

State of Louisiana

Coastal Protection and Restoration Authority of Louisiana

Office of Coastal Protection and Restoration

2009 Operations, Maintenance, and Monitoring Report

for

Pecan Island Terracing (ME-14)

State Project Number ME-14 Priority Project List 7

June, 2009 Vermilion Parish

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Preface

The 2009 OM&M Report format is a streamlined approach which combines the Operations and Maintenance annual project inspection information with the Monitoring data and analyses on a project-specific basis. This new reporting format includes monitoring data collected through December 2008, and annual Maintenance Inspections through October 2008.

The 2009 report is the 3rd report in a series of reports. For additional information on lessons learned, recommendations and project effectiveness please refer to the 2004 and 2005 Operations, Maintenance, and Monitoring Report on the LDNR web site (LDNR 2004).

2009 Operations, Maintenance, and Monitoring Report For Pecan Island Terracing (ME-14)

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I. Introduction

The Pecan Island Terracing (ME-14) project is located five miles north of the Gulf of Mexico just south of Pecan Island and Hwy 82 in the Lakes Sub-basin of the Mermentau Basin, Vermilion Parish, Louisiana (figure 1). The total project area comprises 3,753 acres (1,519 ha) of brackish marsh and open water. Area 1 is primarily open water and was formerly pasture land of approximately 1,938 acres (784 ha). Area 2 consists of 1,715 acres (694 ha) of brackish marsh and open water.

The project area was initially classified as fresh marsh. Habitat analysis in 1956 classified Area 1 as 99.1 % fresh marsh and 0.9 % water and Area 2 as 89.7 % fresh marsh and 10.3 % water. The marsh in Area 1 was converted to a dry pasture in the late 1950's by constructing continuous dikes around the perimeter and draining the interior. By 1978, Area 1 was classified as 93.4 % pasture, 0.5 % water, 0.2 % fresh marsh, and 1% intermediate marsh with Area 2 comprised of 16 % intermediate marsh, 14.3 % brackish marsh, and 69.4 % open water. Deterioration and loss of the perimeter levees between 1978 and 1988 converted the entire area into a shallow, open water lake with some sporadic small islands. The analysis performed from1988 through 1990 indicated that Area 1 had converted to 98 % water with 1.6 % brackish marsh. Additionally, Area 2 had converted to 68.2 % water and 31.7 % brackish marsh.

Soils in the northern portion of Area 1 are Bancker muck with Clovelly muck in the southern part of that area. Area 2 consists solely of Clovelly muck. Bancker muck is very poorly drained, very fluid, mineral soil while Clovelly muck is very poorly drained, very fluid and organic soil. The dominant natural vegetation in both areas is *Spartina patens* (marshhay cordgrass). Other common plants include *Juncus roemarianus* (needlegrass rush), *Paspalum vaginatum* (seashore paspalum), *Phragmites australis* (common reed), *Scirpus robustus* (saltmarsh bulrush), *Scirpus pungens* (three-corner grass), *Spartina alterniflora* (saltmarsh cordgrass), and *Distichlis spicata* (seashore saltgrass). Aquatic vegetation historically consisted of *Ruppia maritima* (widgeongrass) and *Eleocharis parvula* (dwarf spikesedge).

The project features include construction of 197,000 linear feet (60,046 m) of terraces in 500 ft (152.4 m) sections with a 50 ft (15.24 m) break between each terrace, creating approximately 344 terraces (figure 2). Terraces run east to west in a staggered gap formation. The terraces were constructed by depositing borrow material with a 40 ft (12.19 m) berm with a crown width of 10 ft (3.04 m) and 4:1 side slopesInitial constructed elevation was approximately 3.75 ft (1.14 m) NAVD 88 which in 5 years should have a final settled elevation approximately 1 ft above marsh elevation, or 2.5 ft NAVD 88. Breaks were constructed to permit water to move in and out of the interior, which may facilitate the settling of suspended soil particles. *Spartina alterniflora* (smooth cordgrass) plugs were planted every five linear feet on both sides of terrace. Construction of the terraces was completed August 15, 2003.



Figure 1. Pecan Island Terracing (ME-14) project and reference boundaries showing terraces and CRMS-*Wetlands* stations.



Figure 2. Pecan Island Terracing (ME-14) schematic of terraces.

