



Coastal Protection and  
Restoration Authority of Louisiana

**State of Louisiana  
Coastal Protection and Restoration  
Authority**

**2017 Annual Inspection Report**

for

**BARATARIA LANDBRIDGE  
SHORELINE PROTECTION PROJECT  
Phase 1, 2, 3 & 4 (Construction Units 1, 2,  
3, 4, 5, 6, 7 & 8)**

State Project Number (BA-27), (BA-27c) and (BA-27d)  
Priority Project Lists 7, 9 and 11

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Lafourche and Jefferson Parishes

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## **Table of Contents**

I. Introduction.....	1
II. Inspection Purpose and Procedures .....	4
III. Project Description and History .....	4
IV. Summary of Past Operation and Maintenance Projects.....	8
V. Inspection Results .....	8
VI. Conclusions and Recommendations .....	10

## **Appendices**

Appendix A .....	Inspection Photos
Appendix B .....	Three Year Budget Projections and Worksheets

## **I. Introduction**

The Barataria Landbridge Shoreline Protection (BA-27) Project (Phases 1, 2, 3 and 4) is located approximately 14 miles south of the town of Lafitte in Jefferson and Lafourche Parishes, Louisiana and is separated into eight (8) construction units (CU's). Phase 1 identified as (BA-27) consists of CU # 1, CU #2, a portion of CU #4 and all of CU #5. Phase 2, also identified as (BA-27), encompasses another segment of CU#4. Phase 3 is identified as (BA-27c) and includes all of CU #3, a portion of CU #4, and all of CU #7 and CU #8. Phase 4 designated (BA-27d) includes the entire segment of CU #6 (Figure 1). A brief description, location and status of all construction units associated with the Barataria Landbridge Shoreline Protection Project (BA-27), (BA-27c) and (BA-27d) is outlined below:

Construction Unit No. 1 (CU #1) – CU #1 is a demonstration project completed in July 2001 and consists of approximately 3,200 linear feet of shoreline protection treatments along the east bank of Bayou Rigolettes and the west bank of Bayou Perot. The shoreline treatments of CU #1 utilizes various methods of shoreline protection to reduce shoreline erosion along the existing banks of Bayou Perot and Bayou Rigolettes and assesses the constructability and economic feasibility of constructing future projects using these techniques on the Barataria Landbridge Shoreline Protection Project (Figure 1).

Construction Unit No. 2 (CU #2) – CU #2 was completed in October 2002 and consists of approximately 6,403 linear feet of shoreline protection (rock dike) parallel to the southeast shoreline of Bayou Rigolettes and Bayou Perot west of the Harvey Cutoff Canal (Figure 1) (O&M Plan, 2002).

Construction Unit No. 3 (CU #3) – CU #3 was completed in May 2004 and consists of approximately 10,865 linear feet of rock dike along the northeast shoreline of Little Lake. (Figure 1) (O&M Plan, 2005).

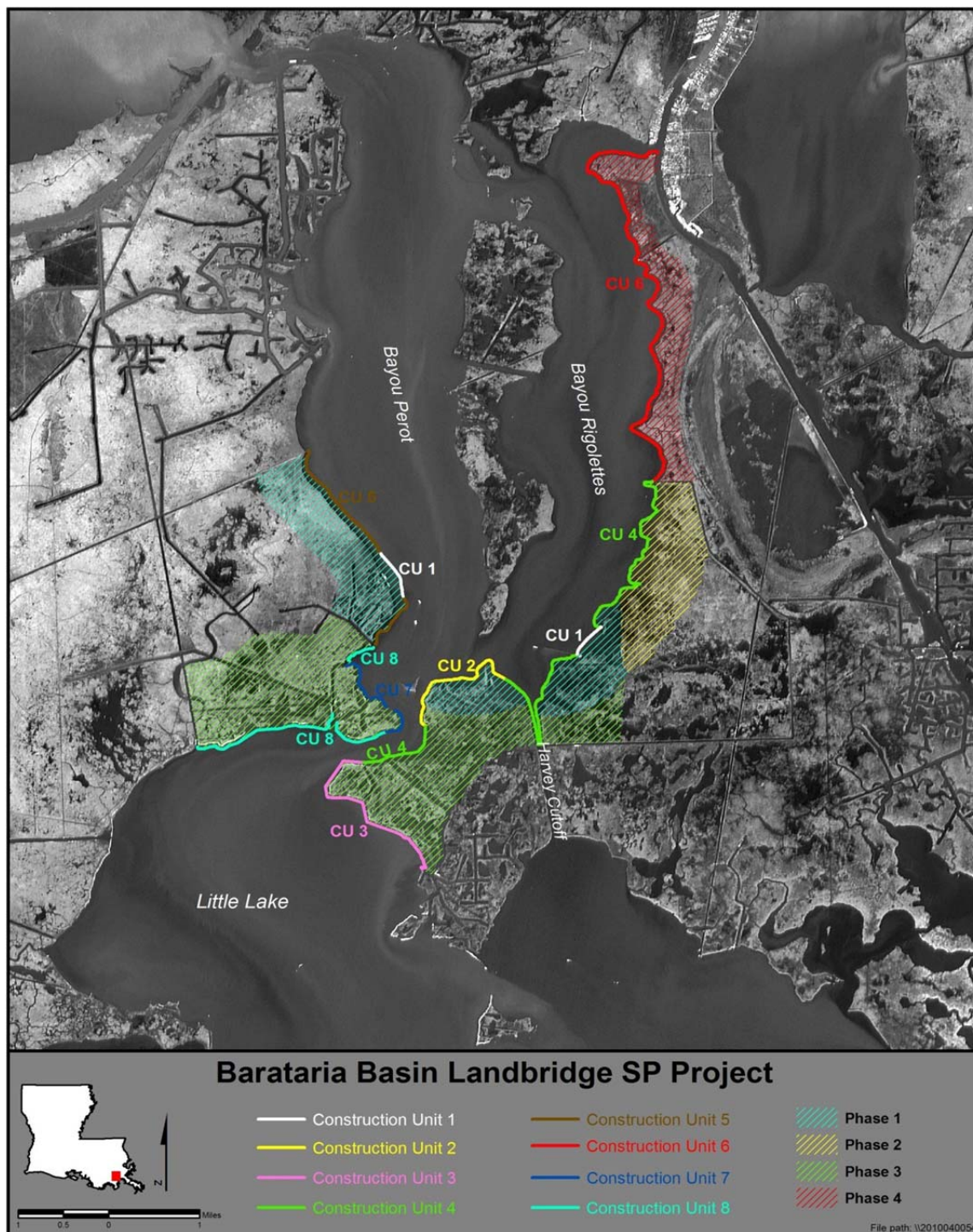
Construction Unit No.4 (CU #4) – CU #4 was completed in July 2009 and included the construction of approximately 30,500 linear feet of concrete pile and wall panels along the southeast shoreline of Bayou Rigolettes, both sides of the mouth of the Harvey Cutoff Canal and a segment between CU #'s 2 and 3 along the south bank of the channel connecting Bayou Perot to Little Lake (Figure 1).

