Attachment F

Monte Carlo Simulation Reports

BUREAU OF RECLAMATION

ESTIMATE WORKSHEET

FEATURE:

REVISION #1
Klamath River Dams Removal
Full Removal Option
Copco No. 1 Dam & Powerplant Removal
Escalation Included
SUMMARY ESTIMATE

PROJECT: Klamath River, Northern California/Southern Oregon

WOID: AF652 | **ESTIMATE LEVEL:** Feasibility
REGION: MP | **PRICE LEVEL:** Jul-2010
FILE: C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 1\[Copco 1 - Full Removal Crystal Ball - with Escalation - 2011-04.xls]Copco 1 - Full - with Esc

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	MPL QUANTITY	MP QUANTITY	MPH QUANTITY	UNIT	MPL UNIT PRICE	MP UNIT PRICE	MPH UNIT PRICE	MPL TOTAL	MP TOTAL	MPH TOTAL
	1	Furnish, Install, and Remove Barge-Mounted Crane in Reservoir for Dam Removal	8130	1	1	1	LS	$340,000.00	$350,000.00	$370,000.00	$340,000.00	$350,000.00	$370,000.00
	2	Remove Sediment from Diversion Tunnel Intake to provide access	8130	30	30	30	CY	$1,700.00	$2,000.00	$3,000.00	$51,000.00	$60,000.00	$90,000.00
	3	Furnish, Install, and Remove Large Crane on Right Abutment	8130	1	1	1	LS				$0.00	$0.00	$0.00
	4	Remove Water from behind Tailrace Cofferdam	8130	200,000	200,000	200,000	GAL	$0.01	$0.01	$0.01	$2,000.00	$2,000.00	$2,000.00
	5	Riprap Protection on Cofferdam	8130	260	260	260	CY	$120.00	$150.00	$200.00	$31,200.00	$39,000.00	$52,000.00
	6	Provide Dewatering behind Tailrace Cofferdam	8130	1	1	1	LS	$30,000.00	$35,000.00	$200,000.00	$30,000.00	$35,000.00	$200,000.00
	7	Remove Current Diversion Tunnel Plug	8130	195	195	195	CY	$1,400.00	$1,500.00	$1,800.00	$273,000.00	$292,500.00	$351,000.00
	8	Construct Embankment Cofferdam in Tailrace	8130	1,700	1,700	1,700	CY	$70.00	$85.00	$130.00	$119,000.00	$144,500.00	$221,000.00
	9	Furnish, Install & Remove 3-6'x6' Fabricated Slide Gates	8420	40,500	40,500	40,500	LBS	$12.00	$15.00	$18.00	$486,000.00	$607,500.00	$729,000.00
	10	Remove Concrete Dam down to Elev. 2476	8130	36,000	36,000	36,000	CY	$290.00	$300.00	$320.00	$10,440,000.00	$10,800,000.00	$11,520,000.00
	11	Remove Concrete Intake Structure on Right Abutment	8130	21,000	21,000	21,000	CY	$340.00	$350.00	$390.00	$7,140,000.00	$7,350,000.00	$8,190,000.00
	12	Remove Structural Steel from Spillway	8130	55,000	55,000	55,000	LBS	$0.70	$1.00	$1.50	$38,500.00	$55,000.00	$82,500.00
	13	Install Diversion Tunnel Plugs	8130	30	30	30	CY	$1,100.00	$1,200.00	$1,300.00	$33,000.00	$36,000.00	$39,000.00
	14	Remove Diversion Tunnel Control Structure Concrete	8130	350	350	350	CY	$170.00	$215.00	$380.00	$59,500.00	$75,250.00	$133,000.00
	15	Remove & Dispose of Hand Rails	8420	11,000	11,000	11,000	LBS	$0.70	$1.00	$1.50	$7,700.00	$11,000.00	$16,500.00
	16	Remove & Dispose of Radial Gates	8420	140,500	140,500	140,500	LBS	$0.70	$1.00	$1.50	$98,350.00	$140,500.00	$210,750.00
	17	Remove & Dispose of Radial Gate stoplogs	8420	18,000	18,000	18,000	LBS	$0.70	$1.00	$1.50	$12,600.00	$18,000.00	$27,000.00
	18	Remove & Dispose of Stoplog hoist, track and supports	8420	26,000	26,000	26,000	LBS	$0.70	$1.00	$1.50	$18,200.00	$26,000.00	$39,000.00
	19	Remove & Dispose of 3 sections of 23' of 72"Ø steel lining (embedded)	8420	54,000	54,000	54,000	LBS	$0.60	$0.85	$1.00	$32,400.00	$45,900.00	$54,000.00
	20	Remove & Dispose of 3 - 72" butterfly valves (embedded)	8420	55,000	55,000	55,000	LBS	$0.60	$0.85	$5.00	$33,000.00	$46,750.00	$275,000.00
	21	Remove & Dispose of 3-72" flapper valves with remote mechanical	8420	78,000	78,000	78,000	LBS	$2.50	$3.00	$5.00	$195,000.00	$234,000.00	$390,000.00
	22	Remove & Dispose of Spillway gate motor & control panel	8430	1	1	1	EA	$900.00	$1,000.00	$1,500.00	$900.00	$1,000.00	$1,500.00
	23	Remove & Dispose of Distribution equipment , panelboards	8430	1	1	1	EA	$5,000.00	$6,000.00	$7,000.00	$5,000.00	$6,000.00	$7,000.00
	24	Remove Powerhouse Concrete down to top of rock under the Powerhouse	8130	3,100	3,100	3,100	CY	$270.00	$350.00	$1,000.00	$837,000.00	$1,085,000.00	$3,100,000.00
	25	Remove Powerhouse Structural Steel	8130	110,000	110,000	110,000	LBS	$0.60	$0.85	$1.00	$66,000.00	$93,500.00	$110,000.00
	26	Remove & Dispose of 2 - Governor oil systems	8420	38,000	38,000	38,000	LBS	$0.60	$0.85	$1.00	$22,800.00	$32,300.00	$38,000.00
	27	Remove & Dispose of Cooling water and bearing oil systems	8420	11,000	11,000	11,000	LBS	$0.60	$0.85	$1.00	$6,600.00	$9,350.00	$11,000.00
	28	Remove & Dispose of 4 - Horizontal Tandem Francis Turbines	8420	452,000	452,000	452,000	LBS	$0.60	$0.85	$1.00	$271,200.00	$384,200.00	$452,000.00
	29	Remove & Dispose of 2 - 40 Ton indoor cranes	8420	140,000	140,000	140,000	LBS	$0.60	$0.85	$1.00	$84,000.00	$119,000.00	$140,000.00
	30	Remove & Dispose of Compressed Air system	8420	1,000	1,000	1,000	LBS	$0.60	$0.85	$1.00	$600.00	$850.00	$1,000.00
	31	Remove & Dispose of 2 - CO2 systems	8420	3,100	3,100	3,100	LBS	$0.60	$0.85	$1.00	$1,860.00	$2,635.00	$3,100.00
	32	Remove & Dispose of Plant Water and Fire Protection	8420	2,600	2,600	2,600	LBS	$0.60	$0.85	$1.00	$1,560.00	$2,210.00	$2,600.00
	33	Remove & Dispose of Transformer Oil Fire protection	8420	5,400	5,400	5,400	LBS	$0.60	$0.85	$1.00	$3,240.00	$4,590.00	$5,400.00
	34	Remove & Dispose of Unwatering Piping	8420	27,000	27,000	27,000	LBS	$0.60	$0.85	$1.00	$16,200.00	$22,950.00	$27,000.00
	35	Remove & Dispose of Drainage Piping	8420	5,000	5,000	5,000	LBS	$0.60	$0.85	$1.00	$3,000.00	$4,250.00	$5,000.00
	36	Remove & Dispose of Horizontal AC Generator, Indoor Open Frame	8430	2	2	2	EA	$30,000.00	$35,000.00	$40,000.00	$60,000.00	$70,000.00	$80,000.00
	37	Remove & Dispose of Excitation equipment for 12.5 MVA Generator	8430	2	2	2	EA	$5,000.00	$6,000.00	$7,000.00	$10,000.00	$12,000.00	$14,000.00
	38	Remove & Dispose of Surge protection equip. for 12.5 MVA Generator	8430	2	2	2	EA	$1,500.00	$2,000.00	$3,000.00	$3,000.00	$4,000.00	$6,000.00
	39	Remove & Dispose of Neutral grounding equip. for 12.5 MVA Generator	8430	2	2	2	EA	$1,500.00	$2,000.00	$3,000.00	$3,000.00	$4,000.00	$6,000.00
	40	Remove & Dispose of Generator Switchgear, 5kV-includes unit breakers	8430	1	1	1	EA	$15,000.00	$20,000.00	$25,000.00	$15,000.00	$20,000.00	$25,000.00
	41	Remove & Dispose of Station Service Switchgear, 600 volt -(5 sections)	8430	1	1	1	EA	$15,000.00	$20,000.00	$25,000.00	$15,000.00	$20,000.00	$25,000.00
	42	Remove & Dispose of Unit and plant control switchboard	8430	1	1	1	EA	$14,000.00	$15,000.00	$17,000.00	$14,000.00	$15,000.00	$17,000.00
	43	Remove & Dispose of Battery system	8430	1	1	1	EA	$9,000.00	$10,000.00	$12,000.00	$9,000.00	$10,000.00	$12,000.00
	44	Remove & Dispose of Raceways, Conduit and Cable	8430	1	1	1	EA	$14,000.00	$15,000.00	$17,000.00	$14,000.00	$15,000.00	$17,000.00
	45	Remove & Dispose of Misc. power & control boards	8430	1	1	1	EA	$4,000.00	$5,000.00	$7,000.00	$4,000.00	$5,000.00	$7,000.00
	46	Remove & Dispose of Step-up Transformers, indoor, oil-filled, 1-phase, 5000kVA	8430	3	3	3	EA	$40,000.00	$50,000.00	$60,000.00	$120,000.00	$150,000.00	$180,000.00
	47	Remove & Dispose of Step-up Transformers, indoor, oil-filled, 1-phase, 4165 kVA	8430	3	3	3	EA	$40,000.00	$50,000.00	$60,000.00	$120,000.00	$150,000.00	$180,000.00

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	48	Remove & Dispose of Seven 40-Ton Travelling Crane motors - hoist	8430	1	1	1	EA	$2,000.00	$2,500.00	$3,000.00	$2,000.00	$2,500.00	$3,000.00
	49	Remove & Dispose of 40-Ton Travelling Crane control equipment	8430	1	1	1	EA	$9,000.00	$10,000.00	$12,000.00	$9,000.00	$10,000.00	$12,000.00
	50	Remove & Dispose of 40-Ton Travelling Crane Festoon Cable	8430	1	1	1	EA	$1,000.00	$1,500.00	$2,000.00	$1,000.00	$1,500.00	$2,000.00
	51	Remove & Dispose of Four 15-Ton Overhead Crane motors - hoist	8430	1	1	1	EA	$900.00	$1,000.00	$1,300.00	$900.00	$1,000.00	$1,300.00
	52	Remove & Dispose of 15-Ton Overhead Crane control equipment	8430	1	1	1	EA	$250.00	$300.00	$350.00	$250.00	$300.00	$350.00
	53	Remove & Dispose of 15-Ton Overhead Crane Festoon Cable	8430	1	1	1	EA	$400.00	$500.00	$600.00	$400.00	$500.00	$600.00
	54	Remove & Dispose of 69-kV circuit breakers, oil-filled, PCB	8430	2	2	2	EA	$2,500.00	$3,000.00	$3,500.00	$5,000.00	$6,000.00	$7,000.00
	55	Remove & Dispose of 69-kV disconnect switches, group-operated	8430	2	2	2	EA	$1,000.00	$1,500.00	$2,000.00	$2,000.00	$3,000.00	$4,000.00
	56	Remove & Dispose of 60-foot wood poles	8430	12	12	12	EA	$900.00	$1,000.00	$1,300.00	$10,800.00	$12,000.00	$15,600.00
	57	Remove & Dispose of 30-foot wood crossarms	8430	24	24	24	EA	$400.00	$500.00	$600.00	$9,600.00	$12,000.00	$14,400.00
	58	Remove & Dispose of 69-kV insulator strings	8430	12	12	12	EA	$300.00	$400.00	$500.00	$3,600.00	$4,800.00	$6,000.00
	59	Remove & Dispose of Transmission Line No. 3	8430	1.66	1.66	1.66	MILE	$25,000.00	$30,000.00	$40,000.00	$41,500.00	$49,800.00	$66,400.00
	60	Remove & Dispose of Transmission Line No. 15	8430	1.23	1.23	1.23	MILE	$25,000.00	$30,000.00	$40,000.00	$30,750.00	$36,900.00	$49,200.00
	61	Remove & Dispose of Transmission Line No. 26-1	8430	0.07	0.07	0.07	MILE	$25,000.00	$30,000.00	$40,000.00	$1,750.00	$2,100.00	$2,800.00
	62	Remove & Dispose of Transmission Line No. 26-2	8430	0.07	0.07	0.07	MILE	$25,000.00	$30,000.00	$40,000.00	$1,750.00	$2,100.00	$2,800.00
	63	Remove gate house #1 from top of dam	8130	570	570	570	SF	$55.00	$60.00	$65.00	$31,350.00	$34,200.00	$37,050.00
	64	Remove gate house #2 from top of dam	8130	690	690	690	SF	$55.00	$60.00	$65.00	$37,950.00	$41,400.00	$44,850.00
	65	Remove Concrete Items associated with 10 ft. diam. Penstocks, reinf. Concrete	8130	1,050	1,050	1,050	CY	$170.00	$215.00	$380.00	$178,500.00	$225,750.00	$399,000.00
	66	Plug 14-foot diameter penstock with concrete	8130	23	23	23	CY	$1,100.00	$1,200.00	$1,500.00	$25,300.00	$27,600.00	$34,500.00
	67	Remove & Dispose of 8 screens	8420	18,000	18,000	18,000	LBS	$0.60	$0.85	$1.00	$10,800.00	$15,300.00	$18,000.00
	68	Remove & Dispose of 8 Water Gates	8420	18,000	18,000	18,000	LBS	$0.60	$0.85	$1.00	$10,800.00	$15,300.00	$18,000.00
	69	Remove & Dispose of 3 - 30"Ø x 25' stand pipes	8420	6,000	6,000	6,000	LBS	$0.60	$0.85	$1.00	$3,600.00	$5,100.00	$6,000.00
	70	Remove & Dispose of 14' Ø penstock pipe	8420	256,000	256,000	256,000	LBS	$0.60	$0.85	$1.00	$153,600.00	$217,600.00	$256,000.00
	71	Remove & Dispose of 10' Ø penstock pipe	8140	270,000	270,000	270,000	LBS	$0.60	$0.85	$1.00	$162,000.00	$229,500.00	$270,000.00
	72	Temporary Access Roads	8220	7	7	7	MILE	$60,000.00	$50,000.00	$100,000.00	$420,000.00	$350,000.00	$700,000.00
	73	Spring Ground Seeding	8220	420	420	0	ACRES	$3,000.00	$3,500.00	$4,000.00	$1,260,000.00	$1,470,000.00	$0.00
	74	Spring Barge Seeding	8220	82	82	0	ACRES	$5,000.00	$6,500.00	$8,000.00	$410,000.00	$533,000.00	$0.00
	75	Spring Aerial Seeding	8220	300	300	802	ACRES	$6,500.00	$7,500.00	$15,000.00	$1,950,000.00	$2,250,000.00	$12,030,000.00
	76	Fall Ground Seeding	8220	201	401	602	ACRES	$3,000.00	$3,500.00	$4,000.00	$603,000.00	$1,403,500.00	$2,408,000.00
	77	Riparian Pole Planting	8220	170	170	170	ACRES	$4,000.00	$8,500.00	$10,000.00	$680,000.00	$1,445,000.00	$1,700,000.00
	78	Weed Management	8220	201	401	602	ACRES	$1,000.00	$1,500.00	$2,000.00	$201,000.00	$601,500.00	$1,204,000.00
	79	Fall Ground Seeding	8220	321	321	321	ACRES	$3,000.00	$3,500.00	$4,000.00	$963,000.00	$1,123,500.00	$1,284,000.00
	80	Weed Management	8220	321	321	321	ACRES	$1,000.00	$1,500.00	$2,000.00	$321,000.00	$481,500.00	$642,000.00
	81	Sitework - Clear and Grub Disposal Area	8313	7	7	7	ACRES	$5,000.00	$6,000.00	$7,000.00	$35,000.00	$42,000.00	$49,000.00
	82	Sitework - Soil Cover for Disposal Area	8313	23,000	23,000	35,000	CY	$45.00	$50.00	$60.00	$1,035,000.00	$1,150,000.00	$2,100,000.00
	83	Access/Haul Road Improvements - Soil Excavation	8313	4,500	4,500	9,000	CY	$12.00	$13.00	$14.00	$54,000.00	$58,500.00	$126,000.00
	84	Access/Haul Road Improvements - Rock Excavation	8313	4,500	4,500	9,000	CY	$35.00	$40.00	$45.00	$157,500.00	$180,000.00	$405,000.00
	85	Access/Haul Road Improvements - Soil Backfill	8313	16,000	16,000	30,000	CY	$45.00	$50.00	$55.00	$720,000.00	$800,000.00	$1,650,000.00
	86	Access/Haul Road Improvements - 4" Gravel Surfacing	8313	0	320	320	TON	$80.00	$100.00	$120.00	$0.00	$32,000.00	$38,400.00
	87	County Road Improvements - Asphalt Overlay Repair - Juniper Road	8313	3	3	3	MILE	$35,000.00	$40,000.00	$350,000.00	$105,000.00	$120,000.00	$1,050,000.00
	88	County Road Improvements - Asphalt Overlay Repair - Copco Road	8313	19	19	19	MILE	$35,000.00	$40,000.00	$350,000.00	$665,000.00	$760,000.00	$6,650,000.00
	89	Mallard Cove - Concrete total	BLM	106	106	106	CY	$200.00	$300.00	$400.00	$21,200.00	$31,800.00	$42,400.00
	90	Mallard Cove - 25'x5' Dock made of composite decking and poly floats	BLM	1	1	1	EA	$2,000.00	$2,500.00	$3,000.00	$2,000.00	$2,500.00	$3,000.00
	91	Mallard Cove - 20'x5' Gangway w/ aluminum frame and railings	BLM	1	1	1	EA	$1,500.00	$2,000.00	$2,500.00	$1,500.00	$2,000.00	$2,500.00
	92	Mallard Cove - Signs to be removed and hauled away	BLM	6	6	6	EA	$250.00	$300.00	$350.00	$1,500.00	$1,800.00	$2,100.00
	93	Mallard Cove - Wood plank tables to be removed and hauled away	BLM	8	8	8	EA	$90.00	$100.00	$120.00	$720.00	$800.00	$960.00
	94	Mallard Cove - Parking area to be regraded, ripped, seeded and planted	BLM	2.5	2.5	2.5	ACRES	$20,000.00	$25,000.00	$30,000.00	$50,000.00	$62,500.00	$75,000.00
	95	Copco Cove - Concrete total	BLM	84	84	84	CY	$200.00	$300.00	$400.00	$16,800.00	$25,200.00	$33,600.00

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	96	Copco Cove - Dock abutment railing made of 2.5" dia. steel pipe	BLM	25	25	25	LF	$35.00	$40.00	$45.00	$875.00	$1,000.00	$1,125.00
	97	Copco Cove - Signs to be removed and hauled away	BLM	6	6	6	EA	$250.00	$300.00	$350.00	$1,500.00	$1,800.00	$2,100.00
	98	Copco Cove - Wood plank tables to be removed and hauled away	BLM	2	2	2	EA	$90.00	$100.00	$120.00	$180.00	$200.00	$240.00
	99	Copco Cove - Regrade, rip, seed and plant disturbed areas	BLM	2.3	2.3	2.3	ACRES	$20,000.00	$25,000.00	$30,000.00	$46,000.00	$57,500.00	$69,000.00
		Subtotal 1									$31,603,385.00	$36,555,585.00	$61,003,625.00
		Mobilization (MPL ~ 5%; MP ~ 5%; MPH ~ 5%)		1	1	1	ls	$1,600,000.00	$1,850,000.00	$3,100,000.00	$1,600,000.00	$1,850,000.00	$3,100,000.00
		Subtotal 1 w/ mobilization											
		Escalation to Notice to Proceed (NTP)		1	1	1	ls	$5,330,499.00	$13,208,310.00	$34,262,933.00	$5,330,499.00	$13,208,310.00	$34,262,933.00
		from Unit Price Level (July 2010) to NTP (Jan. 2020)											
		MPL - 1.5% / year for 10 yr.; MP - 3.0% /year for 10 yr.; MPH - 4.375% / year for 10 yr.											
		Design Contingencies (MPL ~ 8%; MP ~ 10%; MPH ~ 15%)		1	1	1	ls	$3,466,116.00	$5,386,105.00	$14,371,011.00	$3,466,116.00	$5,386,105.00	$14,371,011.00
		APS = Allowance for Procurement		1	1	1	ls	$0.00	$0.00	$2,262,431.00	$0.00	$0.00	$2,262,431.00
		Strategies (if applicable) (MPL ~ 0%; MP ~ 0%; MPH ~ 2%)											
		CONTRACT COST									**$42,000,000.00**	**$57,000,000.00**	**$115,000,000.00**
		Construction Contingencies (MPL ~ 18%; MP ~ 20%; MPH ~ 25%)		1	1	1	ls	$7,000,000.00	$11,000,000.00	$30,000,000.00	$7,000,000.00	$11,000,000.00	$30,000,000.00
		FIELD COST									**$49,000,000.00**	**$68,000,000.00**	**$145,000,000.00**
		Non-Contract Cost (MPL ~ 52%; MP ~ 55%; MPH ~ 61%)		1	1	1	ls	$25,000,000.00	$37,000,000.00	$85,000,000.00	$25,000,000.00	$37,000,000.00	$85,000,000.00
		CONSTRUCTION COST									**$74,000,000.00**	**$105,000,000.00**	**$230,000,000.00**

Notes: This estimate does not include non-contract costs and should not be used for funding purposes.
Reference documents RM D&S Cost Estimate (FAC 09-01) and RM D&S CCE and PCE (FAC 09-02)

QUANTITIES			PRICES		
BY	See Group Worksheets	CHECKED: See Group Worksheets	BY	Craig Grush, P.E.	CHECKED 06-01-11
DATE PREPARED	1/20/2011	PEER REVIEW: See Group Worksheets	DATE PREPARED	06/01/11	PEER REVIEW DCO 6/3/11

Crystal Ball Report - Full
Simulation started on 6/8/2011 at 10:26:53
Simulation stopped on 6/8/2011 at 10:28:00

Run preferences:	
Number of trials run	10,000
Monte Carlo	
Seed	999
Precision control on	
Confidence level	95.00%
Run statistics:	
Total running time (sec)	66.84
Trials/second (average)	150
Random numbers per sec	31,117
Crystal Ball data:	
Assumptions	208
Correlations	0
Correlated groups	0
Decision variables	0
Forecasts	3

TECHNICAL SERVICE CENTER
ESTIMATING, SPECIFICATIONS
AND VALUE PROGRAM GROUP
UNIT PRICES BY Craig A. Grosh
DATE 6/8/2011

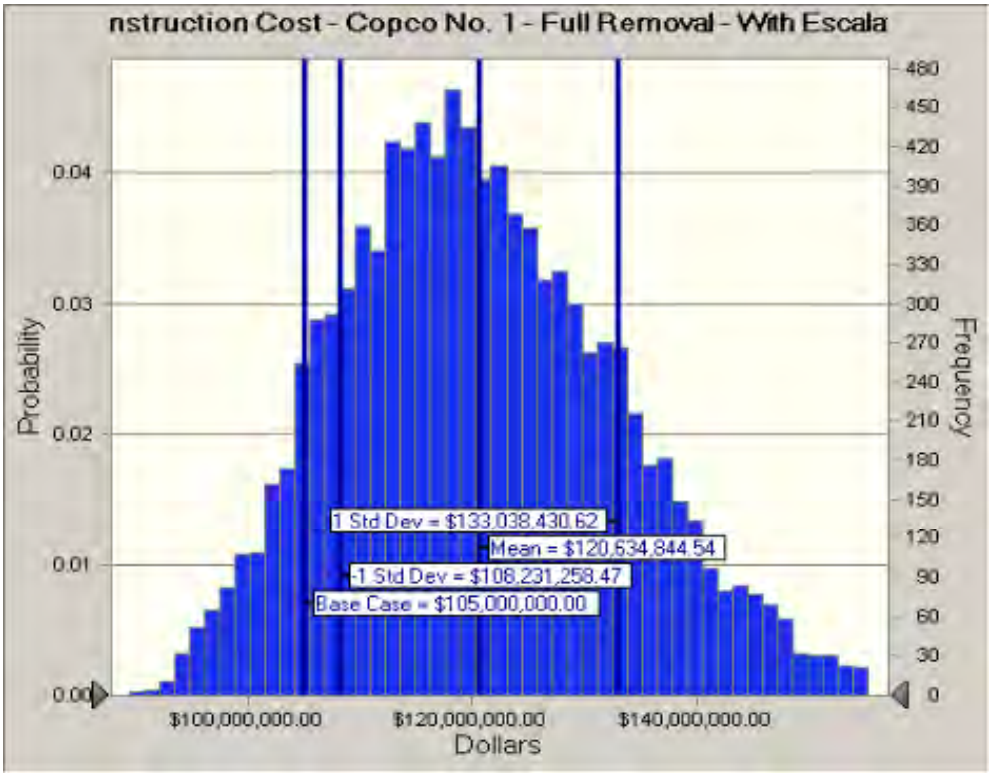
DATE	PEER REVIEWER(S)	CODE
6/8/11	Signature DAN MAAG Printed Name	8170
	Signature Printed Name	
Author Initials	PEER REVIEW NOT REQUIRED	

Forecasts

Worksheet: [Copco 1 - Full Removal Crystal Ball - with Escalation - 2011-04.xls]Copco 1 - Full

Forecast: Construction Cost - Copco No. 1 - Full Removal - With Escalation **Cell: U127**

Summary:
Entire range is from $89,364,741.19 to $169,714,225.48
Base case is $105,000,000.00
After 10,000 trials, the std. error of the mean is $124,035.86



Forecast: Construction Cost - Copco No. 1 - Full Removal - With Escalation (cont'd) **Cell: U127**

Statistics:	Forecast values
Trials	10,000
Mean	$120,634,844.54
Median	$119,596,193.96
Mode	---
Standard Deviation	$12,403,586.08
Variance	$153,848,947,534,112.00
Skewness	0.3670
Kurtosis	2.88
Coeff. of Variability	0.1028
Minimum	$89,364,741.19
Maximum	$169,714,225.48
Range Width	$80,349,484.29
Mean Std. Error	$124,035.86

Percentiles:	Forecast values
0%	$89,364,741.19
10%	$105,292,459.71
20%	$109,776,896.90
30%	$113,364,920.65
40%	$116,525,194.79
50%	$119,593,224.75
60%	$122,918,222.13
70%	$126,680,765.56
80%	$131,282,404.33
90%	$137,281,880.69
100%	$169,714,225.48

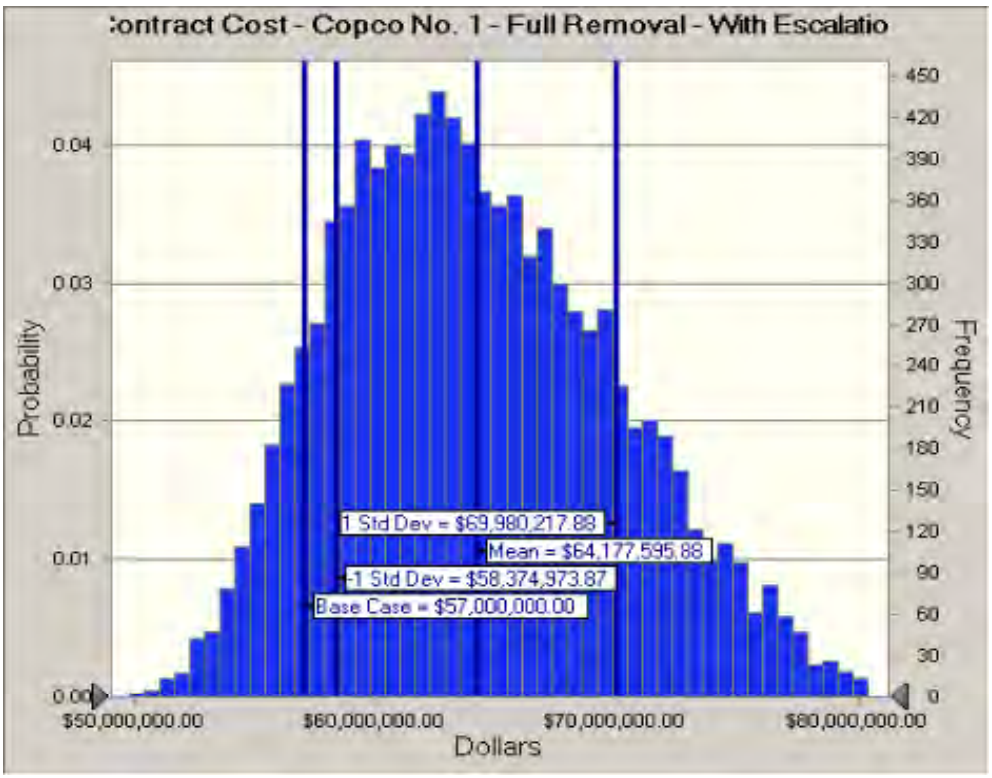
Forecast: Contract Cost - Copco No. 1 - Full Removal - With Escalation **Cell: U123**

Summary:

Entire range is from $49,768,503.14 to $84,015,344.40

Base case is $57,000,000.00

After 10,000 trials, the std. error of the mean is $58,026.22



Forecast: Contract Cost - Copco No. 1 - Full Removal - With Escalation (cont'd) **Cell: U123**

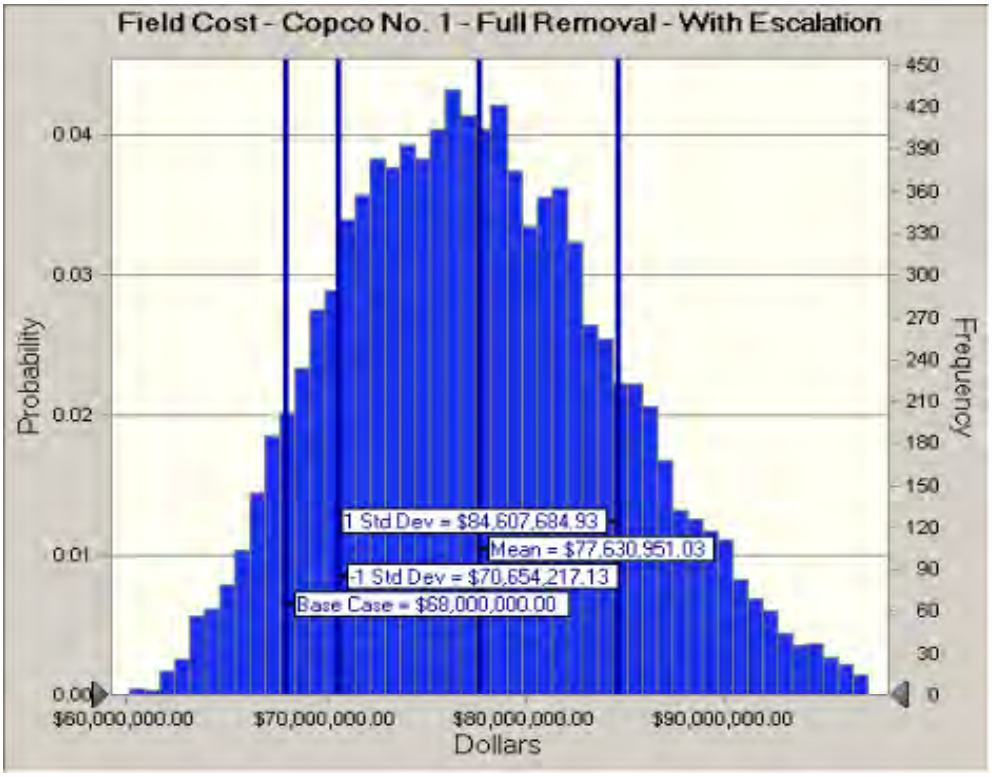
Statistics:	Forecast values
Trials	10,000
Mean	$64,177,595.88
Median	$63,613,707.88
Mode	---
Standard Deviation	$5,802,622.01
Variance	$33,670,422,145,439.20
Skewness	0.3751
Kurtosis	2.69
Coeff. of Variability	0.0904
Minimum	$49,768,503.14
Maximum	$84,015,344.40
Range Width	$34,246,841.25
Mean Std. Error	$58,026.22

Percentiles:	Forecast values
0%	$49,768,503.14
10%	$56,972,184.56
20%	$58,991,837.98
30%	$60,598,194.12
40%	$62,125,274.45
50%	$63,613,063.63
60%	$65,260,071.77
70%	$67,090,256.21
80%	$69,289,373.02
90%	$72,155,984.87
100%	$84,015,344.40

Forecast: Field Cost - Copco No. 1 - Full Removal - With Escalation **Cell: U125**

Summary:

Entire range is from $60,146,826.62 to $106,450,077.22
Base case is $68,000,000.00
After 10,000 trials, the std. error of the mean is $69,767.34



Forecast: Field Cost - Copco No. 1 - Full Removal - With Escalation (cont'd) **Cell: U125**

Statistics:	Forecast values
Trials	10,000
Mean	$77,630,951.03
Median	$77,192,942.66
Mode	---
Standard Deviation	$6,976,733.90
Variance	$48,674,815,930,974.30
Skewness	0.3216
Kurtosis	2.79
Coeff. of Variability	0.0899
Minimum	$60,146,826.62
Maximum	$106,450,077.22
Range Width	$46,303,250.60
Mean Std. Error	$69,767.34

Percentiles:	Forecast values
0%	$60,146,826.62
10%	$68,782,177.11
20%	$71,426,820.74
30%	$73,498,839.39
40%	$75,434,155.48
50%	$77,191,864.59
60%	$79,051,132.48
70%	$81,155,601.59
80%	$83,548,240.01
90%	$86,986,439.66
100%	$106,450,077.22

