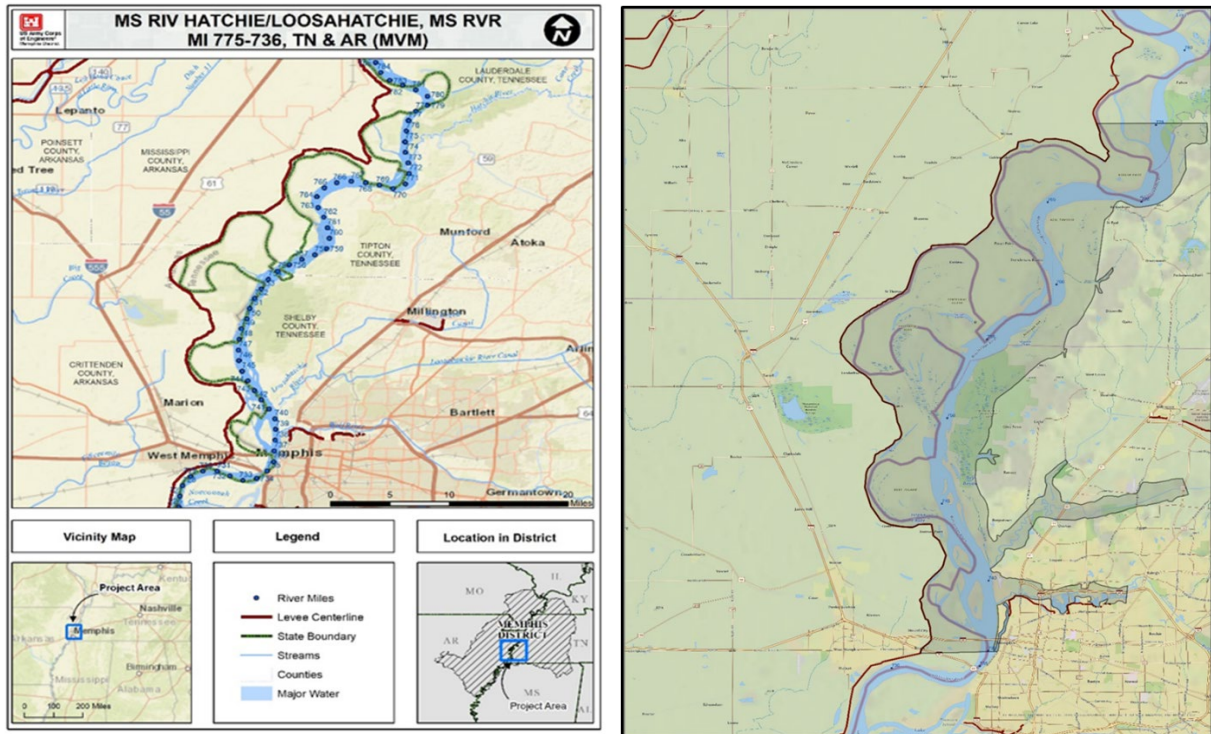


Mississippi River Hatchie/Loosahatchie, River Mile 775-736 – Integrated Feasibility Report and Environmental Assessment

Appendix 4 – Cost Engineering



February 2023

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4.1 Cost Analysis

4.1.1 Measures

The PDT developed measures for the Hatchie-Loosahatchie project. A measure is a feature or activity that can be implemented at a specific geographic site that is intended to cause a desirable change and results, preferably, in a positive output. Costs were developed for 83 measures and are available up on request. Costs and benefits were applied to each measure resulting in a cost – habitat benefit ratio, to inform the decision-making process. Costs included Real Estate, Relocations, Construction, Engineering and Design (E&D), and Supervision and Administration (S&A). The benefits were interpreted as the cumulative habitat benefit to the study area. These habitat benefits for example could be interpreted as an increased spawning area for the wildlife in the area of the study. Once the costs and benefits for the measures were developed economic models were run and the measures were screened and combined to form 10 alternative plans. See below for a table of the measures analyzed for the TSP (Table 4-1 Measures 1-38). There were 58 ecological measures in the final array of alternatives with 2 additional recreation measures (Table 4-1, 39-40)

4.1.2 Cost Benefit Ratio

Each measure is weighted with a benefit in the Habitat-benefit methodology for the protection of wildlife areas including streams, streambanks and forest areas for the use of wildlife and humans. The costs of the Habitat-benefit methodologies are included in the Total Project Costs (TPC) which include Real Estate, Relocations, Construction, PED (Planning, Engineering, and Design), and S&A (Supervision and Administration). Comparison and ranking ultimately provides an array of alternatives that, for their cost, provide the best return in benefit to the study area.

4.1.3 Cost Methodology

For this study, the design engineers took each measure and prepared a preliminary design for each measure, which includes the calculated quantities for each construction cost. The quantities are tabulated for each of the 38 ecological measures and 2 recreational measures incorporated in the TSP and shown in Table 4-2-4-8 below. In the measure analysis phase, the cost estimator developed a parametric or unit cost estimate. The costs for each measure were then placed in an excel spreadsheet by a code of accounts with the associated costs for each measure. ERDC developed the habitat benefits to then obtain the optimum measures. Once these measures were selected, the PDT combined the measures to produce alternative plan solutions for the project. The measures (See Table 4-9 through 4-57) are the parameters of the study. These measures were combined to make each respective alternative. Alternative C3 was determined to be the best alternative for the project with the best benefit to the community and study areas. This plan is called the Tentatively Selected Plan.

For the initial phase of this study, parametric costs were used for the cost input on the various alternatives. Parametric costs are costs from similar projects that can be used to develop a cost basis for the various alternatives. The development of these costs was done to include project location, inflation factors, contracting mechanisms, and other variables that would change the costs from whence they were taken.

When the study progresses to the TSP, MII software will be used to formulate a detailed cost estimate format. The current or latest versions of the cost book (2022 MII English Cost Book) and equipment manual (2022 Equipment R03_Rev3.mle) are used to develop the estimate for the project. The software will be used to build each bid schedule of quantities and then formulate the costs for the TSP such as (Alternative C3). There are 4 subgroups to the direct cost formulation for each bid item. They

include labor, equipment, materials, and subcontracting. Labor rates are derived from Davis Bacon wage rates provided at <http://www.wdol.gov/dba.aspx>. Equipment is selected based on experience, preference, and crew makeup. Within the MII software there is an RS Means Database from which equipment can be selected. Every couple of years these databases for labor and equipment are reevaluated and indexed to the current year. Material prices were provided by local suppliers within the study or Greater Memphis area. The equipment manual is divided based on region. The region that the study area is included in is Region III. In order to populate costs within the project; labor, equipment and material are combined into crews. These crews then have production rates applied to them based on the estimator's knowledge and experience. Once the materials and crews are tied to the quantities, they produce a cost for which gives you a direct cost for the group of quantities. For this job, the acquisition approach assumed there would be subcontracting of various elements of the project such as concrete and turfing. The Prime Contractor would construct the remaining items.

