Coastal Protection and Restoration Authority of Louisiana

Office of Coastal Protection and Restoration

2009 Annual Inspection Report

Fritchie Marsh Restoration

State Project Number PO-06
Priority Project List 2

July 1, 2009
St. Tammany Parish

Prepared by:

Barry Richard, E.I.
OCPR/Operations Division
New Orleans District Office
CERM, Suit 309
2045 Lakeshore Dr.
New Orleans, La 70122

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Appendices

I. Introduction

The Fritchie Marsh Restoration Project (PO-06) project area contains intermediate and brackish marsh, and is located southeast of Slidell in St. Tammany Parish (Appendix A). The area is bound by US Hwy 190 to the north, US Hwy 90 to the south and east, and LA Hwy 433 to the west and south.

II. Project Description and History

From 1956 to 1984, 2,260-ac (915-ha) of emergent marsh within the Fritchie Marsh project area have been converted to open water, with the greatest loss occurring in the northern project area. This loss reflects a pattern of marsh deterioration from north to south due to a reduction of freshwater and sediment input into the northern part of the project area. Natural hydrologic patterns have been disrupted by the construction of the perimeter highways. These embankments isolate the marsh from the West Pearl River, and have restricted inflow of freshwater, nutrients, and sediment. Additionally, saltwater from Lake Pontchartrain enters the marsh through the W-14 canal and Little Lagoon during high tides and strong winds. As a result, the project area has converted from a predominantly fresh marsh in 1956 to a predominantly brackish marsh in 1990.

The objective of the Fritchie Marsh Restoration Project is to reduce marsh loss by restoring more natural hydrologic conditions in the project area through management of available freshwater. Specific objectives are (1) to increase freshwater flow and promote water exchange into the area from West Pearl River by enlarging the culvert at U.S. Highway 90 and by dredging portions of Salt Bayou and (2) increase freshwater flow into the northern project area by diverting flow from the W-14 canal.

The Fritchie Marsh Restoration Project was constructed in one phase beginning in October 2000 and completed in March 2001. The project has a 20-year economic life which began in March 2001.

The principal project features include:

- A 72-inch diameter by 136-foot long concrete culvert under U.S. Highway 90, rock riprap lining of the Salt Bayou channel bottom and pipe outlets, and installation of 308 linear feet of sheet piling to form a bulkhead.
- Dredging of approximately 5300 linear feet of Salt Bayou.
- Installation of a weir in the W-14 canal. The weir consists of 108 linear feet of sheet pile with a 20-foot wide boat bay.
- Dredging approximately 400 linear feet of the W-14 diversion channel.

In August 2005 Hurricane Katrina passed directly over the Fritchie Marsh Project area. The forces created by this storm caused significant damage to the marsh but not to any of the project features. Large areas of marsh were converted to open water, whereas sections

of sheared marsh were deposited into the natural bayous and canals creating a number of blockages. Existing breaches on the banks of Salt Bayou were enlarged and new breaches were created, which are diverting water away from the natural conveyance channels. The previously established hydrology within the project area has been significantly altered.

III. Inspection Purpose and Procedures

The purpose of the annual inspection of the Fritchie Marsh Restoration Project (PO-06) 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 July 10, 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 Fritchie Marsh Restoration Project (PO-06) was held on November 18, 2008 by Barry Richard of OCPR and Brad Sticker of NRCS. The inspection was conducted from the Highways as boat access was unavailable. A more detailed inspection will take place later in 2009. This inspection was prompted by the coastal Louisiana landfall of Hurricanes Gustav and Ike. As discussed in Section V, another inspection was performed on July 9, 2009, by Brad Sticker (NRCS) and Barry Richard (OCPR). A detailed report of this inspection can be found in Appendix F.

IV. Inspection Results

Hwy 90 Culvert and Stone Revetment

There is no change in this structure from the previous inspection. The bank scour reported in previous inspection reports is still of concern although little change was noted. If this bank were to completely breach, the hydrologic exchange between the marsh and Salt Bayou would be altered.

Salt Bayou Dredging

There was not a detailed inspection performed of this feature. The inspection consisted of the portion of this feature observed from Highway 90. There was no major damage to what was observed.

