State of Louisiana
Office of Coastal Protection and Restoration
Operations Division

2009 Annual Inspection Report

for

CAERNARVON OUTFALL MANAGEMENT (BS-03a)

State Project Number BS–03a
Priority Project List 2

August 5, 2009
Plaquemines Parish

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I. Introduction

The Caernarvon Outfall Management Project (State Project No. BS-03a) was approved on the Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA) Second Priority Project List The project is located to the south and west of Big Mar, a body of water which formed as the result of a failed agricultural impoundment. The project features are located entirely in Plaquemines Parish and the project outfall area encompasses 15,556 acres in Plaquemines Parish. Project features are located on a number of streams in the outfall area.

II. Inspection Purpose and Procedures

The purpose of the annual inspection of the Caernarvon Outfall Management Project (BA-03a) is to evaluate the constructed project features to identify any deficiencies and prepare a report detailing the condition of project features and recommended corrective actions needed. Should it be determined that corrective actions are needed, OCPR shall provide, in the report, a detailed cost estimate for engineering, design, supervision, inspection, and construction contingencies, and an assessment of the urgency of such repairs (O&M Plan May 15, 2003). The annual inspection report also contains a summary of maintenance projects and an estimated projected budget for the upcoming three (3) years for operation, maintenance and rehabilitation. The three (3) year projected operation and maintenance budget is shown in Appendix C. A summary of past operation and maintenance projects completed since completion of the Caernarvon Outfall Management Project are outlined in Section IV.

This annual inspection of the Caernarvon Outfall Management Project (BA-03a) was done on August 5, 2009 on a clear, hot day. Taking part in the inspection was Tom Bernard and Barry Richard, OCPR and Loland Broussard, NRCS, the federal sponsor. On the day of the inspection the diversion structure was flowing at 3,000 cubic feet per second. The Marsh Gage reading was +2.40 feet NGVD and the River Gage reading was +3.30 feet NGVD. All photographs were taken at the time of the inspection and are included in Appendix B of this report.
Note: Simon & Delany, the O & M contractor for this diversion and the outfall project are often called upon to conduct specific inspections and maintenance items periodically between these annual inspections.

III. Project Description and History

In August, 1991, the Caernarvon Freshwater Diversion Structure on the east bank of the Mississippi River near Big Mar, was placed into operation. The Caernarvon structure was constructed (construction funded by the Water Resources Development Act) for the purpose of diverting Mississippi River water through Big Mar into the marshes to the south and west of Big Mar. These marshes, since the early 1900's, had deteriorated due, largely, to being isolated, because of levee construction, from direct river influxes. This isolation, with the resultant absence of minerals and nutrients formerly regularly deposited during high river stages, caused a net loss of the organic soils prevalent in the project area. The specific mechanisms causing the soil loss included natural subsidence, erosion, salt water intrusion and oxidation.

In addition to the losses due to Mississippi River levee construction, the increased construction of navigation and oil/gas canals in the project area contributed to the problem. These straight canals provided a perfect avenue for saltwater intrusion and the canals' high water velocity led to increased erosion rates.

An earlier hurricane also contributed to the loss of wetlands in the project area. In 1965, storm surges from Hurricane Betsy traveled over the above-discussed canals and the forested swamp area in the northern part of the project area was destroyed by salt stress when the salt water from the storm surge became trapped behind Tigers Ridge.

From 1932 to 1990, 5,546 acres of land in the project area were converted to open water via the above-discussed mechanisms. By 1978, saltwater intrusion had transformed the project area from a primarily intermediate marsh to primarily a brackish marsh. In addition, Hurricane Katrina caused significant damage to the entire project area.

The Caernarvon Freshwater Diversion Structure was intended to counter some of the mechanisms causing wetlands loss in the project area particularly the saltwater intrusion and loss of sediment input resulting from the Mississippi River levee construction and the new oil/gas and navigation canals that have been constructed. Specifically, the Caernarvon structure was intended to increase wildlife and fisheries productivity, enhance emergent marsh vegetation growth, and reduce marsh loss.

The structure has a discharge capacity of approximately 8,000 cubic feet of freshwater per second. Once diversion waters enter Big Mar, presently 80% of the water exits to the southeast via Bayou Mandeville which flows into Lake Lery. Eventually this flow reaches Bayou Terre aux Boeufs. So, in summary, 80 % of the discharge water flows to the southeast of Big Mar and only 20 % flows to the more-deteriorated marshes to the southwest of Big Mar. Prior to Hurricane Katrina, Gustav and Ike, those percentages were closer to 66%--34%. An additional problem is, prior to the present Caernarvon Outfall Management Project, much of the flow of water to the southwest channeled rapidly to the lower reaches of the basin and did not inundate the interior marshes as was originally intended. The present project promotes better utilization and distribution of water from the Caernarvon Freshwater Diversion Structure. Project features will allow water from the channels to flow into the marsh interior and will cause the water to be retained in the marsh for a longer period of time.

The project features are listed below:

All elevations are at NAVD 88. Inspection photos of the features are shown in Appendix B of this report.

