



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
MOBILE DISTRICT, CORPS OF ENGINEERS
P.O. BOX 2288
MOBILE, AL 36628-0001

April 19, 2016

South Mississippi Branch
Regulatory Division

SUBJECT: Department of the Army Permit Application Number SAM-2013-00088-MJF, Mississippi Department of Environmental Quality, Hancock County Living Shoreline Project, Mississippi Sound, Hancock County, Mississippi

Mississippi Department of
Environmental Quality
Attention: Mr. Richard Harrell
PO Box 2261
Jackson, Mississippi 39225

Dear Mr. Harrell:

Enclosed are two copies of a Department of the Army **draft** permit for work specified in accordance with the enclosed plans, drawings, and specifications. If the permit is acceptable as drafted, you are requested to sign both copies in the space indicated and return both signed copies to me for final action. The original will be signed by me and returned to you with a placard to be posted at all times that construction is performed at the site. **This permit is not valid until the District Commander signs it;** therefore, work must not commence on the project until a fully executed copy is returned to you.

Please mail both signed copies of the draft permit to the letterhead address to the attention of the South Mississippi Branch, Regulatory Division. **This permit is not valid until it is properly signed by both the applicant and me;** therefore, work must not commence on the project until a fully executed copy has been returned to you.

Your attention is directed to all conditions under which this permit will be issued. Failure to comply with any condition of the approved permit may result in its suspension, cancellation, or revocation. If you object to certain terms and conditions contained within the permit, you may request that the permit be modified. Enclosed you will find a Notification of Administrative Appeal Options and Process fact sheet and Request for Appeal (RFA) form. If you choose to object to certain terms and conditions of the permit, you must follow the directions provided in Section 1, Part A and submit the completed RFA form to the letterhead address.


In order for an RFA to be accepted by the U.S. Army Corps of Engineers (USACE), the USACE must determine that it is complete, that it meets the criteria under 33 CFR

Part 331.5, and that it has been received by the District office within 60 days of the date of the RFA. Should you decide to submit an Request for Appeal (RFA) form, it must be received at the letterhead address by within 60 days of the date of this letter.

It is not necessary to submit an RFA form to the District office, if you do not object to the determination/decision in this letter. In this case, both copies must be signed by the applicant in the space provided on the signature page of the permit. In the case of corporations, acceptance must be by an officer of that corporation authorized to sign on behalf of the corporation. The party responsible for assuring the work is done in accordance with the permit terms and conditions must sign the permit. Please type or print the name and title of the person signing below the signature and the date signed.

Please contact Maryellen Farmer at (228) 523-4116, if you have any questions. For additional information about our Regulatory Program, please visit our web site at: www.sam.usace.army.mil/Missions/Regulatory and please take a moment to complete our customer satisfaction survey while you're there. Your responses are appreciated and will allow us to improve our services.

Sincerely,


for

Munther N. Sahawneh
Chief, South Mississippi Branch
Regulatory Division

Enclosures



US Army Corps
of Engineers®

**THIS NOTICE OF AUTHORIZATION MUST BE
CONSPICUOUSLY DISPLAYED AT THE SITE OF WORK.**

A permit to perform work authorized by statutes and regulations of the Department of the Army

MISSISSIPPI SOUND, BETWEEN BAYOU CADDY AND MOUTH OF THE EAST PEARL RIVER, SECTION 11,
at TOWNSHIP 10 SOUTH, RANGE 15 WEST, HANCOCK COUNTY, MISSISSIPPI

has been issued to MISSISSIPPI DEPARTMENT OF
ENVIRONMENTAL QUALITY on 19 APR 2016

Address of Permittee PO BOX 2261, JACKSON, MISSISSIPPI 39226

Permit Number

SAM2013-00088-MJF

Allison Monave

District Commander

MUNTER N. SAHAWNEH, CH, RD-M

ENG FORM 4336, Jul 81 (33 CFR 320-330) EDITION OF JUL 70 MAY BE USED

(Proponent: CECW-0)

DEPARTMENT OF THE ARMY PERMIT

Permittee: MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY

Permit No.: SAM-2013-00088-MJF

Issuing Office: MOBILE DISTRICT

NOTE: The term "you" and its derivatives, as used in this permit, means the permittee or any future transferee. The term "this office" refers to the appropriate district or division office of the U.S. Army Corps of Engineers (Corps) having jurisdiction over the permitted activity or the appropriate official of that office acting under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below.

Project Description: The permittee is authorized to place approved fill material for the creation of 46 acres of salt marsh; place approved fill material for the creation of 46 acres of subtidal reef; and construct 5.9 miles of breakwater structures.

Breakwaters would be constructed at two locations: The first is an approximately 4 mile long structure along St. Joseph's Point and the second is approximately 1.9 miles from the Pearl River to Heron Bay. The breakwater crest elevation would be at Mean Higher High Water (MHHW) to facilitate increased marsh shoreline protection. The breakwater base width will be 60 feet wide. The breakwaters will be installed in segments with each segment being approximately 180 feet with 30-foot gaps between segments. The breakwaters will consist of riprap underlain by geotextile fabric. The structure will have a 15-foot crest width and 60-foot width at the base, and would be approximately 5.0-8.5 -feet in total height, with a total footprint of approximately 40.3 acres. The gap areas will also be underlain by geotextile fabric with a minimum of 1.5 feet of riprap covering the fabric. The target depth for deployment of the breakwaters will be approximately -3.5 feet North American Vertical Datum of 1988 (NAVD 88). The volume of material for the St. Joseph's segment will be approximately 132,000 cubic yards of rock material. The volume of material for the Pearl River-Heron Bay segment will be approximately 58,000 cubic yards of rock material. The project will be marked as required by U.S. Coast Guard.

Creation of 46 acres of salt marsh. The marsh creation area is an approximately 78 acre area in the southeastern portion of Heron Bay. Approximately 46 acres of marsh will be created in one of several locations within this area. A dike (containment structure) will be constructed by excavating existing material from unvegetated water bottoms within the marsh creation site and possibly with suitable permitted dredged materials from other sources, filling the area within the dike with appropriate dredged material to final marsh grade. The applicant intends to revegetate the area by planting using native species. Sediment will be pumped through a floating pipeline from a hydraulic dredge located where suitable fill material is available. Pumps and sediment controls will remain in place throughout the dredging and filling process and after initial settling. Dredged material will be obtained from a tested and permitted dredge project or some other suitable, permitted source. Once the entire marsh area(s) is constructed and planted, the area will be monitored.

Placement of 46 acres for Subtidal Reef. The subtidal reef deployment area is an approximately 194 acre area in the western portion of Heron Bay. Approximately 46 acres of subtidal reef habitat will be created in one to several locations with this area. Cultch deployment will occur generally in water depths of -3 to -5 feet NAVD 88. The subtidal reef(s) will be sited based on data from an oyster presence survey and will consist of approximately 6- to 9-inch thick layer of limestone or other suitable material. Deployment will be by a barge-mounted crane with clam shell bucket. As a construction alternative, water jetting of cultch material may be used in case of water depth constraints.

Project Component	Impact Type	Duration of Impact	Habitat Type Impacted	Revised Acreage of Impact (per Design Change)
St. Joseph's Point Area Breakwater Construction Activity Area	Filling fine-grained sediment with riprap over geotextile/geogrid layer	Long-Term	Shallow water/fine-grained sediment bottom	29.1
Pearl River to Heron Bay Breakwater Construction Activity Area	Filling fine-grained sediment with riprap over geotextile/geogrid layer	Permanent	Shallow water/fine-grained sediment bottom	13.8
Subtidal Reefs in Heron Bay	Filling with Cultch (shells, limestone); siting refined based on siting study	Long-Term	Shallow water/hard bottom	46
Marsh Creation (Inside Heron Bay)	Filling with suitable material; site for marsh creation selected	Long-Term	Shallow water with fine-grained sediment bottom	46
Total Permanent Impacts				134.9
Total Impacts				134.9

The permittee or their representative will conduct monitoring for a period of seven (7) years following completion. The applicant will monitor the project's performance with respect to erosion control, marsh habitat creation, and the support of secondary productivity. Information collected and evaluated will include water quality parameters; structural integrity of breakwater structure; height/elevation and area of structure; consolidation rate of breakwater structure; shoreline profile; bivalve biomass and survival; non-bivalve invertebrate biomass and survival; and an assessment of marsh vegetation. The project will incorporate a mix of long-term monitoring efforts to ensure project designs are correctly implemented during construction, and to identify any potential unanticipated erosion/sediment accumulation issues associated with the project. Corrective actions will be addressed through the maintenance budget included in the overall project budget.

- ATTACHED:
1. Plan Drawings
 2. Mississippi Department of Marine Resources (DMR) Coastal Program Certification dated November 25, 2015 and Modification dated February 5, 2016 (DMR-140197).
 3. Mississippi Department of Environmental Quality (DEQ) Section 401 Certification dated December 1, 2015 (WQC2015010).
 4. National Marine Fisheries Service Consultation Letters for SER-2014-12925
 5. Department of the Interior, United Fish and Wildlife Service final concurrence letter for review under Section 106 of the National Historic Preservation Act.
 6. Monitoring and Adaptive Management Plan

Project Location: The project is located in the Mississippi Sound, between Bayou Caddy and the mouth of the East Pearl River, Section 11, Township 10 South, Range 15 West, Hancock County, Mississippi [Bounding Coordinates: West – (-89.530W/30.184N) South – (-89.462W/30.169N) East – (-89.415W/30.233N) North – (-89.53W/30.184W) Centroid – (-89.457W/30.19N).

Permit Conditions

General Conditions:

1. The time limit for completing the work authorized ends on **19 April 2021**. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least 1 month before the above date is reached.
2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.
3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and State coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.
4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.
5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions.
6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

Special Conditions:

- a. **The permittee shall comply with all requirements of the Mississippi Department of Environmental Quality 401 Water Quality Certification (WQC2015010) dated December 1, 2015.**
- b. **The permittee shall comply with all requirements of the Mississippi Department of Marine Resources Coastal Zone Consistency Determination (DMR-140197) dated November 25, 2015 and modification dated February 5, 2016.**
- c. **Best management practices shall be implemented to minimize erosion, siltation damage to adjacent wetlands and waters of the United States, and submerged aquatic vegetation. Appropriate erosion and siltation control measures must be used and maintained in effective operating condition during construction. All temporary erosion control features shall remain in place until permanent stabilization measures have been completed and have become fully effective.**
- d. **All excavation and fill activities shall be performed in a manner that minimizes disturbance and turbidity increases in "waters of the United States", wetlands, and submerged aquatic vegetation; and shall be retained in a manner to preclude its erosion into any adjacent wetlands, submerged aquatic vegetation, or waterway.**
- e. **It is the permittee's responsibility to ensure that the contractors working on this project are aware of all general and special permit conditions associated with this permit verification.**
- f. **The project must be constructed in accordance with the description and plans presented.**
- g. **The Permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the Permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.**

h. The project site shall be monitored during and after construction. An initial site report documenting site conditions (to include photos) should be completed and submitted to this office 30 days prior to construction and prior to restoration activities. A second site report (to include photos) should be completed and submitted to this office 30 days after each component of work at the project site. Annual monitoring reports (to include photos) are to be completed each year and submitted to this office no later than April 30th of that following year. Monitoring reports are to include all information as outlined in the attached Monitoring and Corrective Action Plan. The monitoring reports shall be provided on a yearly basis for a period of seven years from the final construction phase.

i. If corrective actions are deemed necessary, the permittee shall submit all proposals to this office, the MDMR, and the MDEQ for review as a potential permit modification.

j. This Department of Army (DA) permit does not authorize you to take an endangered species, in particular the Piping Plover, the Gulf sturgeon, and sea turtles (leatherback, Kemp's ridley, hawksbill, green, and loggerhead). If a take occurs or new information reveals effects of the action not previously considered, or the identified action is subsequently modified in a manner that causes an effect to listed species or critical habitat in a manner or to an extent not previously considered, or if a new species is listed or critical habitat designated that may be affected by the identified action reinitiation of consultation with NMFS-PRD and/or USFWS must take place. Therefore, within 24 hours of any of the above mentioned actions taking place you shall notify this office of the event and/or finding. The enclosed (National Marine Fisheries Service) Formal Consultation Letter (April 11, 2014, F/SER31:JBH); Amendment Consultation Letter (September 26, 2014, F/SER31:JBH; and the undated NMFS Memorandum subject titled "Deepwater Horizon Early Restoration Phase III – Hancock County Marsh Living Shoreline Project: Re-Initiation of ESA Consultation" (undated 2016), contains mandatory terms and conditions to implement reasonable and prudent measures that are associated with your project. Your authorization under this DA permit is conditional upon your compliance with all of the mandatory terms and conditions associated with the enclosed Sea Turtle and Smalltooth Sawfish Construction Conditions, dated March 23, 2006; Measures for Reducing Entrapment Risk to Protected Species, revised May 22, 2012; and USFWS Standard Manatee Conditions for In-Water Work, dated 2011. Lack of compliance with these enclosed conditions would constitute non-compliance with your DA permit. The NMFS is the appropriate authority to determine compliance with the terms and conditions of these requirements (SER-2014-12925).

k. "In order for the Coast Guard to give proper notice to the maritime community; the permitted owners, contractors, or responsible party(s) shall contact Coast Guard Sector Mobile Waterways Management Branch (spw), 1500 15th Street, Mobile, AL 36615 at (251) 441-5684 OR (251) 441-5720, 60 days prior to performing the proposed action. The permitted owners, contractors, or responsible party(s) must also install and maintain, at the permitted owners, contractors, or responsible party(s) expense, any safety lights, signs and signals required by the U.S. Coast Guard, through regulations or otherwise, on the permitted owners, contractors, or responsible party(s) fixed structures. To receive a U.S. Coast Guard Private Aids to Navigation marking determination, at no later than 30 days prior to the installation of any fixed structures in navigable waters and/or prior to installation of any floating private aids to navigation, you are required to contact the Eighth Coast Guard District (dpw), 500 Poydras St. Suite 1230, New Orleans, LA 70130, (504)671-2328 or via email to: D8oanPATON@uscg.mil. For general information related to Private Aids to Navigation please visit the Eighth CG District web site at: <http://www.uscg.mil/d8/waterways/PATON.Home.asp>

l. The permittee shall comply with all requirements and stipulations of the United States Department of the Interior, Fish and Wildlife Service Review under Section 106 of the National Historic Preservation Act (NHPA)(FWS/R4/DH NRDAR) dated March 14, 2016.

Further Information:

1. Congressional Authorities: You have been authorized to undertake the activity described above pursuant to:

- (X) Section 404 of the Clean Water Act (33 U.S.C. 1344).
- (X) Section 10 of the Rivers and Harbors Act 1899 (33 U.S.C. 403).

2. Limits of this authorization.

- a. This permit does not obviate the need to obtain other Federal, State, or local authorizations required by law.
- b. This permit does not grant any property rights or exclusive privileges.
- c. This permit does not authorize any injury to the property or rights of others.
- d. This permit does not authorize interference with any existing or proposed Federal project.

3. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:

- a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.
- b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.
- c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.
- d. Design or construction deficiencies associated with the permitted work.
- e. Damage claims associated with any future modification, suspension, or revocation of this permit.

4. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

5. Reevaluation of Permit Decision. This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:

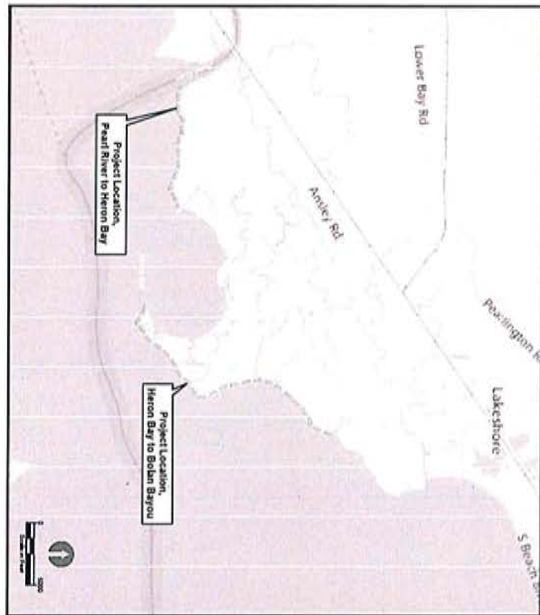
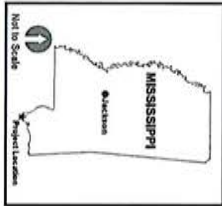
- a. You fail to comply with the terms and conditions of this permit.
- b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (See 4 above).
- c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. Extensions. General condition 1 establishes a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give favorable consideration to a request for an extension of this time limit.

HANCOCK COUNTY MARSH LIVING SHORELINE

HANCOCK COUNTY, MISSISSIPPI



DRAWING INDEX	
SHEET	DRAWING TITLE
1	G1 TITLE SHEET
2	C1 PEARL RIVER TO HERON BAY PROJECT LAYOUT, STA. 0+00 TO 13+00
3	C2 PEARL RIVER TO HERON BAY PROJECT LAYOUT, STA. 13+00 TO 28+40
4	C3 PEARL RIVER TO HERON BAY PROJECT LAYOUT, STA. 28+40 TO 44+00
5	C4 PEARL RIVER TO HERON BAY PROJECT LAYOUT, STA. 44+00 TO 59+80
6	C5 PEARL RIVER TO HERON BAY PROJECT LAYOUT, STA. 59+80 TO 75+40
7	C6 PEARL RIVER TO HERON BAY PROJECT LAYOUT, STA. 75+40 TO 90+20
8	C7 PEARL RIVER TO HERON BAY PROJECT LAYOUT, STA. 90+20 TO 102+70
9	C8 PEARL RIVER TO HERON BAY PROJECT LAYOUT, STA. 102+70 TO 16+60
10	C9 LIGHTHOUSE BAYOU TO BOLAN BAYOU PROJECT LAYOUT, STA. 16+60 TO 23+40
11	C10 LIGHTHOUSE BAYOU TO BOLAN BAYOU PROJECT LAYOUT, STA. 23+40 TO 33+40
12	C11 LIGHTHOUSE BAYOU TO BOLAN BAYOU PROJECT LAYOUT, STA. 33+40 TO 46+00
13	C12 LIGHTHOUSE BAYOU TO BOLAN BAYOU PROJECT LAYOUT, STA. 46+00 TO 57+80
14	C13 LIGHTHOUSE BAYOU TO BOLAN BAYOU PROJECT LAYOUT, STA. 57+80 TO 74+80
15	C14 LIGHTHOUSE BAYOU TO BOLAN BAYOU PROJECT LAYOUT, STA. 74+80 TO 81+40
16	C15 LIGHTHOUSE BAYOU TO BOLAN BAYOU PROJECT LAYOUT, STA. 81+40 TO 88+00
17	C16 LIGHTHOUSE BAYOU TO BOLAN BAYOU PROJECT LAYOUT, STA. 88+00 TO 118+00
18	C17 LIGHTHOUSE BAYOU TO BOLAN BAYOU PROJECT LAYOUT, STA. 118+00 TO 128+40
19	C18 LIGHTHOUSE BAYOU TO BOLAN BAYOU PROJECT LAYOUT, STA. 128+40 TO 144+00
20	C19 LIGHTHOUSE BAYOU TO BOLAN BAYOU PROJECT LAYOUT, STA. 144+00 TO 154+00
21	C20 LIGHTHOUSE BAYOU TO BOLAN BAYOU PROJECT LAYOUT, STA. 154+00 TO 167+20
22	C21 LIGHTHOUSE BAYOU TO BOLAN BAYOU PROJECT LAYOUT, STA. 167+20 TO 180+80
23	C22 LIGHTHOUSE BAYOU TO BOLAN BAYOU PROJECT LAYOUT, STA. 180+80 TO 196+40
24	C23 LIGHTHOUSE BAYOU TO BOLAN BAYOU PROJECT LAYOUT, STA. 196+40 TO 208+20
25	C24 LIGHTHOUSE BAYOU TO BOLAN BAYOU PROJECT LAYOUT, STA. 208+20 TO 218+40
26	C25 TYPICAL BREAKWATER SECTIONS AND DETAILS
27	C26 HERON BAY REEF PROBE LOCATIONS FOR PROPOSED SUB-TIDAL REEF
28	C27 HERON BAY MARSH PROBE LOCATIONS FOR PROPOSED MARSH FILL PLACEMENT



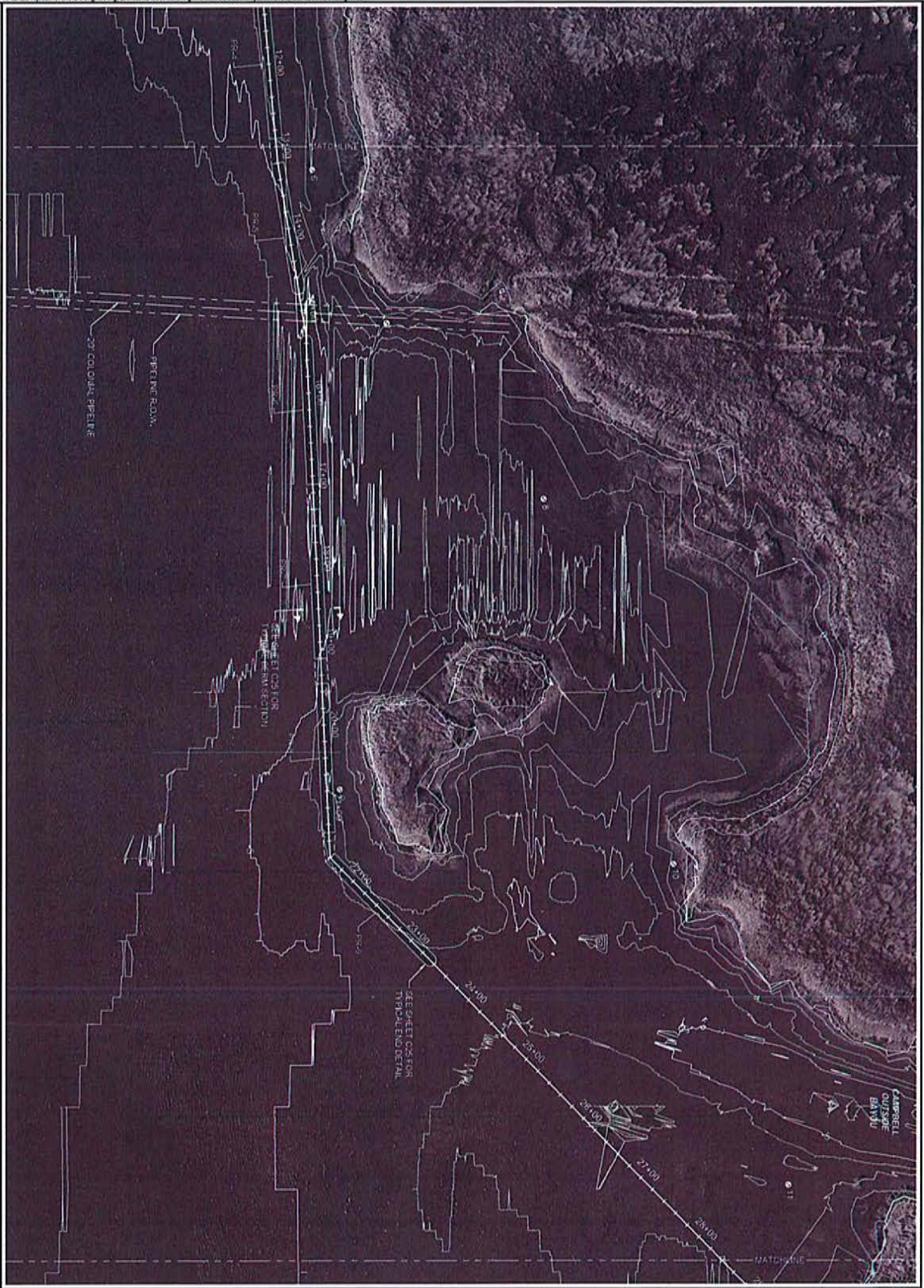
REV	DATE	BY	APP'D	DESCRIPTION

DESIGNED BY: M. ROBERTSON
 DRAWN BY: D. JONES
 APPROVED BY: S. WATKINS
 SCALE: AS SHOWN
 DATE: AUGUST 2011

HANCOCK COUNTY MARSH LIVING SHORELINE, MS
 SAM-2013-00088-M/JF / DMR-140197
 TITLE SHEET

G1
 SHEET NO. 1 OF 28





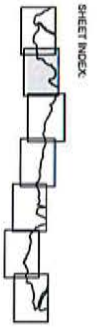
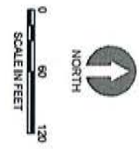
REV	DATE	BY	APP'D	REVISIONS	DESCRIPTION

DESIGNED BY: A. WOODRICK	DRAWN BY: J. WOODRICK
CHECKED BY: J. WOODRICK	APPROVED BY: J. WOODRICK
SCALE: AS SHOWN	DATE: 2/20/2019

HANCOCK COUNTY MARSH LIVING SHORELINE, MS
SAM-2013-00088-MUF / DMR-140197
PEARL RIVER TO HERON BAY PROJECT LAYOUT,
STA. 19+00 TO 28+40

C2
 SHEET NO. 3 OF 28

- LEGEND:**
- BREAKWATER CHEST (SEE NOTE 6)
 - BREAKWATER GAP (SEE SHEET C25)
 - PROJECT ALIGNMENT AND STATION
 - GEOTECHNICAL BORING BY BURNS, COOLEY DENNIS, INC. (MAY 2015)
 - GEOTECHNICAL BORING BY SOLTECH CONSULTANTS (JUNE 2015)
 - SILT SAMPLE BY ANCHOR OEA (2015)
- NOTES:**
1. HORIZONTAL DATUM, MISSISSIPPI STATE PLAINS EAST ZONE, NAD 83, U.S. FEET.
 2. VERTICAL DATUM, NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
 3. 0.0 FEET MEAN LOWER LOW WATER (MLLW) = 4.3 FEET NAVD88
 4. AERIAL PHOTOGRAPH FROM GOOGLE EARTH PRO, 2015.
 5. SURVEY BY HYDROTEK, MISSISSIPPI LIVING SHORELINE RESTORATION PROJECT, PEARL RIVER TO HERON BAY, ABANDON TO MARCH 2015.
 6. PLANS DO NOT SHOW FULL EXTENT OF BREAKWATER; ONLY THE 15' CREST WIDTH.
 7. PIPELINE RIGHT-OF-WAY INFORMATION PROVIDED BY COLONIAL PIPELINE.



