



Coastal Protection and Restoration Authority of Louisiana

Office of Coastal Protection and Restoration

2008 Annual Inspection Report

Jonathan Davis Wetland Protection

State Project Number BA-20
Priority Project List 2

July 13, 2009
Jefferson Parish

Prepared by:

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I. Introduction

The Jonathan Davis Wetland Protection (BA-20) project is located in Jefferson Parish within the Barataria Basin. It encompasses 7,199 acres (2,880 ha) of wetlands, which were classified as intermediate marsh in 1994 (OCPR 1998). The project is bounded on the north by the Paillet Canal, on the east by La. Hwy. 301, on the south by Bayous Perot and Rigolettes, and on the west by the Gulf Intracoastal Waterway (GIWW) (Appendix A).

II. Project Description and History

Overall, 1,393 ac (557 ha) of land within the Jonathan Davis Wetland Protection project area have been converted to open water between 1945 and 1989 (Coastal Environments Inc. 1991). The average rate of change of marsh to non-marsh (including loss to both open water and commercial development) has increased since the 1940s. National Biological Survey (NBS) Geographic Information System (GIS) habitat data from 1956 characterized the majority of the area as fresh marsh. However, the 1978 and 1990 data indicate that the area has become more saline. In both 1978 and 1990, the area was classified as primarily intermediate marsh. Chabreck and Linscombe (1988) also characterize the area as intermediate marsh.

Large scale factors influencing degradation in the Barataria basin include subsidence, lack of sedimentation, and reduced freshwater influx due to the levee system on the Mississippi River and its major distributaries. To compound this problem, there are no major external sources of inorganic sediment into the project area although some sediment does enter via the GIWW. Moreover, storm surges moving through numerous oil field canals within the area have facilitated the export of a large portion of the indigenous inorganic and organic sediments.

Other factors influencing wetland loss within the project area are increased water exchange, saltwater intrusion, tidal scour, and shoreline erosion along Bayous Perot and Rigolettes. Shoreline erosion from 1945 to 1989 caused primarily by wave action along Bayou Perot has been measured at 20 ft/yr (6.1 m/yr). Saltwater intrusion and tidal scour are believed to have been enhanced with the construction of various oil field canals that were dredged in the 1940s when oil companies were not responsible for maintaining a continuous spoil bank along the canals. As a result, the breaches that occurred were not repaired and subsequently exposed the interior marsh to increased tidal flows and salinity during storm surges.

Project features consist of shoreline protection, rock armored plugs, rock weirs, and weirs with boat bays. Construction Unit 1, which consists of project features 12, 13, 14, 15, 16, 17, 19, 20, and 21, was completed in September 1998. Construction Unit 2 was completed in May 2001. It encompassed installing a weir at structure 22, and shoreline protection from structures 20 to 22. Construction Unit 3, which consists of shoreline

protection extending from project feature 12, west to the Gulf Intracoastal Waterway, was completed on July 7, 2003. Construction of features 1, 2, 3, 6, 8, 9, 10, and 11 in the northern project area has been deferred due to lack of funding, and land rights issues. (Appendix A)

On January 30, 2002, Stone Energy Corporation was issued a Coastal Use Permit to plug and abandon existing wells within the Jonathan Davis Wetland Protection Project. This work was completed on 7/18/02 and consisted of removing and replacing structures 13 & 19 to plug and abandon several existing wells located behind these structures. The cost associated with removing and replacing these structures was incurred entirely by Stone Energy Corporation. However, at the request of NRCS, OCPR was required to provide inspection services for this project. OCPR obtained the services of GSE Associates, Inc. to inspect construction activities and prepare a project completion report and as-built drawings. These services were performed for a total cost of \$9,394.13.

As part of the construction documents prepared by NRCS for this project, Stone Energy Corporation was required to reconstruct structure 13, increasing the boat bay crest from 50' to 100' in width and raising the crest elevation from -5.0' NGVD to -2.5' NGVD.

No other maintenance work has been performed on this project since the completion of Construction Unit 1.

III. Inspection Purpose and Procedures

The purpose of the annual inspection of the Jonathan Davis Wetland Protection (BA-20) project 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 March 18, 2002). 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 project are outlined in Section II.