The remaining costs for the alternative are considered indirect costs. Indirect costs are the costs that are not specifically associated with one item of work but multiple items of work. These items include job office overhead, home office overhead, bond, and profit. These items are distributed as a % over the construction items. Job office overhead is generally found to range between 5-10% in the U.S. but it can be more based on the project itself. Home office generally ranges between 7-15% but can also be more based on accounting practices or a company's way of doing business. Bond generally ranges from 1-2% and profit can range from 3% and up based on competition. For our purposes, we chose a 10% profit which was applied to the alternative. The job office overhead costs were based on a project schedule modeled using Primavera Software.

Once the construction costs were formulated, they were entered into the Alternative spreadsheets. Each alternative includes all the costs that would be incurred on the project which for this project include: Lands and Damages or Real Estate Costs, Utility Relocations, Construction Costs, Planning, Engineering and Design, and Supervision and Administration. Feasibility costs are not included in the Planning portion. These items are broken out by chart of accounts as follows:

- 01 Lands and Damages
- 02 Relocations
- 06 Fish and Wildlife Facilities
- 06 Adaptive Management (Fish and Wildlife)
- 08 Bridges and Roadways
- 09 Channels and Canals
- 11 Levees and Floodwalls
- 12 Navigation Ports and Harbors
- 14 Recreation Facilities
- 15 Floodway Control and Diversion Structures
- 16 Bank Stabilization
- 18 Cultural Resource
- 30 Planning, E & D
- 31 Supervision and Administration

4.1.4 Risk Analysis

For the TSP of this study, the Corps of Engineers requires a Contingency Cost Based Risk Analysis to be performed. For the evaluation of each alternative the Cost Engineer can use an abbreviated version of the Cost Schedule Risk Analysis (CSRA) to capture risk or calculate contingency for the alternatives or ARA.

If the TSP is chosen as the Recommended Plan at the Alternative Decision Milestone, the Corps of Engineers can use the Abbreviated Risk Analysis for studies less than \$40,000,000 or the CSRA for studies of value greater than \$40,000,000. Because the TPCS for this study will be greater than \$40,000,000, a CSRA will be performed once the study progresses to the Recommended Plan. The ARA for the alternatives was performed the week of September 1st to capture risk or contingency for the various alternatives. The PDT held meetings to discuss and determine the risks associated with each of the Alternatives for this project. Each risk then was evaluated to determine a contingency factor using the abbreviated risk analysis spreadsheet.

The risk analysis spreadsheet defines the risk of each bid item by the likelihood of project scope growth, acquisition strategy, construction elements, and quantities for current scope, specialty fabrication of equipment, cost estimate assumptions, and external project risks. During the course of these meetings, the Cost Engineer reviewed with the PDT the risk for each of these elements as they pertain to each bid item. The PDT decided the likelihood that each of these elements could impact that bid item or vary from what was assumed in the design process. The PDT went through each item and decided whether the likelihood that each element would vary was Very Likely, Likely, Possible, or Unlikely. Likewise, the PDT determined the impact of this likelihood as either negligible, marginal, significant, critical, or crisis. Using this matrix, the spreadsheet is designed to formulate a risk for each bid item which culminates into an overall risk or contingency for that alternative. For the abbreviated risk analysis (See Table J-68 through J-69.)

The final costs for each respective Measure of the preferred alternative (C3) are summarized in Table 4-9 through 4-57 below. These tables also show the risk contingencies developed for the features of work in the PDT’s September meeting. All costs are considered FY23 Price Levels. (January 2023 First Cost)

4.1.5 OMRR&R Costs

In addition to current working costs, Operation, Maintenance, Repair, Replacement, and Rehabilitation (OMRR&R) costs are needed to determine the economic costs to the life cycle of a project. These costs or future costs are used in determining the habitat – benefit ratio to the project. Those costs are calculated for the life of the project and indexed forward to the life year cycle of each alternative measure. These costs can be seen in current year dollars in Table 4-58 below. All costs are considered FY23 Price Levels. (January 2023 First Cost)

Table 4-1. Measures included in the TSP with Associated Costs

Measures	Construction & Adaptive Management & Monitoring Costs
01– BR_1 Brandywine	\$205,649
02 – BR_2 Brandywine	\$828,566
03 – BR_4 Brandywine	\$116,657
04 – BR_5 Brandywine	\$8,510,306
05 – BR_6 Brandywine	\$970,233
06 – BR_7 Brandywine	\$156,649
07 – BR_8 Brandywine	\$261,646
08 – BR_11 Brandywine	\$533,938
09 – D_3 Densford	\$111,257
10 – HB_1 Hopefield Point Big River Park	\$167,693
11 – HB_2ab Hopefield Point Big River Park	\$392,336
12 – HB_2c Hopefield Point Big River Park	\$1,167,033
13 – HT_6 Hatchie Towhead Randolph	\$35,201
14 – I35_12a Island35_DeanIsland	\$24,293
15– I35_12b Island35_DeanIsland	\$37,232
16 – I35_2 Island35_DeanIsland	\$362,933

17 – I35_6b Island35 DeanIsland	\$94,929
18 – I35_7a Island35 DeanIsland	\$276,554
19 – I35_7g Island35 DeanIsland	\$1,172,637
20 – I35_7h Island35 DeanIsland	\$5,416
21 – I35_9b Island35 DeanIsland	\$67,650
22 – I40_1a Island40_41	\$69,392
23 – I40_1b Island40_41	\$163,434
24 - I40_3 Island40_41	\$39,601
25 - M5 Meeman Shelby Forest Eagle Lake	\$111,797
26 - M6 Meeman Shelby Forest Eagle Lake	\$40,458
27 - M_14 Meeman Shelby Forest Eagle Lake	\$643,730
28 - RCP_1 Richardson Cedar Point	\$44,597
29 - RCP_2 Richardson Cedar Point	\$210,247
30 - RCP_4 Richardson Cedar Point	\$7,459
31 - RL_3 Redman Point Loosahatchie Bar	\$88,749
32 - RL_4 Redman Point Loosahatchie Bar	\$1,400,335
33 - RL_6 Redman Point Loosahatchie Bar	\$115,590
34 - S_10 Sunrise_Island34	\$121,489
35 - S_4 Sunrise_Island34	\$11,585,274
36 - S_6 Sunrise_Island34	\$72,517
37 - S_7 Sunrise_Island34	\$113,957
38 - S_8 Sunrise_Island34	\$105,918
Rec 1 - LW-1 Wolf River	\$117,649
Rec 2 – M_2	\$235,097
AM&M Programmatic Costs - TSP	\$2,600,000
Real Estate Costs - TSP	\$17,288,160
Subtotal - TSP	\$50,674,258
Annualized OMRR&R – TSP	\$61,149