End of Forecasts

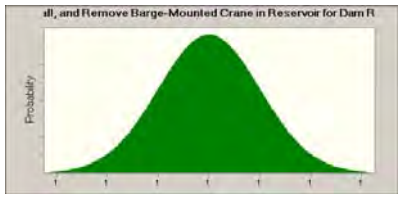
Assumptions

Worksheet: [Copco 1 - Full Removal Crystal Ball - with Escalation - 2011-04.xls]Copco 1 - Full

Assumption: 1 Furnish, Install, and Remove Barge-Mounted Crane in Reservoir for Dam R **Cell: L14**

Normal distribution with parameters:

Mean	1	(=L14)
Std. Dev.	0	(=0.000001)



Assumption: 1 Furnish, Install, and Remove Barge-Mounted Crane in Reservoir for Dam R **Cell: R14**

BetaPERT distribution with parameters:

Minimum	$340,000.00	(=Q14)
Likeliest	$350,000.00	(=R14)
Maximum	$370,000.00	(=S14)

Assumption: 10 Remove Concrete Dam down to Elev. 2476 Quantity **Cell: L23**

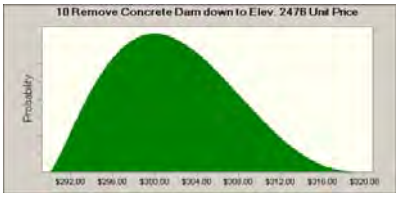
Normal distribution with parameters:

Mean	36,000	(=L23)
Std. Dev.	0	(=0.000001)

Assumption: 10 Remove Concrete Dam down to Elev. 2476 Unit Price **Cell: R23**

BetaPERT distribution with parameters:

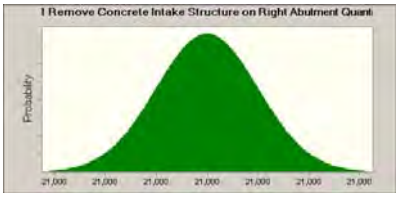
Minimum	$290.00	(=Q23)
Likeliest	$300.00	(=R23)
Maximum	$320.00	(=S23)



Assumption: 11 Remove Concrete Intake Structure on Right Abutment Quantity **Cell: L24**

Normal distribution with parameters:

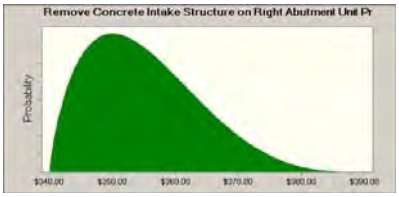
Mean	21,000	(=L24)
Std. Dev.	0	(=0.000001)



Assumption: 11 Remove Concrete Intake Structure on Right Abutment Unit Price **Cell: R24**

BetaPERT distribution with parameters:

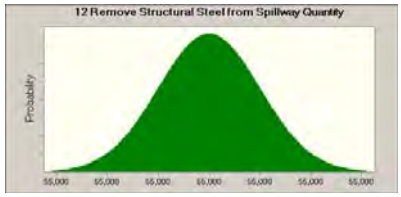
Minimum	$340.00	(=Q24)
Likeliest	$350.00	(=R24)
Maximum	$390.00	(=S24)



Assumption: 12 Remove Structural Steel from Spillway Quantity **Cell: L25**

Normal distribution with parameters:

Mean	55,000	(=L25)
Std. Dev.	0	(=0.000001)



Assumption: 12 Remove Structural Steel from Spillway Unit Price **Cell: R25**

BetaPERT distribution with parameters:

Minimum	$0.70	(=Q25)
Likeliest	$1.00	(=R25)
Maximum	$1.50	(=S25)

Assumption: 13 Install Diversion Tunnel Plugs Quantity **Cell: L26**

Normal distribution with parameters:

Mean	30	(=L26)
Std. Dev.	0	(=0.000001)

Assumption: 13 Install Diversion Tunnel Plugs Unit Price **Cell: R26**

BetaPERT distribution with parameters:

Minimum	$1,100.00	(=Q26)
Likeliest	$1,200.00	(=R26)
Maximum	$1,300.00	(=S26)

Assumption: 14 Remove Diversion Tunnel Control Structure Concrete Quantity **Cell: L27**

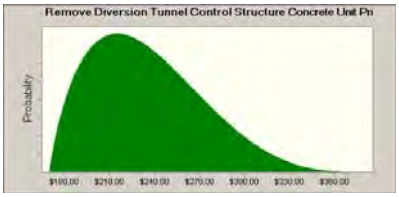
Normal distribution with parameters:

Mean	350	(=L27)
Std. Dev.	0	(=0.000001)

Assumption: 14 Remove Diversion Tunnel Control Structure Concrete Unit Price **Cell: R27**

BetaPERT distribution with parameters:

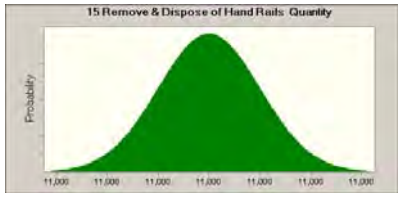
Minimum	$170.00	(=Q27)
Likeliest	$215.00	(=R27)
Maximum	$380.00	(=S27)



Assumption: 15 Remove & Dispose of Hand Rails Quantity **Cell: L28**

Normal distribution with parameters:

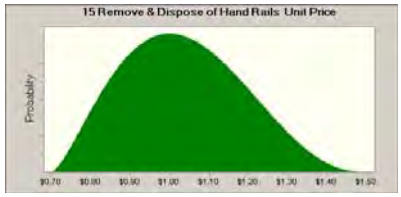
Mean	11,000	(=L28)
Std. Dev.	0	(=0.000001)



Assumption: 15 Remove & Dispose of Hand Rails Unit Price **Cell: R28**

BetaPERT distribution with parameters:

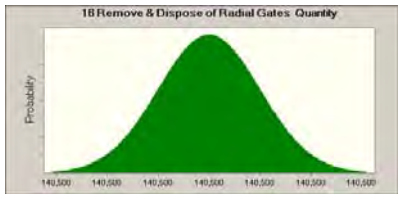
Minimum	$0.70	(=Q28)
Likeliest	$1.00	(=R28)
Maximum	$1.50	(=S28)



Assumption: 16 Remove & Dispose of Radial Gates Quantity **Cell: L29**

Normal distribution with parameters:

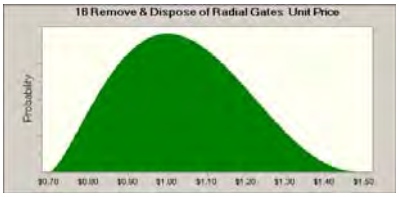
Mean	140,500	(=L29)
Std. Dev.	0	(=0.000001)



Assumption: 16 Remove & Dispose of Radial Gates Unit Price **Cell: R29**

BetaPERT distribution with parameters:

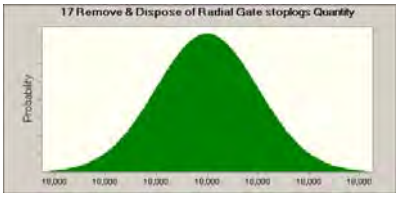
Minimum	$0.70	(=Q29)
Likeliest	$1.00	(=R29)
Maximum	$1.50	(=S29)



Assumption: 17 Remove & Dispose of Radial Gate stoplogs Quantity **Cell: L30**

Normal distribution with parameters:

Mean	18,000	(=L30)
Std. Dev.	0	(=0.000001)



Assumption: 17 Remove & Dispose of Radial Gate stoplogs Unit Price **Cell: R30**

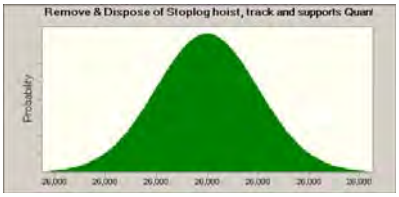
BetaPERT distribution with parameters:

Minimum	$0.70	(=Q30)
Likeliest	$1.00	(=R30)
Maximum	$1.50	(=S30)

Assumption: 18 Remove & Dispose of Stoplog hoist, track and supports Quantity **Cell: L31**

Normal distribution with parameters:

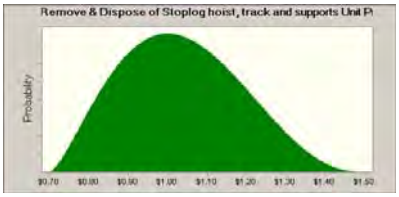
Mean	26,000	(=L31)
Std. Dev.	0	(=0.000001)



Assumption: 18 Remove & Dispose of Stoplog hoist, track and supports Unit Price **Cell: R31**

BetaPERT distribution with parameters:

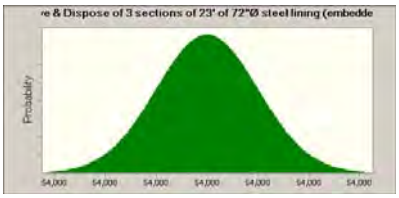
Minimum	$0.70	(=Q31)
Likeliest	$1.00	(=R31)
Maximum	$1.50	(=S31)



Assumption: 19 Remove & Dispose of 3 sections of 23' of 72"Ø steel lining (embedded) Qu **Cell: L32**

Normal distribution with parameters:

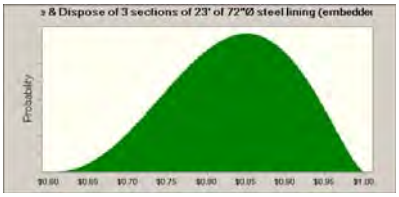
Mean	54,000	(=L32)
Std. Dev.	0	(=0.000001)



Assumption: 19 Remove & Dispose of 3 sections of 23' of 72"Ø steel lining (embedde **Cell: R32**

BetaPERT distribution with parameters:

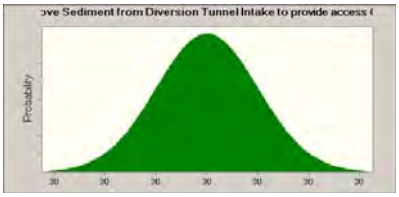
Minimum	$0.60	(=Q32)
Likeliest	$0.85	(=R32)
Maximum	$1.00	(=S32)



Assumption: 2 Remove Sediment from Diversion Tunnel Intake to provide access Quantity **Cell: L15**

Normal distribution with parameters:

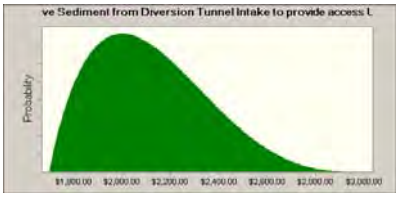
Mean	30	(=L15)
Std. Dev.	0	(=0.000001)



Assumption: 2 Remove Sediment from Diversion Tunnel Intake to provide access Unit Pri **Cell: R15**

BetaPERT distribution with parameters:

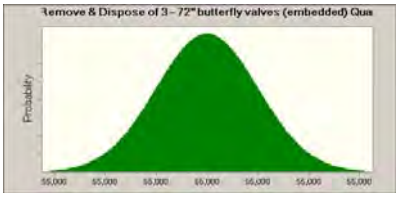
Minimum	$1,700.00	(=Q15)
Likeliest	$2,000.00	(=R15)
Maximum	$3,000.00	(=S15)



Assumption: 20 Remove & Dispose of 3 - 72" butterfly valves (embedded) Quantity Cell: L33

Normal distribution with parameters:

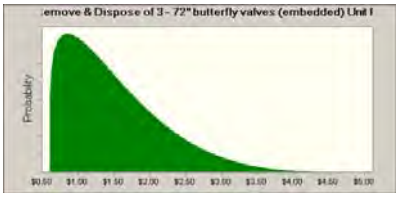
Mean	55,000	(=L33)
Std. Dev.	0	(=0.000001)



Assumption: 20 Remove & Dispose of 3 - 72" butterfly valves (embedded) Unit Price Cell: R33

BetaPERT distribution with parameters:

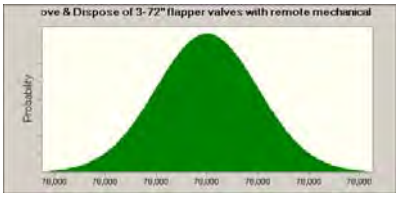
Minimum	$0.60	(=Q33)
Likeliest	$0.85	(=R33)
Maximum	$5.00	(=S33)



Assumption: 21 Remove & Dispose of 3-72" flapper valves with remote mechanical Quantity Cell: L34

Normal distribution with parameters:

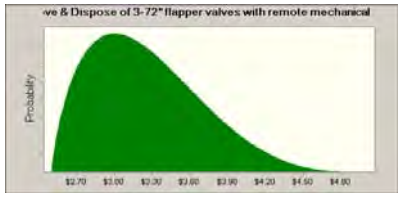
Mean	78,000	(=L34)
Std. Dev.	0	(=0.000001)



Assumption: 21 Remove & Dispose of 3-72" flapper valves with remote mechanical Cell: R34

BetaPERT distribution with parameters:

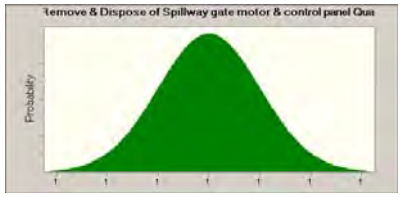
Minimum	$2.50	(=Q34)
Likeliest	$3.00	(=R34)
Maximum	$5.00	(=S34)



Assumption: 22 Remove & Dispose of Spillway gate motor & control panel Quantity Cell: L35

Normal distribution with parameters:

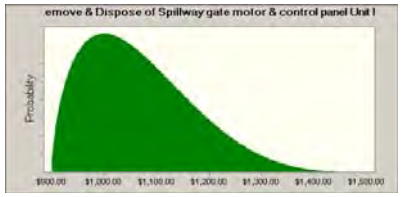
Mean	1	(=L35)
Std. Dev.	0	(=0.000001)



Assumption: 22 Remove & Dispose of Spillway gate motor & control panel Unit Price Cell: R35

BetaPERT distribution with parameters:

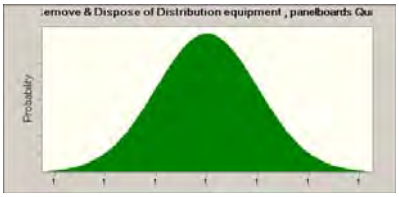
Minimum	$900.00	(=Q35)
Likeliest	$1,000.00	(=R35)
Maximum	$1,500.00	(=S35)



Assumption: 23 Remove & Dispose of Distribution equipment , panelboards Quantity **Cell: L36**

Normal distribution with parameters:

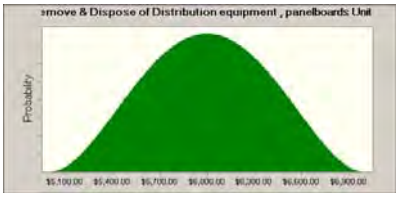
Mean	1	(=L36)
Std. Dev.	0	(=0.000001)



Assumption: 23 Remove & Dispose of Distribution equipment , panelboards Unit Price **Cell: R36**

BetaPERT distribution with parameters:

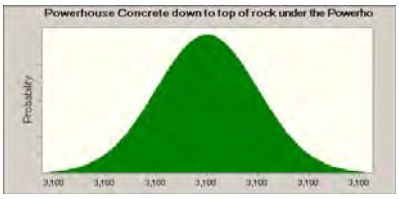
Minimum	$5,000.00	(=Q36)
Likeliest	$6,000.00	(=R36)
Maximum	$7,000.00	(=S36)



Assumption: 24 Remove Powerhouse Concrete down to top of rock under the Powerhouse **Cell: L37**

Normal distribution with parameters:

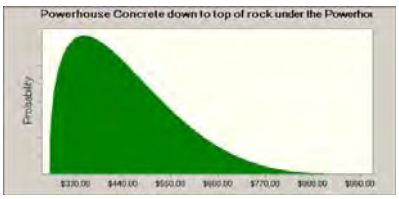
Mean	3,100	(=L37)
Std. Dev.	0	(=0.000001)



Assumption: 24 Remove Powerhouse Concrete down to top of rock under the Powerhouse **Cell: R37**

BetaPERT distribution with parameters:

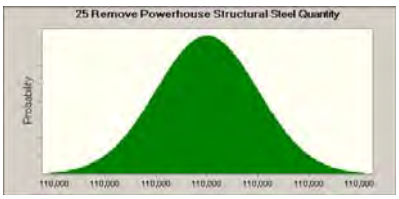
Minimum	$270.00	(=Q37)
Likeliest	$350.00	(=R37)
Maximum	$1,000.00	(=S37)



Assumption: 25 Remove Powerhouse Structural Steel Quantity **Cell: L38**

Normal distribution with parameters:

Mean	110,000	(=L38)
Std. Dev.	0	(=0.000001)



Assumption: 25 Remove Powerhouse Structural Steel Unit Price **Cell: R38**

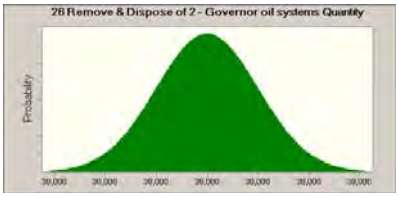
BetaPERT distribution with parameters:

Minimum	$0.60	(=Q38)
Likeliest	$0.85	(=R38)
Maximum	$1.00	(=S38)

Assumption: 26 Remove & Dispose of 2 - Governor oil systems Quantity **Cell: L39**

Normal distribution with parameters:

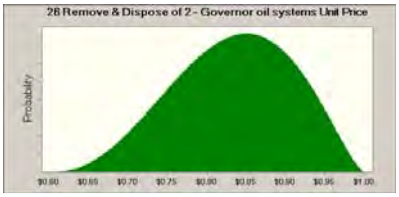
Mean	38,000	(=L39)
Std. Dev.	0	(=0.000001)



Assumption: 26 Remove & Dispose of 2 - Governor oil systems Unit Price **Cell: R39**

BetaPERT distribution with parameters:

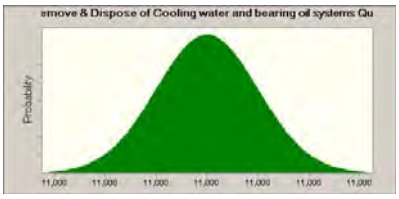
Minimum	$0.60	(=Q39)
Likeliest	$0.85	(=R39)
Maximum	$1.00	(=S39)



Assumption: 27 Remove & Dispose of Cooling water and bearing oil systems Quantity **Cell: L40**

Normal distribution with parameters:

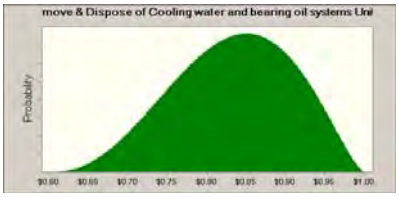
Mean	11,000	(=L40)
Std. Dev.	0	(=0.000001)



Assumption: 27 Remove & Dispose of Cooling water and bearing oil systems Unit Price **Cell: R40**

BetaPERT distribution with parameters:

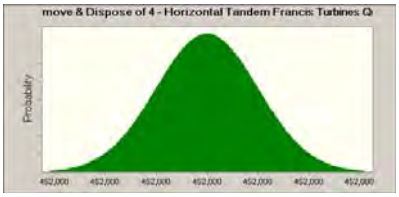
Minimum	$0.60	(=Q40)
Likeliest	$0.85	(=R40)
Maximum	$1.00	(=S40)



Assumption: 28 Remove & Dispose of 4 - Horizontal Tandem Francis Turbines Quantity **Cell: L41**

Normal distribution with parameters:

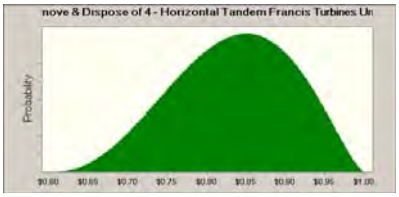
Mean	452,000	(=L41)
Std. Dev.	0	(=0.000001)



Assumption: 28 Remove & Dispose of 4 - Horizontal Tandem Francis Turbines Unit Price **Cell: R41**

BetaPERT distribution with parameters:

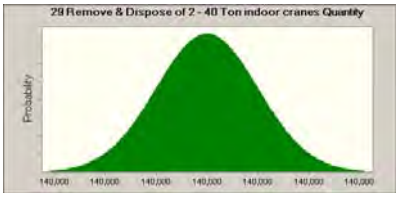
Minimum	$0.60	(=Q41)
Likeliest	$0.85	(=R41)
Maximum	$1.00	(=S41)



Assumption: 29 Remove & Dispose of 2 - 40 Ton indoor cranes Quantity **Cell: L42**

Normal distribution with parameters:

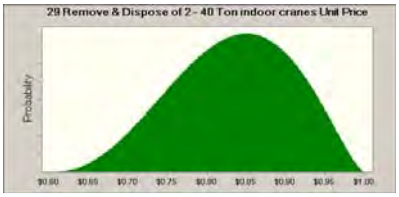
Mean	140,000	(=L42)
Std. Dev.	0	(=0.000001)



Assumption: 29 Remove & Dispose of 2 - 40 Ton indoor cranes Unit Price **Cell: R42**

BetaPERT distribution with parameters:

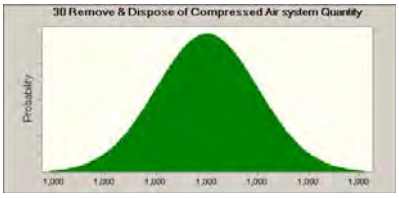
Minimum	$0.60	(=Q42)
Likeliest	$0.85	(=R42)
Maximum	$1.00	(=S42)



Assumption: 30 Remove & Dispose of Compressed Air system Quantity **Cell: L43**

Normal distribution with parameters:

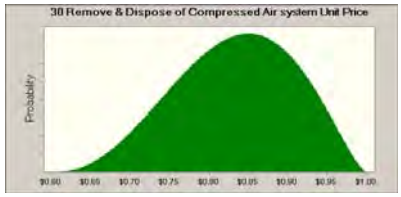
Mean	1,000	(=L43)
Std. Dev.	0	(=0.000001)



Assumption: 30 Remove & Dispose of Compressed Air system Unit Price **Cell: R43**

BetaPERT distribution with parameters:

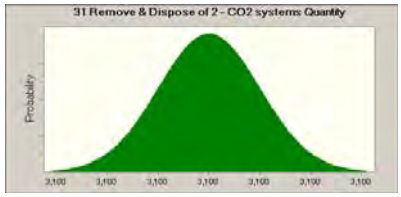
Minimum	$0.60	(=Q43)
Likeliest	$0.85	(=R43)
Maximum	$1.00	(=S43)



Assumption: 31 Remove & Dispose of 2 - CO2 systems Quantity **Cell: L44**

Normal distribution with parameters:

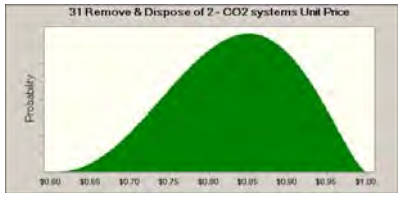
Mean	3,100	(=L44)
Std. Dev.	0	(=0.000001)



Assumption: 31 Remove & Dispose of 2 - CO2 systems Unit Price **Cell: R44**

BetaPERT distribution with parameters:

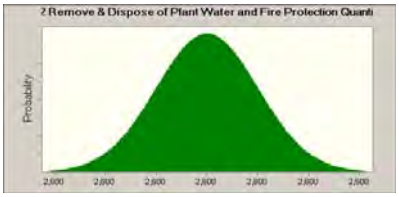
Minimum	$0.60	(=Q44)
Likeliest	$0.85	(=R44)
Maximum	$1.00	(=S44)



Assumption: 32 Remove & Dispose of Plant Water and Fire Protection Quantity **Cell: L45**

Normal distribution with parameters:

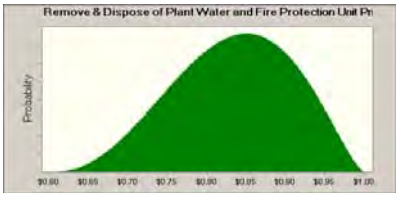
Mean	2,600	(=L45)
Std. Dev.	0	(=0.000001)



Assumption: 32 Remove & Dispose of Plant Water and Fire Protection Unit Price **Cell: R45**

BetaPERT distribution with parameters:

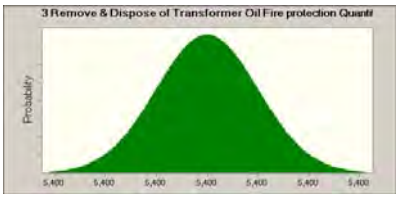
Minimum	$0.60	(=Q45)
Likeliest	$0.85	(=R45)
Maximum	$1.00	(=S45)



Assumption: 33 Remove & Dispose of Transformer Oil Fire protection Quantity **Cell: L46**

Normal distribution with parameters:

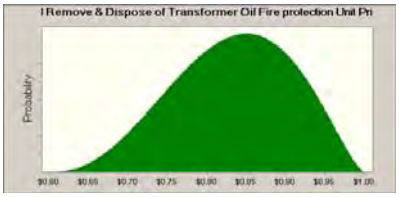
Mean	5,400	(=L46)
Std. Dev.	0	(=0.000001)



Assumption: 33 Remove & Dispose of Transformer Oil Fire protection Unit Price **Cell: R46**

BetaPERT distribution with parameters:

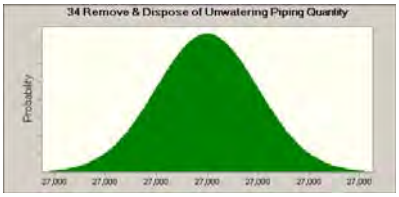
Minimum	$0.60	(=Q46)
Likeliest	$0.85	(=R46)
Maximum	$1.00	(=S46)



Assumption: 34 Remove & Dispose of Unwatering Piping Quantity **Cell: L47**

Normal distribution with parameters:

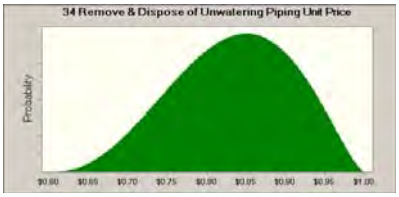
Mean	27,000	(=L47)
Std. Dev.	0	(=0.000001)



Assumption: 34 Remove & Dispose of Unwatering Piping Unit Price **Cell: R47**

BetaPERT distribution with parameters:

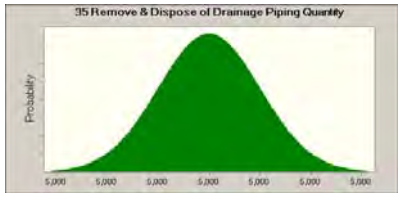
Minimum	$0.60	(=Q47)
Likeliest	$0.85	(=R47)
Maximum	$1.00	(=S47)



Assumption: 35 Remove & Dispose of Drainage Piping Quantity **Cell: L48**

Normal distribution with parameters:

Mean	5,000	(=L48)
Std. Dev.	0	(=0.000001)



Assumption: 35 Remove & Dispose of Drainage Piping Unit Price **Cell: R48**

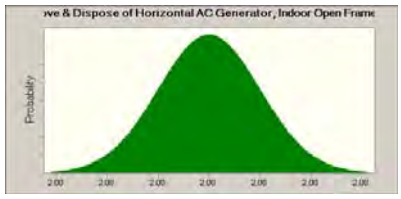
BetaPERT distribution with parameters:

Minimum	$0.60	(=Q48)
Likeliest	$0.85	(=R48)
Maximum	$1.00	(=S48)

Assumption: 36 Remove & Dispose of Horizontal AC Generator, Indoor Open Frame Quant **Cell: L49**

Normal distribution with parameters:

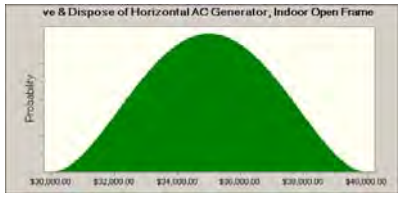
Mean	2.00	(=L49)
Std. Dev.	0.00	(=0.000001)



Assumption: 36 Remove & Dispose of Horizontal AC Generator, Indoor Open Frame Cell: R49

BetaPERT distribution with parameters:

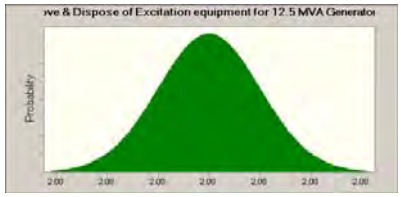
Minimum	$30,000.00	(=Q49)
Likeliest	$35,000.00	(=R49)
Maximum	$40,000.00	(=S49)



Assumption: 37 Remove & Dispose of Excitation equipment for 12.5 MVA Generator Cell: L50

Normal distribution with parameters:

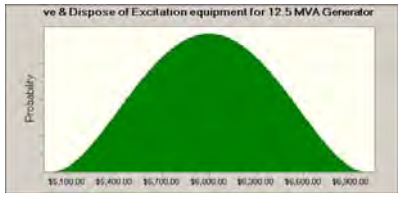
Mean	2.00	(=L50)
Std. Dev.	0.00	(=0.000001)



Assumption: 37 Remove & Dispose of Excitation equipment for 12.5 MVA Generator Cell: R50

BetaPERT distribution with parameters:

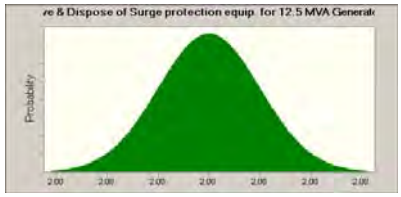
Minimum	$5,000.00	(=Q50)
Likeliest	$6,000.00	(=R50)
Maximum	$7,000.00	(=S50)



Assumption: 38 Remove & Dispose of Surge protection equip. for 12.5 MVA Generator **Cell: Q51**

Normal distribution with parameters:

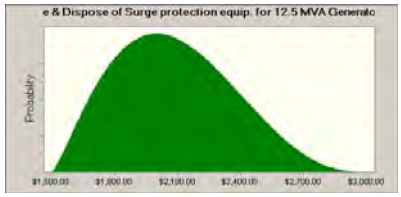
Mean	2.00	(=L51)
Std. Dev.	0.00	(=0.000001)



Assumption: 38 Remove & Dispose of Surge protection equip. for 12.5 MVA Generator **Cell: R51**

BetaPERT distribution with parameters:

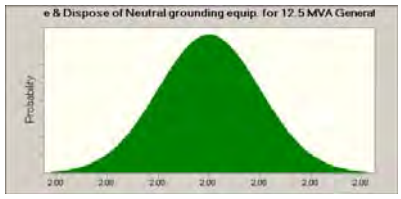
Minimum	$1,500.00	(=Q51)
Likeliest	$2,000.00	(=R51)
Maximum	$3,000.00	(=S51)



Assumption: 39 Remove & Dispose of Neutral grounding equip. for 12.5 MVA Generator **Cell: Q52**

Normal distribution with parameters:

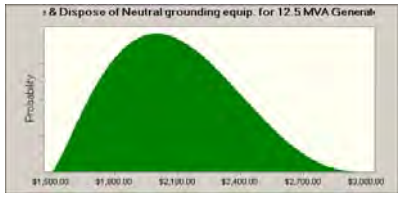
Mean	2.00	(=L52)
Std. Dev.	0.00	(=0.000001)



Assumption: 39 Remove & Dispose of Neutral grounding equip. for 12.5 MVA Generat Cell: R52

BetaPERT distribution with parameters:

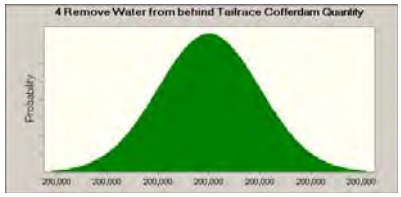
Minimum	$1,500.00	(=Q52)
Likeliest	$2,000.00	(=R52)
Maximum	$3,000.00	(=S52)



Assumption: 4 Remove Water from behind Tailrace Cofferdam Quantity Cell: L17

Normal distribution with parameters:

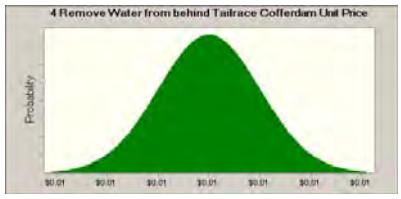
Mean	200,000	(=L17)
Std. Dev.	0	(=0.000001)



Assumption: 4 Remove Water from behind Tailrace Cofferdam Unit Price Cell: R17

Normal distribution with parameters:

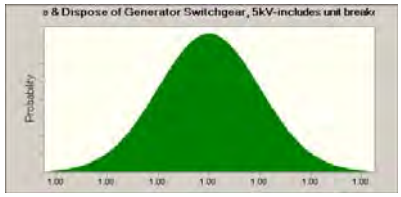
Mean	$0.01	(=R17)
Std. Dev.	$0.00	(=0.000001)



Assumption: 40 Remove & Dispose of Generator Switchgear, 5kV-includes unit breaks: Q53 **Cell: L53**

Normal distribution with parameters:

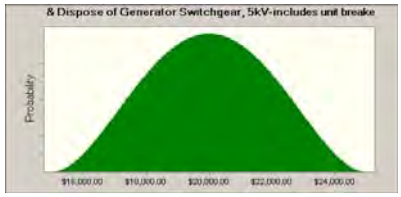
Mean	1.00	(=L53)
Std. Dev.	0.00	(=0.000001)



Assumption: 40 Remove & Dispose of Generator Switchgear, 5kV-includes unit breaks: R53 **Cell: R53**

BetaPERT distribution with parameters:

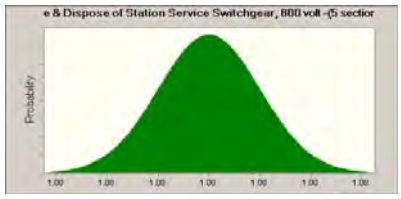
Minimum	$15,000.00	(=Q53)
Likeliest	$20,000.00	(=R53)
Maximum	$25,000.00	(=S53)



Assumption: 41 Remove & Dispose of Station Service Switchgear, 600 volt -(5 sections): Q54 **Cell: L54**

Normal distribution with parameters:

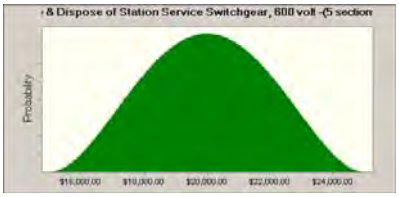
Mean	1.00	(=L54)
Std. Dev.	0.00	(=0.000001)



Assumption: 41 Remove & Dispose of Station Service Switchgear, 600 volt -(5 sections) Cell: R54

BetaPERT distribution with parameters:

