Coastal Protection and Restoration Authority of Louisiana

State of Louisiana
Coastal Protection and Restoration Authority

2017 Annual Inspection Report

for

Penchant Basin Natural Resource Plan, Increment No. 1 (TE-34)

State Project Number TE-34
Priority Project List 6

July 12, 2017
Terrebonne Parish

Prepared by:

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I. Introduction

The Penchant Basin Natural Resource Plan, Increment No. 1 (TE-34) is located in Terrebonne Parish, Louisiana and is bounded on the north by the Gulf Intracoastal Waterway (GIWW), to the east by a north/south line from Lake Decade to the GIWW, to the south by Lake Mechant and Lost Lake, and to the west by a north/south line from Lost Lake to Avoca Island (CWWPRA, February 2008). (Appendix A – Project Features Map)

The Penchant Basin consists of a dynamic and variable-component landscape shaped by deltaic abandonment, initiation of a new delta via the Atchafalaya River and anthropogenic landscape alterations (NRCS, April 2007). To the north, a vast area of freshwater floating marshes transitions south to intermediate and brackish marshes, all of which have experienced some of the highest land loss rates in the state. While the freshwater floating marshes have been studied extensively, the exact cause of the high rates of deterioration remain somewhat elusive, The losses have been attributed to a combination of elevated water levels, increase flows from the Atchafalaya and GIWW and associated water quality impacts, hydrologic alterations, stagnation in some areas that have been isolated from riverine influence and nourishment, and herbivory (O'Neil 1949, Sassar 1994. Coastal Environments, Inc. 1997, Swarzenski 2003). To the south, loss to intermediate and brackish marshes can be contributed to natural deltaic abandonment process of subsidence accelerated by channelization and alteration of hydrology, sea level rise, saltwater intrusion (USDA-SCS, 1984).

The Penchant Basin Natural Resource Plan, Increment No. 1 (TE-34) is intended to reduce water levels in the northwestern portion of the project by diverting freshwater southeastward to where it is needed (CWWPRA, 2008). The goals of the project are to eliminate erosion and re-establish emergent marsh along the southern bank of Bayou Chene at the intersection of Bayou Penchant, to transfer water, sediment and nutrients from the Atchafalaya River to the lower Penchant Basin tidal marshes to offset saltwater intrusion and subsidence, to maintain the integrity of the northern bank of Bayou Decade and increase nourishment to the deteriorating upper Penchant Basin marshes by providing an exchange of freshwater through the system (NRCS and CPRA, April 2007)

Increment 1 of the Penchant Basin Natural Resource Plan has a twenty-year (20 year) project life, which began in August 2011. The principle project features include foreshore rock dikes and marsh creation at the intersection of Bayou Chene and Bayou Penchant, a weir with a boat bay and flap-gates at the intersection of Bayou Penchant and Brady Canal, a weir with flap-gates along Superior Canal, rock riprap revetment and two (2) fixed crest weirs along north bank of Bayou Decade from Voss Canal to Lost Lake.

II. Inspection Purpose and Procedures

The purpose of the annual inspection of the Penchant Basin Natural Resource Plan, Increment No. 1 (TE-34) Project is to evaluate the constructed project features in order to identify any deficiencies. The inspection results are used to prepare a report detailing the condition of the

project features and recommending any corrective actions considered necessary. Should it be determined that corrective actions are needed, the CPRA shall provide in the report, a detailed cost estimate for engineering, design, supervision, inspection, construction, and contingencies, as well as an assessment of the urgency of such repairs. The annual inspection report also contains a summary of maintenance projects, which were completed since the 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 construction of the project is outlined in Section IV.

The annual inspection of Penchant Basin Natural Resource Plan – Increment 1 (TE-34) project took place on April 6, 2017, the same day as the GIWW Bank Restoration of Critical Areas (TE-43) inspection. In attendance were Brian Babin, Todd Hubbell, and Adam Ledet with CPRA, and Doug Baker and Quin Kinler with NRCS. The inspection began around 8:30 am near the rock dike and marsh creation area at the intersection of Bayou Chene and Bayou Penchant. From there, we proceeded to the weir at Brady Canal; the floating debris barrier along Superior Canal; the rock revetment along Bayou Decade; and ended at Lost Lake. The Superior Canal Structure was inspected on a previous date during the inspection of the Brady Canal (TE-28) project. The trip included a visual inspection of the project features, structures and outer edges of the marsh creation areas. Photographs of the inspection are located in Appendix B.