A. Site/Structure # 13 – Earthen channel plug with riprap armor located along the west bank of Bayou Mandeville. The plug is set at an elevation of +4.0 ft. and is 100 ft. long x 100 ft. wide with

18 inches of riprap armor. The crest of the structure is 10 ft. wide. The plug includes a one (1) 48" diameter corrugated aluminum pipe which passes through the rock fill plug at an elevation of -3.5 ft. with an aluminum combination gate attached to the pipe on the interior side of the marsh. A timber walkway to the gate is at elevation +4.0.

B. Site/Structure # 25 - Earthen channel plug with riprap armor located on the Forty Arpent Canal near Big Mar. The plug is set at an elevation of +4.0 ft and is 169 ft. long and 100 ft. wide with 18 inches of riprap armor. The crest of the structure is 10 ft. wide. The plug includes two (2) 48" diameter corrugated aluminum pipes which pass through the rock fill (and are supported by the rock fill) at an elevation of -4.0 ft. Earth fill has been placed on each side of the rock fill. Aluminum canal gates are attached to the end of each pipe on the exterior side of the marsh. A timber walkway to the gates is at elevation +4.0.

C. Site/Structure # 26 – Earthen channel plug with riprap armor plate located along Reggio Canal spoil bank. The plug is set at a crest elevation of +4.0 ft. and is 154 ft. long and 100 ft. wide and is capped with 18 inches of riprap rock. The crest of the structure is 10 ft. wide. The plug includes four (4) 48" corrugated aluminum pipe which pass through the earthen material at an elevation of -4.0 ft. Aluminum canal gates are attached to the end of each pipe on the exterior side of the marsh. The pipe and gates are supported by a timber pile system. A timber walkway is installed at elevation +4.0 ft.

D. Site/Structure # 32 – Riprap channel plug across an unnamed channel which flowed into Lake Lery at the west end of the lake. The plug is 117 ft. long and the 6 ft. wide plug crest is set at +4.0 ft. The 70 ft. stretch of channel from the plug eastward to Lake Lery has 2 feet thick riprap placed on both channel banks.

E. Site/Structure # 40 – Earthen channel plug with riprap armor along the Reggio canal spoil bank. The plug is 142 ft. long and 100 ft. wide. The crest of the structure is 10 ft. wide and is set at an elevation of +4.0 ft. The plug includes 2- 48" diameter corrugated aluminum pipes thorough the rock fill portion of the rock fill at an elevation of -4.0 ft. Earth fill was placed on each side of the rock fill. The entire structure is capped with an 18" thick layer of rip-rap. Aluminum canal gates are attached to the ends of the aluminum pipes on the exterior side of the marsh. The pipe and gates are supported by a timber pile system and a timber walkway to the gates is installed at elevation +4.0 ft.

F. Site/Structure # 50 – Earthen channel plug with riprap armor along the west bank of Bayou Mandeville. The plug is 55 ft. long and 100 ft. wide. The crest of the structure is 10 ft. wide and is set at an elevation of +4.0 ft. The plug includes one (1) 48" diameter corrugated aluminum pipe through an aggregate embankment at an elevation of -3.5 ft. The embankment is capped with an 18" thick layer of rip-rap. The pipe has a combination gate attached on the pipe end on the interior side of the marsh. The pipe and gate are supported by a timber pile system and a timber walkway to the gate is installed at elevation +4.0.

G. Site/Structure # 52 – Earthen channel plug with riprap armor along DP Canal spoil bank. The plug is 100 ft. long and 100 ft. wide. The crest of the structure is 10 ft. wide and is set at an elevation of +4.0 ft. The plug includes two (2) 48" diameter corrugated aluminum pipes through the

embankment at -3.0 ft. The embankment is capped with a 18" thick layer of riprap. Aluminum combination gates are attached to the end of each pipe on the interior side of the marsh. The two pipes are supported by a timber pile system and a timber walkway to the gates is installed at elevation +4.0.

H. Site/Structure # 54 – Earth fill channel plug with riprap armor located at the intersection of Reggio Canal and Promise Land Canal. The plug is 140 ft. long and 150 ft. wide. The crest of the structure is 10 ft. wide and is set at an elevation of +4.0 ft. The plug includes two (2) 48" diameter corrugated aluminum pipes through the rock fill portion of the embankment at an elevation of -4.0 ft. Earth fill was placed of each side of the rock fill. The entire embankment is capped with a 18" thick layer of riprap. Aluminum canal gates are attached to the end of each pipe on the exterior side of the marsh. The pipes and gates are supported by a timber pile system and a timber walkway to the gates installed at elevation +4.0 ft.

The existing spoil bank on the south side of Promise Land Canal was degraded in three locations on the west side of Structure # 54. The excavated material was placed on the south side behind the existing spoil bank.

I. Site/Structure # 56 - Rock riprap channel plug across an unnamed channel on the east side of the Reggio Canal. The plug is 208 ft. long and the side slopes of the plug are 3 horizontal to 1 vertical. The crest of the structure is 6 ft. wide and is set at an elevation of +4.0 ft.