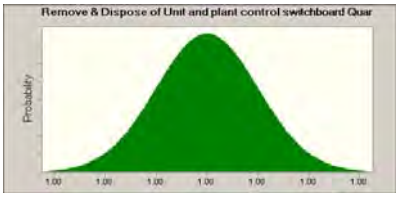
Minimum	$15,000.00	(=Q54)
Likeliest	$20,000.00	(=R54)
Maximum	$25,000.00	(=S54)



Assumption: 42 Remove & Dispose of Unit and plant control switchboard Quantity Cell: L55

Normal distribution with parameters:

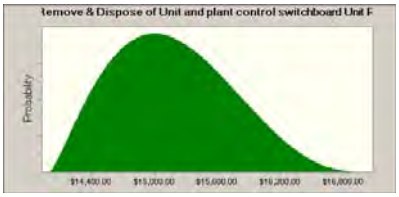
Mean	1.00	(=L55)
Std. Dev.	0.00	(=0.000001)



Assumption: 42 Remove & Dispose of Unit and plant control switchboard Unit Price Cell: R55

BetaPERT distribution with parameters:

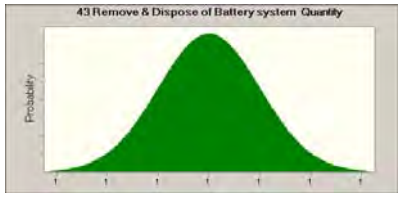
Minimum	$14,000.00	(=Q55)
Likeliest	$15,000.00	(=R55)
Maximum	$17,000.00	(=S55)



Assumption: 43 Remove & Dispose of Battery system Quantity **Cell: L56**

Normal distribution with parameters:

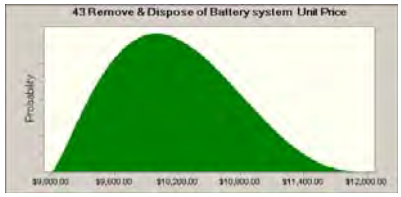
Mean	1	(=L56)
Std. Dev.	0	(=0.000001)



Assumption: 43 Remove & Dispose of Battery system Unit Price **Cell: R56**

BetaPERT distribution with parameters:

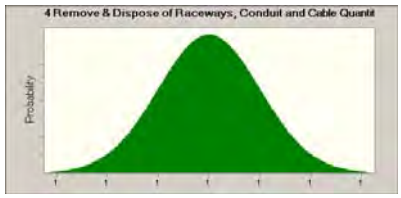
Minimum	$9,000.00	(=Q56)
Likeliest	$10,000.00	(=R56)
Maximum	$12,000.00	(=S56)



Assumption: 44 Remove & Dispose of Raceways, Conduit and Cable Quantity **Cell: L57**

Normal distribution with parameters:

Mean	1	(=L57)
Std. Dev.	0	(=0.000001)



Assumption: 44 Remove & Dispose of Raceways, Conduit and Cable Unit Price **Cell: R57**

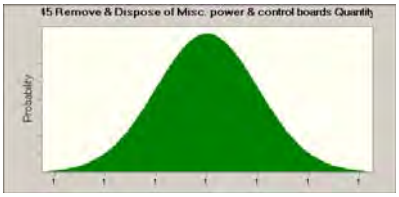
BetaPERT distribution with parameters:

Minimum	$14,000.00	(=Q57)
Likeliest	$15,000.00	(=R57)
Maximum	$17,000.00	(=S57)

Assumption: 45 Remove & Dispose of Misc. power & control boards Quantity **Cell: L58**

Normal distribution with parameters:

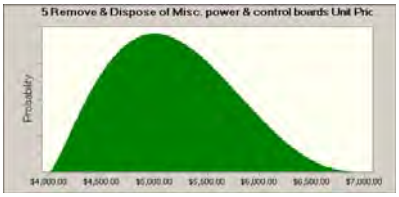
Mean	1	(=L58)
Std. Dev.	0	(=0.000001)



Assumption: 45 Remove & Dispose of Misc. power & control boards Unit Price **Cell: R58**

BetaPERT distribution with parameters:

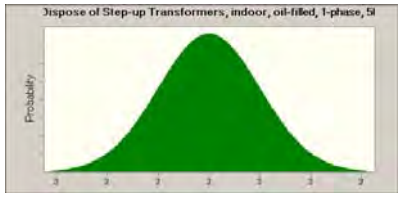
Minimum	$4,000.00	(=Q58)
Likeliest	$5,000.00	(=R58)
Maximum	$7,000.00	(=S58)



Assumption: 46 Remove & Dispose of Step-up Transformers, indoor, oil-filled, 1-phase, 50 Cell: L59

Normal distribution with parameters:

Mean	3	(=L59)
Std. Dev.	0	(=0.000001)



Assumption: 46 Remove & Dispose of Step-up Transformers, indoor, oil-filled, 1-phase, 50 Cell: R59

BetaPERT distribution with parameters:

Minimum	$40,000.00	(=Q59)
Likeliest	$50,000.00	(=R59)
Maximum	$60,000.00	(=S59)

Assumption: 47 Remove & Dispose of Step-up Transformers, indoor, oil-filled, 1-phase, 41 Cell: L60

Normal distribution with parameters:

Mean	3	(=L60)
Std. Dev.	0	(=0.000001)

Assumption: 47 Remove & Dispose of Step-up Transformers, indoor, oil-filled, 1-phase, 41 **Cell: R60**

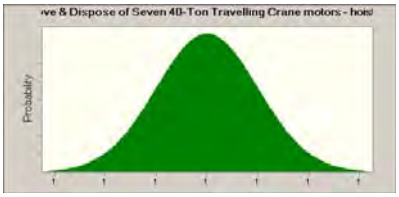
BetaPERT distribution with parameters:

Minimum	$40,000.00	(=Q60)
Likeliest	$50,000.00	(=R60)
Maximum	$60,000.00	(=S60)

Assumption: 48 Remove & Dispose of Seven 40-Ton Travelling Crane motors - hoist Qty **Cell: L61**

Normal distribution with parameters:

Mean	1	(=L61)
Std. Dev.	0	(=0.000001)



Assumption: 48 Remove & Dispose of Seven 40-Ton Travelling Crane motors - hoist Unit P **Cell: R61**

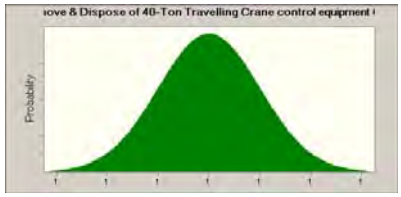
BetaPERT distribution with parameters:

Minimum	$2,000.00	(=Q61)
Likeliest	$2,500.00	(=R61)
Maximum	$3,000.00	(=S61)

Assumption: 49 Remove & Dispose of 40-Ton Travelling Crane control equipment Quantity **Cell: L62**

Normal distribution with parameters:

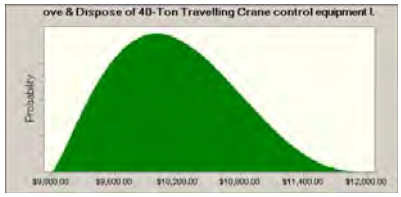
Mean	1	(=L62)
Std. Dev.	0	(=0.000001)



Assumption: 49 Remove & Dispose of 40-Ton Travelling Crane control equipment Unit Price **Cell: R62**

BetaPERT distribution with parameters:

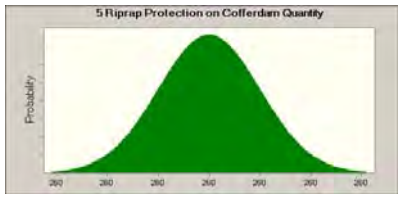
Minimum	$9,000.00	(=Q62)
Likeliest	$10,000.00	(=R62)
Maximum	$12,000.00	(=S62)



Assumption: 5 Riprap Protection on Cofferdam Quantity **Cell: L18**

Normal distribution with parameters:

Mean	260	(=L18)
Std. Dev.	0	(=0.000001)



Assumption: 5 Riprap Protection on Cofferdam Unit Price **Cell: R18**

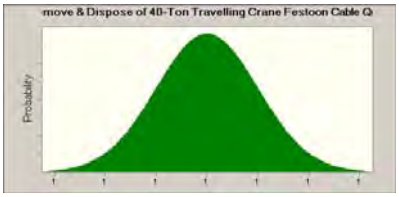
BetaPERT distribution with parameters:

Minimum	$120.00	(=Q18)
Likeliest	$150.00	(=R18)
Maximum	$200.00	(=S18)

Assumption: 50 Remove & Dispose of 40-Ton Travelling Crane Festoon Cable Quantity **Cell: L63**

Normal distribution with parameters:

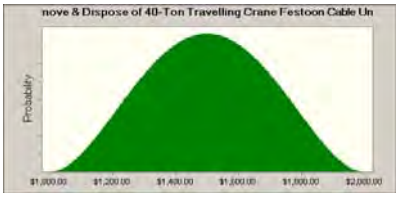
Mean	1	(=L63)
Std. Dev.	0	(=0.000001)



Assumption: 50 Remove & Dispose of 40-Ton Travelling Crane Festoon Cable Unit Price **Cell: R63**

BetaPERT distribution with parameters:

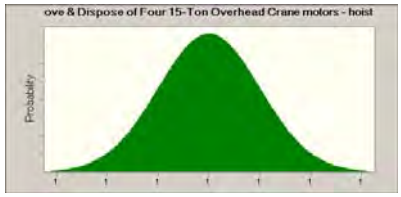
Minimum	$1,000.00	(=Q63)
Likeliest	$1,500.00	(=R63)
Maximum	$2,000.00	(=S63)



Assumption: 51 Remove & Dispose of Four 15-Ton Overhead Crane motors - hoist Quantity **Cell: L64**

Normal distribution with parameters:

Mean	1	(=L64)
Std. Dev.	0	(=0.000001)



Assumption: 51 Remove & Dispose of Four 15-Ton Overhead Crane motors - hoist Unit Price **Cell: R64**

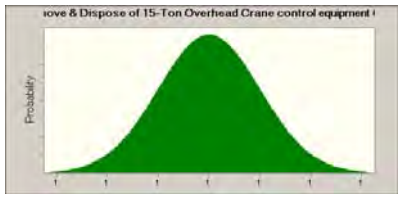
BetaPERT distribution with parameters:

Minimum	$900.00	(=Q64)
Likeliest	$1,000.00	(=R64)
Maximum	$1,300.00	(=S64)

Assumption: 52 Remove & Dispose of 15-Ton Overhead Crane control equipment Quantity **Cell: L65**

Normal distribution with parameters:

Mean	1	(=L65)
Std. Dev.	0	(=0.000001)



Assumption: 52 Remove & Dispose of 15-Ton Overhead Crane control equipment Unit Pri **Cell: R65**

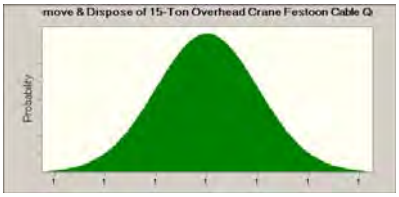
BetaPERT distribution with parameters:

Minimum	$250.00	(=Q65)
Likeliest	$300.00	(=R65)
Maximum	$350.00	(=S65)

Assumption: 53 Remove & Dispose of 15-Ton Overhead Crane Festoon Cable Quantity **Cell: L66**

Normal distribution with parameters:

Mean	1	(=L66)
Std. Dev.	0	(=0.000001)



Assumption: 53 Remove & Dispose of 15-Ton Overhead Crane Festoon Cable Unit Price **Cell: R66**

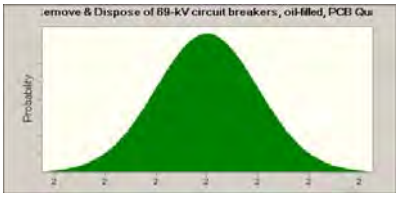
BetaPERT distribution with parameters:

Minimum	$400.00	(=Q66)
Likeliest	$500.00	(=R66)
Maximum	$600.00	(=S66)

Assumption: 54 Remove & Dispose of 69-kV circuit breakers, oil-filled, PCB QuantityCell: L67

Normal distribution with parameters:

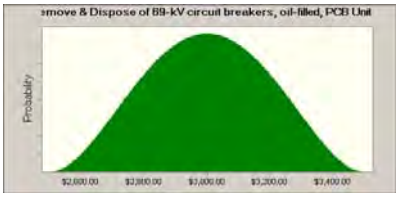
Mean	2	(=L67)
Std. Dev.	0	(=0.000001)



Assumption: 54 Remove & Dispose of 69-kV circuit breakers, oil-filled, PCB Unit PricCell: R67

BetaPERT distribution with parameters:

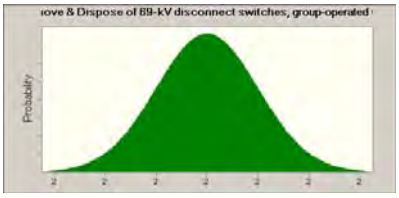
Minimum	$2,500.00	(=Q67)
Likeliest	$3,000.00	(=R67)
Maximum	$3,500.00	(=S67)



Assumption: 55 Remove & Dispose of 69-kV disconnect switches, group-operated QCell: L68

Normal distribution with parameters:

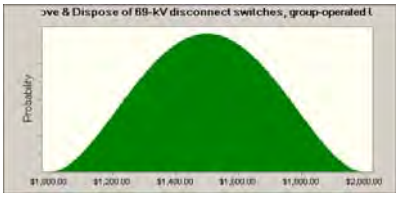
Mean	2	(=L68)
Std. Dev.	0	(=0.000001)



Assumption: 55 Remove & Dispose of 69-kV disconnect switches, group-operated Unit Price **Cell: R68**

BetaPERT distribution with parameters:

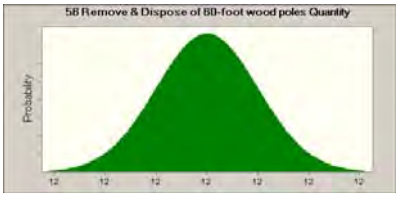
Minimum	$1,000.00	(=Q68)
Likeliest	$1,500.00	(=R68)
Maximum	$2,000.00	(=S68)



Assumption: 56 Remove & Dispose of 60-foot wood poles Quantity **Cell: L69**

Normal distribution with parameters:

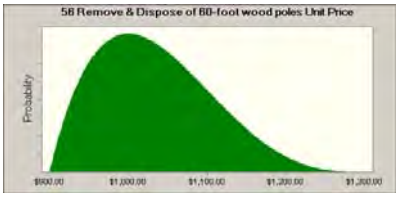
Mean	12	(=L69)
Std. Dev.	0	(=0.000001)



Assumption: 56 Remove & Dispose of 60-foot wood poles Unit Price **Cell: R69**

BetaPERT distribution with parameters:

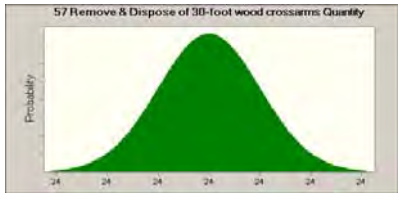
Minimum	$900.00	(=Q69)
Likeliest	$1,000.00	(=R69)
Maximum	$1,300.00	(=S69)



Assumption: 57 Remove & Dispose of 30-foot wood crossarms Quantity **Cell: L70**

Normal distribution with parameters:

Mean	24	(=L70)
Std. Dev.	0	(=0.000001)



Assumption: 57 Remove & Dispose of 30-foot wood crossarms Unit Price **Cell: R70**

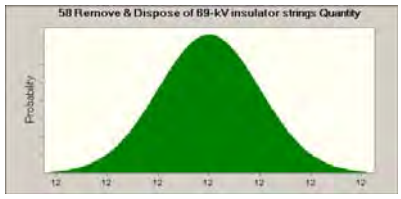
BetaPERT distribution with parameters:

Minimum	$400.00	(=Q70)
Likeliest	$500.00	(=R70)
Maximum	$600.00	(=S70)

Assumption: 58 Remove & Dispose of 69-kV insulator strings Quantity **Cell: L71**

Normal distribution with parameters:

Mean	12	(=L71)
Std. Dev.	0	(=0.000001)



Assumption: 58 Remove & Dispose of 69-kV insulator strings Unit Price **Cell: R71**

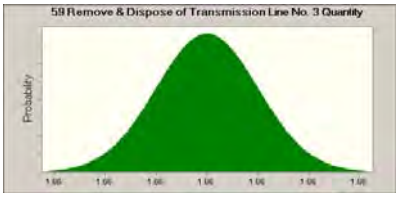
BetaPERT distribution with parameters:

Minimum	$300.00	(=Q71)
Likeliest	$400.00	(=R71)
Maximum	$500.00	(=S71)

Assumption: 59 Remove & Dispose of Transmission Line No. 3 Quantity **Cell: L72**

Normal distribution with parameters:

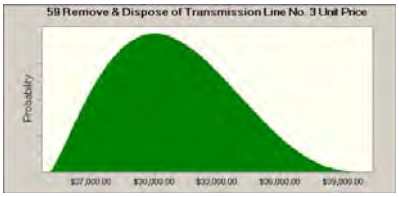
Mean	1.66	(=L72)
Std. Dev.	0.00	(=0.000001)



Assumption: 59 Remove & Dispose of Transmission Line No. 3 Unit Price **Cell: R72**

BetaPERT distribution with parameters:

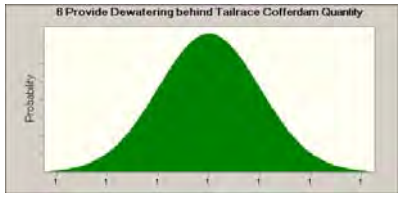
Minimum	$25,000.00	(=Q72)
Likeliest	$30,000.00	(=R72)
Maximum	$40,000.00	(=S72)



Assumption: 6 Provide Dewatering behind Tailrace Cofferdam Quantity **Cell: L19**

Normal distribution with parameters:

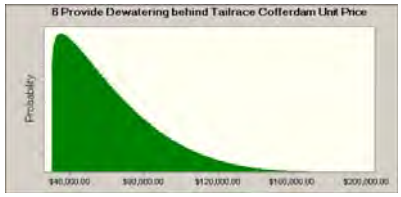
Mean	1	(=L19)
Std. Dev.	0	(=0.000001)



Assumption: 6 Provide Dewatering behind Tailrace Cofferdam Unit Price **Cell: R19**

BetaPERT distribution with parameters:

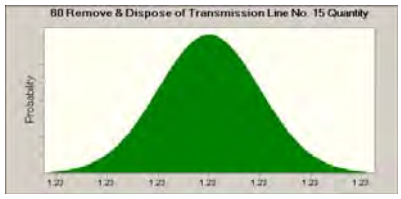
Minimum	$30,000.00	(=Q19)
Likeliest	$35,000.00	(=R19)
Maximum	$200,000.00	(=S19)



Assumption: 60 Remove & Dispose of Transmission Line No. 15 Quantity **Cell: L73**

Normal distribution with parameters:

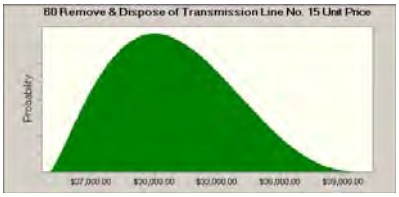
Mean	1.23	(=L73)
Std. Dev.	0.00	(=0.000001)



Assumption: 60 Remove & Dispose of Transmission Line No. 15 Unit Price **Cell: R73**

BetaPERT distribution with parameters:

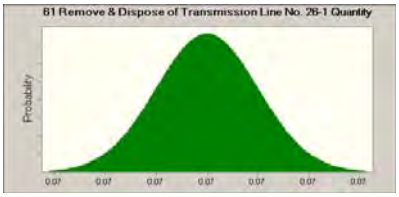
Minimum	$25,000.00	(=Q73)
Likeliest	$30,000.00	(=R73)
Maximum	$40,000.00	(=S73)



Assumption: 61 Remove & Dispose of Transmission Line No. 26-1 Quantity **Cell: L74**

Normal distribution with parameters:

Mean	0.07	(=L74)
Std. Dev.	0.00	(=0.000001)



Assumption: 61 Remove & Dispose of Transmission Line No. 26-1 Unit Price **Cell: R74**

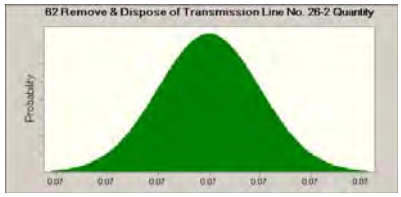
BetaPERT distribution with parameters:

Minimum	$25,000.00	(=Q74)
Likeliest	$30,000.00	(=R74)
Maximum	$40,000.00	(=S74)

Assumption: 62 Remove & Dispose of Transmission Line No. 26-2 Quantity **Cell: L75**

Normal distribution with parameters:

Mean	0.07	(=L75)
Std. Dev.	0.00	(=0.000001)



Assumption: 62 Remove & Dispose of Transmission Line No. 26-2 Unit Price **Cell: R75**

BetaPERT distribution with parameters:

Minimum	$25,000.00	(=Q75)
Likeliest	$30,000.00	(=R75)
Maximum	$40,000.00	(=S75)

Assumption: 63 Remove gate house #1 from top of dam Quantity **Cell: L76**

Normal distribution with parameters:

Mean	570	(=L76)
Std. Dev.	0	(=0.000001)

Assumption: 63 Remove gate house #1 from top of dam Unit Price **Cell: R76**

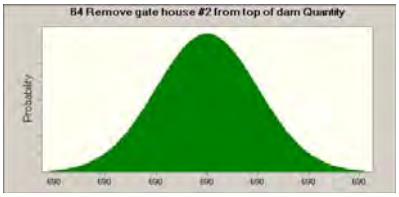
BetaPERT distribution with parameters:

Minimum	$55.00	(=Q76)
Likeliest	$60.00	(=R76)
Maximum	$65.00	(=S76)

Assumption: 64 Remove gate house #2 from top of dam Quantity **Cell: L77**

Normal distribution with parameters:

Mean	690	(=L77)
Std. Dev.	0	(=0.000001)



Assumption: 64 Remove gate house #2 from top of dam Unit Price **Cell: R77**

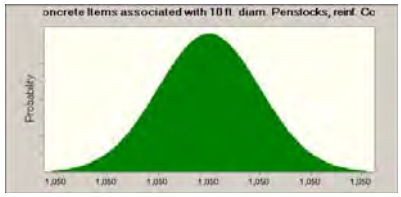
BetaPERT distribution with parameters:

Minimum	$55.00	(=Q77)
Likeliest	$60.00	(=R77)
Maximum	$65.00	(=S77)

Assumption: 65 Remove Concrete Items associated with 10 ft. diam. Penstocks, reinf. Co **Cell: L78**

Normal distribution with parameters:

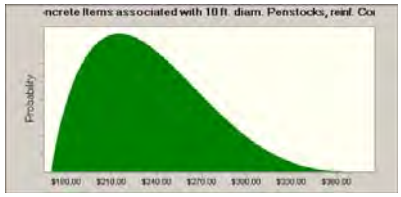
Mean	1,050	(=L78)
Std. Dev.	0	(=0.000001)



Assumption: 65 Remove Concrete Items associated with 10 ft. diam. Penstocks, reinf. Co **Cell: R78**

BetaPERT distribution with parameters:

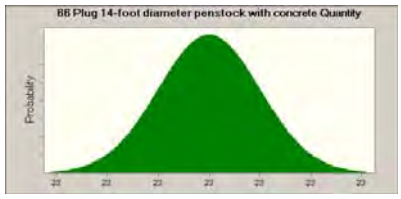
Minimum	$170.00	(=Q78)
Likeliest	$215.00	(=R78)
Maximum	$380.00	(=S78)



Assumption: 66 Plug 14-foot diameter penstock with concrete Quantity **Cell: L79**

Normal distribution with parameters:

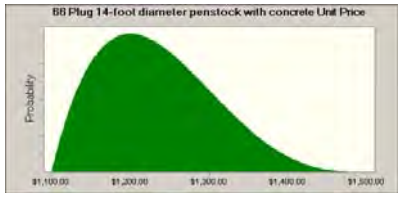
Mean	23	(=L79)
Std. Dev.	0	(=0.000001)



Assumption: 66 Plug 14-foot diameter penstock with concrete Unit Price **Cell: R79**

BetaPERT distribution with parameters:

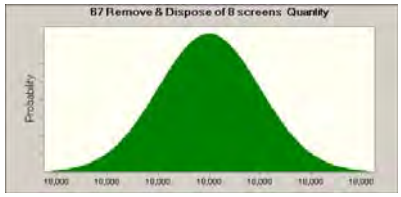
Minimum	$1,100.00	(=Q79)
Likeliest	$1,200.00	(=R79)
Maximum	$1,500.00	(=S79)



Assumption: 67 Remove & Dispose of 8 screens Quantity **Cell: L80**

Normal distribution with parameters:

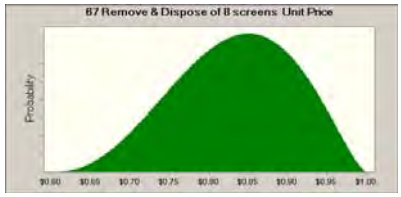
Mean	18,000	(=L80)
Std. Dev.	0	(=0.000001)



Assumption: 67 Remove & Dispose of 8 screens Unit Price **Cell: R80**

BetaPERT distribution with parameters:

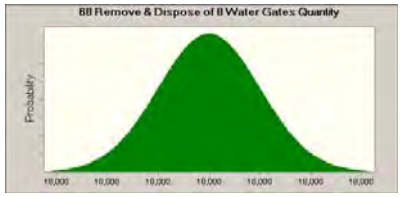
Minimum	$0.60	(=Q80)
Likeliest	$0.85	(=R80)
Maximum	$1.00	(=S80)



Assumption: 68 Remove & Dispose of 8 Water Gates Quantity **Cell: L81**

Normal distribution with parameters:

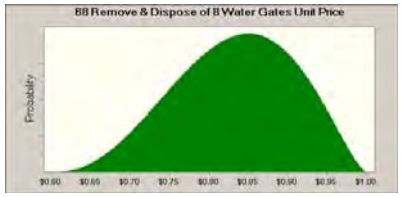
Mean	18,000	(=L81)
Std. Dev.	0	(=0.000001)



Assumption: 68 Remove & Dispose of 8 Water Gates Unit Price **Cell: R81**

BetaPERT distribution with parameters:

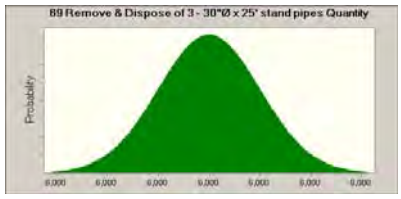
Minimum	$0.60	(=Q81)
Likeliest	$0.85	(=R81)
Maximum	$1.00	(=S81)



Assumption: 69 Remove & Dispose of 3 - 30"Ø x 25' stand pipes Quantity **Cell: L82**

Normal distribution with parameters:

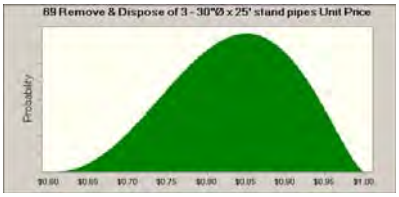
Mean	6,000	(=L82)
Std. Dev.	0	(=0.000001)



Assumption: 69 Remove & Dispose of 3 - 30"Ø x 25' stand pipes Unit Price **Cell: R82**

BetaPERT distribution with parameters:

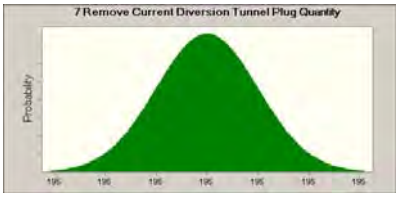
Minimum	$0.60	(=Q82)
Likeliest	$0.85	(=R82)
Maximum	$1.00	(=S82)



Assumption: 7 Remove Current Diversion Tunnel Plug Quantity **Cell: L20**

Normal distribution with parameters:

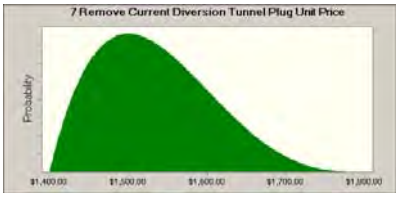
Mean	195	(=L20)
Std. Dev.	0	(=0.000001)



Assumption: 7 Remove Current Diversion Tunnel Plug Unit Price **Cell: R20**

BetaPERT distribution with parameters:

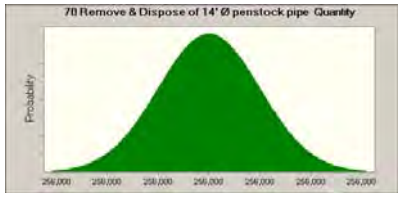
Minimum	$1,400.00	(=Q20)
Likeliest	$1,500.00	(=R20)
Maximum	$1,800.00	(=S20)



Assumption: 70 Remove & Dispose of 14' Ø penstock pipe Quantity **Cell: L83**

Normal distribution with parameters:

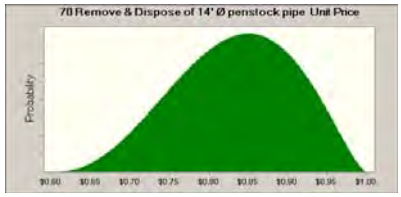
Mean	256,000	(=L83)
Std. Dev.	0	(=0.000001)



Assumption: 70 Remove & Dispose of 14' Ø penstock pipe Unit Price **Cell: R83**

BetaPERT distribution with parameters:

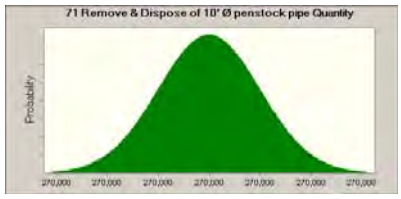
Minimum	$0.60	(=Q83)
Likeliest	$0.85	(=R83)
Maximum	$1.00	(=S83)



Assumption: 71 Remove & Dispose of 10' Ø penstock pipe Quantity **Cell: L84**

Normal distribution with parameters:

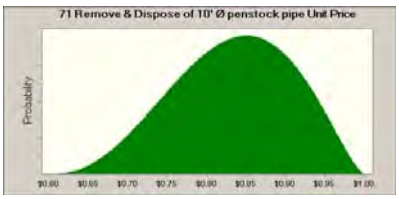
Mean	270,000	(=L84)
Std. Dev.	0	(=0.000001)



Assumption: 71 Remove & Dispose of 10' Ø penstock pipe Unit Price **Cell: R84**

BetaPERT distribution with parameters:

Minimum	$0.60	(=Q84)
Likeliest	$0.85	(=R84)
Maximum	$1.00	(=S84)



Assumption: 72 Temporary Access Roads Quantity **Cell: L85**

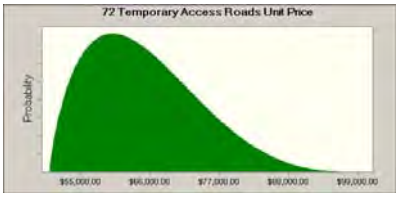
Normal distribution with parameters:

Mean	7	(=L85)
Std. Dev.	0	(=0.000001)

Assumption: 72 Temporary Access Roads Unit Price **Cell: R85**

BetaPERT distribution with parameters:

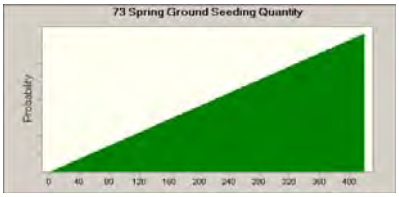
Minimum	$50,000.00	(=R85)
Likeliest	$60,000.00	(=Q85)
Maximum	$100,000.00	(=S85)



Assumption: 73 Spring Ground Seeding Quantity **Cell: L86**

Triangular distribution with parameters:

Minimum	0	(=M86)
Likeliest	420	(=L86)
Maximum	420	(=K86)



Assumption: 73 Spring Ground Seeding Unit Price **Cell: R86**

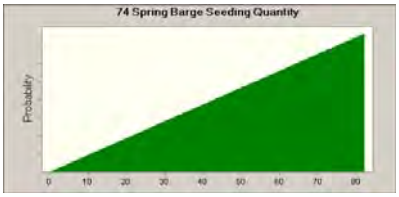
BetaPERT distribution with parameters:

Minimum	$3,000.00	(=Q86)
Likeliest	$3,500.00	(=R86)
Maximum	$4,000.00	(=S86)

Assumption: 74 Spring Barge Seeding Quantity **Cell: L87**

Triangular distribution with parameters:

Minimum	0	(=M87)
Likeliest	82	(=L87)
Maximum	82	(=K87)



Assumption: 74 Spring Barge Seeding Unit Price **Cell: R87**

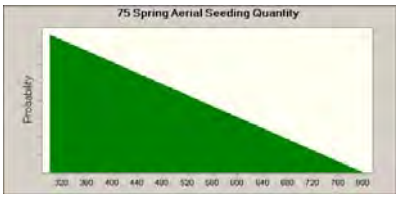
BetaPERT distribution with parameters:

Minimum	$5,000.00	(=Q87)
Likeliest	$6,500.00	(=R87)
Maximum	$8,000.00	(=S87)

Assumption: 75 Spring Aerial Seeding Quantity **Cell: L88**

Triangular distribution with parameters:

Minimum	300	(=K88)
Likeliest	300	(=L88)
Maximum	802	(=M88)



Assumption: 75 Spring Aerial Seeding Unit Price **Cell: R88**

BetaPERT distribution with parameters:

Minimum	$6,500.00	(=Q88)
Likeliest	$7,500.00	(=R88)
Maximum	$15,000.00	(=S88)

Assumption: 76 Fall Ground Seeding Quantity **Cell: L89**

Triangular distribution with parameters:

Minimum	201	(=K89)
Likeliest	401	(=L89)
Maximum	602	(=M89)

Assumption: 76 Fall Ground Seeding Unit Price **Cell: R89**

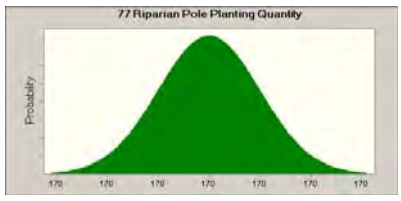
BetaPERT distribution with parameters:

Minimum	$3,000.00	(=Q89)
Likeliest	$3,500.00	(=R89)
Maximum	$4,000.00	(=S89)