III. Project Description

The following completed, structural components jointly accepted by CPRA and NRCS will require operation, maintenance, repair, and/or rehabilitation throughout the twenty (20) year life of the project.

- Approximately 6,667 linear feet of foreshore rock dike along the southern bank of Bayou Chene at the mouth of Bayou Penchant. The rock dike was constructed to an maximum overbuild elevation of 4.0’ NAVD 88 (Geoid 99) and target elevation of +3.5’ NAVD88 (Geoid 99); with 4 (H):1(V) side slopes from Station 0+00 to 07+50 along east dike and 3(H):1(V) from Station 08+00 to the end, and a top width of 3.0’.

- Approximately 30 acres of marsh creation along the southern bank of Bayou Chene at the mouth of Bayou Penchant. The target marsh elevation in this location is approximately 2.0’ NAVD 88 (Geoid 99).

- 92’ steel sheet pile weir with a ten (10) foot wide boat bay and six (6) - 5’ x 5’ flap gated openings at the intersection of Brady Canal and Bayou Penchant.

- 85’ long steel sheet pile weir with six (6) - 5’ x 5’ flap gated openings along Superior Canal.

- Approximately 14,500 linear feet of earthen embankment armored with rock

riprap along the north bank of Bayou Decade from Voss Canal to the mouth of Lost Lake. The earthen embankment was constructed to an elevation of +4.0' NAVD 88 (Geoid 99) with 6:1 side slopes and a 10' wide earthen embankment crest and 6'. rock revetment crest. The rock riprap revetment is approximately 2' thick, 10' wide base and 6:1 side slopes along the canal face of the earthen embankment.

- Structure No.5 – 139 linear feet steel bulkhead weir with 10' wide boat bay. The top elevation of the bulkhead was constructed to an elevation of 0.9' NAVD 88. The crest of the boat bay was constructed to -4.0' NAVD 88 (Geoid 99). A rock scour pad above a geotextile fabric was constructed along both sides of the steel bulkhead to an elevation of -4.0' NAVD (Geoid 99) with 3:1 side slopes.

- Structure No.4 – 120 linear feet steel bulkhead with 10' wide boat bay. The top elevation of the bulkhead was constructed to an elevation of 0.9' NAVD 88 (Geoid 99). The crest of the boat bay was constructed to -4.0' NAVD 88 (Geoid 99). A rock scout pad above a geotextile fabric was constructed along both sides of the bulkhead to an elevation of -4.0' NAVD with 3:1 side slopes.

Upon completion of the Brady Canal and Superior Canal structures, it was evident that floating vegetation and debris would present problems with the flap-gates functioning properly. NRCS took the lead on designing a debris barrier on the up-stream side of both structures to mitigate any interference with the functionality of the gates. The floating debris barrier consisted of floating PVC bodies secured by timber piles and hanging debris screens below the bodies to catch debris above and below the surface of the water. The floating debris barriers were constructed on each side of the boat bay at the Brady Canal Structure and across the entire channel north of the Superior Canal Structure.

IV. Summary of Past Operation and Maintenance Projects

To date, there have been no maintenance events or project features identified that will require routine maintenance. This section of the report will be used to reference all maintenance activities on future inspection reports. There was a 2017 survey conducted along the rock containment dike and marsh creation areas on the east and west side of Bayou Penchant at Bayou Chene. The results of the 2017 elevation survey are discussed in Section V of this report.

V. Inspection Results

Rock Dike and Marsh Creation Area

Upon arrival at the marsh creation sites and rock dike at Bayou Penchant near Bayou Chene, we noticed that the rock containment dike was barely visible, just above the water line with the majority of the marsh creation areas under water. (Appendix B, Photos 1 through 12)

Over the years since the project was completed, it was noted through periodic inspections that the rock containment dike and marsh platform had settled from observations following the completion of the project. To determine the extent of settlement, CPRA tasked T. Baker Smith to perform a post-construction survey to collect current elevations of the rock containment dike and marsh platforms and to compare them to the constructed elevations. Since no previous survey data was available for the marsh creation areas, the profiles and transect data collected will be used as the baseline data and the comparison in this report will be based on the design elevation of the fill material in the disposal areas. All of the survey data collected for the profiles, transects and settlement plates were collected in NAVD 88 (Geoid 12a). The east and west rock containment dikes elevations were compared to the 2011 as-built drawings survey data collected by NRCS.