W-14 Weir

There was no visible damage to this structure and it appears to be operating as designed.

W-14 Diversion Channel Dredging

There was not a detailed inspection performed of this feature as it cannot be observed from a highway and boat access was not available.

V. Conclusions

The project features for the Fritchie Marsh Restoration Project are performing as designed and are showing no signs of damage. Based upon past inspections, a more thorough inspection of Salt Bayou is required and scheduled for later in 2009. The results of this inspection will aid in the decision to survey Salt Bayou or not. This survey will be performed to determine the need for further dredging of Salt Bayou.

VI. Recommendations

Both OCPR and NRCS agree that there is a need to evaluate Salt Bayou to determine if any action shall be taken to restore the previously established hydrology. Dredging of Salt Bayou and repair of the scour at Hwy 90 are under consideration.

Immediate Repairs

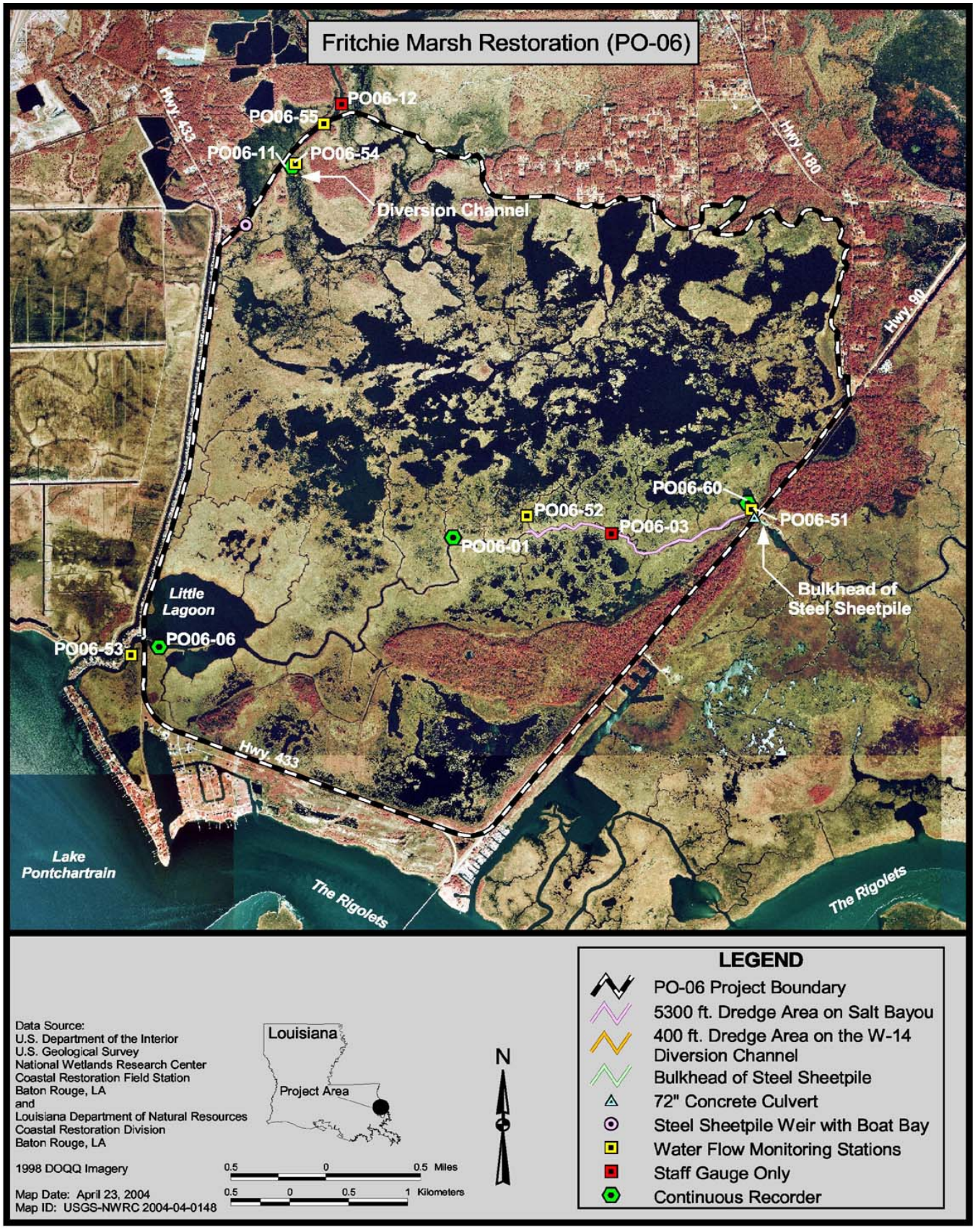
- Possible survey and dredge of Salt Bayou upon further field investigation.