Construction Unit No. 5 (CU #5) – CU #5 was completed in October 2008 and included approximately 14,000 linear feet of concrete pile and wall panels along the southwest shoreline of Bayou Perot and repair of the CU #1 segments along the shorelines of bayous Perot and Rigolettes. (Figure 1).

Construction Unit No. 6 (CU #6) – CU #6 was completed in late 2005 and included the construction of 29,500 linear feet of shoreline protection (rock revetment) along northern reach along the east bank of Bayou Rigolettes (Figure 1).

Construction Unit Nos. 7 & 8 (CU #7&8) – CU #7&8 were constructed together under the same contract and was constructed in seven (7) segments identified as a rock dike and Revetments 1 through 6. All seven (7) segments totaled approximately 21,401 linear feet of a combination of rock dike and rock revetment. The project began at the east end of the rock dike along the north shore of Little Lake at the mouth of the Tennessee Pipeline Canal and ended at the northern end of Revetment 6 near the mouth of an existing oilfield access channel along the east bank of Bayou Perot (Figure 1).

The Barataria Landbridge Shoreline Protection (BA-27) Project is co-sponsored by the Natural Resources Conservation Service (NRCS) and the Coastal Protection and Restoration Authority (CPRA) of Louisiana. The project was authorized by Section 303(a) of Title III Public law 101-646, the Coastal Wetlands Planning Protection and Restoration Act (CWPPRA) enacted on November 29, 1990, as amended. Phases 1 & 2 (BA-27), Phase 3 (BA-27c) and Phase 4 (BA-27d) of the Barataria Landbridge Shoreline Protection Project were approved on the 7<sup>th</sup>, 8<sup>th</sup>, 9<sup>th</sup>, and 11<sup>th</sup> Priority Project List, respectively.



**Figure 2.** Project infrastructure map for the Barataria Landbridge Shoreline Protection Project (BA-27-Phase 1 &2, BA-27c – Phase 3 and BA-27d – Phase 4) – Construction Units #1 through #8

## **II. Inspection Purpose and Procedure**

The purpose of the annual inspection of the Barataria Landbridge Shoreline Protection Projects (BA-27), (BA-27c) and (BA-27d) is to evaluate the constructed project features, identify any deficiencies, prepare a report detailing the condition of such features and to recommend corrective actions needed, if any (O&M Plan, 2002 & 2005). Should it be determined that corrective actions are needed, CPRA shall provide in report form, a detailed cost estimate for engineering, design, supervision, inspection, construction contingencies, and an assessment of the urgency of such repairs (O&M Plan, 2002 & 2005). The inspection report also contains a summary of maintenance projects undertaken since the constructed features were completed and an estimated project budget for the upcoming three (3) years for operation and maintenance and rehabilitation. The three (3) year projected operation and maintenance budgets for CU #1, CU #2, CU #3, CU #4, CU #5, and CU #6 are based on the outcome of this inspection and are compiled in Appendix B. On Bayou Rigolettes, the CU #1 concrete panel wall segment has been incorporated, and will be maintained, with CU# 4; the other CU# 1 features at this location remain in place, now under water and on the protected side of the CU #4 concrete panel wall. On Bayou Perot, the CU #1 concrete panel wall segment has been incorporated, and will be maintained with, CU# 5; the other CU# 1 features at this location were removed prior to construction of CU #5. A summary of past operation and maintenance projects undertaken since the completion of the Barataria Landbridge Shoreline Protection (CU #1, CU #2, CU #3, CU #4, CU #5 and CU #6) project are outlined in Section IV of this report.

An inspection of the Barataria Landbridge Shoreline Protection Project (BA-27), (BA-27c), and (BA-27d) was held on April 20, 2017 and included Construction Units 1, 2, 3, 4, 5, 6 7 & 8. In attendance were Brian Babin, Darin Lee, Elaine Lear, and Melissa Hymel with CPRA, and Quin Kinler, Cody Colvin and Doug Baker with NRCS. The inspection began following the GIWW to Clovelly (BA-02) inspection which concluded at approximately 11:00 am. The inspection began at the southern extent of CU #3 in Little Lake and proceeded northward into Bayou Rigolettes, encompassing all of CU #2, CU #4, and CU #6. Upon completion of the CU#6, the project team crossed over to Bayou Perot to inspect CU#5, CU#7 and CU#8. The inspection concluded at approximately 1:30 pm near Revetment 1 along the northern bank of Little Lake.

## **III. Project Description and History**

The Barataria Basin Landbridge Shoreline Protection Project area is located within the Barataria Basin, which is bounded on the north and east by the Mississippi River, on the west by Bayou Lafourche, and on the south by the Gulf of Mexico. The upper portion of the Barataria Basin is largely a freshwater-dominated system of natural levee ridges, bald-cypress, water tupelo swamps, and fresh marsh habitats (Monitoring Plan, October 2003). The lower portion of the basin is dominated by marine/tidal processes, with barrier islands, saline marsh, brackish marshes, tidal channels, and large bays and lakes (Monitoring Plan, October 2003). Historically, a small meandering Bayou Perot, and the longer, narrower Bayou Dupont, Bayou Barataria and Bayou Villars channels provided limited hydrologic connection between the

upper and lower basin. The hydrologic connections between the upper and lower basin are much greater today due to the Barataria Waterway, Bayou Segnette Waterway, Harvey Cutoff, and substantial erosion and interior marsh loss along and between the now-enlarged Bayou Perot and Bayou Rigolettes (Monitoring Plan, October 2003). Fortunately, there is still a landmass that extends southwest to northeast across the basin, roughly between Lake Salvador and Little Lake. This landmass can be referred to as the “Barataria Basin Landbridge.” The shoreline protection project aims to protect the functional integrity of this critical area of the Barataria Basin (Monitoring Plan, October 2003)

Major factors contributing to the excessive marsh loss in this area included the elimination of overbank flooding of the Mississippi River; closure of Bayou Lafourche at the Mississippi River; dredging of the Gulf Intracoastal Waterway, Barataria Waterway, Harvey Cutoff Canal, and oilfield access channels; physical erosion due to wind, boat wake, and tidal energy, subsidence, and sea level rise (Monitoring Plan, October 2003).

The project objective for the Barataria Basin Landbridge Project as a whole is to provide 107,500 (now over 117,418) linear feet of shoreline protection to areas along the west and south banks of Bayou Perot, the east and south banks of Bayou Rigolettes, the north and northeast banks of Little Lake, and the east and west banks of the Harvey Cutoff Canal in order to reduce or eliminate shoreline/bankline erosion of the Barataria Basin Landbridge (Monitoring Plan, 2003).