T. Baker Smith was contracted through CPRA's IDIQ contract to survey seven (7) settlement plates along the containment dike and perform profiles and transects of the rock dike and marsh creation areas on the east and west side of Bayou Penchant. Topographic surveys were performed along the centerline of the two (2) existing rock containment dikes and twenty-six (26) marsh transects were taken across the thirty (30) acre marsh fill area. The points along profile of rock containment dike were taken at 50 ft. intervals and at abrupt changes in elevation. The marsh transects were taken at 250 ft. spacing in both directions across the marsh fill areas, capturing the rock dike containment. Positions and elevations along the marsh creation transects were collected at 50 ft. intervals also. In addition to the survey of the settlement plates, profiles and transects, a single staff gage was installed along the west bank of Bayou Penchant near the south end of the west project area. The gage was placed on an existing timber piling and the elevation was set to NAVD 88 (Geoid 12a).

As stated in T. Baker Smiths Survey Report dated April 4, 2017, the survey was based on two (2) Louisiana Coastal Zone Secondary Monuments (TE-43-SM-C and CRMSTE-SM-11). These monuments were used to transmit real time corrections to the rover unit, where the horizontal and vertical positions were established on all data collected within the respective project areas.

TBS obtained mean low and mean high water levels by collecting daily water level elevations and comparing them to the water data gathered from the nearest CRMS continuous data collection station. TBS compiled this date to compute an average tidal data in NAVD 88. The mean average water elevation was determined to be 1.2' NAVD 88.

All of the survey data for the profiles, transects and settlement plates were collected in NAVD 88 (Geoid 12a). TBS was also required to superimpose the newly collected elevation data onto the as-built survey drawings to make a comparison of what was constructed to the current conditions. Since the as-built survey data was collected in Geoid 99, all of the previously collected survey data had to be converted to the most recent geometric height (Geoid 12a). It was determined that the adjustment from the Geoid 99 to the current Geoid

12a was a factor of -1.5'. The final deliverables contained plan and profile drawings of the constructed features from as-built elevations converted to Geoid 12a and the current configuration of the dike in 2017. The corrected design elevation of the rock dike containment and marsh fill area in Geoid 12a are +2.0' NAVD and +0.5' NAVD 88, respectively.

A review of the elevation data and drawings of the Penchant Basin Natural Resource Plan, Increment 1 revealed the following:

Rock Containment Dike – West Side

After comparing the 2017 settlement data and as-built elevation data of the East Containment Dike, it was determined that although the rock structure has experienced moderate settlement in several locations since construction, the average settlement rates of the majority of the rock structure was minimal.

From Sta. 0+00 to 07+50, the rock containment dike experienced moderate settlement with settlement rates ranging from 1.5' between Sta. 0+00 to 03+00 and 1.0' between Sta. 03+00 to 07+50. The average crest elevation between 0+00 and 07+50 was approximately 0.5' NAVD 88 (Geoid 12a)

From Sta. 07+50 to Sta. 21+00, the rock containment dike experienced minimal settled from a maximum of 1.0'' to a minimum of 0.0. The average settlement rate for this 1,350' section was approximately 0.4'. The average current crest elevation from Sta. 07+50 to Sta. 21+00 is 1.63' NAVD 88 (Geoid 12a).

The settlement increased from 0.0' at Sta. 21+00 to 1.2' at Sta. 23+00. From the maximum settlement of 1.2' near Sta. 23+00, the crest elevation increased back to the original design elevation of 2.0' NAVD near the end of the east containment dike (Sta. 29+00). The average crest elevation between Sta. 23+00 and Sta. 29+00 was approximately 1.2' NAVD 88 (Geoid 12a)

Rock Containment Dike – East Side

After comparing the as-built survey data to the current 2017 survey data, it was determined that the rock dike has experienced minor to moderate settlement which ranged from 0.1' to a maximum of 1.9'. The average crest elevation of the entire reach was approximately 1.0' NAVD 88 (Geoid 12a).