Programmed Maintenance

- None at this time.

Appendix A

Project Features Map


Fritchie Marsh Restoration (PO-06)
PO06-12
PO06-55
PO06-11
PO06-54
Diversion Channel
Hwy. 433
Hwy. 180
Hwy. 90
PO06-60
PO06-52
PO06-03
PO06-51
PO06-01
Bulkhead of Steel Sheetpile
Little Lagoon
PO06-06
PO06-53
Hwy. 433
Lake Pontchartrain
The Rigolets
The Rigolets
LEGEND
PO-06 Project Boundary
5300 ft. Dredge Area on Salt Bayou
400 ft. Dredge Area on the W-14 Diversion Channel
Bulkhead of Steel Sheetpile
72" Concrete Culvert
Steel Sheetpile Weir with Boat Bay
Water Flow Monitoring Stations
Staff Gauge Only
Continuous Recorder
Data Source:
U.S. Department of the Interior
U.S. Geological Survey
National Wetlands Research Center
Coastal Restoration Field Station
Baton Rouge, LA
and
Louisiana Department of Natural Resources
Coastal Restoration Division
Baton Rouge, LA
1998 DOQQ Imagery
Map Date: April 23, 2004
Map ID: USGS-NWRC 2004-04-0148
Louisiana
Project Area
N
0.5 0 0.5 Miles
0.5 0 0.5 1 Kilometers

Appendix B

Photographs

There were no photographs taken during this inspection.

Appendix C

Three Year Budget Projection

Fritchie Marsh Restoration / PO-06 / PPL 2

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

Project Manager	O & M Manager	Federal Sponsor	Prepared By
Barry Richard	*Barry Richard*	*NRCS*	*Barry Richard*

	2009/2010	2010/2011	2011/2012
Maintenance Inspection	$3,606.00	$3,700.00	$3,796.00
General Maintenance	$0.00	$0.00	$0.00
Structure Operation	$0.00	$0.00	$0.00
Administration	$3,000.00	$0.00	$0.00
Maintenance/Rehabilitation			

09/10 Description: Salt Bayou Survey

E&D	$60,000.00
Construction	$0.00
Construction Oversight	$0.00
Sub Total - Maint. And Rehab.	$ 60,000.00

10/11 Description

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

11/12 Description:

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

	2009/2010	2010/2011	2011/2012
Total O&M Budgets	$ 66,606.00	$ 3,700.00	$ 3,796.00

O &M Budget (3 yr Total)	**$ 74,102.00**
Unexpended O & M Budget	**$ 113,000.00**
Remaining O & M Budget (Projected)	**$ 38,898.00**

OPERATION AND MAINTENANCE BUDGET WORKSHEET 2009/2010

Fritchie Marsh Restoration / PO-06 / PPL 2

DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
O&M Inspection and Report	EACH	1	$3,606.00	**$3,606.00**
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	$3,000.00	$3,000.00
OTHER				$0.00
			TOTAL ADMINISTRATION COSTS:	**$3,000.00**

MAINTENANCE / CONSTRUCTION

SURVEY

SURVEY DESCRIPTION:					
Secondary Monument	EACH	1	$0.00	$0.00
Staff Gauge / Recorders	EACH	1	$0.00	$0.00
Marsh Elevation / Topography	LUMP	1	$60,000.00	$60,000.00
TBM Installation	EACH	1	$0.00	$0.00
OTHER				$0.00
			TOTAL SURVEY COSTS:	**$60,000.00**

GEOTECHNICAL

GEOTECH DESCRIPTION:					
Borings	EACH	1	$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
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: $66,606.00