ONE INCH
 AT FULL SIZE, IF NOT ONE INCH SCALE ACCORDINGLY

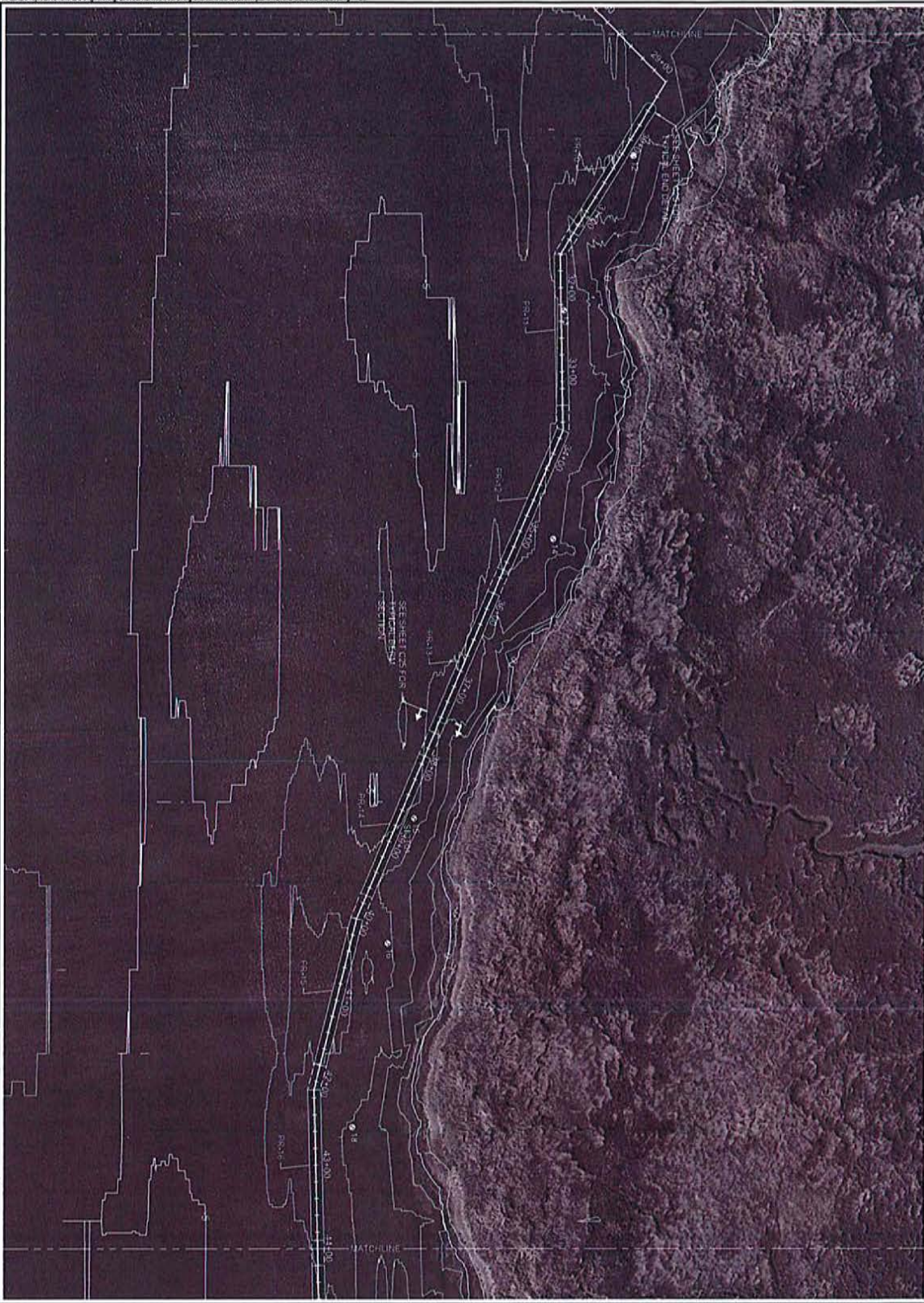


REV	DATE	BY	APP'D	DESCRIPTION

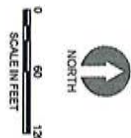
DESIGNED BY: J. ROBERTSON
 DRAWN BY: J. ROBERTSON
 CHECKED BY: J. ROBERTSON
 APPROVED BY: J. ROBERTSON
 SCALE: AS SHOWN
 DATE: AUGUST 2015

HANCOCK COUNTY MARSH LIVING SHORELINE, MS
 SAM-2013-00088-MAJF / DMR-140197
 PEARL RIVER TO HERON BAY PROJECT LAYOUT,
 STA. 28+40 TO 44+00

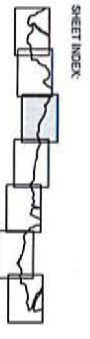
C3
 SHEET NO. 4 OF 28



- NOTES:
- HORIZONTAL DATUM: MISSISSIPPI STATE PLANES EAST ZONE, NAD 83, U.S. FEET.
 - VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
 - 0.0 FEET MEAN LOWER LOW WATER (MLLW) = -0.3 FEET NAVD88
 - AERIAL PHOTOGRAPHY FROM GOOGLE EARTH FROM 2015.
 - SURVEY BY HYDROTECH, MISSISSIPPI LIVING SHORELINE RESTORATION PROJECT, PEARL RIVER TO HERON BAY, SURVEY TO MARCH 2014, SURVEY TO MARCH 2015.
 - PLANS DO NOT SHOW FULL EXTENT OF BREAKWATER ONLY THE 15' CREST WIDTH.



- LEGEND:
- BREAKWATER CREST (SEE NOTE 6)
 - BREAKWATER GAP (SEE SHEET C28)
 - PROJECT ALIGNMENT AND STATION
 - GEOTECHNICAL BORING BY BURNS, COOLEY, DENNIS, INC. (JANV 2015)
 - GEOTECHNICAL BORING BY SOLITECH CONSULTANTS (JUNE 2013)
 - SILT SAMPLE BY ANCHOR OEA (2015)



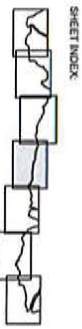
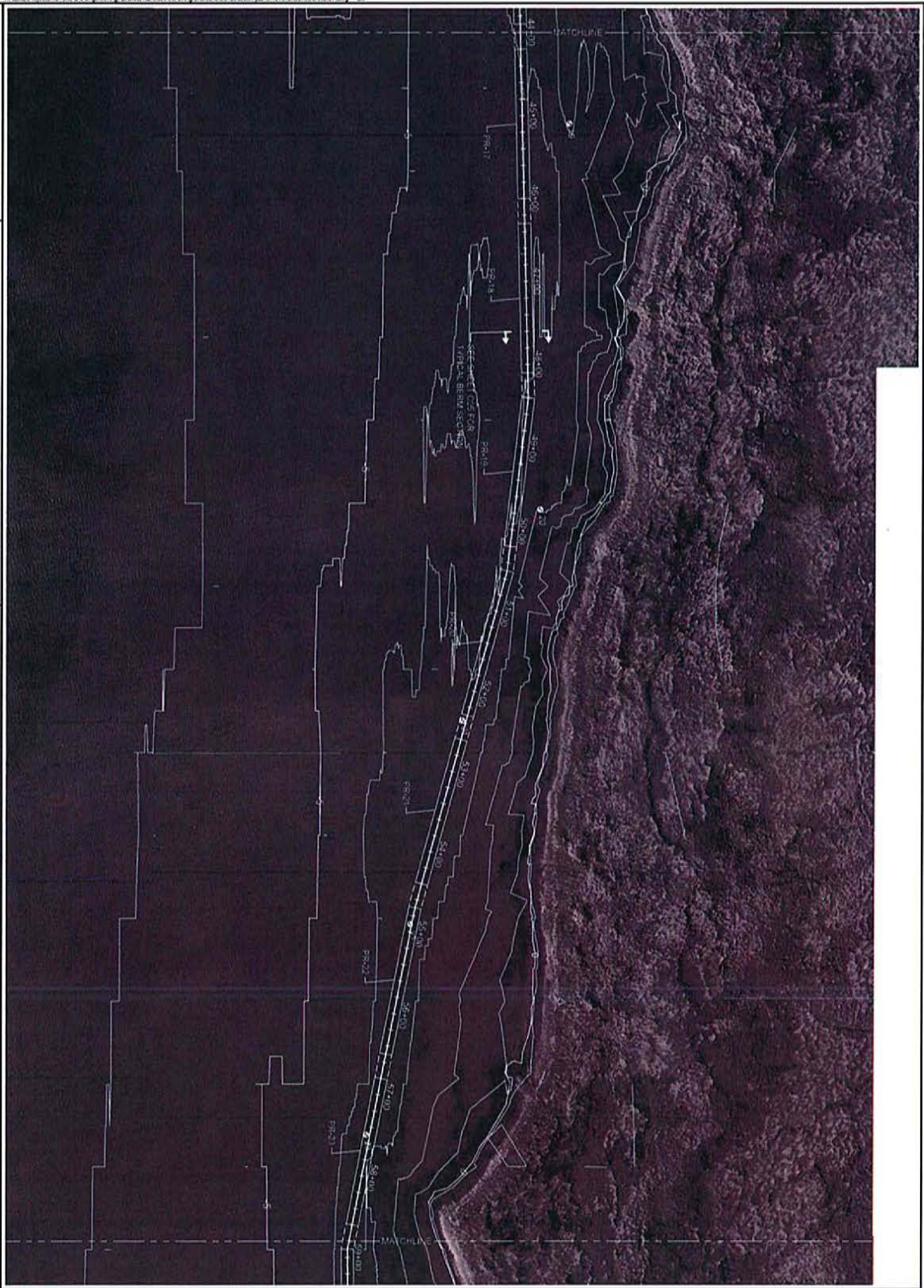


REV	DATE	BY	APP'D	DESCRIPTION

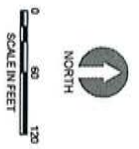
DESIGNED BY: A. ROBERTSON
DRAWN BY: J. MCKENNA
CHECKED BY: J. MCKENNA
SCALE: AS SHOWN
DATE: 2/28/2015

HANCOCK COUNTY MARSH LIVING SHORELINE, MS
SAM-2013-00088-MAJF / DMR-140197
PEARL RIVER TO HERON BAY PROJECT LAYOUT,
STA. 44+00 TO 58+80

C4
 SHEET NO. 5 OF 28



- LEGEND:**
- BREAKWATER CHEST (SEE NOTE 6)
 - BREAKWATER GAP (SEE SHEET C29)
 - PROJECT ALIGNMENT AND STATION
 - GEOTECHNICAL BORING BY BURNS, COOLEY DENNIS, INC. (MAY 2015)
 - GEOTECHNICAL BORING BY SOLITECH CONSULTANTS (JUNE 2013)
 - SICT SAMPLE BY ANCHOR OEA (2015)



- NOTES:**
1. HORIZONTAL DATUM, MISSISSIPPI STATE PLANS EAST ZONE, AND 83 U.S. FEET.
 2. VERTICAL DATUM, NORTH AMERICAN VERTICAL DATUM OF 1989 (NAVD89).
 3. 0.0 FEET MEAN LOWER LOW WATER (MLLW) = 0.3 FEET NAVD89.
 4. AERIAL PHOTOGRAPHY FROM GOOGLE EARTH PRIO. 2015.
 5. SURVEY BY HYDROTECH, MISSISSIPPI PROJECT PEARL RIVER TO HERON BAY, SURVEY PERFORMED DECEMBER 2014, JANUARY TO MARCH 2015.
 6. PLANS DO NOT SHOW FULL EXTENT OF BREAKWATER, ONLY THE 15' CHEST WIDTH.

ORIENTATION
 AT FULL SIZE, IF NOT ONE INCH SCALE ACCORDINGLY



NO.	DATE	BY	APP'D	REVISION

NO.	DATE	BY	APP'D	REVISION

HANCOCK COUNTY MARSH LIVING SHORELINE, MS
 SAM-2013-00088-MUF / DMR-140197
LIGHTHOUSE BAYOU TO BOLAN BAYOU
 PROJECT LAYOUT, STA. 0+00 TO 16+60

C8
 SHEET NO. 9 OF 28



LEGEND:

- BREAKWATER CREST (SEE NOTE 6)
- BREAKWATER GAP (SEE SHEET C29)
- PROJECT ALIGNMENT AND STATION
- 1+400
- GEOTECHNICAL BORING BY BURNS, COOLEY, DENNIS, INC. (JAN 2015)
- GEOTECHNICAL BORING BY SOILTECH CONSULTANTS (JUNE 2013)
- SOIL SAMPLE BY ANCHOR OEA (2015)

NOTES:

- HORIZONTAL DATUM: MISSISSIPPI STATE PLANES EAST ZONE, NAD 83, U.S. FEET.
- VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM OF 1989 (NAVD89).
- 0.0 FEET MEAN LOWER LOW WATER (MLLW) = 42.5 FEET NAVD89
- AERIAL PHOTOGRAPH FROM GOOGLE EARTH PRO, 2015.
- SURVEY BY ANCHOR OEA, MISSISSIPPI LIVING SHORELINE PROJECT, LIGHTHOUSE BAYOU TO BOLAN BAYOU, SURVEY PERFORMED DECEMBER 2014, JANUARY TO MARCH 2015.
- PLANS DO NOT SHOW FULL EXTENT OF BREAKWATER, ONLY THE 16 CREST WIDTH.

SCALE IN FEET
 0 50 100
 NORTH

SHEET INDEX:

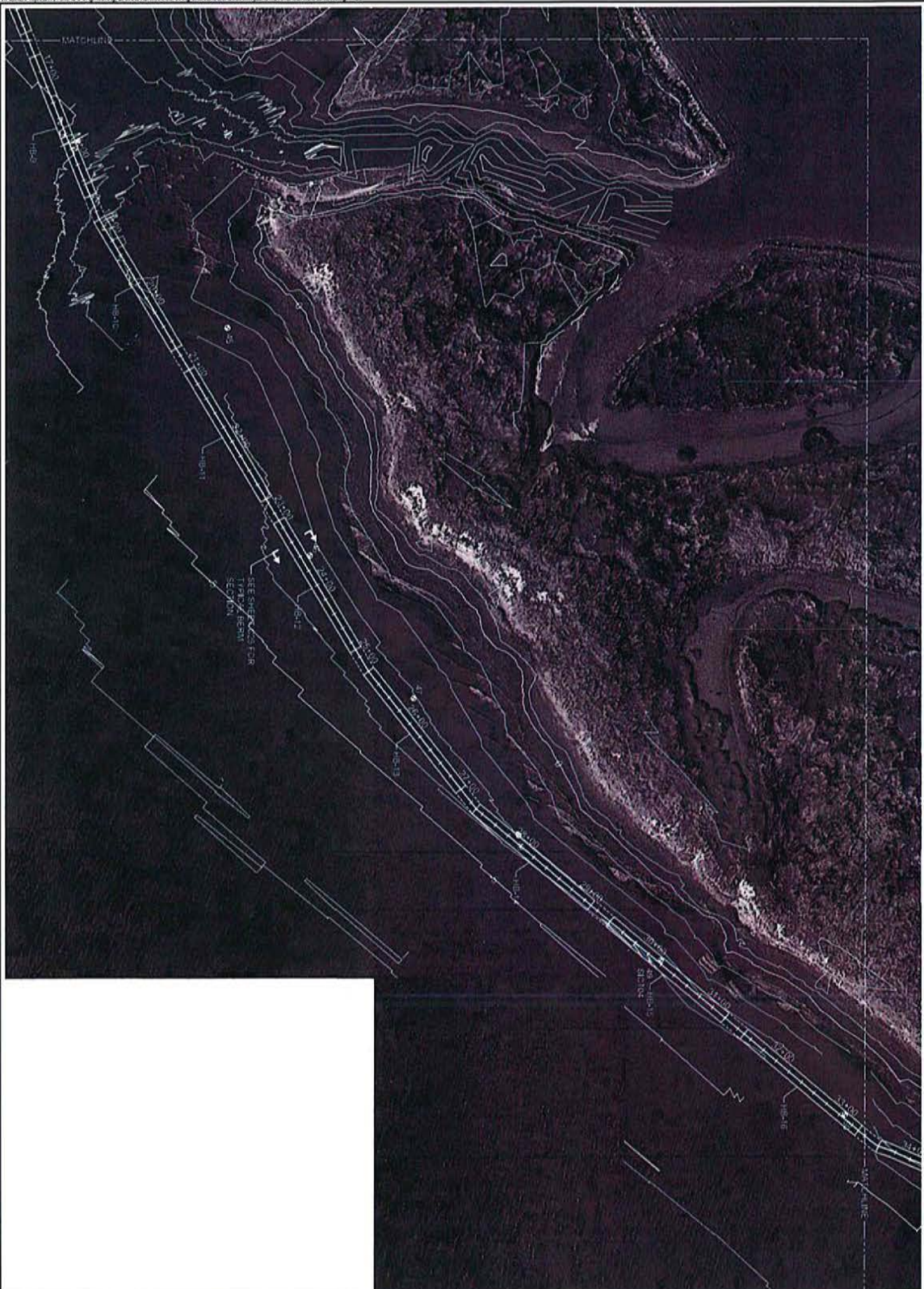


REV	DATE	BY	APP'D	DESCRIPTION

REVISED BY	DATE	DESCRIPTION

HANCOCK COUNTY MARSH LIVING SHORELINE, MS
SAM-2013-00088-MAJF / DMR-140197
LIGHTHOUSE BAYOU TO BOLAN BAYOU
PROJECT LAYOUT I, STA. 14+50 TO 33+40

C9
 SHEET NO. 10 OF 28



LEGEND:

- BREAKWATER CHEST (SEE NOTE 6)
- BREAKWATER GAP (SEE SHEET C29)
- PROJECT ALIGNMENT AND STATION
- 14+00
- 33+40
- GEOTECHNICAL BORING BY BURNS, COOLEY DENNIS, INC. (MAY 2015)
- GEOTECHNICAL BORING BY SOLITECH CONSULTANTS (JUNE 2013)
- SILT SAMPLE BY ANCHOR OEA (2015)

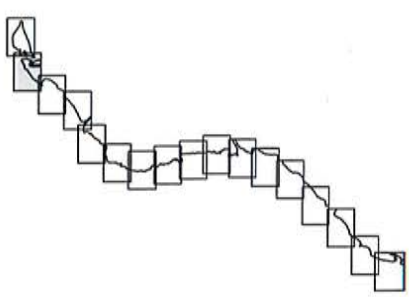
NOTES:

- HORIZONTAL DATUM, MISSISSIPPI STATE PLAINS EAST ZONE, NAD 83, U.S. FEET.
- VERTICAL DATUM, NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
- 0.0 FEET MEAN LOWER LOW WATER (MLLW) = 0.3 FEET NAVD88
- AERIAL PHOTOGRAPH FROM GOOGLE EARTH PRO, 2015.
- SURVEY BY HYDROTERRA, MISSISSIPPI DUNE AND MARSH REPAIR AND BOLAN BAYOU PROJECT, LINDSEY WILSON AND BOLAN BAYOU SURVEY PERFORMED DECEMBER 2014, JANUARY TO MARCH 2015.
- PLANS DO NOT SHOW FULL EXTENT OF BREAKWATER, ONLY THE 15' CHEST WIDTH.

0 50 100
 SCALE IN FEET
 NORTH

ONE INCH
 AT FULL SIZE, IF NOT ONE INCH SCALE ACCORDINGLY

SHEET INDEX



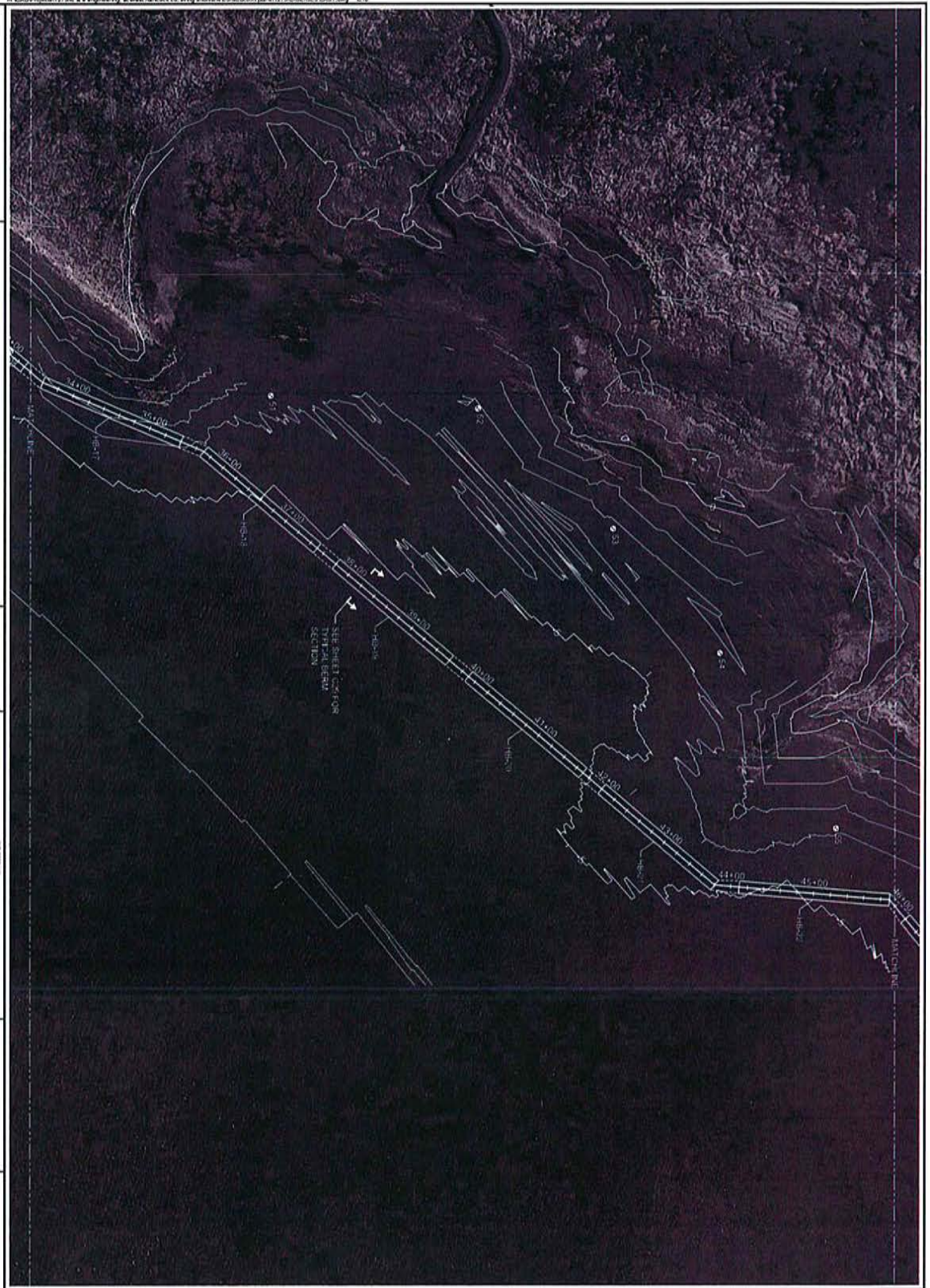


REV	DATE	BY	APP'D	DESCRIPTION

DESIGNED BY: A. ANDERSON
CHECKED BY: A. ANDERSON
APPROVED BY: A. ANDERSON
SCALE: AS SHOWN
DATE: AUGUST 2015

HANCOCK COUNTY MARSH LIVING SHORELINE, MS
 SAM-2013-00088-MAJF / DMR-140197
LIGHTHOUSE BAYOU TO BOLAN BAYOU
 PROJECT LAYOUT, STA. 33+40 TO 48+00

C10
 SHEET NO. 11 OF 28



LEGEND:

- BREAKWATER CREST (SEE NOTE 6)
- BREAKWATER GAP (SEE SHEET C2)
- PROJECT ALIGNMENT AND STATION
- 14+00
- GEOTECHNICAL BORING BY BURNS, COOLEY, DENNIS, INC. (MAY 2015)
- GEOTECHNICAL BORING BY SOLTECH CONSULTANTS (JUNE 2013)
- SILT SAMPLE BY ANCHOR OEA (2015)

NOTES:

- HORIZONTAL DATUM: MISSISSIPPI STATE PLAINS EAST ZONE, NAD 83, U.S. FEET.
- VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD83).
- 0.0 FEET MEAN LOWER LOW WATER (MLLW) = -2.5 FEET NAVD83
- AERIAL PHOTOGRAPHY FROM GOOGLE EARTH PRO, 2015.
- SURVEY BY HYDROTERA, MISSISSIPPI LIVING SHORELINE RESTORATION BAYOU SURVEY/DESIGNED DECEMBER 2014, JANUARY TO MARCH 2015.
- PLANS DO NOT SHOW FULL EXTENT OF BREAKWATER, ONLY THE 15' CREST WIDTH.

SCALE IN FEET: 0, 60, 120

NORTH (with arrow pointing up)

SHEET INDEX: (with grid of sheets)

ONE INCH AT FULL SIZE, IF NOT ONE INCH SCALE ACCORDINGLY

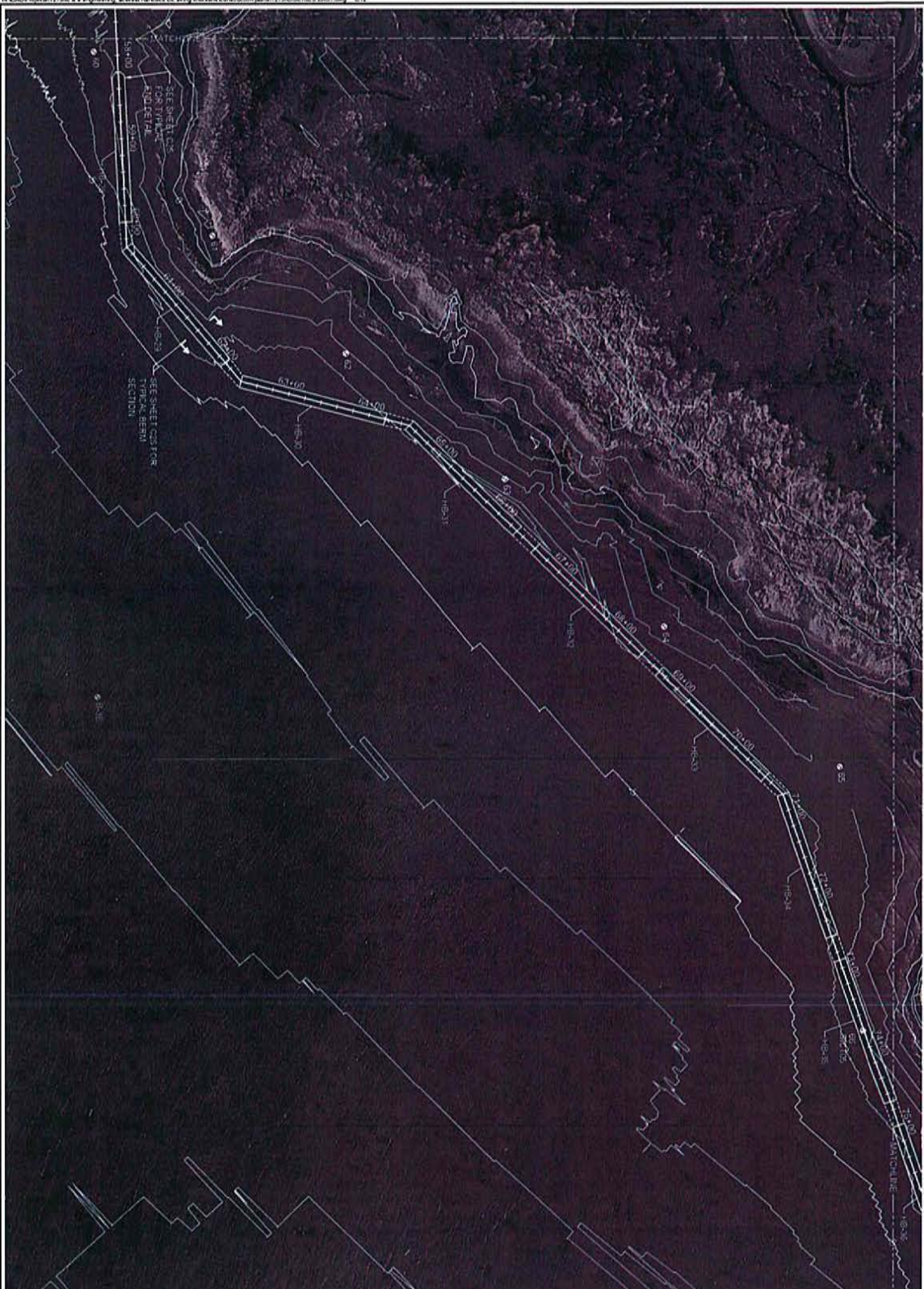


REV	DATE	BY	APP'D	DESCRIPTION

REVISED BY	DESCRIPTION

HANCOCK COUNTY MARSH LIVING SHORELINE, MS
SAM-2013-00088-MAJF / DMR-140197
LIGHTHOUSE BAYOU TO BOIAN BAYOU
PROJECT LAYOUT, STA. 57+80 TO 74+80

C12
 SHEET NO. 13 OF 28



LEGEND:

- BREAKWATER CREST (SEE NOTE 6)
- BREAKWATER GAP (SEE SHEET C28)
- PROJECT ALIGNMENT AND STATION
- 14+00
- GEOTECHNICAL BORING BY BURNS, COOLEY DENNIS, INC. (MAY 2015)
- GEOTECHNICAL BORING BY SOLUTECH CONSULTANTS (JUNE 2013)
- SILT SAMPLE BY ANCHOR OEA (2015)

NOTES:

- HORIZONTAL DATUM, MISSISSIPPI STATE PLAINS EAST ZONE, NAD 83, U.S. FEET.
- VERTICAL DATUM, NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
- 0.0 FEET MEAN LOWER LOW WATER (MLLW) = 4.23 FEET NAVD88
- AERIAL PHOTOGRAPH FROM GOOGLE EARTH PRO, 2015.
- SURVEY BY HYDROTERRA, MISSISSIPPI DRAINAGE DISTRICT, FROM LTO BOLAN BAYOU SURVEY PERFORMED DECEMBER 2014, JANUARY TO MARCH 2015.
- PLANS DO NOT SHOW FULL EXTENT OF BREAKWATER, ONLY THE 15' CREST WIDTH.

