



State of Louisiana

**Coastal Protection and Restoration
Authority of Louisiana (CPRA)**

**2016/2017 Annual Inspection
Report**

for

**EAST MARSH ISLAND MARSH
CREATION PROJECT (TV-21)**

State Project Number TV-21
Priority Project List 14

May 16, 2017
Iberia Parish

Prepared by:

Jody White, P.E.
CPRA
Lafayette Field Office
635 Cajundome Blvd.
Lafayette, LA 70596



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I. Introduction

The East Marsh Island Marsh Creation (TV-21) project is located approximately 14 miles (22.53 km) southeast of Cypremort Point in Iberia Parish, Louisiana, and is part of the larger (77,000 acres) uninhabited Marsh Island which is bordered on the north by Vermilion Bay, West Cote Blanche Bay, East Cote Blanche Bay and to the south by the Gulf of Mexico. (Appendix A). The total project area which is situated on the northeast corner of Marsh Island comprises approximately 362 acres of marsh creation and 665 acres of nourished marsh.

The East Marsh Island Marsh Creation 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 and approved on the fourteenth Priority Project List. The East Marsh Island Marsh Creation Project has a twenty year (20 year) economic life, which began in December 2010. A revised budget and spending schedule has modified the Operations, Maintenance and Monitoring

II. Inspection Purpose and Procedures

The purpose of the annual inspection of the East Marsh Island Marsh Creation Project (TV-21) 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, CPRA 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. The annual inspection report also contains a summary of maintenance projects which were completed since completion of constructed project features 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 East Marsh Island Marsh Creation Project are outlined in Section IV.

An inspection of the East Marsh Island Marsh Creation Project (TV-21) was held on May 16, 2017 under sunny skies, mild temperatures, and choppy seas. In attendance were Darrell Pontiff, Dion Broussard, Mark Mouledous, and Jody White from CPRA, Tyson Crouch and Steven Berger from LDWF, Sharon Osowski from EPA, Dale Garber from NRCS and Scott Wandell from USACE. Parties met at the Quintana Boat launch at Cypremort Point at 10:00am and traveled to the Northeast corner of Marsh Island. WLF provided boat transportation.

The field inspection included a visual inspection of the project site. Staff gauge readings were not available to determine approximate elevations of water level.. Photographs were taken at each project feature (see Appendix B) and Field Inspection notes were completed in the field to record measurements and deficiencies (see Appendix D).

III. Project Description and History

Marsh Island is an uninhabited island and is owned by the State of Louisiana and constitutes the Marsh Island Wildlife Refuge, which was established by the Louisiana Department of Wildlife and Fisheries as a sanctuary for migratory birds. Recent aerial surveys have documented approximately 30,000 geese and 50,000 ducks utilizing the island (Martin 2008).

Between 1930 and the present, the hydrology of Marsh Island has changed due to tidally influenced erosion, subsidence, and oil and gas exploration (Barrilleaux 2004 and 2005). As a result of oil exploration in the 1950's, oil field canals were constructed and the spoil was deposited along these canals to form continuous banks. The newly created banks disrupted the surface water flow and created ponding in the interior marshes (Barrilleaux 2004 and 2005).

In 2001, the Marsh Island Hydrologic Restoration (TV-14) project was constructed to help restore the historical hydrology of Marsh Island by stabilizing the northeastern shoreline of Marsh Island and plugging nine oilfield access canals (Barrilleaux 2004 and 2005). Average marsh loss rates within the project area were historically low (-0.29% per year); however, after Hurricane *Lili* in 2002, aerial photography revealed that substantial areas of interior emergent marsh had been converted to open water (Martin 2008). Hurricanes *Rita* in 2005 and Hurricane *Ike* in 2008 further aggravated this erosion problem. To help stabilize this area, the EPA, NRCS and CPRA proposed to create and nourish 362 acres of marsh in two containment cells. During construction, the amount of unobligated CWPPRA construction funds and an abundance of borrow material available allowed nourishment of 665 acres of additional marsh north and west of the original containment cells. The TV-21 project has worked synergistically with the previously completed TV-14 project to help reduce the effects of lateral erosion in existing marsh areas.