OPERATION AND MAINTENANCE BUDGET WORKSHEET 2010/2011

Fritchie Marsh Restoration / PO-06 / PPL 2

DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
O&M Inspection and Report	EACH	1	$3,700.00	**$3,700.00**
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	1	$0.00	$0.00
Staff Gauge / Recorders	EACH	1	$0.00	$0.00
Marsh Elevation / Topography	LUMP	1	$0.00	$0.00
TBM Installation	EACH	1	$0.00	$0.00
				$0.00
			TOTAL SURVEY COSTS:	**$0.00**

GEOTECHNICAL

GEOTECH DESCRIPTION:					
Borings	EACH	1	$0.00	$0.00
OTHER				$0.00
			TOTAL GEOTECHNICAL COSTS:	**$0.00**

CONSTRUCTION

CONSTRUCTION DESCRIPTION:	Salt Bayou 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	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
OTHER				$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: **$3,700.00**

Annual Inspection Report
Fritchie Marsh Restoration
State Project No. PO-06

OPERATION AND MAINTENANCE BUDGET WORKSHEET 2011/2012

Fritchie Marsh Restoration / PO-06 / PPL 2

DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
O&M Inspection and Report	EACH	1	$3,796.00	**$3,796.00**
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	1	$0.00	$0.00
Staff Gauge / Recorders		EACH	1	$0.00	$0.00
Marsh Elevation / Topography		LUMP	1	$0.00	$0.00
TBM Installation		EACH	1	$0.00	$0.00
OTHER					$0.00
				TOTAL SURVEY COSTS:	**$0.00**

GEOTECHNICAL

GEOTECH DESCRIPTION:					
Borings		EACH	1	$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
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: **$3,796.00**

Appendix D

Field Inspection Form

Annual Inspection Report
Fritchie Marsh Restoration
State Project No. PO-06

MAINTENANCE INSPECTION REPORT CHECK SHEET

Project No. / Name: **PO-06 Fritchie Marsh**

Date of Inspection: 11/18/2008 Time: 10:15am

Structure No. n/a

Inspector(s): Richard, Sticker

Structure Description: **HWY 90 Culvert & Salt Bayou Bulkhead**

Water Level Inside: N/A Outside: _____

Type of Inspection: Post Storm

Weather Conditions: Warm, partly cloudy

Item	Condition	Pysical Damage	Corrosion	Photo #	Observations and Remarks
Steel Bulkhead / Caps	Good	None	None	n/a	
Handrails, Grating, Hardware, etc.	Good	None	None	n/a	
Signage, Supports	Good	None	None	n/a	
Rock RipRap channel lining	Good	None	None	n/a	
W-14 Weir structure	Good	None	None	n/a	
W-14 diversion channel dredge	n/a	n/a	n/a	n/a	
Salt Bayou dredging	n/a	n/a	n/a	n/a	
72" Diameter culvert	Good	None	None	n/a	
HWY 90 road surface	Good	None	None	n/a	

Appendix F

Inspection Report 7/9/2009

NRCS
Natural Resources Conservation Service
3737 Government Street
Alexandria, LA 71302
(318) 473-7791
Fax: (318) 473-7750

Subject: PO-06 Fritchie Marsh
O&M Inspection

Date: July 12, 2009

To: Ed Giering
State Conservation Engineer
Alexandria, Louisiana

File Code: 210-20

On July 9, 2009, a site visit to the subject project area was made by Barry Richard, OCPR, and the undersigned to assess the condition of the project and to determine if any maintenance work is needed.

FIELD OBSERVATIONS

All of the components of the project construction were observed during the site visit, and the condition and comments regarding each are as follows:

W-14 DIVERSION

The water elevation was determined by shooting the water elevation at a known elevation point on the W-14 weir which is approximately 600 feet from the diversion channel. The water elevation at the W-14 weir was at +0.4' at the time of inspection.

There was no apparent sedimentation in the W-14 Diversion Channel from visual observations. At the time of the site visit water was flowing from the W-14 Canal into the W-14 Diversion Channel and out into the open water area south and east of the channel.

