

Attachment C2

Cost Estimate Worksheets

Raise Friant Dam (Chapter 2)

CODE:D-8170

ESTIMATE WORKSHEET

SHEET_1 OF 3

FEATURE: Friant Dam Raise 25 Foot Raise Option	08-Jan-04	PROJECT: FRIANT DAM
		DIVISION:
		FILE: \\Ussac1s-muni1\Jobs\US_Bureau_Reclamation\DIQ_01CS20210B\Upper_San_Jo in_Phase_1\Documents\Surface Storage Option TMs\TM Friant\USBR

WOID: UPSJS

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	1	Diversion and care of river		1	LS	\$500,000.00	\$500,00
	2	Excavation, all classes, for dam foundation		145,000	CY	\$12.00	\$1,740,00
	3	Excavation, concrete		30,000	CY	\$200.00	\$6,000,00
	4	Backfill		63,300	CY	\$5.00	\$316,50
	5	RCC in dam		270,700	CY	\$45.00	\$12,181,50
	6	Concrete facing elements		34,500	CY	\$120.00	\$4,140,00
	7	Concrete cap on top of dam		3,900	CY	\$250.00	\$975,00
	8	Leveling concrete in dam foundation		5,000	CY	\$200.00	\$1,000,00
	9	Concrete for drainage gallery (No gallery in this option)		N/A	CY		
	10	Concrete in spillway crest and piers		13,600	CY	\$240.00	\$3,264,00
	11	Concrete in spillway training walls		4,300	CY	\$320.00	\$1,376,00
	12	Concrete in stilling basin walls		3,200	CY	\$340.00	\$1,088,00
	13	Concrete in stilling basin floors and aprons		24,900	CY	\$185.00	\$4,606,50
	14	Concrete in sidewalks, curbs and parapets on dam		3,200	CY	\$370.00	\$1,184,00
	15	Furnishing and handling cement		62,400	TONS	\$100.00	\$6,240,00
	16	Furnishing and handling reinforcement		10,730,000	LB	\$0.60	\$6,438,00
	17	Installing new track rails for gantry cranes		85,000	LB	\$3.50	\$297,50
	18	Dismantling, modifying and reinstalling gantry cranes		1	LS	\$1,000,000.00	\$1,000,00
		Subtotal (sheet 1 of 3)					\$52,347,00

QUANTITIES		PRICES	
BY S. Higinbotham	CHECKED	BY T. Artichoker	CHECKED
DATE PREPARED	APPROVED	DATE 01/08/04	PRICE LEVEL Appraisal

CODE:D-8170

ESTIMATE WORKSHEET

SHEET_3_OF_3

PLANT ACCT.		PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT																											
FEATURE:			08-Jan-04	PROJECT:																															
Friant Dam Raise 25 Foot Raise Option				FRIANT DAM																															
WOID: UPSJS				DIVISION:																															
				FILE: \\ussac1s-muni1\Jobs\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joa_in_Phase_1\Documents\Surface Storage Option TMs\TM Friant\USBR																															
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td colspan="4" style="text-align: center;">QUANTITIES</td> <td colspan="5" style="text-align: center;">PRICES</td> </tr> <tr> <td colspan="3">BY S. Higinbotham</td> <td colspan="2">CHECKED</td> <td colspan="2">BY T. Artichoker</td> <td colspan="2">CHECKED</td> </tr> <tr> <td colspan="3">DATE PREPARED</td> <td colspan="2">APPROVED</td> <td colspan="2">DATE 01/08/04</td> <td colspan="2">PRICE LEVEL Appraisal</td> </tr> </table>									QUANTITIES				PRICES					BY S. Higinbotham			CHECKED		BY T. Artichoker		CHECKED		DATE PREPARED			APPROVED		DATE 01/08/04		PRICE LEVEL Appraisal	
QUANTITIES				PRICES																															
BY S. Higinbotham			CHECKED		BY T. Artichoker		CHECKED																												
DATE PREPARED			APPROVED		DATE 01/08/04		PRICE LEVEL Appraisal																												
		35	Zone 3 shell material: (Sand, Gravel, Cobbles, Boulders from Stockpile)		114,000	CY	\$7.00	\$798,000																											
		36	Zone 2 filter material (Processed SP material)		60,000	CY	\$25.00	\$1,500,000																											
		37	Zone 1 material (Select CL, SC, SM, ML and GC materials) Core material		129,000	CY	\$10.00	\$1,290,000																											
			Subtotal (sheet 1)					\$52,347,000																											
			Subtotal (sheet 2)					\$11,490,600																											
			Subtotal (sheet 3)					\$3,588,000																											
			Subtotal					\$67,425,600																											
		40	Mobilization		(+/-)		5%	\$3,400,000																											
			Subtotal					\$70,825,600																											
			Unlisted Items		(+/-)		15%	\$10,174,400																											
			Contract Cost					\$81,000,000																											
			Contingencies		(+/-)		30%	\$24,000,000																											
			Field Cost					\$105,000,000																											