An inspection of the Jonathan Davis Wetland Protection (BA-20) project was held on September 30, 2008, by Barry Richard of OCPR and Quin Kinler of NRCS. This inspection was a result of Hurricanes Gustav and Ike making landfall in coastal Louisiana. There was a light southeast wind and clear skies. Photographs of that inspection are included in Appendix B of this report.

IV. Inspection Results

Construction Unit No. 1

Structure No. 12 – Rock rip-rap armored plug

The structure is in good condition. There is some slight settling near the edge of the plug adjacent to the two signs. All of the signs and supports were in good condition. At this time there is no need for any maintenance work to be done at this structure.

Structure No. 13 – Rock rip-rap armored weir w/ boat bay

We observed slight settlement on the west side of the structure 13. All signs and supports were also in good condition. No maintenance will be required at this time.

Structure No. 14 – Rock rip-rap armored plug

Upon a visual inspection, we noticed a large breach on the west side of the structure and in the center of the structure. (Photo #1). Due to poor soil conditions, this structure has experienced significant settlement problems since the time it was constructed. Several attempts were made during construction to stabilize the structure by placing several lifts of rock, but the structure continued to settle. The maintenance work for this structure will be performed during the construction of Construction Unit 4 (CU 4).

Structure No. 15 – Rock rip-rap weir w/ boat bay

Structure 15 appeared to be in good condition at the time of the inspection with little or no noticeable settlement of the rock weir (Photo #2). Signs and supports were also in good condition. The original design of this structure was modified to include a boat bay to accommodate oilfield activities and navigation on the interior marsh of the structure. During the construction of CU 4, this structure will be modified so that it represents the original design more accurately.

Structure No. 16 – Rock rip-rap channel plug

Structure 16 appeared to be in good condition with exception of a low area on the south side of the channel plug (Photo #3). The maintenance work for this structure will be performed during the construction of CU4.

Structure No. 17 – Rock rip-rap channel plug

During the inspection, we observed significant settlement near the warning sign on the south side of the structure and just east of the warning sign on the north side of the structure. The maintenance work for this structure will be performed during the construction of CU 4.

Structure No. 19 – Rock rip-rap weir w/ boat bay

Structure 19 appeared to be in good condition with little signs of settlement of the rock weir. The warning signs and supports were also in good condition. NRCS and OCPR agree that this structure will not require maintenance.

Structure No. 20 – Rock rip-rap armored plug

The structure appeared to be in good condition with no signs of settlement of the rock weir. The warning signs and supports were also in good condition. (Photo #4) NRCS and OCPR agree that this structure will not require maintenance.

Structure No. 21 – Rock rip-rap armored plug

The rock armored plug appeared to be in good condition with slight settlement on the east side of the structure. This was hard to fully assess due to the amount of growth on the structure. OCPR and NRCS agree that the structure will not require maintenance at this time.

Construction Unit No.2

Structure No. 22 A – Canal bank stabilization

The structure looked to be in good condition. There were very few signs of settlement along the bank stabilization. OCPR and NRCS agree that maintenance of this structure is not needed at this time.

Structure No.22 – Steel sheet pile weir w/ boat bay

The structure itself appears to be in good condition along with the signs, supports, and sheet pile caps. OCPR and NRCS agree that this structure will require no work at this time.

Bayou Rigolettes Bank Stabilization

The rock dike along the northern shore of Bayou Rigolettes appeared to be in good condition with a few signs of settlement. Maintenance work will not be needed at this time.

Construction Unit No.3

Bayou Perot Bank Stabilization

The Bayou Perot Bank Stabilization looks good. There was some erosion noticed at the western most portion of the West Reach of the structure. There was also some settlement noticed between Sta. 90+00 and 92+00. The maintenance work for this structure will be performed during the construction of CU4.

V. Conclusions

Overall this project has proven very effective in reducing shoreline erosion. With the exception of the few soft spots where the dike is experiencing more rapid settlement, the structure has proven very stable. The erosion at the end of Construction Unit 3 will continue to be monitored. The project features mentioned above will all be tied together with the construction of Construction Unit 4 which will provide a stronger, more stable shoreline protection system.

VI. Recommendations

There is no need for any maintenance activity at this time.

Immediate Repairs

- It should be noted that all of the maintenance items listed to be performed during the construction of CU#4 are contingent upon bids coming in within the funds allocated for construction of CU#4. If this does not occur, then the need for maintenance and to what extent will be determined at that time.