II. Maintenance Activity

a. Project Feature Inspection Procedures

The purpose of the annual inspection of the Pecan Island Terracing Project (ME-14) is to evaluate the constructed project features, 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. The annual inspection report also contains a summary of maintenance projects, if any, 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 B.

In 2003, the CWPPRA Task Force determined, due to the fact that OCPR was responsible for the operation and maintenance phase of the vast majority of CWPPRA projects, that OCPR would be the responsible party for all Post Storm/Hurricane Assessments. After Hurricane Ike, every project appeared to have been impacted by the storms; therefore, OCPR determined that all projects should be assessed for damages (Broussard, 2006). With concurrence from the federal sponsor, OCPR has decided to use the information obtained during this post hurricane assessment in this Annual Maintenance Inspection.

An inspection of the Pecan Island Terracing Project (ME-14) was held on October 7, 2008 under clear skies and mild temperatures. In attendance were Stan Aucoin and Mel Guidry of (OCPR) and John Foret representing (NOAA). All parties met at the CED Lafayette Field Office and proceeded to the boat launch adjacent to the Pecan Island Terracing Project (ME-14). The group traveled throughout the project area via CED boat inspecting the terraces.

The field inspection included a complete visual inspection of all earthen terraces. Staff gauge readings when available were used to determine approximate water level and earthen terrace elevation. Photographs were taken of various earthen terraces (see Appendix A) and Field Inspection notes were completed in the field to record measurements and any notable deficiencies (see Appendix C).

b. Inspection Results

Terraces

Overall the majority of the earthen terraces are in good condition and did not appear to suffer any major damage from Hurricane Ike. Previously noted erosion in past O&M Inspections of the southern sacrificial terraces has worsened. The southern sacrificial terraces are providing less protection for the interior earthen terraces than in previous years. (Photos: Appendix A, Photo 1)

Vegetative Plantings

The tops of the terraces are approximately 50 per cent covered with vegetation. Species noted include *Spartina alterniflora*, *Juncus*, *Baccharis*, and *Spartina patens*. (Photos: Appendix A, Photo 1).

c. Maintenance Recommendations

- i. Immediate/ Emergency Repairs None
- **ii. Programmatic/ Routine Repairs** Install a staff gage.

d. Maintenance History

General Maintenance: Below is a summary of completed maintenance projects and operation tasks performed since September 2003, the construction completion date of the Pecan Island Terracing Project (ME-14).

No maintenance has been required on this project.

III. Operation Activity

a. Operation Plan

There are no water control structures associated with this project, therefore no Structural Operation Plan is required.

b. Actual Operations

There are no water control structures associated with this project, therefore no required structural operations.

III. Monitoring Activity

Pursuant to a CWPPRA Task Force decision on August 14, 2003 to adopt the Coastwide Reference Monitoring System-*Wetlands* (CRMS-*Wetlands*) for CWPPRA, updates were made to the ME-14 Monitoring Plan to merge it with CRMS-*Wetlands* and provide more useful information for modeling efforts and future project planning while maintaining the monitoring mandates of the Breaux Act.

a. Monitoring Goals

The objective of the Pecan Island Terracing Project is to convert areas of open water in Area 1 to vegetated marsh through the construction of earthen terraces and vegetation plantings.

The following goals will contribute to the evaluation of the above objective:

- 1. Increase land to water ratios by constructing approximately 100 acres (41.3 ha) of earthen terraces in Area 1.
- 2. Increase land to water ratios by creating over 300 acres (121.4 ha) of land within Areas 1 and 2 over 20 years after construction.
- 3. Increase percent cover of SAV in remaining open water areas to 50% in Area 1 and 15% in Area 2.
- 4. Establish emergent vegetated marsh on planted terraces.

b. Monitoring Elements

Aerial Photography:

To document land to open-water ratios and marsh loss/gain rates in Area 1 and Area 2, nearvertical color infrared aerial photography (1:12,000) was obtained in 2001 prior to construction, and post-construction in 2004, and will be obtained 2017. Imagery will be delineated to classify all land in the project and reference areas as either (1) preexisting wetlands, (2) vegetated and non-vegetated terraces, and (3) non-terrace, newly developed wetlands (i.e., those that develop in open water areas between the terraces or adjacent to the preexisting perimeter levees). The original photography was checked for flight accuracy, color correctness, and clarity and was subsequently archived. Aerial photography was scanned, mosaicked, and georectified by USGS/NWRC personnel according to standard operating procedures (Steyer et al. 1995, revised 2000).