From Sta. 0+00 to 12+00, the rock dike showed minor settlement averaging 0.7'. The most settlement between these stations was in the first 500' beginning at Sta. 0+00. From Sta. 5+00 to Sta. 12+00, the settlement varied from a minimum of 0.5' to a maximum 0.9'. The average elevation of the dike between Sta. 0+00 and 12+00 was 1.3' NAVD 88 (Geoid 12a).

From Sta. 12+00 to the end of the dike at Sta. 38+00, the settlement was moderate and more uniform with an average settlement of 1.1'. The settlement was uniform except between Sta. 24+00 and 25+00 where the structure did not settle at all since construction. The average elevation of the dike at the time of the 2017 survey was 0.9' NAVD 88 (Geoid 12a).

Marsh Fill – West Side

A review of the transect taken during the 2017 survey revealed that the marsh platform had settled from the design elevation of 0.5' NAVD 88 (Geoid 12a). The settlement of the platform appears to be uniform with remnants of the containment dike visible above the design platform elevation on the swamp side. The average elevation of the platform in 2017 is -0.5' NAVD88 (Geoid 12a) which is about 1.0' lower than the design elevation.

Marsh Fill – East Side

The east side marsh fill area doesn't appear to have settled as much as the west side. Aside from the high areas in the vicinity of the containment dikes and depressions near the spoil excavation, the marsh platform elevation in 2017 is 0.0' NAVD 88 (Geoid 12a) which is about 0.5' lower than the design elevation.

Brady Canal Structure

The fixed crest weir with a boat bay and flap-gates at the intersection of Brady Canal and Bayou Penchant was in good condition with no noticeable defects. The bank tie-ins were stable with no signs of erosion. The floating debris barrier installed to prevent build-up of vegetation against the structure was also in good condition. All signs and supports were in good condition as well. No maintenance will be required at this time. (Appendix B, Photos 13 through 17)

Superior Canal Structure

The fixed crest weir with flap-gates across Superior Canal was in good condition with no obvious defects or damage. The galvanized steel components, channel cap and sign supports all appeared to be in good condition. The rock armored bank tie-ins were also in good condition. The floating debris barrier installed on the north side of the structure was in good condition and working well. A large portion of the channel was clogged with water hyacinth north of the floating barrier. The warning signs were all intact without damage. The structure will not require maintenance at this time. (Appendix B, Photos 18 through 24)

Structure No. 4

Structure No.4 appeared to be in very good condition with no evident damage or corrosion. The armored bank tie-ins were in good condition. The signs and supports were also in good condition. No maintenance is required at this time. (Appendix B, Photos 29 through 31)

Structure No. 5

The fixed crest weir with boat bay closest to Lost Lake along the north bank of Bayou Decade was in good condition at the time of the inspection. On the north tie-in, it appeared that someone had cut the rock dike connecting the steel bulkhead to the bank revetment structure. The contractor, Weeks Marine, currently working on the Lost Lake Marsh Creation (TE-72) project has agreed to repair the rock dike at an estimated cost of approximately $15,000. A change order has been issued to Weeks Marine and the work should be completed by the end of November 2017. There were also several long lengths of white PVC pipe in front of the structure that didn't appear to have a function and were not installed during construction of the project. It was later discovered that a fisherman placed the PVC pipe in front of the structure to block the water hyacinth from moving his crab traps around on the interior side of the marsh. The steel sheet piling and structural components were in good condition with no noticeable corrosion or damage. The signs and supports were in good condition as well. No maintenance will be required at this time. (Appendix B, Photos 34 and 40)

Rock Revetment along Bayou Decade

The rock armored revetment along the north bank of Bayou Decade was in good condition with only one minor flaw at the end of Reach 3 near Voss Canal. It appeared that earthen embankment was recently refurbished, but the material was placed without grading and was not uniform (Appendix B, Photo 25). The remaining reaches (Reach 1 and 2) were in good condition with only minor erosion around the southern beginning of Reach 1 near Lost Lake (Appendix B, Photos 44-45). The earthen embankment is well vegetated and the rock revetment is stable. No maintenance will be required at this time. (Appendix B, Photos 26 through 28, 32-33, 41-43)

Floating Debris Barriers

Overall, the floating debris barriers at the Brady Canal and Superior Canal structures appeared to be in good condition with no obvious corrosion or defects. The floating PVC bodies, timber piles and connections all appear to be functioning properly. We were unable to determine the condition of the debris screens since they are located below the water surface. We did not notice anything unusual with the floating debris barriers that would indicated that the screens were not functioning. We will continue to monitor the condition of the floating debris barriers on future site visits and perform maintenance/cleaning as needed.