Programmed Maintenance

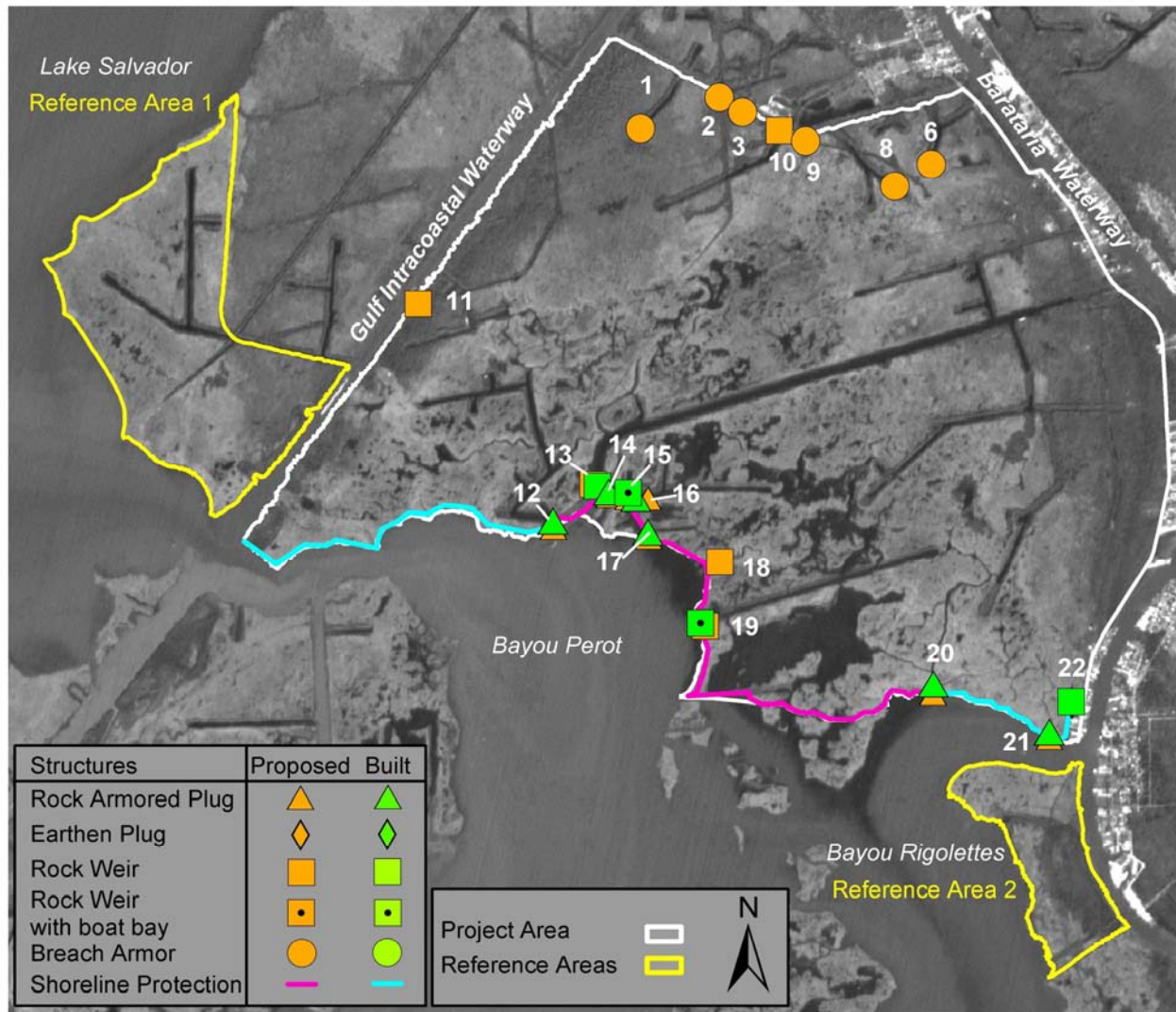
- It should be noted that all of the maintenance items listed to be performed during the construction of CU#4 are contingent upon bids coming in within the funds allocated for construction of CU#4. If this does not occur, then the need for maintenance and to what extent will be determined at that time.

