

APPENDIX F

COST ENGINEERING

- Parametric Costs for Alternatives 2a, 2b, and 2c
- Operations and Maintenance Costs for Alternative 2a, 2b, and 2c

Corps of Engineers, Memphis District
LOWER CACHE RIVER, Monroe Co, AR; Section 1135 Feasibility Study
Prices as of Nov 2010; Preparation Date: 12/15/10
ALTERNATIVE 2a FOR 7 WEIRS and 6 PLUG REMOVALS

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	AMOUNT	CONTING.	TOTAL	COMMENT
01 LANDS AND DAMAGES (w/ contin.)							
Lands and Damages	1	LS	\$177,000	\$177,000	\$0	\$177,000	Contingency included, 102 acres total
Mitigation Land (none required)	1	LS		\$0	\$0	\$0	
Total 01				\$177,000	\$0	\$177,000	
02 RELOCATIONS							(none required)
Roads & Bridges	1	LS		\$0	\$0	\$0	
Utilities	1	LS	\$0	\$0	\$0	\$0	
Total 02				\$0	\$0	\$0	
06 FISH & WILDLIFE FACILITIES							
Plug Removal	6	EA	\$60,167	\$361,000	\$98,000	\$459,000	Total for plug removals
Mob & Demob	1	LS	\$103,400	\$103,000	\$26,000	\$129,000	Includes environmental protection and assumes 2 work seasons, lots of rock
Clearing	36	AC	\$1,400	\$50,000	\$13,000	\$63,000	Medium-Heavy, pile and/or burn
Excavate Plug	39,600	CY	\$4.45	\$176,000	\$53,000	\$229,000	Spoil beside Cache River, Dragline & Dozer
Turfing	18	AC	\$1,800	\$32,000	\$6,000	\$38,000	Fertilize & Seed
Large Weir Construction	1	EA	\$2,176,000	\$2,176,000	\$669,000	\$2,845,000	Total for building southern-most weir
Excavation for Keys	21,170	CY	\$4.45	\$94,000	\$24,000	\$118,000	Spoil beside Cache River, Dragline & Dozer
Filter Material	2,790	TN	\$39.75	\$111,000	\$34,000	\$145,000	All Rock delivered by barge, placed by barge mounted equipment
Riprap R-90	5,570	TN	\$41.05	\$229,000	\$71,000	\$300,000	
Riprap R-2200	37,530	TN	\$46.35	\$1,740,000	\$539,000	\$2,279,000	
Tree Planting	1,600	EA	\$1.55	\$2,000	\$1,000	\$3,000	Four 200' rows on each bank beside weirs
Smaller Weir Construction	6	EA	\$995,667	\$5,974,000	\$1,837,000	\$7,811,000	Total for building all other weirs
Excavation for Keys	56,082	CY	\$4.45	\$250,000	\$63,000	\$313,000	Spoil beside Cache River, Dragline & Dozer
Filter Material	9,462	TN	\$39.75	\$376,000	\$117,000	\$493,000	All Rock delivered by barge, placed by barge mounted equipment
Riprap R-90	18,918	TN	\$41.05	\$777,000	\$241,000	\$1,018,000	
Riprap R-2200	98,292	TN	\$46.35	\$4,556,000	\$1,412,000	\$5,968,000	
Tree Planting	9,600	EA	\$1.55	\$15,000	\$4,000	\$19,000	Four 200' rows on each bank beside weirs
Total 06				\$8,511,000	\$2,604,000	\$11,115,000	
30 PLANNING, E&D							"Quantity" for 06 is cost of construction in dollars
E&D for study costs	1	LS		\$895,000	\$0	\$895,000	Cost to do study (most is sunk costs)
E&D for 02 relocations	0	DOL			\$0	\$0	Unit is Dollars
E&D for 06 Fish & Wildlife	8,511,000	DOL	10%	\$851,000	\$128,000	\$979,000	"Unit Price" is Percent of construction

