



**State of Louisiana
Coastal Protection and Restoration
Authority
Operations Division**

2015 Inspection Report

for

**ATCHAFALAYA SEDIMENT
DELIVERY**

State Project Number AT-02
Priority Project List 2

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St. Mary Parish

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I. Introduction

The Atchafalaya delta and the Wax Lake delta formed in the shallow Atchafalaya Bay between the mouth of the Atchafalaya River navigation channel and the Point au Fer shell reef (Curole, 2003). The Atchafalaya River has been a tributary of the Mississippi River since the 1500's and is typical of diversion or capture of mainstream flow by tributary (van Heerden and Roberts, 1980). In 1960, the Old River control structure was completed by the U.S. Corps of Engineers (USACE) and has since maintained the flow of the Atchafalaya River at the historic rate of 30% of the combined flow of the Mississippi and Red Rivers (Louisiana Coastal Wetlands Conservation and Restoration Task Force, 1993). A sub-aqueous delta began to form at the mouth of the Atchafalaya River between 1952 and 1962 with the introduction of silts and fine sands to the bay. Prior to 1952 the lakes and bays within the Atchafalaya Basin floodway system, north of the Atchafalaya Delta, filled with sediment. Only pro-delta clay deposition was occurring in the Atchafalaya Bay due to contact with higher salinity waters (Louisiana Coastal Wetlands Conservation and Restoration Task Force, 1993). From 1962 to 1972, coarser materials began to be deposited into the bay and a period of distal bar and sub-aqueous bar accretion occurred (van Heerden and Roberts, 1980). The spring flood of 1973 produced the first sub-aerial growth of the Atchafalaya Delta on both sides of the navigation channel (van Heerden et. al., 1991).

The Atchafalaya Delta is bisected by the Lower Atchafalaya River navigation channel, which is maintained by the USACE for navigational purposes. Dredge material on the channel banks and increased channel depth have created unnatural conditions forming an efficient conduit for river sediment transportation to the Gulf of Mexico, depriving the adjacent delta environments of sediments critical to the delta-building process. Also, tributary channels in the eastern portion of the Atchafalaya delta have undergone large reductions in cross-sectional area and flow efficiency, further reducing sediment to the delta lobes (van Heerden and Roberts, 1980).

The Atchafalaya Sediment Delivery Project (AT-02) is a tributary channel maintenance and delta lobe creation project consisting of approximately 2,182 acres of freshwater wetlands and shallow open water. The project is located in the northeastern region of the Atchafalaya Delta within the Louisiana Department of Wildlife and Fisheries Atchafalaya Delta Wildlife Management Area in the southeast corner of St. Mary Parish, Louisiana. The project is bounded on the north by Mile Island, the west by East Pass, and to the east and south by the Atchafalaya Bay (Monitoring Plan, 2003). The Atchafalaya Sediment tributary features include two tertiary channels (Natal Channel and Castille Pass) located on the east side of East Pass, the secondary tributary channel on the eastern side of the Atchafalaya delta. A map of the project boundary and features are shown in Appendix A. The objective and specific goals of the project according to the Monitoring Plan prepared by the Coastal Protection and Restoration Authority (CPRA) are outlined below:

Project Objectives:

1. Restore Natal Channel and Castille Pass to functioning tertiary distributary channels thereby enhancing the system's natural delta-building potential.
2. Utilizing dredge material from the dredging of Natal Channel and Castille Pass to create delta lobe islands suitable for establishment of emergent marsh.

Specific goals:

1. To increase the distributary potential of Natal Channel and Castille Pass by increasing their cross-sectional area and length.
2. Create approximately 230 acres of delta lobe islands through the beneficial use of dredge material at elevations suitable for emergent marsh vegetation.
3. Increase the rate of subaerial delta growth in the project area to that measured from historical photographs since 1956.
4. Increase frequency of occurrence of submerged aquatic vegetation.