CODE:D-8170

ESTIMATE WORKSHEET

SHEET_1__ OF _3__

FEATURE:		08-Jan-04	PROJECT:				
Friant Dam Raise 60 Foot Raise Option			FRIANT DAM				
WOID: UPSJS			DIVISION:				
			FILE: \\Ussac1s-muni1\Jobs\US_Bureau_Reclamation\DIQ_01CS20210B\Upper_San_Joa_n_Phase_1\Documents\Surface Storage Option TMs\TM Friant\USBR				
PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	1	Diversion and care of river		1	LS	\$750,000.00	\$750,000
	2	Excavation, all classes, for dam foundation		355,400	CY	\$10.00	\$3,554,000
	3	Excavation, concrete		30,000	CY	\$200.00	\$6,000,000
	4	Backfill		144,000	CY	\$5.00	\$720,000
	5	RCC in dam		934,000	CY	\$40.00	\$37,360,000
	6	Concrete in spillway crest and piers		13,600	CY	\$240.00	\$3,264,000
	7	Concrete in spillway training walls		4,300	CY	\$320.00	\$1,376,000
	8	Concrete in stilling basin walls		3,200	CY	\$340.00	\$1,088,000
	9	Concrete in stilling basin floors and aprons		24,900	CY	\$185.00	\$4,606,500
	10	Concrete in sidewalks, curbs and parapets on dam		3,200	CY	\$370.00	\$1,184,000
	11	Furnishing and handling cement		208,000	TONS	\$95.00	\$19,760,000
	12	Furnishing and handling reinforcement		7,380,000	LB	\$0.60	\$4,428,000
	13	Installing new track rails for gantry cranes		85,000	LB	\$3.50	\$297,500
	14	Dismantling, modifying and reinstalling gantry cranes		1	LS	\$1,000,000.00	\$1,000,000
	15	Moving, modifying and resettling gantry cranes (assume redundant and deleted)		1	LS	\$0.00	\$0
	16	Installing outlet pipe extensions		335,000	LB	\$2.50	\$837,500
	17	Replacing wheel gates and outlet valves		1	LS	\$4,000,000	\$4,000,000
	18	Dismantling existing drum gate		1	LS	\$405,000.00	\$405,000
		Subtotal (1 of 3)					\$90,630,500
QUANTITIES			PRICES				
BY S. Higinbotham		CHECKED		BY T. Artichoker		CHECKED	
DATE PREPARED		APPROVED		DATE 01/08/04		PRICE LEVEL Appraisal	