J. Site #57 – Consists of 5,315 linear feet of spoil bank restoration along the east side of the Reggio Canal between the Delacroix Canal and Site # 54. The spoil bank restoration consists of an earth fill embankment placed on existing spoil to an elevation of +4.0 ft. with a 12 ft. top width and 3 horizontal to 3 vertical side slopes. The entire length of embankment has been seeded to permanent vegetation.

K. Site # 58 – Consists of 5,244 linear ft. of spoil bank restoration along the west side of Bayou Mandeville between the Delacroix Canal and Site # 13. The spoil bank restoration consists of an earth fill embankment placed on existing spoil to an elevation of +4.0 ft. with a 12 ft. top width and 3 horizontal to 3 vertical slope. The entire length of embankment has been seeded to permanent vegetation.

L. Site/Structure # 60 – Rock fill channel plug at the intersection of Reggio Canal and an existing pipeline canal. The plug is 200 ft. long and 100 ft. wide. The crest of the structure is 10 ft. wide and set at an elevation of +4.0. The adjacent earth plug with riprap armor includes two (2) 36" diameter corrugated aluminum pipes through the earth plug at an elevation of -3.0 ft. The entire length of the plug is capped with an 18" layer of riprap. Aluminum combination gates are attached to the end of each aluminum pipe on the interior side of the marsh. The pipes and gates are supported by a timber pile system and a timber walkway to the gates is installed at elevation +4.0 ft.

IV. Summary of Past Operation and Maintenance Projects

General Maintenance: Below is a summary of completed maintenance projects and operation tasks:

Three flow meters were installed at structures No. 26, 40, and 54 to monitor the flow of fresh water into the interior marshes to determine if it would be necessary to maintain the associated channels to increase flow. These flow meters were put out of service as a result of Hurricane Katrina, and have since been removed. Plans are in place to repair and replace those flow meters at their original locations after the spoil-banks and channels are restored to their pre-storm conditions.

Prior to the 2008 inspection, a team from OCPR & NRCS mobilized a mud boat and flushed out the culverts at sites # 40, 26, 54, & 60 that were blocked with debris from Hurricane Katrina; those culverts were still free flowing during this 2009 inspection.

The O & M Contractor was given a maintenance schedule that keeps the project features in good operating condition. Some of the O & M tasks are, lubricating and periodic operating of each structure, cleaning the wood platforms and spraying of the area for unwanted vegetation and insects. Periodic inspections of all project features are also performed and deficiencies are corrected.

2008 Structure Operations:

In accordance with the operation schedule outlined in the Operations and Maintenance Plan, none of the structures were operated this past year. All gates have been left in the open position to allow fresh water in all the marsh areas. Even the combination gates were left wide open to allow the maximum (in and out) water exchange to take place while the spoil banks are being rebuilt.

In early 2008 the contract for operation of the main diversion structure was re-bid, with the operation of the outfall structures was included. That contract went into affect on July 1, 2008 and has recently been renewed for an additional year. That renewed contract went into affect July 1, 2009. The contractor is performing periodic operations of each of the gated structures, he also cleans and maintains the timber platforms and performs periodic inspections as directed by OCPR.

V. Inspection Results (See Appendix B for photos of each site)

Much of the marsh debris that was deposited throughout the area as a result of Hurricane Katrina has been cleared making the project again accessible, with the exception of Structure # 25 which is still only accessible by air boat. The O & M contractor has recently procured an air boat to access # 25 and all other structures should blockages occur in the future. The main blockage, approx. 4,800 ft., still partially remains in the Delacroix Canal just east of structure #26. The Delacroix Corp. excavated flotation and access through the blockage to allow mobilization of their floating plant to access areas where they are working on their marsh management project. This work now allows some water to flow into the western side of the project area which is fed by the Reggio Canal. This moving water continues to slowly erode the floating blockage; however, OCPR & NRCS is actively working with the landowner and the COE to obtain a permit for cleaning out the remainder of the debris. It is anticipated that a small dredging contract will be awarded in FY 2010 to accomplish the work. During the inspection, information was recorded on the area that needs dredging and was given to a NRCS survey team who since has performed the necessary surveys which are now being used to plan that dredging contract. At the time of the inspection, water levels were relatively low due to reduced diversion flows. Some of the spoil banks surrounding the areas nourished by the structures still lay breached from Katrina and allows diverted water to flow freely in and out of the project areas.

A. Site/Structure # 13 – Water is moving into the marsh where it appeared that a few rocks were still displaced on the north end of the closure accented by some scouring of the embankment at the tie-in. This gap in the closure allows water to flow freely in and out of the project area at that point. The combination gate was in the up/open operating position to allow maximum uninterrupted tidal exchange into the marsh. The plan is to place the combination gate in the down/closed position and allow the flap gate to automatically control the marsh side water levels. The timber walkway still lays separated from its support beam at one end. (See Photo 1 & 2)

B. Site/Structure # 25 – Canal blockage did not permit the inspection team from reaching the structure; however, that structure was later observed from the Braithwaite levee just to its north side of the 40 arpent canal. Again, the gates were closed at the time of the inspection but plans are to open these gates in the near future. It appears that there is very little (if any) blockage from storm debris. The 40 arpent canal was relatively clear leading to the structure.