Table 4-2. Items of Work by Measure in TSP

#	Measure ID	Bridge Replacement [Structure]	Culverts [Structure]	Dike notching - Stone or Pile	Earth Work - Tree Clearing/Grubbing	Earthwork - Channel Cleanout	Floodplain Vegetative - Seasonal Herbaceous	Floodplain Vegetative - Tree	Groundwater Wells [Structure]	Pump [Structure]	Riprap Hardpoints [Tons]	Riprap for Control Structure/Weir	Riprap R-200 [Tons]	Riprap River Placement [Tons]	Trail Access Improvements	Walking Trail/Interpretive	Stop Log Structures [Structure]	Woody Debris Traps [Trap]
01	BR_1			3														
02	BR_2																	1
03	BR_4	1			0.3	166						506						
04	BR_5				2								12222					
05	BR_6							1.0										
06	BR_7							1										
07	BR_8		1 Box Culvert					1										
08	BR_11		1 Aluminum Flapgate					1										
09	D_3																	1
10	HB_1						1											
11	HB_2ab		60" at 160 LF			445.56	1					153.33						
12	HB_2c					897.22												
13	HT_6																	
14	I35_12a							1										
15	I35_12b																	
16	I35_2							1										
17	I35_6b							1										
18	I35_7a			1														
19	I35_7g									160.00								
20	I35_7h																	
21	I35_9b							1										
22	I40_1a							1										
23	I40_1b		48" at 50 LF			833.3							123					
24	I40_3																	
25	M_5					179.3						142						
26	M_6					331.1		1	1	1							1	
27	M_14																	1
28	RCP_1							1										
29	RCP_2		60" at 60 LF		0.55	310.7	1						185					
30	RCP_4																	
31	RL_3			1														
32	RL_4							1										
33	RL_6																	1
34	S_10							1										
35	S_4												24,800.00					
36	S_6			1														
37	S_7																	1
38	S_8							1										

Re c- 02	#	Measure ID
M_2	LW-1	Bridge Replacement [Structure]
		Culverts [Structure]
		Dike notching - Stone or Pile
1		Earth Work - Tree Clearing/Grubbing
		Earthwork - Channel Cleanout
		Floodplain Vegetative - Seasonal/Herbaceous
		Floodplain Vegetative - Tree
		Groundwater Wells [Structure]
		Pump [Structure]
		Riprap Hardpoints [Tons]
		Riprap for Control Structure/Weir
		Riprap R-200 [Tons]
		Riprap River Placement [Tons]
5280		Trail Access Improvements
1	1	Walking Trail/Interpretive
		Stop Log Structures [Structure]
	1	Woody Debris Traps [Trap]

The following tables include construction, real estate, and adaptive management & monitoring costs by measure.

Table 4-3. Measure BR 1 – BR 1a. Brandywine

Feature	Cost	Contingency	Total
01 Lands and Damages	n/a		
06 Fish and Wildlife Facilities	\$45,000.00	\$4,090.50	\$49,090.50
06 Fish and Wildlife (Adaptive Management)	\$26,233.33		\$26,233.33
30 Planning Engineering and Design	\$6,750.00	\$1,254.83	\$8,004.83
31 Construction Management	\$6,750.00	\$1,370.25	\$8,120.25
Totals	\$84,733.33	\$16,125.08	\$91,448.91

Table 4-4. Measure BR 1 – BR 1b Brandywine

Feature	Cost	Contingency	Total
01 Lands and Damages	n/a		
06 Fish and Wildlife Facilities	\$33,800.00	\$3,072.42	\$36,872.42
30 Planning Engineering and Design	\$5,070.00	\$942.51	\$6,012.51
31 Construction Management	\$5,070.00	\$1,029.21	\$6,090.21
Totals	\$43,940.00	\$5,044.14	\$48,984.14

Table 4-5. Measure BR 1 – BR 1c. Brandywine

Feature	Cost	Contingency	Total
01 Lands and Damages	n/a		
06 Fish and Wildlife Facilities	\$45,000.00	\$4,090.50	\$49,090.50
30 Planning Engineering and Design	\$6,750.00	\$1,254.83	\$8,004.83
31 Construction Management	\$6,750.00	\$1,370.25	\$8,120.25
Totals	\$58,500.00	\$6,715.58	\$65,215.58

Table 4-6. Measure BR 2a Brandywine

Feature	Cost	Contingency	Total
01 Lands and Damages	n/a		
06 Fish and Wildlife Facilities	\$50,000.00	\$13,340.00	\$63,340.00
06 Fish and Wildlife Facilities (Adaptive Management)	\$35,400.00		\$35,400.00

30 Planning Engineering and Design	\$7,500.00	\$1,394.25	\$8,894.25
31 Construction Management	\$7,500.00	\$1,522.50	\$9,022.50
Totals	\$100,400.00	\$17,916.75	\$116,656.75

Table 4-7. Measure BR 4a Brandywine

Feature	Cost	Contingency	Total
01 Lands and Damages	\$15,000.00	\$3,000.00	\$18,000.00
01 Mitigation	n/a		
06 Fish and Wildlife Facilities (Adaptive Management)	\$50,533.33		\$50,533.33
08 Bridges	\$3,750,000.00	\$3,317,625.00	\$7,067,625.00
30 Planning Engineering and Design	\$562,500.00	\$104,568.75	\$667,068.75
31 Construction Management	\$562,500.00	\$114,187.50	\$676,687.50
Totals	\$4,940,533.33	\$3,539,381.25	\$8,479,914.58

Table 4-8. Measure BR 4b Brandywine

Feature	Cost	Contingency	Total
01 Lands and Damages	n/a		
01 Mitigation	n/a		
09 Channels and Canals	\$26,904.00	\$11,030.74	\$37,934.74
30 Planning Engineering and Design	\$3,995.10	\$1,174.16	\$5,169.26
31 Construction Management	\$3,995.10	\$1,292.41	\$5,287.51
Totals	\$34,894.20	\$13,497.31	\$48,391.51

Table 4-9. Measure BR 5a Brandywine

Feature	Cost	Contingency	Total
01 Lands and Damages	\$6,000.00	\$1,200.00	\$7,200.00
06 Fish and Wildlife Facilities (Adaptive Management)	\$61,350.00		\$61,350.00
12 Navigation Ports and Harbors	\$499,680.00	\$213,024.00	\$712,704.00
30 Planning Engineering and Design	\$74,952.00	\$22,028.39	\$96,980.39
31 Construction Management	\$74,952.00	\$24,246.97	\$99,198.97

Totals	\$716,934.00	\$260,499.36	\$977,433.36
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Table 4-10. Measure BR 6a Brandywine

Feature	Cost	Contingency	Total
01 Lands and Damages	\$234,000.00	\$46,800.00	\$280,800.00
06 Fish and Wildlife Facilities	\$50,760.00	\$20,848.94	\$71,608.94
06 Fish and Wildlife Facilities (Adaptive Management)	\$55,339.20		\$55,339.20
30 Planning Engineering and Design	\$7,614.00	\$1,415.44	\$9,029.44
31 Construction Management	\$7,614.00	\$1,545.64	\$9,159.64
Totals	\$355,327.20	\$70,610.02	\$425,937.22

Table 4-11. Measure BR 7a Brandywine

Feature	Cost	Contingency	Total
01 Lands and Damages	\$588,000.00	\$117,600.00	\$705,600.00
06 Fish and Wildlife Facilities	\$127,551.00	\$52,389.74	\$179,940.74
06 Fish and Wildlife Facilities (Adaptive Management)	\$30,213.55		\$30,213.55
30 Planning Engineering and Design	\$19,132.65	\$3,556.76	\$22,689.41
31 Construction Management	\$19,132.65	\$3,883.93	\$23,016.58
Totals	\$784,029.85	\$177,430.43	\$961,460.28