SCALE IN FEET: 0, 60, 120
 NORTH

ONE INCH = 100 FEET
 AT FULL SIZE, IF NOT ONE INCH SCALE ACCORDING TO

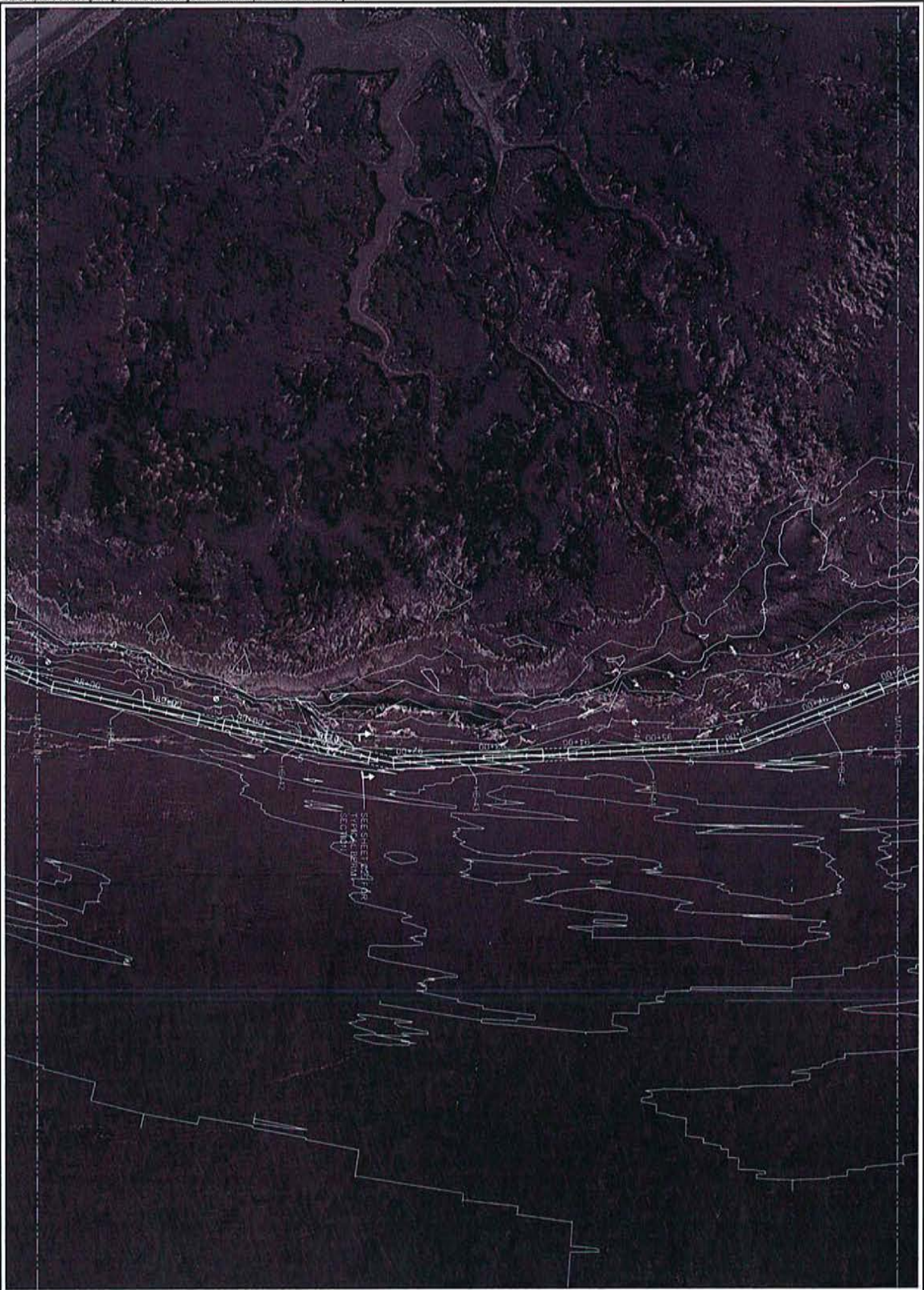


REV	DATE	BY	APP'D	REVISIONS

DESIGNED BY: A. ROBERTSON
CHECKED BY: A. WALKER
APPROVED BY: A. WALKER
SCALE AS SHOWN
DATE AUGUST 2015

HANCOCK COUNTY MARSH LIVING SHORELINE, MS
 SAM-2013-00088-MAJF / DMR-140197
LIGHTHOUSE BAYOU TO BOLAN BAYOU
 PROJECT LAYOUT, STA. 87+40 TO 98+00

C14
 SHEET NO. 15 OF 28



LEGEND:

- BREAKWATER CREST (SEE NOTE 6)
- BREAKWATER GAP (SEE SHEET C25)
- PROJECT ALIGNMENT AND STATION
- 14+00
- GEOTECHNICAL BORING BY BURNS, COOLEY, DENNIS, INC. (MAY 2015)
- GEOTECHNICAL BORING BY SOLITECH CONSULTANTS (JUNE 2015)
- SILT SAMPLE BY ANCHOR O&A (2015)

NOTES:

- HORIZONTAL DATUM, MISSISSIPPI STATE PLAINS EAST ZONE, NAD 83, U.S. FEET.
- VERTICAL DATUM, NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD83).
- 0.0 FEET MEAN LOWER LOW WATER (MLLW) = -0.3 FEET NAVD83
- AERIAL PHOTOGRAPHY FROM GOOGLE EARTH PRO, 2015.
- SURVEY BY HYDROTERA, MISSISSIPPI LIVING SHORELINE RESTORATION PLAN (SUNSET) RESUMED DECEMBER 2014, JANUARY TO MARCH 2015.
- PLANS DO NOT SHOW FULL EXTENT OF BREAKWATER, ONLY THE 15' CREST WIDTH.

SCALE IN FEET: 0, 60, 120

NORTH (with arrow pointing up)

SHEET INDEX: (with diagram showing sheet sequence)

ONE INCH
 AT FULL SIZE, IF NOT ONE INCH SCALE ACCORDINGLY

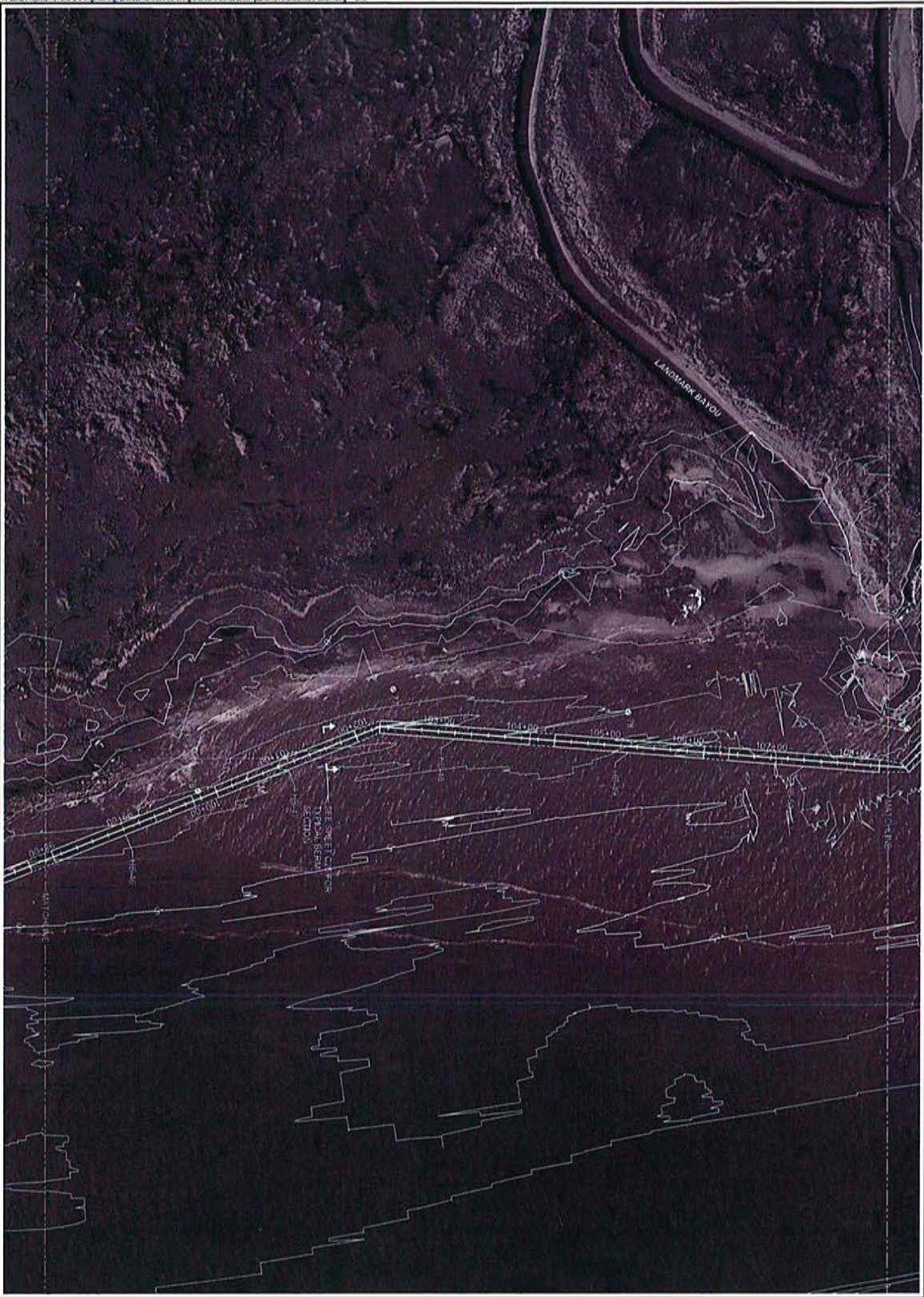


REV	DATE	BY	APP'D	DESCRIPTION

DESIGNED BY: J. WINTERSON
DRAWN BY: J. WINTERSON
CHECKED BY: J. WINTERSON
APPROVED BY: J. WINTERSON
SCALE: AS SHOWN
DATE: AUGUST 2015

HANCOCK COUNTY MARSH LIVING SHORELINE MS
SAM-2013-00088-MAJF / DMR-140197
LIGHTHOUSE BAYOU TO BOLAN BAYOU
PROJECT LAYOUT, STA. 98+00 TO 108+40

C15
 SHEET NO. 16 OF 28



LEGEND:

- BREAKWATER CHEST (SEE NOTE 6)
- BREAKWATER GAP (SEE SHEET C25)
- PROJECT ALIGNMENT AND STATION
- 14+00
- GEOTECHNICAL BORING BY BURNS, COOLEY DENNIS, INC. (MAY 2015)
- GEOTECHNICAL BORING BY SOLITECH CONSULTANTS (JUNE 2013)
- SICP SAMPLE BY ANCHOR OEA (2015)

NOTES:

- HORIZONTAL DATUM: MISSISSIPPI STATE PLAINS EAST ZONE, NAD 83, U.S. FEET.
- VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD83).
- 0.0 FEET MEAN LOWER LOW WATER (MLLW) = -0.3 FEET NAVD83
- AERIAL PHOTOGRAPHY FROM GOOGLE EARTH PRIO. 2015.
- SURVEY BY HYDROTERRA, MISSISSIPPI DURING SHORELINE RESTORATION PROJECT. SURVEY PERFORMED DECEMBER 2014, JANUARY TO MARCH 2015.
- PLANS DO NOT SHOW FULL EXTENT OF PLANNED BREAKWATER, ONLY THE 15' CHEST WIDTH.

SCALE IN FEET: 0, 60, 120

ONE INCH = 100 FEET
 AT FULL SIZE. IF NOT ONE INCH SCALE ACCORDINGLY.

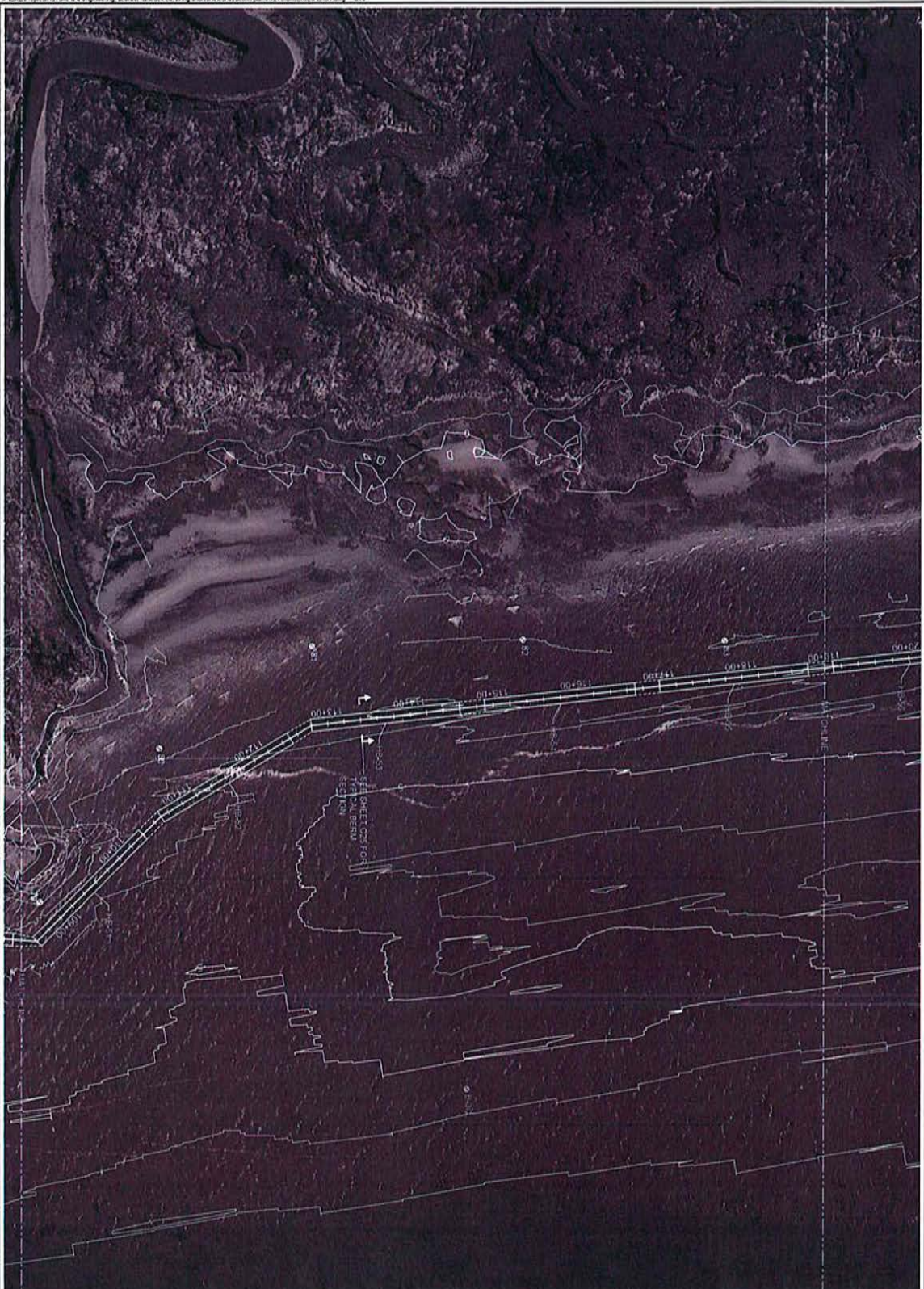


REV	DATE	BY	APPV	DESCRIPTION

DESIGNED BY	A. ROBERTSON
DRAWN BY	J. LUKYAN
CHECKED BY	J. LUKYAN
APPROVED BY	J. LUKYAN
SCALE	AS SHOWN
DATE	2008/07/2015

HANCOCK COUNTY MARSH LIVING SHORELINE, MS
SAM-2013-00088-MAJF / DMR-140197
LIGHTHOUSE BAYOU TO BOULAN BAYOU
PROJECT LAYOUT, STA. 108+40 TO 119+00

C16
 SHEET NO. 17 OF 28



LEGEND:

- BREAKWATER GAB (SEE NOTE 6)
- BREAKWATER GAP (SEE SHEET C25)
- PROJECT ALIGNMENT AND STATION
- 14+00
- GEOTECHNICAL BORING BY BURNS, COOLEY DENNIS, INC. (JULY 2015)
- GEOTECHNICAL BORING BY SOLITECH CONSULTANTS (JUNE 2013)
- SIC1 SAMPLE BY ANCHOR OEA (2015)

NOTES:

- HORIZONTAL DATUM, MISSISSIPPI STATE PLAINS EAST ZONE, NAD 83, U.S. FEET.
- VERTICAL DATUM, NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD83).
- 0.0 FEET MEAN LOWER LOW WATER (MLLW) = -0.3 FEET NAVD83
- AERIAL PHOTOGRAPH FROM GOOGLE EARTH PRO, 2015.
- SURVEY BY HYDROTEK, MISSISSIPPI LIVING SHORELINE RESTORATION PROJECT, LIGHTHOUSE BAYOU TO BOULAN BAYOU. SURVEY RESUMED DECEMBER 2014, JANUARY TO MARCH 2015.
- PLANS DO NOT SHOW FULL EXTENT OF BREAKWATER, ONLY THE 15 CRIST WIDTH.

SCALE IN FEET: 0, 60, 120

NORTH (with arrow pointing up)

SHEET INDEX: (with diagram showing sheet C16 highlighted in a sequence of sheets)

ONE INCH = 100 FEET
 AT FULL SIZE IF NOT ONE INCH SCALE ACCORDINGLY

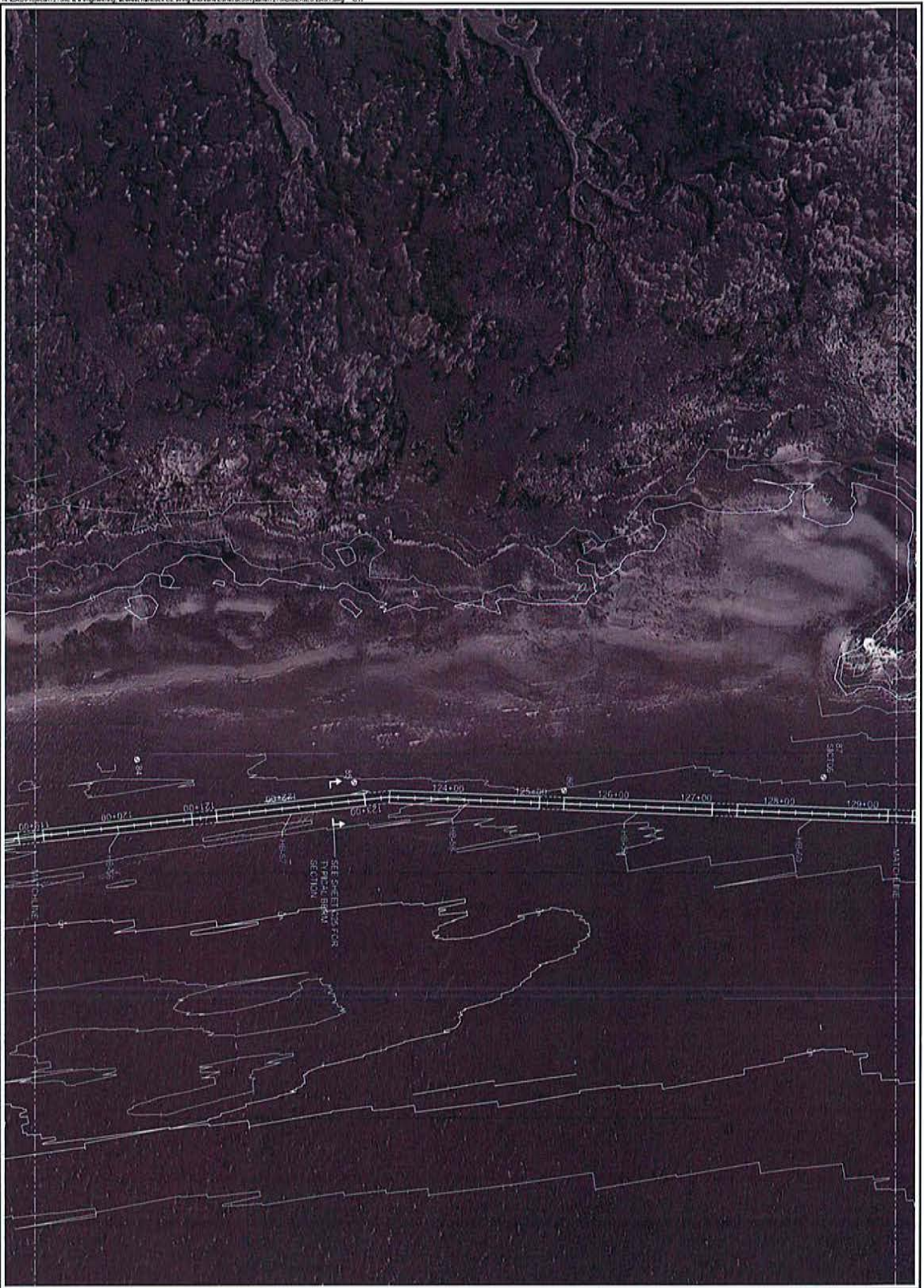


REV	DATE	BY	APP'D	DESCRIPTION

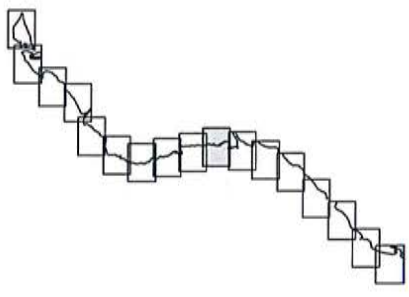
DESIGNED BY: A. WOODRUFF
DRAWN BY: A. WOODRUFF
CHECKED BY: J. WALKER
APPROVED BY: J. WALKER
SCALE: AS SHOWN
SHEET: 20/27 (2015)

HANCOCK COUNTY MARSH LIVING SHORELINE, MS
SAM-2013-00088-MAJF / DMR-140197
LIGHTHOUSE BAYOU TO BOLAN BAYOU
PROJECT LAYOUT, STA. 119+00 TO 129+40

C17
 SHEET NO. 18 OF 28



SHEET INDEX



LEGEND:

- BREAKWATER CREST (SEE NOTE 6)
- BREAKWATER GAP (SEE SHEET C28)
- PROJECT ALIGNMENT AND STATION
- GEOTECHNICAL BORING BY BURNS, COOLEY DENNIS, INC. (MAY 2015)
- GEOTECHNICAL BORING BY SOLITECH CONSULTANTS (JUNE 2013)
- SILT SAMPLE BY ANCHOR OEA (2015)



- NOTES:
1. HORIZONTAL DATUM, MISSISSIPPI STATE PLAINS EAST ZONE, NAD 83, U.S. FEET.
 2. VERTICAL DATUM, NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
 3. 0.0 FEET MEAN LOWER LOW WATER (MLLW) = 0.3 FEET NAVD88
 4. AERIAL PHOTOGRAPHY FROM GOOGLE EARTH PRO, 2015.
 5. SURVEY BY HYDROTERRA, MISSISSIPPI PROJECT LINES BOUND TO BOLAN BAYOU SURVEY PERFORMED DECEMBER 2014, JANUARY TO MARCH 2015.
 6. PLANS DO NOT SHOW FULL EXTENT OF WATERWAY, ONLY THE 10 FEET WIDTH.

ONE INCH
 AT FULL SIZE, IF NOT ONE INCH SCALE ACCORDINGLY

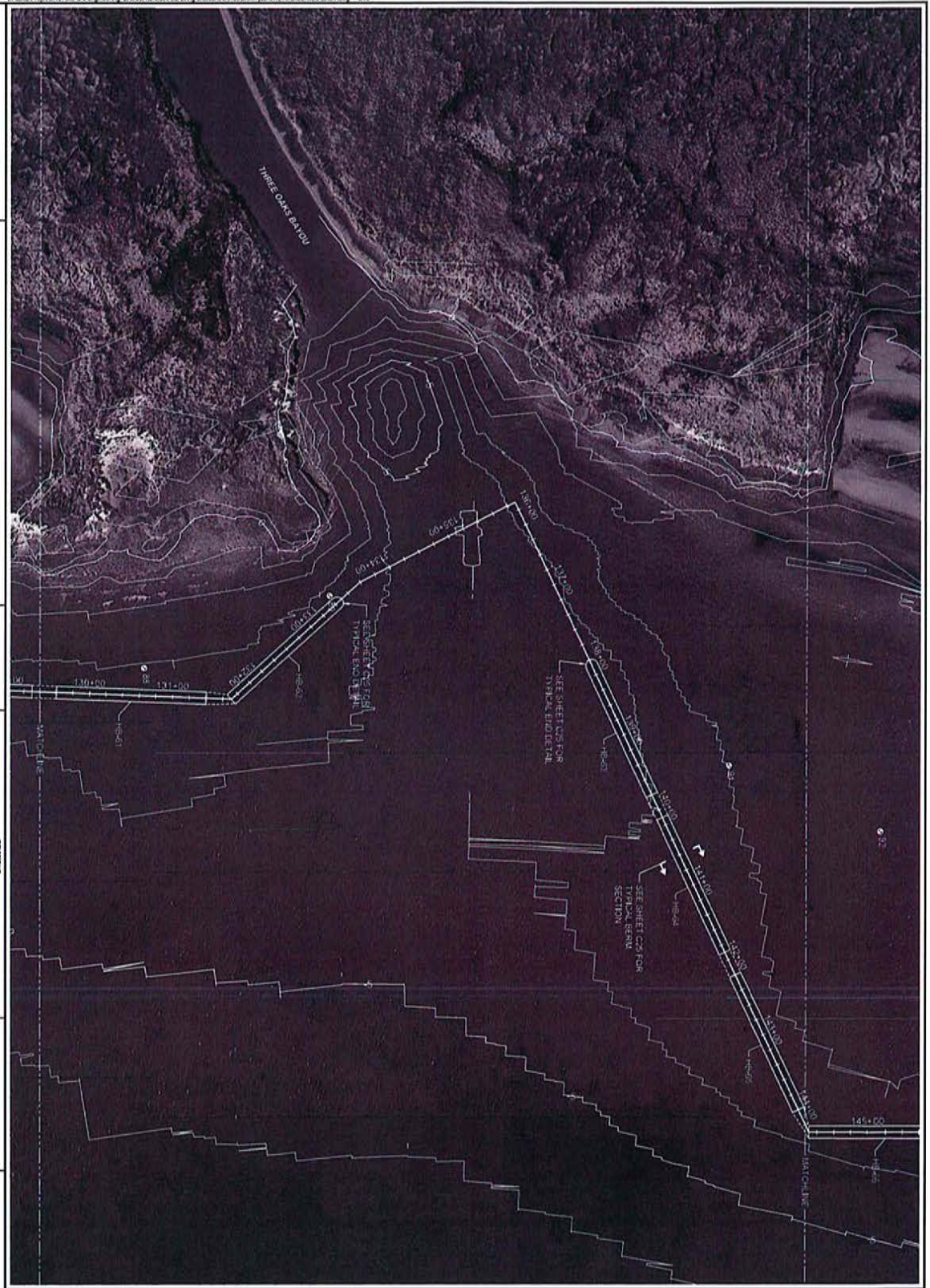


REV	DATE	BY	APP'D	DESCRIPTION

DESIGNED BY: A. ROBERTSON
DRAWN BY: J. WALKER
CHECKED BY: J. WALKER
APPROVED BY: J. WALKER
SCALE: AS SHOWN
DATE: 2/20/2015

HANCOCK COUNTY MARSH LIVING SHORELINE, MS
 SAM-2013-00088-MAJF / DMR-140197
LIGHTHOUSE BAYOU TO BOLAN BAYOU
 PROJECT LAYOUT, STA. 128+40 TO 144+00

C18
 SHEET NO. 19 OF 28



LEGEND:

- BREWWATER CREST (SEE NOTE 6)
- BREWWATER GAP (SEE SHEET C25)
- PROJECT ALIGNMENT AND STATION
- 14+00
- GEOTECHNICAL BORING BY BURNS, COOLEY, DENNIS, INC. (MAY 2015)
- GEOTECHNICAL BORING BY SOLITECH CONSULTANTS (JUNE 2015)
- SICP SAMPLE BY ANCHOR OEA (2015)

NOTES:

- HORIZONTAL DATUM, MISSISSIPPI STATE PLAINES EAST ZONE, NAD 83, U.S. FEET.
- VERTICAL DATUM, NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
- 0.0 FEET MEAN LOWER LOW WATER (MLLW) = -0.3 FEET NAVD88
- AERIAL PHOTOGRAPHY FROM GOOGLE EARTH PRO, 2015.
- SURVEY BY PHOTOGRAMMETRY, MISSISSIPPI LIVING SHORELINE RESTORATION PROJECT, LIGHTHOUSE BAYOU TO BOLAN BAYOU. SURVEY PERFORMED OCTOBER 2014, JANUARY TO MARCH 2015.
- PLANS DO NOT SHOW FULL EXTENT OF BREWWATER, ONLY THE 15 CREST WIDTH.