CODE:D-8170

ESTIMATE WORKSHEET

SHEET 2 OF 3

FEATURE:		08-Jan-04		PROJECT:			
Friant Dam Raise 60 Foot Raise Option		FRIANT DAM		DIVISION:			
				FILE:			
				C:\Artichoker\Appraisal-Feasibility Estimates\Friant Dam Alternatives\FRIANT60.WK4\B			
WOID: UPSJS							
PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	19	Dismantling existing crest gates		1	LS	\$150,000.00	\$150,000
	20	Dismantling control system for crest gates		1	LS	\$13,000.00	\$13,000
	21	Reinstalling crest gates		1	LS	\$165,000.00	\$165,000
	22	Reinstalling control system for crest gates		1	LS	\$50,000.00	\$50,000
	23	Furnishing and installing one new crest gate		1	LS	\$1,500,000	\$1,500,000
	24	Installing control system for new crest gate		1	LS	\$25,000.00	\$25,000
	25	Furnishing and installing flat drains		54,000	LF	\$22.00	\$1,188,000
	26	Setup for foundation drain drilling		327	EA	\$200.00	\$65,400
	27	Foundation drain drilling outside the gallery		210,000	FT	\$35.00	\$7,350,000
	28	Clearing and grubbing 6" to waste		45	AC	\$3,500.00	\$157,500
	29	Excavation		405,000	CY	\$7.50	\$3,037,500
	30	U/S slope protection		199,000	CY	\$10.00	\$1,990,000
	31	D/S slope protection		193,000	CY	\$10.00	\$1,930,000
	32	Zone 3 material: (Sand, Gravel, Cobbles, Boulders from Borrow)					
		U/S		1,230,000	CY	\$11.00	\$13,530,000
		D/S		502,000	CY	\$11.00	\$5,522,000
	33	Filter material (Processed SP material)					
		U/S		154,000	CY	\$18.00	\$2,772,000
		D/S		205,000	CY	\$18.00	\$3,690,000
		Subtotal (2 of 3)					\$43,135,400
QUANTITIES				PRICES			
BY		CHECKED		BY		CHECKED	
S. Higinbotham				T. Artichoker			
DATE PREPARED		APPROVED		DATE		PRICE LEVEL	
				01/08/04		Appraisal	

CODE:D-8170

ESTIMATE WORKSHEET

SHEET 3 OF 3

FEATURE:		08-Jan-04	PROJECT:				
Friant Dam Raise 60 Foot Raise Option			FRIANT DAM				
WOID: UPSJS			DIVISION:				
			FILE: \\Ussac1s-muni1\Jobs\US_Bureau_Reclamation\DIQ_01CS20210B\Upper_San...in_Phase_1\Documents\Surface Storage Option TMs\TM Friant\USBR				
PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	34	Zone 1 material (Select CL, SC, SM, ML and GC materials) Core material		972,000	CY	\$8.00	\$7,776.00
	35	D/S Filter and drainage blanket:					
		Processed GP materials		366,000	CY	\$18.00	\$6,588.00
		12-in dia perforated, corrug. HDPE drain pipe		3,800	LF	\$12.00	\$45,600.00
		Manholes, 5-ft dia, 20-ft high		50	EA	\$7,000.00	\$350,000.00
		Weirs		50	EA	\$700.00	\$35,000.00
		Foundation Treatment (grout curtain)		1	LS	\$1,100,000.00	\$1,100,000.00
	36	Concrete facing elements (upstream and downstream)		116,000	CY	\$80.00	\$9,280,000.00
	37	Concrete cap on top of dam		5,000	CY	\$250.00	\$1,250,000.00
	38	Leveling concrete in dam foundation		5,500	CY	\$200.00	\$1,100,000.00
	39	Concrete for drainage gallery		6,000	CY	\$300.00	\$1,800,000.00
		Subtotal (1 of 3)					\$90,630,500.00
		Subtotal (2 of 3)					\$43,135,400.00
		Subtotal (3 of 3)					\$29,324,600.00
		SUBTOTAL					\$163,090,500.00
	40	Mobilization		(+/-)		5%	\$8,200,000.00
		Subtotal					\$171,290,500.00
		Unlisted Items		(+/-)		15%	\$23,709,500.00
		Contract Cost					\$195,000,000.00
		Contingencies		(+/-)		30%	\$59,000,000.00
		Field Cost					\$254,000,000.00
QUANTITIES			PRICES				
BY		CHECKED	BY		CHECKED		
S. Higinbotham			T. Artichoker				
DATE PREPARED		APPROVED	DATE		PRICE LEVEL		
			01/08/04		Appraisal		