C. Site/Structure # 26 – The structure has been completely cleaned of any storm debris since the last inspection by the O&M contractor. The gates were in the open position and water flow was visible despite the low diversion flow rate and the partial blockage in the Delacroix Canal. It was evident that no structure blockage remains from the storm debris. Like all other canal closures, heavy seasonal vegetation (deer pea) covers the earthen/rock closures that house the culverts. (See Photo 3 & 4)

D. Site/Structure # 32 –Overall condition was good with the exception of the area that was vandalized in early 2003. That area was partially repaired by the 2003 inspection team; however, that repair was again vandalized to the existing depth. The canal closure still functions during low to medium flows from the main structure. This structure was constructed to keep diversion water from entering Lake Leary from the western lake rim; Katrina devastated that portion of the lake rim rendering this structure ineffective until such time that the lake rim is repaired. (See Photo 5 & 6)

E. Site/ Structure # 40 – The structure has been cleared of storm debris. The gates remain in the open position. Water flow was moderately visible entering the marsh side due to the present low flow rate at the main structure. The culverts at this site were flushed out prior to the last inspection and remain clean. The interior channel that leads to the site was relatively clear of debris and hyacinths. Most of the unwanted water hyacinth was destroyed from the high salinities brought in by Gustav and Ike.
(See Photo 7 & 8)

F. Site/Structure # 50 – The combination gate was in the up/open position. The plan is to lower/close the combination gate and allow the flap gate to automatically control the inside marsh levels. Small amount of water movement was noticed through the structure to the interior marsh. The timber walkway remains slightly bowed, and remains free of any storm debris. (See Photo 9 & 10)

G. Site/Structure #52 – The two combination gates were in the up/open position. There appeared to be a movement on the water surface near the inlet indicating some water flow into the marsh. The combination gates will be closed to allow the flap gates to automatically adjust the water

levels on the marsh side. There is a small breach of the spoil bank to the right and left of the plug allowing some flow from the canal to the marsh depending on the tidal exchange. (See Photo 11 & 12)

H. Site/Structure # 54 – The structure has been cleared of all storm debris, and the gates remain in the open position. Water flow was visible indicating that the culverts are still clear after being flushed out after Katrina. The channel leading to the earthen/rock closure is relatively clear as is the closure itself. (See Photo 13 & 14)

I. Site/ Structure # 56 - No additional subsidence was noted in this rock structure since the last inspection. Small amount of debris with vegetation remains on the entire rock closure. Soon after construction, the middle section of the plug subsided approximately 0.5 ft. more than the sides. The warning signs that were damaged during the storm were previously reset; however, one of the signs appears to be leaning. (See Photo 15)

J. Site # 57 –It appears that the vegetation on the spoil bank along the sides of the Reggio Canal that was damaged by Katrina continues to recover although some sparse areas remain. There are small breaches in the spoil-bank between structure nos. 26 and 40. One large cut (~15' wide) exists in the spoil-bank east of structure no. 54.

K. Site # 58 –The vegetation on the spoil bank along the sides of the Bayou Mandeville that was damaged by Katrina is recovering although some sparse areas remain.

L. Site/Structure # 60 – The gate structure is completely cleared from any storm debris. At the time of the inspection, the two combination gates were in the up/open position but will be closed to allow the flap gate to control the marsh water levels. Water flow was slightly visible going into the marsh, indicated by a small eddy at the canal side of the culverts. The culverts at this site were cleared prior to the 2008 annual inspection, and remain clear. Thick vegetation has covered most all of the canal closure and the majority of the earthen/rock closure that house the culverts. (See Photo 16)