SCALE IN FEET: 0, 60, 120

NORTH (with arrow pointing up)

SHEET INDEX: (A grid of sheet numbers with sheet C18 highlighted)

ONE INCH AT FULL SIZE IF NOT ONE INCH SCALE ACCORDINGLY

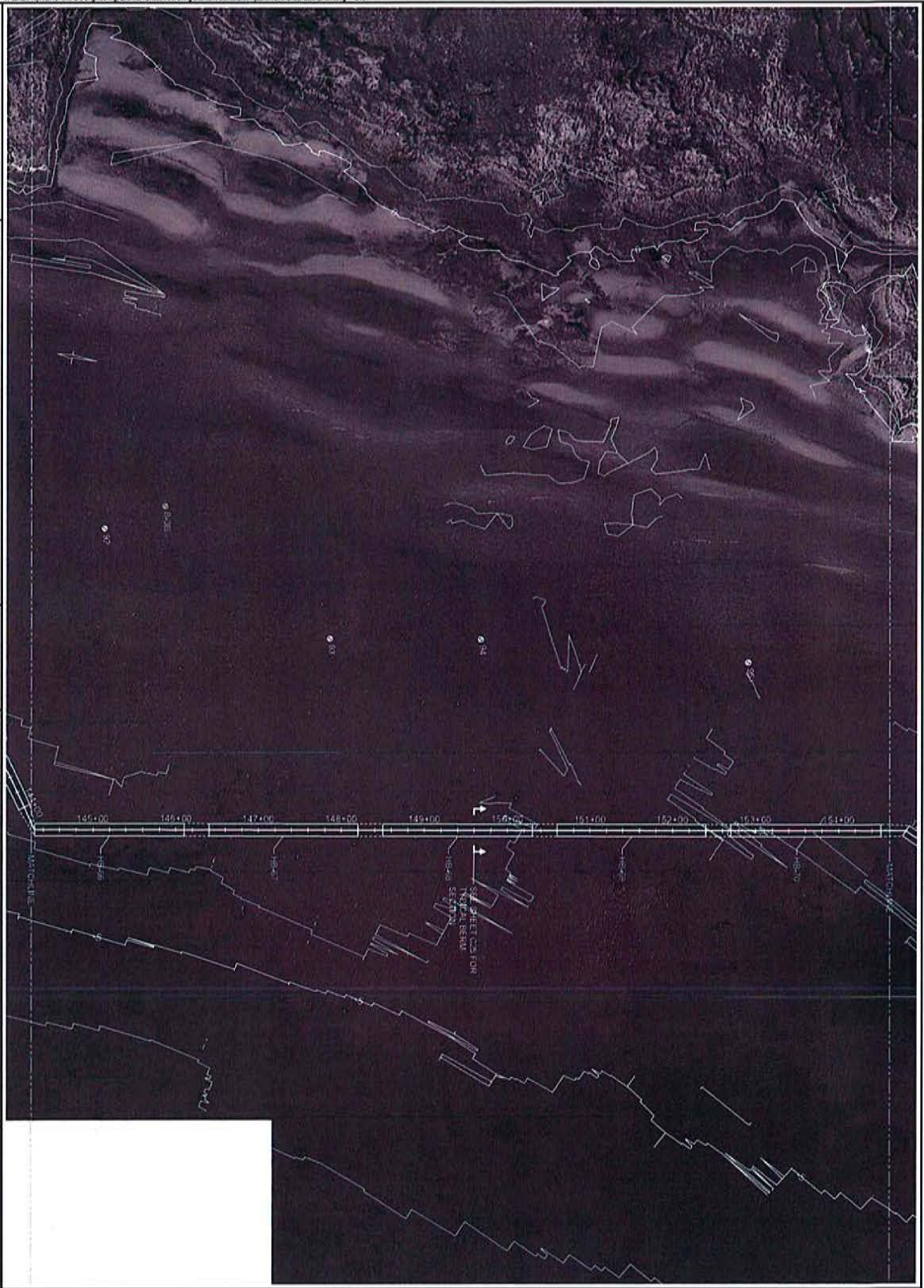


REV	DATE	BY	APP'D	DESCRIPTION

DESIGNED BY: J. ROBERTSON
DRAWN BY: J. ROBERTSON
CHECKED BY: J. ROBERTSON
APPROVED BY: J. ROBERTSON
SCALE: AS SHOWN
DATE: 2/28/2016

HANCOCK COUNTY MARSH LIVING SHORELINE, MS
SAM-2013-00088-MJF / DMR-140197
LIGHTHOUSE BAYOU TO BOLAN BAYOU
PROJECT LAYOUT, STA. 144+00 TO 154+60

C19
 SHEET NO. 20 OF 28



LEGEND:

- BREAKWATER CREST (SEE NOTE 6)
- BREAKWATER DAM (SEE SHEET C20)
- PROJECT ALIGNMENT AND STATION
- 14+00
- GEOTECHNICAL BORING BY BURNS, COLLEY DENNIS, INC. (MAY 2015)
- GEOTECHNICAL BORING BY SOLUTECH CONSULTANTS (JUNE 2013)
- SPT SAMPLE BY ANCHOR O&E (2015)

NOTES:

- HORIZONTAL DATUM, MISSISSIPPI STATE PLAINS EAST ZONE, NAD 83, U.S. FEET.
- VERTICAL DATUM, NORTH AMERICAN VERTICAL DATUM OF 1988 (NAD88).
- 0.0 FEET MEAN LOWER LOW WATER (MLLW) = 42.7 FEET NAVD83
- AERIAL PHOTOGRAPH FROM GOOGLE EARTH PRO, 2015.
- SURVEY BY HANCOCK COUNTY, MISSISSIPPI LIGHTHOUSE BAYOU TO BOLAN BAYOU PROJECT SURVEY PERFORMED DECEMBER 2014, JANUARY TO MARCH 2015.
- PLANS DO NOT SHOW FULL EXTENT OF BREAKWATER, ONLY THE 15' CREST WIDTH.

SCALE IN FEET: 0, 60, 120

NORTH (arrow pointing up)

SHEET INDEX: (diagonal line of boxes)

ONE INCH = 100 FEET
 AT FULL SIZE, IF NOT ONE INCH SCALE ACCORDINGLY

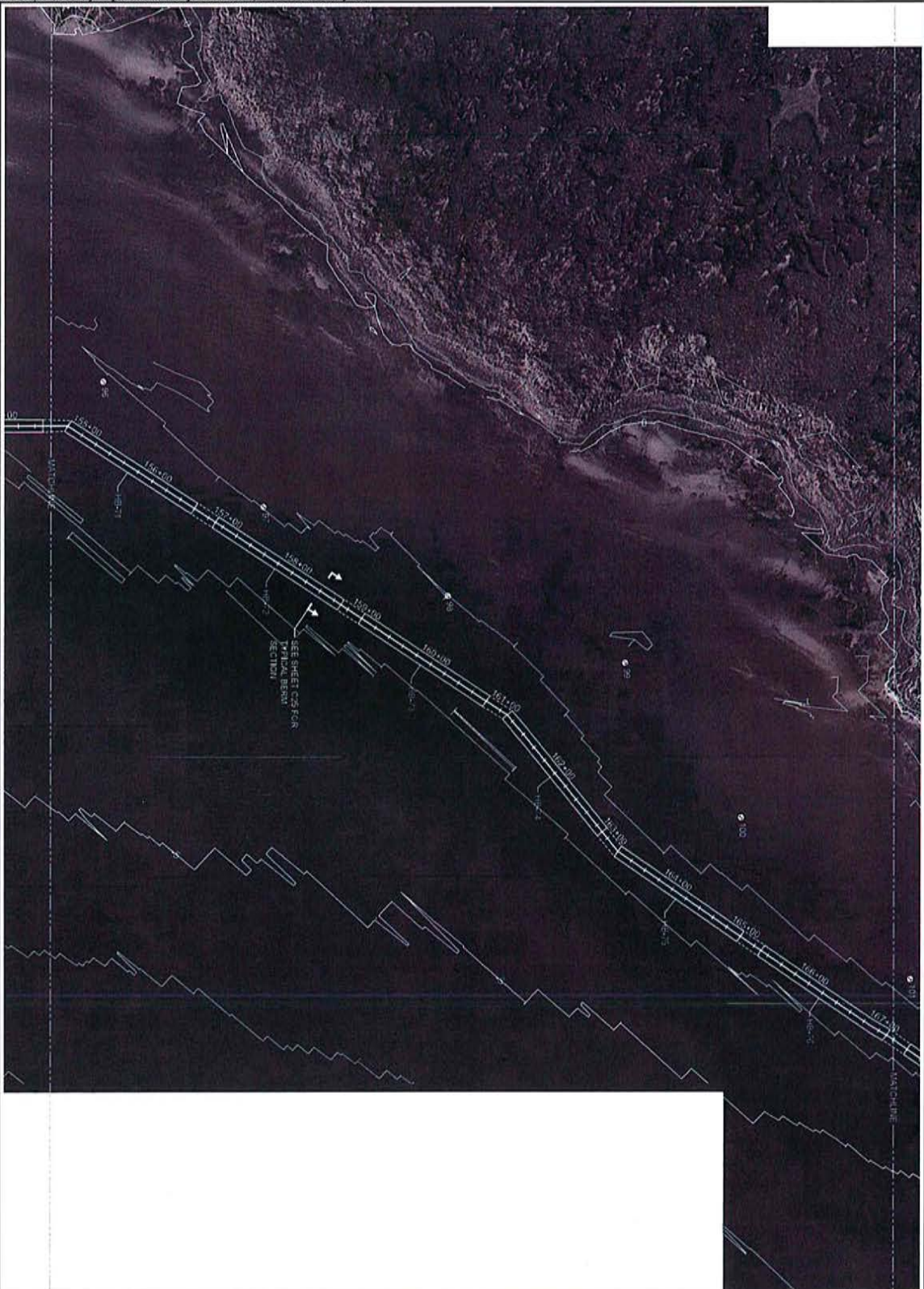


REV	DATE	BY	APPV	DESCRIPTION

DESIGNED BY	CHECKED BY	APPROVED BY	DATE
A. ROBERTSON	J. WALKER	J. WALKER	2/20/2015
J. WALKER	J. WALKER	J. WALKER	2/20/2015
J. WALKER	J. WALKER	J. WALKER	2/20/2015

HANCOCK COUNTY MARSH LIVING SHORELINE, MS
 SAM-2013-00088-MJF / DMR-140197
LIGHTHOUSE BAYOU TO BOLAN BAYOU
 PROJECT LAYOUT, STA. 154+00 TO 167+20

C20
 SHEET NO. 21 OF 28



LEGEND:

- BREWSTER CREST (SEE NOTE 6)
- BREWSTER GAP (SEE SHEET C25)
- PROJECT ALIGNMENT AND STATION
- GEOTECHNICAL BORING BY BURNS, COOLEY, DENNIS, INC. (MAY 2015)
- GEOTECHNICAL BORING BY SOILTECH CONSULTANTS (JUNE 2013)
- SICT SAMPLE BY ANCHOR OEA (2015)

NOTES:

1. HORIZONTAL DATUM: MISSISSIPPI STATE PLANE, EAST ZONE, NAD 83, U.S. FEET.
2. VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
3. 0.0 FEET MEAN LOWER LOW WATER (MLLW) = -0.3 FEET (NAVD88)
4. AERIAL PHOTOGRAPH FROM GOOGLE EARTH PRO, 2015.
5. SURVEY BY HYDROTERRA, MISSISSIPPI LIVING SHORELINE RESTORATION & BAYOU SURVEY PERFORMED DECEMBER 2014, JANUARY TO MARCH 2015.
6. PLANS DO NOT SHOW FULL EXTENT OF BREWSTER CREST, ONLY THE 15' GREATEST WIDTH.

SCALE IN FEET:
 0 60 120
 NORTH

SHEET INDEX:

ONE INCH = 100 FEET
 AT FULL SIZE IF NOT ONE INCH SCALE ACCORDINGLY

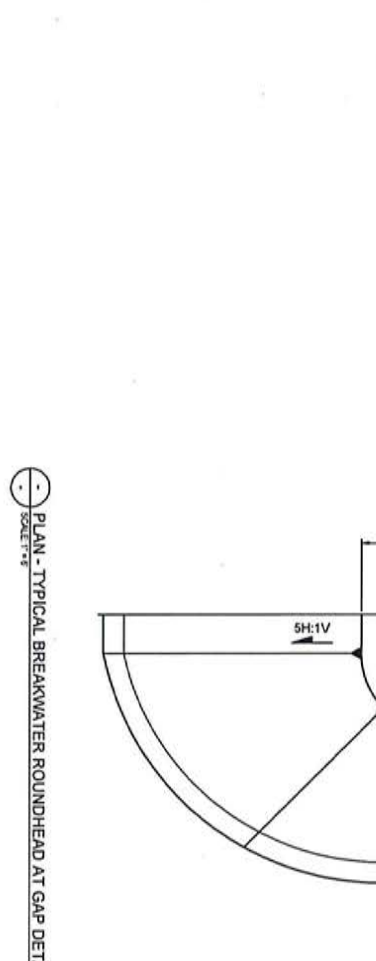
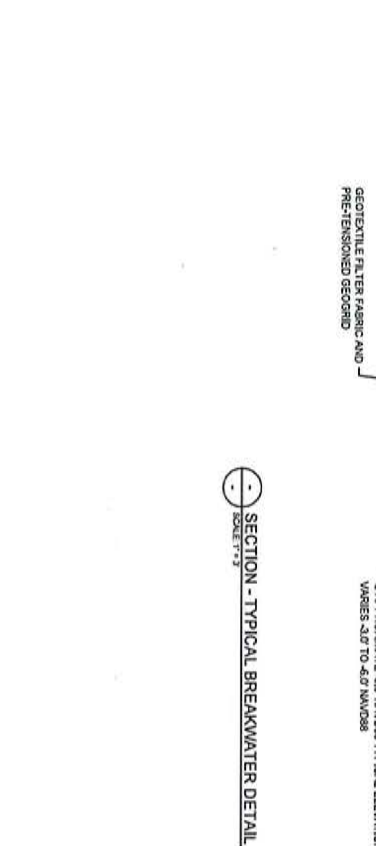
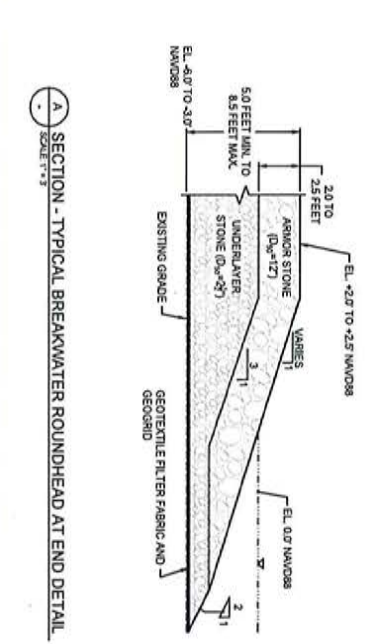
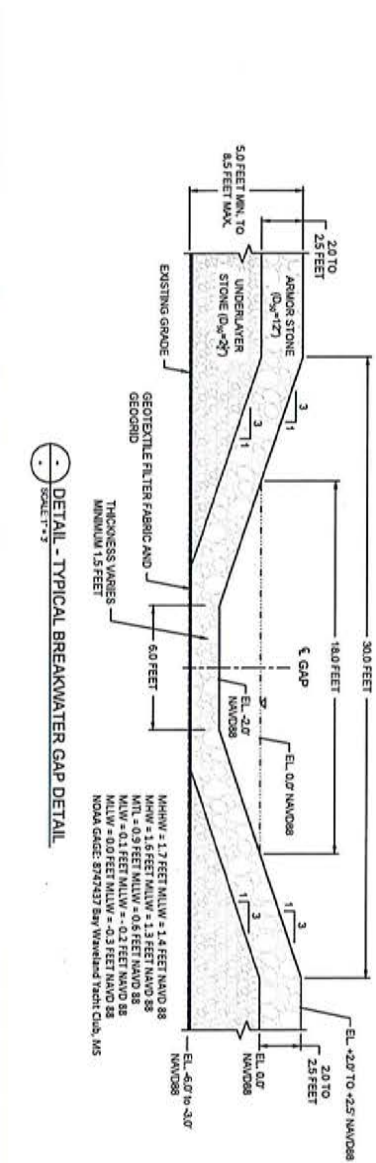


REV	DATE	BY	APP'D	DESCRIPTION

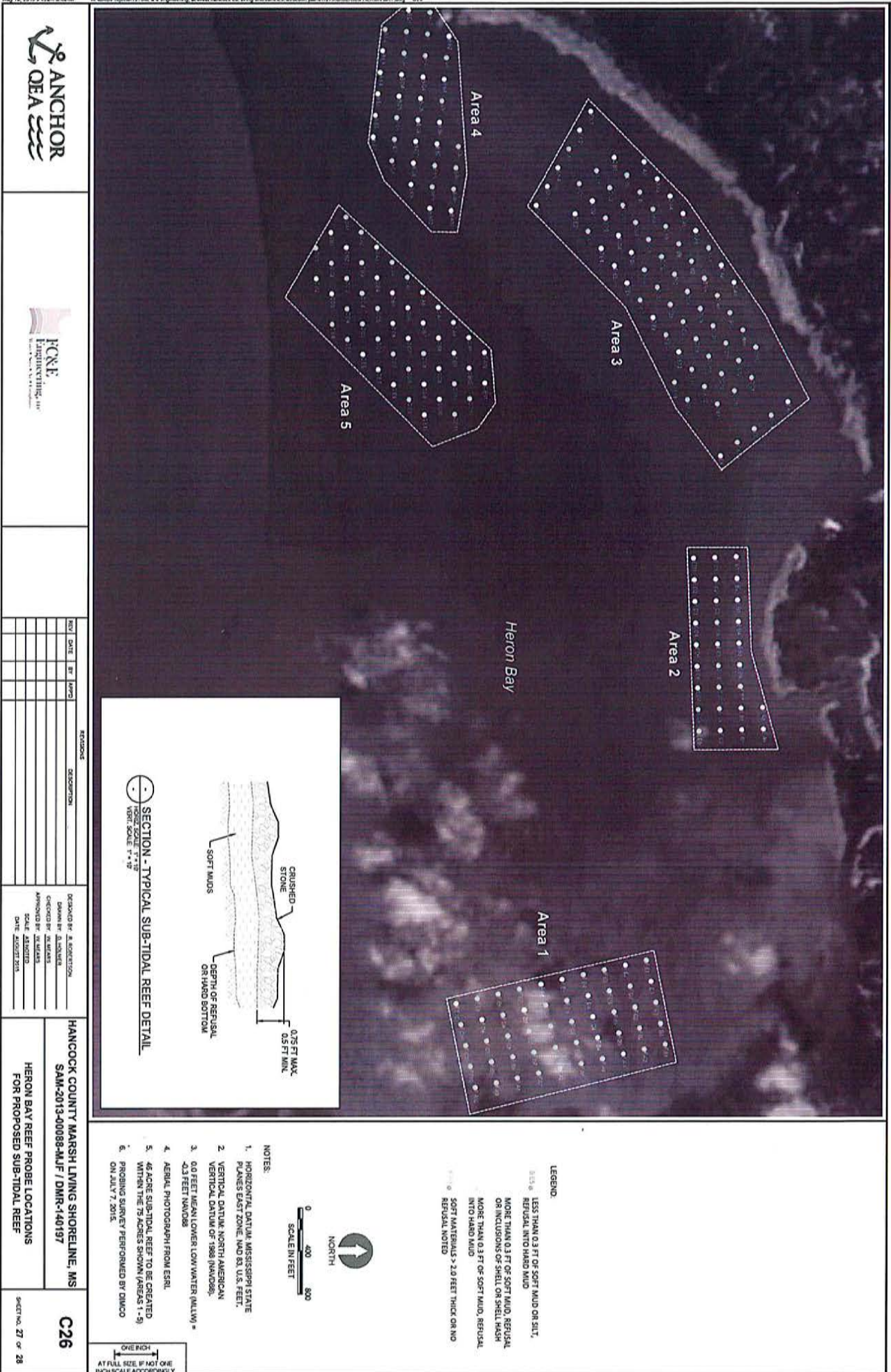
DESIGNED BY: S. ANDRESON
DRAWN BY: S. ANDRESON
CHECKED BY: M. WATKINS
APPROVED BY: M. WATKINS
SCALE: AS SHOWN
DATE: AUGUST 2015

HANCOCK COUNTY MARSH LIVING SHORELINE, MS
 SAM-2013-00088-MJF / DMR-140197
 TYPICAL BREAKWATER
 SECTIONS AND DETAILS

C25
 SHEET NO. 25 OF 28



ONE INCH
 AT FULL SIZE, IF NOT ONE
 INCH SCALE ACCORDINGLY





STATE OF MISSISSIPPI

Phil Bryant
Governor

MISSISSIPPI DEPARTMENT OF MARINE RESOURCES

Jamie M. Miller, Executive Director

November 25, 2015

Mississippi Department of Environmental Quality
Attn: Mr. Richard Harrell
P.O. Box 2261
Jackson, MS 39225

RE: Permit DMR-140197

Dear Mr. Harrell:

Please find enclosed the original and one copy of the Permit issued to you by the Mississippi Commission on Marine Resources on November 17, 2015.

Please execute this Permit by signing both documents and returning the copy to the Department of Marine Resources.

The Department of Marine Resources has also coordinated a review of your project through the Coastal Program review procedures and determined that the project referenced above is consistent with the Mississippi Coastal Program, provided that you comply with the noted conditions.

If you have any questions regarding the Permit or this correspondence, please contact Willa Brantley with the Bureau of Wetlands Permitting at 228-523-4108 or willa.brantley@dmr.ms.gov.

Sincerely,

A handwritten signature in black ink that reads "Jamie M. Miller".

Jamie M. Miller
Executive Director
Mississippi Department of Marine Resources

JMM/wjb

Enclosures

cc: Ms. Alane Young, Covington Civil and Environmental, LLC

Ms. Maryellen Farmer, USACE
Ms. Florance Bass, OPC
Mr. Raymond Carter, SOS

Permit No.: DMR-140197
 Type: Permit
 Date: November 25, 2015

WHEREAS, application by: The Mississippi Department of Environmental Quality for a Permit under the provisions of Chapter 27, Mississippi Code of 1972, as amended, to perform certain works affecting the coastal wetlands of the State of Mississippi in the Mississippi Sound south of the Hancock County marshes from the mouth of the Pearl River to approximately 4 miles northeast of Heron Bay and including Heron Bay, south of Ansley, Hancock County, Mississippi, was approved by said State of Mississippi Commission on Marine Resources on November 17, 2015.

NOW THEREFORE, this Permit authorizes the above named applicant hereinafter called Permittee, to perform such works in adherence to the following conditions contained herein:

1. Approximately 28.1 acres of unvegetated waterbottoms shall be filled for the construction of a breakwater/high profile reef structure approximately 4 miles in length as indicated on the attached diagram (Figure 1). This breakwater shall conform to the design criteria listed in the chart below:

Breakwater Design Criteria	St. Joseph's Point Breakwater (eastern reach)
Total project length	Approx. 4 miles
Total project acreage	28.1 acres
Crest width	15.0 ft.
Base width	60 ft. (maximum)
Assumed bottom elevation	-3.5 NAVD 88 (MHHW)
Total structure height	5.0 to 8.5 ft.
Riprap volume	132,000 cubic yards
Thickness of material (riprap)	5.0 to 8.5 ft.
Estimated initial settlement	0.5 - 1.0 ft.
Design side slopes (Seaward Face)	5h:1v
Design side slopes (Landward Face)	3h:1v
Breakwater distance from shoreline	20 to 400 ft.
Reach of each breakwater	180 ft.
Design Crest Elevation	1.4 ft. NAVD88 (MHHW)
Width of gaps between breakwaters at design crest to crest	30 ft.

2. Approximately 12.2 acres of unvegetated waterbottoms shall be filled for the construction of a breakwater/high profile reef structure approximately 1.9 miles in length as indicated

on the attached diagram (Figure 1). This breakwater shall conform to the design criteria listed in the chart below:

Breakwater Design Criteria	Beaulieu River to Heron Bay Breakwater (western reach)
Total project length	Approx. 1.9 miles
Total project acreage	12.2 acres
Crest width	15.0 ft.
Base width	60 ft. (maximum)
Assumed bottom elevation	-3.5 NAVD 88 (MHHW)
Total structure height	5.0 to 8.5 ft.
Riprap volume	58,000 cubic yards
Thickness of material (riprap)	5.0 to 8.5 ft.
Estimated initial settlement	0.5 – 1.0 ft.
Design side slopes (Seaward Face)	5h:1v
Design side slopes (Landward Face)	3h:1v
Breakwater distance from shoreline	40 to 150 ft.
Reach of each breakwater	180 ft.
Design Crest Elevation	1.4 ft. NAVD 88 (MHHW)
Width of gaps between breakwaters at design crest height	30 ft.

3. Approximately 46 acres of unvegetated waterbottoms shall be planted with cultch material in the form of crushed or processed stone with a median diameter between 1.0 and 2.0 inches in order to enhance benthic habitat. The 46 acres shall be located within the 194-acre site within Heron Bay as indicated on the attached diagram (Figure 1). Only clean material free of waste, metal and organic trash, and unsightly debris shall be used;
4. Approximately 46 acres of marsh habitat shall be created within the 76-acre site within Heron Bay as indicated on the attached diagram (Figure 1). Authorized activities associated with this marsh creation include:
 - a. Two linear containment dikes to create a cell:
 - i. One along the edge of the existing marsh;
 - ii. One along the waterward limits of the marsh creation area;
 - iii. Construction will be completed by either excavating sediment from within the cell creation area or by using suitable dredged material if available;
 - iv. Four (4) weirs shall be installed in the dikes to allow water to decant during the filling of the containment cell and to manage consolidation of fill material;
 - v. After consolidation, the weirs will be removed and the dikes will be breached or degraded to provide for appropriate intertidal circulation;

- vi. Any use of dredged material shall be approved in writing by DMR prior to placement and shall be tested in accordance with current standards for beneficial use of dredged material as determined by the Mississippi Department of Environmental Quality's Office of Pollution Control;
- b. Placement of up to 540,000 cubic yards of appropriate material within the created cell:
 - i. Material shall be placed by barge or pipeline to create a variety of elevations within the target intertidal marsh elevation range of +1 MLLW, plus or minus 0.5';
 - ii. Consolidated material will be allowed to vegetate naturally with native marsh grasses, but if natural recruitment does not result in the desired vegetative cover, planting with appropriate native marsh grasses approved by DMR shall be allowed;
 - iii. Vegetation proposed for planting shall be approved in writing by DMR prior to placement;
 - iv. The marsh creation area shall be monitored for the life of the project for the presence of invasive species. These species shall be removed upon discovery;
 - v. Any use of dredged material shall be approved in writing by DMR prior to placement and shall be tested in accordance with current standards for beneficial use of dredged material as determined by the Mississippi Department of Environmental Quality's Office of Pollution Control;
5. Prior to the commencement of construction, permittee must submit to the DMR a copy of the Tidelands Lease as required by the Secretary of State and as filed in the subject County Land Records, or a statement from the Secretary of State that the permitted activity does not require a Tidelands Lease;
6. A variance to Chapter 8, Section 2, Part III.O.1. of the Mississippi Coastal Program is hereby granted;
7. A change to the Coastal Wetlands Use Plan from a General Use District and a Preservation Use District to an S6 Special Use – Preservation District is hereby granted. The change covers the footprint of the project as indicated on the attached diagram (Figure 2);
8. No construction debris or unauthorized fill material shall be allowed to enter coastal wetlands or waters;
9. Best Management Practices shall be used at all times during construction;
10. Vegetated wetlands shall not be impacted; and,
11. No creosote material shall be used in construction.

The Permittee shall maintain all water quality standards, regulations, and restrictions as set forth by the DEQ.

Any deviations beyond the restrictive conditions as set forth in your permit shall be considered a violation and may result in the revocation of the permit. Violations of these conditions may be subject to fines, project modifications and/or site restoration. Both the permittee and the contractor may be held liable for conducting unauthorized work. A modification to these conditions may be requested by submitting a written request along with a revised project diagram to DMR. Proposed modifications to dimensions, project footprint, and/or procedures must be approved in writing prior to commencement of work.

