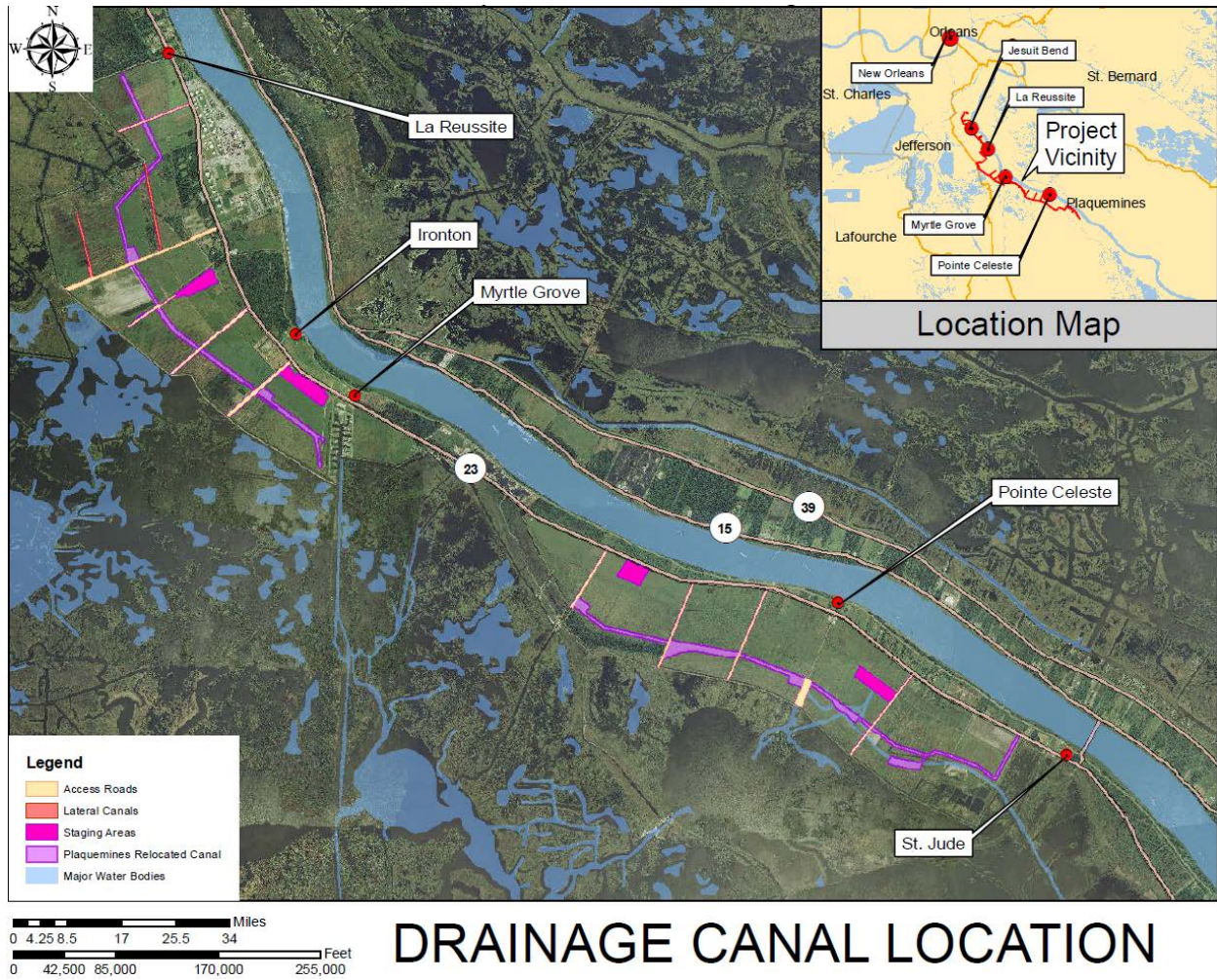


Figure 2. Canal Alignment and Crossing Locations



DRAINAGE CANAL LOCATION

Figure 3. Staging Areas and Access Roads

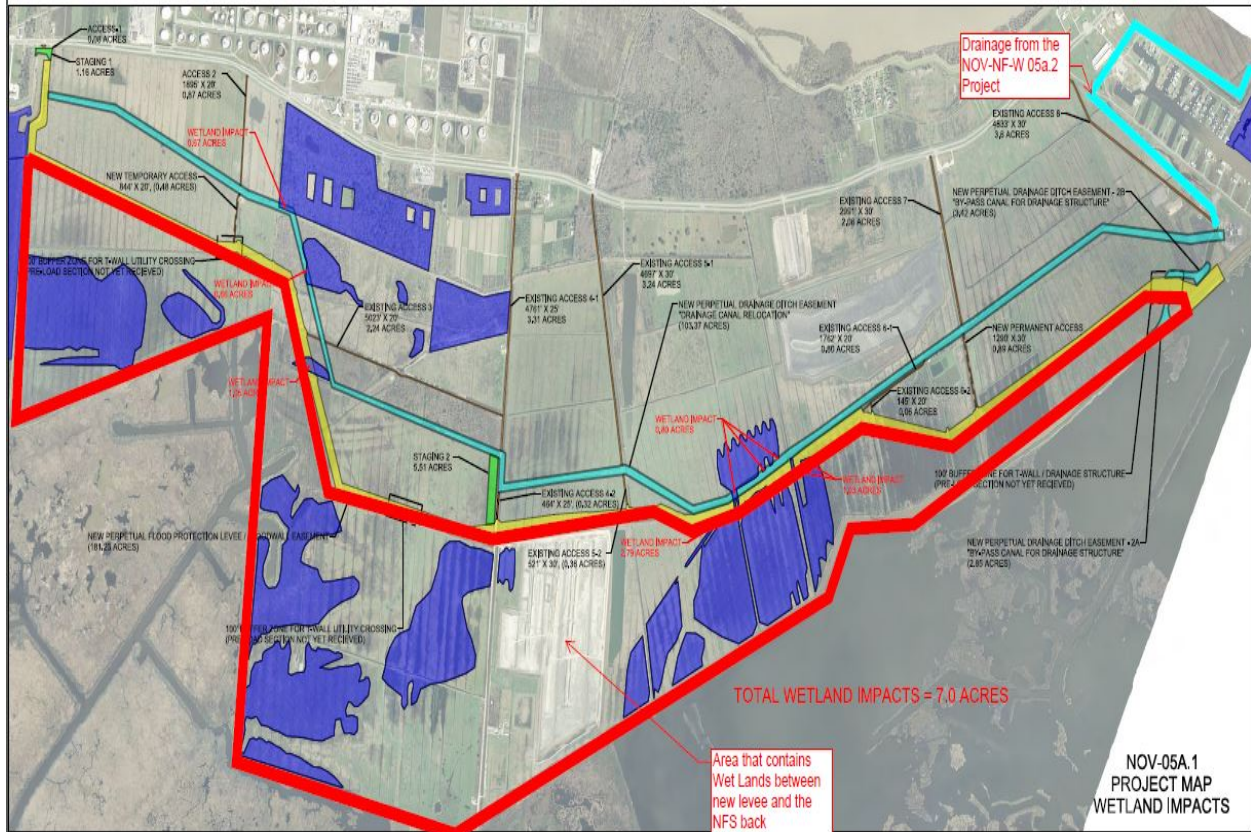


Figure 4. Wetland Impacts

1. Review of Compliance (§230.10 (a)-(d)).

Preliminary¹

Final²

A review of this project indicates that:

a. The discharge represents the least environmentally damaging practicable alternative and if in a special aquatic site, the activity associated with the discharge must have direct access or proximity to, or be located in the aquatic ecosystem to fulfill its basic purpose (if no, see section 2 and information gathered for environmental assessment alternative);

YES	NO*	YES	NO
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b. The activity does not appear to: (1) violate applicable state water quality standards or effluent standards prohibited under Section 307 of the Clean Water Act; (2) jeopardize the existence of Federally listed endangered or threatened species or their habitat; and (3) violate requirements of any Federally designated marine sanctuary (if no, see section 2b and check responses from resource and water quality certifying agencies);

FOR (1)
ONLY

--

YES NO* YES NO

c. The activity will not cause or contribute to significant degradation of waters of the United States including adverse effects on human health, life stages of organisms dependent on the aquatic ecosystem, ecosystem diversity, productivity and stability, and recreational, esthetic, and economic values (if no, see section 2);

YES NO* YES NO

d. Appropriate and practicable steps have been taken to minimize potential adverse impacts of the discharge on the aquatic ecosystem (if no, see section 5).