Appendix A

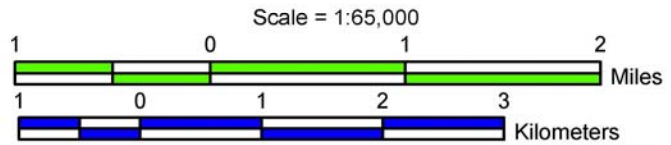
Project Features Map



Jonathan Davis Wetland Protection (BA-20)
 Coastal Wetlands Planning, Protection and Restoration Act
 Proposed Structures



Data Source:
 Background image is a 1993 SPOT panchromatic satellite image shown at 1:65,000.



Prepared by:
 U.S. Department of the Interior
 U.S. Geological Survey
 National Wetlands Research Center
 Lafayette, LA
 and
 Louisiana Department of Natural Resources
 Coastal Restoration Division
 New Orleans Field Office



Federal Sponsor:
 U.S. Department of Agriculture
 Natural Resources Conservation Service



Map ID: USGS-NWRC 2004-02-XXXX

Appendix B

Photographs



Photo #1 – Structure #14 (Note Gaps)



Photo #2 – Structure #15



Photo #3 – Structure #16



Photo #4 – Structure #20

Appendix C

Three Year Budget Projection

**Jonathan Davis Wetland Restoration Project / BA-20 / PPL NO. 2
Three-Year Operations & Maintenance Budgets 07/01/2009 - 06/30/2012**

Project Manager
Barry Richard

O & M Manager
Barry Richard

Federal Sponsor
NRCS

Prepared By
Barry Richard

	2009/2010	2010/2011	2011/2012
<i>Maintenance Inspection</i>	\$3,609.00	\$3,703.00	\$3,799.00
<i>General Maintenance</i>	\$0.00	\$0.00	\$0.00
<i>Structure Operation</i>	\$0.00	\$0.00	\$0.00
<i>Administration</i>	\$0.00	\$0.00	\$0.00
<i>Maintenance/Rehabilitation</i>			

09/10 Description:

<i>E&D</i>	\$0.00
<i>Construction</i>	\$0.00
<i>Construction Oversight</i>	\$0.00
<i>Sub Total - Maint. And Rehab.</i>	\$ -

10/11 Description: Cap Rock Structures

<i>E&D</i>	\$0.00
<i>Construction</i>	\$0.00
<i>Construction Oversight</i>	\$0.00
<i>Sub Total - Maint. And Rehab.</i>	\$ -

11/12 Description:

<i>E&D</i>	\$0.00
<i>Construction</i>	\$0.00
<i>Construction Oversight</i>	\$0.00
<i>Sub Total - Maint. And Rehab.</i>	\$ -

	2009/2010	2010/2011	2011/2012
<u>Total O&M Budgets</u>	\$ 3,609.00	\$ 3,703.00	\$ 3,799.00

<u>O & M Budget (3 yr Total)</u>	\$ 11,111.00
<u>Unexpended O & M Budget</u>	\$ 7,239,987.70
<u>Remaining O & M Budget (Projected)</u>	\$ 7,228,876.70

OPERATION AND MAINTENANCE BUDGET WORKSHEET 2009/2010
Jonathan Davis Wetland Restoration Project / BA-20 / PPL NO. 2

DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
O&M Inspection and Report	EACH	1	\$3,609.00	\$3,609.00
General Structure Maintenance	LUMP	1	\$0.00	\$0.00
Engineering and Design	LUMP	1	\$0.00	\$0.00
Operations Contract	LUMP	1	\$0.00	\$0.00
Construction Oversight	LUMP	1	\$0.00	\$0.00

ADMINISTRATION

LDNR / CRD Admin.	LUMP	1	\$0.00	\$0.00
FEDERAL SPONSER Admin.	LUMP	1	\$0.00	\$0.00
SURVEY Admin.	LUMP	1	\$0.00	\$0.00
OTHER				\$0.00
TOTAL ADMINISTRATION COSTS:				\$0.00

MAINTENANCE / CONSTRUCTION

SURVEY

SURVEY DESCRIPTION:					
Secondary Monument	EACH	0	\$0.00	\$0.00	\$0.00
Staff Gauge / Recorders	EACH	0	\$0.00	\$0.00	\$0.00
Marsh Elevation / Topography	LUMP	0	\$0.00	\$0.00	\$0.00
TBM Installation	EACH	0	\$0.00	\$0.00	\$0.00
Structure Survey	LUMP	1	\$0.00	\$0.00	\$0.00
TOTAL SURVEY COSTS:					\$0.00