VI. Conclusions and recommendations

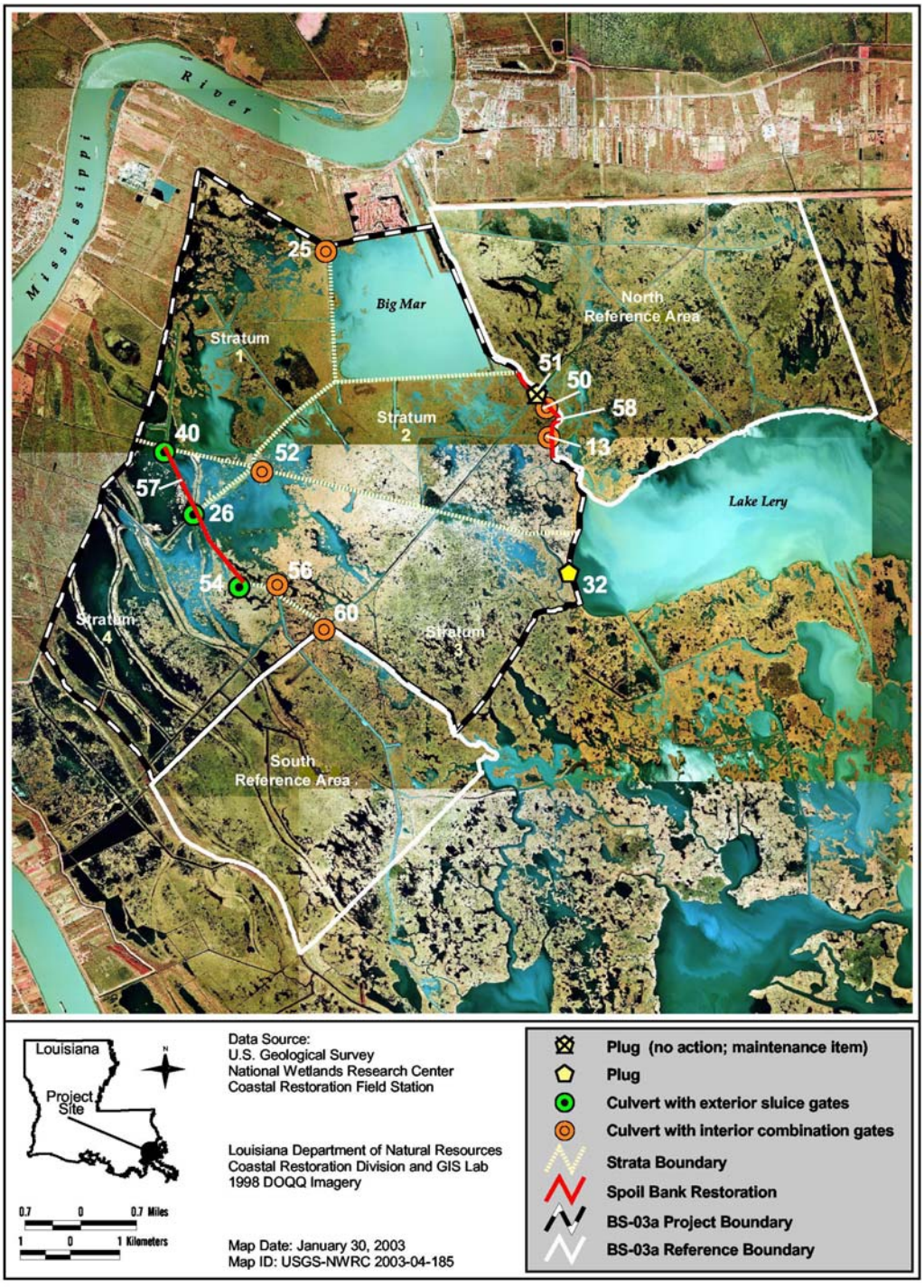
1. As you can see from the inspection report and photographs, areas of the outfall project show good signs of recovery from the Katrina, Gustav, and Ike Storm event. This recovery appears to be due to a steady moderate to high flow of river water through the diversion. Many structures may still be slightly blocked by storm debris but still function as required. Completed repair operations to the levee that occurred behind Braithwaite and Scarsdale now allow the Caernarvon Diversion structure to be operated above the previously restricted 5,000 cfs without fear of further flooding the east bank of Plaquemines Parish.
2. OCPR concludes that the outfall project could possibly be restored to its original condition; however, the entire complexion of the project has been changed. It will take clearing of the channels, and repair all the washed out embankments that formed the marsh perimeter affected by each individual structure. It will also be necessary to repair the entire west and north lake rim of Lake Leary that was damaged, so as not to allow diversion water to enter the lake from those sides. There is a Corps of

Engineers project in the planning stage to do just that; however, it may be 3 to 4 years, if not more, before that project is complete.

3. OCPR suggests that we continue to aggressively operate the diversion structure with hopes that more of the marsh debris that was deposited by the three storms will be displaced from the project area. It is also thought that by operating the structure aggressively, will allow more desirable vegetation to take over and expand where it did exist. The Delacroix Corp. received a marsh management permit that will allow them to repair much of the spoil-banks and holding areas that contributed to the success of this project. That work is ongoing. In the interim, OCPR will continue to divert fresh water into the South and West section of the outfall area.
   OCPR would also like to suggest that the State and NRCS continue to work together to make the necessary changes, to the original project, that were brought on by the following post design and construction events:
   - **a.** Resolution of the oyster litigation that for so long influenced the operational plan for the diversion.
   - **b.** Severe storm damage from the three storms that dramatically changed the complexion of the entire outfall landscape.
   - **c.** Legislation resulting from the storm damage that granted the project $10.1 million by the 4th supplemental appropriation. These funds will be used to modify the Caernarvon Freshwater Diversion Project by restoring the surrounding wetlands to reverse wetland losses and modification of the main structure operations.
   - **d.** Under that supplemental appropriation, the COE will look to re-authorize the project in order to maximize freshwater diversion to the Breton Sound Basin.