YES NO* YES NO

2. Technical Evaluation Factors (Subparts C-F).

N/A Not Significant* Significant*

a. Physical and Chemical Characteristics of the Aquatic Ecosystem (Subpart C).

- (1) Substrate impacts.
- (2) Suspended particulates/turbidity impacts.
- (3) Water column impacts.

	x	
	x	
	x	

- (4) Alteration of current patterns and water circulation.
- (5) Alteration of normal water fluctuations/hydroperiod.
- (6) Alteration of salinity gradients.

	x	
	x	
	x	

b. Biological Characteristics of the Aquatic Ecosystem (Subpart D).

- (1) Effect on threatened/endangered species and their habitat.
- (2) Effect on the aquatic food web.
- (3) Effect on other wildlife (mammals, birds, reptiles, and amphibians).

X		
X		
	X	

c. Special Aquatic Sites (Subpart E).

- (1) Sanctuaries and refuges.
- (2) Wetlands.
- (3) Mud flats.
- (4) Vegetated shallows.
- (5) Coral reefs.
- (6) Riffle and pool complexes.

X		
	X	
X		
X		
X		
X		

d. Human Use Characteristics (Subpart F).

- (1) Effects on municipal and private water supplies.
- (2) Recreational and commercial fisheries impacts.
- (3) Effects on water-related recreation.
- (4) Esthetic impacts.
- (5) Effects on parks, national and historical monuments, national seashores, wilderness areas, research sites, and similar preserves.

x		
X		
X		
X		
X		

Remarks. Where a check is placed under the significant category, the preparer has attached explanation.

3. Evaluation of Dredged or Fill Material (Subpart G).³

- a. The following information has been considered in evaluating the biological availability of possible contaminants in dredged or fill material.

(1) Physical characteristics	X
(2) Hydrography in relation to known or anticipated sources of contaminants	X
(3) Results from previous testing of the material or similar material in the vicinity of the project	X
(4) Known, significant sources of persistent pesticides from land runoff or percolation	X
(5) Spill records for petroleum products or designated (Section 311 of CWA) hazardous substances	X
(6) Other public records of significant introduction of contaminants from industries, municipalities, or other sources	X
(7) Known existence of substantial material deposits of substances which could be released in harmful quantities to the aquatic environment by man-induced discharge activities	
(8) Other sources (specify)	X

Appropriate references: See memorandum (Encl 2)

b. An evaluation of the appropriate information in 3a above indicates that there is reason to believe the proposed dredge or fill material is not a carrier of contaminants, or the material meets the testing exclusion criteria.

YES

NO*

4. Disposal Site Delineation
(§230.11(f)).

a. The following factors, as appropriate, have been considered in evaluating the disposal site.

(1) Depth of water at disposal site	X
(2) Current velocity, direction, and variability at disposal site	X
(3) Degree of turbulence	X
(4) Water column stratification	X
(5) Discharge vessel speed and direction	
(6) Rate of discharge	
(7) Dredged material characteristics (constituents, amount, and type of material, settling velocities)	X
(8) Number of discharges per unit of time	
(9) Other factors affecting rates and patterns of mixing (specify)	

Appropriate references: See memorandum (Encl 2)

b. An evaluation of the appropriate factors in 4a above indicates that the disposal site and/or size of mixing zone are acceptable.

YES NO*

5. Actions to Minimize Adverse Effects (Subpart H).

All appropriate and practicable steps have been taken, through application of the recommendations of §230.70-230.77 to ensure minimal adverse effects of the proposed discharge.