The specific goal of the project is to decrease the mean rate of shoreline/bankline erosion along selected reaches of Bayous Perot and Rigolettes, Little Lake, and Harvey Cutoff. This was accomplished through the use of one or more of the following shoreline protection techniques:

- a) traditional rock dike
- b) traditional rock revetment
- c) rock dike or revetment with encapsulated lightweight aggregate core
- d) pre-stressed concrete pile and panel wall

### **Construction Unit No. 1 (CU #1)**

CU #1 of the Barataria Landbridge Shoreline Protection Project consisted of the installation of a total of 3,200 linear ft. of shoreline protection along the west bank of Bayou Perot and southeast bank of Bayou Rigolettes (Figure 2). The shoreline features at each location included four different types of shoreline protection treatments measuring 400 feet in length, spaced 50 to 75 feet apart. Identified below are the tested techniques constructed along the shoreline at each location:

- Section A and A1 – consisted of approximately 200 linear foot of rock dike and 200 linear ft. of rock dike placed on freshly excavated spoil material.
- Section B – consisted of approximately 400 linear ft. of composite rock dike with a lightweight aggregate core encapsulated in geotextile fabric.

- Section C – consisted of approximately 400 linear ft. of composite rock dike using a furrow method to place and encapsulate the lightweight aggregate core.
- Section D – consisted of approximately 400 linear ft. of pre-stressed concrete pile and panel wall.

The purpose of the Barataria Landbridge Shoreline Protection Project (Phase I – CU #1) was to evaluate several methods of shoreline protection that would reduce or minimize shoreline/bankline erosion along Bayou Perot and Bayou Rigolettes. The performance of these test sections were monitored and assessed by the Natural Resource Conservation Service (NRCS). The evaluation of the test sections included the constructability, construction cost, short-term stability, maintenance cost, and aesthetic quality.

### **Construction Unit No. 2 (CU #2)**

CU #2 of the Barataria Landbridge Shoreline Protection Project consisted of a 2,712 linear foot rock dike on the west side of an existing oil field canal opening on the southern bank of Bayou Rigolettes and 3,691 linear foot rock dike from the east bank of the existing oil field canal toward the opening of the Harvey Cutoff Canal. The rock dike was constructed to an elevation of +3.5' NAVD with a 2.0 ft. wide crest and 2:1 side slopes (O&M Plan, 2002). CU# 2 of the Barataria Landbridge

### **Construction Unit No. 3 (CU #3)**

CU #3 consisted of approximately 10,865 linear feet of rock dike along the northeast shoreline of Little Lake. The rock riprap structure was constructed to an elevation of +3.5' NAVD with a 4' wide top width and 3:1 side slopes. The rock dike was constructed over a geotextile fabric. Two (2) fish dips were constructed at Sta. 43+05 and Sta. 74+79 consisting of a 60' wide (bottom width) opening in the rock dike to allow access for marine organisms. Warning signs were installed at both fish dips and at the entrance of an existing oilfield canal plugged with rock riprap near Sta. 96+00 (O&M Plan, 2005). CU#3 also included a beneficial use of dredge material component in which spoil material resulting from flotation channel excavation was used to fill seven (7) small ponds in the marsh behind the rock dike creating a total of 30 acres of marsh.

### **Construction Unit No.4 (CU#4)**

CU #4 was constructed in three (3) reaches and consisted of the construction of approximately 32,400 linear feet of reinforced concrete pile and panel sections. Reach 1 began at the end of CU #6 near an existing location canal and extended southward along the southeast bank of Bayou Rigolettes to the mouth of the Harvey Cutoff Canal (HCC), and proceeded along the east bank of the HCC to the first channel south of the mouth of the HCC. Reach 2 commenced along the west bank of the HCC near the intersection of the east-west channel and runs along the west bank of the HCC and south bank of Bayou Rigolettes to the beginning of CU #2. Reach 3 begins at the termination point of CU #2, followed the south bank of the channel connecting Bayou Perot to Little Lake and ended at the beginning point of CU #3. The reinforced concrete pile sizes ranged from 20" x 20" to 24" x 24" square and 70 feet long with



a finished top elevation of +4.0' NAVD. The reinforced concrete wall sections were 6 ft. high and ranged in length from 11'-10" to 19'-4" with a finished elevation of +3.5' NAVD. The rock tie-ins were constructed of rock riprap to an elevation of +3.5' NAVD with 3:1 side slopes and a 2 ft. top width.

#### **Construction Unit No.5 (CU#5)**

Construction of CU#5 consisted of approximately 12,602 linear feet of reinforced concrete pile and wall sections along the southwest shoreline of Bayou Perot. The reinforced concrete piles were 24" x 24" square with lengths ranging from 63' to 79' long. The reinforced concrete panel lengths 6' high and ranged from 13'-8" to 19'-4" in length. The bank tie-ins were constructed of rock riprap to an elevation of +3.5' NAVD with 3:1 side slopes and a 2' wide top width. After installation of the concrete piles and walls, a one (1) foot thick blanket of surface course aggregate was installed, extending ten (10) feet in front, back and around the ends of the concrete wall panels.

#### **Construction Unit No.6 (CU #6)**

CU #6 consists of approximately 30,541 linear feet of rock shoreline revetment along the east bank of Bayou Rigolettes. The rock revetment was constructed to an elevation of 3.5 ft NAVD with a top width of 4 ft. and 3:1 side slopes. At seven locations along the rock revetment, organism access openings were constructed to allow continued aquatic organism ingress and egress and provide adequate discharge of surface water flow. Each opening was lined with two (2) ft of rock to a sill elevation two (2) ft below the average water elevation (-0.8 ft NAVD).

#### **Construction Unit No. 7 & 8(CU #7 & 8)**

CU#7 and CU# 8 consists of approximately 21,401 linear feet of rock dike and rock revetment along the north bank of Little Lake and the western shoreline of Bayou Perot. The rock dike and revetment was constructed using a light aggregate core design with a crest elevation of +3.5' NAVD 88 and 3:1 side slopes. Fish dips were also constructed at three (3) locations along Revetment 1 and at two (2) locations along Revetment 2 to allow for marine organism access. A total of seventeen (17) settlement plates were installed throughout the rock revetment segments on all reaches to monitor settlement of the structure and twenty-two (22) warning signs mounted with navigational aids lights were placed along the shoreline to notify boaters of potential hazards.

## **IV. Summary of Past Operation and Maintenance Projects**

Since the completion of Construction Units 1, 2, 3, 4, 5, 6, 7 and 8, no maintenance, rehabilitation or corrective actions have been required.