Assumption: 77 Riparian Pole Planting Quantity **Cell: L90**

Normal distribution with parameters:

Mean	170	(=L90)
Std. Dev.	0	(=0.000001)



Assumption: 77 Riparian Pole Planting Unit Price **Cell: R90**

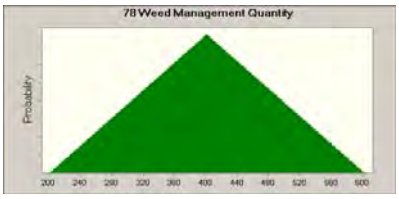
BetaPERT distribution with parameters:

Minimum	$4,000.00	(=Q90)
Likeliest	$8,500.00	(=R90)
Maximum	$10,000.00	(=S90)

Assumption: 78 Weed Management Quantity **Cell: L91**

Triangular distribution with parameters:

Minimum	201	(=K91)
Likeliest	401	(=L91)
Maximum	602	(=M91)



Assumption: 78 Weed Management Unit Price **Cell: R91**

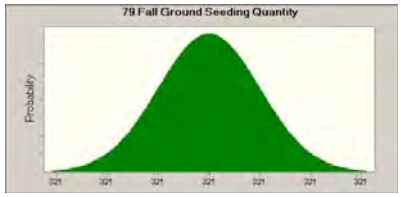
BetaPERT distribution with parameters:

Minimum	$1,000.00	(=Q91)
Likeliest	$1,500.00	(=R91)
Maximum	$2,000.00	(=S91)

Assumption: 79 Fall Ground Seeding Quantity **Cell: L92**

Normal distribution with parameters:

Mean	321	(=L92)
Std. Dev.	0	(=0.000001)



Assumption: 79 Fall Ground Seeding Unit Price **Cell: R92**

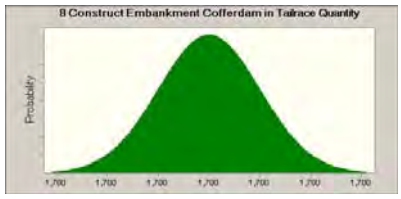
BetaPERT distribution with parameters:

Minimum	$3,000.00	(=Q92)
Likeliest	$3,500.00	(=R92)
Maximum	$4,000.00	(=S92)

Assumption: 8 Construct Embankment Cofferdam in Tailrace Quantity **Cell: L21**

Normal distribution with parameters:

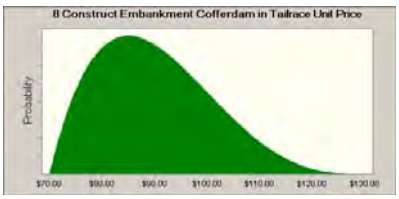
Mean	1,700	(=L21)
Std. Dev.	0	(=0.000001)



Assumption: 8 Construct Embankment Cofferdam in Tailrace Unit Price **Cell: R21**

BetaPERT distribution with parameters:

Minimum	$70.00	(=Q21)
Likeliest	$85.00	(=R21)
Maximum	$130.00	(=S21)



Assumption: 80 Weed Management Quantity **Cell: L93**

Normal distribution with parameters:

Mean	321	(=L93)
Std. Dev.	0	(=0.000001)

Assumption: 80 Weed Management Unit Price **Cell: R93**

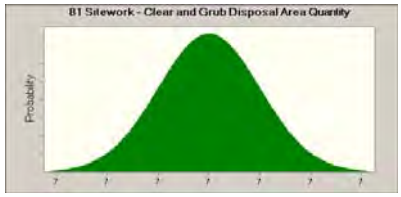
BetaPERT distribution with parameters:

Minimum	$1,000.00	(=Q93)
Likeliest	$1,500.00	(=R93)
Maximum	$2,000.00	(=S93)

Assumption: 81 Sitework - Clear and Grub Disposal Area Quantity **Cell: L94**

Normal distribution with parameters:

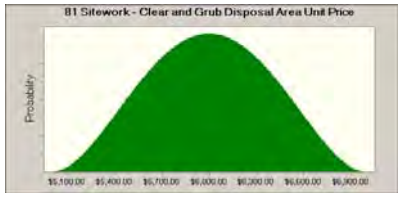
Mean	7	(=L94)
Std. Dev.	0	(=0.000001)



Assumption: 81 Sitework - Clear and Grub Disposal Area Unit Price **Cell: R94**

BetaPERT distribution with parameters:

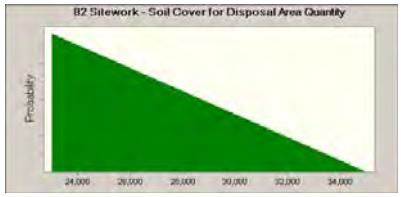
Minimum	$5,000.00	(=Q94)
Likeliest	$6,000.00	(=R94)
Maximum	$7,000.00	(=S94)



Assumption: 82 Sitework - Soil Cover for Disposal Area Quantity **Cell: L95**

Triangular distribution with parameters:

Minimum	23,000	(=K95)
Likeliest	23,000	(=L95)
Maximum	35,000	(=M95)



Assumption: 82 Sitework - Soil Cover for Disposal Area Unit Price **Cell: R95**

BetaPERT distribution with parameters:

Minimum	$45.00	(=Q95)
Likeliest	$50.00	(=R95)
Maximum	$60.00	(=S95)

Assumption: 83 Access/Haul Road Improvements - Soil Excavation Quantity **Cell: L96**

Triangular distribution with parameters:

Minimum	4,500	(=K96)
Likeliest	4,500	(=L96)
Maximum	9,000	(=M96)

Assumption: 83 Access/Haul Road Improvements - Soil Excavation Unit Price **Cell: R96**

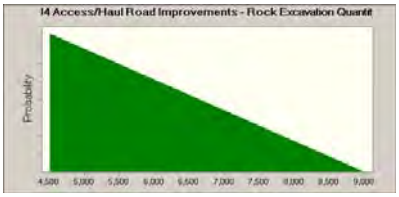
BetaPERT distribution with parameters:

Minimum	$12.00	(=Q96)
Likeliest	$13.00	(=R96)
Maximum	$14.00	(=S96)

Assumption: 84 Access/Haul Road Improvements - Rock Excavation Quantity **Cell: L97**

Triangular distribution with parameters:

Minimum	4,500	(=K97)
Likeliest	4,500	(=L97)
Maximum	9,000	(=M97)



Assumption: 84 Access/Haul Road Improvements - Rock Excavation Unit Price **Cell: R97**

BetaPERT distribution with parameters:

Minimum	$35.00	(=Q97)
Likeliest	$40.00	(=R97)
Maximum	$45.00	(=S97)

Assumption: 85 Access/Haul Road Improvements - Soil Backfill Quantity **Cell: L98**

Triangular distribution with parameters:

Minimum	16,000	(=K98)
Likeliest	16,000	(=L98)
Maximum	30,000	(=M98)

Assumption: 85 Access/Haul Road Improvements - Soil Backfill Unit Price **Cell: R98**

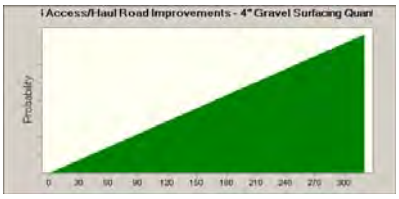
BetaPERT distribution with parameters:

Minimum	$45.00	(=Q98)
Likeliest	$50.00	(=R98)
Maximum	$55.00	(=S98)

Assumption: 86 Access/Haul Road Improvements - 4" Gravel Surfacing Quantity **Cell: L99**

Triangular distribution with parameters:

Minimum	0	(=K99)
Likeliest	320	(=L99)
Maximum	320	(=M99)



Assumption: 86 Access/Haul Road Improvements - 4" Gravel Surfacing Unit Price **Cell: R99**

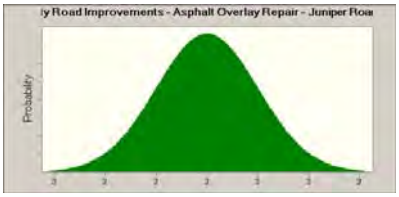
BetaPERT distribution with parameters:

Minimum	$80.00	(=Q99)
Likeliest	$100.00	(=R99)
Maximum	$120.00	(=S99)

Assumption: 87 County Road Improvements - Asphalt Overlay Repair - Juniper Road Quant **C/Q-L100**

Normal distribution with parameters:

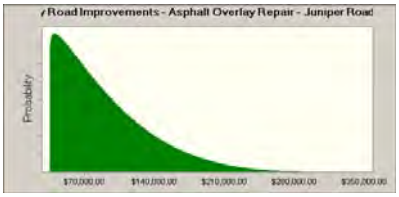
Mean	3	(=L100)
Std. Dev.	0	(=0.000001)



Assumption: 87 County Road Improvements - Asphalt Overlay Repair - Juniper Road Unit **C/Unit-R100**

BetaPERT distribution with parameters:

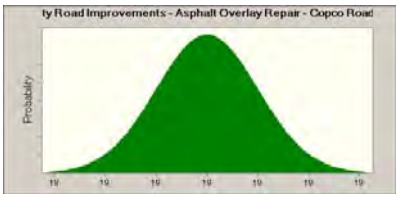
Minimum	$35,000.00	(=Q100)
Likeliest	$40,000.00	(=R100)
Maximum	$350,000.00	(=S100)



Assumption: 88 County Road Improvements - Asphalt Overlay Repair - Copco Road Quant **C/Q-L101**

Normal distribution with parameters:

Mean	19	(=L101)
Std. Dev.	0	(=0.000001)



Assumption: 88 County Road Improvements - Asphalt Overlay Repair - Copco Road Cell: R101

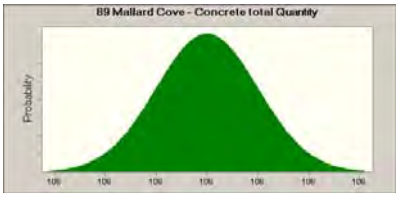
BetaPERT distribution with parameters:

Minimum	$35,000.00	(=Q101)
Likeliest	$40,000.00	(=R101)
Maximum	$350,000.00	(=S101)

Assumption: 89 Mallard Cove - Concrete total Quantity Cell: L102

Normal distribution with parameters:

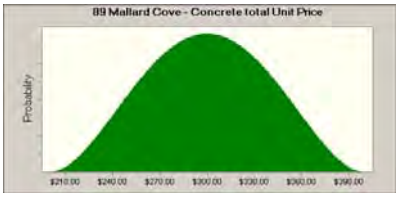
Mean	106	(=L102)
Std. Dev.	0	(=0.000001)



Assumption: 89 Mallard Cove - Concrete total Unit Price Cell: R102

BetaPERT distribution with parameters:

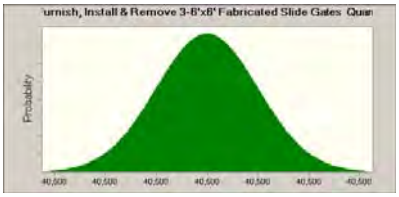
Minimum	$200.00	(=Q102)
Likeliest	$300.00	(=R102)
Maximum	$400.00	(=S102)



Assumption: 9 Furnish, Install & Remove 3-6'x6' Fabricated Slide Gates Quantity Cell: L22

Normal distribution with parameters:

Mean	40,500	(=L22)
Std. Dev.	0	(=0.000001)



Assumption: 9 Furnish, Install & Remove 3-6'x6' Fabricated Slide Gates Unit Price Cell: R22

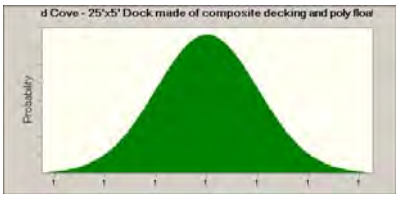
BetaPERT distribution with parameters:

Minimum	$12.00	(=Q22)
Likeliest	$15.00	(=R22)
Maximum	$18.00	(=S22)

Assumption: 90 Mallard Cove - 25'x5' Dock made of composite decking and poly floats Cell: L103

Normal distribution with parameters:

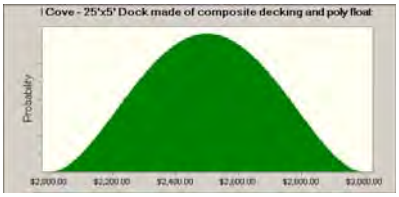
Mean	1	(=L103)
Std. Dev.	0	(=0.000001)



Assumption: 90 Mallard Cove - 25'x5' Dock made of composite decking and poly flo **Cell: R103**

BetaPERT distribution with parameters:

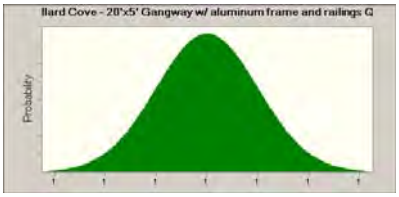
Minimum	$2,000.00	(=Q103)
Likeliest	$2,500.00	(=R103)
Maximum	$3,000.00	(=S103)



Assumption: 91 Mallard Cove - 20'x5' Gangway w/ aluminum frame and railings Quantity **Cell: L104**

Normal distribution with parameters:

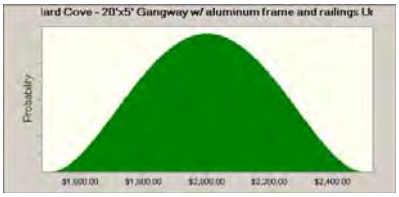
Mean	1	(=L104)
Std. Dev.	0	(=0.000001)



Assumption: 91 Mallard Cove - 20'x5' Gangway w/ aluminum frame and railings Unit Price **Cell: R104**

BetaPERT distribution with parameters:

Minimum	$1,500.00	(=Q104)
Likeliest	$2,000.00	(=R104)
Maximum	$2,500.00	(=S104)



Assumption: 92 Mallard Cove - Signs to be removed and hauled away Quantity **Cell: L105**

Normal distribution with parameters:

Mean	6	(=L105)
Std. Dev.	0	(=0.000001)

Assumption: 92 Mallard Cove - Signs to be removed and hauled away Unit Price **Cell: R105**

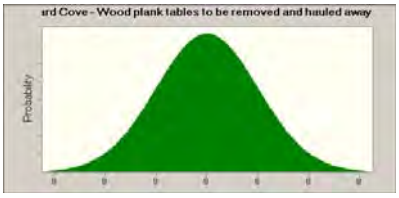
BetaPERT distribution with parameters:

Minimum	$250.00	(=Q105)
Likeliest	$300.00	(=R105)
Maximum	$350.00	(=S105)

Assumption: 93 Mallard Cove - Wood plank tables to be removed and hauled away Quantity **Cell: L106**

Normal distribution with parameters:

Mean	8	(=L106)
Std. Dev.	0	(=0.000001)



Assumption: 93 Mallard Cove - Wood plank tables to be removed and hauled away Cell: R106

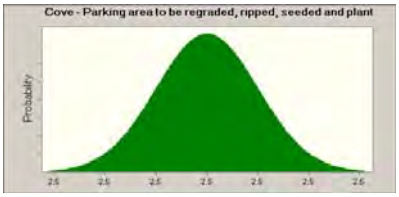
BetaPERT distribution with parameters:

Minimum	$90.00	(=Q106)
Likeliest	$100.00	(=R106)
Maximum	$120.00	(=S106)

Assumption: 94 Mallard Cove - Parking area to be regraded, ripped, seeded and plant Cell: Q107

Normal distribution with parameters:

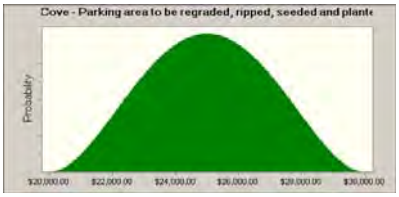
Mean	2.5	(=L107)
Std. Dev.	0.0	(=0.000001)



Assumption: 94 Mallard Cove - Parking area to be regraded, ripped, seeded and plant Cell: R107

BetaPERT distribution with parameters:

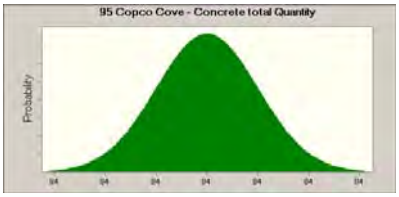
Minimum	$20,000.00	(=Q107)
Likeliest	$25,000.00	(=R107)
Maximum	$30,000.00	(=S107)



Assumption: 95 Copco Cove - Concrete total Quantity **Cell: L108**

Normal distribution with parameters:

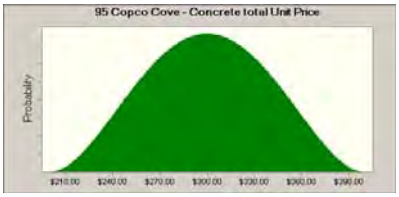
Mean	84	(=L108)
Std. Dev.	0	(=0.000001)



Assumption: 95 Copco Cove - Concrete total Unit Price **Cell: R108**

BetaPERT distribution with parameters:

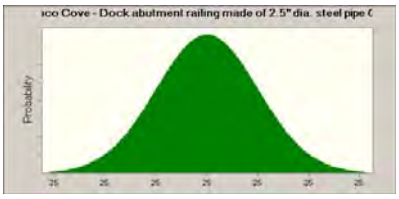
Minimum	$200.00	(=Q108)
Likeliest	$300.00	(=R108)
Maximum	$400.00	(=S108)



Assumption: 96 Copco Cove - Dock abutment railing made of 2.5" dia. steel pipe Quantity **Cell: L109**

Normal distribution with parameters:

Mean	25	(=L109)
Std. Dev.	0	(=0.000001)



Assumption: 96 Copco Cove - Dock abutment railing made of 2.5" dia. steel pipe Unit Price **Cell: R109**

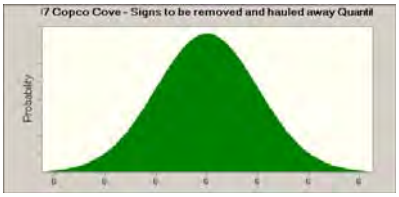
BetaPERT distribution with parameters:

Minimum	$35.00	(=Q109)
Likeliest	$40.00	(=R109)
Maximum	$45.00	(=S109)

Assumption: 97 Copco Cove - Signs to be removed and hauled away Quantity **Cell: L110**

Normal distribution with parameters:

Mean	6	(=L110)
Std. Dev.	0	(=0.000001)



Assumption: 97 Copco Cove - Signs to be removed and hauled away Unit Price **Cell: R110**

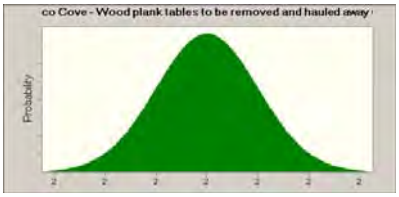
BetaPERT distribution with parameters:

Minimum	$250.00	(=Q110)
Likeliest	$300.00	(=R110)
Maximum	$350.00	(=S110)

Assumption: 98 Copco Cove - Wood plank tables to be removed and hauled away Quantity Cell: L111

Normal distribution with parameters:

Mean	2	(=L111)
Std. Dev.	0	(=0.000001)



Assumption: 98 Copco Cove - Wood plank tables to be removed and hauled away Unit Price Cell: R111

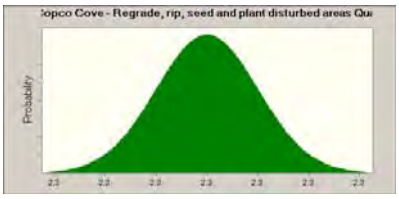
BetaPERT distribution with parameters:

Minimum	$90.00	(=Q111)
Likeliest	$100.00	(=R111)
Maximum	$120.00	(=S111)

Assumption: 99 Copco Cove - Regrade, rip, seed and plant disturbed areas Quantity Cell: L112

Normal distribution with parameters:

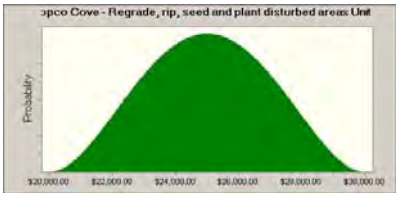
Mean	2.3	(=L112)
Std. Dev.	0.0	(=0.000001)



Assumption: 99 Copco Cove - Regrade, rip, seed and plant disturbed areas Unit Price **Cell: R112**

BetaPERT distribution with parameters:

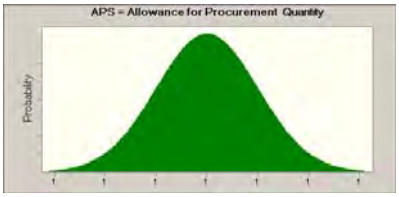
Minimum	$20,000.00	(=Q112)
Likeliest	$25,000.00	(=R112)
Maximum	$30,000.00	(=S112)



Assumption: APS = Allowance for Procurement Quantity **Cell: L121**

Normal distribution with parameters:

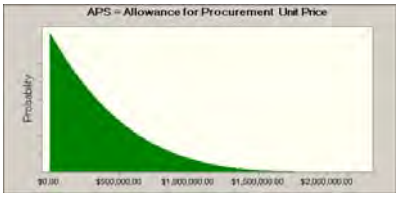
Mean	1	(=L121)
Std. Dev.	0	(=0.000001)



Assumption: APS = Allowance for Procurement Unit Price **Cell: R121**

BetaPERT distribution with parameters:

Minimum	$0.00	(=Q121)
Likeliest	$0.00	(=R121)
Maximum	$2,262,431.00	(=S121)



Assumption: Construction Contingencies Quantity **Cell: L124**

Normal distribution with parameters:

Mean	1	(=L124)
Std. Dev.	0	(=0.000001)

Assumption: Construction Contingencies Unit Price **Cell: R124**

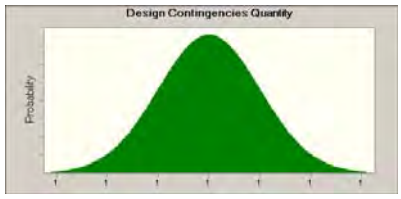
BetaPERT distribution with parameters:

Minimum	$7,000,000.00	(=Q124)
Likeliest	$11,000,000.00	(=R124)
Maximum	$30,000,000.00	(=S124)

Assumption: Design Contingencies Quantity **Cell: L120**

Normal distribution with parameters:

Mean	1	(=L120)
Std. Dev.	0	(=0.000001)



Assumption: Design Contingencies Unit Price **Cell: R120**

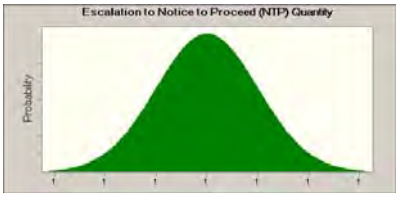
BetaPERT distribution with parameters:

Minimum	$3,466,116.00	(=Q120)
Likeliest	$5,386,105.00	(=R120)
Maximum	$14,371,011.00	(=S120)

Assumption: Escalation to Notice to Proceed (NTP) Quantity **Cell: L117**

Normal distribution with parameters:

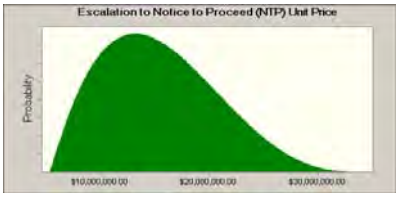
Mean	1	(=L117)
Std. Dev.	0	(=0.000001)



Assumption: Escalation to Notice to Proceed (NTP) Unit Price **Cell: R117**

BetaPERT distribution with parameters:

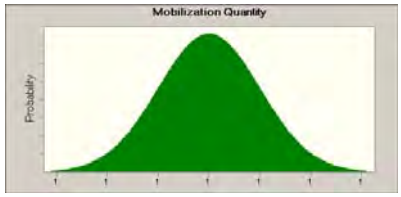
Minimum	$5,330,499.00	(=Q117)
Likeliest	$13,208,310.00	(=R117)
Maximum	$34,262,933.00	(=S117)



Assumption: Mobilization Quantity **Cell: L115**

Normal distribution with parameters:

Mean	1	(=L115)
Std. Dev.	0	(=0.000001)



Assumption: Mobilization Unit Price **Cell: R115**

BetaPERT distribution with parameters:

Minimum	$1,600,000.00	(=Q115)
Likeliest	$1,850,000.00	(=R115)
Maximum	$3,100,000.00	(=S115)

Assumption: Non-Contract Cost Quantity **Cell: L126**

Normal distribution with parameters:

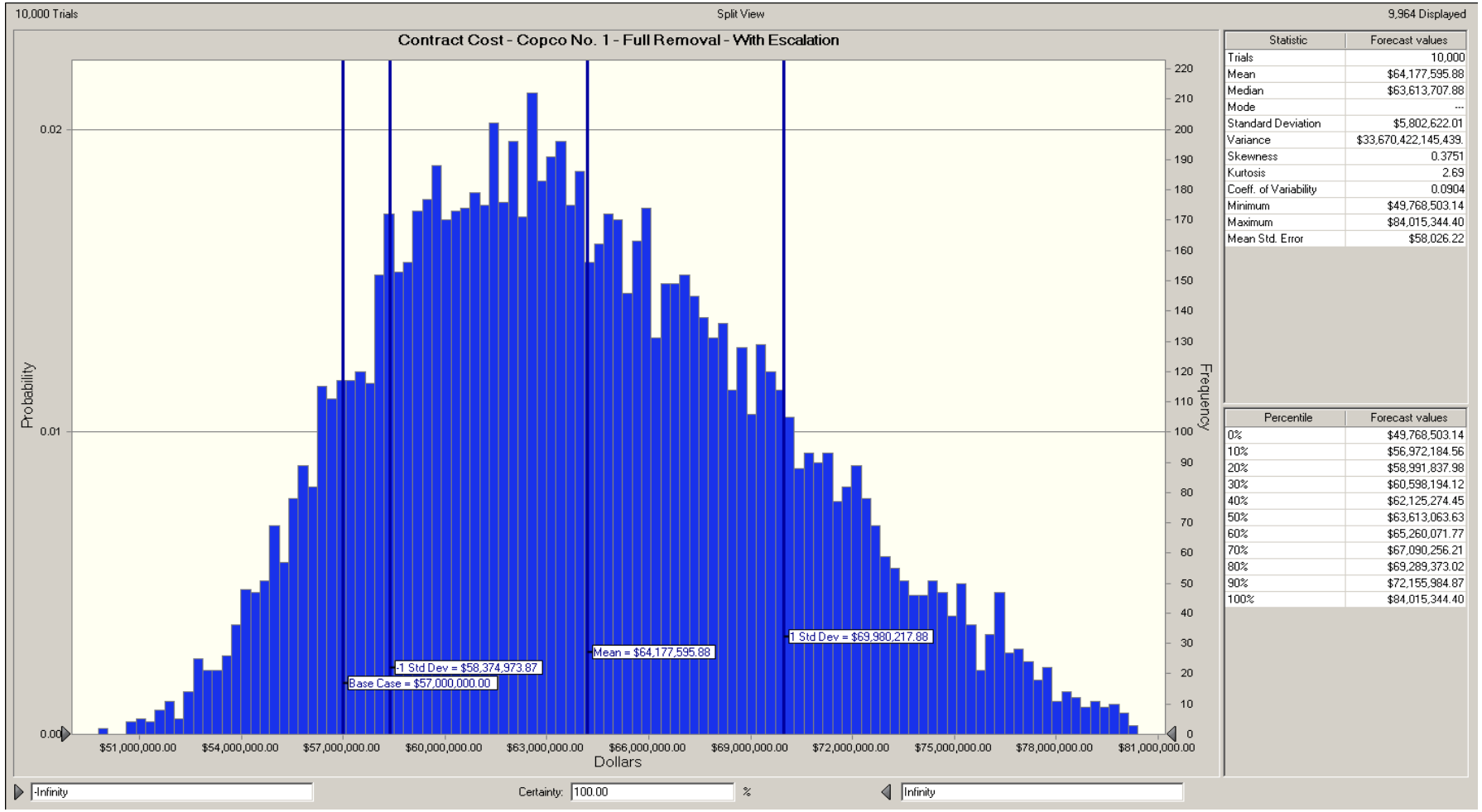
Mean	1	(=L126)
Std. Dev.	0	(=0.000001)

Assumption: Non-Contract Cost Unit Price **Cell: R126**

BetaPERT distribution with parameters:

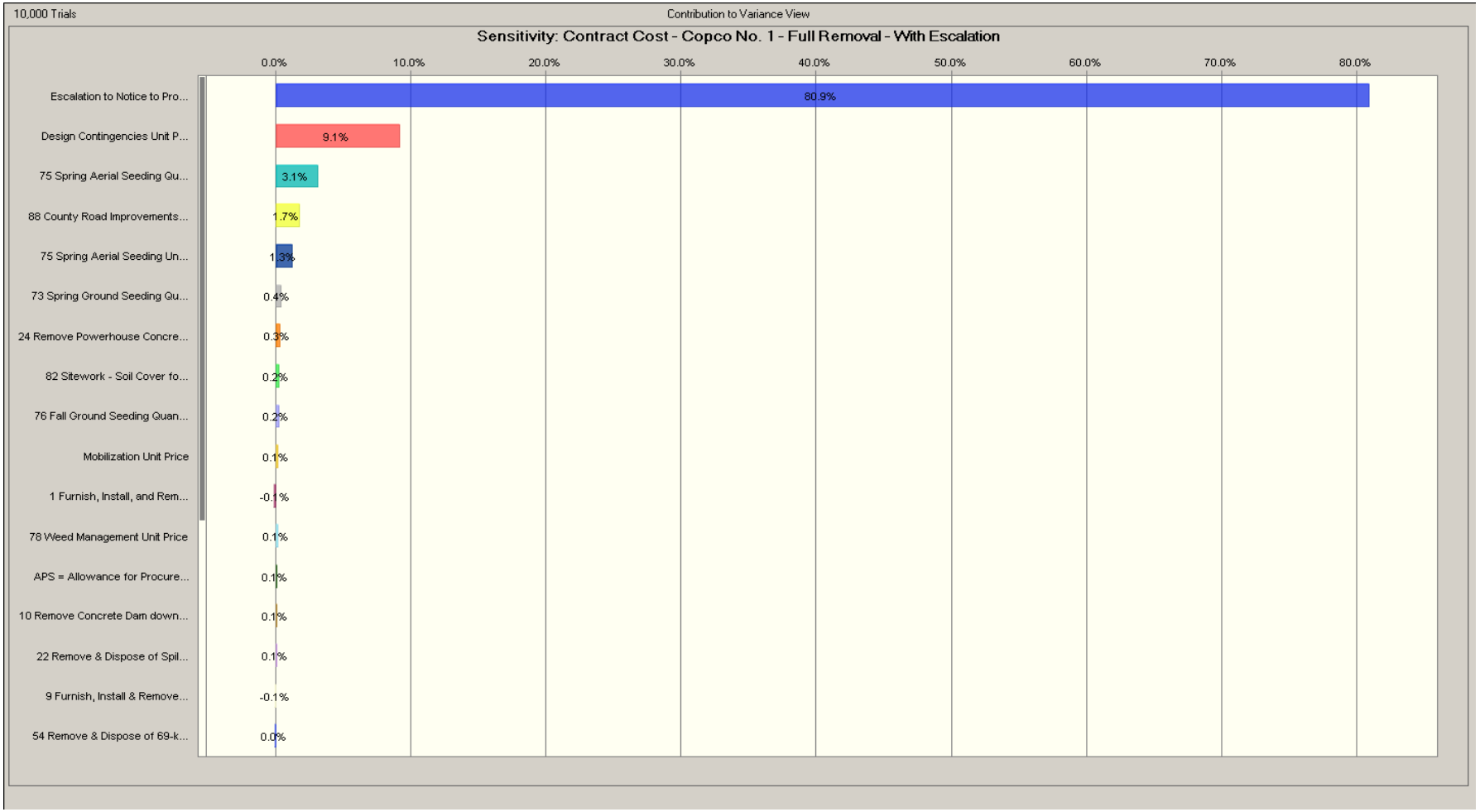
Minimum	$25,000,000.00	(=Q126)
Likeliest	$37,000,000.00	(=R126)
Maximum	$85,000,000.00	(=S126)

End of Assumptions

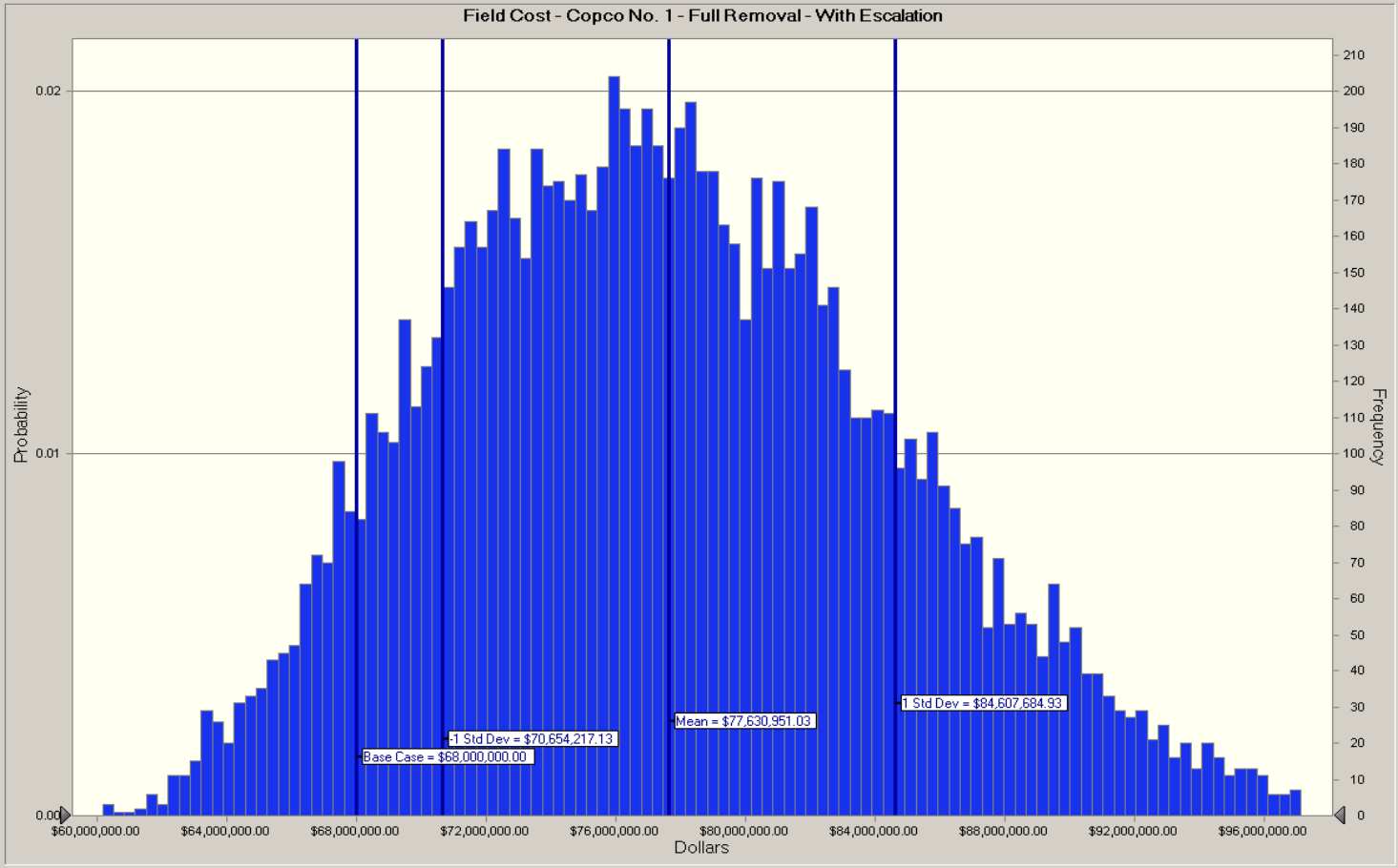


Statistic	Forecast values
Trials	10,000
Mean	$64,177,595.88
Median	$63,613,707.88
Mode	---
Standard Deviation	$5,802,622.01
Variance	$33,670,422,145,439.
Skewness	0.3751
Kurtosis	2.69
Coeff. of Variability	0.0904
Minimum	$49,768,503.14
Maximum	$84,015,344.40
Mean Std. Error	$58,026.22