The objectives of the East Marsh Island Marsh Creation (TV-21) project are to re-create brackish marsh in the open water and mud flat areas of the interior marsh primarily formed by hurricane damage and to nourish additional adjacent marsh (Gillen 2008). The use of dredged material for marsh creation has been an important technique in restoration for decades in the United States.

The principal project features include:

1. 362 acres of marsh creation in two confined cells referenced as Fill Areas No. 1 & 2.
2. An earthen plug located at the end of the North-South Pipeline Canal within the northern boundary of the Fill Area No. 2 containment dike.
3. 665 acres of marsh nourishment in four different partially confined areas referenced as Additional Fill Areas No. 1-4 which were located north and west of the original marsh creation cells.
4. 55,000 vegetative plantings within the two confined cells (3,257 actually planted during the construction phase of the project)

IV. Summary of Past Operation and Maintenance Projects

General Maintenance: Below is a summary of completed maintenance projects and operation tasks performed since December 2010, the construction completion date of the East Marsh Island Marsh Creation Project.

2014 Maintenance Project – Professional Construction Services, Inc.

This maintenance project included Year 1 Surveying (marsh creation, nourishment, containment dike, borrow area, CRMS stations), excavation of four interior plugs left from original construction in Marsh Nourishment Areas No.1 & 2, removal of a timber mat plug in the Marsh Creation Cell No. 2 containment dike near Hawkins Lake with creation of a 100 foot gap, degradation of an existing Gap “N” between Marsh Creation Cell No. 2 and Nourishment Area No. 3, and repair and installation of articulated concrete mat armoring of 890ft of containment dike on the East End of the East-West Pipeline Canal along the Gulfward shoreline. In conjunction with this maintenance event, the existing rock plug at the West end of the East-West Canal was removed and replaced with improvements to repair erosion occurring around the plug as part of TV-14 maintenance. In addition, LAWLF installed a PVC sheetpile plug on the interior containment dike at the East end of the East-West Canal. This coinciding work was not paid out of the CWPPRA TV-21 budget.

Construction	\$1,260,374.32
Year 1 Surveying, E&D, Construction Oversight, Asbuilts	\$250,774.45
Project Total	\$1,511,148.77

2017 Year 5 Suvey Effort – T. Baker Smith

The task included topographic surveys of the marsh creation cells, nourishment areas, and containment dike and bathymetric surveys of the borrow area.

Project Total	\$ 88,535.80
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Structure Operations:

There are no active operations associated with this project.

V. Inspection Results

Site 1—Marsh Creation Cells (Fill Areas No. 1&2)

The two marsh creation cells are in good condition since the project was completed in 2010. Vegetation is thriving since curbing the nutria population. According to the Year 5 survey, the average marsh elevation is approximately +1.33 ft NAVD88. This is pretty consistent with the original settlement curve projections.

The remaining containment dike is at an average elevation of +3.37ft NAVD88 with 15 gaps to allow tidal exchange. Vegetation has expanded on the dikes which negated the need to plant. The concrete articulated mats placed in March 2015 on the Northeast corner of the island in MC Cell No. 1 at the East-West Pipeline Canal has settled significantly at the original breach location. However, it continues to break the wave action approaching the shoreline. In addition, from survey information the borrow channel on the interior of the containment dike which was excavated to repair the breach has silted in to -2.5ft NAVD88.

(Photos: Appendix B, Photo 1- 4&6)

Site 2—Nourished Areas (Additional Fill Areas No. 1-4)

During the Year 5 Survey, point shots were collected within the Nourished Areas. According to the Survey, Nourished Area No.1 has seen minor settlement. Nourished Area No. 2, is showing a positive elevation trend ranging from a 1 in. to a 7in. increase. Nourished Areas No. 3 & 4 are stable with little change.

(Photos: Appendix B, Photo 2)

Site 3—Earthen Plug

The earthen plug at the end of the North-South Pipeline Canal was intact. (Photos: Appendix B, Photo No. 4)

Site 4—Vegetation plantings

The vegetation in the marsh creation cells and containment dikes has propagated well despite the nutria damage seen in prior years. The Nutria Program implemented by LAWLF has effectively controlled the nutria population giving the vegetation time to reestablish itself. At this time no additional plantings are planned.