## **V. Inspection Results**

### **BA-27 -Construction Unit No. 1 (CU #1)**

On Bayou Rigolettes, the CU #1 concrete panel wall segment has been incorporated, and will be inspected and described, with CU# 4. On Bayou Perot, the CU #1 concrete panel wall segment has been incorporated, and will be inspected and described, with CU# 5.

### **BA-27 - Construction Unit No. 2 (CU #2)**

The inspection of CU #2 began at the west end near Sta. 0+42 and proceeded to the east end of the reach near Sta. 36+83. As previously reported, a low area of the rock dike approximately 200 feet wide exists from Sta. 31+50 to Sta. 29+50. We have been monitoring this area for several years now and have not noticed any further settlement or erosion of the marsh behind the structure. Also previously reported was a slight dip in the rock dike above the Exxon/Humble pipeline right-of-way located near Sta. 12+33. Again, there is no indication of further settlement of the rock dike or deterioration of the containment dike directly behind it. (Appendix A, Photos 13 through 22)

### **BA-27c - Construction Unit No. 3 (CU #3)**

The inspection of CU #3 began on the east bank of Little Lake at Sta. 108+65 and progressed along the northeast bank of Little Lake to the mouth of Bayou Perot at Sta. 0+00. As noted during previous inspections, the rock dike is in good condition with only minor settlement near the BP pipeline crossing near Sta. 67+00. The embankment tie-ins on both ends of the project appear to be in good condition with no obvious erosion or breaching. Overall, the rock revetment (CU #3) is in good condition and marsh behind the structure is very healthy. (Appendix A, Photos 1 through 6)

### **BA-27 & BA-27c - Construction Unit No. 4 (CU #4)**

The inspection of CU #4 began with the concrete pile and wall structure along Reach 3 located between CU #2 and CU #3. From there the inspection continued along the south bank of Bayou Rigolettes and the west bank of Harvey Cutoff along Reach 2. The inspection of CU #4 concluded as we traveled north from the east bank of Harvey Cutoff and the east bank of Bayou Rigolettes along Reach 1. All of the transitions from rock riprap to concrete wall were in good condition. The rock riprap embankment tie-ins were also in good condition. A

warning sign and support marking the concrete pile on the west side of the oilfield canal along Reach 3 is missing. We are recommending that reflective tape be placed directly on the concrete pile and pile wall in this location to notify boaters of impending danger until a new pile and sign can be installed. (Appendix A, Photos 7 through 12, and 22 through 31)

#### **BA-27 - Construction Unit No. 5 (CU #5)**

The inspection of Construction Unit #5 began at the northernmost point of CU #5 on the west bank of Bayou Perot near the Enbridge Pipeline Canal and progressed southward along the shoreline to the southernmost point of CU #5 at an existing canal. Overall, CU #5 is in good condition with only one (1) concrete panel that had slipped from the channel guide and was positioned lower on one side near the intersection of wall 5 and 6a. The rock to concrete panels and earthen embankments tie-ins were in very good condition with no obvious washouts or erosion. We will continue to monitor the condition of the concrete panel that has slipped from its guide channel and recommend repairs if the condition worsens. (Appendix A, Photos 43 through 46)

#### **BA-27c – Construction Unit No. 6 (CU #6)**

The inspection of Construction Unit #6 began at Sta. 0+00 near an existing oilfield access canal and proceeded along the east bank of Bayou Rigolettes to Sta. 307+78 near the Barataria Waterway. Overall, the rock dike appeared to be in good condition with no visual displacement or settlement of rock material. All signs and supports at the fish dip locations are also in good condition. (Appendix A, Photos 32 through 42)

#### **BA-27d – Construction Unit No. 7 & 8 (CU #7&8)**

The inspection of Construction Unit #7 & #8 began at Sta. 19+31 of Revetment 6, along the western bank of Bayou Perot near an existing access canal near the beginning of CU#5, and proceeded along the west bank of Bayou Perot southward covering Revetments 6, 5, 4, and 3; then around to the northern bank of Little Lake along Revetment 2 and 1 and the rock dike. Overall, the rock revetments (1 through 6) and the rock dike appeared to be in good condition with only one section along Revetment 2 that had settled immediately following construction. This section appears to be approximately 300 ft. long near Sta. 39+00 with the crest below the water line. All the bank tie-ins at each end of the revetments were in stable condition with no obvious washouts. The signs, supports and navigation aids were also in good condition (Appendix A, Photos 47 through 63)

## VI. Conclusions and Recommendations

Overall, the Barataria Landbridge Shoreline Protection Project (BA-27, BA-27c, and BA-27d) was in good condition with only minor deficiencies in isolated locations. These deficiencies included a low area approximately 200 ft. wide in the rock dike along CU #2 near Sta. 30+00 at the Harvey Cutoff Canal, a single warning sign down from broken timber support on CU #4, a concrete panel that had slipped from its guide channel along CU #5, and a 300 ft. wide section along Revetment 2 of CU #7&8 near Sta. 39+00 that has settled below the water surface. Although these defects are not considered serious, we will coordinate with NRCS to come up with a work plan that is economically feasible for addressing the items described above.

## References:

Hymel, Melissa, August 2003. *Monitoring Plan*, Barataria Basin Landbridge Shoreline Protection (Phases 1, 2 & 3), Louisiana Department of Natural Resources, Coastal Restoration Division, 11 pp.

LDNR, July 2002. *Operation, Maintenance and Rehabilitation Plan*, BA-27 Barataria Landbridge Shoreline Protection Phases 1 & 2 (Construction Units No. 1 & 2), Louisiana Department of Natural Resources, Coastal Engineering Division.

LDNR, February 2005. *Operation, Maintenance and Rehabilitation Plan*, BA-27c Barataria Landbridge Shoreline Protection Phase 3 (Construction Unit No. 3), Louisiana Department of Natural Resources, Coastal Engineering Division.

## **Appendix A**

### **Photographs**



Photo No.1 – view of rock revetment to bank tie-in on southern end of CU#3 near Sta. 108+65.



Photo No.2 – view of rock revetment (CU#3) along northeast shoreline of Little Lake near Sta. 96+00.



Photo No.3 – view of rock revetment (CU#3) along northeast shoreline of Little Lake near Sta. 67+00.



Photo No.4 – view of rock revetment (CU#3) along south shoreline of Bayou Perot near entrance to Little Lake at Sta. 13+00.





Photo No.5 – view of rock revetment (CU#3) along south shoreline of Bayou Perot at the entrance to Little Lake near an existing camp location at Sta. 3+00.



Photo No.6 – view of the rock revetment along the south bank of Bayou Perot at the end of CU#3 and beginning of CU#4 at Sta.0+00.





Photo No.7 – view of the concrete pile wall (CU#4) along the south bank of Bayou Perot connecting to Little Lake.



Photo No.8 – view of south bank tie-in of CU#4 Concrete Wall (Section 9) along unnamed canal.