II. Inspection Purpose and Procedures

The purpose of the project inspections of the Atchafalaya Sediment Delivery Project (AT-02) are to evaluate the constructed project features, identify any deficiencies and prepare a report detailing the condition of such features and to recommend corrective actions needed, if any. Should it be determined that corrective actions are needed, CPRA shall provide, in report form, a detailed cost estimate for engineering, design, supervision, inspection, construction contingencies, and an assessment of the urgency of such repairs. The inspection report also contains a summary of maintenance projects undertaken since the constructed features were completed and an estimated project 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 undertaken since the completion of the Atchafalaya Sediment Delivery Project (AT-02) are outlined in Section IV of this report.

An inspection of the Atchafalaya Sediment Delivery Project (AT-02) was held on June 3, 2015 under partly cloudy skies and warm temperatures. In attendance were Brian Babin, Glen Curole and Adam Ledet of the CPRA, Dr. John Foret of the National Marine Fisheries Service (NMFS), Lance Cambell and David LeBlanc with the Louisiana Department of Wildlife and Fisheries (LDWF). The attendees met at the Berwick Public Boat Launch in St. Mary Parish. The inspection began at approximately 9:00 a.m. and ended at 11:30 a.m.

The field trip included a visual inspection of adjacent marsh, channels and limited soundings of Natal and Castille Pass using a hand-held fathometer.

III. Project Description and History

The Atchafalaya Delta is bisected by the Lower Atchafalaya River which is maintained by the U.S. Corps of Engineers to an elevation of -20.0 ft. NGVD with a 400 foot bottom width for navigation purposes. The continued dredging and placement of spoil material along the banks of the river has caused sediment deprivation in adjacent delta environments.

The Atchafalaya Sediment (AT-02) project was constructed under the Coastal Wetlands, Planning, Protection, and Restoration Project (CWPPRA) with the Coastal Protection and Restoration Authority as the local state sponsor and the National Marine Fisheries Service of the Department of Commerce as the federal sponsor. The general contractor performing the construction of the Atchafalaya Sediment (AT-02) and Big Island projects (AT-03), which was accomplished under one contract by the State of Louisiana Division of Administration, and administered by the Louisiana Department of Natural Resources (LDNR) was River Road Construction Co. of Mandeville, LA. The Atchafalaya Sediment Delivery Project (AT-02) and the Big Island Mining Project (AT-03) were constructed during the period of January 28, 1998 and October 27, 1998. Final cost of the construction contract for both projects was \$7,238,449.36. The design, engineering, and construction oversight for this project was performed by Brown, Cunningham, and Gannuch Engineers under an engineering services contract with LDNR.

The principle project features of the Atchafalaya Sediment Delivery (AT-02) project include:

- Natal Channel – 5,100 linear ft. dredged channel with a 200 ft. bottom width and a smaller 1,500 linear ft. branch channel oriented to the northeast from Station 74+00. The bottom width of this branch channel was 150 ft.
- Castille Pass – 2,000 linear ft. dredged channel with a 125 ft. bottom width.
- Marsh Creation – approximately 668,683 cubic yards of dredge material from Natal Channel placed at four (4) different sites creating approximately 257 acres of wetlands.
- Marsh Creation – approximately 32,242 cubic yards of dredge material from Castille Pass placed at a location southeast of the pass creating approximately 20.5 acres of wetlands.

IV. Summary of Past Operation and Maintenance Projects

Since the completion of the Atchafalaya Sediment Delivery (AT-02) Project in March 1998, there were no maintenance dredging or marsh creation efforts proposed or undertaken.

V. Inspection Results

Inspection of the Atchafalaya Sediment Project (AT-02) began at the head of Natal Channel near East Pass and proceeded downstream to the fork near the Atchafalaya Bay. We did not have problems traveling the length of Natal Channel by boat but the water bottoms became very shallow along the lower reaches of both “forks”. Without current bathymetric data, we are not sure of the water depths in the channel or if the channel has shifted as indicated in previous surveys. The aquatic vegetation in the bay on both sides of the “fork” channel was plentiful and appeared to be healthy. After traveling Natal Channel, we proceeded back upstream to an existing northeast tributary channel extending northeast near Sta. 55+00 of Natal Channel. We will call this channel the “Bill Good” Channel. Currently, there is no historic survey data on this channel and we are not sure of the changes taken place along the channel bottom or near the mouth of the bay. Without current bathymetric data, it is difficult to determine if there are significant changes in channel contours since the 2008 survey; therefore, we are recommending a final survey of Natal Channel, Castille Pass and the fill areas prior to the next project inspection.