Percentile	Forecast values
0%	$49,768,503.14
10%	$56,972,184.56
20%	$58,991,837.98
30%	$60,598,194.12
40%	$62,125,274.45
50%	$63,613,063.63
60%	$65,260,071.77
70%	$67,090,256.21
80%	$69,289,373.02
90%	$72,155,984.87
100%	$84,015,344.40


10,000 Trials
Contribution to Variance View
Sensitivity: Contract Cost - Copco No. 1 - Full Removal - With Escalation
0.0%
10.0%
20.0%
30.0%
40.0%
50.0%
60.0%
70.0%
80.0%
Escalation to Notice to Pro...
80.9%
Design Contingencies Unit P...
9.1%
75 Spring Aerial Seeding Qu...
3.1%
88 County Road Improvements...
1.7%
75 Spring Aerial Seeding Un...
1.3%
73 Spring Ground Seeding Qu...
0.4%
24 Remove Powerhouse Concre...
0.3%
82 Sitework - Soil Cover fo...
0.2%
76 Fall Ground Seeding Quan...
0.2%
Mobilization Unit Price
0.1%
1 Furnish, Install, and Rem...
-0.1%
78 Weed Management Unit Price
0.1%
APS = Allowance for Procure...
0.1%
10 Remove Concrete Dam down...
0.1%
22 Remove & Dispose of Spil...
0.1%
9 Furnish, Install & Remove...
-0.1%
54 Remove & Dispose of 69-k...
0.0%

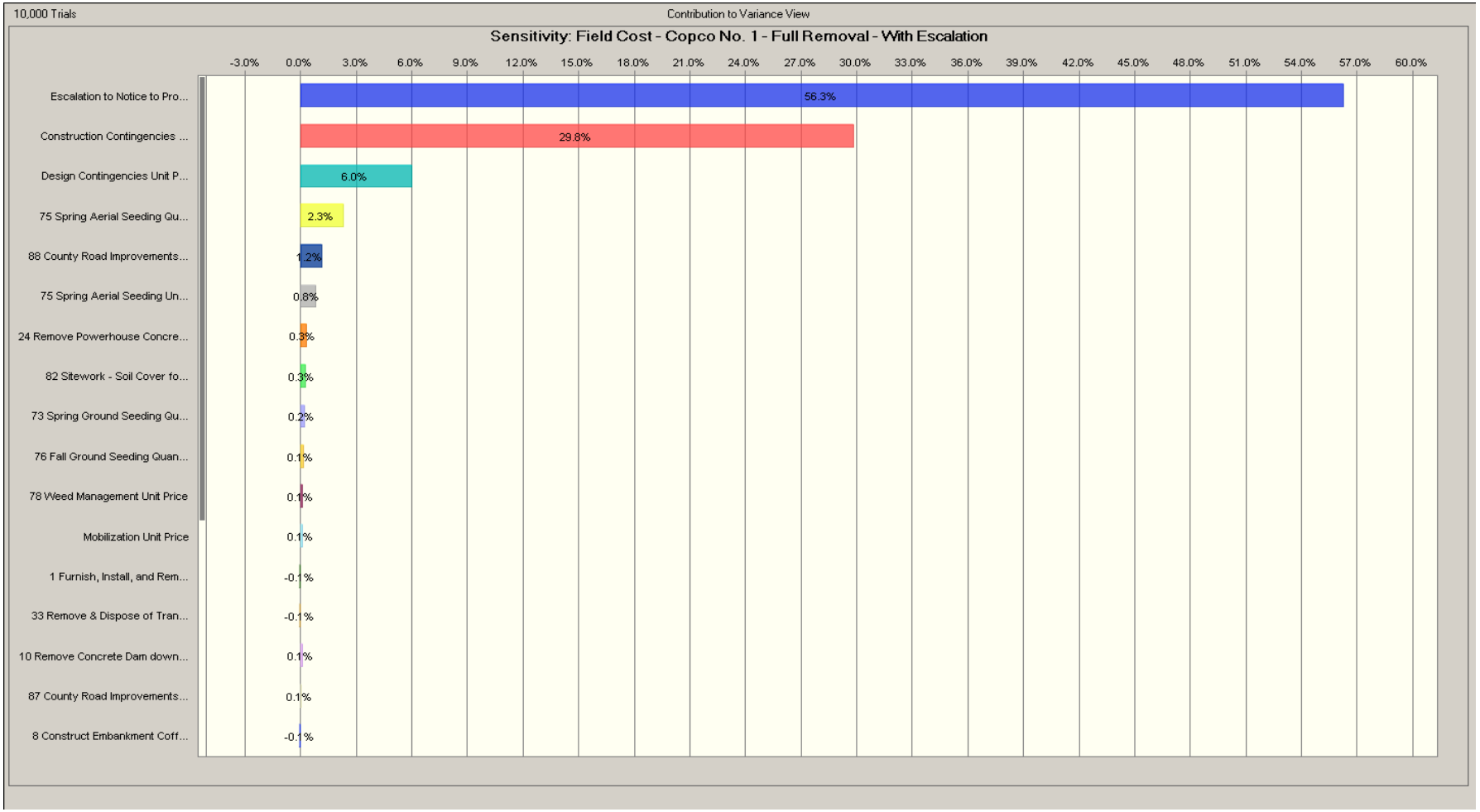
10,000 Trials | Split View | 9,962 Displayed

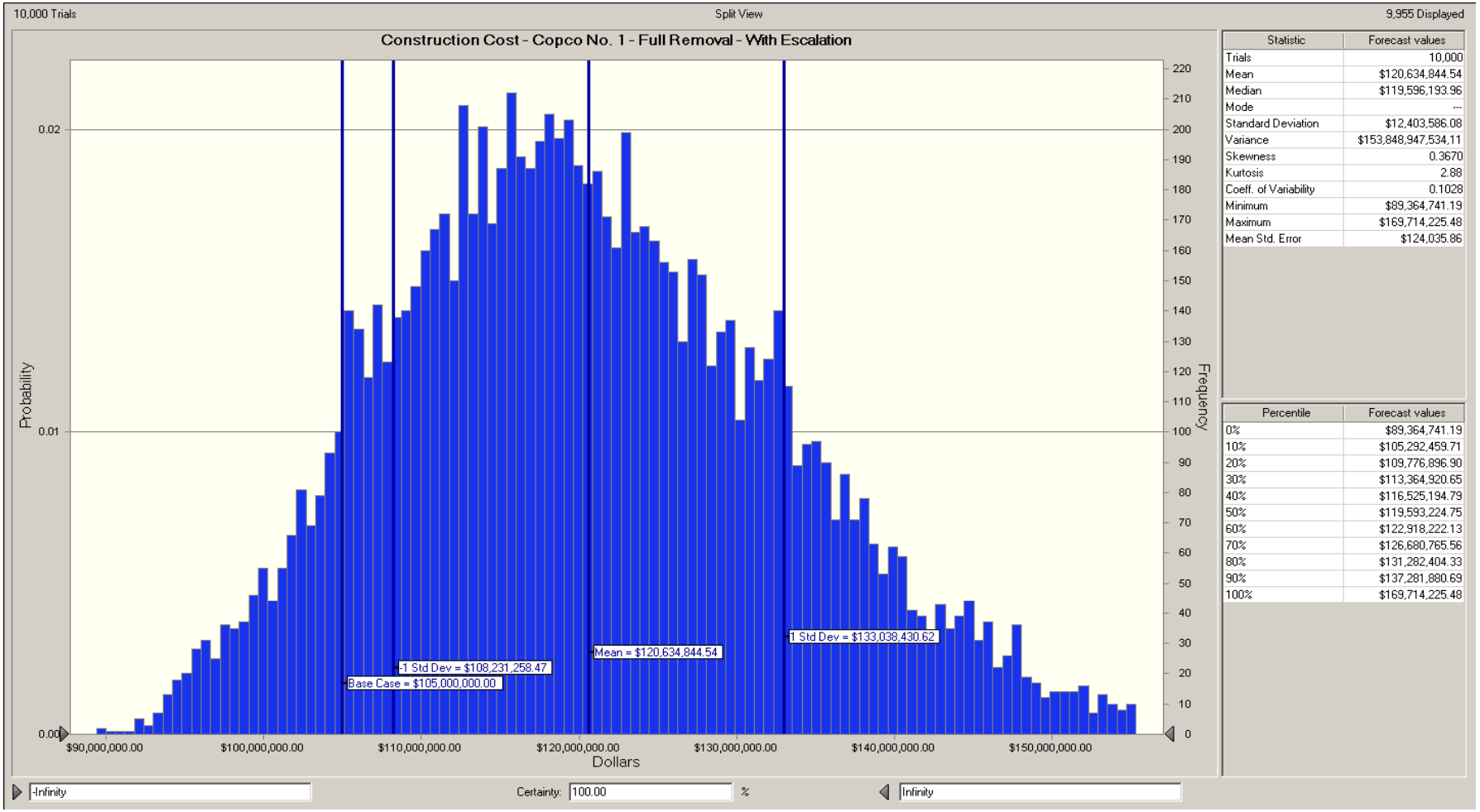


Statistic	Forecast values
Trials	10,000
Mean	$77,630,951.03
Median	$77,192,942.66
Mode	---
Standard Deviation	$6,976,733.90
Variance	$48,674,815,930,974.
Skewness	0.3216
Kurtosis	2.79
Coeff. of Variability	0.0899
Minimum	$60,146,826.62
Maximum	$106,450,077.22
Mean Std. Error	$69,767.34

Percentile	Forecast values
0%	$60,146,826.62
10%	$68,782,177.11
20%	$71,426,820.74
30%	$73,498,839.39
40%	$75,434,155.48
50%	$77,191,864.59
60%	$79,051,132.48
70%	$81,155,601.59
80%	$83,548,240.01
90%	$86,986,439.66
100%	$106,450,077.22

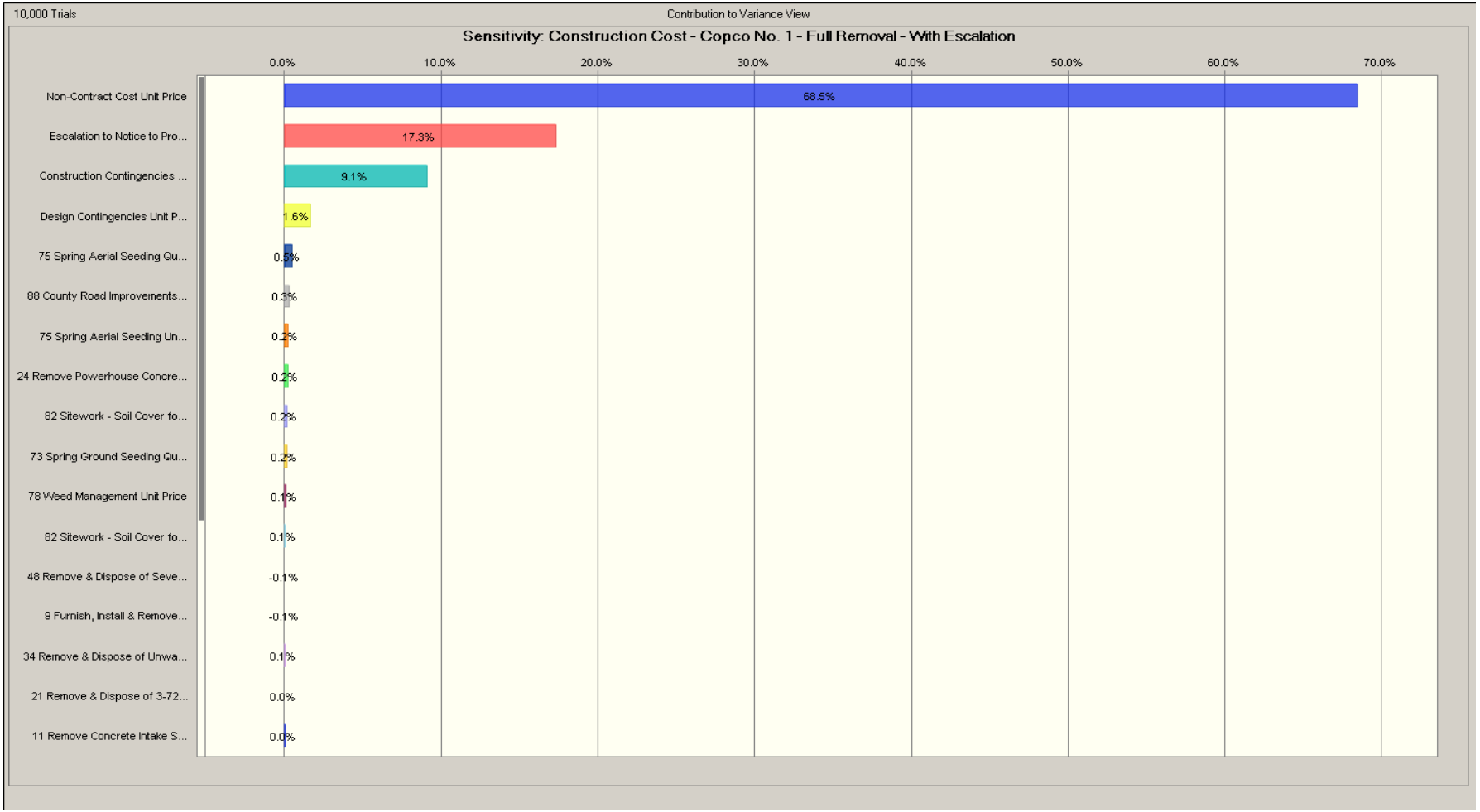
-Infinity | Certainty: 100.00 % | Infinity


10,000 Trials
Contribution to Variance View
Sensitivity: Field Cost - Copco No. 1 - Full Removal - With Escalation
-3.0% 0.0% 3.0% 6.0% 9.0% 12.0% 15.0% 18.0% 21.0% 24.0% 27.0% 30.0% 33.0% 36.0% 39.0% 42.0% 45.0% 48.0% 51.0% 54.0% 57.0% 60.0%
Escalation to Notice to Pro... 56.3%
Construction Contingencies ... 29.8%
Design Contingencies Unit P... 6.0%
75 Spring Aerial Seeding Qu... 2.3%
88 County Road Improvements... 1.2%
75 Spring Aerial Seeding Un... 0.8%
24 Remove Powerhouse Concre... 0.3%
82 Sitework - Soil Cover fo... 0.3%
73 Spring Ground Seeding Qu... 0.2%
76 Fall Ground Seeding Quan... 0.1%
78 Weed Management Unit Price 0.1%
Mobilization Unit Price 0.1%
1 Furnish, Install, and Rem... -0.1%
33 Remove & Dispose of Tran... -0.1%
10 Remove Concrete Dam down... 0.1%
87 County Road Improvements... 0.1%
8 Construct Embankment Coff... -0.1%



Statistic	Forecast values
Trials	10,000
Mean	$120,634,844.54
Median	$119,596,193.96
Mode	---
Standard Deviation	$12,403,586.08
Variance	$153,848,947,534.11
Skewness	0.3670
Kurtosis	2.88
Coeff. of Variability	0.1028
Minimum	$89,364,741.19
Maximum	$169,714,225.48
Mean Std. Error	$124,035.86

Percentile	Forecast values
0%	$89,364,741.19
10%	$105,292,459.71
20%	$109,776,896.90
30%	$113,364,920.65
40%	$116,525,194.79
50%	$119,593,224.75
60%	$122,918,222.13
70%	$126,680,765.56
80%	$131,282,404.33
90%	$137,281,880.69
100%	$169,714,225.48


10,000 Trials
Contribution to Variance View
Sensitivity: Construction Cost - Copco No. 1 - Full Removal - With Escalation
0.0%
10.0%
20.0%
30.0%
40.0%
50.0%
60.0%
70.0%
Non-Contract Cost Unit Price
68.5%
Escalation to Notice to Pro...
17.3%
Construction Contingencies ...
9.1%
Design Contingencies Unit P...
1.6%
75 Spring Aerial Seeding Qu...
0.5%
88 County Road Improvements...
0.3%
75 Spring Aerial Seeding Un...
0.2%
24 Remove Powerhouse Concre...
0.2%
82 Sitework - Soil Cover fo...
0.2%
73 Spring Ground Seeding Qu...
0.2%
78 Weed Management Unit Price
0.1%
82 Sitework - Soil Cover fo...
0.1%
48 Remove & Dispose of Seve...
-0.1%
9 Furnish, Install & Remove...
-0.1%
34 Remove & Dispose of Unwa...
0.1%
21 Remove & Dispose of 3-72...
0.0%
11 Remove Concrete Intake S...
0.0%

BUREAU OF RECLAMATION

ESTIMATE WORKSHEET

FEATURE:

REVISION #1
Klamath River Dams Removal
Full Removal Option
Copco No. 1 Dam & Powerplant Removal
Escalation NOT Included
SUMMARY ESTIMATE

PROJECT: Klamath River, Northern California/Southern Oregon

WOID: AF652 | **ESTIMATE LEVEL:** Feasibility
REGION: MP | **PRICE LEVEL:** Jul-2010
FILE: C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 1\[Copco 1 - Full Removal Crystal Ball - with Escalation - 2011-04.xls]Copco 1 - Full - with Esc

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	MPL QUANTITY	MP QUANTITY	MPH QUANTITY	UNIT	MPL UNIT PRICE	MP UNIT PRICE	MPH UNIT PRICE	MPL TOTAL	MP TOTAL	MPH TOTAL
	1	Furnish, Install, and Remove Barge-Mounted Crane in Reservoir for Dam Removal	8130	1	1	1	LS	$340,000.00	$350,000.00	$370,000.00	$340,000.00	$350,000.00	$370,000.00
	2	Remove Sediment from Diversion Tunnel Intake to provide access	8130	30	30	30	CY	$1,700.00	$2,000.00	$3,000.00	$51,000.00	$60,000.00	$90,000.00
	3	Furnish, Install, and Remove Large Crane on Right Abutment	8130	1	1	1	LS				$0.00	$0.00	$0.00
	4	Remove Water from behind Tailrace Cofferdam	8130	200,000	200,000	200,000	GAL	$0.01	$0.01	$0.01	$2,000.00	$2,000.00	$2,000.00
	5	Riprap Protection on Cofferdam	8130	260	260	260	CY	$120.00	$150.00	$200.00	$31,200.00	$39,000.00	$52,000.00
	6	Provide Dewatering behind Tailrace Cofferdam	8130	1	1	1	LS	$30,000.00	$35,000.00	$200,000.00	$30,000.00	$35,000.00	$200,000.00
	7	Remove Current Diversion Tunnel Plug	8130	195	195	195	CY	$1,400.00	$1,500.00	$1,800.00	$273,000.00	$292,500.00	$351,000.00
	8	Construct Embankment Cofferdam in Tailrace	8130	1,700	1,700	1,700	CY	$70.00	$85.00	$130.00	$119,000.00	$144,500.00	$221,000.00
	9	Furnish, Install & Remove 3-6'x6' Fabricated Slide Gates	8420	40,500	40,500	40,500	LBS	$12.00	$15.00	$18.00	$486,000.00	$607,500.00	$729,000.00
	10	Remove Concrete Dam down to Elev. 2476	8130	36,000	36,000	36,000	CY	$290.00	$300.00	$320.00	$10,440,000.00	$10,800,000.00	$11,520,000.00
	11	Remove Concrete Intake Structure on Right Abutment	8130	21,000	21,000	21,000	CY	$340.00	$350.00	$390.00	$7,140,000.00	$7,350,000.00	$8,190,000.00
	12	Remove Structural Steel from Spillway	8130	55,000	55,000	55,000	LBS	$0.70	$1.00	$1.50	$38,500.00	$55,000.00	$82,500.00
	13	Install Diversion Tunnel Plugs	8130	30	30	30	CY	$1,100.00	$1,200.00	$1,300.00	$33,000.00	$36,000.00	$39,000.00
	14	Remove Diversion Tunnel Control Structure Concrete	8130	350	350	350	CY	$170.00	$215.00	$380.00	$59,500.00	$75,250.00	$133,000.00
	15	Remove & Dispose of Hand Rails	8420	11,000	11,000	11,000	LBS	$0.70	$1.00	$1.50	$7,700.00	$11,000.00	$16,500.00
	16	Remove & Dispose of Radial Gates	8420	140,500	140,500	140,500	LBS	$0.70	$1.00	$1.50	$98,350.00	$140,500.00	$210,750.00
	17	Remove & Dispose of Radial Gate stoplogs	8420	18,000	18,000	18,000	LBS	$0.70	$1.00	$1.50	$12,600.00	$18,000.00	$27,000.00
	18	Remove & Dispose of Stoplog hoist, track and supports	8420	26,000	26,000	26,000	LBS	$0.70	$1.00	$1.50	$18,200.00	$26,000.00	$39,000.00
	19	Remove & Dispose of 3 sections of 23' of 72"Ø steel lining (embedded)	8420	54,000	54,000	54,000	LBS	$0.60	$0.85	$1.00	$32,400.00	$45,900.00	$54,000.00
	20	Remove & Dispose of 3 - 72" butterfly valves (embedded)	8420	55,000	55,000	55,000	LBS	$0.60	$0.85	$5.00	$33,000.00	$46,750.00	$275,000.00
	21	Remove & Dispose of 3-72" flapper valves with remote mechanical	8420	78,000	78,000	78,000	LBS	$2.50	$3.00	$5.00	$195,000.00	$234,000.00	$390,000.00
	22	Remove & Dispose of Spillway gate motor & control panel	8430	1	1	1	EA	$900.00	$1,000.00	$1,500.00	$900.00	$1,000.00	$1,500.00
	23	Remove & Dispose of Distribution equipment , panelboards	8430	1	1	1	EA	$5,000.00	$6,000.00	$7,000.00	$5,000.00	$6,000.00	$7,000.00
	24	Remove Powerhouse Concrete down to top of rock under the Powerhouse	8130	3,100	3,100	3,100	CY	$270.00	$350.00	$1,000.00	$837,000.00	$1,085,000.00	$3,100,000.00
	25	Remove Powerhouse Structural Steel	8130	110,000	110,000	110,000	LBS	$0.60	$0.85	$1.00	$66,000.00	$93,500.00	$110,000.00
	26	Remove & Dispose of 2 - Governor oil systems	8420	38,000	38,000	38,000	LBS	$0.60	$0.85	$1.00	$22,800.00	$32,300.00	$38,000.00
	27	Remove & Dispose of Cooling water and bearing oil systems	8420	11,000	11,000	11,000	LBS	$0.60	$0.85	$1.00	$6,600.00	$9,350.00	$11,000.00
	28	Remove & Dispose of 4 - Horizontal Tandem Francis Turbines	8420	452,000	452,000	452,000	LBS	$0.60	$0.85	$1.00	$271,200.00	$384,200.00	$452,000.00
	29	Remove & Dispose of 2 - 40 Ton indoor cranes	8420	140,000	140,000	140,000	LBS	$0.60	$0.85	$1.00	$84,000.00	$119,000.00	$140,000.00
	30	Remove & Dispose of Compressed Air system	8420	1,000	1,000	1,000	LBS	$0.60	$0.85	$1.00	$600.00	$850.00	$1,000.00
	31	Remove & Dispose of 2 - CO2 systems	8420	3,100	3,100	3,100	LBS	$0.60	$0.85	$1.00	$1,860.00	$2,635.00	$3,100.00
	32	Remove & Dispose of Plant Water and Fire Protection	8420	2,600	2,600	2,600	LBS	$0.60	$0.85	$1.00	$1,560.00	$2,210.00	$2,600.00
	33	Remove & Dispose of Transformer Oil Fire protection	8420	5,400	5,400	5,400	LBS	$0.60	$0.85	$1.00	$3,240.00	$4,590.00	$5,400.00
	34	Remove & Dispose of Unwatering Piping	8420	27,000	27,000	27,000	LBS	$0.60	$0.85	$1.00	$16,200.00	$22,950.00	$27,000.00
	35	Remove & Dispose of Drainage Piping	8420	5,000	5,000	5,000	LBS	$0.60	$0.85	$1.00	$3,000.00	$4,250.00	$5,000.00
	36	Remove & Dispose of Horizontal AC Generator, Indoor Open Frame	8430	2	2	2	EA	$30,000.00	$35,000.00	$40,000.00	$60,000.00	$70,000.00	$80,000.00
	37	Remove & Dispose of Excitation equipment for 12.5 MVA Generator	8430	2	2	2	EA	$5,000.00	$6,000.00	$7,000.00	$10,000.00	$12,000.00	$14,000.00
	38	Remove & Dispose of Surge protection equip. for 12.5 MVA Generator	8430	2	2	2	EA	$1,500.00	$2,000.00	$3,000.00	$3,000.00	$4,000.00	$6,000.00
	39	Remove & Dispose of Neutral grounding equip. for 12.5 MVA Generator	8430	2	2	2	EA	$1,500.00	$2,000.00	$3,000.00	$3,000.00	$4,000.00	$6,000.00
	40	Remove & Dispose of Generator Switchgear, 5kV-includes unit breakers	8430	1	1	1	EA	$15,000.00	$20,000.00	$25,000.00	$15,000.00	$20,000.00	$25,000.00
	41	Remove & Dispose of Station Service Switchgear, 600 volt -(5 sections)	8430	1	1	1	EA	$15,000.00	$20,000.00	$25,000.00	$15,000.00	$20,000.00	$25,000.00
	42	Remove & Dispose of Unit and plant control switchboard	8430	1	1	1	EA	$14,000.00	$15,000.00	$17,000.00	$14,000.00	$15,000.00	$17,000.00
	43	Remove & Dispose of Battery system	8430	1	1	1	EA	$9,000.00	$10,000.00	$12,000.00	$9,000.00	$10,000.00	$12,000.00
	44	Remove & Dispose of Raceways, Conduit and Cable	8430	1	1	1	EA	$14,000.00	$15,000.00	$17,000.00	$14,000.00	$15,000.00	$17,000.00
	45	Remove & Dispose of Misc. power & control boards	8430	1	1	1	EA	$4,000.00	$5,000.00	$7,000.00	$4,000.00	$5,000.00	$7,000.00
	46	Remove & Dispose of Step-up Transformers, indoor, oil-filled, 1-phase, 5000kVA	8430	3	3	3	EA	$40,000.00	$50,000.00	$60,000.00	$120,000.00	$150,000.00	$180,000.00
	47	Remove & Dispose of Step-up Transformers, indoor, oil-filled, 1-phase, 4165 kVA	8430	3	3	3	EA	$40,000.00	$50,000.00	$60,000.00	$120,000.00	$150,000.00	$180,000.00

ESTIMATE WORKSHEET

FEATURE:

REVISION #1
Klamath River Dams Removal
Full Removal Option
Copco No. 1 Dam & Powerplant Removal
Escalation NOT Included
SUMMARY ESTIMATE

PROJECT: Klamath River, Northern California/Southern Oregon

WOID: AF652 | **ESTIMATE LEVEL:** Feasibility
REGION: MP | **PRICE LEVEL:** Jul-2010
FILE: C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 1\[Copco 1 - Full Removal Crystal Ball - with Escalation - 2011-04.xls]Copco 1 - Full - with Esc

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	MPL QUANTITY	MP QUANTITY	MPH QUANTITY	UNIT	MPL UNIT PRICE	MP UNIT PRICE	MPH UNIT PRICE	MPL TOTAL	MP TOTAL	MPH TOTAL
	48	Remove & Dispose of Seven 40-Ton Travelling Crane motors - hoist	8430	1	1	1	EA	$2,000.00	$2,500.00	$3,000.00	$2,000.00	$2,500.00	$3,000.00
	49	Remove & Dispose of 40-Ton Travelling Crane control equipment	8430	1	1	1	EA	$9,000.00	$10,000.00	$12,000.00	$9,000.00	$10,000.00	$12,000.00
	50	Remove & Dispose of 40-Ton Travelling Crane Festoon Cable	8430	1	1	1	EA	$1,000.00	$1,500.00	$2,000.00	$1,000.00	$1,500.00	$2,000.00
	51	Remove & Dispose of Four 15-Ton Overhead Crane motors - hoist	8430	1	1	1	EA	$900.00	$1,000.00	$1,300.00	$900.00	$1,000.00	$1,300.00
	52	Remove & Dispose of 15-Ton Overhead Crane control equipment	8430	1	1	1	EA	$250.00	$300.00	$350.00	$250.00	$300.00	$350.00
	53	Remove & Dispose of 15-Ton Overhead Crane Festoon Cable	8430	1	1	1	EA	$400.00	$500.00	$600.00	$400.00	$500.00	$600.00
	54	Remove & Dispose of 69-kV circuit breakers, oil-filled, PCB	8430	2	2	2	EA	$2,500.00	$3,000.00	$3,500.00	$5,000.00	$6,000.00	$7,000.00
	55	Remove & Dispose of 69-kV disconnect switches, group-operated	8430	2	2	2	EA	$1,000.00	$1,500.00	$2,000.00	$2,000.00	$3,000.00	$4,000.00
	56	Remove & Dispose of 60-foot wood poles	8430	12	12	12	EA	$900.00	$1,000.00	$1,300.00	$10,800.00	$12,000.00	$15,600.00
	57	Remove & Dispose of 30-foot wood crossarms	8430	24	24	24	EA	$400.00	$500.00	$600.00	$9,600.00	$12,000.00	$14,400.00
	58	Remove & Dispose of 69-kV insulator strings	8430	12	12	12	EA	$300.00	$400.00	$500.00	$3,600.00	$4,800.00	$6,000.00
	59	Remove & Dispose of Transmission Line No. 3	8430	1.66	1.66	1.66	MILE	$25,000.00	$30,000.00	$40,000.00	$41,500.00	$49,800.00	$66,400.00
	60	Remove & Dispose of Transmission Line No. 15	8430	1.23	1.23	1.23	MILE	$25,000.00	$30,000.00	$40,000.00	$30,750.00	$36,900.00	$49,200.00
	61	Remove & Dispose of Transmission Line No. 26-1	8430	0.07	0.07	0.07	MILE	$25,000.00	$30,000.00	$40,000.00	$1,750.00	$2,100.00	$2,800.00
	62	Remove & Dispose of Transmission Line No. 26-2	8430	0.07	0.07	0.07	MILE	$25,000.00	$30,000.00	$40,000.00	$1,750.00	$2,100.00	$2,800.00
	63	Remove gate house #1 from top of dam	8130	570	570	570	SF	$55.00	$60.00	$65.00	$31,350.00	$34,200.00	$37,050.00
	64	Remove gate house #2 from top of dam	8130	690	690	690	SF	$55.00	$60.00	$65.00	$37,950.00	$41,400.00	$44,850.00
	65	Remove Concrete Items associated with 10 ft. diam. Penstocks, reinf. Concrete	8130	1,050	1,050	1,050	CY	$170.00	$215.00	$380.00	$178,500.00	$225,750.00	$399,000.00
	66	Plug 14-foot diameter penstock with concrete	8130	23	23	23	CY	$1,100.00	$1,200.00	$1,500.00	$25,300.00	$27,600.00	$34,500.00
	67	Remove & Dispose of 8 screens	8420	18,000	18,000	18,000	LBS	$0.60	$0.85	$1.00	$10,800.00	$15,300.00	$18,000.00
	68	Remove & Dispose of 8 Water Gates	8420	18,000	18,000	18,000	LBS	$0.60	$0.85	$1.00	$10,800.00	$15,300.00	$18,000.00
	69	Remove & Dispose of 3 - 30"Ø x 25' stand pipes	8420	6,000	6,000	6,000	LBS	$0.60	$0.85	$1.00	$3,600.00	$5,100.00	$6,000.00
	70	Remove & Dispose of 14' Ø penstock pipe	8420	256,000	256,000	256,000	LBS	$0.60	$0.85	$1.00	$153,600.00	$217,600.00	$256,000.00
	71	Remove & Dispose of 10' Ø penstock pipe	8140	270,000	270,000	270,000	LBS	$0.60	$0.85	$1.00	$162,000.00	$229,500.00	$270,000.00
	72	Temporary Access Roads	8220	7	7	7	MILE	$60,000.00	$50,000.00	$100,000.00	$420,000.00	$350,000.00	$700,000.00
	73	Spring Ground Seeding	8220	420	420	0	ACRES	$3,000.00	$3,500.00	$4,000.00	$1,260,000.00	$1,470,000.00	$0.00
	74	Spring Barge Seeding	8220	82	82	0	ACRES	$5,000.00	$6,500.00	$8,000.00	$410,000.00	$533,000.00	$0.00
	75	Spring Aerial Seeding	8220	300	300	802	ACRES	$6,500.00	$7,500.00	$15,000.00	$1,950,000.00	$2,250,000.00	$12,030,000.00
	76	Fall Ground Seeding	8220	201	401	602	ACRES	$3,000.00	$3,500.00	$4,000.00	$603,000.00	$1,403,500.00	$2,408,000.00
	77	Riparian Pole Planting	8220	170	170	170	ACRES	$4,000.00	$8,500.00	$10,000.00	$680,000.00	$1,445,000.00	$1,700,000.00
	78	Weed Management	8220	201	401	602	ACRES	$1,000.00	$1,500.00	$2,000.00	$201,000.00	$601,500.00	$1,204,000.00
	79	Fall Ground Seeding	8220	321	321	321	ACRES	$3,000.00	$3,500.00	$4,000.00	$963,000.00	$1,123,500.00	$1,284,000.00
	80	Weed Management	8220	321	321	321	ACRES	$1,000.00	$1,500.00	$2,000.00	$321,000.00	$481,500.00	$642,000.00
	81	Sitework - Clear and Grub Disposal Area	8313	7	7	7	ACRES	$5,000.00	$6,000.00	$7,000.00	$35,000.00	$42,000.00	$49,000.00
	82	Sitework - Soil Cover for Disposal Area	8313	23,000	23,000	35,000	CY	$45.00	$50.00	$60.00	$1,035,000.00	$1,150,000.00	$2,100,000.00
	83	Access/Haul Road Improvements - Soil Excavation	8313	4,500	4,500	9,000	CY	$12.00	$13.00	$14.00	$54,000.00	$58,500.00	$126,000.00
	84	Access/Haul Road Improvements - Rock Excavation	8313	4,500	4,500	9,000	CY	$35.00	$40.00	$45.00	$157,500.00	$180,000.00	$405,000.00
	85	Access/Haul Road Improvements - Soil Backfill	8313	16,000	16,000	30,000	CY	$45.00	$50.00	$55.00	$720,000.00	$800,000.00	$1,650,000.00
	86	Access/Haul Road Improvements - 4" Gravel Surfacing	8313	0	320	320	TON	$80.00	$100.00	$120.00	$0.00	$32,000.00	$38,400.00
	87	County Road Improvements - Asphalt Overlay Repair - Juniper Road	8313	3	3	3	MILE	$35,000.00	$40,000.00	$350,000.00	$105,000.00	$120,000.00	$1,050,000.00
	88	County Road Improvements - Asphalt Overlay Repair - Copco Road	8313	19	19	19	MILE	$35,000.00	$40,000.00	$350,000.00	$665,000.00	$760,000.00	$6,650,000.00
	89	Mallard Cove - Concrete total	BLM	106	106	106	CY	$200.00	$300.00	$400.00	$21,200.00	$31,800.00	$42,400.00
	90	Mallard Cove - 25'x5' Dock made of composite decking and poly floats	BLM	1	1	1	EA	$2,000.00	$2,500.00	$3,000.00	$2,000.00	$2,500.00	$3,000.00
	91	Mallard Cove - 20'x5' Gangway w/ aluminum frame and railings	BLM	1	1	1	EA	$1,500.00	$2,000.00	$2,500.00	$1,500.00	$2,000.00	$2,500.00
	92	Mallard Cove - Signs to be removed and hauled away	BLM	6	6	6	EA	$250.00	$300.00	$350.00	$1,500.00	$1,800.00	$2,100.00
	93	Mallard Cove - Wood plank tables to be removed and hauled away	BLM	8	8	8	EA	$90.00	$100.00	$120.00	$720.00	$800.00	$960.00
	94	Mallard Cove - Parking area to be regraded, ripped, seeded and planted	BLM	2.5	2.5	2.5	ACRES	$20,000.00	$25,000.00	$30,000.00	$50,000.00	$62,500.00	$75,000.00
	95	Copco Cove - Concrete total	BLM	84	84	84	CY	$200.00	$300.00	$400.00	$16,800.00	$25,200.00	$33,600.00