Photo No.9 – view of north bank tie-in of CU#4 Concrete Wall (Section 8) along unnamed canal.



Photo No.10 – view of Concrete Wall CU#4 (Reach 3) along the south bank of Bayou Perot near Little Lake.



Photo No.11 – view of Concrete Wall CU#4 (Reach 3) along the south bank of Bayou Perot near Little Lake.



Photo No.12 – view of Concrete Wall (Reach 3) along the south bank of Bayou Perot at CU#2.





Photo No. 13 – view of rock revetment (CU#2- West Site) along south bank of Bayou Perot.



Photo No. 14 – view of rock revetment (CU#2- West Site) along south bank of Bayou Perot.



Photo No. 15 – view of rock revetment (CU#2- West Site) tie-in along existing channel near Sta. 26+47.



Photo No. 16 – view of rock revetment (CU#2- East Site) tie-in along existing channel near Sta. 00+00.



Photo No. 17 – view of rock revetment (CU#2- East Site) along south bank of Bayou Perot.



Photo No. 18 – view of rock revetment (CU#2- East Site) along south bank of Bayou Perot.





Photo No. 19 – view of low area along rock revetment (CU#2 – East Site) around Sta. 30+00 near the Harvey Cutoff Canal.



Photo No. 20 – view of low area along rock revetment (CU#2 – East Site) around Sta. 30+00 near the Harvey Cutoff Canal.



Photo No. 21 – view of rock revetment to concrete wall tie-in at Sta. 36+83 of CU#2 (East Site).



Photo No.22 – view of concrete wall of CU#4 (Reach 2) near Sta. 0+00 along south bank of Bayou Rigolettes.





Photo No.23 – view of concrete wall CU#4 (Reach 2) along the west bank of the Harvey Cutoff Canal.



Photo No.24 – view of the rock tie-in from concrete wall to bank of CU#4 (Reach 2) along the west bank of the Harvey Cutoff Canal near Sta. 0+00.



Photo No.25 – view of the rock tie-in from concrete wall to bank of CU#4 (Reach 1) along the east bank of the Harvey Cutoff Canal near Sta. 0+00.



Photo No.26 – view of CU#4 (Reach 1) Concrete Wall along the east bank of the Harvey Cutoff Canal.



Photo No.27 – view of CU#4 (Reach 1) Concrete Wall along the east bank of the Bayou Rigolettes.



Photo No.28 – view of CU#4 (Reach 1) Concrete Wall along the east bank of the Bayou Rigolettes.





Photo No.29 – view of CU#4 (Reach 1) Concrete Wall along the east bank of the Bayou Rigolettes.



Photo No. 30 – view of CU#4 (Reach 1) Concrete Wall and rock tie-in along east bank of Bayou Rigolettes near existing canal near 4+50.



Photo No. 31 – view of CU#4 (Reach 1) rock dike along existing canal along east bank of Bayou Rigolettes that ties into the Concrete Wall near 4+50.



Photo No.32 – view Rock Revetment (CU#6) at the far southern end that ties into the bank of an existing oilfield canal near Sta. 305+00.



Photo No. 33 – view of Rock Revetment (Cu#6) along the east bank of Bayou Rigolettes.



Photo No. 34 – view of Fish Dip No.6 along the rock revetment on the east bank of Bayou Rigolettes near Sta. 257+00.





Photo No. 35 – view of Rock Revetment (Cu#6) along the east bank of Bayou Rigolettes.



Photo No. 36 – view of Fish Dip No.5 along the rock revetment on the east bank of Bayou Rigolettes near Sta. 250+00.



Photo No. 37 – view of Rock Revetment (Cu#6) along the east bank of Bayou Rigolettes.



Photo No.38 – view of Rock Revetment (CU#6) tie-in to the east bank of Bayou Rigolettes and an old timber bulkhead along pipeline canal.





Photo No.39 – view of Rock Revetment (CU#6) tie-in to the east bank of Bayou Rigolettes and an old timber bulkhead along pipeline canal.



Photo No.40 – view of Fish Dip No.3 along the east bank of Bayou Rigolettes near Sta. 107+00.



Photo No. 41 – view of Rock Revetment (Cu#6) along the east bank of Bayou Rigolettes.



Photo No.42 – view of Rock Revetment (Cu#6) along the east bank of Bayou Rigolettes.



Photo No.42 – view of Rock Revetment (Cu#6) along the east bank of Bayou Rigolettes near Sta. 1+00.



Photo No. 43 – view of rock dike tie-in from Concrete Wall (CU#5) to existing shoreline along the west bank of Bayou Perot near Sta. 4+50.





Photo No.44 – view of Concrete Wall (Cu#5) along the west bank of Bayou Perot looking south near Sta. 3+80.



Photo No.45 – view of Concrete Wall (Cu#5) along the west bank of Bayou Perot.



Photo No. 46 – view of rock dike tie-in from Concrete Wall (CU#5) to existing shoreline along the west bank of Bayou Perot near Sta. 0+50.



Photo No. 47 – view of rock revetment to bank tie-in at the north end (Sta. 19+31) of CU #7 & 8 (Revetment #6) along the west bank of Bayou Perot.





Photo No. 48 – view of rock revetment to bank tie-in at the south end (Sta. 0+00) of CU #7 & 8 (Revetment #6) along the west bank of Bayou Perot.



Photo No. 49 - view of rock revetment at the north end of CU# 7 & 8 (Revetment #4) near Sta. 10+06.



Photo No. 50 - view of rock revetment of CU #7 & 8 (Revetment #4) along west bank of Bayou Perot.



Photo No. 51- view of rock revetment tie-in to bank at north end of CU# 7 & 8 (Revetment #3) near Sta. 09+48.





Photo No. 52 - view of rock revetment tie-in to bank at south end of CU # 7&8 (Revetment #3) near Sta. 0+00.



Photo No. 53 - view of rock revetment tie-in to bank at north end of CU # 7&8 (Revetment #2) near Sta. 58+86.





Photo No. 54 - view of rock revetment CU # 7&8 (Revetment #2) along the west bank of Bayou Perot.



Photo No. 55 - view of low area of the rock revetment along CU # 7&8 (Revetment #2) near Sta. 40+90.



Photo No. 56 - view of low area of the rock revetment along CU # 7&8 (Revetment #2) near Sta. 40+90.



Photo No. 57 - view of low area of the rock revetment along CU # 7&8 (Revetment #2) between Sta. 37+97 and Sta. 40+90.



Photo No. 58 - view of rock revetment along CU # 7 & 8 (Revetment #2) along the north bank of Bayou Perot near Little Lake.



Photo No. 59 - view of rock revetment along CU # 7 & 8 (Revetment #2) along the north bank of Bayou Perot near Little Lake.





Photo No. 60 - view of rock revetment tie-in to bank at southern end of CU # 7&8 (Revetment #2) near Sta. 0+00.