Emergent Vegetation:

The condition of the emergent and planted vegetation on the terraces was monitored at sampling stations established systematically on 15 planted and 15 unplanted terraces using a modified Braun Blanquet sampling method. Transects were established uniformly along each transect. Three transects were established across the long (500 ft) terraces, and one transect was established across the shorter (120 and 250 ft) terraces. At each station, percent cover, dominant plant height, and species composition was documented in a 4 m² sample area. Vegetation was evaluated at the sampling sites in the fall of 2003 (as built) and late summer 2005. A subset of 10 terraces (5 planted and 5 unplanted) was evaluated after Hurricane Rita in November 2005 and October 2007. Changes in funding and CRMS-*Wetlands* implementation has caused the 2010 and 2017 projected sampling dates to be terminated.

Individual species' cover data from vegetated and unvegetated terraces were summarized according to the Floristic Quality Index (FQI) method utilized by CRMS (Cretini et al. 2009) where species cover is qualified by scoring species according to whether they are generally associated with disturbance or stability. Two continuous recorders were established; one in the project area and one in the reference area. Staff gauges were associated with a bench mark surveyed to the North American Vertical Datum 88 (NAVD 88) to tie water levels to a known datum. Water level and salinity data were collected for one year prior to emergent vegetation sampling in 2003 and partially in 2005 due to Hurricane Rita. Hydrologic data will not be collected in the future. Water level data was used to document environmental conditions that may have an effect on emergent and planted vegetation.

SAV:

To document changes in the frequency of occurrence of submersed aquatic vegetation, a modification of the rake method was employed. The project and reference area were monitored along 15 transects: 6 transects on the east side of the project, 6 transects on the west side of the project and 3 in the reference area. Each transect had a minimum of 20 sampling stations. At each station, aquatic vegetation was sampled by dragging a garden rake on the pond bottom for about one second. The presence of vegetation was recorded to determine the frequency of aquatic plant occurrence (frequency = number of occurrences/number of stations x 100). When vegetation was present, the species present were recorded in order to determine the frequencies of individual species. SAV abundance was sampled in the spring of 2001 (pre-construction), and in 2005. Continuous data recorders will document hourly salinity and water level for one year prior to the years that SAV is collected with the exception of 2001 (pre-construction). Salinity data will be used to document environmental conditions that may have an effect on SAV occurrence.

CRMS Supplemental

Additional data collected at CRMS-*Wetlands* stations which can be used as supporting or contextual information for this project. Data types collected at CRMS sites include hydrologic, emergent vegetation, physical soil characteristics, discrete porewater salinity, marsh surface elevation change, vertical accretion, and land:water analysis of 1 km² area encompassing the station. For this report, vegetation data from one site just outside the project area (CRMS0623) on naturally occurring marsh is used to reference the sites on the

terraces. In the future, data collected from the CRMS network over a sufficient amount of time to develop valid trends will be used to develop integrated data indices at different spatial scales (local, basin, coastal) to which we can compare project performance.

IV. Monitoring Activity

c. Preliminary Monitoring Results and Discussion

Aerial Photography

Aerial photography was collected pre-construction on December 18, 2001 and postconstruction on November 25, 2004 (figures 3, 4 and 5). In Area 1, 201 acres (81 ha) of terraces were constructed, half of which were vegetated in 2004. Terraces in Area 2 and the Reference area were constructed by Vermilion Corp and are not part of the ME-14 project. Percent land excluding the terraces decreased slightly in all three areas between 2001 and 2004 (by 0.4% in Area 1, 3.4% in Area 2, and 1.2% in the Reference Area)..

Table	1.	Acreages	and	percentages	for	land	water	classifications	from	aerial	photography
collect	ed	in 2001 ar	nd 20	04.							