VI. Conclusions and Recommendations

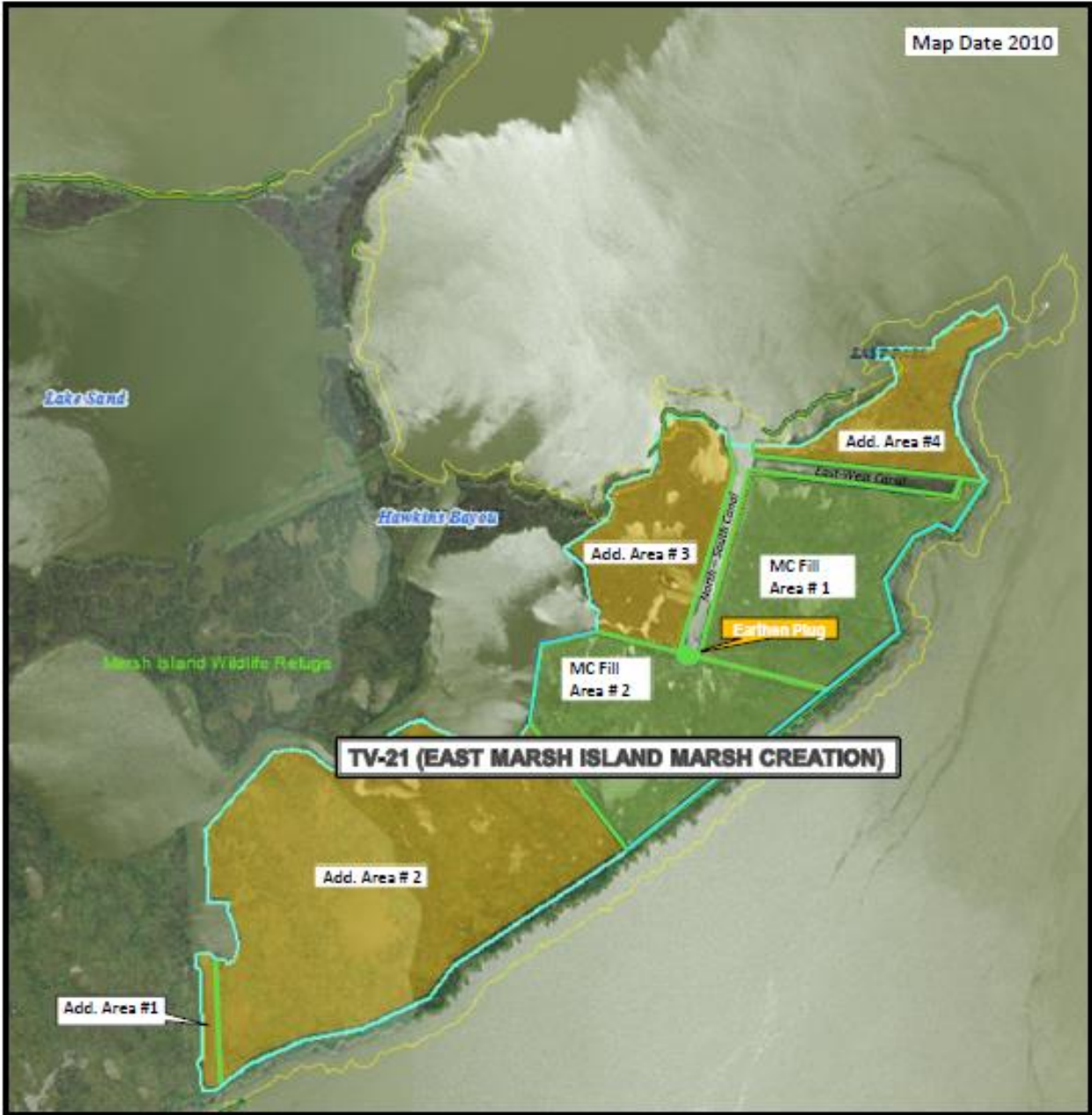
The East Marsh Island Marsh Creation Project is in good condition. The vegetation is thriving in all areas of the project. The contained marsh creation cells have settled within the originally predicted settlement curve projections. The nourished areas have held a steady elevation with Nourishment Area No. 2 showing a slight elevation gain.

The 2015 maintenance performed to address the breaches near the East-West Canal has experienced settling due to the soil quality and site conditions during construction. It however is still protecting the area of concern.