Photo No. 61 - view of rock revetment tie-in to bank at eastern end of CU # 7&8 (Revetment #1) near Sta. 64+64.



Photo No. 62 - view of rock revetment along CU # 7&8 (Revetment #1) along the north bank of Bayou Perot near Little Lake.



Photo No. 63 - view of rock revetment tie-in to bank at the western end of CU # 7&8 (Revetment #1) near Sta. 0+00.

**Appendix B**

**Three Year Budget Projections and Worksheet**

**BARATARIA LAND BRIDGE, PH 1 & 2 / BA27 / PPL7**  
**Three-Year Operations & Maintenance Budgets 07/01/2017- 06/30/20**

<u>Project Manager</u>	<u>O &amp; M Manager</u>	<u>Federal Sponsor</u>	<u>Prepared By</u>
	<i>Babin</i>	<i>NRCS</i>	<i>Babin</i>

	2017/2018	2018/2019	2019/2020
<b>Maintenance Inspection</b>	\$ 6,772.00	\$ 6,975.00	\$ 7,184.00
<b>Structure Operation</b>	\$ -	\$ -	\$ -
<b>CPRA Administration</b>	\$ 6,690.00	\$ -	\$ -
	\$ -	\$ -	\$ -

**Maintenance/Rehabilitation**

<b>17/18 Description:</b>	<b>Rock Dike Survey</b>

E&D	\$ 20,538.00
Construction	\$ -
Construction Oversight	\$ -
Sub Total - Maint. And Rehab.	\$ 20,538.00

<b>18/19 Description</b>	

Surveying	\$ -
Construction	\$ -
Construction Oversight	\$ -
Sub Total - Maint. And Rehab.	\$ -

<b>19/20 Description:</b>	

E&D	\$ -
Construction	\$ -
Construction Oversight	\$ -
Sub Total - Maint. And Rehab.	\$ -

	2017/2018	2018/2019	2019/2020
<b>Total O&amp;M Budgets</b>	<b>\$34,000</b>	<b>\$6,975</b>	<b>\$7,184</b>
<b>O&amp;M Budget (3 Yr Total)</b>			<b>\$48,159</b>
<b>Unexpended O&amp;M Funds</b>			<b>\$1,309,364</b>
<b>Remaining O&amp;M Funds</b>			<b>\$1,261,205</b>

Note: Unexpended O&M budget includes a deduction of \$133,491 for MIPR O&M funds for NRCS



## OPERATIONS & MAINTENANCE BUDGET WORKSHEET

**Project: Barataria Landbridge Shoreline Protection ( Phase 1 & 2 CU#2)**

**FY 17/18 –**

Administration	\$ 6,690
O&M Inspection & Report	\$ 6,772
Survey::	\$ 20,538
Maintenance:	\$ 0
E&D:	\$ 0
Construction:	\$ 0
Construction Oversight:	\$ 0

### **Inspection and Report**

#### CPRA Direct Costs

##### Inspection:

CPRA Engineer 3 – 4 hrs@ \$68/hr.:	\$ 272
CPRA Engineer 6 – 4 hrs @ \$78/hr.	\$ 312
CPRA Scientist 4 – 4 hrs @ \$56/hr.	\$ 224
	<u>\$ 808</u>

##### Report:

CPRA Engineer 6 – 20 hrs. @ \$78/hr.	\$ 1,560
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Total Direct CPRA Costs: **\$ 2,368**

#### CPRA Indirect Costs

##### Inspection:

CPRA Engineer 3 – 4 hrs@ \$127/hr.:	\$ 508
CPRA Engineer 6 – 4 hrs @ \$145/hr.	\$ 580
CPRA Scientist 4 – 4 hrs @ \$104/hr.	\$ 416
	<u>\$ 1,504</u>

##### Report:

CPRA Engineer 6 – 20 hrs. @ \$145/hr.	\$ 2,900
---------------------------------------	----------

Total Indirect CPRA Costs: **\$ 4,404**

### **Survey of Rock Dike**

#### Estimated 5 days field work

Professional Land Surveyor:	\$ 1,260
(10 hrs @ \$126/hr.)	
CAD Operator:	\$ 2,760
(30 hrs @ \$92/hr.)	
3 Man Survey Crew:	\$ 8,450
(50 hrs. @ \$169/hr.	
Boat (19 – 22 ft.):	\$ 2,270

(5 days @ \$454/day)	
Trimble GPS Total Station:	\$ 2,375
(5 days @ \$475/day)	
Contingency: (20%):	<u>\$ 3,423</u>
Total Estimated Cost:	<b>\$20,538</b>

**CPRA Administration – Survey**

Direct Costs:	
CPRA Administration:	\$ 2,340
(30 hrs @ \$78/hr.)	
Indirect Costs:	
CPRA Administration:	\$ 4,350
(30 hrs @ \$145/hr.)	
Total CPRA Administration Costs:	<b>\$ 6,690</b>

**FY 18/19 –**

Administration	\$	
O&M Inspection & Report	\$	6,975
Maintenance:	\$	

**Operation and Maintenance Assumptions:**

**Inspection and Report**

**CPRA Direct Costs**

<u>Inspection:</u>	
CPRA Engineer 3 – 4 hrs@ \$68/hr.:	\$ 272
CPRA Engineer 6 – 4 hrs @ \$78/hr.	\$ 312
CPRA Scientist 4 – 4 hrs @ \$56/hr.	<u>\$ 224</u>
	\$ 808

<u>Report:</u>	
CPRA Engineer 6 – 20 hrs. @ \$78/hr.	\$ 1,560

Total Direct CPRA Costs:	<b>\$ 2,368 x 3% = \$2,439</b>
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**CPRA Indirect Costs**

<u>Inspection:</u>	
CPRA Engineer 3 – 4 hrs@ \$127/hr.:	\$ 508
CPRA Engineer 6 – 4 hrs @ \$145/hr.	\$ 580
CPRA Scientist 4 – 4 hrs @ \$104/hr.	<u>\$ 416</u>
	\$ 1,504

<u>Report:</u>	
CPRA Engineer 6 – 20 hrs. @ \$145/hr.	\$ 2,900

Total Indirect CPRA Costs:  $\$ 4,404 \times 3\% = \$4,536$

**FY 19/20 –**

Administration	\$	0
O&M Inspection & Report	\$	7,184
Operation:	\$	0
Maintenance:	\$	0
E&D:	\$	0
Construction:	\$	0
Construction Oversight:	\$	0

**CPRA Direct/Indirect Costs - Inspection**

Total Direct CPRA Costs:  $\$ 2,439 \times 3\% = \$2,512$

Total Indirect CPRA Costs:  $\$ 4,536 \times 3\% = \$4,672$

**2017-2020 Accounting**

Approved O&M Budget	\$	1,525,609
Total Expenditures (LaGov)	\$	-82,754
MIPR O&M for NRCS	\$	<u>-133,491</u>
Estimated Unexpended Funds:	\$	1,309,364