BUREAU OF RECLAMATION

ESTIMATE WORKSHEET

FEATURE:

REVISION #1
Klamath River Dams Removal
Full Removal Option
Copco No. 1 Dam & Powerplant Removal
Escalation NOT Included
SUMMARY ESTIMATE

PROJECT: Klamath River, Northern California/Southern Oregon

WOID: AF652 | **ESTIMATE LEVEL:** Feasibility
REGION: MP | **PRICE LEVEL:** Jul-2010
FILE: C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 1\[Copco 1 - Full Removal Crystal Ball - with Escalation - 2011-04.xls]Copco 1 - Full - with Esc

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	MPL QUANTITY	MP QUANTITY	MPH QUANTITY	UNIT	MPL UNIT PRICE	MP UNIT PRICE	MPH UNIT PRICE	MPL TOTAL	MP TOTAL	MPH TOTAL
	96	Copco Cove - Dock abutment railing made of 2.5" dia. steel pipe	BLM	25	25	25	LF	$35.00	$40.00	$45.00	$875.00	$1,000.00	$1,125.00
	97	Copco Cove - Signs to be removed and hauled away	BLM	6	6	6	EA	$250.00	$300.00	$350.00	$1,500.00	$1,800.00	$2,100.00
	98	Copco Cove - Wood plank tables to be removed and hauled away	BLM	2	2	2	EA	$90.00	$100.00	$120.00	$180.00	$200.00	$240.00
	99	Copco Cove - Regrade, rip, seed and plant disturbed areas	BLM	2.3	2.3	2.3	ACRES	$20,000.00	$25,000.00	$30,000.00	$46,000.00	$57,500.00	$69,000.00
		Subtotal 1									$31,603,385.00	$36,555,585.00	$61,003,625.00
		Mobilization (MPL ~ 5%; MP ~ 5%; MPH ~ 5%)		1	1	1	ls	$1,600,000.00	$1,850,000.00	$3,100,000.00	$1,600,000.00	$1,850,000.00	$3,100,000.00
		Subtotal 1 w/ mobilization											
		Escalation to Notice to Proceed (NTP)											
		NOT INCLUDED											
		Design Contingencies (MPL ~ 8%; MP ~ 10%; MPH ~ 15%)		1	1	1	ls	$2,796,615.00	$3,594,415.00	$9,421,992.00	$2,796,615.00	$3,594,415.00	$9,421,992.00
		APS = Allowance for Procurement		1	1	1	ls	$0.00	$0.00	$1,474,383.00	$0.00	$0.00	$1,474,383.00
		Strategies (if applicable) (MPL ~ 0%; MP ~ 0%; MPH ~ 2%)											
		CONTRACT COST									**$36,000,000.00**	**$42,000,000.00**	**$75,000,000.00**
		Construction Contingencies (MPL ~ 18%; MP ~ 20%; MPH ~ 25%)		1	1	1	ls	$6,000,000.00	$9,000,000.00	$19,000,000.00	$6,000,000.00	$9,000,000.00	$19,000,000.00
		FIELD COST									**$42,000,000.00**	**$51,000,000.00**	**$94,000,000.00**
		Non-Contract Cost (MPL ~ 52%; MP ~ 55%; MPH ~ 61%)		1	1	1	ls	$22,000,000.00	$28,000,000.00	$56,000,000.00	$22,000,000.00	$28,000,000.00	$56,000,000.00
		CONSTRUCTION COST									**$64,000,000.00**	**$79,000,000.00**	**$150,000,000.00**

Notes: This estimate does not include non-contract costs and should not be used for funding purposes.
Reference documents RM D&S Cost Estimate (FAC 09-01) and RM D&S CCE and PCE (FAC 09-02)

QUANTITIES			PRICES		
BY	See Group Worksheets	CHECKED: See Group Worksheets	BY	Craig Grush, P.E.	CHECKED
DATE PREPARED	1/20/2011	PEER REVIEW: See Group Worksheets	DATE PREPARED	06/01/11	PEER REVIEW

06-01-11
ACB 6/3/11

Crystal Ball Report - Full
Simulation started on 6/8/2011 at 10:56:41
Simulation stopped on 6/8/2011 at 10:57:47

Run preferences:	
Number of trials run	10,000
Monte Carlo	
Seed	999
Precision control on	
Confidence level	95.00%
Run statistics:	
Total running time (sec)	66.34
Trials/second (average)	151
Random numbers per sec	31,053
Crystal Ball data:	
Assumptions	206
Correlations	0
Correlated groups	0
Decision variables	0
Forecasts	3

TECHNICAL SERVICE CENTER
ESTIMATING, SPECIFICATIONS
AND VALUE PROGRAM GROUP
UNIT PRICES BY Craig A. Grosh
DATE 6/8/2011

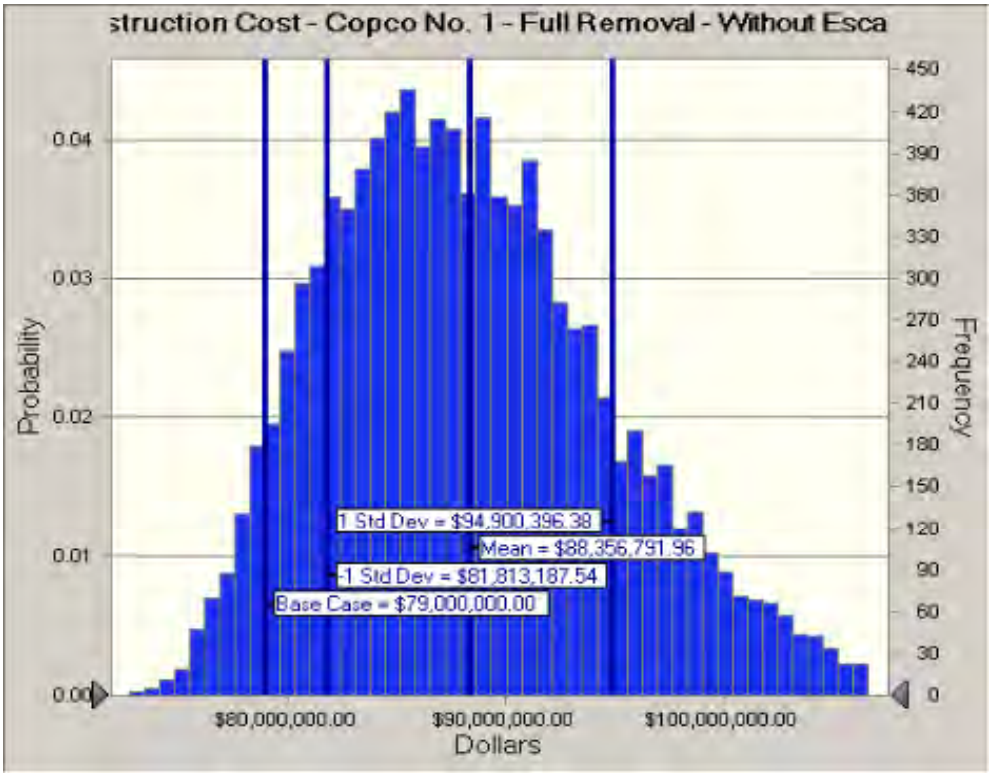
DATE	PEER REVIEWER(S)	CODE
6/8/11	Signature DAN MAAG Printed Name	8170
	Signature Printed Name	
Author Initials	PEER REVIEW NOT REQUIRED	

Forecasts

Worksheet: [Copco 1 - Full Removal Crystal Ball - without Escalation - 2011-04.xls]Copco 1 - F

Forecast: Construction Cost - Copco No. 1 - Full Removal - Without Escalation **Cell: U127**

Summary:
Entire range is from $72,736,574.03 to $113,529,206.28
Base case is $79,000,000.00
After 10,000 trials, the std. error of the mean is $65,436.04



Forecast: Construction Cost - Copco No. 1 - Full Removal - Without Escalation (cont'd) **Cell: U127**

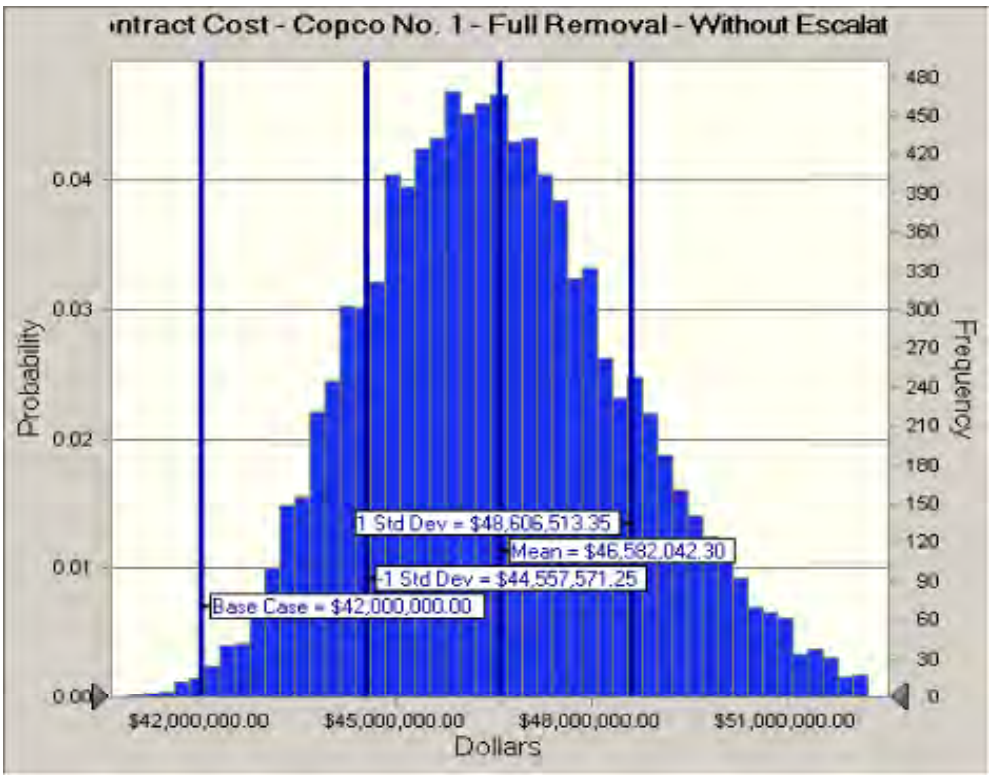
Statistics:	Forecast values
Trials	10,000
Mean	$88,356,791.96
Median	$87,713,342.90
Mode	---
Standard Deviation	$6,543,604.42
Variance	$42,818,758,765,244.40
Skewness	0.4940
Kurtosis	2.93
Coeff. of Variability	0.0741
Minimum	$72,736,574.03
Maximum	$113,529,206.28
Range Width	$40,792,632.25
Mean Std. Error	$65,436.04

Percentiles:	Forecast values
0%	$72,736,574.03
10%	$80,365,791.16
20%	$82,522,922.75
30%	$84,363,523.51
40%	$85,993,016.78
50%	$87,712,673.96
60%	$89,473,718.53
70%	$91,392,514.83
80%	$93,725,152.82
90%	$97,321,089.32
100%	$113,529,206.28

Forecast: Contract Cost - Copco No. 1 - Full Removal - Without Escalation **Cell: U123**

Summary:

Entire range is from $40,891,609.66 to $55,589,627.14
Base case is $42,000,000.00
After 10,000 trials, the std. error of the mean is $20,244.71



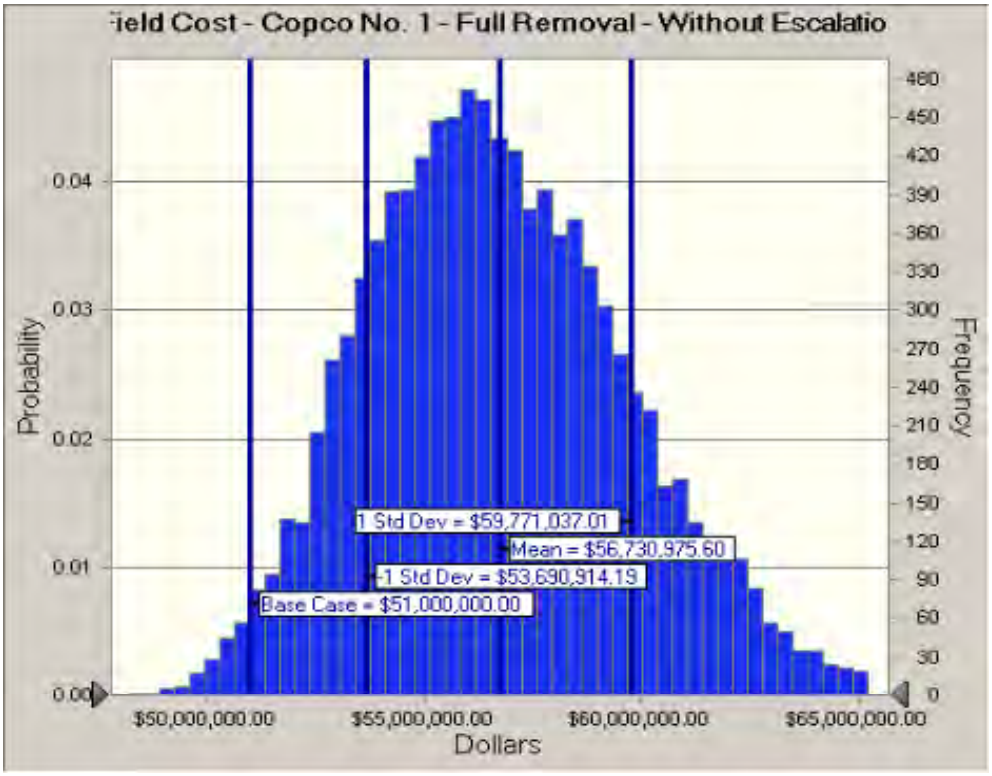
Forecast: Contract Cost - Copco No. 1 - Full Removal - Without Escalation (cont'd) Cell: U123

Statistics:	Forecast values
Trials	10,000
Mean	$46,582,042.30
Median	$46,446,898.70
Mode	---
Standard Deviation	$2,024,471.05
Variance	$4,098,483,029,595.18
Skewness	0.3949
Kurtosis	3.07
Coeff. of Variability	0.0435
Minimum	$40,891,609.66
Maximum	$55,589,627.14
Range Width	$14,698,017.48
Mean Std. Error	$20,244.71

Percentiles:	Forecast values
0%	$40,891,609.66
10%	$44,066,771.29
20%	$44,841,018.84
30%	$45,411,795.22
40%	$45,938,733.76
50%	$46,446,625.78
60%	$46,958,390.02
70%	$47,517,386.16
80%	$48,248,521.59
90%	$49,284,250.21
100%	$55,589,627.14

Forecast: Field Cost - Copco No. 1 - Full Removal - Without Escalation **Cell: U125**

Summary:
Entire range is from $48,046,227.47 to $70,717,499.74
Base case is $51,000,000.00
After 10,000 trials, the std. error of the mean is $30,400.61



Forecast: Field Cost - Copco No. 1 - Full Removal - Without Escalation (cont'd) **Cell: U125**

Statistics:	Forecast values
Trials	10,000
Mean	$56,730,975.60
Median	$56,494,037.13
Mode	---
Standard Deviation	$3,040,061.41
Variance	$9,241,973,388,518.85
Skewness	0.3786
Kurtosis	3.05
Coeff. of Variability	0.0536
Minimum	$48,046,227.47
Maximum	$70,717,499.74
Range Width	$22,671,272.27
Mean Std. Error	$30,400.61

Percentiles:	Forecast values
0%	$48,046,227.47
10%	$52,978,382.43
20%	$54,084,510.21
30%	$54,963,177.84
40%	$55,765,498.46
50%	$56,493,859.60
60%	$57,306,083.62
70%	$58,236,980.41
80%	$59,252,646.47
90%	$60,794,616.90
100%	$70,717,499.74

End of Forecasts

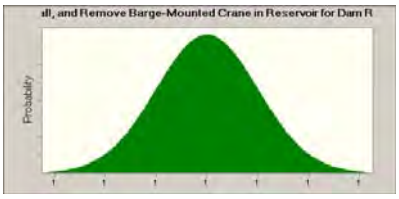
Assumptions

Worksheet: [Copco 1 - Full Removal Crystal Ball - without Escalation - 2011-04.xls]Copco 1 - F

Assumption: 1 Furnish, Install, and Remove Barge-Mounted Crane in Reservoir for Dam R **Cell: L14**

Normal distribution with parameters:

Mean	1	(=L14)
Std. Dev.	0	(=0.000001)



Assumption: 1 Furnish, Install, and Remove Barge-Mounted Crane in Reservoir for Dam R **Cell: R14**

BetaPERT distribution with parameters:

Minimum	$340,000.00	(=Q14)
Likeliest	$350,000.00	(=R14)
Maximum	$370,000.00	(=S14)

Assumption: 10 Remove Concrete Dam down to Elev. 2476 Quantity **Cell: L23**

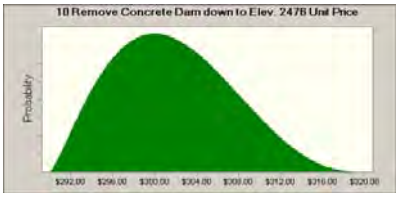
Normal distribution with parameters:

Mean	36,000	(=L23)
Std. Dev.	0	(=0.000001)

Assumption: 10 Remove Concrete Dam down to Elev. 2476 Unit Price **Cell: R23**

BetaPERT distribution with parameters:

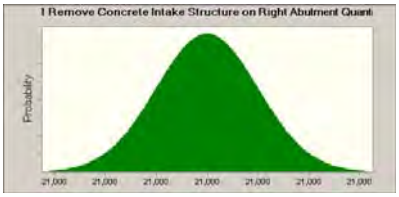
Minimum	$290.00	(=Q23)
Likeliest	$300.00	(=R23)
Maximum	$320.00	(=S23)



Assumption: 11 Remove Concrete Intake Structure on Right Abutment Quantity **Cell: L24**

Normal distribution with parameters:

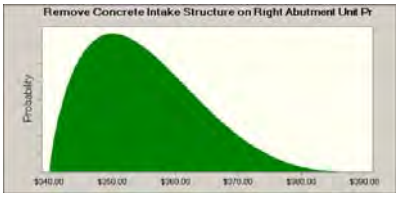
Mean	21,000	(=L24)
Std. Dev.	0	(=0.000001)



Assumption: 11 Remove Concrete Intake Structure on Right Abutment Unit Price **Cell: R24**

BetaPERT distribution with parameters:

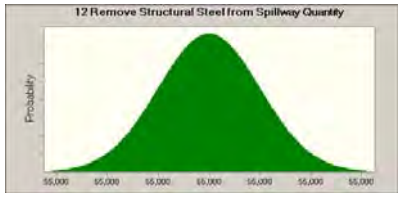
Minimum	$340.00	(=Q24)
Likeliest	$350.00	(=R24)
Maximum	$390.00	(=S24)



Assumption: 12 Remove Structural Steel from Spillway Quantity **Cell: L25**

Normal distribution with parameters:

Mean	55,000	(=L25)
Std. Dev.	0	(=0.000001)



Assumption: 12 Remove Structural Steel from Spillway Unit Price **Cell: R25**

BetaPERT distribution with parameters:

Minimum	$0.70	(=Q25)
Likeliest	$1.00	(=R25)
Maximum	$1.50	(=S25)

Assumption: 13 Install Diversion Tunnel Plugs Quantity **Cell: L26**

Normal distribution with parameters:

Mean	30	(=L26)
Std. Dev.	0	(=0.000001)

Assumption: 13 Install Diversion Tunnel Plugs Unit Price **Cell: R26**

BetaPERT distribution with parameters:

Minimum	$1,100.00	(=Q26)
Likeliest	$1,200.00	(=R26)
Maximum	$1,300.00	(=S26)

Assumption: 14 Remove Diversion Tunnel Control Structure Concrete Quantity **Cell: L27**

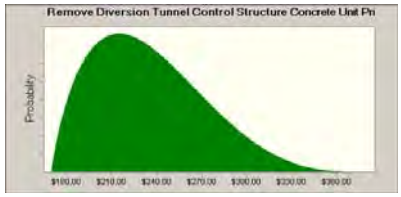
Normal distribution with parameters:

Mean	350	(=L27)
Std. Dev.	0	(=0.000001)

Assumption: 14 Remove Diversion Tunnel Control Structure Concrete Unit Price **Cell: R27**

BetaPERT distribution with parameters:

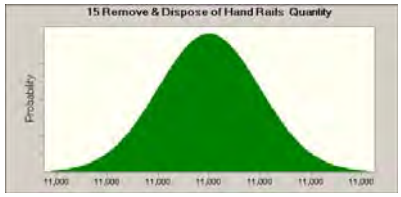
Minimum	$170.00	(=Q27)
Likeliest	$215.00	(=R27)
Maximum	$380.00	(=S27)



Assumption: 15 Remove & Dispose of Hand Rails Quantity **Cell: L28**

Normal distribution with parameters:

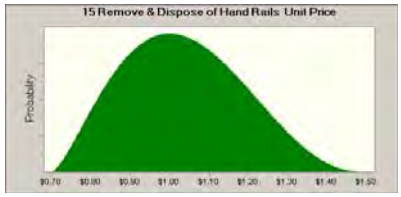
Mean	11,000	(=L28)
Std. Dev.	0	(=0.000001)



Assumption: 15 Remove & Dispose of Hand Rails Unit Price **Cell: R28**

BetaPERT distribution with parameters:

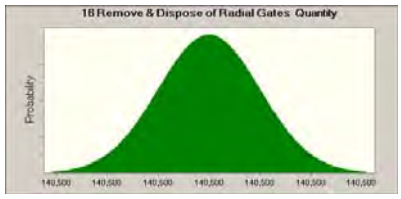
Minimum	$0.70	(=Q28)
Likeliest	$1.00	(=R28)
Maximum	$1.50	(=S28)



Assumption: 16 Remove & Dispose of Radial Gates Quantity **Cell: L29**

Normal distribution with parameters:

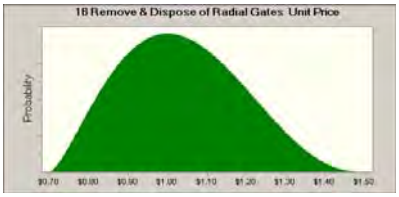
Mean	140,500	(=L29)
Std. Dev.	0	(=0.000001)



Assumption: 16 Remove & Dispose of Radial Gates Unit Price **Cell: R29**

BetaPERT distribution with parameters:

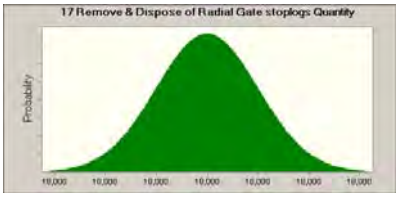
Minimum	$0.70	(=Q29)
Likeliest	$1.00	(=R29)
Maximum	$1.50	(=S29)



Assumption: 17 Remove & Dispose of Radial Gate stoplogs Quantity **Cell: L30**

Normal distribution with parameters:

Mean	18,000	(=L30)
Std. Dev.	0	(=0.000001)



Assumption: 17 Remove & Dispose of Radial Gate stoplogs Unit Price **Cell: R30**

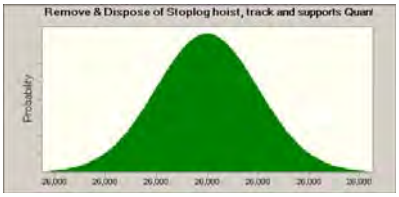
BetaPERT distribution with parameters:

Minimum	$0.70	(=Q30)
Likeliest	$1.00	(=R30)
Maximum	$1.50	(=S30)

Assumption: 18 Remove & Dispose of Stoplog hoist, track and supports Quantity **Cell: L31**

Normal distribution with parameters:

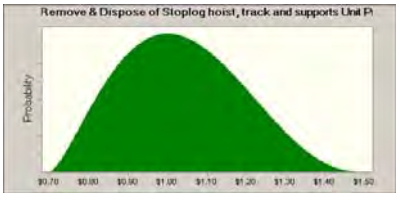
Mean	26,000	(=L31)
Std. Dev.	0	(=0.000001)



Assumption: 18 Remove & Dispose of Stoplog hoist, track and supports Unit Price **Cell: R31**

BetaPERT distribution with parameters:

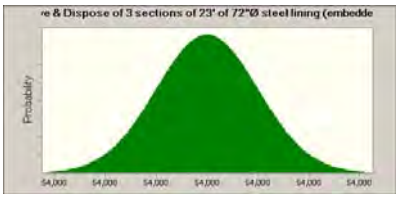
Minimum	$0.70	(=Q31)
Likeliest	$1.00	(=R31)
Maximum	$1.50	(=S31)



Assumption: 19 Remove & Dispose of 3 sections of 23' of 72"Ø steel lining (embedded) Qu **Cell: L32**

Normal distribution with parameters:

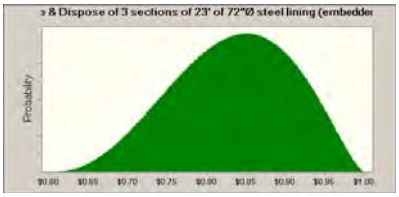
Mean	54,000	(=L32)
Std. Dev.	0	(=0.000001)



Assumption: 19 Remove & Dispose of 3 sections of 23' of 72"Ø steel lining (embedde **Cell: R32**

BetaPERT distribution with parameters:

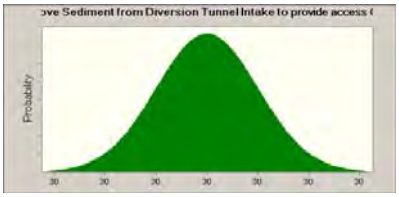
Minimum	$0.60	(=Q32)
Likeliest	$0.85	(=R32)
Maximum	$1.00	(=S32)



Assumption: 2 Remove Sediment from Diversion Tunnel Intake to provide access Quantity **Cell: L15**

Normal distribution with parameters:

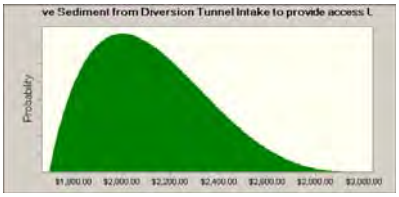
Mean	30	(=L15)
Std. Dev.	0	(=0.000001)



Assumption: 2 Remove Sediment from Diversion Tunnel Intake to provide access Unit Pri **Cell: R15**

BetaPERT distribution with parameters:

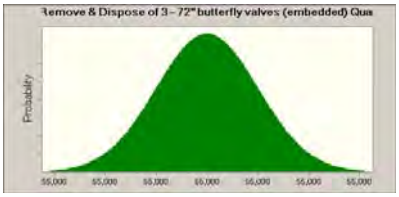
Minimum	$1,700.00	(=Q15)
Likeliest	$2,000.00	(=R15)
Maximum	$3,000.00	(=S15)



Assumption: 20 Remove & Dispose of 3 - 72" butterfly valves (embedded) Quantity Cell: L33

Normal distribution with parameters:

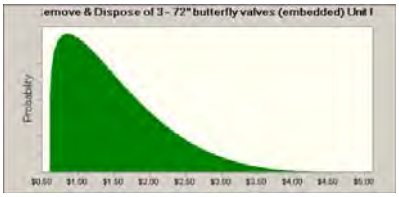
Mean	55,000	(=L33)
Std. Dev.	0	(=0.000001)



Assumption: 20 Remove & Dispose of 3 - 72" butterfly valves (embedded) Unit Price Cell: R33

BetaPERT distribution with parameters:

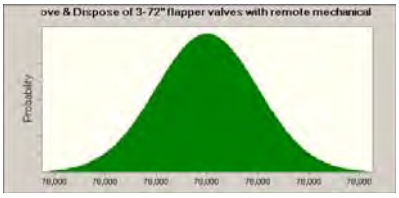
Minimum	$0.60	(=Q33)
Likeliest	$0.85	(=R33)
Maximum	$5.00	(=S33)



Assumption: 21 Remove & Dispose of 3-72" flapper valves with remote mechanical Quantity Cell: L34

Normal distribution with parameters:

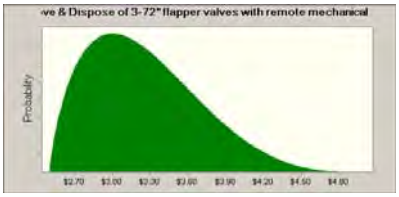
Mean	78,000	(=L34)
Std. Dev.	0	(=0.000001)



Assumption: 21 Remove & Dispose of 3-72" flapper valves with remote mechanical Cell: R34

BetaPERT distribution with parameters:

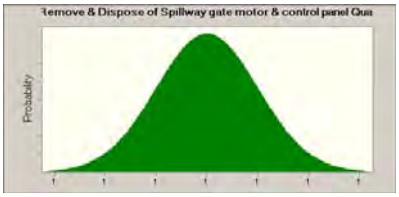
Minimum	$2.50	(=Q34)
Likeliest	$3.00	(=R34)
Maximum	$5.00	(=S34)



Assumption: 22 Remove & Dispose of Spillway gate motor & control panel Quantity Cell: L35

Normal distribution with parameters:

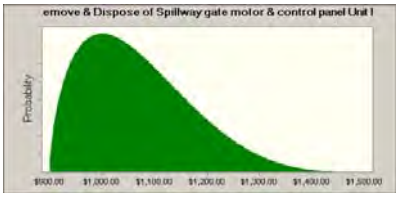
Mean	1	(=L35)
Std. Dev.	0	(=0.000001)



Assumption: 22 Remove & Dispose of Spillway gate motor & control panel Unit Price Cell: R35

BetaPERT distribution with parameters:

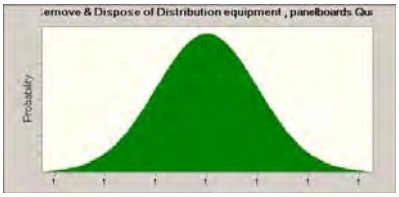
Minimum	$900.00	(=Q35)
Likeliest	$1,000.00	(=R35)
Maximum	$1,500.00	(=S35)



Assumption: 23 Remove & Dispose of Distribution equipment , panelboards Quantity **Cell: L36**

Normal distribution with parameters:

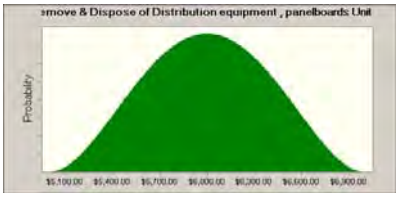
Mean	1	(=L36)
Std. Dev.	0	(=0.000001)



Assumption: 23 Remove & Dispose of Distribution equipment , panelboards Unit Price **Cell: R36**

BetaPERT distribution with parameters:

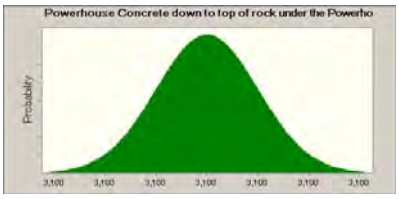
Minimum	$5,000.00	(=Q36)
Likeliest	$6,000.00	(=R36)
Maximum	$7,000.00	(=S36)