Corps of Engineers, Memphis District							
LOWER CACHE RIVER, Monroe Co, AR; Section 1135 Feasibility Study							
Prices as of Nov 2010; Preparation Date: 12/15/10							
ALTERNATIVE 2a FOR 7 WEIRS and 6 PLUG REMOVALS							
ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	AMOUNT	CONTING.	TOTAL	COMMENT
Total 30				\$1,746,000	\$128,000	\$1,874,000	
31 CONSTRUCTION MANAGEMENT							"Quantity" for 06 is cost of construction in dollars
S&A for 02 relocations	0	DOL		\$0	\$0	\$0	Unit is Dollars
S&A for 06 Fish & Wildlife	8,511,000	DOL	8%	\$681,000	\$102,000	\$783,000	"Unit Price" is Percent of construction
Total 31				\$681,000	\$102,000	\$783,000	
TOTAL PROJECT COSTS (Nov 2010)	1	LS		\$11,115,000	\$2,834,000	\$13,949,000	
TOTAL PROJECT COSTS (Nov 2010)	1	LS	100.0%		25.5%	\$13,949,000	

Corps of Engineers, Memphis District
LOWER CACHE RIVER, Monroe Co, AR; Section 1135 Feasibility Study
Prices as of Nov 2010; Preparation Date: 12/15/10
ALTERNATIVE 2b FOR 5 WEIRS and 4 PLUG REMOVALS

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	AMOUNT	CONTING.	TOTAL	COMMENT
01 LANDS AND DAMAGES (w/ contin.)							
Lands and Damages	1	LS	\$135,000	\$135,000	\$0	\$135,000	Contingency included, 70 acres total
Mitigation Land (none required)	1	LS		\$0	\$0	\$0	
Total 01				\$135,000	\$0	\$135,000	
02 RELOCATIONS							(none required)
Roads & Bridges	1	LS		\$0	\$0	\$0	
Utilities	1	LS	\$0	\$0	\$0	\$0	
Total 02				\$0	\$0	\$0	
06 FISH & WILDLIFE FACILITIES							
Plug Removal	4	EA	\$69,000	\$276,000	\$74,000	\$350,000	Total for plug removals
Mob & Demob	1	LS	\$103,400	\$103,000	\$26,000	\$129,000	Includes environmental protection and assumes 2 work seasons, lots of rock
Clearing	24	AC	\$1,400	\$34,000	\$9,000	\$43,000	Medium-Heavy, pile and/or burn
Excavate Plug	26,400	CY	\$4.45	\$117,000	\$35,000	\$152,000	Spoil beside Cache River, Dragline & Dozer
Turfing	12	AC	\$1,800	\$22,000	\$4,000	\$26,000	Fertilize & Seed
Large Weir Construction	1	EA	\$2,176,000	\$2,176,000	\$669,000	\$2,845,000	Total for building southern-most weir
Excavation for Keys	21,170	CY	\$4.45	\$94,000	\$24,000	\$118,000	Spoil beside Cache River, Dragline & Dozer
Filter Material	2,790	TN	\$39.75	\$111,000	\$34,000	\$145,000	All Rock delivered by barge, placed by barge mounted equipment
Riprap R-90	5,570	TN	\$41.05	\$229,000	\$71,000	\$300,000	0.0
Riprap R-2200	37,530	TN	\$46.35	\$1,740,000	\$539,000	\$2,279,000	0.0
Tree Planting	1,600	EA	\$1.55	\$2,000	\$1,000	\$3,000	Four 200' rows on each bank beside weirs
Smaller Weir Construction	4	EA	\$995,500	\$3,982,000	\$1,225,000	\$5,207,000	Total for building all other weirs
Excavation for Keys	37,388	CY	\$4.45	\$166,000	\$42,000	\$208,000	Spoil beside Cache River, Dragline & Dozer
Filter Material	6,308	TN	\$39.75	\$251,000	\$78,000	\$329,000	All Rock delivered by barge, placed by barge mounted equipment
Riprap R-90	12,612	TN	\$41.05	\$518,000	\$161,000	\$679,000	0.0
Riprap R-2200	65,528	TN	\$46.35	\$3,037,000	\$941,000	\$3,978,000	0.0
Tree Planting	6,400	EA	\$1.55	\$10,000	\$3,000	\$13,000	Four 200' rows on each bank beside weirs
Total 06				\$6,434,000	\$1,968,000	\$8,402,000	
30 PLANNING, E&D							"Quantity" for 06 is cost of construction in dollars
E&D for study costs	1	LS		\$895,000	\$0	\$895,000	Cost to do study (most is sunk costs)
E&D for 02 relocations	0	DOL			\$0	\$0	Unit is Dollars
E&D for 06 Fish & Wildlife	6,434,000	DOL	10%	\$643,000	\$96,000	\$739,000	"Unit Price" is Percent of construction