VI. Conclusions and Recommendations

All features of the Penchant Basin Natural Resource Plan – Increment 1 were in good condition with only minor erosion at the Lost Lake near the beginning of Reach 1 and the end of Reach 3 near Voss Canal. There was also damage to the rock dike connecting the north side of Structure No. 5 to the revetment structure. The damage was intentionally done by the contractor, Weeks Marine, to benefit the ongoing construction of the Lost Lake Marsh Creation (TE-72) project. Weeks Marine has been notified by CPRA that we expect this area to restored to its previous condition prior to demobilizing from the Lost Lake project. An inspection of the repairs shall be done prior to final payment for the Lost Lake Project. We will continue to monitor the areas of

concern on future inspections and recommend repairs at a later date should maintenance be required. The rock dike containment and fill areas near Bayou Penchant and Bayou Chene were in good to fair condition with minor to moderate settlement of the rock dike and uniform settlement of the both marsh platforms. This area is subject to seasonal high river stages which at times can cover the structures with several feet of water for extended periods of time. The impact of several feet of water over the disposal areas may have accelerated the consolidation of the marsh platform since construction was completed. It may be beneficial to pump additional material into the disposal areas sometimes in the future to raise the platform so that vegetation can take hold. Further discussions with NRCS will be required prior to pursuing action on marsh re-nourishment. We are also not recommending any action regarding the maintenance of the rock dike at this time. Although the rock containment dike has settled since construction, it is still providing protection of the marsh creation areas. The project team will continue to monitor the condition of the dike and fill areas and make appropriate recommendation for maintenance as needed.

As noted in Section V of this report, there are unknowns as to the condition of the floating debris screens at the Brady Canal and Superior Canal structures due to limited access to the structures and that the screens are below the surface of the channel. Due to this uncertainty, we have included maintenance funding for maintenance/cleaning of the floating barrier system in the FY 17/18 funding cycle. Although we are not recommending any immediate actions at this time, we have allocated funding in order to quickly address any issues that may arise before the next schedule inspection.

References:

O'Neil, T. 1949. The muskrat in the Louisiana coastal Marsh. Louisiana Department of Wildlife and Fisheries, New Orleans. 152 pp.

Sasser, C.E. 1994. Vegetation dynamics in relation to nutrients in floating marshes in Louisiana, USE. 193 pp.

Coastal Environments, Inc., 1997. Watershed plan and environmental assessment for the Lower Penchant Basin, Terrebonne Parish, Louisiana. United States Department of Agriculture, Natural Resource Conservation Service, Partial Draft, July 1997. 49pp.

Swarzenski, C.M. 2003. Surface-water hydrology of the gulf intercoastal waterway in South-Central Louisiana. 1996-99. U.S. Geological Survey. Reston, Virgina. 51 pp.