CODE:D-8170

ESTIMATE WORKSHEET

SHEET 1 OF 3

FEATURE: <p style="text-align: center;">Friant Dam Raise 140 Foot Raise Option</p>	08-Jan-04	PROJECT: <p style="text-align: center;">FRIANT DAM</p>
		DIVISION:
WOID: UPSJS		FILE: \\Ussac1s-muni1\Jobs\US_Bureau_Reclamation\IDIQ_01CS20210B\Upper_San_Joaq Phase_1\Documents\Surface Storage Option TMs\TM Friant\USBR

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	1	Diversion and care of river		1	LS	\$1,000,000.00	\$1,000,000
	2	Excavation, all classes, for dam foundation		900,000	CY	\$10.00	\$9,000,000
	3	Excavation, concrete		30,000	CY	\$200.00	\$6,000,000
	4	Backfill		300,000	CY	\$4.50	\$1,350,000
	5	RCC in dam		3,880,000	CY	\$33.00	\$128,040,000
	6	Concrete in spillway crest and piers		13,600	CY	\$240.00	\$3,264,000
	7	Concrete in spillway training walls		4,300	CY	\$320.00	\$1,376,000
	8	Concrete in stilling basin walls		3,200	CY	\$340.00	\$1,088,000
	9	Concrete in stilling basin floors and aprons		24,900	CY	\$185.00	\$4,606,500
	10	Concrete in sidewalks, curbs and parapets on dam		6,300	CY	\$370.00	\$2,331,000
	11	Furnishing and handling cement		652,000	TONS	\$90.00	\$58,680,000
	12	Furnishing and handling reinforcement		7,845,000	LB	\$0.60	\$4,707,000
	13	Installing new track rails for gantry cranes		85,000	LB	\$3.50	\$297,500
	14	Dismantling, modifying and reinstalling gantry cranes		1	LS	\$1,000,000.00	\$1,000,000
	15	Moving, modifying and resettling gantry cranes (assume redundant and deleted)		1	LS	\$0.00	\$0
	16	Installing outlet pipe extensions		915,000	LB	\$2.00	\$1,830,000
	17	Replacing wheel gates and outlet valves		1	LS	\$4,000,000	\$4,000,000
	18	Dismantling existing drum gate		1	LS	\$405,000.00	\$405,000
		Subtotal (1 of 3)					\$228,975.00

QUANTITIES		PRICES	
BY S. Higinbotham	CHECKED	BY T. Artichoker	CHECKED
DATE PREPARED	APPROVED	DATE 01/08/04	PRICE LEVEL Appraisal

CODE:D-8170

ESTIMATE WORKSHEET

SHEET_2_OF_3

FEATURE: <p style="text-align: center;">Friant Dam Raise 140 Foot Raise Option</p>	08-Jan-04	PROJECT: <p style="text-align: center;">FRIANT DAM</p>
		DIVISION:
WOID: UPSJS		FILE: \\Ussac1s-muni1\Jobs\US_Bureau_Reclamation\DIQ_01CS20210B\Upper_San_Jo uin_Phase_1\Documents\Surface Storage Option TMs\TM Friant\USBR

PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	19	Dismantling existing crest gates		1	LS	\$150,000.00	\$150,000
	20	Dismantling control system for crest gates		1	LS	\$13,000.00	\$13,000
	21	Reinstalling crest gates		1	LS	\$165,000.00	\$165,000
	22	Reinstalling control system for crest gates		1	LS	\$50,000.00	\$50,000
	23	Furnishing and installing one new crest gate		1	LS	\$1,500,000	\$1,500,000
	24	Installing control system for new crest gate		1	LS	\$25,000.00	\$25,000
	25	Furnishing and installing flat drains		54,000	LF	\$22.00	\$1,188,000
	26	Setup for foundation drain drilling		327	EA	\$200.00	\$65,400
	27	Foundation drain drilling, outside the gallery		262,000	FT	\$33.00	\$8,646,000
	28	Clearing and grubbing 6" to waste		165	AC	\$3,500.00	\$577,500
	29	Excavation		1,500,000	CY	\$7.00	\$10,500,000
	30	U/S slope protection		572,000	CY	\$9.00	\$5,148,000
	31	D/S slope protection		643,000	CY	\$9.00	\$5,787,000
	32	Zone 3 material: (Sand, Gravel, Cobbles, Boulders from Borrow)					
		U/S		5,602,000	CY	\$8.00	\$44,816,000
		D/S		3,914,000	CY	\$8.00	\$31,312,000
	33	Filter material (Processed SP material)					
		U/S material		484,000	CY	\$16.00	\$7,744,000
		D/S material		632,000	CY	\$16.00	\$10,112,000
		Subtotal (2 of 3)					\$127,798,900