	Pre-Construction (December 18, 2001)									
		Area 1			Area 2		Reference			
	Acres (ha) %			Acres	(ha)	%	Acres	(ha)	%	
Land	46	19	2.4	395	160	23.0	28	11	8.7	
Water	1892	766	97.6	1320	534	77.0	294	119	91.3	
Terrace, Vegetated	0			0			0			
Terrace, Non-Vegetated	0			0			0			
Total	1938	784		1715	694		322	130		

	Post-Construction (November 25, 2004)										
	Area 1				Area 2		Reference				
	Acres (ha) %			Acres	(ha)	%	Acres	(ha)	%		
Land	39	16	2.0	337	136	19.7	24	10	7.5		
Water	1698	687	87.6	1375	556	80.2	284	115	88.2		
Terrace, Vegetated	134	54	6.9	<1			1	0.4	0.3		
Terrace, Non-Vegetated	67	27	3.5	3	1	0.2	13	5	4.0		
Total	1938	784		1715	694		322	130			

Emergent Vegetation

Emergent vegetation data were collected on terraces post construction in August 2003 and 2005 with an extra sampling after Hurricane Rita in November 2005 and August 2007. Total cover of emergent vegetation at stations on vegetated and unvegetated terraces was utilized to determine whether initial planting of terraces had an effect on total cover after a few years. Floristic Quality (FQI) of vegetation on terraces was described in order to describe succession on planted and unplanted terraces. Salinity data were collected in order to describe the environment prior to vegetation sampling each year. Salinities were less than 5 ppt during the growing season in both the project and reference areas before vegetation sampling in both 2003 and 2005 (figure 6). Water levels were between one and two feet higher in the growing season in 2005 than 2003 in both the project and reference areas (figure 7).

ANOVA was conducted on total cover data and included planted/unplanted terraces, sample date, and the interaction of the two. The overall model was significant (p<.0001, $F=_{7, 579}=18.86$) and there was a significant difference between sample dates (p<.0001) and the interaction of sample date and planted/unplanted terraces (p=0.0012). Post-ANOVA contrasts showed no difference in cover between planted and unplanted terraces for all sample dates except the last one in October 2007 when cover was significantly higher in the planted terraces (42%) than the unplanted terraces (26%) (figure 8).

Floristic quality and mean cover of vegetation on planted terraces increased between each sampling period except immediately following Hurricane Rita (figure 9) The planted terraces had higher cover and quality than the unplanted terraces principally due to the presence of the planted, high quality *Spartina alterniflora*. The unplanted terraces showed a slower increase in cover and quality and were dominated by *Paspalum vaginatum, Iva frutescens*, and volunteer *Spartina alterniflora* (figure 10). As expected, neither the planted nor unplanted terraces were similar to the species assemblage in the emergent brackish marsh at CRMS0623 which was dominated by *Spartina patens, Distichlis spicata,* and *Schoenoplectus robustus* with a little bit of *Spartina alterniflora* (figure 11).

Submerged Aquatic Vegetation:

SAV data were collected in May of 2001 and 2005. Pre-construction, the only SAV present in either the project or reference area was an unknown Alga. Post-construction, there were several species of SAV in both the project areas and none in the reference area (figure 12). Salinity and water level data are not available for the period before data collection in May 2001 but are available for 2005. Salinity prior to data collection in 2005 was around 1 to 2 ppt higher than 2003 (the only other year of record) but was still below 5 ppt (figure 6). Water levels were at least a foot higher in 2005 than they were in 2003 before and during the growing season (figure 7). Since there was no SAV in the reference area either year and water levels and salinities were relatively high in 2005, the presence of SAV in the project areas may be due to the construction of terraces and their effect on fetch, wind driven waves, and turbidity.

ANOVA was conducted on the presence/absence of SAV species excluding Alga to test the effect of project area (A1, A2, Reference), year (2001, 2005) and the interaction between the two on SAV cover (figures 12 and 13). The data used for the model were transect cover

values (n samples with SAV present/total n samples) with six transects for each project area and three for the reference area.

There was a significant difference in SAV presence in the three areas sampled in 2001 and 2005 (p=0.0003) and the interaction of area and year was significant (p=0.0436). There was no SAV other than Alga in 2001 in any of the three areas. Post ANOVA contrasts showed the two project areas to have virtually the same amount of SAV in 2005 (p = 0.0832) and the two project areas together and individually to have significantly more SAV than the Reference area in 2005 (together p = 0.0028; A1 p=0.0009; A2 p=0.0307). These results suggest the area containing the project terraces (A1) and the area south of the project terraces (A2) are more conducive to the growth of SAV than the reference area. It is important to note that Ducks Unlimited was actively building their own terraces in the reference area during sampling in 2005 which may have negatively impacted the potential for SAV growth in that area.



Figure 3. Pecan Island Terracing (ME-14) photomosaic of the project and reference area from aerial photography taken December 18, 2001.