YES NO*

6. Factual Determination (§230.11).

A review of appropriate information as identified in items 2-5 above indicates that there is minimal potential for short- or long-term environmental effects of the proposed discharge as related to:

- | | | |
|---|------------------------------|------------------------------|
| a. Physical substrate at the disposal site (review sections 2a, 3, 4, and 5 above). | <input type="checkbox"/> YES | <input type="checkbox"/> NO* |
| b. Water circulation, fluctuation and salinity (review sections 2a, 3, 4, and 5). | <input type="checkbox"/> YES | <input type="checkbox"/> NO* |
| c. Suspended particulates/turbidity (review sections 2a, 3, 4, and 5) | <input type="checkbox"/> YES | <input type="checkbox"/> NO* |
| d. Contaminant availability (review sections 2a, 3, and 4). | <input type="checkbox"/> YES | <input type="checkbox"/> NO* |
| e. Aquatic ecosystem structure and function (review sections 2b and c, 3, and 5). | <input type="checkbox"/> YES | <input type="checkbox"/> NO* |
| f. Disposal site (review sections 2, 4, and 5). | <input type="checkbox"/> YES | <input type="checkbox"/> NO* |
| g. Cumulative impact on the aquatic ecosystem. | <input type="checkbox"/> YES | <input type="checkbox"/> NO* |
| h. Secondary impacts on the aquatic ecosystem. | <input type="checkbox"/> YES | <input type="checkbox"/> NO* |

*A negative, significant, or unknown response indicates that the project may not be in compliance with the Section 404(b)(1) Guidelines.

¹Negative responses to three or more of the compliance criteria at this stage indicates that the proposed projects may not be evaluated using this "short form procedure". Care should be used in assessing pertinent portions of the technical information of items 2a-d, before completing the final review of compliance.

²Negative responses to one of the compliance criteria at this stage indicates that the proposed project does not comply with the guidelines. If the economics of navigation and anchorage of Section 404(b)(2) are to be evaluated in the decision-making process, the "short form" evaluation process is inappropriate.

³If the dredged or fill material cannot be excluded from individual testing, the "short form" evaluation process is inappropriate.

7. Evaluation Responsibility.

a. This evaluation was prepared by:

Name: Whitney Hickerson
Position: Hydraulic Engineer
Organization: U.S. Army Corps of Engineers, New Orleans District
Date: 10/10/2018

b. This evaluation was reviewed by:

Name: Eric Glisch
Position: Environmental Engineer
Organization: U.S. Army Corps of Engineers, New Orleans District
Date: 10/17/2018

8. Findings.

a. The proposed disposal site for discharge of dredged or fill material complies with the Section 404(b)(1) guidelines
.....

b. The proposed disposal site for discharge of dredged or fill material complies with the

Section 404(b)(1) guidelines with the inclusion of the following conditions
.....

c. The proposed disposal site for discharge of dredged or fill material does not comply with the Section 404(b)(1) guidelines for the following reason(s):

(1) There is a less damaging practicable alternative
.....

(2) The proposed discharge will result in significant degradation of the aquatic ecosystem
.....

(3) The proposed discharge does not include all practicable and appropriate measures to minimize potential harm to the aquatic ecosystem
.....

Date: _____

Chief, Environmental Planning and
Compliance Branch



**US Army Corps of Engineers,
New Orleans District**

To: File

From: Whitney Hickerson, CEMVN-EDH

CC:

Date: 17 October 2018

Re: New Orleans to Venice (NOV) Hurricane Risk Reduction Project: Realignment of Non-Federal Hurricane Protection Levees (NFL) reach NOV-NF-05a.1 Drainage Canal Relocation from La Reussite to Myrtle Grove in Plaquemines Parish, Louisiana.

A short form 404 (b)(1) evaluation of the Federal actions for the subject project was performed by ED-H for water quality impacts. Existing data were used to make factual determinations for the subject actions. The following summarizes the review process and comments noted:

I. Subpart B – Review of Compliance

- a. *230.10 (b) (1):* After consideration of disposal site dilution and dispersion, there are no expected violations of State water quality standards from the proposed Federal actions.

II. Subpart C – Physical and Chemical Characteristics of the Aquatic Ecosystem

- a. *230.20 - Substrate Impacts:* Material to be used for construction would come from an approved contractor furnished borrow site. The estimated amount of material that would be excavated during construction of the new canal is approximately 53,000 cubic yards and would be used for backfilling the existing canal adjacent to the levee. Therefore, the spoil material is not expected to contribute to the toxicity of benthic organisms in the proposed disposal areas.
- b. *230.21 – Suspended Particulates/Turbidity Impacts:* The proposed Federal actions would not cause significant impacts. The project is therefore expected to generate minor, localized increases in turbidity in the vicinity of the project site during construction activities.