   All of these events will influence the effectiveness of the Caernarvon Outfall Project as we now see it. It is anticipated that the low flows that initially were an integral part of the yearly operational plan will be a thing of the past. We are now looking at a more aggressive flow plan and, if the project is re-authorized, and given the demand for introduction of more freshwater into the marshes, we could enter into a pattern that would approach maximum flow (8,000 cfs) whenever the river stage will allow.

APPENDIX A
Project Features Map


Mississippi River
Big Mar
North Reference Area
Stratum 1
Stratum 2
Stratum 3
Stratum 4
Lake Lery
South Reference Area
25
51
50
58
13
40
52
57
26
54
56
60
32
Louisiana
Project Site
Data Source:
U.S. Geological Survey
National Wetlands Research Center
Coastal Restoration Field Station
Louisiana Department of Natural Resources
Coastal Restoration Division and GIS Lab
1998 DOQQ Imagery
Map Date: January 30, 2003
Map ID: USGS-NWRC 2003-04-185
0.7 0 0.7 Miles
1 0 1 Kilometers
Plug (no action; maintenance item)
Plug
Culvert with exterior sluice gates
Culvert with interior combination gates
Strata Boundary
Spoil Bank Restoration
BS-03a Project Boundary
BS-03a Reference Boundary

APPENDIX B
Photographs

Photo No. 1, Site 13

Photo No. 2, Site 13

Photo No. 3, Site 26

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Photo No. 4, Site 26

Photo No. 5, Site 32

Photo No. 6, Site 32

Photo No. 7, Site 40

Photo No. 8, Site 40

Photo No. 9, Site 50

Photo No. 10, Site 50

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Photo No. 11, Site 52

Photo No. 12, Site 52

Photo No. 13, Site 54

Photo No. 14, Site 54

Photo No.15, Site 56

Photo No. 16, Site 60

Appendix C
Three-Year Operations & Maintenance Budgets

Caernarvon Outfall Management / BS-03a / PPL 2

Three-Year Operations & Maintenance Budgets 07/01/2009 - 06/30/2012

Project Manager	O & M Manager	Federal Sponsor	Prepared By
Thomas Bernard	*Thomas Bernard*	*NRCS*	*Thomas Bernard*

	2009/2010	2010/2011	2011/2012
Maintenance Inspection	$4,515.00	$4,633.00	$4,753.00
General Maintenance	$19,800.00	$13,800.00	$13,800.00
Structure Operation	$30,000.00	$30,000.00	$30,000.00
Administration	$30,000.00	$15,000.00	$15,000.00
Maintenance/Rehabilitation			

09/10 Description:

E&D	$10,000.00
Construction	$265,000.00
Construction Oversight	$5,000.00
Sub Total - Maint. And	$ 280,000.00

10/11 Description

E&D		$0.00
Construction		$0.00
Construction Oversight		$0.00
	Sub Total - Maint. And	$ -

11/12 Description:

E&D		$0.00
Construction		$0.00
Construction Oversight		$0.00
	Sub Total - Maint. And	$ -

	2009/2010	2010/2011	2011/2012
Total O&M Budgets	**$ 364,315.00**	**$ 63,433.00**	**$ 63,553.00**

O &M Budget (3 yr	**$ 491,301.00**
Unexpended O & M	**$ 909,754.55**
Remaining O & M Budget (Projected)	**$ 418,453.55**

OPERATION AND MAINTENANCE BUDGET WORKSHEET 2009/2010

Caernarvon Outfall Management / BS-03a / PPL 2

DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
O&M Inspection and Report	EACH	1	$4,515.00	**$4,515.00**
General Structure Maintenance	LUMP	1	$10,800.00	**$10,800.00**
Engineering and Design	LUMP	1	$10,000.00	**$10,000.00**
Operations	LUMP	1	$30,000.00	**$30,000.00**
Construction Oversight	LUMP	1	$5,000.00	**$5,000.00**
ADMINISTRATION				
LDNR / CRD Admin.	LUMP	1	$15,000.00	$15,000.00
FEDERAL SPONSER Admin.	LUMP	1	$15,000.00	$15,000.00
SURVEY Admin.	LUMP	0	$0.00	$0.00
OTHER				$0.00
			TOTAL ADMINISTRATION COSTS:	**$30,000.00**

MAINTENANCE / CONSTRUCTION

SURVEY

SURVEY DESCRIPTION:					
Secondary Monument	EACH	0	$0.00	$0.00
Staff Gauge / Recorders	EACH	0	$0.00	$0.00
Marsh Elevation / Topography	LUMP	0	$0.00	$0.00
TBM Installation	EACH	0	$0.00	$0.00
Flow Meters (Repair, Install, & Gen. Maintain.)	EACH	3	$3,000.00	$9,000.00
			TOTAL SURVEY COSTS:	**$9,000.00**