Issuance of this certification by DMR and acceptance by the applicant does not release the applicant from other legal requirements including but not limited to other applicable federal, state or local laws, ordinances, zoning codes or other regulations.

This certification conveys no title to land and water, does not constitute authority for reclamation of coastal wetlands and does not authorize invasion of private property or rights in property.

Please notify this Department upon completion of the permitted project so that compliance checks may be conducted by DMR staff.

This certification shall become effective upon acceptance by the applicant and receipt of the executed copy by the Director.

Please execute this certification by signing both documents and returning the copy to the Department of Marine Resources.

Work authorized by this certification must be completed on or before November 25, 2020.

Enclosed is a "Notice of Compliance" which must be conspicuously displayed at the site during construction of the permitted work.

The Department of Marine Resources has also coordinated a review of your project through the Coastal Program review procedures and determined that the project referenced above is consistent with the Mississippi Coastal Program, provided that you comply with the noted conditions and reviewing coastal program agencies do not disagree with said plans. By copy of this certification, we are notifying the U.S. Army Corps of Engineers of this determination.

November 25, 2015

THE PERMITTEE BY ACCEPTANCE OF THIS PERMIT AGREES TO ABIDE BY THE STIPULATIONS AND CONDITIONS CONTAINED HEREIN AND AS DESCRIBED BY THE PLANS AND SPECIFICATIONS SUBMITTED AS PART OF THE COMPLETED APPLICATION.

STATE OF MISSISSIPPI
DEPARTMENT OF MARINE RESOURCES

BY: 
Jamie M. Miller
Executive Director
Mississippi Department of Marine Resources

Accepted this the ____ day of _____, 20 ____.

BY: _____

MISSISSIPPI



Department of Marine Resources

NOTICE OF COMPLIANCE
DMR- 140197 PERMIT
THIS NOTICE ACKNOWLEDGES THAT:

DATE: November 25, 2015

Mississippi Department of Environmental Quality
P.O. Box 2261
Jackson, MS 39225

HAS, THROUGH APPLICATION TO THIS DEPARTMENT, DULY COMPLIED WITH THE MISSISSIPPI COASTAL WETLANDS PROTECTION LAW TO:

1. Approximately 28.1 acres of unvegetated waterbottoms shall be filled for the construction of a breakwater/high profile reef structure approximately 4 miles in length as indicated on the attached diagram (Figure 1). This breakwater shall conform to the design criteria listed in the chart below:

Breakwater Design Criteria	Design Criteria (Point Breakwater - 423,000 cu yd)
Total project length	Approx. 4 miles
Total project acreage	28.1 acres
Crest width	15.0 ft.
Bank width	60 ft. (maximum)
Assumed bottom elevation	-3.5 NAVD 88 (MHHW)
Total structure height	5.0 to 8.5 ft.
Riprap volume	132,000 cubic yards
Thickness of material (riprap)	5.0 to 8.5 ft.
Estimated initial settlement	0.5 - 1.0 ft.
Design side slopes (Seaward Face)	5h:1v
Design side slopes (Landward Face)	3h:1v
Breakwater distance from shoreline	20 to 400 ft.
Width of each breakwater	180 ft.
Design Crest Elevation	1.4 ft. NAVD88 (MHHW)
Width of gaps between breakwaters at design crest height	30 ft.

2. Approximately 12.2 acres of unvegetated waterbottoms shall be filled for the construction of a breakwater/high profile reef structure approximately 1.9 miles in length as indicated on the attached diagram (Figure 1). This breakwater shall conform to the design criteria listed in the chart below:

Breakwater Design Criteria	Design Criteria (Point Breakwater - 423,000 cu yd)
Total project length	Approx. 1.9 miles
Total project acreage	12.2 acres
Crest width	15.0 ft.
Bank width	60 ft. (maximum)
Assumed bottom elevation	-3.5 NAVD 88 (MHHW)
Total structure height	5.0 to 8.5 ft.
Riprap volume	58,000 cubic yards
Thickness of material (riprap)	5.0 to 8.5 ft.
Estimated initial settlement	0.5 - 1.0 ft.
Design side slopes (Seaward Face)	5h:1v
Design side slopes (Landward Face)	3h:1v
Breakwater distance from shoreline	40 to 150 ft.
Width of each breakwater	180 ft.
Design Crest Elevation	1.4 ft. NAVD 88 (MHHW)
Width of gaps between breakwaters at design crest height	30 ft.

POST THIS NOTICE CONSPICUOUSLY AT SITE OF WORK

MISSISSIPPI

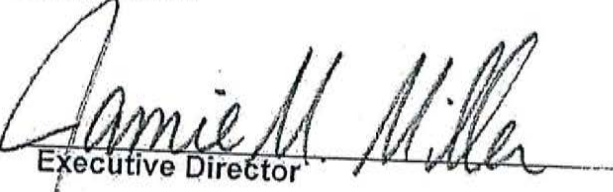


Department of Marine Resources

3. Approximately 46 acres of unvegetated waterbottoms shall be planted with cultch material in the form of crushed or processed stone with a median diameter between 1.0 and 2.0 inches in order to enhance benthic habitat. The 46 acres shall be located within the 194-acre site within Heron Bay as indicated on the attached diagram (Figure 1). Only clean material free of waste, metal and organic trash, and unsightly debris shall be used;
4. Approximately 46 acres of marsh habitat shall be created within the 76-acre site within Heron Bay as indicated on the attached diagram (Figure 1). Authorized activities associated with this marsh creation include:
 - a. Two linear containment dikes to create a cell:
 - i. One along the edge of the existing marsh;
 - ii. One along the waterward limits of the marsh creation area;
 - iii. Construction will be completed by either excavating sediment from within the cell creation area or by using suitable dredged material if available;
 - iv. Four (4) weirs shall be installed in the dikes to allow water to decant during the filling of the containment cell and to manage consolidation of fill material;
 - v. After consolidation, the weirs will be removed and the dikes will be breached or degraded to provide for appropriate intertidal circulation;
 - vi. Any use of dredged material shall be approved in writing by DMR prior to placement and shall be tested in accordance with current standards for beneficial use of dredged material as determined by the Mississippi Department of Environmental Quality's Office of Pollution Control;
 - b. Placement of up to 540,000 cubic yards of appropriate material within the created cell:
 - i. Material shall be placed by barge or pipeline to create a variety of elevations within the target intertidal marsh elevation range of +1 MLLW, plus or minus 0.5';
 - ii. Consolidated material will be allowed to vegetate naturally with native marsh grasses, but if natural recruitment does not result in the desired vegetative cover, planting with appropriate native marsh grasses approved by DMR shall be allowed;
 - iii. Vegetation proposed for planting shall be approved in writing by DMR prior to placement;
 - iv. The marsh creation area shall be monitored for the life of the project for the presence of invasive species. These species shall be removed upon discovery;
 - v. Any use of dredged material shall be approved in writing by DMR prior to placement and shall be tested in accordance with current standards for beneficial use of dredged material as determined by the Mississippi Department of Environmental Quality's Office of Pollution Control;
5. Prior to the commencement of construction, permittee must submit to the DMR a copy of the Tidelands Lease as required by the Secretary of State and as filed in the subject County Land Records, or a statement from the Secretary of State that the permitted activity does not require a Tidelands Lease;
6. A variance to Chapter 8, Section 2, Part III.O.1. of the Mississippi Coastal Program is hereby granted;
7. A change to the Coastal Wetlands Use Plan from a General Use District and a Preservation Use District to an S6 Special Use - Preservation District is hereby granted. The change covers the footprint of the project as indicated on the attached diagram (Figure 2);
8. No construction debris or unauthorized fill material shall be allowed to enter coastal wetlands or waters;
9. Best Management Practices shall be used at all times during construction;
10. Vegetated wetlands shall not be impacted; and,
11. No creosote material shall be used in construction.

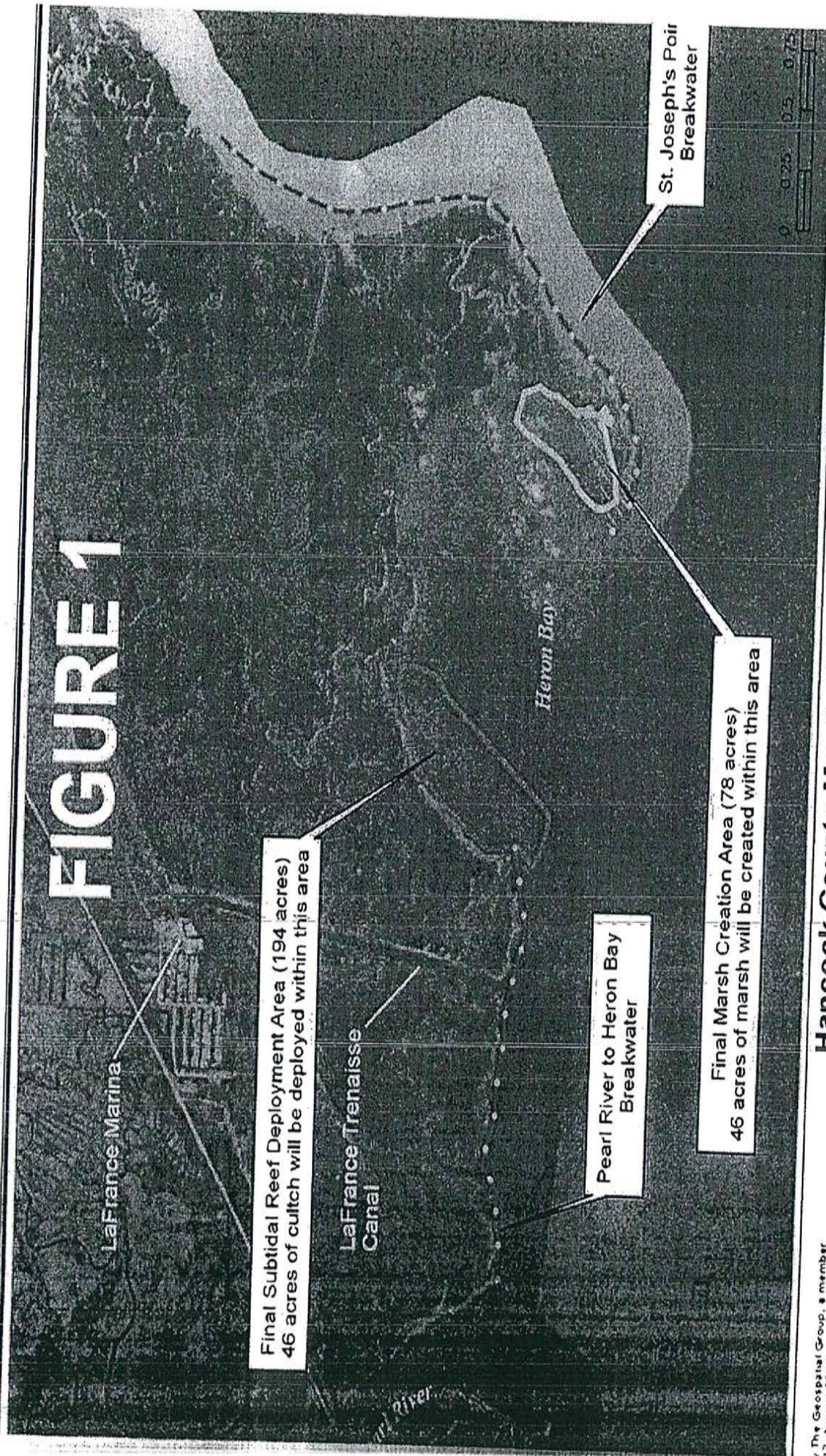
On the Mississippi Sound south of the Hancock County marshes from the mouth of the Pearl River to approximately 4 miles northeast of Heron Bay and including Heron Bay, south of Ansley, Hancock County, Mississippi.

No construction debris or unauthorized fill material shall be allowed to enter coastal wetlands or waters.
FURTHERMORE, THIS PROJECT AS PROPOSED HAS BEEN FOUND TO BE CONSISTENT WITH ALL GUIDELINES FOR CONDUCT OF REGULATED ACTIVITIES IN COASTAL WETLANDS AS SET FORTH IN THE MISSISSIPPI COASTAL PROGRAM.


Executive Director

POST THIS NOTICE CONSPICUOUSLY AT SITE OF WORK

FIGURE 1



Final Subtidal Reef Deployment Area (194 acres)
46 acres of culch will be deployed within this area

LaFrance Trenaisse Canal

Pearl River to Heron Bay Breakwater

Final Marsh Creation Area (78 acres)
46 acres of marsh will be created within this area

St. Joseph's Poir Breakwater

Hancock County Marsh Living Shoreline

Breakwater

Final Marsh Creation Area

Final Subtidal Reef Deployment Area

Phase III FERP/PEIS Potential Marsh Creation Area

Phase III FERP/PEIS Potential Subtidal Reef Deployment Area

The Geospatial Group, a member of the CCE

Geospatial Cleanhouse, and Etn

IAI, 1983 UTM Zone 18N

the Mercator

no warranties, expressed or

accuracy, completeness,

or suitability for any particular

contained on this map



FIGURE 2

Heron Bay

0 0.5 1 Miles



STATE OF MISSISSIPPI

Phil Bryant
Governor

MISSISSIPPI DEPARTMENT OF MARINE RESOURCES

Jamie M. Miller, Executive Director

February 5, 2016

Mississippi Department of Environmental Quality
Attn: Mr. Richard Harrell
P.O. Box 2261
Jackson, MS 39225

RE: Permit DMR-140197

Dear Mr. Harrell:

Due to an error in condition number 7 in the Permit issued to you on November 25, 2015, please find attached a corrected Permit.

Please execute this Permit by signing both documents and returning the copy to the Department of Marine Resources.

If you have any questions regarding the Permit or this correspondence, please contact Willa Brantley with the Bureau of Wetlands Permitting at 228-523-4108 or willa.brantley@dmr.ms.gov.

Sincerely,

A handwritten signature in black ink that reads "Jamie M. Miller".

Jamie M. Miller
Executive Director
Mississippi Department of Marine Resources

JMM/wjb

Enclosures

cc: Ms. Alane Young, Covington Civil and Environmental, LLC
Ms. Maryellen Farmer, USACE
Ms. Florance Bass, OPC
Mr. Raymond Carter, SOS

Permit No.: DMR-140197
 Type: Permit
 Date: November 25, 2015

WHEREAS, application by: The Mississippi Department of Environmental Quality for a Permit under the provisions of Chapter 27, Mississippi Code of 1972, as amended, to perform certain works affecting the coastal wetlands of the State of Mississippi in the Mississippi Sound south of the Hancock County marshes from the mouth of the Pearl River to approximately 4 miles northeast of Heron Bay and including Heron Bay, south of Ansley, Hancock County, Mississippi, was approved by said State of Mississippi Commission on Marine Resources on November 17, 2015.

NOW THEREFORE, this Permit authorizes the above named applicant hereinafter called Permittee, to perform such works in adherence to the following conditions contained herein:

1. Approximately 28.1 acres of unvegetated waterbottoms shall be filled for the construction of a breakwater/high profile reef structure approximately 4 miles in length as indicated on the attached diagram (Figure 1). This breakwater shall conform to the design criteria listed in the chart below:

Breakwater Design Criteria	St. Joseph's Point Breakwater (as shown)
Total project length	Approx. 4 miles
Total project acreage	28.1 acres
Crest width	15.0 ft.
Base width	60 ft. (maximum)
Assumed bottom elevation	-3.5 NAVD 88 (MHHW)
Total structure height	5.0 to 8.5 ft.
Riprap volume	132,000 cubic yards
Thickness of material (riprap)	5.0 to 8.5 ft.
Estimated initial settlement	0.5 - 1.0 ft.
Design side slopes (Seaward Face)	5h:1v
Design side slopes (Landward Face)	3h:1v
Breakwater distance from shoreline	20 to 400 ft.
Length of each breakwater	180 ft.
Design Crest Elevation	1.4 ft. NAVD88 (MHHW)
Width of gaps between breakwaters at design crest height	30 ft.

2. Approximately 12.2 acres of unvegetated waterbottoms shall be filled for the construction of a breakwater/high profile reef structure approximately 1.9 miles in length as indicated

on the attached diagram (Figure 1). This breakwater shall conform to the design criteria listed in the chart below:

Breakwater Design Criteria	Peard River to Heron Bay Breakwater (western reach)
Total project length	Approx. 1.9 miles
Total project acreage	12.2 acres
Crest width	15.0 ft.
Base width	60 ft. (maximum)
Assumed bottom elevation	-3.5 NAVD 88 (MHHW)
Total structure height	5.0 to 8.5 ft.
Riprap volume	58,000 cubic yards
Thickness of material (riprap)	5.0 to 8.5 ft.
Estimated initial settlement	0.5 – 1.0 ft.
Design side slopes (Seaward Face)	5h:1v
Design side slopes (Landward Face)	3h:1v
Breakwater distance from shoreline	40 to 150 ft.
Reach of each breakwater	180 ft.
Design Crest Elevation	1.4 ft. NAVD 88 (MHHW)
Width of gaps between breakwaters at design crest height	30 ft.

3. Approximately 46 acres of unvegetated waterbottoms shall be planted with cultch material in the form of crushed or processed stone with a median diameter between 1.0 and 2.0 inches in order to enhance benthic habitat. The 46 acres shall be located within the 194-acre site within Heron Bay as indicated on the attached diagram (Figure 1). Only clean material free of waste, metal and organic trash, and unsightly debris shall be used;
4. Approximately 46 acres of marsh habitat shall be created within the 76-acre site within Heron Bay as indicated on the attached diagram (Figure 1). Authorized activities associated with this marsh creation include:
 - a. Two linear containment dikes to create a cell:
 - i. One along the edge of the existing marsh;
 - ii. One along the waterward limits of the marsh creation area;
 - iii. Construction will be completed by either excavating sediment from within the cell creation area or by using suitable dredged material if available;
 - iv. Four (4) weirs shall be installed in the dikes to allow water to decant during the filling of the containment cell and to manage consolidation of fill material;
 - v. After consolidation, the weirs will be removed and the dikes will be breached or degraded to provide for appropriate intertidal circulation;

- vi. Any use of dredged material shall be approved in writing by DMR prior to placement and shall be tested in accordance with current standards for beneficial use of dredged material as determined by the Mississippi Department of Environmental Quality's Office of Pollution Control;
- b. Placement of up to 540,000 cubic yards of appropriate material within the created cell:
 - i. Material shall be placed by barge or pipeline to create a variety of elevations within the target intertidal marsh elevation range of +1 MLLW, plus or minus 0.5';
 - ii. Consolidated material will be allowed to vegetate naturally with native marsh grasses, but if natural recruitment does not result in the desired vegetative cover, planting with appropriate native marsh grasses approved by DMR shall be allowed;
 - iii. Vegetation proposed for planting shall be approved in writing by DMR prior to placement;
 - iv. The marsh creation area shall be monitored for the life of the project for the presence of invasive species. These species shall be removed upon discovery;
 - v. Any use of dredged material shall be approved in writing by DMR prior to placement and shall be tested in accordance with current standards for beneficial use of dredged material as determined by the Mississippi Department of Environmental Quality's Office of Pollution Control;
5. Prior to the commencement of construction, permittee must submit to the DMR a copy of the Tidelands Lease as required by the Secretary of State and as filed in the subject County Land Records, or a statement from the Secretary of State that the permitted activity does not require a Tidelands Lease;
6. A variance to Chapter 8, Section 2, Part III.O.1. of the Mississippi Coastal Program is hereby granted;
7. A change to the Coastal Wetlands Use Plan from a General Use District and a Preservation Use District to an S6 Special Use – Restoration District is hereby granted. The change covers the footprint of the project as indicated on the attached diagram (Figure 2);
8. No construction debris or unauthorized fill material shall be allowed to enter coastal wetlands or waters;
9. Best Management Practices shall be used at all times during construction;
10. Vegetated wetlands shall not be impacted; and,
11. No creosote material shall be used in construction.

The Permittee shall maintain all water quality standards, regulations, and restrictions as set forth by the DEQ.

Any deviations beyond the restrictive conditions as set forth in your permit shall be considered a violation and may result in the revocation of the permit. Violations of these conditions may be subject to fines, project modifications and/or site restoration. Both the permittee and the contractor may be held liable for conducting unauthorized work. A modification to these conditions may be requested by submitting a written request along with a revised project diagram to DMR. Proposed modifications to dimensions, project footprint, and/or procedures must be approved in writing prior to commencement of work.

Issuance of this certification by DMR and acceptance by the applicant does not release the applicant from other legal requirements including but not limited to other applicable federal, state or local laws, ordinances, zoning codes or other regulations.

This certification conveys no title to land and water, does not constitute authority for reclamation of coastal wetlands and does not authorize invasion of private property or rights in property.

Please notify this Department upon completion of the permitted project so that compliance checks may be conducted by DMR staff.

This certification shall become effective upon acceptance by the applicant and receipt of the executed copy by the Director.

Please execute this certification by signing both documents and returning the copy to the Department of Marine Resources.

Work authorized by this certification must be completed on or before November 25, 2020.

Enclosed is a "Notice of Compliance" which must be conspicuously displayed at the site during construction of the permitted work.

The Department of Marine Resources has also coordinated a review of your project through the Coastal Program review procedures and determined that the project referenced above is consistent with the Mississippi Coastal Program, provided that you comply with the noted conditions and reviewing coastal program agencies do not disagree with said plans. By copy of this certification, we are notifying the U.S. Army Corps of Engineers of this determination.

THE PERMITTEE BY ACCEPTANCE OF THIS PERMIT AGREES TO ABIDE BY THE STIPULATIONS AND CONDITIONS CONTAINED HEREIN AND AS DESCRIBED BY THE PLANS AND SPECIFICATIONS SUBMITTED AS PART OF THE COMPLETED APPLICATION.

STATE OF MISSISSIPPI
DEPARTMENT OF MARINE RESOURCES

BY: Jamie M. Miller
Jamie M. Miller
Executive Director
Mississippi Department of Marine Resources

Accepted this the ____ day of _____, 20 ____.

BY: _____

MISSISSIPPI

Department of Marine Resources



NOTICE OF COMPLIANCE
DMR- 140197 PERMIT
THIS NOTICE ACKNOWLEDGES THAT:

DATE: November 25, 2015

Mississippi Department of Environmental Quality
P.O. Box 2261
Jackson, MS 39225

HAS, THROUGH APPLICATION TO THIS DEPARTMENT, DULY COMPLIED WITH THE MISSISSIPPI COASTAL WETLANDS PROTECTION LAW TO:

1. Approximately 28.1 acres of unvegetated waterbottoms shall be filled for the construction of a breakwater/high profile reef structure approximately 4 miles in length as indicated on the attached diagram (Figure 1). This breakwater shall conform to the design criteria listed in the chart below:

Breakwater Design Criteria	St. Joseph - Pebris Breakwater (eastern reach)
Total project length	Approx. 4 miles
Total project acreage	28.1 acres
Crest width	15.0 ft.
Base width	60 ft. (maximum)
Assumed bottom elevation	-3.5 NAVD 88 (MHHW)
Total structure height	5.0 to 8.5 ft.
Riprap volume	132,000 cubic yards
Thickness of material (riprap)	5.0 to 8.5 ft.
Estimated initial settlement	0.5 - 1.0 ft.
Design side slopes (Seaward Face)	5h:1v
Design side slopes (Landward Face)	3h:1v
Breakwater distance from shoreline	20 to 400 ft.
Reach of each breakwater	180 ft.
Design Crest Elevation	1.4 ft. NAVD88 (MHHW)
Width of gaps between breakwaters at design crest elevation	30 ft.

2. Approximately 12.2 acres of unvegetated waterbottoms shall be filled for the construction of a breakwater/high profile reef structure approximately 1.9 miles in length as indicated on the attached diagram (Figure 1). This breakwater shall conform to the design criteria listed in the chart below:

Breakwater Design Criteria	Point River to Hard Bay Breakwater (western reach)
Total project length	Approx. 1.9 miles
Total project acreage	12.2 acres
Crest width	15.0 ft.
Base width	60 ft. (maximum)
Assumed bottom elevation	-3.5 NAVD 88 (MHHW)
Total structure height	5.0 to 8.5 ft.
Riprap volume	58,000 cubic yards
Thickness of material (riprap)	5.0 to 8.5 ft.
Estimated initial settlement	0.5 - 1.0 ft.
Design side slopes (Seaward Face)	5h:1v
Design side slopes (Landward Face)	3h:1v
Breakwater distance from shoreline	40 to 150 ft.
Reach of each breakwater	180 ft.
Design Crest Elevation	1.4 ft. NAVD 88 (MHHW)
Width of gaps between breakwaters at design crest elevation	30 ft.

POST THIS NOTICE CONSPICUOUSLY AT SITE OF WORK

MISSISSIPPI



Department of Marine Resources

3. Approximately 46 acres of unvegetated waterbottoms shall be planted with cultch material in the form of crushed or processed stone with a median diameter between 1.0 and 2.0 inches in order to enhance benthic habitat. The 46 acres shall be located within the 194-acre site within Heron Bay as indicated on the attached diagram (Figure 1). Only clean material free of waste, metal and organic trash, and unsightly debris shall be used;
4. Approximately 46 acres of marsh habitat shall be created within the 76-acre site within Heron Bay as indicated on the attached diagram (Figure 1). Authorized activities associated with this marsh creation include:
 - a. Two linear containment dikes to create a cell:
 - i. One along the edge of the existing marsh;
 - ii. One along the waterward limits of the marsh creation area;
 - iii. Construction will be completed by either excavating sediment from within the cell creation area or by using suitable dredged material if available;
 - iv. Four (4) weirs shall be installed in the dikes to allow water to decant during the filling of the containment cell and to manage consolidation of fill material;
 - v. After consolidation, the weirs will be removed and the dikes will be breached or degraded to provide for appropriate intertidal circulation;
 - vi. Any use of dredged material shall be approved in writing by DMR prior to placement and shall be tested in accordance with current standards for beneficial use of dredged material as determined by the Mississippi Department of Environmental Quality's Office of Pollution Control;
 - b. Placement of up to 540,000 cubic yards of appropriate material within the created cell:
 - i. Material shall be placed by barge or pipeline to create a variety of elevations within the target intertidal marsh elevation range of +1 MLLW, plus or minus 0.5';
 - ii. Consolidated material will be allowed to vegetate naturally with native marsh grasses, but if natural recruitment does not result in the desired vegetative cover, planting with appropriate native marsh grasses approved by DMR shall be allowed;
 - iii. Vegetation proposed for planting shall be approved in writing by DMR prior to placement;
 - iv. The marsh creation area shall be monitored for the life of the project for the presence of invasive species. These species shall be removed upon discovery;
 - v. Any use of dredged material shall be approved in writing by DMR prior to placement and shall be tested in accordance with current standards for beneficial use of dredged material as determined by the Mississippi Department of Environmental Quality's Office of Pollution Control;
5. Prior to the commencement of construction, permittee must submit to the DMR a copy of the Tidelands Lease as required by the Secretary of State and as filed in the subject County Land Records, or a statement from the Secretary of State that the permitted activity does not require a Tidelands Lease;
6. A variance to Chapter 8, Section 2, Part III.O.1. of the Mississippi Coastal Program is hereby granted;
7. A change to the Coastal Wetlands Use Plan from a General Use District and a Preservation Use District to an S6 Special Use - Restoration District is hereby granted. The change covers the footprint of the project as indicated on the attached diagram (Figure 2);
8. No construction debris or unauthorized fill material shall be allowed to enter coastal wetlands or waters;
9. Best Management Practices shall be used at all times during construction;
10. Vegetated wetlands shall not be impacted; and,
11. No creosote material shall be used in construction.

On the Mississippi Sound south of the Hancock County marshes from the mouth of the Pearl River to approximately 4 miles northeast of Heron Bay and including Heron Bay, south of Ansley, Hancock County, Mississippi.

No construction debris or unauthorized fill material shall be allowed to enter coastal wetlands or waters.

FURTHERMORE, THIS PROJECT AS PROPOSED HAS BEEN FOUND TO BE CONSISTENT WITH ALL GUIDELINES FOR CONDUCT OF REGULATED ACTIVITIES IN COASTAL WETLANDS AS SET FORTH IN THE MISSISSIPPI COASTAL PROGRAM.