Figure 4. Pecan Island Terracing (ME-14) Land/Water analysis of the project and reference area from aerial photography taken November 25, 2004.



Figure 5. Comparison of 2001 and 2004 aerial photography.



Figure 6. Mean daily salinity at project and reference sondes.



Figure 7. Mean daily water elevation at project and reference sondes.



Figure 8. Pecan Island Terracing (ME-14) % total cover on terraces planted with *Spartina alterniflora* vs. unplanted terraces.



Figure 9. Percent coverage of species and floristic quality index of vegetation data collected on the planted terraces. Values are means of 15 or 5 terraces within the site; therefore, the sum of % coverage of individual species can be greater than 100 %.



Figure 10. Percent coverage of species and floristic quality index of vegetation data collected on the unplanted terraces. Values are means of 15 or 5 terraces within the site; therefore, the sum of % coverage of individual species can be greater than 100 %.



Figure 11. Percent coverage of species and floristic quality index of vegetation data collected on the planted terraces. Values are means of 10 stations within the site; therefore, the sum of % coverage of individual species can be greater than 100 %.



Figure 12. Pecan Island Terracing (ME-14) submerged aquatic vegetation % cover and species richness. Species consisted of one alga not identified to species.



Figure 13. Pecan Island Terracing (ME-14) least squared means % cover of SAV in Area1 (terraced), Area 2 and the reference area. Algae were excluded from means.

V. Conclusions

a. **Project Effectiveness**

Overall, the Pecan Island Terracing Project (ME-14) structural features are functioning as designed and in good condition. The erosion of the southern most terraces was expected due to the open water area just south of the terraces in Area 2. Two hundred and one acres of terraces were successfully constructed, 134 of which were vegetated in 2005. Planted terraces vegetated more quickly than non planted terraces. The project effectively increased cover of SAV which was present in both project areas in 2005. The area between the terraces has not begun to fill in yet. The effect of the project on additional land building will be assessed at the life of the project in year 2023.

b. Recommended Improvements

Install a staff gage within the terrace field. Terraces that have been eroded by fetch in Area 1 could be re-established and additional terraces could be created in Area 2 where open water areas are presently located.

c. Lessons Learned

The number of terraces constructed and their close proximity to one another reduced fetch and the erosive action of waves. South Louisiana's mild climate and adequate precipitation creates optimal growing conditions for vegetation species located within the natural seed bank. Intensive planting schemes may be unnecessary in protected environments but are probably important in high energy environments and when projects are completed when vegetation is dormant.

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Appendix A (Inspection Photographs)



Photo No. 1, Typical earthen terrace

Appendix B (Three Year Budget Projection) PECAN ISLAND TERRACING/ ME-14 / PPL 7 Three-Year Operations & Maintenance Budgets 07/01/2009 - 06/30/2012

Prepared By Project Manager O & M Manager Federal Sponsor NMFS Mel Guidry Pat Landry Mel Guidry 2009/2010 2010/2011 2011/2012 Maintenance Inspection 5,737.00 5,909.00 6,086.00 \$ \$ \$ Structure Operation Administration Maintenance/Rehabilitation 09/10 Description: Add a staff gage. E&D \$7,500.00 Construction Construction Oversight 7,500.00 Sub Total - Maint. And Rehab. \$ 10/11 Description: E&D \$ Construction \$ Construction Oversight \$ \$ Sub Total - Maint. And Rehab. 11/12 Description: E&D \$ Construction \$ Construction Oversight \$ Sub Total - Maint. And Rehab. \$ 2009/2010 2010/2011 2011/2012 Total O&M Budgets 13,237.00 _\$ 5,909.00 \$ 6,086.00 \$ O &M Budget (3 yr Total) \$ 25,232.00 Unexpended O & M Budget \$ 185,554.00 Remaining O & M Budget (Projected) 160,322.00 \$

OPERATION AND MAINTENANCE BUDGET WORKSHEET 07/01/2009-06/30/2010

PECAN ISLAND TERRACES PROJECT / PROJECT NO. ME-14 / PPL NO. 7

DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
O&M Inspection and Report	EACH	1	\$5,737.00	\$5,737.00
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
	ADN	INISTRAT	ION	
OCPR / CRD Admin.	LUMP	1	\$0.00	\$0.00
FEDERAL SPONSOR Admin.	LUMP	1	\$0.00	\$0.00
SURVEY Admin.	LUMP	0	\$0.00	\$0.00
OTHER				\$0.00
	\$0.00			