GEOTECHNICAL

GEOTECH DESCRIPTION:					
Borings	EACH	0	$0.00	$0.00
OTHER				$0.00
			TOTAL GEOTECHNICAL COSTS:	**$0.00**

CONSTRUCTION

CONSTRUCTION DESCRIPTION:	Dredging				
Rip Rap	LIN FT	TON / FT	TONS	UNIT PRICE	
	0	0.0	0	$0.00	$0.00
	0	0.0	0	$0.00	$0.00
	0	0.0	0	$0.00	$0.00
Filter Cloth / Geogrid Fabric		SQ YD	0	$0.00	$0.00
Navagation Aid		EACH	0	$0.00	$0.00
Signage		EACH	0	$0.00	$0.00
General Excavation / Fill		CU YD	0	$0.00	$0.00
Dredging		CU YD	80,000	$3.00	$240,000.00
Sheet Piles (Lin Ft or Sq Yds)			0	$0.00	$0.00
Timber Piles (each or lump sum)			0	$0.00	$0.00
Timber Members (each or lump sum)			0	$0.00	$0.00
Hardware		LUMP	1	$0.00	$0.00
Materials		LUMP	1	$0.00	$0.00
Mob / Demob		LUMP	1	$25,000.00	$25,000.00
Contingency		LUMP	1	$0.00	$0.00
General Structure Maintenance		LUMP	1	$0.00	$0.00
OTHER				$0.00	$0.00
OTHER				$0.00	$0.00
OTHER				$0.00	$0.00
				TOTAL CONSTRUCTION COSTS:	**$265,000.00**

TOTAL OPERATIONS AND MAINTENANCE BUDGET: $364,315.00

OPERATION AND MAINTENANCE BUDGET WORKSHEET 2010/2011

Caernarvon Outfall Management / BS-03a / PPL 2

DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
O&M Inspection and Report	EACH	1	$4,633.00	**$4,633.00**
General Structure Maintenance	LUMP	1	$10,800.00	**$10,800.00**
Engineering and Design	LUMP	0	$0.00	**$0.00**
Operations	LUMP	1	$30,000.00	**$30,000.00**
Construction Oversight	LUMP	0	$0.00	**$0.00**
ADMINISTRATION				
LDNR / CRD Admin.	LUMP	1	$10,000.00	$10,000.00
FEDERAL SPONSER Admin.	LUMP	1	$5,000.00	$5,000.00
SURVEY Admin.	LUMP	0	$2,000.00	$0.00
OTHER				$0.00
			TOTAL ADMINISTRATION COSTS:	**$15,000.00**

MAINTENANCE / CONSTRUCTION

SURVEY

SURVEY DESCRIPTION:					
Secondary Monument		EACH	0	$0.00	$0.00
Staff Gauge / Recorders		EACH	0	$0.00	$0.00
Marsh Elevation / Topography		LUMP	0	$0.00	$0.00
TBM Installation		EACH	0	$0.00	$0.00
Flow Meters (General Maintenance)		EACH	3	$1,000.00	$3,000.00
				TOTAL SURVEY COSTS:	**$3,000.00**

GEOTECHNICAL

GEOTECH DESCRIPTION:					
Borings		EACH	0	$0.00	$0.00
OTHER					$0.00
				TOTAL GEOTECHNICAL COSTS:	**$0.00**

CONSTRUCTION

CONSTRUCTION DESCRIPTION:					
Rip Rap	LIN FT	TON / FT	TONS	UNIT PRICE	
	0	0.0	0	$0.00	$0.00
	0	0.0	0	$0.00	$0.00
	0	0.0	0	$0.00	$0.00
Filter Cloth / Geogrid Fabric		SQ YD	0	$0.00	$0.00
Navigation Aid		EACH	0	$0.00	$0.00
Signage		EACH	0	$0.00	$0.00
General Excavation / Fill		CU YD	0	$0.00	$0.00
Dredging		CU YD	0	$0.00	$0.00
Sheet Piles (Lin Ft or Sq Yds)			0	$0.00	$0.00
Timber Piles (each or lump sum)			0	$0.00	$0.00
Timber Members (each or lump sum)			0	$0.00	$0.00
Hardware		LUMP	0	$0.00	$0.00
Materials		LUMP	0	$0.00	$0.00
Mob / Demob		LUMP	0	$0.00	$0.00
Contingency		LUMP	0	$0.00	$0.00
General Structure Maintenance		LUMP	0		$0.00
Survey		LUMP	0	$0.00	$0.00
OTHER				$0.00	$0.00
OTHER				$0.00	$0.00
				TOTAL CONSTRUCTION COSTS:	**$0.00**

TOTAL OPERATIONS AND MAINTENANCE BUDGET: $63,433.00

OPERATION AND MAINTENANCE BUDGET WORKSHEET 2011/2012

Caernarvon Outfall Management / BS-03a / PPL 2

DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
O&M Inspection and Report	EACH	1	$4,753.00	**$4,753.00**
General Structure Maintenance	LUMP	1	$10,800.00	**$10,800.00**
Engineering and Design	LUMP	0	$0.00	**$0.00**
Operations	LUMP	1	$30,000.00	**$30,000.00**
Construction Oversight	LUMP	0	$0.00	**$0.00**
ADMINISTRATION				
LDNR / CRD Admin.	LUMP	1	$10,000.00	$10,000.00
FEDERAL SPONSER Admin.	LUMP	1	$5,000.00	$5,000.00
SURVEY Admin.	LUMP	0	$2,000.00	$0.00
OTHER				$0.00
			TOTAL ADMINISTRATION COSTS:	**$15,000.00**