Executive Director

POST THIS NOTICE CONSPICUOUSLY AT SITE OF WORK

DWH-AR0308624



STATE OF MISSISSIPPI
PHIL BRYANT
GOVERNOR
MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
GARY C. RIKARD, EXECUTIVE DIRECTOR
December 1, 2015

Mr. Richard Harrell
Mississippi Department of Environmental Quality
Post Office Box 2288
Jackson, MS 39073

Dear Mr. Harrell:

Re: MDEQ, NRDA, Hancock
County Marsh Living Shoreline
Hancock County
COE No. SAM201300088MJF
WQC No. WQC2015010

Pursuant to Section 401 of the Federal Water Pollution Control Act (33 U. S. C. 1251, 1341), the Office of Pollution Control (OPC) issues this Certification, after public notice and opportunity for public hearing, to Mississippi Department of Environmental Quality, an applicant for a Federal License or permit to conduct the following activity:

MDEQ, NRDA, Hancock County Marsh Living Shoreline: Placement of fill material for the creation of 46 acres of salt marsh; place fill material for the creation of 46 acres of oyster cultch; and construct 5.9 miles of breakwater structures.

Breakwaters would be constructed in two locations. Approximately 4.0 miles of breakwater would be constructed along St. Joseph's Point and approximately 1.9 miles from the Pearl River to Heron Bay. **The breakwater design includes:**

Breakwater Design Criteria	St. Joseph's Point Breakwater (eastern reach)	Pearl River to Heron Bay Breakwater (western reach)
Total project length	Approximately 4 miles	Approximately 1.9 miles
Total project acreage	28.1 acres	12.2 acres
Crest width	15.0 ft	15.0 ft
Base width	60 foot (maximum)	60 foot (maximum)
Assumed bottom elevation	-3.5 NAVD 88	-3.5 NAVD 88
Total structure height	5.0 to 8.5 ft	5.0 to 8.5 ft
Riprap volume	132,000 cubic yards	58,000 cubic yards
Thickness of material (riprap)	5.0 to 8.5 ft	5.0 to 8.5 ft
Estimated initial settlement	0.5-0.9 ft	0.5-0.9 ft
Design side slopes (Seaward Face)	5v:1h	5v:1h
Design side slopes (Landward Face)	3v:1h	3v:1h
Breakwater distance from shoreline	20 to 400 ft	40 to 150 ft
Reach of each breakwater	180 ft	180 ft
Design Crest Elevation	1.4 ft NAVD88 (MHHW)	1.4 ft NAVD88 (MHHW)
Width of gaps between breakwaters at design crest height	30 ft	30 ft

All proposed temporary flotation channels proposed for the construction of the breakwater are eliminated from the project resulting in a 123.9 acre reduction in impacts from the proposed channel footprint and sidecast of spoil.

The 46 acre salt marsh creation includes:

The final marsh creation area is an approximately 78 acre area in the southeastern portion of Heron Bay. Approximately 46 acres of marsh would be created in one of several locations within this area. A dike would be constructed by excavating existing material from un-vegetated water bottoms within the marsh creation site and possibly with suitable permitted dredged materials from other sources, filling the area within the dike with appropriate dredged material to final marsh grade, and allowing the area to vegetate by natural colonization of estuarine marsh species. Dredged material would be obtained through the Mississippi Beneficial Sediment Use Program as available or excavated from a suitable borrow source. Once the entire marsh area(s) is constructed, the area would be monitored for natural re-vegetation. The applicant anticipates natural vegetative colonization would occur within one to three years.

The 46 acre sub-tidal reef includes:

The final sub-tidal reef deployment area is an approximately 194-acre area in the western portion of Heron Bay. Approximately 46 acres of sub-tidal reef habitat would be created in one to several locations within this area. Cultch material would be deployed in water depths of -3 to -5 feet NAVD 88. The sub-tidal reef(s) would be sited based on data from an oyster presence survey and would consist of approximately 6- to 9-inch thick layer of limestone or other suitable material.

Post-construction monitoring will be conducted for a period of seven (7) years following completion. Monitoring would occur for erosion control, marsh habitat creation, and the support of secondary productivity. Evaluation includes water quality parameters; structural integrity of breakwater structure; height/elevation and area of structure; consolidation rate of breakwater structure; shoreline profile; bivalve density, size, biomass and survival; non-bivalve invertebrate density and biomass; and percent cover of marsh vegetation. The project will incorporate a mix of long-term monitoring efforts to ensure project designs are correctly implemented during construction, and to identify any potential unanticipated erosion/sediment accumulation issues associated with the project. Corrective action will be addressed through the maintenance budget included in the overall project budget. [SAM-2013-00088-MJF, WQC2015010].

The Office of Pollution Control certifies that the above-described activity will be in compliance with the applicable provisions of Sections 301, 302, 303, 306, and 307 of the Federal Water Pollution Control Act and Section 49-17-29 of the Mississippi Code of 1972, if the applicant complies with the following conditions:

1. All material placed for beneficial use shall be properly tested and analyzed as required by the Mississippi Beneficial Use Program.
2. The final post-construction monitoring plan shall be provided prior to the start of construction activities.
3. All timber pilings or bulkhead materials shall be steel, concrete, plastic, or timber treated with chromated copper arsenate (CCA).
4. Turbidity outside the limits of a 750-foot mixing zone shall not exceed the ambient turbidity by more than 50 Nephelometric Turbidity Units.
5. No sewage, oil, refuse, or other pollutants shall be discharged into the watercourse.

Mr. Richard Harrell

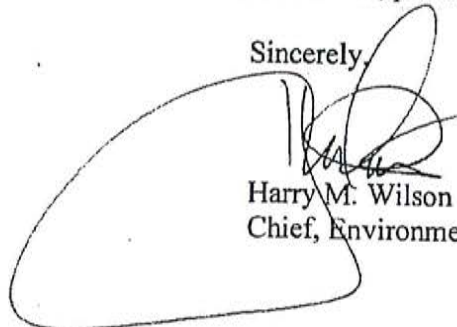
Page 4 of 4

December 1, 2015

The Office of Pollution Control also certifies that there are no limitations under Section 302 nor standards under Sections 306 and 307 of the Federal Water Pollution Control Act which are applicable to the applicant's above-described activity.

This certification is valid for the project as proposed. Any deviations without proper modifications and/or approvals may result in a violation of the 401 Water Quality Certification. If we can be of further assistance, please contact us.

Sincerely,



Harry M. Wilson III, P.E., DEE
Chief, Environmental Permits Division

HMW: FB

cc: Maryellen Farmer, U.S. Army Corps of Engineers, Mobile District
Willa Brantley, Department of Marine Resources
Calista Mills, Environmental Protection Agency
Alane Young, Covington Civil and Environmental, LLC

65644 WQC20150001

DWH-AR0308628



STATE OF MISSISSIPPI

PHIL BRYANT
GOVERNOR

MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY

GARY C. RIKARD, EXECUTIVE DIRECTOR

December 1, 2015

Mr. Richard Harrell
Mississippi Department of Environmental Quality
Post Office Box 2288
Jackson, MS 39073

Dear Mr. Harrell:

Re: MDEQ, NRDA, Hancock
County Marsh Living Shoreline
Hancock County
COE No. SAM201300088MJF
WQC No. WQC2015010

Pursuant to Section 401 of the Federal Water Pollution Control Act (33 U. S. C. 1251, 1341), the Office of Pollution Control (OPC) issues this Certification, after public notice and opportunity for public hearing, to Mississippi Department of Environmental Quality, an applicant for a Federal License or permit to conduct the following activity:

MDEQ, NRDA, Hancock County Marsh Living Shoreline: Placement of fill material for the creation of 46 acres of salt marsh; place fill material for the creation of 46 acres of oyster cultch; and construct 5.9 miles of breakwater structures.

Breakwaters would be constructed in two locations. Approximately 4.0 miles of breakwater would be constructed along St. Joseph's Point and approximately 1.9 miles from the Pearl River to Heron Bay. **The breakwater design includes:**

RECEIVED

DEC 18 2015

Per _____

Breakwater Design Criteria	St. Joseph's Point Breakwater (eastern reach)	Pearl River to Heron Bay Breakwater (western reach)
Total project length	Approximately 4 miles	Approximately 1.9 miles
Total project acreage	28.1 acres	12.2 acres
Crest width	15.0 ft	15.0 ft
Base width	60 foot (maximum)	60 foot (maximum)
Assumed bottom elevation	-3.5 NAVD 88	-3.5 NAVD 88
Total structure height	5.0 to 8.5 ft	5.0 to 8.5 ft
Riprap volume	132,000 cubic yards	58,000 cubic yards
Thickness of material (riprap)	5.0 to 8.5 ft	5.0 to 8.5 ft
Estimated initial settlement	0.5-0.9 ft	0.5-0.9 ft
Design side slopes (Seaward Face)	5v:1h	5v:1h
Design side slopes (Landward Face)	3v:1h	3v:1h
Breakwater distance from shoreline	20 to 400 ft	40 to 150 ft
Reach of each breakwater	180 ft	180 ft
Design Crest Elevation	1.4 ft NAVD88 (MHHW)	1.4 ft NAVD88 (MHHW)
Width of gaps between breakwaters at design crest height	30 ft	30 ft

All proposed temporary flotation channels proposed for the construction of the breakwater are eliminated from the project resulting in a 123.9 acre reduction in impacts from the proposed channel footprint and sidecast of spoil.

The 46 acre salt marsh creation includes:

The final marsh creation area is an approximately 78 acre area in the southeastern portion of Heron Bay. Approximately 46 acres of marsh would be created in one of several locations within this area. A dike would be constructed by excavating existing material from un-vegetated water bottoms within the marsh creation site and possibly with suitable permitted dredged materials from other sources, filling the area within the dike with appropriate dredged material to final marsh grade, and allowing the area to vegetate by natural colonization of estuarine marsh species. Dredged material would be obtained through the Mississippi Beneficial Sediment Use Program as available or excavated from a suitable borrow source. Once the entire marsh area(s) is constructed, the area would be monitored for natural re-vegetation. The applicant anticipates natural vegetative colonization would occur within one to three years.

The 46 acre sub-tidal reef includes:

The final sub-tidal reef deployment area is an approximately 194-acre area in the western portion of Heron Bay. Approximately 46 acres of sub-tidal reef habitat would be created in one to several locations within this area. Cultch material would be deployed in water depths of -3 to -5 feet NAVD 88. The sub-tidal reef(s) would be sited based on data from an oyster presence survey and would consist of approximately 6- to 9-inch thick layer of limestone or other suitable material.

Post-construction monitoring will be conducted for a period of seven (7) years following completion. Monitoring would occur for erosion control, marsh habitat creation, and the support of secondary productivity. Evaluation includes water quality parameters; structural integrity of breakwater structure; height/elevation and area of structure; consolidation rate of breakwater structure; shoreline profile; bivalve density, size, biomass and survival; non-bivalve invertebrate density and biomass; and percent cover of marsh vegetation. The project will incorporate a mix of long-term monitoring efforts to ensure project designs are correctly implemented during construction, and to identify any potential unanticipated erosion/sediment accumulation issues associated with the project. Corrective action will be addressed through the maintenance budget included in the overall project budget. [SAM-2013-00088-MJF, WQC2015010].

The Office of Pollution Control certifies that the above-described activity will be in compliance with the applicable provisions of Sections 301, 302, 303, 306, and 307 of the Federal Water Pollution Control Act and Section 49-17-29 of the Mississippi Code of 1972, if the applicant complies with the following conditions:

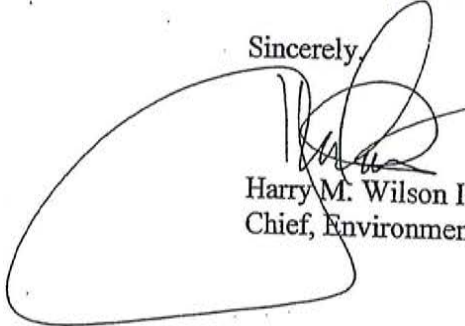
1. All material placed for beneficial use shall be properly tested and analyzed as required by the Mississippi Beneficial Use Program.
2. The final post-construction monitoring plan shall be provided prior to the start of construction activities.
3. All timber pilings or bulkhead materials shall be steel, concrete, plastic, or timber treated with chromated copper arsenate (CCA).
4. Turbidity outside the limits of a 750-foot mixing zone shall not exceed the ambient turbidity by more than 50 Nephelometric Turbidity Units.
5. No sewage, oil, refuse, or other pollutants shall be discharged into the watercourse.

Mr. Richard Harrell
Page 4 of 4
December 1, 2015

The Office of Pollution Control also certifies that there are no limitations under Section 302 nor standards under Sections 306 and 307 of the Federal Water Pollution Control Act which are applicable to the applicant's above-described activity.

This certification is valid for the project as proposed. Any deviations without proper modifications and/or approvals may result in a violation of the 401 Water Quality Certification. If we can be of further assistance, please contact us.

Sincerely,



Harry M. Wilson III, P.E., DEE
Chief, Environmental Permits Division

HMW: FB

cc: Maryellen Farmer, U.S. Army Corps of Engineers, Mobile District
Willa Brantley, Department of Marine Resources
Calista Mills, Environmental Protection Agency
Alane Young, Covington Civil and Environmental, LLC



UNITED STATES DEPARTMENT OF COMMERCE
 National Oceanic and Atmospheric Administration
 NATIONAL MARINE FISHERIES SERVICE
 Southeast Regional Office
 263 13th Avenue South
 St. Petersburg, Florida 33701-5505
<http://sero.nmfs.noaa.gov>

APR 11 2014

F/SER31:JBH

Ms. Leslie Craig
 Supervisor, NOAA Restoration Center-Southeast Region
 NOAA Fisheries-Office of Habitat Conservation
 263 13th Avenue South
 St. Petersburg, Florida 33701

Ref.: Deepwater Horizon-Early Restoration Plan Phase III Living Shoreline Projects

	Applicant	NMFS Number	Location
1	MS Department of Environmental Quality	SER-2014-12925	Hancock County, Mississippi
2	NOAA Restoration Center – SE Office	SER-2014-12926	Baldwin County, Alabama
3	FL Department of Environmental Protection	SER-2014-13016	Escambia County, Florida
4	FL Department of Environmental Protection	SER-2014-13083	Franklin County, Florida

Dear Ms. Craig:

This document responds to 4 letters, received between January 13 and February 4, 2014, from the National Oceanic and Atmospheric Administration (NOAA) Restoration Center, requesting National Marine Fisheries Service (NMFS) concurrence under Section 7 of the Endangered Species Act (ESA) with the project-effects determinations associated with living shoreline construction projects in the Gulf of Mexico. On February 5, 2014, we decided to batch these projects into a single consultation based on the similarity of the proposed activities. You determined that the proposed activities may affect, but are not likely to adversely affect 5 sea turtle species (green, hawksbill, Kemp's ridley, leatherback, and loggerhead), Gulf sturgeon, smalltooth sawfish, and designated Gulf sturgeon critical habitat in Units 8, 9, and 13. NMFS requested additional information via email on February 19, 2014. We received the response on March 13, 2014. We asked for clarification of that information via email on March 14, 2014.

We received clarification on March 19, 2014, and we initiated consultation that day. NMFS's findings on the projects' potential effects are based on the project descriptions in this response; thus, any changes to the proposed actions may negate the findings of this consultation and may require reinitiation of consultation with NMFS.

All of the applicants will use floating turbidity curtains around all in-water construction areas and will follow NMFS's *Sea Turtle and Smalltooth Sawfish Construction Conditions*, dated March 23, 2006; *Measures for Reducing Entrapment Risk to Protected Species*, revised May 22, 2012; and U.S. Fish and Wildlife Service's (USFWS) *Standard Manatee Conditions for In-Water Work*, dated 2011. Each project is described in detail below and locations are shown in the figures attached at the end of this consultation (all project location datum are North American Datum 1983).

1. The Hancock County Marsh Living Shoreline projects (3) are located in Hancock County, Mississippi. Action Area Bounding Coordinates (N-S-E-W): 30.184°N, 89.53°W; 30.169°N,



89.462°W; 30.233°N, 89.415°W; 30.184°N, 89.530339°W. The proposed projects consist of 3 components: (1) use of breakwater materials to reduce shoreline erosion, (2) creation of 46 acres of salt marsh, and (3) enhancement of 46 acres of oyster reef habitat that have historically supported oyster habitat (Figure 1). The breakwater at St. Joseph's Point (eastern reach) will be approximately 4 miles long, have a crest width of 15 feet (ft), a total height of 4 ft, and include openings throughout to allow for tidal flow. The breakwater will have a footprint of approximately 14.4 acres and will be placed on substrate of fine-grained sediment. It will be composed of a riprap core covered by a 9-inch-thick layer of bagged oyster shell. The Pearl River to Heron Bay breakwater (western reach) will be constructed identical to the St. Joseph's Point breakwater, but will be 1.9 miles long. The Pearl River to Heron Bay breakwater will have a footprint of approximately 5.5 acres. Temporary flotation access channels will be used to facilitate access for work barges into the work area. One channel will be excavated parallel to the breakwaters and additional channels excavated perpendicular to provide access from the Mississippi Sound (Figure 1). The excavated, dredged material will be cast on the seaward side of the channels so they naturally fill back in after construction. The channels will be dredged to 8 ft below mean lower low water (MLLW) to accommodate barge draft. The channels will be excavated using standard, construction best management practices (BMPs) to minimize environmental impacts. Permanent navigation signs will be installed in accordance with safety requirements.

A total of 46 acres of marsh will be created behind the constructed breakwater at St. Joseph's Point. It will be backfilled with dredged material obtained from the Mississippi Beneficial Sediment Use Program and allowed to re-vegetate by natural colonization of estuarine marsh species. Sediment will be pumped through a floating pipeline from a hydraulic dredge until final marsh target elevations are achieved. Pumps and sediment controls will remain in place throughout the dredging and filling process until initial settling has occurred. Once the entire marsh area is constructed, the area would be monitored for natural re-vegetation.

Oyster cultch will be deployed over 46 acres in Heron Bay in areas that currently support or previously supported oyster production. Oyster cultch deployment will occur in water depths of -3 to -5 ft MLLW and the limits of the cultch deployment areas will be marked with buoys or poles. A barge-mounted crane with a clamshell bucket will deploy the cultch in a 6- to 9-inch-thick layer of oyster shell or limestone. A material barge loaded with cultch will be moored to the crane barge. As a construction alternative, water jetting of loose shell off of the material barge may be used in case of water-depth constraints. Construction is scheduled to take place from May-October to avoid potential impacts to migrating Gulf sturgeon.

2. The Swift Tract Living Shoreline project is located at 30.335832°N, 87.812745°W, along the eastern portion of Bon Secour Bay, approximately 6 miles northwest of Gulf Shores in Baldwin County, Alabama (Figure 2). The Swift Tract breakwater will be 8,500 ft long, have a crest width of 10 ft, and a total height of 3 ft. Calculated volumes of material are 15,800 tons of riprap and 2,200 cubic yards (yd³) of oyster shell. Approximately 2.9 acres of fine-grained sediment or soft bottom will be covered with riprap and topped with bagged, oyster shell. One or more work barges, with a long-reach backhoe, will be positioned along the seaward side of the breakwater construction area. A material barge will be positioned seaward of the work barge. Additionally, 6 warning signs placed on 12-inch-diameter, treated posts will be installed adjacent to the

breakwaters. In an effort to reduce noise and turbidity effects, these posts will be pushed into the sediment rather than using a pile driver or jetting the piles into place. Construction is anticipated to be completed within 6 months.

3. The Pensacola Bay Living Shoreline projects are located in Escambia County, Florida at 30.410278°N, 87.202778°W, Project Green Shores Site II (PGSII); and 30.399722°N, 87.232222°W, Sanders Beach (Figure 3). Construction activities at PGSII will include expansion of an existing breakwater with a crest width of 100 ft and a total height of 3.5 ft. The volume of material needed will be approximately 11,000 tons of riprap and fossilized oyster shell covering a footprint of 1.9 acres of fine-grained sediment. Breakwaters constructed at Sanders Beach will be 2,400 ft long, have a crest width of 30 ft, and a total height of 3.5 ft. The volume of material needed will be approximately 14,000 tons of riprap and fossilized oyster shell, covering a footprint of 3.15 acres of fine-grained sediment. A gap of 100 ft will be left between each breakwater to allow for tidal flow.

Work barges with a long-reach backhoe will be positioned along the seaward side of the breakwaters and the material barge will be positioned seaward of the work barge. Additionally, 14 warning signs, placed on 12-inch-diameter posts, will be installed adjacent to the breakwaters. In an effort to reduce noise and turbidity effects, these posts will be pushed into the sediment rather than using a pile driver or jetting the piles into place.

After the breakwaters have been constructed, selected landward areas will be filled with dredged material obtained from one or more existing dredge disposal sites or navigational channels adjacent to the project sites (Figures 5 and 6). Approximately 16 acres will be required to provide the estimated 102,000 cubic yd³ using the following criteria: (1) borrow source will be free of contaminants as described in the *Inland Testing Manual (Evaluation of Dredged Material Proposed For Discharge in Waters of the United States)*, (U.S. Army Corps of Engineers, 1998); and (2) borrow areas in depths of 6 ft or less will be limited to excavated depths of 4 ft below the sediment line and borrow areas in 6 ft or more of depth will be limited to excavated depths of 6 ft below the sediment line.

The marsh creation areas will be filled beginning at the most landward extent and filled until final marsh elevations are achieved. Marsh elevations will be designed to meet the requirements of native marsh plant species and to withstand normal wave heights for the project area. Based on similar projects, it is estimated that approximately 6,000 yd³ of fill will be needed for PGSII and approximately 96,000 yd³ of fill will be needed for Sanders Beach. To avoid potential impacts to protected species, the proposed project will use a hydraulic cutterhead pipeline dredge rather than a hopper dredge. Floating turbidity screens will be used to control turbidity levels and meet State of Florida requirements (Chapter 62-302.530 F.A.C.). Sediment controls will remain in place throughout the dredging and filling process. Construction is anticipated to take between 6-10 months for all elements, occurring between August-October 2015.

4. The Cat Point Living Shoreline project is located at 29.73093°N, 84.88433°W, along an area just off the Apalachicola National Estuarine Research Reserve Office Complex and Nature Center in Eastpoint, Florida (Figure 4). Proposed activities include expanding an existing breakwater structure by up to 0.3 miles and creating 1 acre of salt marsh habitat. The extensions

to the existing breakwater will be added on the north end (689 ft) and south end (750 ft). The structure is approximately 30 ft from the shoreline, has a crest width of 5 ft, and a total height of 2.5 ft. The extensions will be similar in measurement. Gaps ranging in size from 3-25 ft wide will be built into the breakwater to allow for tidal flow. Expansion of the breakwater will be undertaken during the winter season (November through early March), when low tides in the project area expose the tidal flats. Then materials can be placed from shore with a backhoe or crane (the area is too shallow to use a barge). Materials and equipment will be staged on state-owned lands adjacent to the road right-of-way, and will be accessed by an existing road (Millender Street). Native marsh plant species will be planted behind the breakwater structures, along the shoreline, to create approximately 1 acre of new marsh. Marsh creation will involve planting species on 2- to 3-ft centers. This activity would commence once the constructed breakwater extensions are complete and stabilized so the restored areas will be protected to the fullest extent possible.

We believe that sea turtles (the endangered Kemp's ridley; the threatened loggerhead,¹ and the threatened/endangered green²) and the threatened Gulf sturgeon may be present in the action areas and may be affected by the projects. We believe leatherback and hawksbill sea turtles will not be present, thus, they will not be affected, because their very-specific foraging and life history requirements are not met in or near the action areas: leatherbacks are deepwater, pelagic species and hawksbills are associated with coral reefs. Smalltooth sawfish also are not likely to be encountered at any of the project sites and therefore will not be affected. Their current distribution has contracted to peninsular Florida and, within that area, they can only be found with regularity off the extreme southern portion of Florida. Of the proposed projects, 3 fall within ESA-designated Gulf sturgeon critical habitat (Units 8, 9, and 13); Swift Tract is not located in designated critical habitat.

NMFS has identified the following potential effects to sea turtles and Gulf sturgeon and has concluded that the species are not likely to be adversely affected by the proposed actions for several reasons. Effects include the risks of being struck by transiting vessels, cutterhead and mechanical dredge-related activities, and deployment of material from the barges. Due to the species' mobility, natural avoidance behaviors, and the slow transit speed of the towed barges (5 knots or less), the risk of injury will be discountable. Compliance with NMFS's *Sea Turtle and Smalltooth Sawfish Construction Conditions*, dated March 23, 2006 (enclosed), will further reduce the risk as it requires work to stop if a listed species is observed within 50 ft of operating or moving machinery. NMFS believes that the temporary pipeline put in place to pump sediment from the dredged material disposal site to the marsh creation area will not adversely affect or impede the passage or transit of any of these species, as they can simply avoid it, or swim over, under, or around it; thus, any effects of pipeline presence are insignificant.

Sea turtles and Gulf sturgeon may be temporarily unable to use the sites for foraging or shelter habitat due to avoidance of construction activities, related noise, and physical exclusion from areas blocked by turbidity curtains. These effects will be temporary and insignificant, given the projects' small footprints, short construction durations, and turbidity controls that will only

¹ Northwest Atlantic Ocean distinct population segment (DPS)

² Green turtles are listed as threatened except for the Florida and Pacific coast of Mexico breeding populations, which are listed as endangered.

enclose a small portion of the project sites and will be removed after construction. In addition, the Hancock County, Swift Tract, and Pensacola Bay project activities will occur between May and October when Gulf sturgeon are found primarily in freshwater rivers. Activities at Cat Point will occur during the winter months when the tide is at its lowest so cranes can work from shore. Due to the shallow water depths, that particular project area provides poor foraging and refuge habitat for sturgeon. Gulf sturgeon are suction feeders, using their relatively narrow mouths to funnel water and prey items. Because of their feeding morphology, they are usually found at slightly deeper depths (greater than 6 ft) where there is lower wave energy. There is ample available foraging and refuge habitat for Gulf sturgeon outside of, but adjacent to, the Cat Point site just offshore where the depths provide more suitable habitat to Gulf sturgeon.

The essential features for the conservation of Gulf sturgeon present in Units 8, 9, and 13 are: (1) abundant prey items; (2) water quality and sediment quality necessary for normal behavior, growth, and viability of all life stages; and (3) safe and unobstructed migratory pathways necessary for passage within and between riverine, estuarine, and marine habitats. Of these essential features, NMFS believes prey abundance, water quality, and sediment quality may be affected.

The prey abundance essential feature may be affected by burial or excavation of Gulf sturgeon foraging sites during marsh creation, flotation channel dredging, and oyster reef creation. The temporary loss of prey species within the project area will not appreciably decrease the prey available to Gulf sturgeon as there are abundant, similar, nearby foraging habitats. Any decrease in numbers of these prey species would be minimal in relation to their numbers across the entire critical habitat units or nearby areas. Prey species can quickly recolonize the project areas after construction; thus, effects to the prey abundance essential feature of critical habitat will be insignificant. Furthermore, effects to the ecological functions and values of the critical habitat units for Gulf sturgeon will be insignificant.

The marsh creation projects will likely have a beneficial impact on Gulf sturgeon by increasing prey abundance in adjacent areas. Partyka and Peterson (2008) found even the smallest patches of marsh habitat supported a larger diversity of fauna than nearby areas.³ Therefore, it is likely that Gulf sturgeon prey species (e.g., amphipods, lancelets, polychaetes, gastropods, ghost shrimp, isopods, mollusks, and crustaceans) will benefit from the restoration of a marsh area with native vegetation. While some of this enhanced prey abundance will remain in the marsh and not be available to Gulf sturgeon for foraging, we believe that directly (through spillover) or indirectly (through trophic movement) prey abundance will be increased in areas accessible to foraging Gulf sturgeon. This spillover effect is supported by Whaley and Minello's (2002) findings of the strong trophic link between infauna and nekton near the marsh edge and the high fishery productivity derived from Gulf coast marshes.⁴

Water quality will be temporarily affected by disturbance to the bottom sediments during dredging activities. The effects are expected to be insignificant, given that increases in turbidity

³ Partyka, M.L. and M.S. Peterson. 2008. Habitat quality and salt-marsh assemblages along an anthropogenic estuarine shoreline. *Journal of Coastal Research* 24(6):1570-1581.

⁴ Minello, T.J., K.W. Able, M.P. Weinstein, and C.G. Hays. 2003. Salt marshes as nurseries for nekton: testing hypotheses on density, growth, and survival through meta-analysis. *Marine Ecology Progress Series* 246:39-59.

will be temporary and minimized by the use of turbidity curtains. In addition, sediments will settle out of the water column quickly, and/or tidal currents will disperse the disturbed sediments to baseline conditions. We do not expect any adverse changes to the sediment quality from the proposed dredging, as the composition of the dredged materials to be replaced (put back into the flotation channels, post project construction) in critical habitat are from the same approximate area in critical habitat, and therefore are expected to be similar or identical to those that are currently present.