The depth of the W-14 Diversion Channel was sounded from the end of construction to the W-14 Canal. The bottom elevation of the channel ranged from -4.0' to -4.5' elevation. The channel was originally planned to be excavated to an elevation of -4.0'. The As-Built Plans indicate the channel was actually excavated to an average elevation of -4.5'. The W-14 Diversion Channel is flowing water as intended and has not silted in to cause a reduction in capacity; therefore no maintenance is necessary.

W-14 WEIR

The W-14 Weir is in excellent condition as shown in the photographs below. There is some deterioration of the coal tar epoxy paint on the sheet piling and some limited rusting of the sheet pile cap; however this is

minimal. The galvanized pile cap, railings, and signs are in good condition. No maintenance is necessary on this structure.

W-14 Weir

W-14 Weir (Pile Cap, Piles, & Railing)

HWY 90 – RCP IN SALT BAYOU

From visual observations, it appears that the 60" RCP bored under US Highway 90 is stable and has not experienced any movement since construction was completed. Rubble (broken concrete) has been placed on the west side of the structure as shown in photograph below; however the structure appears stable. No maintenance is recommended.

WEST END of RCP Pipe @ Hwy 90

SALT BAYOU BULKHEAD

From visual observations, the bulkhead on the east side of Hwy 90 on the north side of Salt Bayou is in excellent condition. The is no evidence of movement of the bulkhead and the sheet piling and cap are in good condition. No maintenance is recommended.

SALT BAYOU

At the time of the site visit water was flowing west in Salt Bayou at the Hwy 90 structure. Measurement of the water surface elevation was made relative to the box culvert at Hwy 90 on the west side. The water elevation in Salt Bayou was +0.5'. This elevation was used to determine the bottom elevation of the channel represented in Attachment 2 by soundings.

There are considerable segments of Salt Bayou that are nearly completely silted in. Attachment 1 indicates several way points that were taken along Salt Bayou that will be referenced below.

The original channel excavation extended from the west side of Hwy 90 to location identified on the map as SB3. The original excavation was planned for 20' bottom width at elevation -4.0' and 2.5 horizontal to 1 vertical side slopes. Attachment 2 shows three cross sections that were taken during the site visit compared to the original design and as built sections.

Moving from west along Salt Bayou from Hwy 90, the channel section is near the original excavated section up to the waypoint SB6. There are two significant cuts in the bayou bank to the south within this reach. It was observed that significant flow was moving out of Salt Bayou into the open water areas south of the bayou at each of these cuts. From waypoint SB6 moving westward, the channel continues to shallow until at waypoint SB7 the bottom elevation of the channel is -1.5'. From SB7 the channel continues to shallow until SB3 where the channel has basically completely silted in (no water depth). This continues from SB3 to SB2. The channel begins to deepen west of SB2 until a bottom elevation of -2.5' was measured at SB8. The channel continues to deepen toward the west, and a bottom elevation of -4.2' was measured at SB9. SB-9 is also the location of a CRMS station, and the water elevation was measured on the staff gage at the station at elevation +0.5' at the time of the site visit.

SATL BAYOU @ SB2 FACING EAST

CONCLUSIONS AND RECOMMENDATIONS

All of the structural components of the project are in good condition. It does not appear that any maintenance is needed on any of these items.

One of the main concerns is the condition of Salt Bayou. The original intent of the project measure where Salt Bayou was excavated west from Hwy 90 approximately 5000' was to allow for greater inflow from the east. The water was intended to flow into the marsh areas adjacent to Salt Bayou, and not flow straight through Salt Bayou to Lake Ponchartrain. Even though segments of Salt Bayou are completely silted in, it appears the project intent is still being met. From the field observations, it appears that a significant amount of flow from Salt Bayou is moving through the broken marsh to the south of the bayou in the areas around SB 6 and SB7. The water seems to be re-entering Salt Bayou from the south around SB8.