Inspection of the Castille Pass Channel began at the mouth near East Pass and proceeded downstream towards the Atchafalaya bay. The latest survey data available was collected in 2008 and revealed that the water depths at the mouth of Castille Pass were around 6’ deep and became shallower as it proceeded downstream towards the bay. During the 2015 inspection, we were unable to determine if the channel geometry has remained the same or has changed. Therefore, we are recommending a bathymetric survey of the channel and the marsh creation areas prior to the next inspection.

VI. Conclusions and Recommendations

The latest available bathymetric data of the Natal Channel and Castille Pass was collected and analyzed in 2008. This data was used to determine the cross-sectional area and extent of shoaling taking place in both channels since construction of the project. The 2008 analysis revealed that the Atchafalaya Sediment Delivery (AT-02) project did exhibit disproportional shoaling in both channels from 1998 to present. The most severe sediment accumulation was found at the head of East Pass and along Natal Channel from the beginning of the right “fork” to Tiger Pass (Sta. 75+00 to Sta. 88+00). In the case of Castille Pass, the flow field, channel section and length appeared to have aggraded to its pre-construction condition. During the 2015 inspection, we were unable to determine if the condition observed in 2008 are the same or has worsened. To determine the current condition, we are recommending another bathymetric survey be conducted along Natal Channel and Castille Pass. Along with this bathymetric survey, we are also recommending a topographic survey of the marsh creation/disposal areas constructed in 1998. We plan to have the surveys completed and analyzed prior to the next scheduled inspection of the project.

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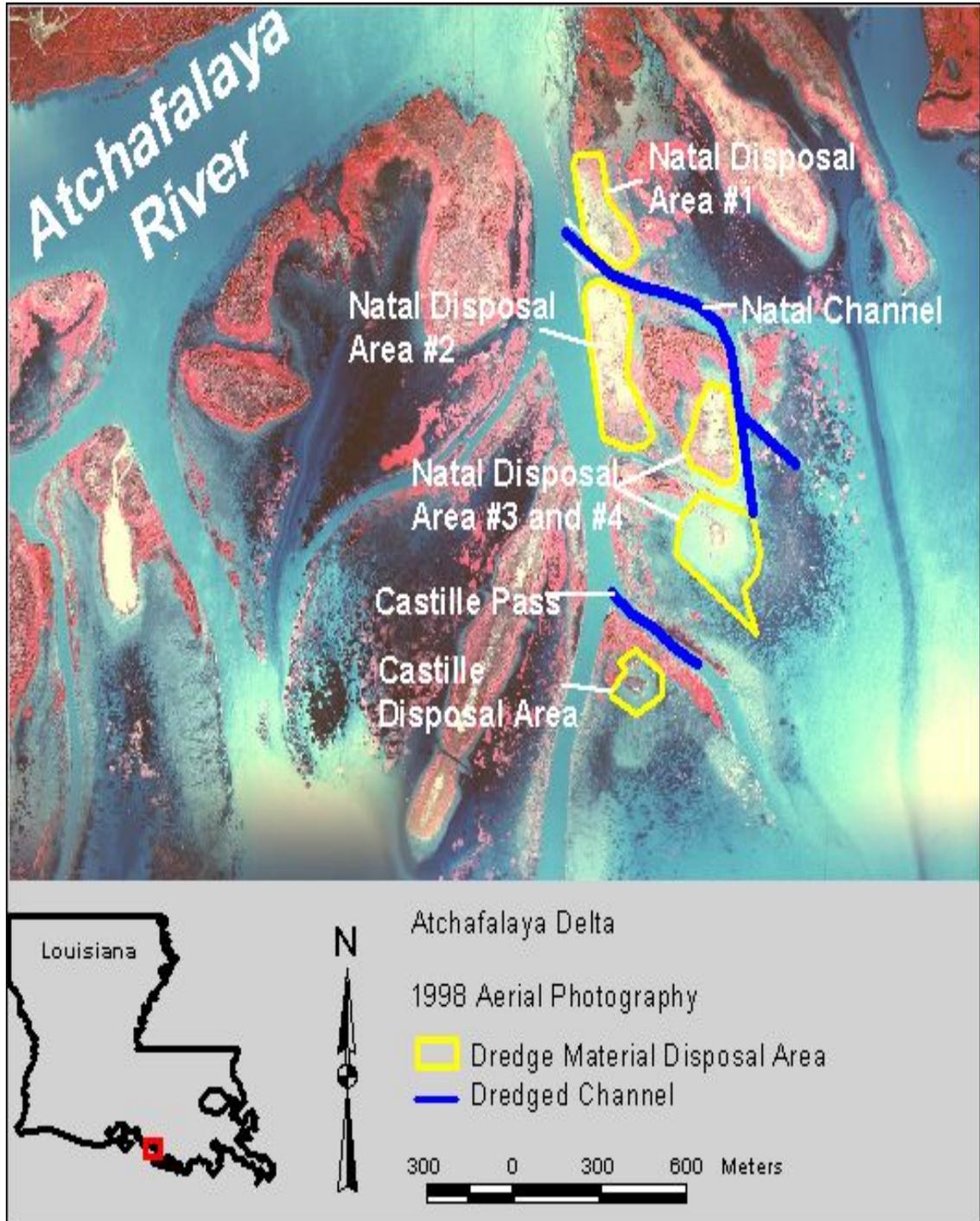
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Appendix A