**BARATARIA LAND BRIDGE, PH 3 / BA27c / PPL9**  
**Three-Year Operations & Maintenance Budgets 07/01/2017 - 06/30/20**

<u>Project Manager</u>	<u>O &amp; M Manager</u>	<u>Federal Sponsor</u>	<u>Prepared By</u>
	<i>Babin</i>	<i>NRCS</i>	<i>Babin</i>

	2017/2018	2018/2019	2019/2020
<i>Maintenance Inspection</i>	\$ 6,772	\$ 6,975	\$ 7,184
<i>Structure Operation</i>	\$ -	\$ -	\$ -
<i>Administration</i>	\$ 6,690	\$ -	\$ -
	\$ -	\$ -	\$ -
<i>17/18 Description:</i>			
<i>E&amp;D</i>	\$ 20,538		
<i>Construction</i>	\$ -		
<i>Construction Oversight</i>	\$ -		
<i>Sub Total - Maint. And Rehab.</i>	\$ 20,538		
<i>18/19 Description</i>			

<i>Surveying</i>	
<i>Construction</i>	\$ -
<i>Construction Oversight</i>	\$ -
<i>Sub Total - Maint. And Rehab.</i>	\$ -
<i>19/20 Description:</i>	

<i>E&amp;D</i>	\$ -
<i>Construction</i>	\$ -
<i>Construction Oversight</i>	\$ -
<i>Sub Total - Maint. And Rehab.</i>	\$ -

	2017/2018	2018/2019	2019/2020
<b><u>Total O&amp;M Budgets</u></b>	<b>\$ 34,000</b>	<b>\$ 6,975</b>	<b>\$ 7,184</b>

<b>O&amp;M Budget (3 Yr Total)</b>	<b>\$ 48,159</b>
<b>Unexpended O&amp;M Funds</b>	<b>\$ 68,168</b>
<b>Remaining O&amp;M Funds</b>	<b>\$ 20,009</b>

## OPERATIONS & MAINTENANCE BUDGET WORKSHEET

### Project: Barataria Landbridge Shoreline Protection BA-27 c (Phase 3)

#### FY 17/18 –

CPRA Administration	\$ 6,690
O&M Inspection & Report	\$ 6,772
Surveying:	\$ 20,583
Maintenance:	\$ 0
E&D:	\$ 0
Construction:	\$ 0
Construction Oversight:	\$ 0

#### Operation and Maintenance Assumption:

##### Inspection and Report

###### CPRA Direct Costs

###### Inspection:

CPRA Engineer 3 – 4 hrs@ \$68/hr.:	\$ 272
CPRA Engineer 6 – 4 hrs @ \$78/hr.	\$ 312
CPRA Scientist 4 – 4 hrs @ \$56/hr.	\$ 224
	<u>\$ 808</u>

###### Report:

CPRA Engineer 6 – 20 hrs. @ \$78/hr.	\$ 1,560
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Total Direct CPRA Costs: **\$ 2,368**

###### CPRA Indirect Costs

###### Inspection:

CPRA Engineer 3 – 4 hrs@ \$127/hr.:	\$ 508
CPRA Engineer 6 – 4 hrs @ \$145/hr.	\$ 580
CPRA Scientist 4 – 4 hrs @ \$104/hr.	\$ 416
	<u>\$ 1,504</u>

###### Report:

CPRA Engineer 6 – 20 hrs. @ \$145/hr.	\$ 2,900
---------------------------------------	----------

Total Indirect CPRA Costs: **\$ 4,404**

##### Survey of Rock Dike

###### Estimated 5 days field work

Professional Land Surveyor: (10 hrs @ \$126/hr.)	\$ 1,260
CAD Operator: (30 hrs @ \$92/hr.)	\$ 2,760
3 Man Survey Crew: (50 hrs. @ \$169/hr.)	\$ 8,450



Boat (19 – 22 ft.):	\$ 2,270
(5 days @ \$454/day)	
Trimble GPS Total Station:	\$ 2,375
(5 days @ \$475/day)	
Contingency: (20%):	<u>\$ 3,423</u>
Total Estimated Cost:	<b>\$20,538</b>

**CPRA Administration – Survey**

**Direct Costs:**

CPRA Administration:	\$ 2,340
(30 hrs @ \$78/hr.)	

**Indirect Costs:**

CPRA Administration:	\$ 4,350
(30 hrs @ \$145/hr.)	

Total CPRA Administration Costs:	<b>\$ 6,690</b>
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**FY 18/19 –**

CPRA Administration	\$	0
O&M Inspection & Report	\$	6,975
Operation:	\$	0
Maintenance:	\$	0
E&D:	\$	0
Construction:	\$	0
Construction Oversight:	\$	0

**Operation and Maintenance Assumptions:**

**Inspection and Report**

**CPRA Direct Costs**

**Inspection:**

CPRA Engineer 3 – 4 hrs@ \$68/hr.:	\$ 272
CPRA Engineer 6 – 4 hrs @ \$78/hr.	\$ 312
CPRA Scientist 4 – 4 hrs @ \$56/hr.	<u>\$ 224</u>
	\$ 808

**Report:**

CPRA Engineer 6 – 20 hrs. @ \$78/hr.	\$ 1,560
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Total Direct CPRA Costs:	<b>\$ 2,368 x 3% = \$2,439</b>
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**CPRA Indirect Costs**

**Inspection:**

CPRA Engineer 3 – 4 hrs@ \$127/hr.:	\$ 508
CPRA Engineer 6 – 4 hrs @ \$145/hr.	\$ 580
CPRA Scientist 4 – 4 hrs @ \$104/hr.	<u>\$ 416</u>

	\$ 1,504
<u>Report:</u>	
CPRA Engineer 6 – 20 hrs. @ \$145/hr.	\$ 2,900
Total Indirect CPRA Costs:	\$ 4,404 x 3%= \$4,536

**FY 19/20 –**

Administration	\$	0
O&M Inspection & Report	\$	7,184
Operation:	\$	0
Maintenance:	\$	0
E&D:	\$	0
Construction:	\$	0
Construction Oversight:	\$	0

**Operation and Maintenance Assumptions:**

**Inspection and Report**

Total Direct CPRA Costs:	\$ 2,439 x 3% = \$2,512
Total Indirect CPRA Costs:	\$ 4,536 x 3%= \$4,672

**2017-2020 Accounting**

Approved O&M Budget (Lana Report)	\$ 74,011
Total Expenditures (Lana Report)	<u>\$ -5,843</u>
Estimated Unexpended Funds:	\$ 68,168