Corps of Engineers, Memphis District							
LOWER CACHE RIVER, Monroe Co, AR; Section 1135 Feasibility Study							
Prices as of Nov 2010; Preparation Date: 12/15/10							
ALTERNATIVE 2b FOR 5 WEIRS and 4 PLUG REMOVALS							
ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	AMOUNT	CONTING.	TOTAL	COMMENT
Total 30				\$1,538,000	\$96,000	\$1,634,000	
31 CONSTRUCTION MANAGEMENT							"Quantity" for 06 is cost of construction in dollars
S&A for 02 relocations	0	DOL		\$0	\$0	\$0	Unit is Dollars
S&A for 06 Fish & Wildlife	6,434,000	DOL	8%	\$515,000	\$77,000	\$592,000	"Unit Price" is Percent of construction
Total 31				\$515,000	\$77,000	\$592,000	
TOTAL PROJECT COSTS (Nov 2010)	1	LS		\$8,622,000	\$2,141,000	\$10,763,000	
TOTAL PROJECT COSTS (Nov 2010)	1	LS	100.0%		24.8%	\$10,763,000	

Corps of Engineers, Memphis District
LOWER CACHE RIVER, Monroe Co, AR; Section 1135 Feasibility Study
Prices as of Nov 2010; Preparation Date: 12/15/10
ALTERNATIVE 2c FOR 4 WEIRS and 3 PLUG REMOVALS

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	AMOUNT	CONTING.	TOTAL	COMMENT
01 LANDS AND DAMAGES (w/ contin.)							
Lands and Damages	1	LS	\$113,000	\$113,000	\$0	\$113,000	Contingency included, 54 acres total
Mitigation Land (none required)	1	LS		\$0	\$0	\$0	
Total 01				\$113,000	\$0	\$113,000	
02 RELOCATIONS							(none required)
Roads & Bridges	1	LS		\$0	\$0	\$0	
Utilities	1	LS	\$0	\$0	\$0	\$0	
Total 02				\$0	\$0	\$0	
06 FISH & WILDLIFE FACILITIES							
Plug Removal	3	EA	\$77,333	\$232,000	\$61,000	\$293,000	Total for plug removals
Mob & Demob	1	LS	\$103,400	\$103,000	\$26,000	\$129,000	Includes environmental protection and assumes 2 work seasons, lots of rock
Clearing	18	AC	\$1,400	\$25,000	\$6,000	\$31,000	Medium-Heavy, pile and/or burn
Excavate Plug	19,800	CY	\$4.45	\$88,000	\$26,000	\$114,000	Spoil beside Cache River, Dragline & Dozer
Turfing	9	AC	\$1,800	\$16,000	\$3,000	\$19,000	Fertilize & Seed
Large Weir Construction	1	EA	\$2,176,000	\$2,176,000	\$669,000	\$2,845,000	Total for building southern-most weir
Excavation for Keys	21,170	CY	\$4.45	\$94,000	\$24,000	\$118,000	Spoil beside Cache River, Dragline & Dozer
Filter Material	2,790	TN	\$39.75	\$111,000	\$34,000	\$145,000	All Rock delivered by barge, placed by barge mounted equipment
Riprap R-90	5,570	TN	\$41.05	\$229,000	\$71,000	\$300,000	
Riprap R-2200	37,530	TN	\$46.35	\$1,740,000	\$539,000	\$2,279,000	
Tree Planting	1,600	EA	\$1.55	\$2,000	\$1,000	\$3,000	Four 200' rows on each bank beside weirs
Smaller Weir Construction	3	EA	\$995,333	\$2,986,000	\$917,000	\$3,903,000	Total for building all other weirs
Excavation for Keys	28,041	CY	\$4.45	\$125,000	\$31,000	\$156,000	Spoil beside Cache River, Dragline & Dozer
Filter Material	4,731	TN	\$39.75	\$188,000	\$58,000	\$246,000	All Rock delivered by barge, placed by barge mounted equipment
Riprap R-90	9,459	TN	\$41.05	\$388,000	\$120,000	\$508,000	
Riprap R-2200	49,146	TN	\$46.35	\$2,278,000	\$706,000	\$2,984,000	
Tree Planting	4,800	EA	\$1.55	\$7,000	\$2,000	\$9,000	Four 200' rows on each bank beside weirs
Total 06				\$5,394,000	\$1,647,000	\$7,041,000	
30 PLANNING, E&D							"Quantity" for 06 is cost of construction in dollars
E&D for study costs	1	LS		\$895,000	\$0	\$895,000	Cost to do study (most is sunk costs)
E&D for 02 relocations	0	DOL			\$0	\$0	Unit is Dollars
E&D for 06 Fish & Wildlife	5,394,000	DOL	10%	\$539,000	\$81,000	\$620,000	"Unit Price" is Percent of construction