Table 4-12. Measure BR 8b Brandywine

Feature	Cost	Contingency	Total
01 Lands and Damages	\$621,000.00	\$124,200.00	\$745,200.00
01 Mitigation	n/a		
06 Fish and Wildlife Facilities	\$133,671.00	\$45,102.98	\$178,773.98
06 Fish and Wildlife Facilities (Adaptive Management)	\$31,857.26		\$31,857.26
09 Channels and Canals	\$138,692.00	\$84,015.08	\$219,599.86
30 Planning Engineering and Design	\$40,854.45	\$7,594.84	\$48,449.29
31 Construction Management	\$40,854.45	\$8,293.45	\$49,147.90
Totals	\$1,006,929.16	\$269,206.35	\$1,273,028.30

Table 4-13. Measure BR 11a Brandywine

Feature	Cost	Contingency	Total
01 Lands and Damages	\$1,800,000.00	\$360,000	\$2,160,000.00
01 Mitigation	n/a		
06 Fish and Wildlife Facilities	\$386,309.00	\$160,925.90	\$547,234.90
06 Fish and Wildlife Facilities (Adaptive Management)	\$100,547.61		\$100,547.61
09 Channels and Canals	\$14,527.00	\$4,913.03	\$19,440.03
30 Planning Engineering and Design	\$60,125.40	\$11,177.31	\$71,302.71
31 Construction Management	\$60,125.40	\$12,205.46	\$72,330.86
Totals	\$2,421,634.41	\$549,221.70	\$2,970,856.11

Table 4-14. Measure D 3 Densford

Feature	Cost	Contingency	Total
01 Lands and Damages	n/a		
06 Fish and Wildlife Facilities	\$50,000.00	\$13,340.00	\$63,340.00
06 Fish and Wildlife Facilities (Adaptive Management)	\$30,000.00		\$30,000.00
30 Planning Engineering and Design	\$7,500.00	\$1,394.25	\$8,894.25
31 Construction Management	\$7,500.00	\$1,522.50	\$9,022.5
Totals	\$95,000.00	\$16,256.75	\$111,256.75

Table 4-15. Measure HB_1 Hopefield Point Big River Park

Feature	Cost	Contingency	Total
01 Lands and Damages	\$235,000.00	\$47,000.00	\$282,000.00
01 Mitigation	\$81,025.40	\$31,973.48	\$112,998.88
06 Fish and Wildlife Facilities (Adaptive Management)	\$29,864.60		\$29,864.60
30 Planning Engineering and Design	\$10,393.50	\$1,932.15	\$12,325.65
31 Construction Management	\$10,393.50	\$2,109.88	\$12,503.38
Totals	\$354,941.60	\$83,015.51	\$449,692.51

Table 4-16. Measure HB_2a Hopefield Point Big River Park

Feature	Cost	Contingency	Total
01 Lands and Damages	\$40,000.00	\$8,000.00	\$48,000.00
06 Fish and Wildlife Facilities	\$39,087.00	\$24,656.50	\$63,743.50

06 Fish and Wildlife Facilities (Adaptive Management)	\$25,633.33		\$25,633.33
09 Channels and Canals	\$11,400.00	\$8,803.17	\$20,203.17
16 Bank Stabilization	\$57,600.00	\$23,066.98	\$80,666.98
30 Planning Engineering and Design	\$16,213.05	\$4,765.02	\$20,978.07
31 Construction Management	\$16,213.05	\$5,244.92	\$21,457.97
Totals	\$206,146.43	\$74,536.59	\$280,683.02

Table 4-17. Measure HB_2b Hopefield Point Big River Park

Feature	Cost	Contingency	Total
01 Lands and Damages	n/a		
09 Channels and Canals	\$67,173.60	\$33,148.26	\$100,321.86
16 Bank Stabilization	\$15,998.40	\$10,67.23	\$26,676.63
30 Planning Engineering and Design	\$12,475.76	\$3,666.63	\$16,142.44
31 Construction Management	\$12,475.76	\$4,035.91	\$16,511.72
Totals	\$108,123.60	\$51,529.05	\$159,652.65

Table 4-18. Measure HB_2c Hopefield Point Big River Park

Feature	Cost	Contingency	Total
01 Lands and Damages	\$110,000.00	\$22,000.00	\$132,000.00
06 Fish and Wildlife Facilities (Adaptive Management)	\$20,093.51		\$20,093.51
09 Channels and Canals	\$538,332.00	\$415,704.28	\$954,036.28
30 Planning Engineering and Design	\$80,749.80	\$15,011.39	\$95,761.19
31 Construction Management	\$80,749.80	\$16,392.21	\$97,142.01
Totals	\$829,925.11	\$369,942.82	\$1,299,032.99

Table 4-19. Measure HT_6 Hatchie Towhead Randolph

Feature	Cost	Contingency	Total
01 Lands and Damages	\$260,000.00	\$52,000.00	\$312,000.00
01 Mitigation	n/a		
06 Adaptive Management (Fish and Wildlife)	\$35,200.80		\$35,200.80
30 Planning Engineering and Design	n/a		
31 Construction Management	n/a		
Totals	\$295,200.80	\$52,000.00	\$347,200.80

Table 4-20. Measure I35_12a Island35_DeanIsland

Feature	Cost	Contingency	Total
01 Lands and Damages	\$70,000.00	\$14,000.00	\$84,000.00
06 Fish and Wildlife Facilities	\$8,145.00	\$3,345.44	\$11,490.44
06 Adaptive Management (Fish and Wildlife)	\$9,884.00		\$9,884.00
30 Planning Engineering and Design	\$1,221.75	\$227.12	\$1,448.87
31 Construction Management	\$1,221.75	\$248.02	\$1,469.77
Totals	\$90,472.50	\$17,820.58	\$108,293.08

Table 4-21. Measure I35_12b Island35_DeanIsland

Feature	Cost	Contingency	Total
01 Lands and Damages	\$275,000.00	\$55,000.00	\$330,000.00
01 Mitigation	n/a		
06 Adaptive Management (Fish and Wildlife)	\$37,231.61		\$37,231.61
30 Planning Engineering and Design	n/a		
31 Construction Management	n/a		
Totals	\$312,231.61	\$55,000.00	\$367,231.61

Table 4-22. Measure I35_2a Island35_DeanIsland

Feature	Cost	Contingency	Total
01 Lands and Damages	\$30,000.00	\$6,000.00	\$36,000.00
06 Fish and Wildlife Facilities	\$183,886.00	\$75,528.53	\$259,414.53
06 Adaptive Management (Fish and Wildlife)	\$37,625.42		\$37,625.42
30 Planning Engineering and Design	\$27,582.90	\$5,127.66	\$32,710.56
31 Construction Management	\$27,582.90	\$5,599.33	\$33,182.23
Totals	\$306,677.22	\$92,255.52	\$398,932.74

Table 4-23. Measure I35_2b Island35_DeanIsland

Feature	Cost	Contingency	Total
01 Lands and Damages	\$96,000.00	\$19,200.00	\$115,200.00
30 Planning Engineering and Design	n/a		
31 Construction Management	n/a		
Totals	\$96,000.00	\$19,200.00	\$115,200.00