QUANTITIES		PRICES	
BY S. Higinbotham	CHECKED	BY T. Artichoker	CHECKED
DATE PREPARED	APPROVED	DATE 01/08/04	PRICE LEVEL Appraisal

CODE:D-8170

ESTIMATE WORKSHEET

SHEET 3 OF 3

FEATURE: <p style="text-align: center;">Friant Dam Raise 140 Foot Raise Option</p>		08-Jan-04	PROJECT: <p style="text-align: center;">FRIANT DAM</p>				
			DIVISION:				
			FILE: \\Ussac1s-muni1\Jobs\US_Bureau_Reclamation\NDIQ_01CS20210B\Upper_San_Joaquin_Phase_1\Documents\Surface Storage Option TMs\TM Friant\USBR				
WOID: UPSJS							
PLANT ACCT.	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	34	Zone 1 material (Select CL, SC, SM, ML and GC materials)					
		Core material		3,358,000	CY	\$7.00	\$23,506,000
	35	D/S Filter and drainage blanket:					
		Processed GP materials		1,410,000	CY	\$17.00	\$23,970,000
		12-in dia perforated, corrug. HDPE drain pipe		14,000	LF	\$12.00	\$168,000
		Manholes, 5-ft dia, 20-ft high		50	EA	\$7,000.00	\$350,000
		Weirs		50	EA	\$700.00	\$35,000
		Foundation Treatment (grout curtain)		1	LS	\$1,100,000.00	\$1,100,000
	36	Concrete facing elements (upstream and downstream)		116,000	CY	\$80.00	\$9,280,000
	37	Concrete cap on top of dam		5,000	CY	\$250.00	\$1,250,000
	38	Leveling concrete in dam foundation		13,000	CY	\$200.00	\$2,600,000
	39	Concrete for drainage gallery		6,000	CY	\$300.00	\$1,800,000
		Subtotal (1 of 3)					\$228,975,000.00
		Subtotal (2 of 3)					\$127,798,900.00
		Subtotal (3 of 3)					\$64,059,000.00
		SUBTOTAL					\$420,832,900.00
	40	Mobilization		(+/-)		5%	\$21,000,000
		Subtotal					\$441,832,900
		Unlisted Items		(+/-)		15%	\$68,167,100
		Contract Cost					\$510,000,000
		Contingencies		(+/-)		30%	\$153,000,000
		Field Cost					\$663,000,000
QUANTITIES			PRICES				
BY S. Higinbotham		CHECKED		BY T. Artichoker		CHECKED	
DATE PREPARED		APPROVED		DATE 01/08/04		PRICE LEVEL Appraisal	

CONTRACT COST FOR ADDITIONAL FRIANT GENERATION CAPACITIES

Cost per MW \$2,000,000

Description	Amount
5 MW Additional Generation Capacity at Friant Dam	
Cost at \$2 million per MW of replaced capacity	\$10,000,000
Mobilization (5%)	\$500,000
Subtotal	\$10,500,000
Unlisted items (~15%)	\$1,500,000
Contract Cost for 4.7MW of Additional Capacity	\$12,000,000
13 MW Additional Generation Capacity at Friant Dam	
Cost at \$2 million per MW	\$26,000,000
Mobilization (5%)	\$1,300,000
Subtotal	\$27,300,000
Unlisted items (~15%)	\$3,700,000
Contract Cost for 12.9MW of Additional Capacity	\$31,000,000
30 MW Additional Generation Capacity at Friant Dam	
Cost at \$2 million per MW	\$60,000,000
Mobilization (5%)	\$3,000,000
Subtotal	\$63,000,000
Unlisted items (~15%)	\$9,000,000
Contract Cost for 30.4MW of Additional Capacity	\$72,000,000