Finally, we concur with your project-effect determinations that the projects for which you requested ESA consultations are not likely to adversely affect Kemp's ridley, loggerhead, or green sea turtles, Gulf sturgeon, or Gulf sturgeon critical habitat in Units 8, 9, and 13.

This concludes the NOAA Restoration Center's consultation responsibilities under the ESA for species under NMFS's purview. Consultation must be reinitiated if a take occurs or new information reveals effects of the action not previously considered, or the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat in a manner or to an extent not previously considered, or if a new species is listed or critical habitat is designated that may be affected by the identified action.

We've enclosed additional relevant information for your review. We look forward to further cooperation with you on other projects to ensure the conservation of our threatened and endangered marine species and designated critical habitat. If you have any questions about this consultation, please contact Joyce Barkley-Hahn, Consultation Biologist, at (727) 551-5741, or by email at joyce.barkley-hahn@noaa.gov.

Sincerely,



for Roy E. Crabtree, Ph.D.
Regional Administrator

- Enc.: 1. *Sea Turtle and Smalltooth Sawfish Construction Conditions* (Revised March 23, 2006)
2. *Measures for Reducing Entrapment Risk to Protected Species* (Revised May 22, 2012)
3. *Standard Manatee Conditions for In-Water Work* (Dated 2011).

File: 1514-22C.

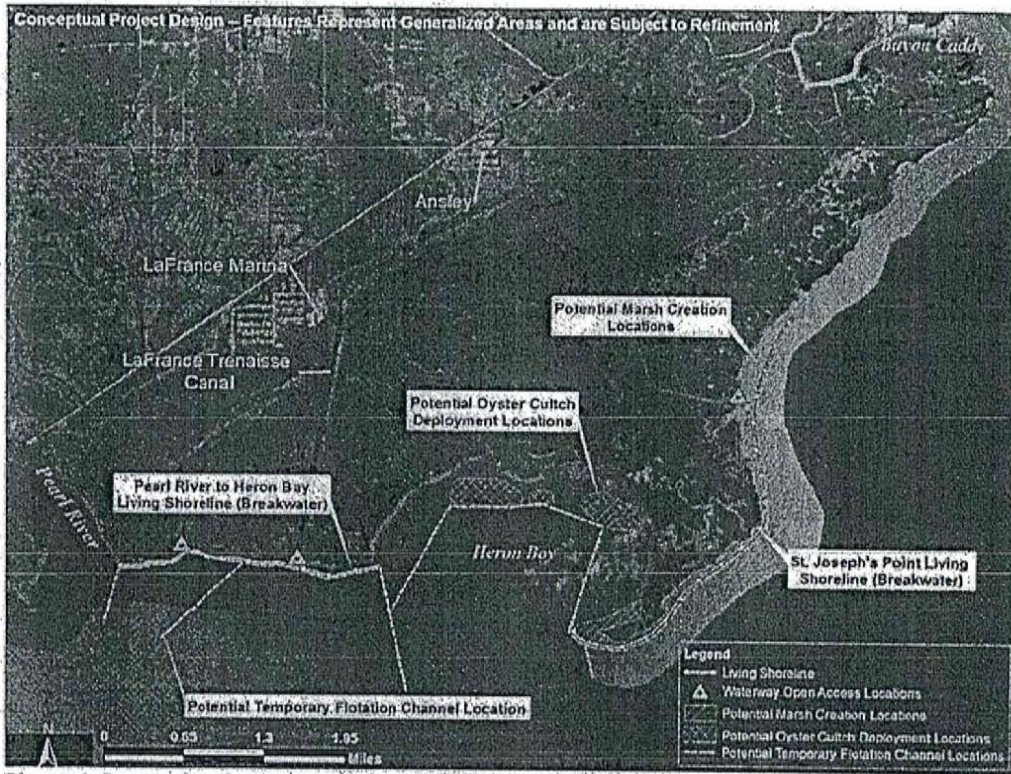


Figure 1. Image showing Hancock County Marsh project locations (©2012 Google, TerraMetrics)



Figure 2. Image showing Swift Tract project location (©2012 Google, TerraMetrics)

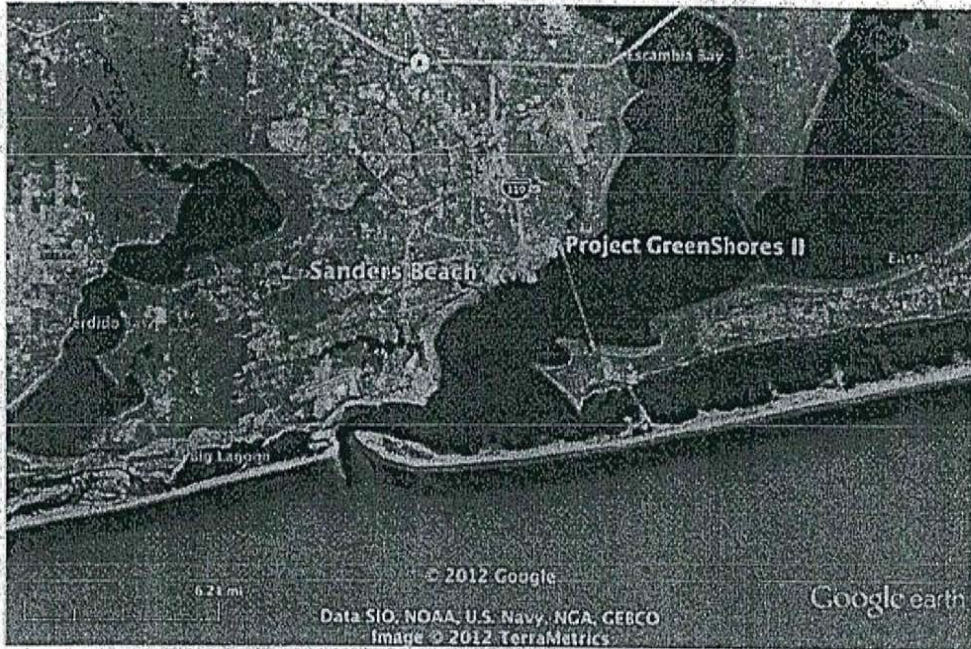


Figure 3. Image showing Pensacola Bay project locations (©2012 Google, TerraMetrics, data SIO, NOAA, U.S. Navy, NGA, GEBCO)

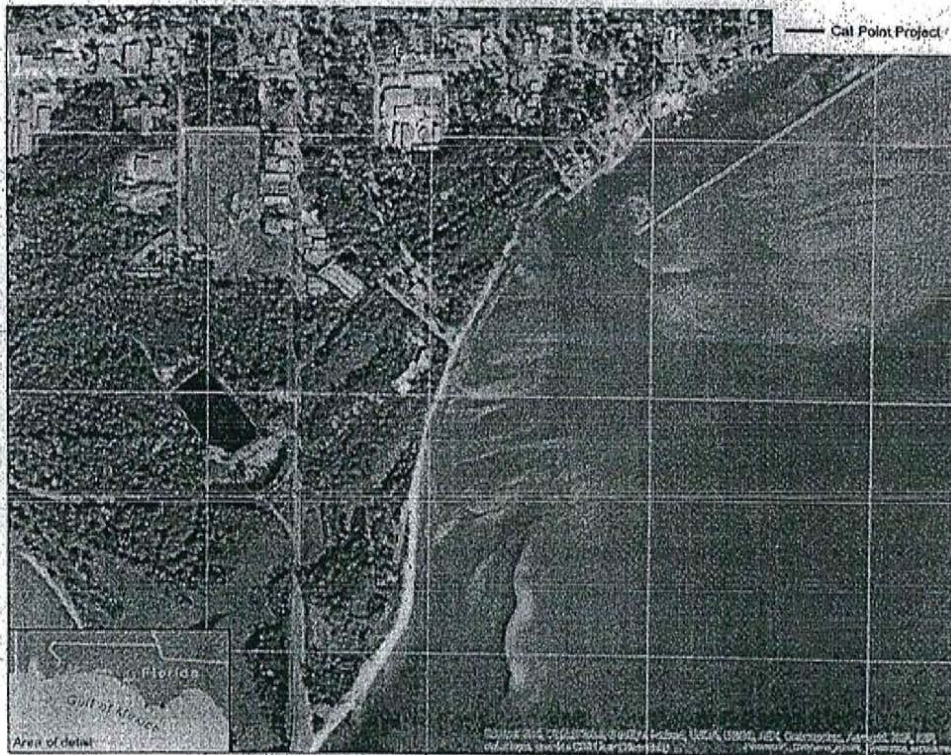


Figure 4. Image showing Cat Point project locations (©ESRI, DigitalGlobe, GeoEye, I-cubed; USDA, USGS, AEX, Getmapping, IGN, IGP, Swisstopo, GIS User Community)

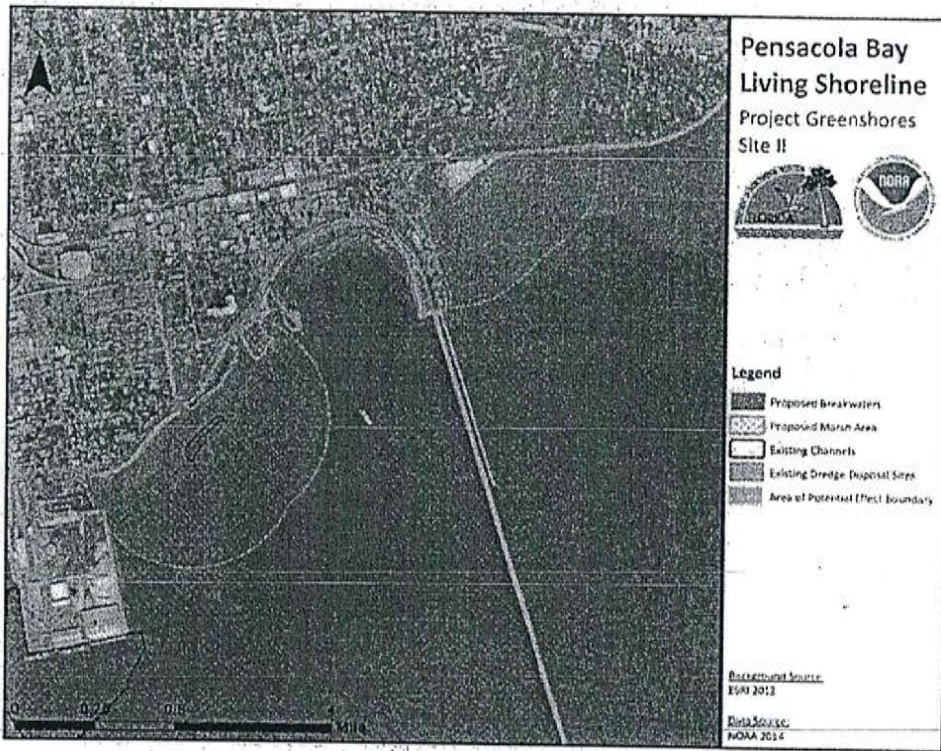


Figure 5. Image showing existing dredge disposal sites at PGSII

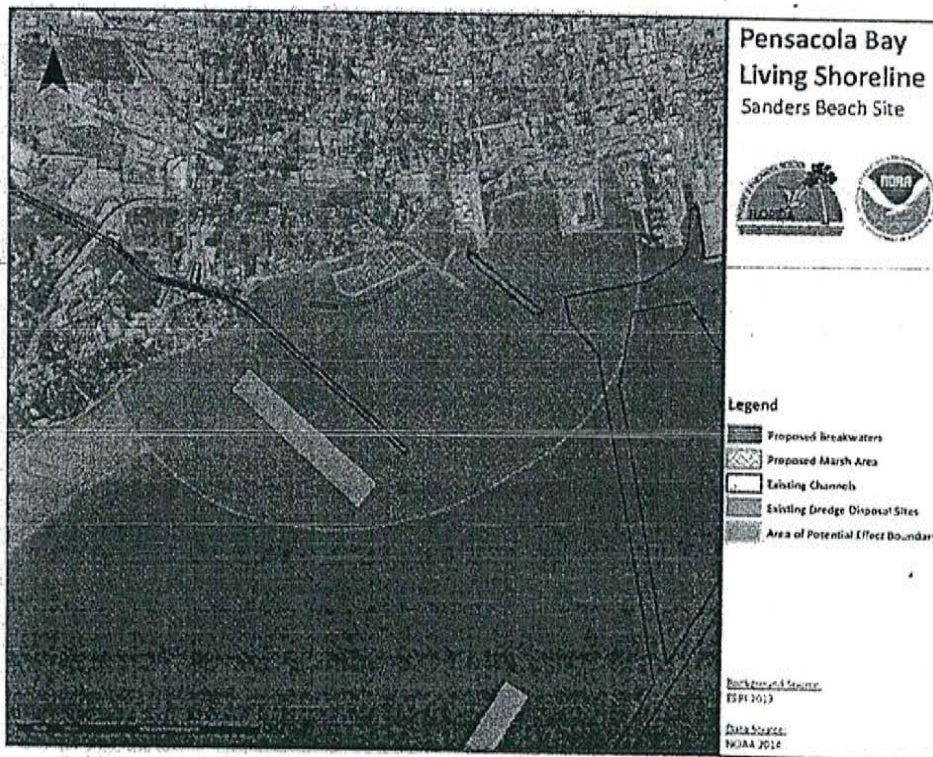


Figure 6. Image showing existing dredge disposal sites at Sanders Beach

SEA TURTLE AND SMALLTOOTH SAWFISH CONSTRUCTION CONDITIONS

The permittee shall comply with the following protected species construction conditions:

- a. The permittee shall instruct all personnel associated with the project of the potential presence of these species and the need to avoid collisions with sea turtles and smalltooth sawfish. All construction personnel are responsible for observing water-related activities for the presence of these species.
- b. The permittee shall advise all construction personnel that there are civil and criminal penalties for harming, harassing, or killing sea turtles or smalltooth sawfish, which are protected under the Endangered Species Act of 1973.
- c. Siltation barriers shall be made of material in which a sea turtle or smalltooth sawfish cannot become entangled, be properly secured, and be regularly monitored to avoid protected species entrapment. Barriers may not block sea turtle or smalltooth sawfish entry to or exit from designated critical habitat without prior agreement from the National Marine Fisheries Service's Protected Resources Division, St. Petersburg, Florida.
- d. All vessels associated with the construction project shall operate at "no wake/idle" speeds at all times while in the construction area and while in water depths where the draft of the vessel provides less than a four-foot clearance from the bottom. All vessels will preferentially follow deep-water routes (e.g., marked channels) whenever possible.
- e. If a sea turtle or smalltooth sawfish is seen within 100 yards of the active daily construction/dredging operation or vessel movement, all appropriate precautions shall be implemented to ensure its protection. These precautions shall include cessation of operation of any moving equipment closer than 50 feet of a sea turtle or smalltooth sawfish. Operation of any mechanical construction equipment shall cease immediately if a sea turtle or smalltooth sawfish is seen within a 50-ft radius of the equipment. Activities may not resume until the protected species has departed the project area of its own volition.
- f. Any collision with and/or injury to a sea turtle or smalltooth sawfish shall be reported immediately to the National Marine Fisheries Service's Protected Resources Division (727-824-5312) and the local authorized sea turtle stranding/rescue organization.
- g. Any special construction conditions, required of your specific project, outside these general conditions, if applicable, will be addressed in the primary consultation.

Revised: March 23, 2006



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southeast Regional Office
263 13th Avenue South
St. Petersburg, Florida 33701-5505
(727) 824-5312; FAX (727) 824-5309
<http://sero.nmfs.noaa.gov>

Measures for Reducing Entrapment Risk to Protected Species

Bottlenose dolphins, sea turtles, and Gulf sturgeon (protected species) are known to inhabit coastal waters of the northern Gulf of Mexico. Bottlenose dolphins are protected under the Marine Mammal Protection Act (MMPA) and sea turtles and Gulf sturgeon are protected under the Endangered Species Act (ESA). Because of the potential for these protected species to become entrapped within coastal waters of construction sites along the northern Gulf coast, projects that enclose shallow open water areas for wetland creation or nourishment will use the following measures to minimize the potential for entrapment:

- 1. Pre-construction planning.** During project design, the Federal Action Agency or project proponents must incorporate at least one escape route into the proposed retention structure(s) to allow any protected species to exit the area(s) to be enclosed. Escape routes must lead directly to open water outside the construction site and must have a minimum width of 100 feet. Escape routes should also have a depth as deep as the deepest natural entrance into the enclosure site and must remain open until a thorough survey of the area, conducted immediately prior to complete enclosure, determines no Protected Species are present within the confines of the structure (see item 5 below for details).
- 2. Pre-construction compliance meeting.** Prior to construction, the Federal Action Agency, project proponents, the contracting officer representative, and construction personnel should conduct a site visit and meeting to develop a project-specific approach to implementing these preventative measures.
- 3. Responsible parties.** The Federal Action Agency will instruct all personnel associated with the project of the potential presence of protected species in the area and the need to prevent entrapment of these animals. All construction personnel will be advised that there are civil and criminal penalties for harming, harassing, or killing protected species. Construction personnel will be held responsible for any protected species harassed or killed as a result of construction activities. All costs associated with monitoring and final clearance surveys are the responsibility of project proponents and must be incorporated in the construction plan.
- 4. Monitoring during retention structure construction.** It is the responsibility of construction personnel to monitor the area for protected species during dike or levee construction. If protected species are regularly sighted over a 2 or 3 day period within the enclosure area during retention structure assembly, construction personnel must notify the Federal Action Agency. It is the responsibility of the Federal Action Agency



to then coordinate with the National Marine Fisheries Service (NMFS) Marine Mammal Health and Stranding Response team (1-877-WHALE HELP [1-877-942-5343]) or the appropriate State Coordinator for the Sea Turtle Stranding and Salvage Network (see http://www.sefsc.noaa.gov/species/turtles/stranding_coordinators.htm) to determine what further actions may be required. Construction personnel may not attempt to scare, herd, disturb, or harass the protected species to encourage them to leave the area.

5. **Pre-closure final clearance.** Prior to completing any retention structure by closing the escape route, the Federal Action Agency will insure that the area to be enclosed is observed for protected species. Surveys must be conducted by experienced marine observers during daylight hours beginning the day prior to closure and continuing during closure. This is best accomplished by small vessel or aerial surveys with 2-3 experienced marine observers per vehicle (vessel/helicopter) scanning for protected species. Large areas (e.g. >300 acres) will likely require the use of more than one vessel or aerial survey to insure full coverage of the area. These surveys will occur in a Beaufort sea state (BSS) of 3 feet or less, as protected species are difficult to sight in choppy water. Escape routes may not be closed until the final clearance determines the absence of protected species within the enclosure sight.
6. **Post closure sightings.** If protected species become entrapped in an enclosed area, the Federal Action Agency and NMFS must be immediately notified. If observers note entrapped animals are visually disturbed, stressed, or their health is compromised then the Action Agency may require any pumping activity to cease and the breaching of retention structures so that the animals can either leave on their own or be moved under the direction of NMFS.
 - a. In coordination with the local stranding networks and other experts, NMFS will conduct an initial assessment to determine the number of animals, their size, age (in the case of dolphins), body condition, behavior, habitat, environmental parameters, prey availability and overall risk.
 - b. If the animal(s) is/are not in imminent danger they will need to be monitored by the Stranding Network for any significant changes in the above variables.
 - c. Construction personnel may not attempt to scare, herd, disturb, or harass the protected species to encourage them to leave the area. Coordination by the Federal Action Agency with the NMFS SER Stranding Coordinator may result in authorization for these actions.
 - d. NMFS may intervene (catch and release and/or rehabilitate) if the protected species are in a situation that is life threatening and evidence suggests the animal is unlikely to survive in its immediate surroundings.
 - e. Surveys will be conducted throughout the area at least twice or more in calm surface conditions (BSS 3 feet or less), with experienced marine observers, to determine whether protected species are no longer present in the area.

Revised: May 22, 2012

While NMFS recommends these best management practices to prevent the future takes of marine mammals by entrapment, use of these measures cannot guarantee a take will not occur. Following these measures does not constitute compliance with the MMPA's Incidental Take requirements and take is not authorized.

STANDARD MANATEE CONDITIONS FOR IN-WATER WORK
2011

The permittee shall comply with the following conditions intended to protect manatees from direct project effects:

- a. All personnel associated with the project shall be instructed about the presence of manatees and manatee speed zones, and the need to avoid collisions with and injury to manatees. The permittee shall advise all construction personnel that there are civil and criminal penalties for harming, harassing, or killing manatees which are protected under the Marine Mammal Protection Act, the Endangered Species Act, and the Florida Manatee Sanctuary Act.
- b. All vessels associated with the construction project shall operate at "Idle Speed/No Wake" at all times while in the immediate area and while in water where the draft of the vessel provides less than a four-foot clearance from the bottom. All vessels will follow routes of deep water whenever possible.
- c. Siltation or turbidity barriers shall be made of material in which manatees cannot become entangled, shall be properly secured, and shall be regularly monitored to avoid manatee entanglement or entrapment. Barriers must not impede manatee movement.
- d. All on-site project personnel are responsible for observing water-related activities for the presence of manatee(s). All in-water operations, including vessels, must be shutdown if a manatee(s) comes within 50 feet of the operation. Activities will not resume until the manatee(s) has moved beyond the 50-foot radius of the project operation, or until 30 minutes elapses if the manatee(s) has not reappeared within 50 feet of the operation. Animals must not be herded away or harassed into leaving.
- e. Any collision with or injury to a manatee shall be reported immediately to the Florida Fish and Wildlife Conservation Commission (FWC) Hotline at 1-888-404-3922. Collision and/or injury should also be reported to the U.S. Fish and Wildlife Service in Jacksonville (1-904-731-3336) for north Florida or in Vero Beach (1-772-562-3909) for south Florida, and emailed to FWC at ImperiledSpecies@myFWC.com.
- f. Temporary signs concerning manatees shall be posted prior to and during all in-water project activities. All signs are to be removed by the permittee upon completion of the project. Temporary signs that have already been approved for this use by the FWC must be used. One sign which reads *Caution: Boaters* must be posted. A second sign measuring at least 8½" by 11" explaining the requirements for "Idle Speed/No Wake" and the shut down of in-water operations must be posted in a location prominently visible to all personnel engaged in water-related activities. These signs can be viewed at http://www.myfwc.com/WILDLIFEHABITATS/manatee_sign_vendors.htm. Questions concerning these signs can be forwarded to the email address listed above.

CAUTION: MANATEE HABITAT

All project vessels

IDLE SPEED / NO WAKE

When a manatee is within 50 feet of work
all in-water activities must

SHUT DOWN

Report any collision with or injury to a manatee:



Wildlife Alert:

1-888-404-FWCC(3922)

cell *FWC or #FWC



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southeast Regional Office
263 13th Avenue South
St. Petersburg, Florida 33701-5505
<http://sero.nmfs.noaa.gov>

SEP 26 2014 F/SER31:JBH

MEMORANDUM FOR: F/HC3 – Leslie Craig

FROM: *for* F/SE – Roy E. Crabtree, Ph.D. *Michael M. Cronin*

SUBJECT: Amendment to Deepwater Horizon-Early Restoration Plan Phase III, Endangered Species Act Section 7 Consultations for 4 Living Shoreline Projects and Mississippi's Popp's Ferry Causeway Park

	Applicant	NMFS Number	Location
1	Mississippi Department of Environmental Quality	SER-2014-12925	Hancock County, Mississippi
2	NOAA Restoration Center – Southeast Regional Office	SER-2014-12926	Baldwin County, Alabama
3	Florida Department of Environmental Protection	SER-2014-13016	Escambia County, Florida
4	Florida Department of Environmental Protection	SER-2014-13083	Franklin County, Florida
5	Mississippi Department of Environmental Quality	SER-2014-13026	Harrison County, Mississippi

This memorandum responds to the National Oceanic and Atmospheric Administration (NOAA) Restoration Center's (RC) April 21, 2014, request for amendments to the National Marine Fisheries Service (NMFS) Section 7 concurrence letters of April 11, 2014, and May 6, 2014, regarding the above-referenced projects. The project-effects determinations were based on information provided by the NOAA RC and NMFS's review of published literature. We concurred with your determinations that the proposed activities may affect, but are not likely to adversely affect, 3 sea turtle species (green, Kemp's ridley, and loggerhead) and Gulf sturgeon. Additionally, for the 4 living shoreline projects (SER-2014-12925, -12926, -13016, and -13083), we concurred with your determination that the proposed activities will not adversely affect designated Gulf sturgeon critical habitat in Units 8, 9, and 13.

You initially indicated Projects 1, 2, and 3 would be constructed within the May-October timeframe to avoid potential impacts to migrating Gulf sturgeon. However, the applicants currently face considerable uncertainty regarding project implementation timing and are unable to commit to conducting in-water activities during the period from May to October. We relied in part on the commitment to conduct in-water activities from May to October to support our conclusion that temporary exclusion from the sites will have an insignificant effect on Gulf sturgeon because Gulf sturgeon are generally found in freshwater rivers during this period. However, the primary basis for our conclusion of the effects analyses were the projects' small footprints, the short construction durations, and the fact that turbidity controls, if used, will only enclose a small portion of the project sites and will be removed after construction (as explained below, turbidity curtains will not be used for Projects 1, 2, and 5). Thus, we have determined



that the change in Projects 1, 2, and 3 do not alter our effects analysis, and any effects caused by the temporary exclusion from foraging or shelter habitat will be insignificant.

In our letters, we erroneously included the use of floating turbidity curtains in the descriptions of the proposed activities for Projects 1, 2, and 5. NOAA RC has provided information indicating that floating turbidity curtains will not be used for these 3 projects. It is our understanding that for the Swift Tract project in Alabama (SER-2014-12926), curtains are not required by the Alabama Department of Environmental Management if the water clarity is monitored and turbidity remains under 50 nephelometric turbidity units (NTU). For the Hancock County project in Mississippi (SER-2014-12925), Florence Watson of the Mississippi Department of Environmental Quality replied in an email to the applicant that, "Turbidity screens are required for activities that will be ongoing for a significant period of time. [The Hancock County project] is temporary in nature, has minimal construction activities in water, and the construction timeframe is very short. Also, the water quality standard establishes that turbidity shall not exceed 50 NTUs of the ambient turbidity outside a 750-foot mixing zone. This activity will likely occur well within this mixing zone and is not expected to disturb the water bottoms to an extent to exceed this standard." It is our understanding that this same reasoning applies to the Harrison County, Mississippi project (SER-2014-13026) as the projects are of similar scale. For these 3 projects, turbidity is expected to remain below 50 NTUs. In addition, the species have the ability to move away from the project sites and will likely avoid construction activities. Therefore, we conclude that any effects caused by this minor modification to the proposed actions will be insignificant.

Consultation must be reinitiated if a take occurs or new information reveals effects of the action not previously considered, or the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat in a manner or to an extent not previously considered, or if a new species is listed or critical habitat is designated that may be affected by the identified action. If you have any questions about this consultation, please contact Joyce Barkley-Hahn, Consultation Biologist, at (727) 551-5741, or by email at joyce.barkley-hahn@noaa.gov.



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Silver Spring, MD 20910

MEMORANDUM FOR: David M. Bernhart, Assistant Regional Administrator for
Protected Resources
Protected Resources Division (PRD)

FROM: Jamie Schubert, Marine Habitat Resource Specialist
Restoration Center

SUBJECT: *Deepwater Horizon* Early Restoration Phase III - Hancock
County Marsh Living Shoreline Project: Re-Initiation of
ESA Consultation

I. Introduction

The Hancock County Marsh Living Shoreline project is part of a suite of projects approved for implementation in the Final Phase III Early Restoration Plan for the *Deepwater Horizon* Oil Spill (Final Phase III ERP/PEIS). The NOAA Restoration Center and Mississippi Department of Environmental Quality (MDEQ) are the action agencies for implementation of this project.

In 2014, the NOAA Restoration Center initiated an ESA consultation with the NMFS Protected Resource Division, Southeast Regional Office (PRD SERO) for this project, along with three other living shoreline projects, as then proposed for inclusion in the Phase III Early Restoration Plan. On April 11, 2014, PRD SERO issued a letter of concurrence, concluding that implementation of the Hancock County project is Not Likely to Adversely Affect four species of sea turtles and the Gulf sturgeon. Because the April 11, 2014 concurrence letter had erroneously included the use of floating turbidity curtains in Mississippi, PRD SERO issued a revised letter of concurrence on September 26, 2014, concluding again that the Hancock County project May Affect but are Not Likely to Adversely Affect four species of sea turtles and the Gulf sturgeon.