Assumption: 24 Remove Powerhouse Concrete down to top of rock under the Powerhouse **Cell: L37**

Normal distribution with parameters:

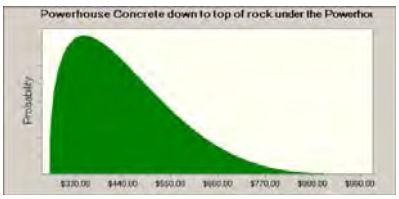
Mean	3,100	(=L37)
Std. Dev.	0	(=0.000001)



Assumption: 24 Remove Powerhouse Concrete down to top of rock under the Powerhouse **Cell: R37**

BetaPERT distribution with parameters:

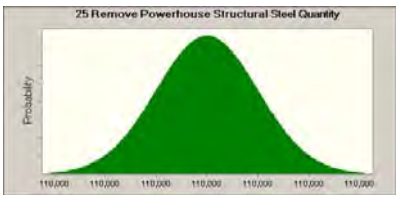
Minimum	$270.00	(=Q37)
Likeliest	$350.00	(=R37)
Maximum	$1,000.00	(=S37)



Assumption: 25 Remove Powerhouse Structural Steel Quantity **Cell: L38**

Normal distribution with parameters:

Mean	110,000	(=L38)
Std. Dev.	0	(=0.000001)



Assumption: 25 Remove Powerhouse Structural Steel Unit Price **Cell: R38**

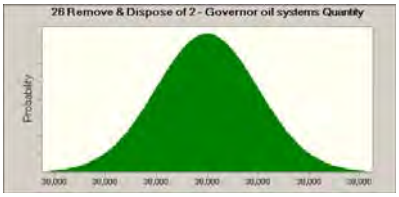
BetaPERT distribution with parameters:

Minimum	$0.60	(=Q38)
Likeliest	$0.85	(=R38)
Maximum	$1.00	(=S38)

Assumption: 26 Remove & Dispose of 2 - Governor oil systems Quantity **Cell: L39**

Normal distribution with parameters:

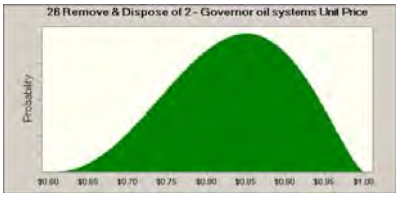
Mean	38,000	(=L39)
Std. Dev.	0	(=0.000001)



Assumption: 26 Remove & Dispose of 2 - Governor oil systems Unit Price **Cell: R39**

BetaPERT distribution with parameters:

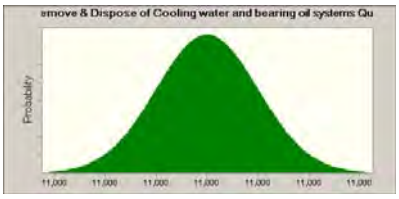
Minimum	$0.60	(=Q39)
Likeliest	$0.85	(=R39)
Maximum	$1.00	(=S39)



Assumption: 27 Remove & Dispose of Cooling water and bearing oil systems Quantity **Cell: L40**

Normal distribution with parameters:

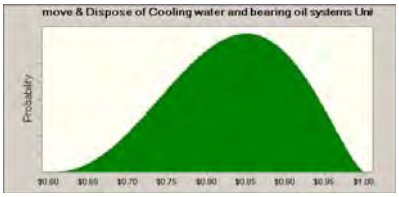
Mean	11,000	(=L40)
Std. Dev.	0	(=0.000001)



Assumption: 27 Remove & Dispose of Cooling water and bearing oil systems Unit Price **Cell: R40**

BetaPERT distribution with parameters:

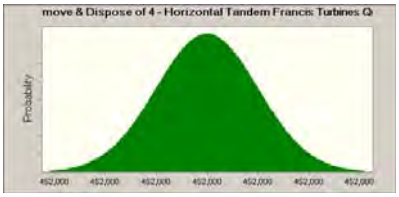
Minimum	$0.60	(=Q40)
Likeliest	$0.85	(=R40)
Maximum	$1.00	(=S40)



Assumption: 28 Remove & Dispose of 4 - Horizontal Tandem Francis Turbines Quantity **Cell: L41**

Normal distribution with parameters:

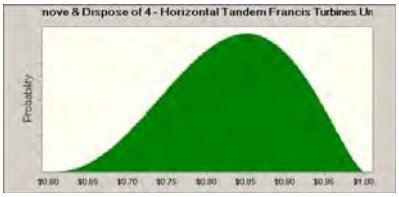
Mean	452,000	(=L41)
Std. Dev.	0	(=0.000001)



Assumption: 28 Remove & Dispose of 4 - Horizontal Tandem Francis Turbines Unit Price **Cell: R41**

BetaPERT distribution with parameters:

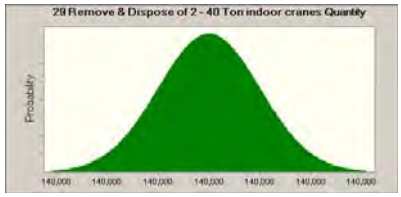
Minimum	$0.60	(=Q41)
Likeliest	$0.85	(=R41)
Maximum	$1.00	(=S41)



Assumption: 29 Remove & Dispose of 2 - 40 Ton indoor cranes Quantity **Cell: L42**

Normal distribution with parameters:

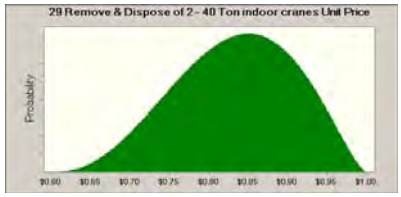
Mean	140,000	(=L42)
Std. Dev.	0	(=0.000001)



Assumption: 29 Remove & Dispose of 2 - 40 Ton indoor cranes Unit Price **Cell: R42**

BetaPERT distribution with parameters:

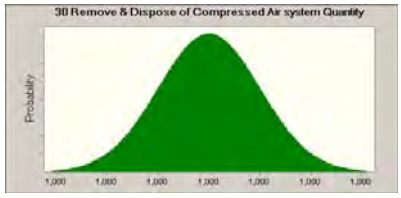
Minimum	$0.60	(=Q42)
Likeliest	$0.85	(=R42)
Maximum	$1.00	(=S42)



Assumption: 30 Remove & Dispose of Compressed Air system Quantity **Cell: L43**

Normal distribution with parameters:

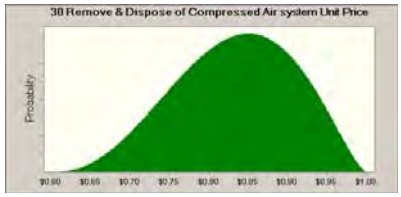
Mean	1,000	(=L43)
Std. Dev.	0	(=0.000001)



Assumption: 30 Remove & Dispose of Compressed Air system Unit Price **Cell: R43**

BetaPERT distribution with parameters:

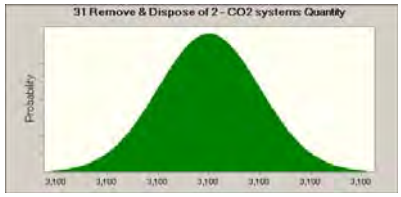
Minimum	$0.60	(=Q43)
Likeliest	$0.85	(=R43)
Maximum	$1.00	(=S43)



Assumption: 31 Remove & Dispose of 2 - CO2 systems Quantity **Cell: L44**

Normal distribution with parameters:

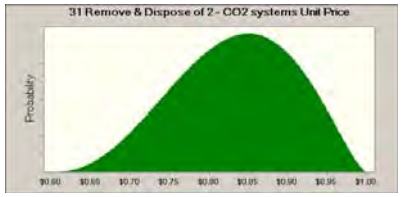
Mean	3,100	(=L44)
Std. Dev.	0	(=0.000001)



Assumption: 31 Remove & Dispose of 2 - CO2 systems Unit Price **Cell: R44**

BetaPERT distribution with parameters:

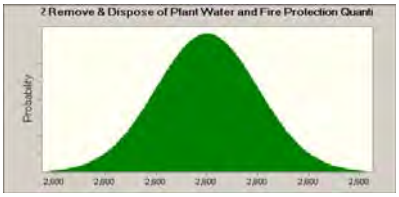
Minimum	$0.60	(=Q44)
Likeliest	$0.85	(=R44)
Maximum	$1.00	(=S44)



Assumption: 32 Remove & Dispose of Plant Water and Fire Protection Quantity **Cell: L45**

Normal distribution with parameters:

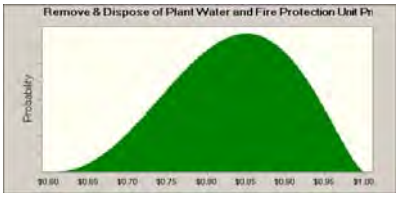
Mean	2,600	(=L45)
Std. Dev.	0	(=0.000001)



Assumption: 32 Remove & Dispose of Plant Water and Fire Protection Unit Price **Cell: R45**

BetaPERT distribution with parameters:

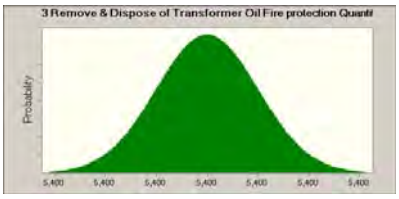
Minimum	$0.60	(=Q45)
Likeliest	$0.85	(=R45)
Maximum	$1.00	(=S45)



Assumption: 33 Remove & Dispose of Transformer Oil Fire protection Quantity **Cell: L46**

Normal distribution with parameters:

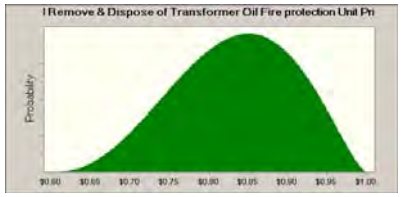
Mean	5,400	(=L46)
Std. Dev.	0	(=0.000001)



Assumption: 33 Remove & Dispose of Transformer Oil Fire protection Unit Price **Cell: R46**

BetaPERT distribution with parameters:

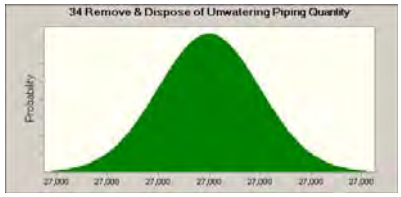
Minimum	$0.60	(=Q46)
Likeliest	$0.85	(=R46)
Maximum	$1.00	(=S46)



Assumption: 34 Remove & Dispose of Unwatering Piping Quantity **Cell: L47**

Normal distribution with parameters:

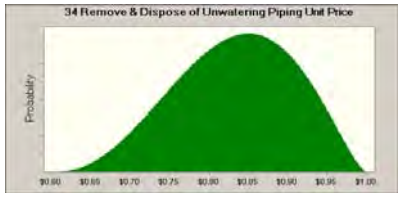
Mean	27,000	(=L47)
Std. Dev.	0	(=0.000001)



Assumption: 34 Remove & Dispose of Unwatering Piping Unit Price **Cell: R47**

BetaPERT distribution with parameters:

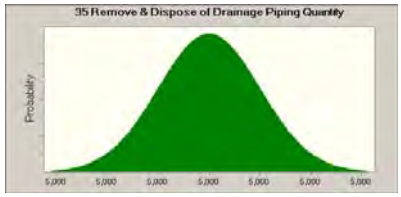
Minimum	$0.60	(=Q47)
Likeliest	$0.85	(=R47)
Maximum	$1.00	(=S47)



Assumption: 35 Remove & Dispose of Drainage Piping Quantity **Cell: L48**

Normal distribution with parameters:

Mean	5,000	(=L48)
Std. Dev.	0	(=0.000001)



Assumption: 35 Remove & Dispose of Drainage Piping Unit Price **Cell: R48**

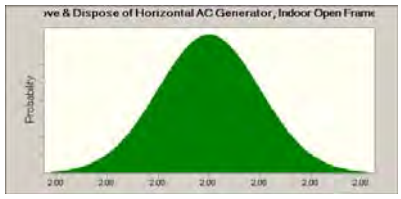
BetaPERT distribution with parameters:

Minimum	$0.60	(=Q48)
Likeliest	$0.85	(=R48)
Maximum	$1.00	(=S48)

Assumption: 36 Remove & Dispose of Horizontal AC Generator, Indoor Open Frame Quant **Cell: L49**

Normal distribution with parameters:

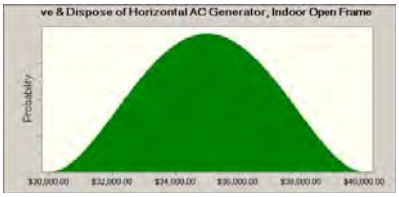
Mean	2.00	(=L49)
Std. Dev.	0.00	(=0.000001)



Assumption: 36 Remove & Dispose of Horizontal AC Generator, Indoor Open Frame Cell: R49

BetaPERT distribution with parameters:

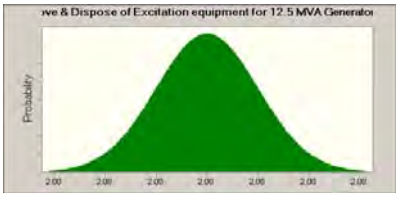
Minimum	$30,000.00	(=Q49)
Likeliest	$35,000.00	(=R49)
Maximum	$40,000.00	(=S49)



Assumption: 37 Remove & Dispose of Excitation equipment for 12.5 MVA Generator Cell: L50

Normal distribution with parameters:

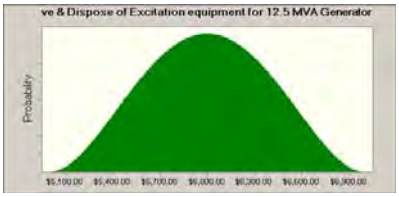
Mean	2.00	(=L50)
Std. Dev.	0.00	(=0.000001)



Assumption: 37 Remove & Dispose of Excitation equipment for 12.5 MVA Generator Cell: R50

BetaPERT distribution with parameters:

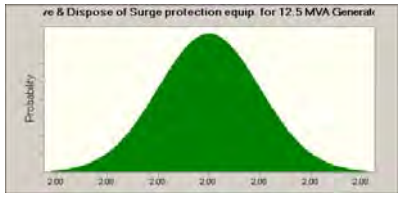
Minimum	$5,000.00	(=Q50)
Likeliest	$6,000.00	(=R50)
Maximum	$7,000.00	(=S50)



Assumption: 38 Remove & Dispose of Surge protection equip. for 12.5 MVA Generator Qu **Cell: L51**

Normal distribution with parameters:

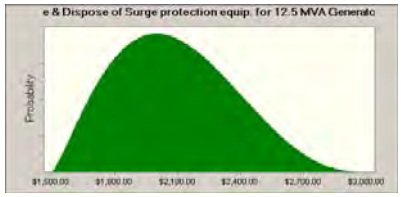
Mean	2.00	(=L51)
Std. Dev.	0.00	(=0.000001)



Assumption: 38 Remove & Dispose of Surge protection equip. for 12.5 MVA Generator Unit **Cell: R51**

BetaPERT distribution with parameters:

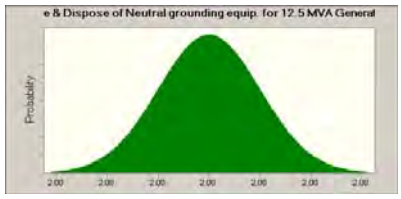
Minimum	$1,500.00	(=Q51)
Likeliest	$2,000.00	(=R51)
Maximum	$3,000.00	(=S51)



Assumption: 39 Remove & Dispose of Neutral grounding equip. for 12.5 MVA Generator Qu **Cell: L52**

Normal distribution with parameters:

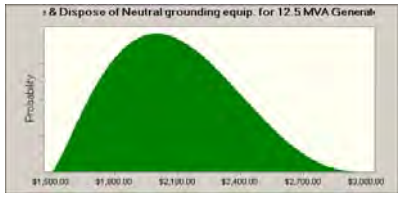
Mean	2.00	(=L52)
Std. Dev.	0.00	(=0.000001)



Assumption: 39 Remove & Dispose of Neutral grounding equip. for 12.5 MVA Generat Cell: R52

BetaPERT distribution with parameters:

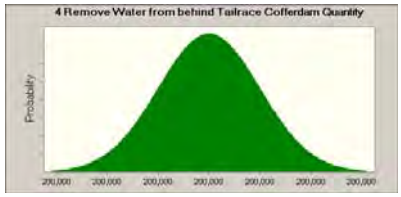
Minimum	$1,500.00	(=Q52)
Likeliest	$2,000.00	(=R52)
Maximum	$3,000.00	(=S52)



Assumption: 4 Remove Water from behind Tailrace Cofferdam Quantity Cell: L17

Normal distribution with parameters:

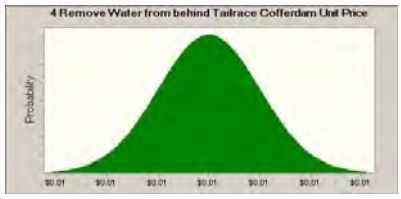
Mean	200,000	(=L17)
Std. Dev.	0	(=0.000001)



Assumption: 4 Remove Water from behind Tailrace Cofferdam Unit Price Cell: R17

Normal distribution with parameters:

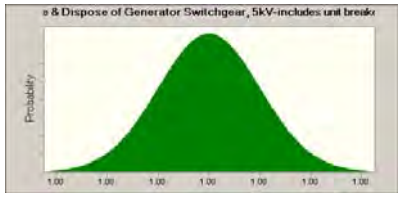
Mean	$0.01	(=R17)
Std. Dev.	$0.00	(=0.000001)



Assumption: 40 Remove & Dispose of Generator Switchgear, 5kV-includes unit breaker: Q53 **Cell: L53**

Normal distribution with parameters:

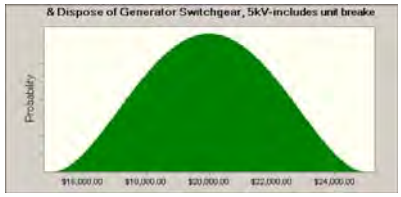
Mean	1.00	(=L53)
Std. Dev.	0.00	(=0.000001)



Assumption: 40 Remove & Dispose of Generator Switchgear, 5kV-includes unit breaker: R53 **Cell: R53**

BetaPERT distribution with parameters:

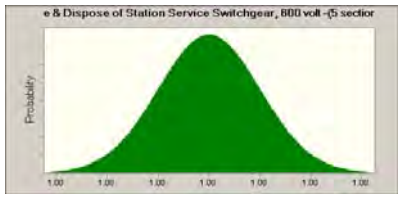
Minimum	$15,000.00	(=Q53)
Likeliest	$20,000.00	(=R53)
Maximum	$25,000.00	(=S53)



Assumption: 41 Remove & Dispose of Station Service Switchgear, 600 volt -(5 sections): Q54 **Cell: L54**

Normal distribution with parameters:

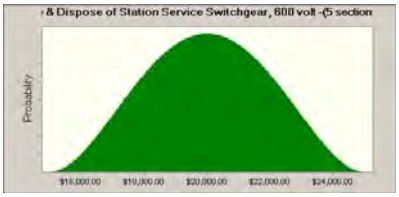
Mean	1.00	(=L54)
Std. Dev.	0.00	(=0.000001)



Assumption: 41 Remove & Dispose of Station Service Switchgear, 600 volt -(5 sections) Cell: R54

BetaPERT distribution with parameters:

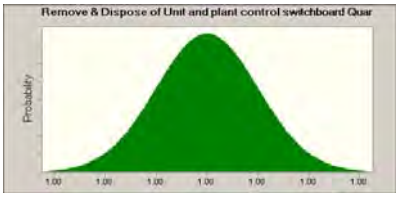
Minimum	$15,000.00	(=Q54)
Likeliest	$20,000.00	(=R54)
Maximum	$25,000.00	(=S54)



Assumption: 42 Remove & Dispose of Unit and plant control switchboard Quantity Cell: L55

Normal distribution with parameters:

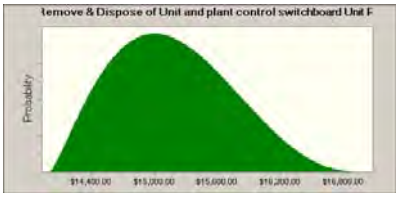
Mean	1.00	(=L55)
Std. Dev.	0.00	(=0.000001)



Assumption: 42 Remove & Dispose of Unit and plant control switchboard Unit Price Cell: R55

BetaPERT distribution with parameters:

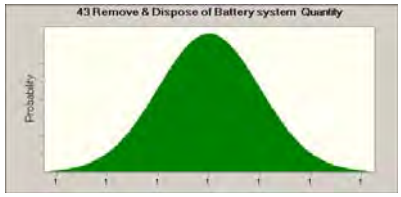
Minimum	$14,000.00	(=Q55)
Likeliest	$15,000.00	(=R55)
Maximum	$17,000.00	(=S55)



Assumption: 43 Remove & Dispose of Battery system Quantity **Cell: L56**

Normal distribution with parameters:

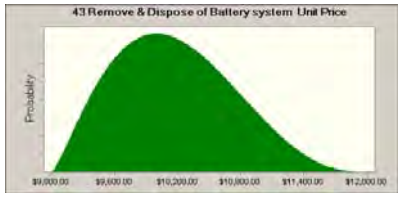
Mean	1	(=L56)
Std. Dev.	0	(=0.000001)



Assumption: 43 Remove & Dispose of Battery system Unit Price **Cell: R56**

BetaPERT distribution with parameters:

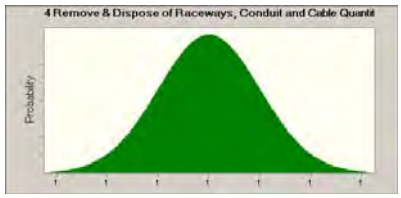
Minimum	$9,000.00	(=Q56)
Likeliest	$10,000.00	(=R56)
Maximum	$12,000.00	(=S56)



Assumption: 44 Remove & Dispose of Raceways, Conduit and Cable Quantity **Cell: L57**

Normal distribution with parameters:

Mean	1	(=L57)
Std. Dev.	0	(=0.000001)



Assumption: 44 Remove & Dispose of Raceways, Conduit and Cable Unit Price **Cell: R57**

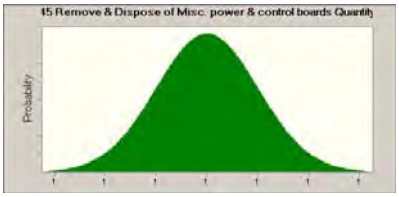
BetaPERT distribution with parameters:

Minimum	$14,000.00	(=Q57)
Likeliest	$15,000.00	(=R57)
Maximum	$17,000.00	(=S57)

Assumption: 45 Remove & Dispose of Misc. power & control boards Quantity **Cell: L58**

Normal distribution with parameters:

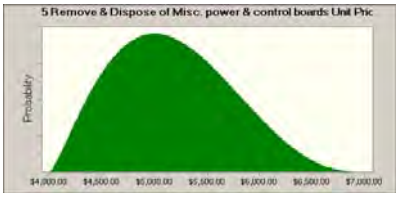
Mean	1	(=L58)
Std. Dev.	0	(=0.000001)



Assumption: 45 Remove & Dispose of Misc. power & control boards Unit Price **Cell: R58**

BetaPERT distribution with parameters:

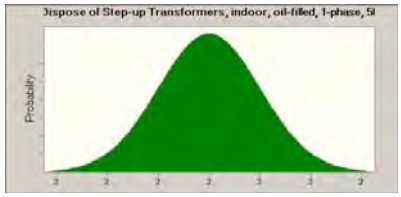
Minimum	$4,000.00	(=Q58)
Likeliest	$5,000.00	(=R58)
Maximum	$7,000.00	(=S58)



Assumption: 46 Remove & Dispose of Step-up Transformers, indoor, oil-filled, 1-phase, 50 Cell: L59

Normal distribution with parameters:

Mean	3	(=L59)
Std. Dev.	0	(=0.000001)



Assumption: 46 Remove & Dispose of Step-up Transformers, indoor, oil-filled, 1-phase, 50 Cell: R59

BetaPERT distribution with parameters:

Minimum	$40,000.00	(=Q59)
Likeliest	$50,000.00	(=R59)
Maximum	$60,000.00	(=S59)

Assumption: 47 Remove & Dispose of Step-up Transformers, indoor, oil-filled, 1-phase, 41 Cell: L60

Normal distribution with parameters:

Mean	3	(=L60)
Std. Dev.	0	(=0.000001)

Assumption: 47 Remove & Dispose of Step-up Transformers, indoor, oil-filled, 1-phase, 41 **Cell: R60**

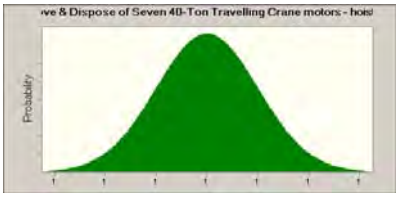
BetaPERT distribution with parameters:

Minimum	$40,000.00	(=Q60)
Likeliest	$50,000.00	(=R60)
Maximum	$60,000.00	(=S60)

Assumption: 48 Remove & Dispose of Seven 40-Ton Travelling Crane motors - hoist Qty **Cell: L61**

Normal distribution with parameters:

Mean	1	(=L61)
Std. Dev.	0	(=0.000001)



Assumption: 48 Remove & Dispose of Seven 40-Ton Travelling Crane motors - hoist Unit P **Cell: R61**

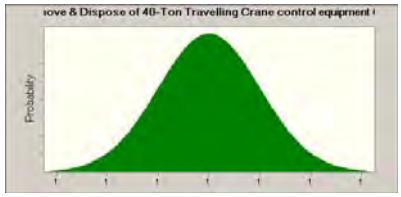
BetaPERT distribution with parameters:

Minimum	$2,000.00	(=Q61)
Likeliest	$2,500.00	(=R61)
Maximum	$3,000.00	(=S61)

Assumption: 49 Remove & Dispose of 40-Ton Travelling Crane control equipment Quantity **Cell: L62**

Normal distribution with parameters:

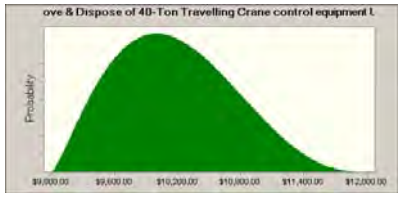
Mean	1	(=L62)
Std. Dev.	0	(=0.000001)



Assumption: 49 Remove & Dispose of 40-Ton Travelling Crane control equipment Unit Price **Cell: R62**

BetaPERT distribution with parameters:

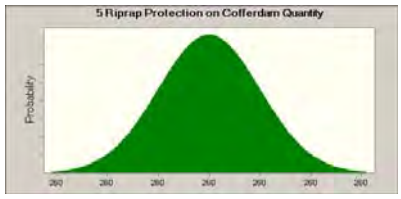
Minimum	$9,000.00	(=Q62)
Likeliest	$10,000.00	(=R62)
Maximum	$12,000.00	(=S62)



Assumption: 5 Riprap Protection on Cofferdam Quantity **Cell: L18**

Normal distribution with parameters:

Mean	260	(=L18)
Std. Dev.	0	(=0.000001)



Assumption: 5 Riprap Protection on Cofferdam Unit Price **Cell: R18**

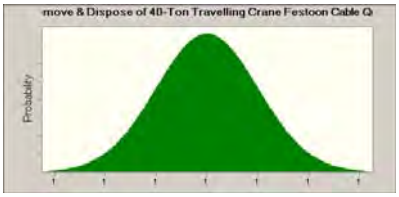
BetaPERT distribution with parameters:

Minimum	$120.00	(=Q18)
Likeliest	$150.00	(=R18)
Maximum	$200.00	(=S18)

Assumption: 50 Remove & Dispose of 40-Ton Travelling Crane Festoon Cable Quantity **Cell: L63**

Normal distribution with parameters:

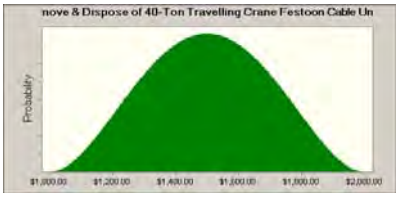
Mean	1	(=L63)
Std. Dev.	0	(=0.000001)



Assumption: 50 Remove & Dispose of 40-Ton Travelling Crane Festoon Cable Unit Price **Cell: R63**

BetaPERT distribution with parameters:

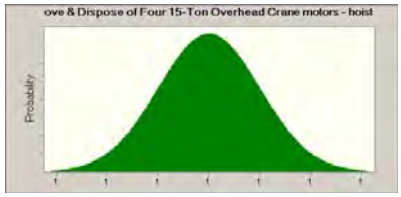
Minimum	$1,000.00	(=Q63)
Likeliest	$1,500.00	(=R63)
Maximum	$2,000.00	(=S63)



Assumption: 51 Remove & Dispose of Four 15-Ton Overhead Crane motors - hoist Quantity **Cell: L64**

Normal distribution with parameters:

Mean	1	(=L64)
Std. Dev.	0	(=0.000001)



Assumption: 51 Remove & Dispose of Four 15-Ton Overhead Crane motors - hoist Unit Price **Cell: R64**

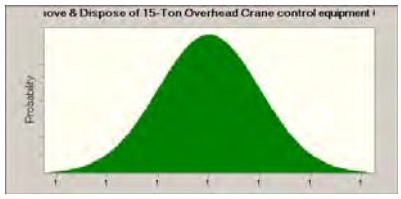
BetaPERT distribution with parameters:

Minimum	$900.00	(=Q64)
Likeliest	$1,000.00	(=R64)
Maximum	$1,300.00	(=S64)

Assumption: 52 Remove & Dispose of 15-Ton Overhead Crane control equipment Quantity **Cell: L65**

Normal distribution with parameters:

Mean	1	(=L65)
Std. Dev.	0	(=0.000001)



Assumption: 52 Remove & Dispose of 15-Ton Overhead Crane control equipment Unit Price **Cell: R65**

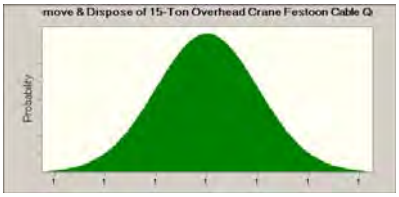
BetaPERT distribution with parameters:

Minimum	$250.00	(=Q65)
Likeliest	$300.00	(=R65)
Maximum	$350.00	(=S65)

Assumption: 53 Remove & Dispose of 15-Ton Overhead Crane Festoon Cable Quantity **Cell: L66**

Normal distribution with parameters:

Mean	1	(=L66)
Std. Dev.	0	(=0.000001)



Assumption: 53 Remove & Dispose of 15-Ton Overhead Crane Festoon Cable Unit Price **Cell: R66**

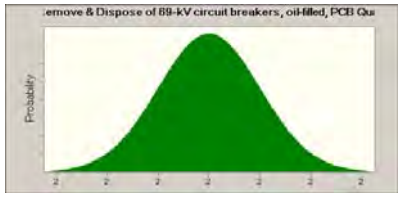
BetaPERT distribution with parameters:

Minimum	$400.00	(=Q66)
Likeliest	$500.00	(=R66)
Maximum	$600.00	(=S66)

Assumption: 54 Remove & Dispose of 69-kV circuit breakers, oil-filled, PCB Quantity **Cell: L67**

Normal distribution with parameters:

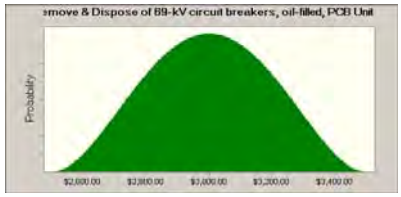
Mean	2	(=L67)
Std. Dev.	0	(=0.000001)



Assumption: 54 Remove & Dispose of 69-kV circuit breakers, oil-filled, PCB Unit Price **Cell: R67**

BetaPERT distribution with parameters:

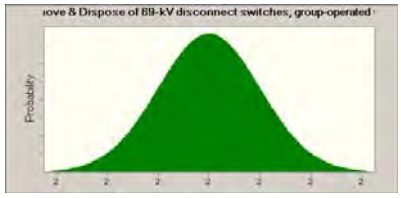
Minimum	$2,500.00	(=Q67)
Likeliest	$3,000.00	(=R67)
Maximum	$3,500.00	(=S67)



Assumption: 55 Remove & Dispose of 69-kV disconnect switches, group-operated Quantity **Cell: L68**

Normal distribution with parameters:

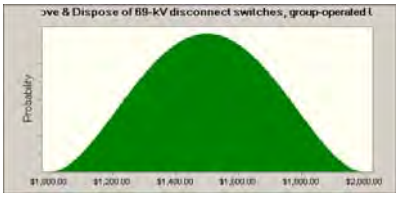
Mean	2	(=L68)
Std. Dev.	0	(=0.000001)



Assumption: 55 Remove & Dispose of 69-kV disconnect switches, group-operated Unit Price **Cell: R68**

BetaPERT distribution with parameters:

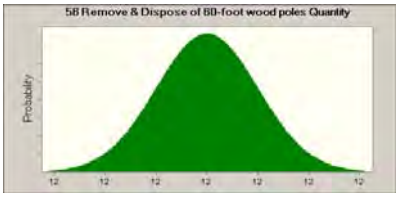
Minimum	$1,000.00	(=Q68)
Likeliest	$1,500.00	(=R68)
Maximum	$2,000.00	(=S68)



Assumption: 56 Remove & Dispose of 60-foot wood poles Quantity **Cell: L69**

Normal distribution with parameters:

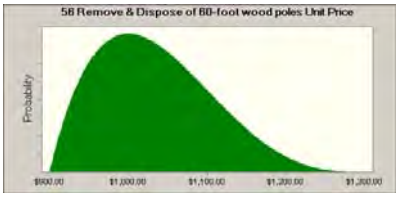
Mean	12	(=L69)
Std. Dev.	0	(=0.000001)



Assumption: 56 Remove & Dispose of 60-foot wood poles Unit Price **Cell: R69**

BetaPERT distribution with parameters:

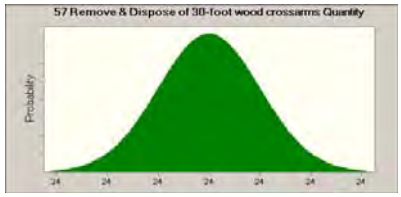
Minimum	$900.00	(=Q69)
Likeliest	$1,000.00	(=R69)
Maximum	$1,300.00	(=S69)