- c. *230.22 – Water Column Impacts:* The proposed project is expected to generate localized water column impacts in the vicinity of the project site during construction activities. Water column impacts of the proposed project are not expected to be significant.
- d. *230.23 – Alteration of Current Patterns and Water Circulation:* The proposed project would locally alter current patterns and water circulation, by creating a new drainage canal in an area that one currently does not exist. However, there are no expected adverse impacts to the alteration of current patterns and water circulation in the project area.
- e. *230.24 – Alteration of Normal Water Fluctuations/Hydroperiod:* The proposed project would have a negligible impact on the hydrology of surrounding surface waters.
- f. *230.25 – Alteration of Salinity Gradients:* Project area salinity gradients are largely determined by the interaction of waters from the Mississippi, the Gulf of Mexico, and rainfall-runoff within the Barataria Basin. Due to the small footprint of the proposed project, as well as its location (e.g., it is not obstructing any large channels connected to the Gulf of Mexico), the project is not anticipated to alter salinity gradients.

III. Subpart F – Human Use Characteristics

- a. *230.50 – Effects on Municipal and Private Water Supplies:* The nearest municipal or private water supply is located in the Mississippi River at West Pointe a la Hache, which is hydraulically separated from the project site by earthen levees.

IV. Subpart G – Evaluation of Dredged or Fill Material

- a. *230.61 (a) – Considerations in Evaluating the Biological Availability of Possible Contaminants in Dredged or Fill Material:* See II(a) above

Appropriate references: See VIII below

- b. An evaluation of the appropriate information in VI(a) above indicates that there is reason to believe the proposed dredge or fill material is not a carrier of contaminants, or the material meets the testing exclusion criteria: Yes

V. Disposal Site Delineation

- a. *230.11 (f) – Considerations in Evaluating the Disposal Site:* The proposed project is located in Plaquemines parish spanning from the towns of La Reussite to Myrtle Grove.

- b. An evaluation of the appropriate factors in V(a) above indicates that the disposal site and/or size of mixing zone are acceptable: Yes.

VI. Subpart H - Actions to Minimize Adverse Effects

All appropriate and practicable steps have been taken, through application of the recommendations of 230.70 – 230.77 to ensure minimal adverse effects of the proposed discharge: NA

VII. Factual Determinations

A review of appropriate information as identified in items I - VI above indicates that there is minimal potential for short- or long-term environmental effects of the proposed discharge:

1. Physical substrate at the disposal site (review sections II, IV, V, and VI above): No
2. Water circulation, fluctuation and salinity (review sections II, IV, V, and VI): No
3. Suspended particulates (review sections II, IV, V, and VI): N/A
4. Contaminant availability (review sections II, IV, and V): N/A

VIII. References

- a. National Oceanic and Atmospheric Administration (NOAA). *SQuiRT Cards*. <http://response.restoration.noaa.gov/environmental-restoration/environmental-assessment-tools/squirt-cards.html>. Last accessed October 10, 2018.
- b. Louisiana DEQ, Chapter 11 Surface Water Quality Standards, May 2017: https://deg.louisiana.gov/assets/docs/Legal_Affairs/Water052017.pdf
- c. U.S. Coast Guard (USCG), April 2018. National Response Center. <http://nrc.uscg.mil/>. Last accessed October 10, 2018.
- d. U.S. Environmental Protection Agency (USEPA). *National Recommended Water Quality Criteria – Aquatic Life Criteria Table*. <https://www.epa.gov/wqc/national-recommended-water-quality-criteria-aquatic-life-criteria-table>. Last accessed October 10, 2018.

APPENDIX G

Scientific Names for Animals

Frog *Anura*

Turtle *Testudines*

Alligator *Alligator Mississippiensis*

Snake *Serpentes*

Songbirds *Passeri*

Duck *Anas Platyrhynchos*

Nutria *Myocastor Coypus*

Deer *Cervidae*

Feral Hog *Sus Scrofa*

Swamp Rabbit *Sylvilagus Aquaticus*

Squirrel *Sciuridae*

Raccoon *Procyon Lotor*

Coyote *Canis Latrans*