Additional surveys, engineering, and design activities since the 2014 letter of concurrence have resulted in some modifications to the Hancock County project. The NOAA Restoration Center and the MDEQ have reviewed the prior letters of concurrence (attached). The project has not changed in scope and the site conditions remain the same as those described and considered in the previous consultation for this action, but the changes in the project's footprint in our view warranted re-initiating the ESA consultation with PRD SERO. The NOAA Restoration Center is unaware of any new information that would change the previous determinations, however. The NOAA Restoration Center and the MDEQ will still implement the project as described in the 2014 letters of concurrence

from NOAA PRD, including adherence to the precautionary measures, best management practices and requirements as described in those letters. Therefore, the NOAA Restoration Center has determined that the Hancock County project, if implemented as modified during its further engineering and design, May Affect but is still Not Likely to Adversely Affect sea turtles and the Gulf sturgeon.

Table 1 – Species evaluated in the initial and re-initiated consultation

SPECIES	STATUS	DETERMINATION
Gulf sturgeon	Threatened	May affect, but not likely to adversely affect
Leatherback sea turtle	Endangered	May affect, but not likely to adversely affect
Kemp’s ridley sea turtle	Endangered	May affect, but not likely to adversely affect
Green sea turtle	Threatened/Endangered	May affect, but not likely to adversely affect
Loggerhead sea turtle	Threatened	May affect, but not likely to adversely affect

II. Description of Project Modifications:

The Final Phase III ERP/PEIS and the Biological Assessment submitted to initiate the original consultation stated that the Hancock County project in Mississippi included construction of three components: 46 acres of marsh, 46 acres of submerged reef, and 5.9 miles of intertidal breakwaters. During the engineering and design phase for the project, additional background studies were conducted to determine the most effective project design to reduce shoreline erosion, restore salt marsh habitat, and restore benthic habitats at the site.

Based on the information provided by these studies, the NOAA Restoration Center and MDEQ determined the breakwater height and base width would have to increase to provide the desired level of shoreline protection. Also, sediment cores taken in Heron Bay revealed a more desirable bottom substrate for the subtidal reef construction in the northwestern portion of Heron Bay than in the northeastern portion. On that basis, the submerged reef footprint was shifted to the northwestern portion of the bay. The construction methodology for the breakwater and sub-tidal reef components were further refined and the temporary flotation channel/sidecasting of sediments became unnecessary and was eliminated from the project, which reduces the potential construction impacts to species and critical habitats. The marsh creation footprint has also been refined and will now be located entirely within Heron Bay and the tidal creeks between Heron Bay and the Mississippi Sound. The 2014 ESA consultation anticipated the marsh footprint would be both in Heron Bay and also on the landward side of the breakwater. The following summarizes the project’s specific design changes:

- The breakwater height will be increased from Mean Low Water to Mean High High Water to facilitate increased shoreline protection;

- Commensurate with breakwater height increase, the breakwater base width will be increased from 30 feet to 60 feet resulting in a net increase in the breakwater footprint of 23 acres;
- Approximately 123.1 acres of the flotation channels/sidecast sediments will be eliminated from the project;
- The Potential Subtidal Reef Deployment Area shown in the Final Phase III ERP/PEIS has been refined based on field studies. The Refined Subtidal Reef Deployment Area is a 200 acre area in the western portion of Heron Bay. Approximately 46 acres of cultch will be deployed in one to several locations within this area (Figure 1).
- The Potential Marsh Creation Area shown in the Final Phase III ERP/PEIS has been refined based on field studies. The Refined Marsh Creation Area is a 76 acre area in the southeastern portion of Heron Bay. Approximately 46 acres of marsh will be created in one to several locations within this area (Figure 1).

Figure 1 depicts the resulting modifications to the project's footprint and Table 2 quantifies the specific increases and decreases in the overall footprint. These changes do not impact the project's overall objectives, which are to 1) construct reef structures to protect shoreline from erosion and support secondary productivity; 2) restore marsh habitat, and 3) restore subtidal reefs to support secondary productivity.

Figure 1. Modified Hancock County Marsh Living Shoreline Project Footprint compared to previously evaluated component areas

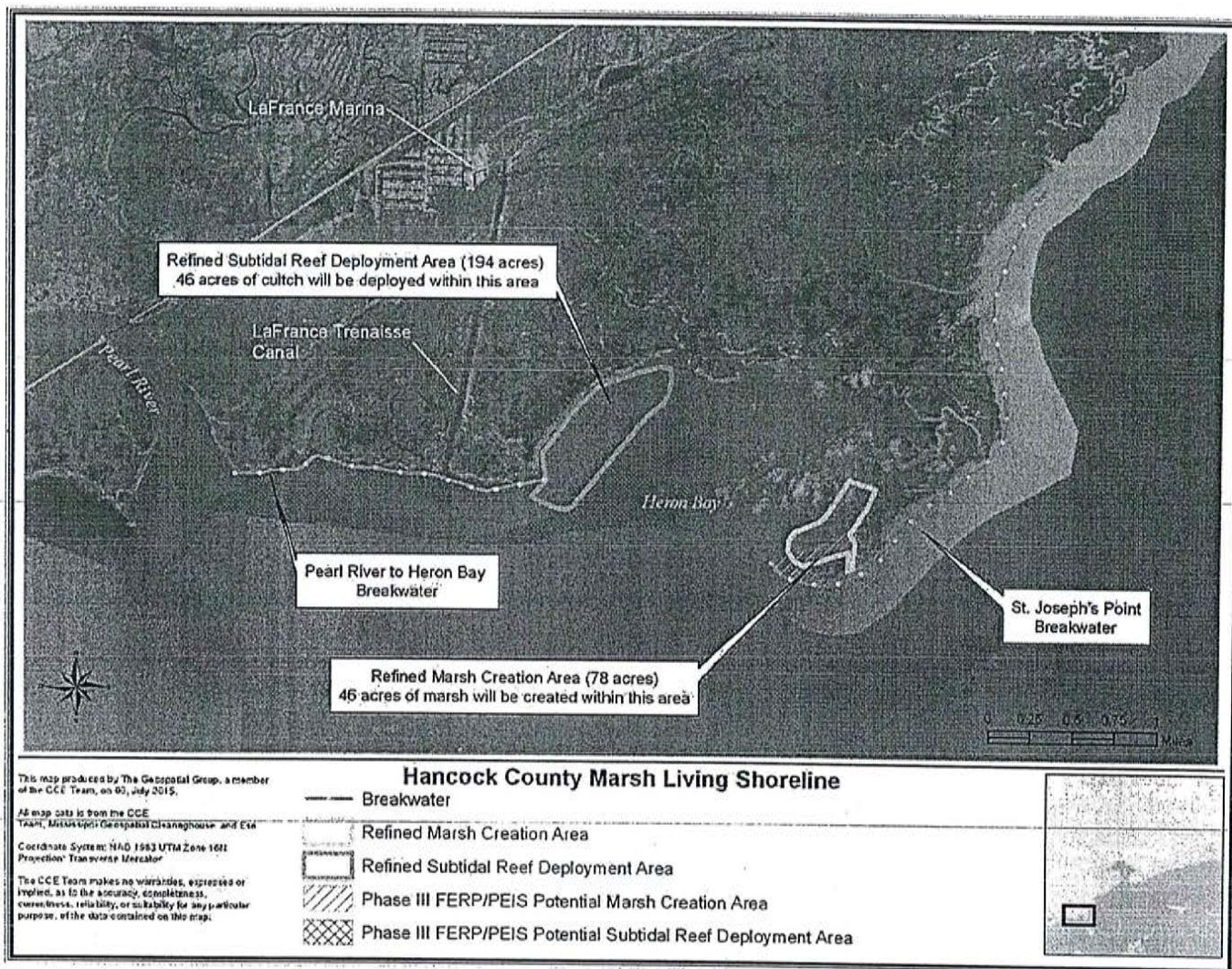


Table 2. Summary of Originally Identified Impacts and Modified Impacts.

Project Component	Impact Type	Revised Impact Type (per Design Change)	Duration of Impact	Habitat Type Impacted	Acreege of Impact (per Phase 3 PEIS)	Revised Acreege of Impact (per Design Change)	Increase/(Decrease) in Acreege of Impact (per Design Change)
St. Joseph's Point Area Breakwater Construction Activity Area	Filling fine-grained sediment with riprap, covered with bagged shell veneer	Filling fine-grained sediment with riprap over geotextile/geogrid layer	Long-Term	Shallow water/fine-grained sediment bottom	14.4	29.1	14.7
Pearl River to Heron Bay Breakwater Construction Activity Area	Filling fine-grained sediment with riprap, covered with bagged shell veneer	Filling fine-grained sediment with riprap over geotextile/geogrid layer	Permanent	Shallow water/fine-grained sediment bottom	5.5	13.8	8.3
Temporary Flotation Channels (breakwaters and subtidal reefs)	Excavation of sea bottom	None	Short-Term	Water depths of 2 to 8 feet with fine-grained sediment bottom	101	0	(101.0)
Temporary Flotation Channel Sidecast material	Placement of excavated sea bottom of seaward side of flotation channels or for use in marsh creation	None	Short-Term	Water depths of 2 to 8 feet with fine-grained sediment bottom	22.9	0	(22.9)
Subtidal Reefs in Heron Bay	Filling with Cultch (shells, limestone)	Filling with Cultch (shells, limestone); siting refined based on siting study	Long-Term	Shallow water/hard bottom	46	46	0.0
Marsh Creation (Inside Heron Bay)	Filling with suitable material	Filling with suitable material; site for marsh creation selected	Long-Term	Shallow water with fine-grained sediment bottom	46	46	0.0
Total Temporary Impacts					123.9	0	(123.9)
Total Permanent Impacts					111.9	134.9	23.0
Total Impacts					242.2	134.9	(100.9)

III. Construction Methodology:

The project's current construction methods and activities are described below in order to determine whether any construction activities are likely to impact species or critical habitats. Actual construction methods and activities have been updated since the initial consultation based on the final design.

A. Breakwaters

The specific breakwater construction elevation (Mean Higher High Water) was selected to maximize shoreline protection (Table 3). Construction will include placement of linear structures that would utilize natural stone and/or shell-based materials. The alignment and limits of the breakwaters would be surveyed; the alignment of the breakwaters would be marked by rock "pods" that would be a minimum of one foot above the Mean Higher High Water (MHHW) surface. The rock pods would be coordinated with the US Coast Guard but have been used in other Gulf regions for habitat projects as a visual marker for recreational mariners. The height of the breakwaters along the alignment would be constructed based on bottom elevations and the initial crest elevation (2.0 ft. NAVD 88; 2.4 ft. Mean Lower Low Water). The initial constructed elevation includes an allowance for short term consolidation and sea level rise. Barriers, navigation warning signs (as required by the U.S. Coast Guard), and other safety devices would be required and utilized during construction.

Table 3. Updated Breakwater specifications for the Hancock County Marsh LSL.

Breakwater Design Criteria	St. Joseph's Point Breakwater (eastern reach)	Pearl River to Heron Bay Breakwater (western reach):
Total project length	Approx. 4 miles	Approx. 1.9 miles
Total project acreage	29.1 acres	13.8 acres
Crest width	15.0 ft.	15.0 ft.
Base width	60 ft. (maximum)	60 ft. (maximum)
Assumed bottom elevation	-3.5 NAVD 88	-3.5 NAVD 88
Total structure height	5.0 to 6.0 ft.	5.0 to 6.0 ft.
Riprap volume	132,000 cubic yards	58,000 cubic yards
Thickness of material (riprap)	5.0 to 6.0 ft.	5.0 to 6.0 ft.
Estimated initial settlement	0.5ft.	0.5ft.
Design side slopes (Seaward Face)	5v:1h	5v:1h
Design side slopes (Landward Face)	3v:1h	3v:1h
Breakwater distance from shoreline	20 to 400 ft.	-40 to 150ft.
Reach of each breakwater	180ft.	180ft.
Design Crest Height	1.4 ft. NAVD88 (MHHW)	1.4 ft. NAVD 88 (MHHW)
Width of gaps at design crest height	25 ft.	25 ft.

The dimensions for the breakwaters would be approximately 60 ft. wide (maximum) at the base and approximately 15 ft. wide at the crest (Table 3).

The breakwaters would be constructed using graded stone. The breakwater material would be transported to the work area on barges and installed by a crane located on a separate barge. Placement of the breakwater material would be monitored to ensure the breakwater dimensions, slopes, and crest elevations are achieved. The deployment of the breakwater material may extend over a period of ten to twelve months. Major construction activities would adhere to the Sea turtle and Smalltooth Sawfish Construction Conditions (NMFS, 2006) and will minimize the potential for impacting Gulf Sturgeon. Total installed volumes would be as follows:

- ***St. Joseph's Point Breakwater (eastern reach)***: The target depth for deployment is approximately -3.5 ft. NAVD 88, but could be between -3.0 and -5.0 ft. NAVD 88. The volume of placed material would be approximately 132,000 cubic yards of riprap. The breakwater would cover a footprint of approximately 29.1 acres of fine-grained sediment.
- ***Pearl River to Heron Bay Breakwater (western reach)***: The target depth for deployment is approximately -3.5 NAVD 88, but could be between -2.0 ft. and -5.0 ft. NAVD 88. The volume of placed material would be approximately 58,000 cubic yards of riprap. The breakwater would cover a footprint of approximately 13.8 acres of fine-grained sediment.

Temporary flotation channels for construction are no longer necessary and have been eliminated from the project. After completion of construction, the breakwater structure would be surveyed. It is not anticipated that permanent navigation signs would be required by the U.S. Coast Guard; visual features, above mean high tide, will be integrated into the rock structure. The location would be installed in accordance with safety requirements.

B. Creation of Marsh in the Vicinity of St. Joseph's Point

After the breakwater along St. Joseph's Point has been installed, area(s) landward of the breakwater and in Heron Bay would be filled with dredged material obtained from the MDMR Beneficial Use of Sediment Program if material is available, or a suitable, permitted borrow source or approved permitted dredging project. The marsh will mimic the adjacent marsh intertidal range. It is anticipated that an earthen dike would be constructed at the seaward extent of the marsh. Upon location of suitable material, the dike would be constructed by excavating existing material from the landward side of the proposed dike location, but not borrowing from the existing marsh. Once an area of the marsh is diked, the area landward of the dike would be filled with dredged material until final marsh grades are achieved. Dike and marsh fill sediments would be placed mechanically or pumped through a floating pipeline from a hydraulic dredge located

where suitable fill material or approved permitted dredge material is available. Pumps and sediment controls would remain in place throughout the dredging and filling process and after initial settling has occurred. Once the entire marsh area(s) is constructed, the area would be monitored for natural re-vegetation.

C. Placement of Subtidal Reef Cultch in Heron Bay

Crushed stone would be deployed in Heron Bay in water depths of -3 to -5 ft. NAVD 88 in areas that currently support or previously supported reef activities. Maps of historic reef areas within Heron Bay were investigated for thickness of soft muds, shell or shell hash and suitable bearing soils. Based on this investigation, an area has been identified that would support the subtidal reef (see Figure 1). A survey has been completed that identified suitable areas. The subtidal reefs materials would be deployed as a high-profile 6- to 9-inch-thick layer of crushed stone. Prior to deployment, the limits of the subtidal reef area(s) would be marked with buoys or poles. Crushed stone would be deployed by a barge-mounted crane with a clam shell bucket or other suitable method. A material barge would be moored to the crane barge. As a construction alternative, water jetting the material off of a barge may be used in case of water-depth constraints. Upon completion, the deployment area would be surveyed. Temporary flotation channels for this project component have been eliminated.

D. Best Management Practices

Throughout the design phase, every practical attempt has been and will continue to be made to avoid and minimize potentially adverse impacts to species and all protection measures identified in the original Biological Assessment and approved in the prior concurrence letters will be adhered to.

IV. Endangered Species Act Re-Initiation Criteria

A. Re-initiation criteria (50 CFR Ch. IV (10-1-08 Edition), Section 402, § 402.16)

1. The amount or extent of take specified in the incidental take statement is exceeded.

For the Hancock County Marsh Living Shoreline Project, this criterion is not applicable since there is no authorized take resulting from the consultations.

2. New information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered.

The proposed changes to the project design could change the *manner* in which the project may affect listed species, but the extent of effects will be similar or less than those analyzed under the previous designs. Therefore reinitiation of informal consultation is warranted, but the project remains not likely to adversely affect listed species. The width of the breakwater footprint has increased, but the flotation channels and spoil piles associated with the breakwater construction have been eliminated. The breakwater will still be placed at a similar water depth contour over soft grained sediment, which is the same as the conditions identified

in the original consultation. Further, although the breakwater footprint is increasing (+/- 23 acres), the overall footprint of breakwater related impacts is significantly reduced due to the elimination of flotation channels. The breakwater and flotation channels would have impacted approximately 93 acres, but with the elimination of the flotation channels this footprint is reduced to approximately 36 acres. The modified placement of the subtidal reef will not result in effects that were not previously considered since the northwestern portion of Heron Bay provides similar habitat to listed species as the northeastern portion of Heron Bay. The entire northern portion of Heron Bay is comprised of soft sediments underlain by varying thicknesses of broken shell material; however, the northwestern portion of the bay has a thinner layer of soft sediment making it more suitable for submerged reef placement. The marsh restoration will be accomplished using the same techniques as previously anticipated and will be within and adjacent to areas already evaluated in the initial concurrence.

3. *The identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion.*

The modifications will not cause an effect to a listed species or critical habitat that was not considered in the original Biological Assessment. As discussed above, although the breakwater footprint has been increased, the subtidal reef footprint has been shifted to the west, the marsh restoration footprint has been limited to Heron Bay only, and the flotation channels have been eliminated which significantly reduces the overall project footprint. Other than elimination of the flotation channels, the same construction methodologies and materials will be used to complete the project, so the project modifications will not cause any effects that were not previously identified.

4. *New species is listed or critical habitat designated that may be affected by the identified action.*

There have been no new species listed or critical habitat designated since the original consultation and concurrence.

B. Specific-Concurrence Considerations:

In addition to the re-initiation criteria evaluated above, the modified project was evaluated as compared to the criteria PRD applied during the consultation process. The initial April 11, 2014 concurrence letter stated “[t]he prey abundance essential feature may be affected by burial or excavation of Gulf sturgeon foraging sites during marsh creation, flotation channel dredging, and oyster reef creation. The temporary loss of prey species within the project area will not appreciably decrease the prey available to Gulf sturgeon as there are abundant, similar, nearby foraging habitats. Any decrease in numbers of these prey species would be minimal in relation to their numbers across the

entire critical habitat units or nearby areas. Prey species can quickly recolonize the project areas after construction; thus, effects to the prey abundance essential feature of critical habitat will be insignificant. Furthermore, effects to the ecological functions and values of the critical habitat units for Gulf sturgeon will be insignificant.” Further, on September 26, 2014, PRD prepared a revised concurrence letter which states “the primary basis for our conclusion of the effects analyses were the projects’ small footprints, the short construction durations, and the fact that turbidity controls, if used, will only enclose a small portion of the project sites and will be removed after construction (as explained below, turbidity curtains will not be used for Projects 1, 2, and 5¹).”

1. Prey Availability

The conditions related to prey availability have not changed related to the Hancock County project modifications discussed above as abundant, similar, and nearby foraging habits are still available. Additionally, the conclusion that the ability of prey species to quickly recolonize impacted areas would not change as a result of the project modifications discussed above.

2. Small Construction Footprint:

As described above, the construction footprint of the marsh and subtidal reef have stayed the same, but have been shifted out of the areas previously proposed, and the anticipated impacts from the breakwater and flotation channels have been reduced. Based upon the dimensions of the project submitted with the original biological assessment prepared by the MS Department of Environmental Quality, the breakwater and flotation channel impacts were approximately 128 feet wide (30 feet for breakwater and 98 feet for top of channel) by 6 miles long (31,680 linear feet). The total aerial footprint of both the breakwater and parallel flotation channel was 93 acres. By eliminating the flotation channels, as currently proposed, and increasing the breakwater width to 60 feet, the total aerial footprint impact is reduced to 36 acres. Overall, the construction footprint is less than in the initial consultation for the breakwater component and there has been no change to the marsh or submerged reef footprint.

3. Short Construction Durations:

The construction duration has not changed since the initial consultation.

VI. Conclusion

The NOAA Restoration Center seeks PRD SERO’s concurrence with the NOAA Restoration Center’s findings that the modified project and construction techniques may affect, but are not likely to adversely affect the four species of sea turtles and the Gulf sturgeon or Gulf sturgeon critical habitat. The basic elements of the proposed project that lead to the Restoration Center’s determination that the project was not likely to adversely

¹ In the concurrence letter, Project 5 was the Hancock County Marsh Living Shoreline Project. Therefore, an evaluation of impacts based on temporary use of flotation channels is not provided.

affect listed species in the earlier PRD concurrence letters have not changed related to the Hancock County Marsh Living Shoreline project.



United States Department of the Interior

FISH AND WILDLIFE SERVICE

1875 Century Boulevard

Atlanta, Georgia 30345

In Reply Refer To:
FWS/R4/DH NRDAR

March 14, 2016

Gary Rikard
Mississippi Department of Environmental Quality
Post Office Box 2261
Jackson, Mississippi 39225-2261

Re: Mississippi Hancock County Marsh Living Shoreline Project. *Deepwater Horizon* Oil Spill
Natural Resources Damage Assessment and Restoration (NRDAR)

Dear Mr. Rikard:

The Department of the Interior (DOI), on behalf of the National Oceanic and Oceanographic Administration, the U.S. Department of Agriculture, and the U.S. Environmental Protection Agency, has completed a review of the Mississippi Hancock County Marsh Living Shoreline Project under section 106 of the National Historic Preservation Act (NHPA). As part of this review, DOI consulted with the Mississippi State Historic Preservation Office, the Choctaw Nation of Oklahoma, the Alabama-Coushatta Tribe of Texas, the Kiowa Tribe of Oklahoma, the Coushatta Tribe of Louisiana, the Muscogee (Creek) Nation, the Caddo Nation, and the Thlopthlocco Tribal Town. DOI has concluded that this project will have "no adverse effect" on historic properties contingent on the following stipulations:

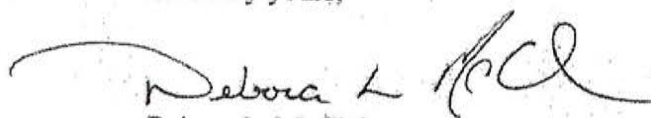
- Those areas containing known archaeological sites as identified in the cultural resource surveys that were conducted for this project, and a sufficient buffer around those sites adequate to protect those resources, will be designated as "no go zones" during project implementation. Construction crews will be provided with maps that identify the "no go zones" but do not specifically identify the location of the cultural resource.
- Training will be provided to the construction crews in the identification of potential cultural resources.
- The construction crews will be provided with procedures on the measures to take if such resources are discovered.
- In the event that archaeological locus JLC022B-0, identified during the pedestrian survey conducted as part of this project, cannot be avoided, additional archaeological assessment of the locus will take place to identify the site's significance prior to any work being conducted which may impact the site.

If any cultural or historic resources are discovered during the implementation of this project.

work must cease in the vicinity of the discovery and staff must contact James Chapman, DOI *Deepwater Horizon* Oil Spill NRDAR Section 106 Coordinator, at (404) 679-7060 or james_chapman@fws.gov. The discovery of cultural or historic resources may necessitate additional review of this project under NHPA Section 106.

If you have any questions, please contact James Chapman using the contact information listed above.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Debora L. McClain". The signature is fluid and cursive, with a large initial "D" and "M".

Debora L. McClain
Deputy DOI DH NRDAR Case Manager

MONITORING AND CORRECTIVE ACTION

The National Oceanic and Atmospheric Administration (NOAA) is working closely with the Hancock County Shoreline Restoration Design Team to evaluate the goals and objectives critical to the Natural Resource Damage Assessment (NRDA) process as well as the success of restoration for the three components of the project.

The Monitoring Plan will be developed to assess the project's performance towards meeting the following goals: (1) Construct reef structures to protect shoreline from erosion and support secondary production; (2) Restore marsh habitat; and (3) Restore submerged reefs to support secondary production. The following monitoring objectives have been developed to evaluate the three components, and specific performance standards are being developed to answer the questions related to each objective. These objectives will be evaluated over a 7-year post-construction monitoring period.

- Objective #1: Build living shorelines that are sustained for the expected lifespan of the project
 - Did the project achieve its design criteria?
 - Is the projected structure of the reefs being maintained?
 - Parameters: Reef Elevation and Reef Area

- Objective #2: Support habitat utilization of reefs by bivalves and other invertebrate infauna and epifauna
 - Are bivalves settling and growing on the reef structures?
 - Are other invertebrate infauna and epifauna colonizing the reef structures?
 - What is the biomass of invertebrate infauna and epifauna associated with the reef structures?
 - Parameters: Bivalve Density and Invertebrate Infauna and Epifauna Biomass

- Objective #3: Reduce shoreline erosion
 - Is wave energy being dissipated?
 - Is shoreline erosion being reduced?
 - Parameters: Shoreline Profile / Slope and Marsh Edge Position

- Objective #4: Create or enhance a marsh that is sustained for the expected lifespan of the project
 - Did the project achieve its design criteria?
 - Is the projected structure of the marsh being maintained?
 - Parameters: Marsh Elevation and Marsh Spatial Extent

- Objective #5: Promote establishment of native marsh vegetation
 - Is native marsh vegetation becoming established?
 - Parameters: Vegetative Species Composition and Percent Cover

- Objective #6: Create or enhance submerged reefs that are sustained for the expected lifespan of the project
 - Did the project achieve its design criteria?
 - Is the projected structure of the submerged reef being maintained?
 - Parameters: Reef Elevation and Reef Area
- Objective #7: Support habitat utilization of submerged reefs by bivalves and other invertebrate infauna and epifauna
 - Are bivalves settling and growing on the reef structures?
 - Are other invertebrate infauna and epifauna colonizing the reef structures?
 - What is the biomass of invertebrate infauna and epifauna associated with the submerged reef?
 - Parameters: Bivalve Density and Invertebrate Infauna and Epifauna Biomass

Corrective Action

Corrective actions may be undertaken, as funding allows, encouraging success of the Hancock County Marsh Living Shoreline Project. A variety of factors may influence management activities and corrective actions at the Hancock County LSL site; however, performance monitoring will be used to assess and identify appropriate corrective actions and to develop associated corrective action plans. Any corrective actions that substantially differ from the original construction methods may have to be coordinated with the regulatory agencies. The Monitoring Plan will identify the corrective action with the project objective, the performance standards developed to assess the objectives, and possible corrective actions to address unattained interim and final performance standards. See Table 1 for objectives with potential corrective actions.

**Table 1
Corrective Actions²⁰**

Objective	Potential Corrective Action
<u>Objective 1:</u> Build living shorelines that are sustained for the expected lifespan of the project based on reef height, reef area, and consolidation rate of the reefs	<ul style="list-style-type: none"> • Add structural material and/or oyster shell to existing reef structure
<u>Objective 2:</u> Support habitat utilization of reefs by bivalves and other invertebrate infauna and epifauna based on measuring bivalve and non-bivalve species composition, density, size, and tissue biomass	<ul style="list-style-type: none"> • Add structural material and/or oyster shell to existing reef structure or • Construct new/additional reef structures.
<u>Objective 3:</u> Reduce shoreline erosion based on evaluation of shoreline elevation/profile, marsh edge position, and wave height reduction	<ul style="list-style-type: none"> • Add structural material and/or oyster shell to existing reef structure, or • Modify existing reef/breakwater design
<u>Objective 4:</u> Create or enhance a marsh that is sustained for the expected lifespan of the project	<ul style="list-style-type: none"> • Add, re-grade, or remove sediment
<u>Objective 5:</u> Promote establishment of native marsh vegetation	<ul style="list-style-type: none"> • Plant, re-plant, or remove non-native vegetation to meet restoration objectives
<u>Objective 6:</u> Create or enhance submerged reefs that are sustained for the expected lifespan of the project	<ul style="list-style-type: none"> • Add structural material and/or oyster shell to existing reef structure • Construct new reef structures
<u>Objective 7:</u> Support habitat utilization of submerged reefs by bivalves and other invertebrate infauna and epifauna	<ul style="list-style-type: none"> • Add structural material and/or oyster shell to existing reef structure • Construct new reef structures in a more suitable location(s)

²⁰ In general, Corrective Actions would occur within the permitted Hancock County Marsh Living Shoreline footprint. Corrective actions outside of the permitted area, if applicable, would be coordinated with the MDMR/USACE.