Table 4-24. Measure I35_6b Island35_DeanIsland

Feature	Cost	Contingency	Total
01 Lands and Damages	\$55,000.00	\$11,000.00	\$66,000.00
06 Fish and Wildlife Facilities	\$48,092.00	\$19,753.10	\$67,845.10
06 Adaptive Management (Fish and Wildlife)	\$9,851.32		\$9,851.32
30 Planning Engineering and Design	\$7,213.80	\$1,341.05	\$8,554.85
31 Construction Management	\$7,213.80	\$1,464.40	\$8,678.20
Totals	\$127,370.92	\$33,5588.55	\$160,929.47

Table 4-25. Measure I35_7a Island35_DeanIsland

Feature	Cost	Contingency	Total
01 Lands and Damages	n/a		
06 Fish and Wildlife Facilities	\$33,800.00	\$3,072.42	\$36,872.42
06 Adaptive Management (Fish and Wildlife)	\$31,633.33		\$31,633.33
30 Planning Engineering and Design	\$5,070.00	\$942.51	\$6,012.51
31 Construction Management	\$5,070.00	\$1,029.21	\$6,099.21
Totals	\$75,573.33	\$5,044.14	\$80,617.47

Table 4-26. Measure I35_7g Island35_DeanIsland

Feature	Cost	Contingency	Total
01 Lands and Damages	n/a		
06 Adaptive Management (Fish and Wildlife)	\$61,350.00		\$61,350.00
16 Bank Stabilization	\$640,000.00	\$220,016.38	\$860,016.38
30 Planning Engineering and Design	\$96,000.00	\$28,214.40	\$124,214.40
31 Construction Management	\$96,000.00	\$31,056.00	\$127,056.00
Totals	\$893,350.00	\$279,286.78	\$1,172,636.78

Table 4-27. Measure I35_7h Island35_DeanIsland

Feature	Cost	Contingency	Total
01 Lands and Damages	\$40,000.00		\$48,000.00
06 Adaptive Management (Fish and Wildlife)	\$5,415.51		\$5,415.51
30 Planning Engineering and Design	n/a		
31 Construction Management	n/a		
Totals	\$55,415.51		\$53,415.51

Table 4-28. Measure I35_9b Island35_DeanIsland

Feature	Cost	Contingency	Total
01 Lands and Damages	\$60,000.00	\$12,000.00	\$72,000.00

06 Fish and Wildlife Facilities	\$32,724.00	\$13,440.91	\$46,164.91
06 Adaptive Management (Fish and Wildlife)	\$9,759.26		\$9,759.26
30 Planning Engineering and Design	\$4,908.60	\$912.51	\$5,821.11
31 Construction Management	\$4,908.60	\$996.45	\$5,905.05
Totals	\$112,300.46	\$27,349.86	\$139,650.32

Table 4-29. Measure I40_1a Island40_41

Feature	Cost	Contingency	Total
01 Lands and Damages	\$185,000.00	\$37,000.00	\$222,000.00
06 Fish and Wildlife Facilities	\$24,378.00	\$10,012.91	\$34,390.91
06 Adaptive Management (Fish and Wildlife)	\$26,265.72		\$26,265.72
30 Planning Engineering and Design	\$3,656.70	\$679.78	\$4,336.48
31 Construction Management	\$3,656.70	\$742.31	\$4,399.01
Totals	\$242,957.12	\$48,435.00	\$291,392.12

Table 4-30. Measure I40_1b Island40_41

Feature	Cost	Contingency	Total
01 Lands and Damages	\$483,000.00	\$96,600.00	\$579,600.00
06 Adaptive Management (Fish and Wildlife)	\$25,633.33		\$25,633.33
09 Channels and Canals	\$16,154.00	\$8,781.98	\$24,935.98
30 Planning Engineering and Design	\$2,423.10	\$2,106.34	\$3,135.25
31 Construction Management	\$2,423.10	\$2,306.31	\$3,206.97
Totals	\$529,633.53	\$106,878.78	\$636,511.53

Table 4-31. Measure I40_1b2 Island40_41

Feature	Cost	Contingency	Total
01 Lands and Damages	n/a		
06 Adaptive Management (Fish and Wildlife)	n/a		
09 Channels and Canals	\$49,998.00	\$38,608.88	\$88,606.80
30 Planning Engineering and Design	\$7,499.70	\$1,394.19	\$8,893.89
31 Construction Management	\$7,499.70	\$1,522.44	\$9,022.14
Totals	\$64,997.40	\$41,525.43	\$106,522.83

Table 4-32. Measure I40_3 Island40_41

Feature	Cost	Contingency	Total
01 Lands and Damages	\$295,000.00	\$59,000.00	\$354,000.00

01 Mitigation	n/a		
06 Adaptive Management (Fish and Wildlife)	\$39,600.90		\$39,600.90
30 Planning Engineering and Design	n/a		
31 Construction Management	n/a		
Totals	\$334,600.90	\$59,000.00	\$393,600.90

Table 4-33. Measure M5 Meeman Shelby Forest Eagle Lake

Feature	Cost	Contingency	Total
01 Lands and Damages	\$18,000.00	\$3,600.00	\$21,600.00
06 Adaptive Management (Fish and Wildlife)	\$4,947.14		\$4,947.14
09 Channels and Canals	\$10,758.00	\$8,063.10	\$18,570.65
16 Bank Stabilization	\$6,816.00	\$3,224.35	\$10,040.35
30 Planning Engineering and Design	\$2,636.10	\$774.75	\$3,410.85
31 Construction Management	\$2,636.10	\$852.78	\$3,488.88
Totals	\$45,793.34	\$16,264.53	\$62,057.87

Table 4-34. Measure M6 Meeman Shelby Forest Eagle Lake

Feature	Cost	Contingency	Total
01 Lands and Damages	\$150,000.00	\$30,000.00	\$180,000.00
06 Fish and Wildlife Facilities	\$53,299.83	\$21,892.14	\$75,191.97
06 Adaptive Management (Fish and Wildlife)	\$22,973.15		\$22,973.15
15 Floodway Control and Diversion Structures	\$281,866.00	\$132,109.80	\$413,975.80
30 Planning Engineering and Design	\$50,274.87	\$14,775.79	\$65,050.66
31 Construction Management	\$50,274.87	\$16,263.92	\$66,538.80
Totals	\$608,688.73	\$215,041.65	\$823,730.38

Table 4-35. Measure M_14 Meeman Shelby Forest Eagle Lake

Feature	Cost	Contingency	Total
01 Lands and Damages	n/a		
06 Fish and Wildlife Facilities	\$50,000.00	\$13,340.40	\$63,340.00
06 Adaptive Management (Fish and Wildlife)	\$30,540.00		\$30,540.00
30 Planning Engineering and Design	\$7,500.00	\$1,394.25	\$8,894.25
31 Construction Management	\$7,500.00	\$1,522.50	\$9,022.50
Totals	\$95,540.00	\$16,256.75	\$111,796.75