PROJECT FEATURES MAP



Appendix B

PHOTOGRAPHS



Photo 1 – View at the mouth of Natal Chanel from East Pass looking southeast.



Photo 2 – View of “Bill Good” Channel from Natal Channel looking east.



Photo 3 - View of "Bill Good" Channel from Natal Channel looking east.



Photo 4 – View of the "fork" at the end of Natal Channel looking southeast toward the Atchafalaya Bay.



Photo 5 – View of the delta pass the “fork” along Natal Channel looking southeast towards the Atchafalaya Bay.



Photo 6 - View of the delta pass the “fork” along Natal Channel looking southeast towards the Atchafalaya Bay.



Photo 7 - View of the delta pass the “fork” along Natal Channel looking southwest.



Photo 8 - View of the delta pass the “fork” along Natal Channel looking north.



Photo 9 - View of the delta pass the “fork” along Natal Channel looking southeast towards the Atchafalaya Bay.



Photo 10 - View at the mouth of “Bill Good’s Channel” from Natal Channel looking northeast.



Photo 11 – View of the “fork” at the end of “Bill Good’s Channel” looking east.



Photo 12 - View of the “fork” at the end of “Bill Good’s Channel” looking east.



Photo 13 – View from the mouth of Castille Pass looking southwest towards the Atchafalaya Bay.



Photo 14 – View of “fork” at the end of Castille Pass looking southeast to the Atchafalaya Bay.



Photo 15 - Channel to the left of the fork along Castille Pass looking southeast.



Photo 16 – View of marsh on the south side of Castille Pass south of the “fork”



Photo 17 – View of the Atchafalaya Bay from the end of Castille Pass looking southeast.



Photo 18 - View of marsh on the north side of Castille Pass south of the “fork”



Photo 19 - View of marsh on the north side of Castille Pass south of the "fork"

Appendix C

Three (3) Year Budget Projections

ATCHAFALAYA SEDIMENT DELIVERY PROJECT (AT-02)
Three-Year Operations & Maintenance Budgets 07/01/2015 - 06/30/2018

Project Manager	O & M Manager	Federal Sponsor	Prepared By
	Brian Babin	NMFS	Brian Babin

	2015/2016	2016/2017	2017/2018
<i>Maintenance Inspection</i>	\$ -	\$ 9,194.00	\$ -
<i>Structure Operation</i>	\$ -	\$ -	\$ -
<i>Administration</i>	\$ 7,072.00		\$ -