For future consideration, in projects where containment dikes are left in place along a gulf or bay shoreline, it has been found that containment dikes fared better if constructed further from the shoreline where vegetation and a parcel of land can act as a buffer to wave action.

Appendix A

Project Features Map



TV-21 East Marsh Island Marsh Creation



Project Completion Date December 2010

Appendix B

Photographs



Photo No. 1, MC Cell No. 1 - Articulated Concrete Mat (2015 Maintenance Event)



Photo No. 2, MC Cell No.1 & Nourished Area No. 4, Breach Repair (NE Corner of Island at East End of E-W Pipeline Canal (2015 Maintenance Event)



Photo No. 3, MC Cell No. 1, North South Canal Looking North



Photo No. 4, MC Cell No. 2, Plug at End of North-South Canal (Looking North)



Photo No. 5, Nourished Area No. 4, Plug (TV-14 Project- End of East West Canal Looking North)



Photo No. 6, MC Cell No. 1, Plug Tie-In (TV-14 Project- End of East West Canal - Looking SouthEast)

Appendix C

Three Year Budget Projection

EAST MARSH ISLAND MARSH CREATION/ TV-21 / PPL 14
Three-Year Operations & Maintenance Budgets 07/01/2017 - 06/30/2020

<u>Project Manager</u> Pat Landry	<u>O & M Manager</u> Jody White	<u>Federal Sponsor</u> NRCS	<u>Prepared By</u> Jody White
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	2017/2018(-6)	2018/2019 (-7)	2019/2020 (-8)
Maintenance Inspection			\$ 7,712.00
Structure Operation			
State Administration	\$ 5,000.00	\$ 5,000.00	\$ 5,000.00
Federal Administration	\$ 8,000.00		\$ 8,000.00

Maintenance/Rehabilitation

17/18 Description: Finalize Survey of Borrow Area and Project Area

E&D	
Construction	\$ 28,000.00
Construction Oversight	
Sub Total - Maint. And Rehab.	\$ 28,000.00

18/19 Description:

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

19/20 Description: Survey Project Area

E&D	\$ 6,176.00
Construction	\$ 70,000.00
Construction Oversight	
Sub Total - Maint. And Rehab.	\$ 76,176.00

	2017/2018(-6)	2018/2019 (-7)	2019/2020 (-8)
Total O&M Budgets	\$ 41,000.00	\$ 5,000.00	\$ 96,888.00

O &M Budget (3 yr Total)	\$ 142,888.00
Unexpended O & M Budget	\$ 290,264.03
Remaining O & M Budget (Projected)	\$ 147,376.03

OPERATION AND MAINTENANCE BUDGET WORKSHEET

EAST MARSH ISLAND MARSH CREATION / PROJECT NO. TV-21 / PPL NO. 14 / 2017/2018

DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
O&M Inspection and Report	EACH	0	\$7,269.00	\$0.00
General Structure Maintenance	LUMP	0	\$0.00	\$0.00
Engineering and Design	LUMP	0	\$0.00	\$0.00
Operations Contract	LUMP	0	\$0.00	\$0.00
Construction Oversight	LUMP	0	\$0.00	\$0.00

ADMINISTRATION

CPRA Admin.	LUMP	0	\$0.00	\$0.00
FEDERAL SPONSOR 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:	Finalize Survey of Borrow Area and Project Area				
	Secondary Monument	EACH	0	\$0.00	\$0.00
	Staff Gauge / Recorders	EACH	0	\$0.00	\$0.00
	Marsh Elevation / Topography	LUMP	1	\$28,000.00	\$28,000.00
	TBM Installation	EACH	0	\$0.00	\$0.00
	OTHER				\$0.00
	TOTAL SURVEY COSTS:				\$28,000.00

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	
	Rock Dike	0	0.0	0	\$0.00	\$0.00
	Bank Paving	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 (25%)		LUMP	0	\$0.00	\$0.00
	Vegetative Plantings		LUMP	0	\$0.00	\$0.00
	OTHER		LUMP	0	\$0.00	\$0.00
	OTHER				\$0.00	\$0.00
	TOTAL CONSTRUCTION COSTS:					\$0.00