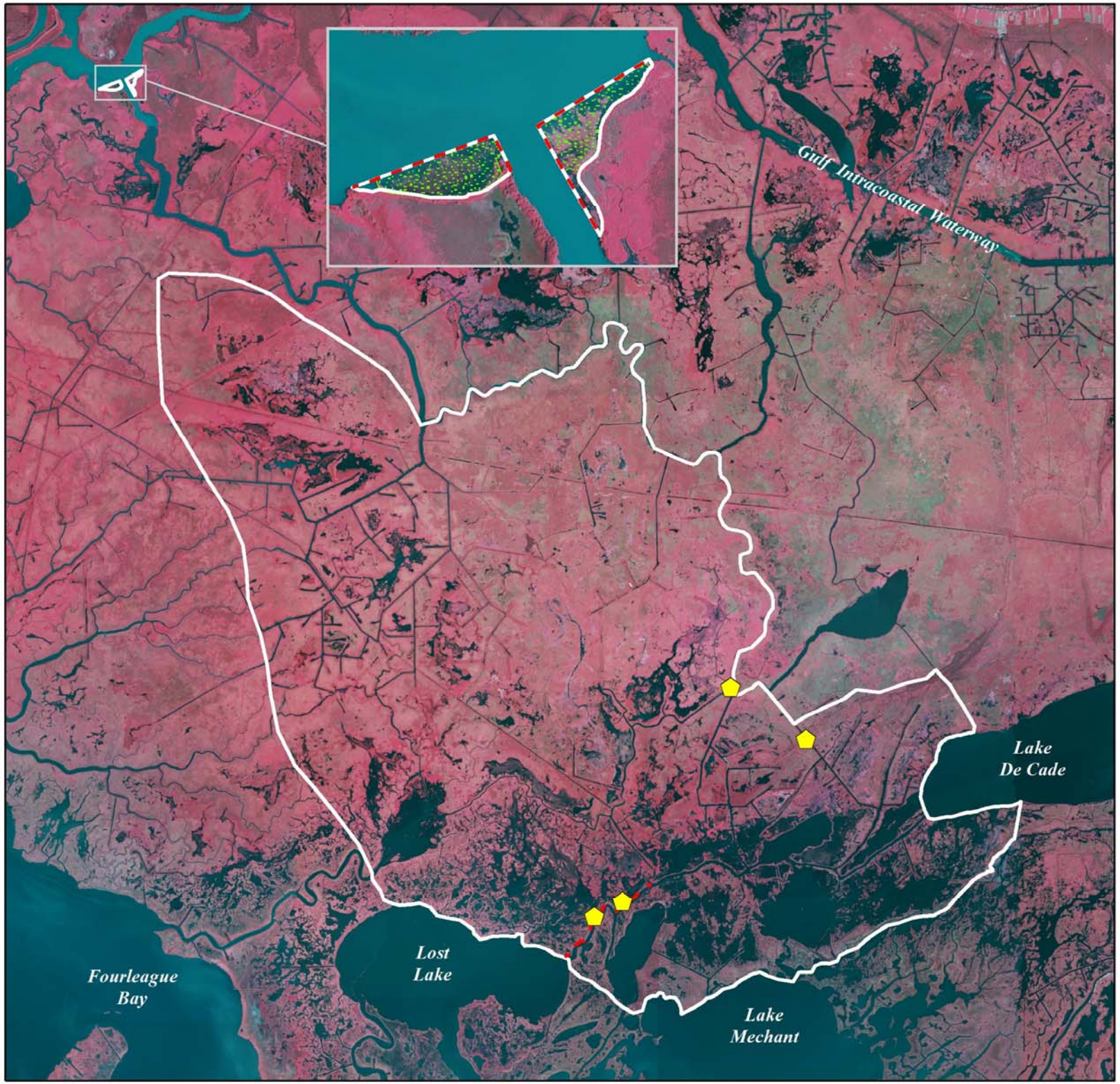
U.S. Department of Agriculture, Soil Conservation Service. 1984. Lafourche-Terrebonne cooperative river basin study report.

CWPPRA, Natural Resource Conservation Service (NRCS), Louisiana Department of Natural Resources (LDNR), 2008. Penchant Basin Natural Resource Plan, Increment 1 (TE-34) – Fact Sheet.

NRCS-LDNR, 2007. Penchant Basin Natural Resource Plan, Increment 1 (TE-34), Project Information Sheet for Wetland Value Assessment
.

Appendix A

Project Features Map



Penchant Basin Natural Resources Plan, Increment 1 (TE-34)

- Weir
- Rock Dike
- Marsh Creation
- Project Boundary

COASTAL PROTECTION AND RESTORATION AUTHORITY
CPRA

2 1 0 2 Kilometers

2 1 0 2 Miles

Scale: 1:170,000

Source:
Coastal Protection and Restoration Authority of Louisiana
Imagery:
2013 National Agriculture Imagery Program
File Path: //RID2015040107/
Map Date: March 18, 2015

Appendix B

Photographs

No.1 – view of rock dike and marsh creation site on east side of Bayou Penchant along Bayou Chene.

Photo No.2 – view of rock dike and marsh creation site on east side of Bayou Penchant along Bayou Chene.

Photo No.3 – view of rock dike and marsh creation site along east bank of Bayou Penchant.

Photo No.4 – view of rock dike tie-in and marsh creation site on east side of Bayou Penchant.

Photo No. 5 – view or rock dike tie-in boundary for the marsh creation site on west side of Bayou Penchant.