Table 4-36. Measure RCP_1 Richardson Cedar Point

Feature	Cost	Contingency	Total
01 Lands and Damages	\$40,000.00	\$8,000.00	\$48,000.00
06 Fish and Wildlife Facilities	\$21,539.00	\$8,846.83	\$30,385.83
06 Adaptive Management (Fish and Wildlife)	\$6,492.51		\$6,492.51
30 Planning Engineering and Design	\$3,230.85	\$600.62	\$3,831.47
31 Construction Management	\$3,230.85	\$655.86	\$3,886.71
Totals	\$74,493.21	\$18,103.31	\$92,596.52

Table 4-37. Measure RCP_2 Richardson Cedar Point

Feature	Cost	Contingency	Total
01 Lands and Damages	\$578,000.00	\$115,600.00	\$693,600.00
06 Fish and Wildlife Facilities	\$32,614.00	\$9,325.78	\$53,187.27
06 Adaptive Management (Fish and Wildlife)	\$15,008.09		\$15,008.09
09 Channels and Canals	\$63,356.50	\$41,016.12	\$104,372.62
30 Planning Engineering and Design	\$14,395.58	\$4,230.86	\$18,626.44
31 Construction Management	\$14,395.58	\$4,656.97	\$19,052.55
Totals	\$717,769.74	\$186,077.21	\$903,846.95

Table 4-38. Measure RCP_4 Richardson Cedar Point

Feature	Cost	Contingency	Total
01 Lands and Damages	\$55,000.00	\$11,000.00	\$66,000.00
01 Mitigation	n/a		
06 Adaptive Management (Fish and Wildlife)	\$7,459.38		\$7,459.38
30 Planning Engineering and Design	n/a		
31 Construction Management	n/a		
Totals	\$62,459.38	\$11,000.00	\$73,459.38

Table 4-39. Measure RL_3 Redman Point Loosahatchie Bar

Feature	Cost	Contingency	Total
01 Lands and Damages	n/a		
06 Fish and Wildlife Facilities	\$45,000.00	\$4,090.5	\$49,090.5
06 Adaptive Management (Fish and Wildlife)	\$23,533.33		\$23,533.33
30 Planning Engineering and Design	\$6,750.00	\$1,254.83	\$8,004.83
31 Construction Management	\$6,750.00	\$1,370.25	\$8,120.25
Totals	\$82,033.33	\$6,715.58	\$88,748.91

Table 4-40. Measure RL_4a Redman Point Loosahatchie Bar

Feature	Cost	Contingency	Total
01 Lands and Damages	\$3,147,000.00	\$629,400.00	\$3,776,400.00
06 Fish and Wildlife Facilities	\$682,658.00	\$280,391.94	\$963,049.94
06 Adaptive Management (Fish and Wildlife)	\$192,665.12		\$192,665.12
30 Planning Engineering and Design	\$102,398.70	\$19,035.92	\$121,434.62
31 Construction Management	\$102,398.70	\$20,786.94	\$123,185.64
Totals	\$4,227,120.52	\$949,614.79	\$5,176,735.31

Table 4-41. Measure RL_6a Redman Point Loosahatchie Bar

Feature	Cost	Contingency	Total
01 Lands and Damages	n/a		
06 Fish and Wildlife Facilities	\$50,000.00	\$13,340	\$63,340.00
06 Adaptive Management (Fish and Wildlife)	\$34,333.33		\$34,333.33
30 Planning Engineering and Design	\$7,500.00	\$1,394.25	\$8,894.25
31 Construction Management	\$7,500.00	\$1,522.50	\$9,022.50
Totals	\$99,333.33	\$16,256.75	\$115,590.08

Table 4-42. Measure S_10a Sunrise Island 34

Feature	Cost	Contingency	Total
01 Lands and Damages	\$105,000.00	\$21,000.00	\$126,000.00
06 Fish and Wildlife Facilities	\$57,268.00	\$23,522.01	\$80,790.01
06 Adaptive Management (Fish and Wildlife)	\$20,177.99		\$20,177.99
30 Planning Engineering and Design	\$8,590.20	\$1,596.92	\$10,187.12
31 Construction Management	\$8,590.20	\$1,743.81	\$10,334.01
Totals	\$199,626.39	\$47,862.74	\$247,489.13

Table 4-43. Measure S_4a Sunrise Island 34

Feature	Cost	Contingency	Total
01 Lands and Damages	n/a		
06 Adaptive Management (Fish and Wildlife)	\$46,483.33		\$46,483.33
09 Channels and Canals	\$992,000.00	\$272,502.40	\$1,411,184.68
30 Planning Engineering and Design	\$148,800.00	\$43,732.32	\$192,532.32
31 Construction Management	\$148,800.00	\$48,136.80	\$196,936.80
Totals	\$1,336,083.33	\$511,053.38	\$1,847,137.13

Table 4-44. Measure S_4b Sunrise Island 34

Feature	Cost	Contingency	Total
01 Lands and Damages	n/a		
08 Bridges	\$3,750,000.00	\$3,317,625.00	\$7,067,625.00
30 Planning Engineering and Design	\$562,500.00	\$104,568.75	\$667,068.75
31 Construction Management	\$562,500.00	\$114,187.50	\$676,687.50
Totals	\$4,875,000.00	\$3,536,381.25	\$8,411,381.25

Table 4-45. Measure S_4c Sunrise Island 34

Feature	Cost	Contingency	Total
01 Lands and Damages	n/a		
15 Floodway Control and Diversion	\$591,999.00	\$453,347.32	\$1,045,346.32
30 Planning Engineering and Design	\$88,799.85	\$26,098.28	\$114,898.13
31 Construction Management	\$88,799.85	\$28,726.75	\$117,526.60
Totals	\$769,598.70	\$508,172.35	\$1,277,771.05

Table 4-46. Measure S_4d Sunrise Island 34

Feature	Cost	Contingency	Total
01 Lands and Damages	n/a		
06 Fish and Wildlife Facilities	\$33,800.00	\$3,072.42	\$36,872.42
30 Planning Engineering and Design	\$5,070.00	\$942.51	\$6,012.51
31 Construction Management	\$5,070.00	\$1,029.21	\$6,099.21
Totals	\$43,940.00	\$5,044.14	\$48,984.14

Table 4-47. Measure S_6a Sunrise Island 34

Feature	Cost	Contingency	Total
01 Lands and Damages	n/a		
06 Fish and Wildlife Facilities	\$33,800.00	\$3,072.42	\$36,872.42
06 Adaptive Management (Fish and Wildlife)	\$23,533.33		\$23,533.33
30 Planning Engineering and Design	\$5,070.00	\$942.51	\$6,012.51
31 Construction Management	\$5,070.00	\$1,029.21	\$6,099.21
Totals	\$67,473.33	\$5,044.14	\$72,517.47

Table 4-48. Measure S_7a Sunrise Island 34

Feature	Cost	Contingency	Total
01 Lands and Damages	n/a		
06 Fish and Wildlife Facilities	\$50,000.00	\$13,340.00	\$63,340.00
06 Adaptive Management (Fish and Wildlife)	\$32,700.00		\$32,700.00

30 Planning Engineering and Design	\$7,500.00	\$1,394.25	\$8,894.25
31 Construction Management	\$7,500.00	\$1,522.50	\$9,022.50
Totals	\$97,700.00	\$16,256.75	\$113,956.75