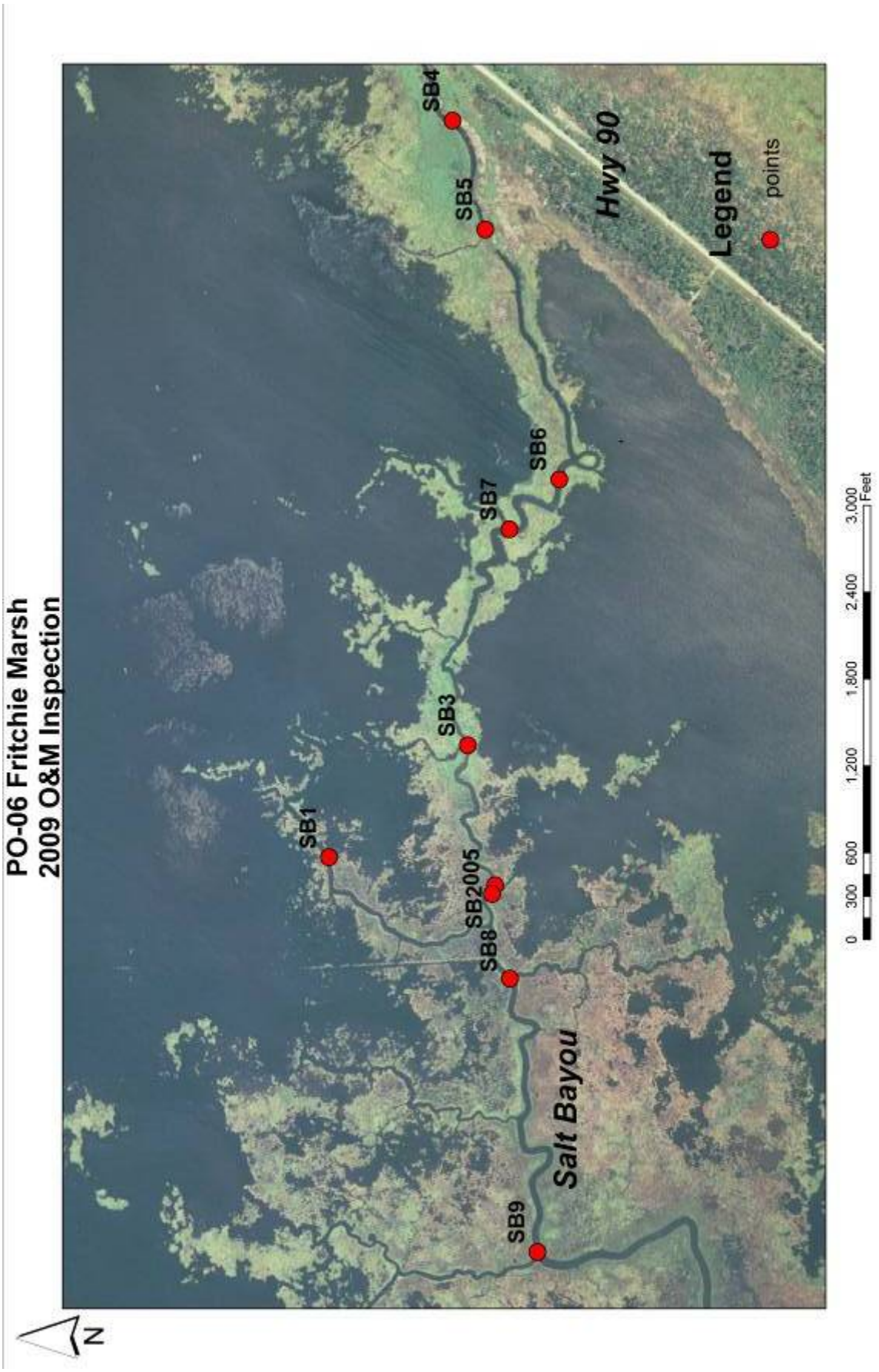
It should be noted that a project to create marsh on the north side of Salt Bayou is in the planning phase. If implemented, this project could materially effect the current hydrology of the area.

Since it appears the original project objectives of moving water into the marsh along Salt Bayou is still being met, and the uncertainty of the proposed project to the north, it is recommended that no action be taken regarding Salt Bayou at this time.

Bradley A. Sticker
ASCE

cc: Barry Richard, OCPR, New Orleans, LA
John Jurgensen, Project Manager, Alexandria, LA

ATTACHMENT 1



ATTACHMENT 2