**BARATARIA LAND BRIDGE, PH 4 / BA27d / PPL11**  
**Three-Year Operations & Maintenance Budgets 07/01/2017 - 06/30/20**

<u>Project Manager</u>	<u>O &amp; M Manager</u>	<u>Federal Sponsor</u>	<u>Prepared By</u>
	<i>Babin</i>	<i>NRCS</i>	<i>Babin</i>
	<b>2017/2018</b>	<b>2018/2019</b>	<b>2019/2020</b>
<i>Maintenance Inspection</i>	\$ 6,772	\$ 6,975	\$ 7,184
<i>Structure Operation</i>	\$ -	\$ -	\$ -
<i>CPRA Administration</i>	\$ 17,840	\$ -	\$ -
	\$ -	\$ -	\$ -
<i>Maintenance/Rehabilitation</i>			
17/18 Description:			
<i>E&amp;D</i>	\$ 116,784		
<i>Construction</i>	\$ -		
<i>Construction Oversight</i>	\$ -		
<i>Sub Total - Maint. And Rehab.</i>	\$ 116,784		
18/19 Description	Survey profile of rock dike and settlement plates		
<i>Surveying</i>		\$ 116,784	
<i>Construction</i>		\$ -	
<i>Construction Oversight</i>		\$ -	
<i>Sub Total - Maint. And Rehab.</i>		\$ 116,784	
19/20 Description:			
<i>E&amp;D</i>			\$ -
<i>Construction</i>			\$ -
<i>Construction Oversight</i>			\$ -
<i>Sub Total - Maint. And Rehab.</i>			\$ -
	<b>2017/2018</b>	<b>2018/2019</b>	<b>2019/2020</b>
<b><u>Total O&amp;M Budgets</u></b>	<b>\$ 141,396</b>	<b>\$ 123,759</b>	<b>\$ 7,184</b>
<b>O&amp;M Budget (3 Yr Total)</b>			<b>\$ 272,339</b>
<b>Unexpended O&amp;M Funds</b>			<b>\$ 6,138,892</b>
<b>Remaining O&amp;M Funds</b>			<b>\$ 5,866,553</b>

Note: Unexpended O&M budget includes a deduction of \$463,509 for MIPR O&M funds allocated for NRCS

## OPERATIONS & MAINTENANCE BUDGET WORKSHEET

**Project: Barataria Landbridge Shoreline Protection BA-27d (Phase 4)**

**FY 17/18 –**

Administration	\$ 17,840
O&M Inspection & Report	\$ 6,772
Survey:	\$116,784
Maintenance:	\$ 0
E&D:	\$ 0
Construction:	\$ 0
Construction Oversight:	\$ 0

**Operation and Maintenance Assumption:**

**Inspection and Report**

CPRA Direct Costs

Inspection:

CPRA Engineer 3 – 4 hrs@ \$68/hr.:	\$ 272
CPRA Engineer 6 – 4 hrs @ \$78/hr.	\$ 312
CPRA Scientist 4 – 4 hrs @ \$56/hr.	<u>\$ 224</u>
	\$ 808

Report:

CPRA Engineer 6 – 20 hrs. @ \$78/hr.	\$ 1,560
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Total Direct CPRA Costs: **\$ 2,368**

CPRA Indirect Costs

Inspection:

CPRA Engineer 3 – 4 hrs@ \$127/hr.:	\$ 508
CPRA Engineer 6 – 4 hrs @ \$145/hr.	\$ 580
CPRA Scientist 4 – 4 hrs @ \$104/hr.	<u>\$ 416</u>
	\$ 1,504

Report:

CPRA Engineer 6 – 20 hrs. @ \$145/hr.	\$ 2,900
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Total Indirect CPRA Costs: **\$ 4,404**

**Survey of Rock Dike**

Estimated 20 days field work

Professional Land Surveyor:	\$ 3,780
(30 hrs @ \$126/hr.)	
CAD Operator:	\$ 7,360
(80 hrs @ \$92/hr.)	
3 Man Survey Crew:	\$ 67,600
(400 hrs. @ \$169/hr.	
Boat (19 – 22 ft.):	\$ 9,080



(20 days @ \$454/day)	
Trimble GPS Total Station:	\$ 9,500
(20 days @ \$475/day)	
Contingency: (20%):	<u>\$ 19,464</u>
<b>Total Estimated Cost:</b>	<b>\$116,784</b>

**CPRA Administration – Dike Survey:**

<u>CPRA Direct Cost</u>	
CPRA Administration:	\$ 6,240
(80 hrs @ \$78/hr.)	

<u>CPRA In-Direct Cost</u>	
CPRA Administration:	\$ 11,600
(80 hrs @ \$145/hr.)	

**FY 18/19 –**

Administration	\$ 0
O&M Inspection and Report:	\$ 6,975
Maintenance:	\$ 0
Surveying:	\$ 0
Construction:	\$ 0
Construction Oversight:	\$ 0

**Operation and Maintenance Assumptions:**

**Inspection and Report**

<u>CPRA Direct Costs</u>	
<u>Inspection:</u>	
CPRA Engineer 3 – 4 hrs@ \$68/hr.:	\$ 272
CPRA Engineer 6 – 4 hrs @ \$78/hr.	\$ 312
CPRA Scientist 4 – 4 hrs @ \$56/hr.	<u>\$ 224</u>
	\$ 808

<u>Report:</u>	
CPRA Engineer 6 – 20 hrs. @ \$78/hr.	\$ 1,560

Total Direct CPRA Costs: **\$ 2,368 x 3% = \$2,439**

<u>CPRA Indirect Costs</u>	
<u>Inspection:</u>	
CPRA Engineer 3 – 4 hrs@ \$127/hr.:	\$ 508
CPRA Engineer 6 – 4 hrs @ \$145/hr.	\$ 580
CPRA Scientist 4 – 4 hrs @ \$104/hr.	<u>\$ 416</u>
	\$ 1,504

<u>Report:</u>	
CPRA Engineer 6 – 20 hrs. @ \$145/hr.	\$ 2,900

Total Indirect CPRA Costs:  $\$ 4,404 \times 3\% = \$4,536$

**FY 19/20 –**

Administration	\$	0
O&M Inspection & Report	\$	7,184
Operation:	\$	0
Maintenance:	\$	0
E&D:	\$	0
Construction:	\$	0
Construction Oversight:	\$	0

**Operation and Maintenance Assumptions:**

**Inspection and Report**

Total Direct CPRA Costs:  $\$ 2,439 \times 3\% = \$2,512$

Total Indirect CPRA Costs:  $\$ 4,536 \times 3\% = \$4,672$

**2017-2020 Accounting**

O&M Budget (Lana Report)	\$ 6,638,463
Total Expenditures (LaGov)	\$ -36,062
MIPR O&M for NRCS	<u>\$ -463,509</u>
Estimated Unexpended Funds:	\$ 6,138,892