Corps of Engineers, Memphis District							
LOWER CACHE RIVER, Monroe Co, AR; Section 1135 Feasibility Study							
Prices as of Nov 2010; Preparation Date: 12/15/10							
ALTERNATIVE 2c FOR 4 WEIRS and 3 PLUG REMOVALS							
ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	AMOUNT	CONTING.	TOTAL	COMMENT
Total 30				\$1,434,000	\$81,000	\$1,515,000	
31 CONSTRUCTION MANAGEMENT							"Quantity" for 06 is cost of construction in dollars
S&A for 02 relocations	0	DOL		\$0	\$0	\$0	Unit is Dollars
S&A for 06 Fish & Wildlife	5,394,000	DOL	8%	\$432,000	\$65,000	\$497,000	"Unit Price" is Percent of construction
Total 31				\$432,000	\$65,000	\$497,000	
TOTAL PROJECT COSTS (Nov 2010)	1	LS		\$7,373,000	\$1,793,000	\$9,166,000	
TOTAL PROJECT COSTS (Nov 2010)	1	LS	100.0%		24.3%	\$9,166,000	

LOWER CACHE RIVER, Monroe Co, AR; Section 1135 Feasibility Study
OPERATION AND MAINTENANCE COSTS
Prices as of Nov 2010; Preparation Date: 12/15/10
ALTERNATIVE 2a FOR 7 WEIRS and 6 PLUG REMOVALS

PROJECT FEATURE	COMMENTS	INTER. YRS	ORIG. QTY.	UNIT	% OF ORIG.	O&M QTY	UNIT PRICE	COST per Occurrence	NO. OF OCCUR.	COST OVER LIFE
Weir Construction										
Mob/Demob		25	1	LS	100%	1	\$60,000	\$60,000	1	\$60,000
Large Weir Construction										
Riprap R-90	Replacing damage after major events	25	1,766	TN	10%	177	\$53	\$9,424	1	\$9,424
Riprap R-2200		25	37,530	TN	10%	3,753	\$60	\$226,137	1	\$226,137
Total	Assumes replacing rock									\$235,561
Small Weir Construction										
Riprap R-90	Replacing damage after major events	25	3,851	TN	10%	385	\$6	\$2,310	1	\$2,310
Riprap R-2200		25	98,292	TN	10%	9,829	\$6	\$58,975	1	\$58,975
Total	Assumes just pulling rock up, reshaping weir.									\$61,286
Large weir is the southern-most weir and will be accessible by barge to bring in rock.										
Weirs US of the large weir will not be accessible, and can only be reshaped.										
R90 original qty does not include portion under R2200.										
TOTAL COST FOR O&M OVER LIFE OF PROJECT ----->										
										\$356,847

Project life, in years ----> 50

INTER. YRS: This is the interval in years that this task must be done.

ORIG. QTY. This is the original quantity for this item when it is constructed.

UNIT PRICE: This is the current price with contingencies and may be higher than the original price since the maintenance contract will have smaller quantities.