GEOTECHNICAL

GEOTECH DESCRIPTION:					
Borings	EACH	0	\$0.00	\$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		\$0.00	\$0.00	\$0.00
	0	0.0	0	\$0.00	\$0.00	\$0.00
	0	0.0	0	\$0.00	\$0.00	\$0.00
Filter Cloth / Geogrid Fabric		SQ YD	0	\$0.00	\$0.00	\$0.00
Navagation Aid		EACH	0	\$0.00	\$0.00	\$0.00
Signage		EACH	0	\$0.00	\$0.00	\$0.00
General Excavation / Fill		CU YD	0	\$0.00	\$0.00	\$0.00
Dredging		CU YD	0	\$0.00	\$0.00	\$0.00
Sheet Piles (Lin Ft or Sq Yds)			0	\$0.00	\$0.00	\$0.00
Timber Piles (each or lump sum)			0	\$0.00	\$0.00	\$0.00
Timber Members (each or lump sum)			0	\$0.00	\$0.00	\$0.00
Hardware		LUMP	1	\$0.00	\$0.00	\$0.00
Materials		LUMP	1	\$0.00	\$0.00	\$0.00
Mob / Demob		LUMP	1	\$0.00	\$0.00	\$0.00
Contingency		LUMP	1	\$0.00	\$0.00	\$0.00
General Structure Maintenance (cap 15%)		LUMP	1	\$0.00	\$0.00	\$0.00
OTHER				\$0.00	\$0.00	\$0.00
OTHER				\$0.00	\$0.00	\$0.00
OTHER				\$0.00	\$0.00	\$0.00
TOTAL CONSTRUCTION COSTS:						\$0.00

TOTAL OPERATIONS AND MAINTENANCE BUDGET: **\$3,609.00**

OPERATION AND MAINTENANCE BUDGET WORKSHEET 2010/2011

Jonathan Davis Wetland Restoration Project / BA-20 / PPL NO. 2

DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
O&M Inspection and Report	EACH	1	\$3,703.00	\$3,703.00
General Structure Maintenance	LUMP	1	\$0.00	\$0.00
Engineering and Design	LUMP	1	\$0.00	\$0.00
Operations Contract	LUMP	1	\$0.00	\$0.00
Construction Oversight	LUMP	1	\$0.00	\$0.00

ADMINISTRATION

LDNR / CRD Admin.	LUMP	0	\$0.00	\$0.00
FEDERAL SPONSER Admin.	LUMP	0	\$0.00	\$0.00
SURVEY Admin.	LUMP	0	\$0.00	\$0.00
OTHER				\$0.00
TOTAL ADMINISTRATION COSTS:				\$0.00

MAINTENANCE / CONSTRUCTION

SURVEY

SURVEY DESCRIPTION:	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
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
OTHER				\$0.00
TOTAL SURVEY COSTS:				\$0.00

GEOTECHNICAL

GEOTECH DESCRIPTION:	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
Borings	EACH	0	\$0.00	\$0.00
OTHER				\$0.00
TOTAL GEOTECHNICAL COSTS:				\$0.00

CONSTRUCTION

CONSTRUCTION DESCRIPTION:	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
Rip Rap	LIN FT	0	\$0.00	\$0.00
	TON / FT	0.0	\$0.00	\$0.00
	TONS	0	\$0.00	\$0.00
		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	LUMP	1	\$0.00	\$0.00
Materials	LUMP	1	\$0.00	\$0.00
Mob / Demob	LUMP	1	\$0.00	\$0.00
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:				\$0.00

TOTAL OPERATIONS AND MAINTENANCE BUDGET: \$3,703.00

OPERATION AND MAINTENANCE BUDGET WORKSHEET 2010/2011

Jonathan Davis Wetland Restoration Project / BA-20 / PPL NO. 2

DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
O&M Inspection and Report	EACH	1	\$3,799.00	\$3,799.00
General Structure Maintenance	LUMP	1	\$0.00	\$0.00
Engineering and Design	LUMP	1	\$0.00	\$0.00
Operations Contract	LUMP	1	\$0.00	\$0.00
Construction Oversight	LUMP	1	\$0.00	\$0.00

ADMINISTRATION

LDNR / CRD Admin.	LUMP	0	\$0.00	\$0.00
FEDERAL SPONSER Admin.	LUMP	0	\$0.00	\$0.00
SURVEY Admin.	LUMP	0	\$0.00	\$0.00
OTHER				\$0.00
TOTAL ADMINISTRATION COSTS:				\$0.00