Maintenance/Rehabilitation

15/16 Description: Bathymetric and Topographic Surveys of Channels and Disposal Areas

Surveys	\$ 110,069.00
Construction	\$ -
Construction Oversight	\$ -
<i>Sub Total - Maint. And Rehab.</i>	\$ <u>110,069.00</u>

16/17 Description:

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

17/18 Description:

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

	2015/2016	2016/2017	2017/2018
<u>Total O&M Budgets</u>	\$ 117,141.00	\$ 9,194.00	\$ -

Total O&M Budget 2015 through 2018	\$126,335
Unexpended O&M Budget	\$373,045
Remaining O&M Budget (Projected)	\$246,710

BIG ISLAND MINING PROJECT (AT-03)
Three-Year Operations & Maintenance Budgets 07/01/2015 - 06/30/18

Project Manager	O & M Manager	Federal Sponsor	Prepared By
	Brian Babin	NMFS	Brian Babin

	2015/2016	2016/2017	2017/2018
<i>Maintenance Inspection</i>	\$ -	\$ 9,194.00	\$ -
<i>Structure Operation</i>	\$ -	\$ -	\$ -
<i>Administration</i>	\$ 7,072.00		\$ -

Maintenance/Rehabilitation

15/16 Description: Bathymetric and Topographic Surveys of Channels and Disposal Areas

<i>E&D</i>	\$ 110,069.00
<i>Construction</i>	\$ -
<i>Construction Oversight</i>	\$ -
<i>Sub Total - Maint. And Rehab.</i>	\$ 110,069.00

16/17 Description:

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

17/18 Description:

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

	2015/2016	2016/2017	2017/2018
<u>Total O&M Budgets</u>	\$ 117,141.00	\$ 9,194.00	\$ -

Total O&M Budget 2015 through 2018	\$126,335
Unexpended O&M Budget	\$338,654
Remaining O&M Budget (Projected)	\$212,319

OPERATIONS & MAINTENANCE BUDGET WORKSHEET

Project: Atchafalaya Sediment Delivery (AT-02)/ Big Island Mining (AT-03)

FY 15/16 –

Administration		\$ 7,072
O&M Inspection & Report		\$ 0
Operation:		\$ 0
Maintenance:		\$110,069
E&D:	\$	
Construction:	\$	
Construction Oversight:	\$	
O&M Surveys:	\$110,069	

Operation and Maintenance Assumptions:

Survey of Channels and Disposal Areas for AT-02 and AT-03. Administrative cost scope development and project management. Cost divided by 2 to split the overall cost between AT-02 and AT-03 projects.

Direct Costs:

CPRA Engineer 3 – 40 hrs @ \$60/hr.:	\$ 2,400
CPRA Engineer 6 – 15 hrs @ \$73/hr.	\$ 1,095
CPRA Engineer Manager – 5 hrs @ \$79/hr.	\$ 395
NMFS – 20 hrs @ 100/hr.	<u>\$ 2000</u>
Total Administrative Cost (CPRA/NMFS)	\$5,890/2 = \$2,945

Indirect Costs:

CPRA Engineer 3 – 40 hrs @ \$127.30/hr.:	\$ 5,092
CPRA Engineer 6 – 15 hrs @ \$154.88/hr.	\$ 2,323
CPRA Engineer Manager – 5 hrs @ \$167.61/hr.	<u>\$ 838</u>
	\$8,253/2 = \$4,127

2015/2016 Bathymetric/Topographic Surveys:

(Survey of channels and 3 marsh creation areas)

Disposal Area Survey

Professional Land Surveyor:	\$ 3,780
(30 hrs @ \$126/hr.)	
CAD Operator:	\$ 2,760
(30 hrs @ \$92/hr.)	
3 Man Survey Crew:	\$65,910
(390 hrs. @ \$169/hr.	
Boat (19 – 22 ft.):	\$17,706

(39 days @ \$454/day)
 Trimble GPS Total Station: \$18,525
 (39 days @ \$475/day)
 Airboat: \$22,035
 (39 days @ \$565/day)

Deliverables:
 Professional Land Surveyor: \$ 1,890
 (15 hrs @ \$126/hr.)
 Project Chief Draftsman: \$ 250
 (2.5 hrs @ \$100/hr.)
 Professional Hydrographic: \$ 1,300
 (10 hrs @ \$130/hr.)