Table 4-49. Measure S_8a Sunrise Island 34

Feature	Cost	Contingency	Total
01 Lands and Damages	\$95,000.00	\$19,000.00	\$114,000.00
06 Fish and Wildlife Facilities	\$51,156.00	\$21,011.59	\$72,167.59
06 Adaptive Management (Fish and Wildlife)	\$15,419.83		\$15,419.83
30 Planning Engineering and Design	\$7,673.40	\$1,426.49	\$9,099.89
31 Construction Management	\$7,673.40	\$1,557.70	\$9,231.10
Totals	\$176,922.63	\$42,995.78	\$219,918.41

Table 4-50. Measure LW-1 Wolf River

Feature	Cost	Contingency	Total
01 Lands and Damages	\$10,000.00	\$2,000.00	\$12,000.00
06 Fish and Wildlife Facilities	\$70,000.00	\$47,649.45	\$92,566.00
30 Planning Engineering and Design	\$10,500.00	\$1,951.95	\$12,451.95
31 Construction Management	\$10,500.00	\$2,131.50	\$12,631.50
Totals	\$101,000.00	\$28,649.45	\$129,649.45

Table 4-51. Measure M_2 Meeman Shelby

Feature	Cost	Contingency	Total
01 Lands and Damages	\$3,000.00	\$600.00	\$3,600.00
06 Fish and Wildlife Facilities	\$189,444.46	\$45,652.69	\$235,097.15
30 Planning Engineering and Design	\$17,442.00	\$5,126.20	\$22,568.20
31 Construction Management	\$17,442.00	\$5,642.49	\$23,084.49
Totals	\$227,328.46	\$57,021.38	\$284,349.84

Table 4-52. AMM, OMRR&R Measures for TSP

Measure	Description	AM&M (Total \$)	OMRR&R (Total \$)
1	BR1 Brandywine	\$26,233.33	\$73,635.75
2	BR2 Brandywine	\$35,400.00	
3	BR4 Brandywine	\$50,533.33	\$17,007.29
4	BR5 Brandywine	\$61,350.00	\$521,597.76
5	BR6 Brandywine	\$66,850.82	
6	BR7 Brandywine	\$35,998.87	
7	BR8 Brandywine	\$37,967.27	\$18,152.40

Measure	Description	AM&M (Total \$)	OMRR&R (Total \$)
8	BR11 Brandywine	\$118,257.80	\$21,695.08
9	D3 Densford	\$30,000.00	
10	HB_1 Hopefield Point Big River Park	\$29,864.60	
11	HB_2ab Hopefield Point Big River Park	\$25,633.33	\$207,975.44
12	HB_2c Hopefield Point Big River Park	\$20,093.51	
13	HT_6 Hatchie Towhead Randolph	\$35,200.80	
14	I35_12a Island35_DeansIsland	\$9,884.00	
15	I35_12b Island35_DeansIsland	\$37,231.61	
16	I35_2 Island35_DeansIsland	\$37,625.41	
17	I35_6b Island35_DeansIsland	\$9,851.32	
18	I35_7a Island35_DeansIsland	\$31,633.33	
19	I35_7g Island35_DeansIsland	\$61,350.00	\$645,012.29
20	I35_9b Island35_DeansIsland	\$9,759.26	
21	I40_1a Island40_41	\$26,265.72	
22	I40_1b Island40_41	\$25,633.33	\$50,774.51
23	S_10 Sunrise_Island34	\$20,177.99	
24	M5 Meeman Shelby Forest Eagle Lake	\$4,947.14	\$4,772.80
25	M6 Meeman Shelby Forest Eagle Lake	\$22,973.15	\$374,320.35
26	M_14 Meeman Shelby Forest Eagle Lake	\$30,540.00	
27	RCP_1 Richardson Cedar Point	\$6,492.51	
28	RCP_2 Richardson Cedar Point	\$15,008.09	\$58,371.20
29	RCP_4 Richardson Cedar Point	\$7,459.38	
30	RL_3 Redman Point Loosahatchie Bar	\$23,533.33	\$36,817.88
31	RL_4 Redman Point Loosahatchie Bar	\$192,665.12	
32	RL_6 Redman Point Loosahatchie Bar	\$34,333.33	
33	S_10 Sunrise_Island34	\$20,177.99	
34	S_4 Sunrise_Island34	\$46,483.33	\$1,058,388.51
35	S_6 Sunrise_Island34	\$23,533.33	
36	S_7 Sunrise_Island34	\$32,700.00	
37	S_8 Sunrise_Island34	\$15,419.83	
38	M_2 Meeman Shelby Forest Eagle Lake		\$271,236.45
39	LW_1 Meeman Shelby Forest Eagle Lake		
Notes			

4.1.6 Plan Alternatives

The various measures considered were combined to produce 10 alternatives (including the no action alternative). The remaining alternatives are shown in the following tables 4-59 to 4-66. All costs are considered FY23 Price Levels. (January 2023 First Cost)

Table 4-53. Alternative A1

Alternative A1		
	Description	Cost w/Contingency
	Lands and Damages	\$ 4,273,200.00
	Relocations	\$ -
	Construction Costs	\$ 20,072,668.00
	Adaptive Management (Fish and Wildlife)	\$ 3,454,987.00
Totals		\$ 27,800,855.00
Total O&M:		\$ 2,111,834.00
Total A1:		\$ 29,912,689.00

Table 4-54. Alternative B1

Alternative B1		
	Description	Cost w/Contingency
	Lands and Damages	\$ 922,800.00
	Relocations	\$ -
	Construction Cost	\$ 22,365,145.00
	Adaptive Management (Fish and Wildlife)	\$ 3,293,458.00
Totals		\$ 26,581,403.00
Total O&M:		\$ 3,517,681.00
Total B1:		\$ 30,099,084.00

Table 4-55. Alternative C1

Alternative C1		
	Description	Cost w/Contingency
	Lands and Damages	\$ 10,941,600.00
	Relocations	\$ -
	Construction Cost	\$ 6,783,150.00
	Adaptive Management (Fish and Wildlife)	\$ 3,743,372.00
Totals		\$ 21,468,122.00
Total O&M:		\$ 1,426,057.00
Total C1:		\$ 22,894,179.00

Table 4-56. Alternative C2

Alternative C2		
	Description	Cost w/Contingency
	Lands and Damages	\$ 10,941,600.00
	Relocations	\$ -
	Construction Cost	\$ 18,321,940.00
	Adaptive Management (Fish and Wildlife)	\$ 3,789,856.00
Totals		\$ 33,053,396.00
Total O&M:		\$ 2,484,445.00
Total C2:		\$ 35,537,841.00

Table 4-57. Alternative C4 (TSP)

Alternative C4		
	Description	Cost w/Contingency
	Lands and Damages	\$ 13,868,880.00
	Relocations	\$ -
	Construction Cost	\$ 44,477,931.00
	Adaptive Management (Fish and Wildlife)	\$ 4,393,988.00
Totals		\$ 62,740,799.00
Total O&M:		\$ 3,772,399.00
Total C4:		\$ 66,513,198.00