All costs are in Nov 2010 dollars.

NO. OF OCCURRENCES: Number of times this task will happen. Assumes nothing is done in last year of project life.

LOWER CACHE RIVER, Monroe Co, AR; Section 1135 Feasibility Study
OPERATION AND MAINTENANCE COSTS
Prices as of Nov 2010; Preparation Date: 12/15/10
ALTERNATIVE 2b FOR 5 WEIRS and 4 PLUG REMOVALS

PROJECT FEATURE	COMMENTS	INTER. YRS	ORIG. QTY.	UNIT	% OF ORIG.	O&M QTY	UNIT PRICE	COST per Occurrence	NO. OF OCCUR.	COST OVER LIFE
Weir Construction										
Mob/Demob		25	1	LS	100%	1	\$60,000	\$60,000	1	\$60,000
Large Weir Construction										
Riprap R-90	Replacing damage after major events	25	1,766	TN	10%	177	\$53	\$9,424	1	\$9,424
Riprap R-2200		25	37,530	TN	10%	3,753	\$60	\$226,137	1	\$226,137
Total	Assumes replacing rock									\$235,561
Small Weir Construction										
Riprap R-90	Replacing damage after major events	25	1,850	TN	10%	185	\$6	\$1,110	1	\$1,110
Riprap R-2200		25	65,528	TN	10%	6,553	\$6	\$39,317	1	\$39,317
Total	Assumes just pulling rock up, reshaping weir.									\$40,427
Large weir is the southern-most weir and will be accessible by barge to bring in rock.										
Weirs US of the large weir will not be accessible, and can only be reshaped.										
R90 original qty does not include portion under R2200.										
TOTAL COST FOR O&M OVER LIFE OF PROJECT ----->										
										\$335,988

Project life, in years ----> 50

INTER. YRS: This is the interval in years that this task must be done.

ORIG. QTY. This is the original quantity for this item when it is constructed.

UNIT PRICE: This is the current price with contingencies and may be higher than the original price since the maintenance contract will have smaller quantities.

All costs are in Nov 2010 dollars.

NO. OF OCCURRENCES: Number of times this task will happen. Assumes nothing is done in last year of project life.

LOWER CACHE RIVER, Monroe Co, AR; Section 1135 Feasibility Study
OPERATION AND MAINTENANCE COSTS
Prices as of Nov 2010; Preparation Date: 12/15/10
ALTERNATIVE 2c FOR 4 WEIRS and 3 PLUG REMOVALS

PROJECT FEATURE	COMMENTS	INTER. YRS	ORIG. QTY.	UNIT	% OF ORIG.	O&M QTY	UNIT PRICE	COST per Occurrence	NO. OF OCCUR.	COST OVER LIFE
Weir Construction										
Mob/Demob		25	1	LS	100%	1	\$60,000	\$60,000	1	\$60,000
Large Weir Construction										
Riprap R-90	Replacing damage after major events	25	1,766	TN	10%	177	\$53	\$9,424	1	\$9,424
Riprap R-2200		25	37,530	TN	10%	3,753	\$60	\$226,137	1	\$226,137
Total	Assumes replacing rock									\$235,561
Small Weir Construction										
Riprap R-90	Replacing damage after major events	25	849	TN	10%	85	\$6	\$509	1	\$509
Riprap R-2200		25	49,146	TN	10%	4,915	\$6	\$29,488	1	\$29,488
Total	Assumes just pulling rock up, reshaping weir.									\$29,997
Large weir is the southern-most weir and will be accessible by barge to bring in rock.										
Weirs US of the large weir will not be accessible, and can only be reshaped.										
R90 original qty does not include portion under R2200.										
TOTAL COST FOR O&M OVER LIFE OF PROJECT ----->										
										\$325,558

Project life, in years ----> 50

INTER. YRS: This is the interval in years that this task must be done.

ORIG. QTY. This is the original quantity for this item when it is constructed.

UNIT PRICE: This is the current price with contingencies and may be higher than the original price since the maintenance contract will have smaller quantities.

All costs are in Nov 2010 dollars.

NO. OF OCCURRENCES: Number of times this task will happen. Assumes nothing is done in last year of project life.