MAINTENANCE / CONSTRUCTION

	SURVEY				
SURVEY DESCRIPTION:	Add staff gage.				
	Secondary Monument	EACH	0	\$0.00	\$0.00
	Staff Gauge / Recorders	EACH	1	\$7,500.00	\$7,500.00
	Marsh Elevation / Topography	LUMP	0	\$0.00	\$0.00
	TBM Installation	EACH	0	\$0.00	\$0.00
	OTHER				\$0.00
			тс	TAL SURVEY COSTS:	\$7,500.00

GEOTECHNICAL

ļ	DESCRIPTION:	Borings	EACH	0	00.02	00.02
		OTHER	LAGIT	0	ψ0.00	\$0.00
			\$0.00			

	CONSTRUCTION					
CONSTRUCTION DESCRIPTION:						
	Rip Rap	LIN FT	TON / FT	TONS	UNIT PRICE	
	Rock Rip rap	0	0.0	0	\$0.00	\$0.00
	Aggregate Surface Course	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	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 OTHER				\$0.00	\$0.00
					\$0.00	\$0.00
	OTHER				\$0.00	\$0.00
	-	\$0.00				

TOTAL CONSTRUCTION COSTS:

TOTAL OPERATIONS AND MAINTENANCE BUDGET:

OPERATIONS AND MAINTENANCE BUDGET WORKSHEET 07/01/2010-06/30/2011 PECAN ISLAND TERRACES/ME-14/PPL7

DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
O&M Inspection and Report	EACH	1	\$5,909.00	\$5,909.00
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
	ADN	INISTRAT	ION	
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
	\$0.00			

MAINTENANCE / CONSTRUCTION

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
OTHER				\$0.00
	\$0.00			

GEOTECHNICAL

GEOTECH DESCRIPTION:					
	Borings	EACH	0	\$0.00	\$0.00
	OTHER				
		\$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			1	\$0.00	\$0.00
	OTHER				\$0.00	\$0.00
	OTHER				\$0.00	\$0.00
	OTHER				\$0.00	\$0.00
				TOTAL CO	NSTRUCTION COSTS:	\$0.00

TOTAL OPERATIONS AND MAINTENANCE BUDGET:

\$5,909.00

OPERATION AND MAINTENANCE BUDGET 07/01/2011-06/30/2012 PECAN ISLAND TERRACES/ME-14/PPL7

DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
O&M Inspection and Report	EACH	1	\$6,086.00	\$6,086.00
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
	ADN	INISTRAT	ION	
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
	\$0.00			

MAINTENANCE / CONSTRUCTION

SURVEY DESCRIPTION:

Secondary Monument	EACH	0	\$0.00	\$0.00
Staff Gauge / Recorders	EACH	0	\$0.00	\$0.00
farsh Elevation / Topography	LUMP	0	\$0.00	\$0.00
BM Installation	EACH	0	\$0.00	\$0.00
DTHER				\$0.00
	\$0.00			

GEOTECHNICAL

SURVEY

C

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

\$6,086.00

Appendix C (Field Inspection Notes)

MAINTENANCE INSPECTION REPORT CHECK SHEET

Project No. / Name:Pecan Island Terracing ME-14

Structure No.

Structure Description: Earthen Terraces

Date of Inspection: October 7, 2008 Time: 10:30 am

Inspector(s):Mel Guidry & Stan Aucoin (OCPR) John Foret (NMFS) Water Level Inside: Outside: _____

Type of Inspection: Annual

Weather Conditions:Clear and Mild

ltem	Condition	Physical Damage	Corrosion	Photo #	Observations and Remarks
Steel Bulkhead	N/A				
/ Caps					
Steel Grating	N/A				
Stop Logs	N/A				
Hardware	N/A				
Timber Piles	N/A				
Timber Wales	N/A				
Galv. Pile Caps	N/A				
Cables	N/A				
Signage	N/A				
/Supports					
Rip Rap (fill)	N/A				
Earthen	Good			1	Terraces are in good condition
Terraces					

What are the conditions of the existing levees? Are there any noticeable breaches? Settlement of rock plugs and rock weirs? Position of stoplogs at the time of the inspection? Are there any signs of vandalism?