MAINTENANCE / CONSTRUCTION

SURVEY

SURVEY DESCRIPTION:					
Secondary Monument	EACH	0	$0.00	$0.00
Staff Gauge / Recorders	EACH	0	$0.00	$0.00
Marsh Elevation / Topography	LUMP	0	$0.00	$0.00
TBM Installation	EACH	0	$0.00	$0.00
Flow Meters (General Maintenance)	EACH	3	$1,000.00	$3,000.00
			TOTAL SURVEY COSTS:	**$3,000.00**

GEOTECHNICAL

GEOTECH DESCRIPTION:					
Borings	EACH	0	$0.00	$0.00
OTHER				$0.00
			TOTAL GEOTECHNICAL COSTS:	**$0.00**

CONSTRUCTION

CONSTRUCTION DESCRIPTION:	Repair of storm damage to valves, fencing, and embankment. Replacement of storm damaged gate actuator.				
Rip Rap	LIN FT	TON / FT	TONS	UNIT PRICE	
	0	0.0	0	$0.00	$0.00
	0	0.0	0	$0.00	$0.00
	0	0.0	0	$0.00	$0.00
Filter Cloth / Geogrid Fabric		SQ YD	0	$0.00	$0.00
Navagation Aid		EACH	0	$0.00	$0.00
Signage		EACH	0	$0.00	$0.00
General Excavation / Fill		CU YD	0	$0.00	$0.00
Dredging		CU YD	0	$0.00	$0.00
Sheet Piles (Lin Ft or Sq Yds)			0	$0.00	$0.00
Timber Piles (each or lump sum)			0	$0.00	$0.00
Timber Members (each or lump sum)			0	$0.00	$0.00
Hardware- Gate Actuator, gate sleeves		LUMP	0	$0.00	$0.00
Materials		LUMP	0	$0.00	$0.00
Mob / Demob		LUMP	0	$0.00	$0.00
Contingency		LUMP	0	$0.00	$0.00
General Structure Maintenance		LUMP	0	$0.00	$0.00
OTHER				$0.00	$0.00
OTHER				$0.00	$0.00
OTHER				$0.00	$0.00
				TOTAL CONSTRUCTION COSTS:	**$0.00**

TOTAL OPERATIONS AND MAINTENANCE BUDGET: **$63,553.00**

Appendix D
Field Inspection Form

Structure No.	**See Report Section III**	Inspector(s):	OCPR: Tom Bernard, Barry Richard----NRCS: Loland Broussard
Structure Description:	See Report Section III	Water Level:	Inside: +2.4 NGVD Outside: +3.3 NGVD
Type of Inspection:	2009 Annual Inspection	Weather Conditions:	Clear and Warm, Wind SW 5-10 mph (3,100 CFS Diversion)

Item	Condition	Physical Damage	Corrosion	Photo	Observations and Remarks
CMP Culverts Earthen / Rock Embankment	Good	None	None	Appendix B	Some of the culverts have rotated slightly with the differential settlement of the rock structure. Most of the visible storm debris has cleared from the embankments. It appears that there is still some small amount of blockage that remains in the culvert
Water Control Gates	Good	None	Moderate	Appendix B	All water Control Gates appear to be in fair condition. A section of Delacroix Canal is blocked by storm displaced marsh. Plans are in place to let a dredging contract to clear the remaining debris. OCPR has applied for the necessary permits for that project.
Rock Canal Closures	Good	See Remarks	N/A	Appendix B	The overall condition of the canal closures is good with small areas of erosion where the rock meets the earthen embankment. The partial repairs (to the vandalism) made by the 2003 inspection team at site #32 was again vandalized and remains that way. It
Timber Piling at Culverts	Very Good	None	None	Appendix B	All of the timber piling are in very good condition. Some of the rock structures have settled as well as the culvert themselves causing some slight rotation in the culverts.
Timber walkways at Culverts	Very Good	See Remarks	N/A	Appendix B	Some of the 4 X 4 timber support posts for the timber walkways settled excessively causing the timber walkway to bend and twist slightly. Small amounts of displaced marsh debris is still evident on some of the walkways.
Spoilbank Restoration	Fair	Severe	N/A	Appendix B	The storm surge has caused extensive damage to all spoilbank work, which was suseptable to erosion from waves. Some of these areas have re-vegetated nicely on their own since Katrina.
Flow Meters	N/A	Severe	N/A	N/A	Flow meters were installed at structures No. 26, 40, and 54 to monitor the flow of water going into the interior marsh were destroyed/damaged and have not yet been replaced. Plans are to reinstall the meters after spoil-banks are rebuilt by the landowner