Est. Cost for Disposal Area Surveys: \$134,156 x 0.5 (50% Cost) = \$67,078

Channel Surveys

Professional Land Surveyor: \$ 3,780
 (30 hrs @ \$126/hr.)
 CAD Operator: \$ 3,520
 (40 hrs @ \$88/hr.)
 3 Man Survey Crew: \$37,180
 (220 hrs. @ \$169/hr.)
 Boat (19 – 22 ft.): \$17,706
 (19 days @ \$454/day)
 Trimble GPS Total Station: \$ 9,025
 (19 days @ \$475/day)
 Airboat: \$10,735
 (19 days @ \$565/day)
 Automated Hydrographic Survey: \$ 1,815
 (3 days @ \$605/day)

Deliverables:
 Professional Land Surveyor: \$ 1,890
 (15 hrs @ \$126/hr.)
 Project Chief Draftsman: \$ 250
 (2.5 hrs @ \$100/hr.)
 Professional Hydrographic: \$ 1,300
 (10 hrs @ \$130/hr.)

Est. Cost for Disposal Area Surveys: \$87,201 x 0.5 (50% Cost) = \$ 43,601

Total Estimated Cost for Survey of AT-02:	\$110,069
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Total Estimated Cost for Survey of AT-03:	\$110,069
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FY 16/17 –

Administration		\$	0
O&M Inspection & Report		\$	9,194
Operation:		\$	0
Maintenance:		\$	0
E&D:	\$	0	
Construction:	\$	0	
Construction Oversight:	\$	0	

Operation and Maintenance Assumptions:

Biennial Inspection Based on new rate schedule. Total cost divided by 2 since the AT-02 and AT-03 projects are inspected on the same day and inspection costs are split between both projects. It is estimated to take 60 hours to compile photos and create report for both projects.

Direct Costs:

Inspection:		
CPRA Engineer 3 – 12 hrs@ \$60/hr.:	\$	720
CPRA Engineer 6 – 10 hrs @ \$73/hr.	\$	730
CPRA Scientist 4 – 10 hrs @ \$50/hr.	\$	500
NMFS – 20 hrs @ 100/hr.	\$	<u>2000</u>
Total Administrative Cost (CPRA/NMFS)	\$	3,950
Report:		
CPRA Engineer 7 – 60 hrs. @ \$73/hr.	\$	4,380
Total Direct Expenses:	\$	8,330

Indirect Costs:

Inspection:		
CPRA Engineer 3 – 12 hrs@ \$127.30/hr.:	\$	1,528
CPRA Engineer 6 – 10 hrs @ \$154.88/hr.	\$	1,549
CPRA Scientist 4 – 10 hrs @ \$106.08/hr.	\$	<u>1,061</u>
Total Administrative Cost (CPRA/NMFS)	\$	4,138
Report:		
CPRA Engineer 7 – 60 hrs. @ \$167.61/hr.	\$	10,057
Total Indirect Expenses:	\$	18,387/2 = 9,194

FY 17/18 –

Administration		\$	0
O&M Inspection & Report		\$	0
Operation:		\$	0
Maintenance:		\$	0
E&D:	\$	0	
Construction:	\$	0	
Construction Oversight:	\$	0	

Operation and Maintenance Assumptions:

Atchafalaya Sediment (AT-02) 2015-2018 Accounting

Total O&M Budget (20 Year)	\$ 452,452.00
Expenditures by LDNR:	<u>\$ 79,407.24</u>

Estimated Unexpended Funds: \$ 373,044.76

Big Island Mining (AT-0) 2015-2018 Accounting

Total O&M Budget (20 Year)	\$ 409,773.00
Expenditures by LDNR:	<u>\$ 71,119.00</u>
Estimated Unexpended Funds:	\$ 338,654.00