Photo No.6 – view of rock dike and marsh creations site on the west side of Bayou Penchant.

Photo No.7 – view of the rock dike and marsh creation site on west side of Bayou Penchant.

Photo No.8 – view of rock dike and marsh creation site on west side of Bayou Penchant at the intersection of Bayou Chene.

Photo No.9 – view of the rock dike and marsh creation site on west side of Bayou Penchant along Bayou Chene.

Photo No.10 – view of rock dike and marsh creation site on west side of Bayou Penchant along Bayou Chene.

Photo No.11 – view of rock dike and marsh creation site on west side of Bayou Penchant along Bayou Chene.

Photo No.12 – view of rock dike and marsh creation site on west side of Bayou Penchant along Bayou Chene near the west tie-in.

Photo No. 13 – view of Brady Canal Structure at the intersection of Bayou Penchant.

Photo No.14 – view of Brady Canal Structure, debris buoys and warning signs on southeast side of structure.

Photo No.15 – view of Brady Canal Structure, debris buoys and warning signs on northwest side of structure.

Photo No.16 – view of Brady Canal structure tie-in to the bank on the southeast side of the structure.

Photo No.17 – view of Brady Canal structure tie-in to the bank on the northwest side of the structure.

Photo No.18 – view of Superior Canal on the north side of the Superior Canal structure showing vegetation that is being held back by the floating debris barrier.

Photo No.19 – view of the Superior Canal Structure and east bank tie-in from the south.

Photo No.20 – view of the Superior Canal Structure and the west bank tie-in from the south.

Photo No.21 – view of the Superior Canal Structure from the south side looking north.

Photo No.22 – view of the floating debris barrier on the north side of the Superior Canal Structure.

Photo No.23 – view of the channel cap, timber piling and flap-gates on the Superior Canal Structure.

Photo No.24 – view of the channel cap, timber pile supports and sign supports along the Superior Canal Structure.

Photo No. 25 – view of rock revetment near Sta. 39+11 (Reach 3) along west bank of Bayou de Cade.

Photo 26- view of rock revetment (Reach 3) along west bank of Bayou de Cade.

Photo 27- view of rock revetment (Reach 3) along west bank of Bayou de Cade.

Photo 28- view of rock revetment (Reach 3) along west bank of Bayou de Cade.

Photo 29- view of steel sheetpile Weir No.4 along west bank of Bayou de Cade.

Photo 30- view of south bank tie-in of steel sheetpile Weir No.4 along west bank of Bayou de Cade.

Photo 31- view of north bank tie-in of steel sheetpile Weir No.4 along west bank of Bayou de Cade.

Photo 32- view of rock revetment (Reach 2) along west bank of Bayou de Cade.

Photo 33- view of rock revetment (Reach 2) along west bank of Bayou de Cade.

Photo 34- view of steel sheetpile Weir No.5 along west bank of Bayou de Cade.

Photo 35- view of south bank tie-in of steel sheetpile Weir No.5 along west bank of Bayou de Cade.

Photo 36- view of north bank tie-in of steel sheetpile Weir No.5 along west bank of Bayou de Cade.

Photo 37- view of south bank tie-in of steel sheetpile Weir No.5 along west bank of Bayou de Cade.

Photo 38- view of cut in rock dike tie-in on the north side steel sheetpile Weir No.5 along west bank of Bayou de Cade.

Photo 39- view of cut in rock dike tie-in on the north side steel sheetpile Weir No.5 along west bank of Bayou de Cade.

Photo 40- view of cut in rock dike tie-in on the north side steel sheetpile Weir No.5 along west bank of Bayou de Cade.

Photo 41- view of rock revetment (Reach 1) along west bank of Bayou de Cade.

Photo 42- view of rock revetment (Reach 1) along west bank of Bayou de Cade.

Photo 43- view of rock revetment (Reach 1) along west bank of Bayou de Cade.

Photo 44- view of rock revetment at the beginning of Reach 1 along west bank of Bayou de Cade at Lost Lake.

Photo 45- view of rock revetment at the beginning of Reach 1 along west bank of Bayou de Cade at Lost Lake.