TOTAL OPERATIONS AND MAINTENANCE BUDGET: **\$28,000.00**

OPERATION AND MAINTENANCE BUDGET WORKSHEET

EAST MARSH ISLAND MARSH CREATION / PROJECT NO. TV-21 / PPL NO. 14 / 2018-2019

DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
O&M Inspection and Report	EACH	0	\$7,487.00	\$0.00
General Structure Maintenance	LUMP	0	\$0.00	\$0.00
Engineering and Design	LUMP	0	\$6,176.00	\$0.00
Operations Contract	LUMP	0	\$0.00	\$0.00
Construction Oversight	LUMP	0	\$0.00	\$0.00

ADMINISTRATION

STATE Admin.	LUMP	1	\$5,000.00	\$5,000.00
FEDERAL SPONSOR Admin.	LUMP	0	\$8,000.00	\$0.00
SURVEY Admin.	LUMP	0	\$0.00	\$0.00
OTHER				\$0.00
TOTAL ADMINISTRATION COSTS:				\$5,000.00

MAINTENANCE / CONSTRUCTION

SURVEY

SURVEY DESCRIPTION:	Survey project area				
	Secondary Monument	EACH	0	\$0.00	\$0.00
	Staff Gauge / Recorders	EACH	0	\$0.00	\$0.00
	Marsh Elevation / Topography	LUMP	0	\$70,000.00	\$0.00
	TBM Installation	EACH	0	\$0.00	\$0.00
	OTHER				\$0.00
	TOTAL SURVEY COSTS:				\$0.00

GEOTECHNICAL

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

CONSTRUCTION

CONSTRUCTION DESCRIPTION:	Vegetative plantings, and engineering monitoring.					
	Rip Rap	LIN FT	TON / FT	TONS	UNIT PRICE	
	Rock Dike	0	0.0	0	\$0.00	\$0.00
	Bank Paving	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 (25%)		LUMP	0	\$0.00	\$0.00
	Vegetative Plantings		LUMP	0	\$0.00	\$0.00
	OTHER		LUMP	0	\$0.00	\$0.00
	OTHER				\$0.00	\$0.00
	TOTAL CONSTRUCTION COSTS:					\$0.00

TOTAL OPERATIONS AND MAINTENANCE BUDGET: **\$5,000.00**

OPERATION AND MAINTENANCE BUDGET WORKSHEET

EAST MARSH ISLAND MARSH CREATION / PROJECT NO. TV-21 / PPL NO. 14 / 2019-2020

DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
O&M Inspection and Report	EACH	1	\$7,712.00	\$7,712.00
General Structure Maintenance	LUMP	0	\$0.00	\$0.00
Engineering and Design	LUMP	1	\$6,176.00	\$6,176.00
Operations Contract	LUMP	0	\$0.00	\$0.00
Construction Oversight	LUMP	0	\$0.00	\$0.00

ADMINISTRATION

STATE Admin.	LUMP	1	\$5,000.00	\$5,000.00
FEDERAL SPONSOR Admin.	LUMP	1	\$8,000.00	\$8,000.00
SURVEY Admin.	LUMP	0	\$0.00	\$0.00
OTHER				\$0.00
TOTAL ADMINISTRATION COSTS:				\$13,000.00

MAINTENANCE / CONSTRUCTION

SURVEY

SURVEY DESCRIPTION:	Survey project area				
	Secondary Monument	EACH	0	\$0.00	\$0.00
	Staff Gauge / Recorders	EACH	0	\$0.00	\$0.00
	Marsh Elevation / Topography	LUMP	1	\$70,000.00	\$70,000.00
	TBM Installation	EACH	0	\$0.00	\$0.00
	OTHER				\$0.00
	TOTAL SURVEY COSTS:				\$70,000.00

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	
	Rock Dike	0	0.0	0	\$0.00	\$0.00
	Bank Paving	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 (25%)		LUMP	0	\$0.00	\$0.00
	Vegetative Plantings		LUMP	0	\$0.00	\$0.00
	OTHER		LUMP	0	\$0.00	\$0.00
	OTHER				\$0.00	\$0.00
	TOTAL CONSTRUCTION COSTS:					\$0.00

TOTAL OPERATIONS AND MAINTENANCE BUDGET: **\$96,888.00**

Appendix D

Field Inspection Form