Table 4-58. Alternative C5

Alternative C5		
	Description	Cost w/Contingency
	Lands and Damages	\$ 11,605,200.00
	Relocations	\$ -
	Construction Cost	\$ 20,629,678.00
	Adaptive Management (Fish and Wildlife)	\$ 3,893,367.00
Totals		\$ 36,128,245.00
Total O&M:		\$ 3,071,514.00
Total C5:		\$ 39,199,759.00

Table 4-59. Alternative C6

Alternative C6		
	Description	Cost w/Contingency
	Lands and Damages	\$ 5,936,400.00
	Relocations	\$ -
	Construction Cost	\$5,080,498
	Adaptive Management (Fish and Wildlife)	\$ 3,397,198.00
Totals		\$ 14,414,096.00
Total O&M:		\$ 1,335,435.00
Total C6:		\$ 15,749,531.00

Table 4-60. Alternative C7

Alternative C7		
	Description	Cost w/Contingency
	Lands and Damages	\$ 9,636,000.00
	Relocations	\$ -
	Construction Cost	\$ 17,954,623.00
	Adaptive Management (Fish and Wildlife)	\$ 3,672,726.00
Totals		\$ 31,263,349.00
Total O&M:		\$ 2,433,671.00
Total C7:		\$ 33,697,020.00

4.1.7 Tentatively Selected Plan C3

Alternative C3 was considered the preferred alternative and is the alternative that is being used for the Hatchie-Loosahatchie project study and is shown in Table J-67.

Table 4-61. Selected Plan C3

Alternative C3		
	Description	Cost w/Contingency
	Lands and Damages	\$ 17,288,160.00
	OMRR&R	\$ 3,359,757.71
	Construction Cost	\$ 29,089,450.00
	Adaptive Management (Fish and Wildlife)	\$ 3,943,901.00
Totals		\$ 53,681,268.71
Total O&M:		\$ 3,088,521.00
Total C3:		\$ 56,769,789.71

4.1.8 Abbreviated Risk Analysis

Table 4-62. Abbreviated Risk Analysis ARA 001

CWWBS	Feature of Work	Contract Cost	% Contingency	\$ Contingency	Total
01 LANDS AND DAMAGES	Real Estate	\$ 1	20.00%	\$ 0	\$ 1.20
18 CULTURAL RESOURCE PRESERVATION	Cultural Resources	\$ 1	11.93%	\$ 0	\$ 1.12
12 NAVIGATION, PORTS AND HARBORS	Pile Dike Notching	\$ 1	9.09%	\$ 0	\$ 1.09
12 NAVIGATION, PORTS AND HARBORS	Stone Dike Notching	\$ 1	9.09%	\$ 0	\$ 1.09
09 01 CHANNELS	Channel Cleanout	\$ 1	58.80%	\$ 1	\$ 1.59
15 FLOODWAY CONTROL AND DIVERSION STRUCTURES	CMP Culvert	\$ 1	33.82%	\$ 0	\$ 1.34
15 FLOODWAY CONTROL AND DIVERSION STRUCTURES	Concrete Box Culvert	\$ 1	51.27%	\$ 1	\$ 1.51
06 03 WILDLIFE FACILITIES AND SANCTUARIES	Tree Planting	\$ 1	26.41%	\$ 0	\$ 1.26
02 01 ROADS, Construction Activities	Bridge Replacement	\$ 1	88.47%	\$ 1	\$ 1.88
06 FISH AND WILDLIFE FACILITIES	Woody Debris Traps	\$ 1	26.68%	\$ 0	\$ 1.27
06 FISH AND WILDLIFE FACILITIES	Borrow Pit Excavation	\$ 1	59.22%	\$ 1	\$ 1.59
06 FISH AND WILDLIFE FACILITIES	Ground Water Wells	\$ 1	13.35%	\$ 0	\$ 1.13
	Remaining Construction Items	\$ -	0.00%	\$ -	\$ -
30 PLANNING, ENGINEERING, AND DESIGN	Planning, Engineering, & Design	\$ 1	18.59%	\$ 0	\$ 1.19
31 CONSTRUCTION MANAGEMENT	Construction Management	\$ 1	20.30%	\$ 0	\$ 1.20
Totals					
	Real Estate	\$ 1	20.00%	\$ 0	\$ 1.20
	Total Construction Estimate	\$ 11	35.28%	\$ 4	\$ 15
	Total Planning, Engineering & Design	\$ 1	18.59%	\$ 0	\$ 1
	Total Construction Management	\$ 1	20.30%	\$ 0	\$ 1
	Total	\$ 14		\$ 4	\$ 18

Table 4-63. Abbreviated Risk Analysis ARA 002

CWWBS	Feature of Work	Contract Cost	% Contingency	\$ Contingency	Total
01 LANDS AND DAMAGES	Real Estate	\$ 1	20.00%	\$ 0	\$ 1.20
1 09 CHANNELS AND CANALS (Except Navigation Ports and Harbors)	Mobilization/Demobilization	\$ 1	15.72%	\$ 0	\$ 1.16
2 08 01 ROADS	Gravel Resurfacing	\$ 1	14.21%	\$ 0	\$ 1.14
3 12 NAVIGATION, PORTS AND HARBORS	Riprap Hardpoints	\$ 1	20.41%	\$ 0	\$ 1.20
4 16 BANK STABILIZATION	Riprap Bank Protection	\$ 1	27.47%	\$ 0	\$ 1.27
5 15 FLOODWAY CONTROL AND DIVERSION STRUCTURES	Riprap Inlet/Outlet Protection	\$ 1	46.13%	\$ 0	\$ 1.46
6 12 NAVIGATION, PORTS AND HARBORS	River Training Structure	\$ 1	27.47%	\$ 0	\$ 1.27
7 15 FLOODWAY CONTROL AND DIVERSION STRUCTURES	Stop Log Structures	\$ 1	54.98%	\$ 1	\$ 1.55
8 14 RECREATION FACILITIES	Clearing and Grubbing	\$ 1	43.04%	\$ 0	\$ 1.43
9 15 FLOODWAY CONTROL AND DIVERSION STRUCTURES	Dewatering/Unwatering	\$ 1	65.69%	\$ 1	\$ 1.66
10 15 FLOODWAY CONTROL AND DIVERSION STRUCTURES	Other Excavation	\$ 1	49.28%	\$ 0	\$ 1.49
11 15 FLOODWAY CONTROL AND DIVERSION STRUCTURES	Stone Structures (Weirs, Grade Control)	\$ 1	25.49%	\$ 0	\$ 1.25
12	Remaining Construction Items	\$ 1	9.1%	\$ 0	\$ 1.46
13 30 PLANNING, ENGINEERING, AND DESIGN	Planning, Engineering, & Design	\$ 1	29.39%	\$ 0	\$ 1.29
14 31 CONSTRUCTION MANAGEMENT	Construction Management	\$ 1	32.35%	\$ 0	\$ 1.32
Totals					
	Real Estate	\$ 1	20.00%	\$ 0	\$ 1.20
	Total Construction Estimate	\$ 12	36.34%	\$ 4	\$ 16
	Total Planning, Engineering & Design	\$ 1	29.39%	\$ 0	\$ 1
	Total Construction Management	\$ 1	32.35%	\$ 0	\$ 1
	Total	\$ 15		\$ 5	\$ 20