Appendix C

Three Year Budget Projection

Penchant Basin/ TE-34 / PPL 6 (2017-2020)

Three-Year Operations & Maintenance Budgets

Project Manager	O & M Manager	Federal Sponsor	Prepared By
	B.Babin	*NRCS*	*B. Babin*

	2017/2018	2018/2019	2019/2020
Annual Inspection/Report	$15,536	$16,002	$16,482
Structure Ops/ Nav Aid			
CPRA Administration			
Maintenance/Rehabilitation			

17/18 Description: Annual Inspection Report, Gate and Trash screen repair & cleaning, debris removal, etc.

E&D	
Construction	$113,750
Construction Oversight	

Sub Total - Maint. And Rehab. $ 113,750.00

18/19 Description: Annual Inspection and Report.

E&D	
Construction	
Construction Oversight	

Sub Total - Maint. And Rehab. $ -

19/20 Description: Annual Inspection and Report.

E&D	
Construction	
Construction Oversight	

Sub Total - Maint. And Rehab. $ -

	2017/2018	2018/2019	2019/2020
Annual O&M Budgets	$ 129,286.00	$ 16,002.00	$ 16,482.00

2017 - 2020 O &M Budget (3 yr Total)	**$ 161,770**
Unexpended O & M Funds	**$1,798,898**
Remaining O & M Budget (Projected)	**$1,637,128**

OPERATIONS & MAINTENANCE BUDGET WORKSHEET

Project: TE-34 Penchant Basin Natural Resource Plan – Increment 1

FY 17/18 –

CPRA Administration		$
O&M Inspection & Report		$ 15,536
Operation/Navigational Aid:		$
Maintenance:		$113,750
E&D:	$ 0	
Construction:	$ 113,750	
Construction Oversight:	$ 0	

Operation and Maintenance Assumptions:
O&M Inspection and Report – 6% Inflation

CPRA Direct Costs

Inspection:	
CPRA Engineer 3 – 12 hrs@ $68/hr.:	$ 816
CPRA Engineer 6 – 12 hrs @ $78/hr.	$ 936
CPRA Scientist 4 – 10 hrs @ $56/hr.	$ 560
	$ 2,312
Report:	
CPRA Engineer 6 – 40 hrs. @ $78/hr.	$ 3,120
Total Direct CPRA Costs:	**$ 5,432**

CPRA Indirect Costs

Inspection:	
CPRA Engineer 3 – 12 hrs@ $127/hr.:	$ 1,524
CPRA Engineer 6 – 12 hrs @ $145/hr.	$ 1,740
CPRA Scientist 4 – 10 hrs @ $104/hr.	$ 1,040
	$ 4,304
Report:	
CPRA Engineer 6 – 40 hrs. @ $145/hr.	$ 5,800
Total Indirect CPRA Costs:	**$10,104**

Maintenance Event No.1
Gate and Trash Screen repair and cleaning, debris removal from structures, etc.

Superior Canal:	$ 35,000
Brady Canal:	$ 35,000
	$ 70,000
CPRA Administration:	$ 21,000
	$ 91,000
Contingency: (25%):	$ 22,750
Overall Estimated Project Cost:	**$113,750**

FY 18/19 –

Administration		$ 0
O&M Inspection & Report		$ 16,002
Operation/Navigational Aid:		$ 0
Maintenance:		$
E&D:	$ 0	
Construction:	$ 0	
Construction Oversight:	$ 0	

Operation and Maintenance Assumptions:
O&M Inspection and Report – 3% Inflation

CPRA Direct Costs

Total Direct CPRA Costs: $ 5,432 x 3% Inflation = **$ 5,595**

CPRA Indirect Costs

Total Indirect CPRA Costs: $10,104 x 3% Inflation =**$10,407**

FY 19/20 –

Administration		$ 0
O&M Inspection & Report		$ 16,482
Operation/Navigational Aid:		$ 0
Maintenance:		$
E&D:	$ 0	

Construction:	$	0
Construction Oversight:	$	0

Operation and Maintenance Assumptions:
O&M Inspection and Report – 3% Inflation

CPRA Direct Costs

Total Direct CPRA Costs: $ 5595 x 3% Inflation = **$ 5,763**

CPRA Indirect Costs

Total Indirect CPRA Costs: $10,407 x 3% Inflation =**$10,719**

2017-2020 Accounting

Expenditures (LaGov):	$ 56,906
Current O&M Funding (LANA Report):	**$1,855,804**
Current Unexpended O&M Funds:	**$1,798,898**