MAINTENANCE / CONSTRUCTION

SURVEY

SURVEY DESCRIPTION:	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
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
OTHER				\$0.00
TOTAL SURVEY COSTS:				\$0.00

GEOTECHNICAL

GEOTECH DESCRIPTION:	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
Borings	EACH	0	\$0.00	\$0.00
OTHER				\$0.00
TOTAL GEOTECHNICAL COSTS:				\$0.00

CONSTRUCTION

CONSTRUCTION DESCRIPTION:	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
Rip Rap	LIN FT	0	\$0.00	\$0.00
	TON / FT	0.0	\$0.00	\$0.00
	TONS	0	\$0.00	\$0.00
		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	1	\$0.00	\$0.00
Materials	LUMP	1	\$0.00	\$0.00
Mob / Demob	LUMP	1	\$0.00	\$0.00
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:				\$0.00

TOTAL OPERATIONS AND MAINTENANCE BUDGET:

\$3,799.00

Appendix D

Field Inspection Form

MAINTENANCE INSPECTION REPORT CHECK SHEET

Project No. / Name: **BA-20 Jonathan Davis Wetland**

Date of Inspection: 9/30/2008

Time: 9:30 am

Structure No. Construction Unit No.1 -Site No. 15

Inspector(s): Richard, Kinler

Structure Description: Rock rip-rap armored weir w/ boat bay

Water Level

Inside: N/A

Outside: N/A

Type of Inspection: Annual, Post Storm, other

Post Storm

Weather Conditions: Clear Skies, Light Wind

Item	Condition	Physical Damage	Corrosion	Photo #	Observations and Remarks
Signage and supports	Good			2	Observations: There have been no changes since the last inspection. The work to be done through the CU4 Construction Contract has not been completed due to contract issues.
Armored Plug	Good			2	
Rock weir	Good			2	Remarks: The original design of this structure was modified to a rock weir with boat bay to accommodate oilfield activities and navigation on the interior of the structure. During above mentioned maintenance this structure will be converted to a rock
Earthen Embankment	Good			2	
Construction Unit No.1 Structure Description: 132 linear ft. of rock rip-rap armored weir with a 50 ft. wide boat bay located in a pipeline channel north of Bayou Perot, west of Bayou Barataria and east of the GIWW and Site 14. The crest of the rock weir was constructed to an elevation of +4.0 ft. NGVD. The invert of the boat bay is at and elevation of -3.0 ft. The rock filled weir contains 1,248 tons of rock fill with and 728 tons of rock rip-rap armor. Two (2) aluminum warning signs are located through the rock armored embankment on each side of the boat bay.					

MAINTENANCE INSPECTION REPORT CHECK SHEET

Project No. / Name: **BA-20 Jonathan Davis Wetland**

Date of Inspection: 9/30/2008

Time: 9:30 am

Structure No. _____ Construction Unit No.2 -Site No. 22 _____

Inspector(s): Richard, Kinler

Structure Description: Steel sheet pile structure w/ boat bay

Water Level

Inside: N/A

Outside: N/A

Type of Inspection: Annual, Post Storm, other Post Storm

Weater Conditions: Clear Skies, Light Wind

Item	Condition	Physical Damage	Corrosion	Photo #	Observations and Remarks
Steel Bulkhead / Caps	Good				
Handrails Hardware, etc.	Good				Observation: There have been no changes since the last inspection. No maintenance required at this time.
Signage and supports	Good				
Rock weir	Good				
Earthen Wingwalls	Good				
Rock Armored Earthen Embankment	Good				
Construction Unit No.2					
Structure Description: 58 linear ft. of steel sheet pile bulkhead with a crest elevation of +1.95 ft. and a 24' - 8-1/2" wide boat bay with a crest elevation of -0.93 ft. located off of Bayou Regolettes, west of Bayou Barataria and east of GIWW. The structure consists of a steel sheet pile weir with 1,426 square feet of sheet piling set at +1.95 ft. At the bottom the boat bay, is a 1.5 ft. thick rock rip-rap scour pad section with an invert of -0.93 ft. This structure ties into structure 22A on the west side. Aluminum warning signs supported by 12" diameter timber piles are located at the entrance of the boat bay.					