Assumption: 57 Remove & Dispose of 30-foot wood crossarms Quantity **Cell: L70**

Normal distribution with parameters:

Mean	24	(=L70)
Std. Dev.	0	(=0.000001)



Assumption: 57 Remove & Dispose of 30-foot wood crossarms Unit Price **Cell: R70**

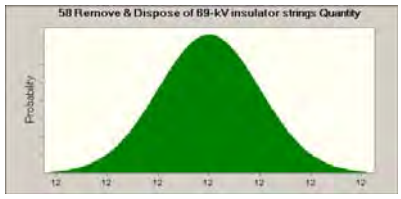
BetaPERT distribution with parameters:

Minimum	$400.00	(=Q70)
Likeliest	$500.00	(=R70)
Maximum	$600.00	(=S70)

Assumption: 58 Remove & Dispose of 69-kV insulator strings Quantity **Cell: L71**

Normal distribution with parameters:

Mean	12	(=L71)
Std. Dev.	0	(=0.000001)



Assumption: 58 Remove & Dispose of 69-kV insulator strings Unit Price **Cell: R71**

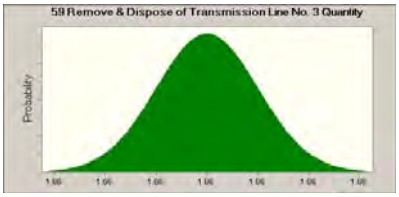
BetaPERT distribution with parameters:

Minimum	$300.00	(=Q71)
Likeliest	$400.00	(=R71)
Maximum	$500.00	(=S71)

Assumption: 59 Remove & Dispose of Transmission Line No. 3 Quantity **Cell: L72**

Normal distribution with parameters:

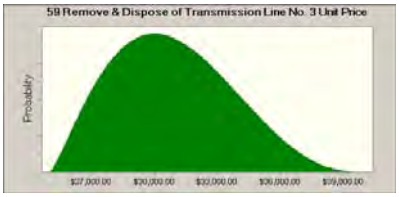
Mean	1.66	(=L72)
Std. Dev.	0.00	(=0.000001)



Assumption: 59 Remove & Dispose of Transmission Line No. 3 Unit Price **Cell: R72**

BetaPERT distribution with parameters:

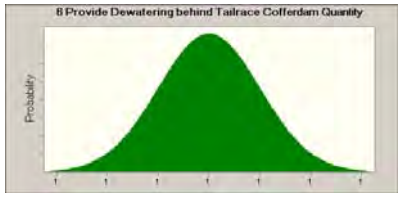
Minimum	$25,000.00	(=Q72)
Likeliest	$30,000.00	(=R72)
Maximum	$40,000.00	(=S72)



Assumption: 6 Provide Dewatering behind Tailrace Cofferdam Quantity **Cell: L19**

Normal distribution with parameters:

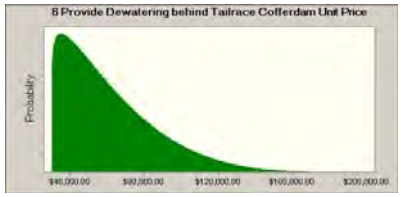
Mean	1	(=L19)
Std. Dev.	0	(=0.000001)



Assumption: 6 Provide Dewatering behind Tailrace Cofferdam Unit Price **Cell: R19**

BetaPERT distribution with parameters:

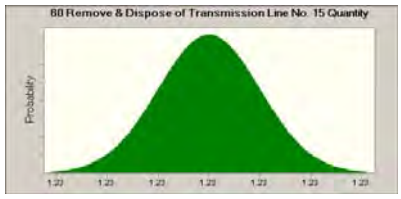
Minimum	$30,000.00	(=Q19)
Likeliest	$35,000.00	(=R19)
Maximum	$200,000.00	(=S19)



Assumption: 60 Remove & Dispose of Transmission Line No. 15 Quantity **Cell: L73**

Normal distribution with parameters:

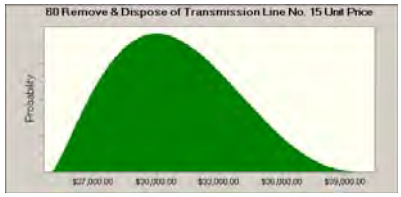
Mean	1.23	(=L73)
Std. Dev.	0.00	(=0.000001)



Assumption: 60 Remove & Dispose of Transmission Line No. 15 Unit Price **Cell: R73**

BetaPERT distribution with parameters:

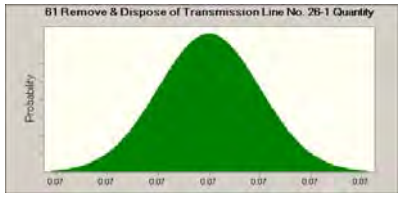
Minimum	$25,000.00	(=Q73)
Likeliest	$30,000.00	(=R73)
Maximum	$40,000.00	(=S73)



Assumption: 61 Remove & Dispose of Transmission Line No. 26-1 Quantity **Cell: L74**

Normal distribution with parameters:

Mean	0.07	(=L74)
Std. Dev.	0.00	(=0.000001)



Assumption: 61 Remove & Dispose of Transmission Line No. 26-1 Unit Price **Cell: R74**

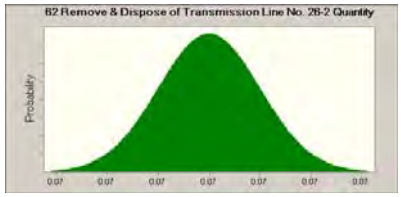
BetaPERT distribution with parameters:

Minimum	$25,000.00	(=Q74)
Likeliest	$30,000.00	(=R74)
Maximum	$40,000.00	(=S74)

Assumption: 62 Remove & Dispose of Transmission Line No. 26-2 Quantity **Cell: L75**

Normal distribution with parameters:

Mean	0.07	(=L75)
Std. Dev.	0.00	(=0.000001)



Assumption: 62 Remove & Dispose of Transmission Line No. 26-2 Unit Price **Cell: R75**

BetaPERT distribution with parameters:

Minimum	$25,000.00	(=Q75)
Likeliest	$30,000.00	(=R75)
Maximum	$40,000.00	(=S75)

Assumption: 63 Remove gate house #1 from top of dam Quantity **Cell: L76**

Normal distribution with parameters:

Mean	570	(=L76)
Std. Dev.	0	(=0.000001)

Assumption: 63 Remove gate house #1 from top of dam Unit Price **Cell: R76**

BetaPERT distribution with parameters:

Minimum	$55.00	(=Q76)
Likeliest	$60.00	(=R76)
Maximum	$65.00	(=S76)

Assumption: 64 Remove gate house #2 from top of dam Quantity **Cell: L77**

Normal distribution with parameters:

Mean	690	(=L77)
Std. Dev.	0	(=0.000001)

Assumption: 64 Remove gate house #2 from top of dam Unit Price **Cell: R77**

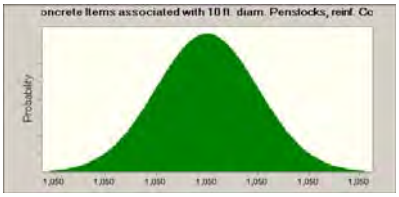
BetaPERT distribution with parameters:

Minimum	$55.00	(=Q77)
Likeliest	$60.00	(=R77)
Maximum	$65.00	(=S77)

Assumption: 65 Remove Concrete Items associated with 10 ft. diam. Penstocks, reinf. Co **Cell: L78**

Normal distribution with parameters:

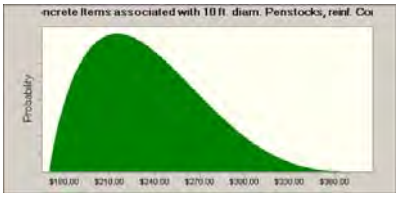
Mean	1,050	(=L78)
Std. Dev.	0	(=0.000001)



Assumption: 65 Remove Concrete Items associated with 10 ft. diam. Penstocks, reinf. Co **Cell: R78**

BetaPERT distribution with parameters:

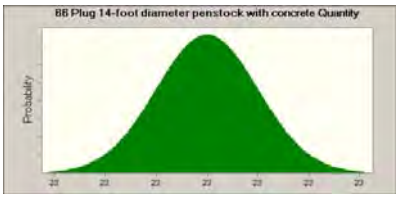
Minimum	$170.00	(=Q78)
Likeliest	$215.00	(=R78)
Maximum	$380.00	(=S78)



Assumption: 66 Plug 14-foot diameter penstock with concrete Quantity **Cell: L79**

Normal distribution with parameters:

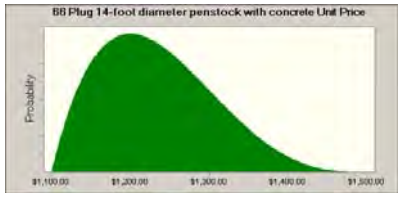
Mean	23	(=L79)
Std. Dev.	0	(=0.000001)



Assumption: 66 Plug 14-foot diameter penstock with concrete Unit Price **Cell: R79**

BetaPERT distribution with parameters:

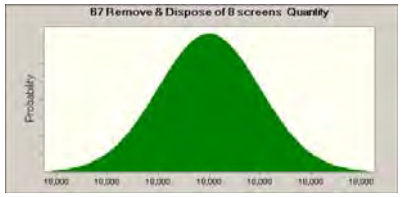
Minimum	$1,100.00	(=Q79)
Likeliest	$1,200.00	(=R79)
Maximum	$1,500.00	(=S79)



Assumption: 67 Remove & Dispose of 8 screens Quantity **Cell: L80**

Normal distribution with parameters:

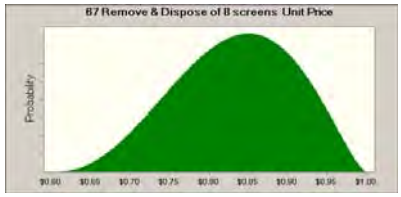
Mean	18,000	(=L80)
Std. Dev.	0	(=0.000001)



Assumption: 67 Remove & Dispose of 8 screens Unit Price **Cell: R80**

BetaPERT distribution with parameters:

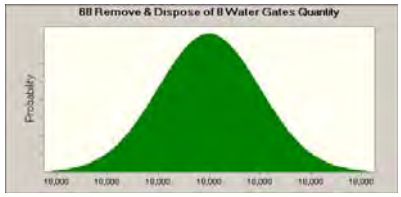
Minimum	$0.60	(=Q80)
Likeliest	$0.85	(=R80)
Maximum	$1.00	(=S80)



Assumption: 68 Remove & Dispose of 8 Water Gates Quantity **Cell: L81**

Normal distribution with parameters:

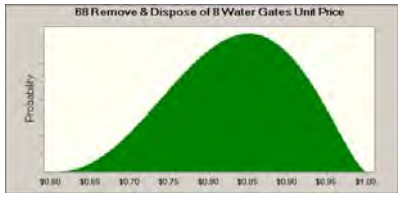
Mean	18,000	(=L81)
Std. Dev.	0	(=0.000001)



Assumption: 68 Remove & Dispose of 8 Water Gates Unit Price **Cell: R81**

BetaPERT distribution with parameters:

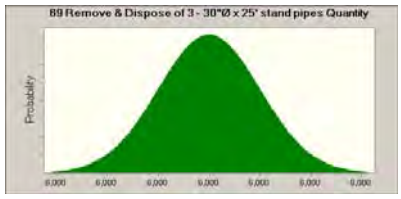
Minimum	$0.60	(=Q81)
Likeliest	$0.85	(=R81)
Maximum	$1.00	(=S81)



Assumption: 69 Remove & Dispose of 3 - 30"Ø x 25' stand pipes Quantity **Cell: L82**

Normal distribution with parameters:

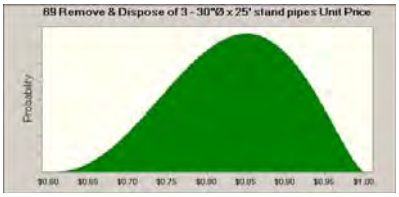
Mean	6,000	(=L82)
Std. Dev.	0	(=0.000001)



Assumption: 69 Remove & Dispose of 3 - 30"Ø x 25' stand pipes Unit Price **Cell: R82**

BetaPERT distribution with parameters:

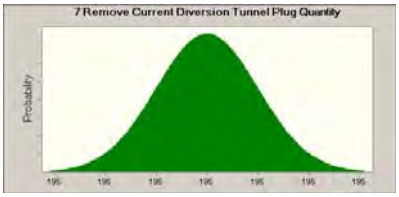
Minimum	$0.60	(=Q82)
Likeliest	$0.85	(=R82)
Maximum	$1.00	(=S82)



Assumption: 7 Remove Current Diversion Tunnel Plug Quantity **Cell: L20**

Normal distribution with parameters:

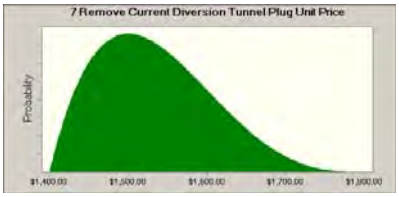
Mean	195	(=L20)
Std. Dev.	0	(=0.000001)



Assumption: 7 Remove Current Diversion Tunnel Plug Unit Price **Cell: R20**

BetaPERT distribution with parameters:

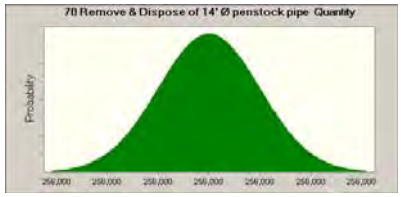
Minimum	$1,400.00	(=Q20)
Likeliest	$1,500.00	(=R20)
Maximum	$1,800.00	(=S20)



Assumption: 70 Remove & Dispose of 14' Ø penstock pipe Quantity **Cell: L83**

Normal distribution with parameters:

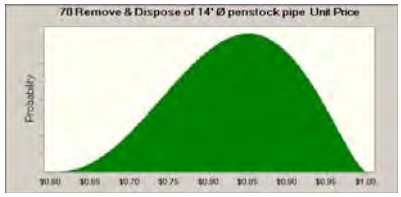
Mean	256,000	(=L83)
Std. Dev.	0	(=0.000001)



Assumption: 70 Remove & Dispose of 14' Ø penstock pipe Unit Price **Cell: R83**

BetaPERT distribution with parameters:

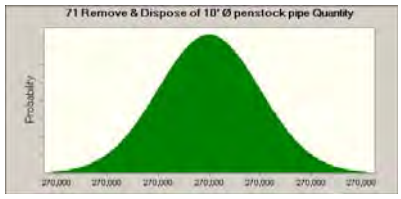
Minimum	$0.60	(=Q83)
Likeliest	$0.85	(=R83)
Maximum	$1.00	(=S83)



Assumption: 71 Remove & Dispose of 10' Ø penstock pipe Quantity **Cell: L84**

Normal distribution with parameters:

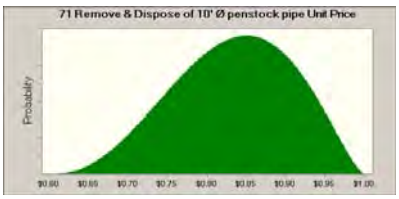
Mean	270,000	(=L84)
Std. Dev.	0	(=0.000001)



Assumption: 71 Remove & Dispose of 10' Ø penstock pipe Unit Price **Cell: R84**

BetaPERT distribution with parameters:

Minimum	$0.60	(=Q84)
Likeliest	$0.85	(=R84)
Maximum	$1.00	(=S84)



Assumption: 72 Temporary Access Roads Quantity **Cell: L85**

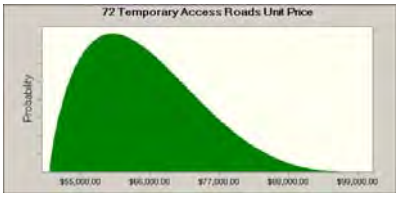
Normal distribution with parameters:

Mean	7	(=L85)
Std. Dev.	0	(=0.000001)

Assumption: 72 Temporary Access Roads Unit Price **Cell: R85**

BetaPERT distribution with parameters:

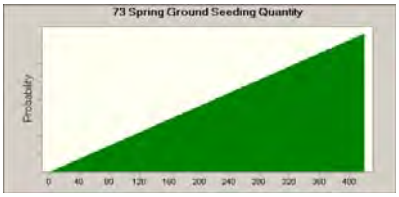
Minimum	$50,000.00	(=R85)
Likeliest	$60,000.00	(=Q85)
Maximum	$100,000.00	(=S85)



Assumption: 73 Spring Ground Seeding Quantity **Cell: L86**

Triangular distribution with parameters:

Minimum	0	(=M86)
Likeliest	420	(=L86)
Maximum	420	(=K86)



Assumption: 73 Spring Ground Seeding Unit Price **Cell: R86**

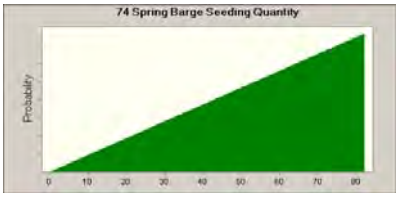
BetaPERT distribution with parameters:

Minimum	$3,000.00	(=Q86)
Likeliest	$3,500.00	(=R86)
Maximum	$4,000.00	(=S86)

Assumption: 74 Spring Barge Seeding Quantity **Cell: L87**

Triangular distribution with parameters:

Minimum	0	(=M87)
Likeliest	82	(=L87)
Maximum	82	(=K87)



Assumption: 74 Spring Barge Seeding Unit Price **Cell: R87**

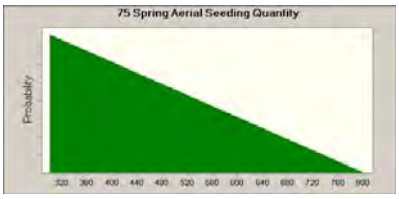
BetaPERT distribution with parameters:

Minimum	$5,000.00	(=Q87)
Likeliest	$6,500.00	(=R87)
Maximum	$8,000.00	(=S87)

Assumption: 75 Spring Aerial Seeding Quantity **Cell: L88**

Triangular distribution with parameters:

Minimum	300	(=K88)
Likeliest	300	(=L88)
Maximum	802	(=M88)



Assumption: 75 Spring Aerial Seeding Unit Price **Cell: R88**

BetaPERT distribution with parameters:

Minimum	$6,500.00	(=Q88)
Likeliest	$7,500.00	(=R88)
Maximum	$15,000.00	(=S88)

Assumption: 76 Fall Ground Seeding Quantity **Cell: L89**

Triangular distribution with parameters:

Minimum	201	(=K89)
Likeliest	401	(=L89)
Maximum	602	(=M89)

Assumption: 76 Fall Ground Seeding Unit Price **Cell: R89**

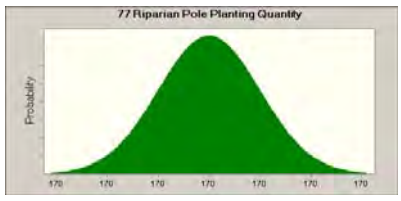
BetaPERT distribution with parameters:

Minimum	$3,000.00	(=Q89)
Likeliest	$3,500.00	(=R89)
Maximum	$4,000.00	(=S89)

Assumption: 77 Riparian Pole Planting Quantity **Cell: L90**

Normal distribution with parameters:

Mean	170	(=L90)
Std. Dev.	0	(=0.000001)



Assumption: 77 Riparian Pole Planting Unit Price **Cell: R90**

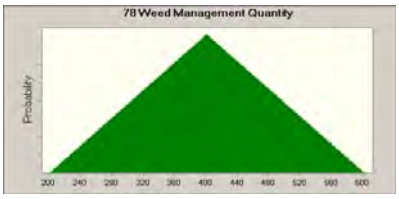
BetaPERT distribution with parameters:

Minimum	$4,000.00	(=Q90)
Likeliest	$8,500.00	(=R90)
Maximum	$10,000.00	(=S90)

Assumption: 78 Weed Management Quantity **Cell: L91**

Triangular distribution with parameters:

Minimum	201	(=K91)
Likeliest	401	(=L91)
Maximum	602	(=M91)



Assumption: 78 Weed Management Unit Price **Cell: R91**

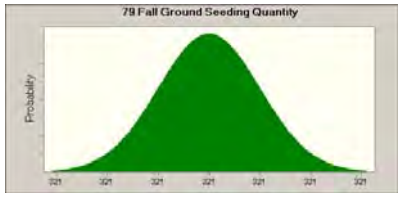
BetaPERT distribution with parameters:

Minimum	$1,000.00	(=Q91)
Likeliest	$1,500.00	(=R91)
Maximum	$2,000.00	(=S91)

Assumption: 79 Fall Ground Seeding Quantity **Cell: L92**

Normal distribution with parameters:

Mean	321	(=L92)
Std. Dev.	0	(=0.000001)



Assumption: 79 Fall Ground Seeding Unit Price **Cell: R92**

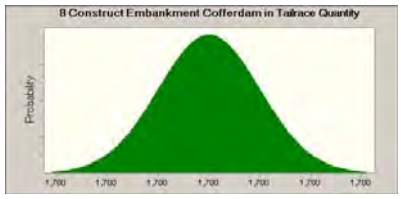
BetaPERT distribution with parameters:

Minimum	$3,000.00	(=Q92)
Likeliest	$3,500.00	(=R92)
Maximum	$4,000.00	(=S92)

Assumption: 8 Construct Embankment Cofferdam in Tailrace Quantity **Cell: L21**

Normal distribution with parameters:

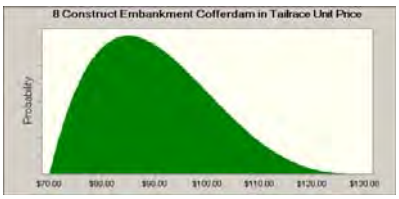
Mean	1,700	(=L21)
Std. Dev.	0	(=0.000001)



Assumption: 8 Construct Embankment Cofferdam in Tailrace Unit Price **Cell: R21**

BetaPERT distribution with parameters:

Minimum	$70.00	(=Q21)
Likeliest	$85.00	(=R21)
Maximum	$130.00	(=S21)



Assumption: 80 Weed Management Quantity **Cell: L93**

Normal distribution with parameters:

Mean	321	(=L93)
Std. Dev.	0	(=0.000001)

Assumption: 80 Weed Management Unit Price **Cell: R93**

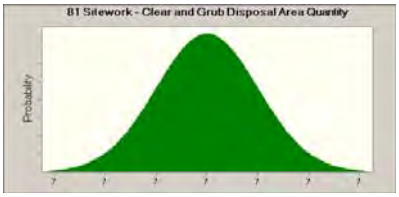
BetaPERT distribution with parameters:

Minimum	$1,000.00	(=Q93)
Likeliest	$1,500.00	(=R93)
Maximum	$2,000.00	(=S93)

Assumption: 81 Sitework - Clear and Grub Disposal Area Quantity **Cell: L94**

Normal distribution with parameters:

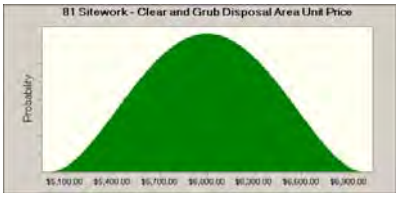
Mean	7	(=L94)
Std. Dev.	0	(=0.000001)



Assumption: 81 Sitework - Clear and Grub Disposal Area Unit Price **Cell: R94**

BetaPERT distribution with parameters:

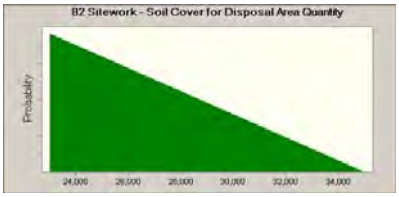
Minimum	$5,000.00	(=Q94)
Likeliest	$6,000.00	(=R94)
Maximum	$7,000.00	(=S94)



Assumption: 82 Sitework - Soil Cover for Disposal Area Quantity **Cell: L95**

Triangular distribution with parameters:

Minimum	23,000	(=K95)
Likeliest	23,000	(=L95)
Maximum	35,000	(=M95)



Assumption: 82 Sitework - Soil Cover for Disposal Area Unit Price **Cell: R95**

BetaPERT distribution with parameters:

Minimum	$45.00	(=Q95)
Likeliest	$50.00	(=R95)
Maximum	$60.00	(=S95)

Assumption: 83 Access/Haul Road Improvements - Soil Excavation Quantity **Cell: L96**

Triangular distribution with parameters:

Minimum	4,500	(=K96)
Likeliest	4,500	(=L96)
Maximum	9,000	(=M96)

Assumption: 83 Access/Haul Road Improvements - Soil Excavation Unit Price **Cell: R96**

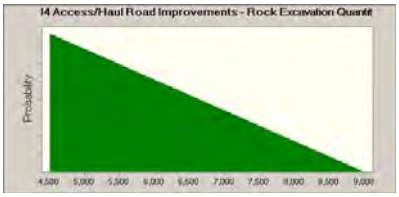
BetaPERT distribution with parameters:

Minimum	$12.00	(=Q96)
Likeliest	$13.00	(=R96)
Maximum	$14.00	(=S96)

Assumption: 84 Access/Haul Road Improvements - Rock Excavation Quantity **Cell: L97**

Triangular distribution with parameters:

Minimum	4,500	(=K97)
Likeliest	4,500	(=L97)
Maximum	9,000	(=M97)



Assumption: 84 Access/Haul Road Improvements - Rock Excavation Unit Price **Cell: R97**

BetaPERT distribution with parameters:

Minimum	$35.00	(=Q97)
Likeliest	$40.00	(=R97)
Maximum	$45.00	(=S97)

Assumption: 85 Access/Haul Road Improvements - Soil Backfill Quantity **Cell: L98**

Triangular distribution with parameters:

Minimum	16,000	(=K98)
Likeliest	16,000	(=L98)
Maximum	30,000	(=M98)

Assumption: 85 Access/Haul Road Improvements - Soil Backfill Unit Price **Cell: R98**

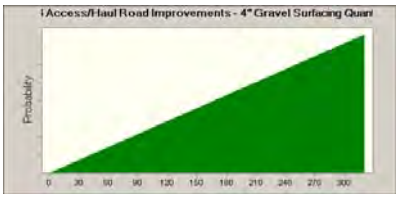
BetaPERT distribution with parameters:

Minimum	$45.00	(=Q98)
Likeliest	$50.00	(=R98)
Maximum	$55.00	(=S98)

Assumption: 86 Access/Haul Road Improvements - 4" Gravel Surfacing Quantity **Cell: L99**

Triangular distribution with parameters:

Minimum	0	(=K99)
Likeliest	320	(=L99)
Maximum	320	(=M99)



Assumption: 86 Access/Haul Road Improvements - 4" Gravel Surfacing Unit Price **Cell: R99**

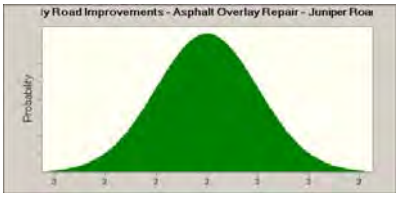
BetaPERT distribution with parameters:

Minimum	$80.00	(=Q99)
Likeliest	$100.00	(=R99)
Maximum	$120.00	(=S99)

Assumption: 87 County Road Improvements - Asphalt Overlay Repair - Juniper Road Quant **C/Q100**

Normal distribution with parameters:

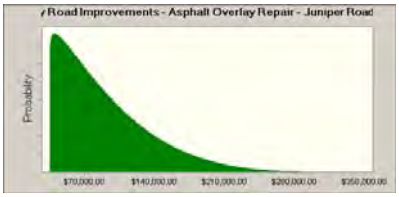
Mean	3	(=L100)
Std. Dev.	0	(=0.000001)



Assumption: 87 County Road Improvements - Asphalt Overlay Repair - Juniper Road Unit **C/R100**

BetaPERT distribution with parameters:

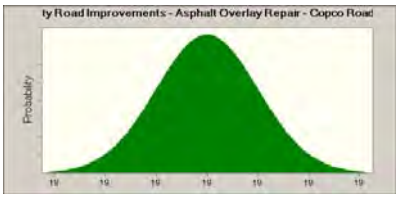
Minimum	$35,000.00	(=Q100)
Likeliest	$40,000.00	(=R100)
Maximum	$350,000.00	(=S100)



Assumption: 88 County Road Improvements - Asphalt Overlay Repair - Copco Road Quant **C/L101**

Normal distribution with parameters:

Mean	19	(=L101)
Std. Dev.	0	(=0.000001)



Assumption: 88 County Road Improvements - Asphalt Overlay Repair - Copco Road Cell: R101

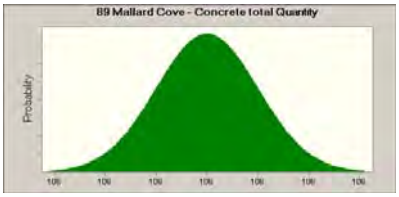
BetaPERT distribution with parameters:

Minimum	$35,000.00	(=Q101)
Likeliest	$40,000.00	(=R101)
Maximum	$350,000.00	(=S101)

Assumption: 89 Mallard Cove - Concrete total Quantity Cell: L102

Normal distribution with parameters:

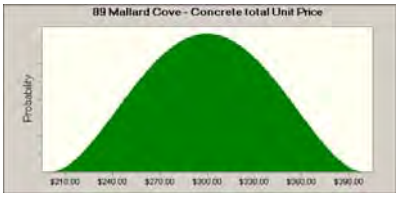
Mean	106	(=L102)
Std. Dev.	0	(=0.000001)



Assumption: 89 Mallard Cove - Concrete total Unit Price Cell: R102

BetaPERT distribution with parameters:

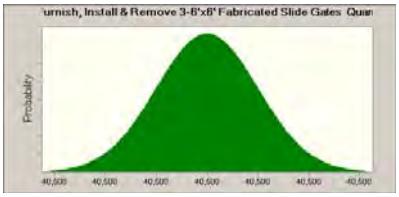
Minimum	$200.00	(=Q102)
Likeliest	$300.00	(=R102)
Maximum	$400.00	(=S102)



Assumption: 9 Furnish, Install & Remove 3-6'x6' Fabricated Slide Gates Quantity Cell: L22

Normal distribution with parameters:

Mean	40,500	(=L22)
Std. Dev.	0	(=0.000001)



Assumption: 9 Furnish, Install & Remove 3-6'x6' Fabricated Slide Gates Unit Price Cell: R22

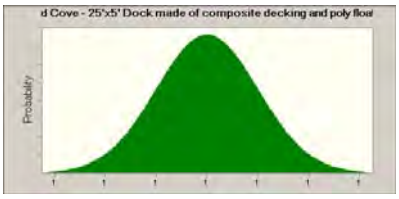
BetaPERT distribution with parameters:

Minimum	$12.00	(=Q22)
Likeliest	$15.00	(=R22)
Maximum	$18.00	(=S22)

Assumption: 90 Mallard Cove - 25'x5' Dock made of composite decking and poly floats Cell: L103

Normal distribution with parameters:

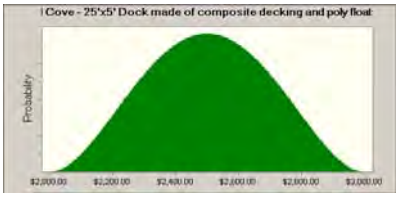
Mean	1	(=L103)
Std. Dev.	0	(=0.000001)



Assumption: 90 Mallard Cove - 25'x5' Dock made of composite decking and poly floats: R103 **Cell: R103**

BetaPERT distribution with parameters:

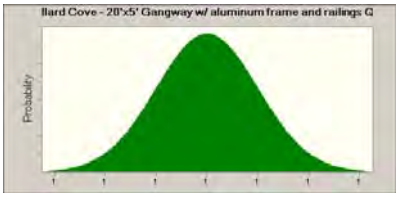
Minimum	$2,000.00	(=Q103)
Likeliest	$2,500.00	(=R103)
Maximum	$3,000.00	(=S103)



Assumption: 91 Mallard Cove - 20'x5' Gangway w/ aluminum frame and railings Quantity **Cell: L104**

Normal distribution with parameters:

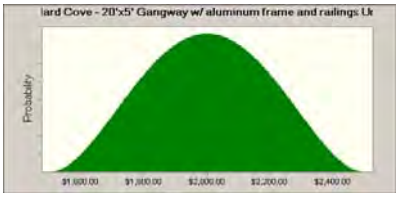
Mean	1	(=L104)
Std. Dev.	0	(=0.000001)



Assumption: 91 Mallard Cove - 20'x5' Gangway w/ aluminum frame and railings Unit Price **Cell: R104**

BetaPERT distribution with parameters:

Minimum	$1,500.00	(=Q104)
Likeliest	$2,000.00	(=R104)
Maximum	$2,500.00	(=S104)



Assumption: 92 Mallard Cove - Signs to be removed and hauled away Quantity **Cell: L105**

Normal distribution with parameters:

Mean	6	(=L105)
Std. Dev.	0	(=0.000001)

Assumption: 92 Mallard Cove - Signs to be removed and hauled away Unit Price **Cell: R105**

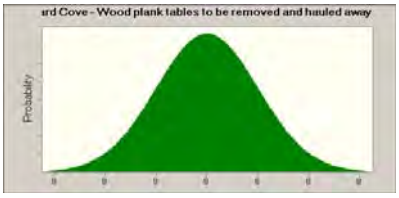
BetaPERT distribution with parameters:

Minimum	$250.00	(=Q105)
Likeliest	$300.00	(=R105)
Maximum	$350.00	(=S105)

Assumption: 93 Mallard Cove - Wood plank tables to be removed and hauled away Quantity **Cell: L106**

Normal distribution with parameters:

Mean	8	(=L106)
Std. Dev.	0	(=0.000001)



Assumption: 93 Mallard Cove - Wood plank tables to be removed and hauled away Cell: R106

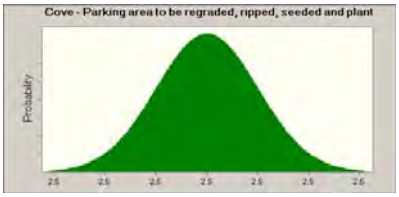
BetaPERT distribution with parameters:

Minimum	$90.00	(=Q106)
Likeliest	$100.00	(=R106)
Maximum	$120.00	(=S106)

Assumption: 94 Mallard Cove - Parking area to be regraded, ripped, seeded and plant Cell: Q107

Normal distribution with parameters:

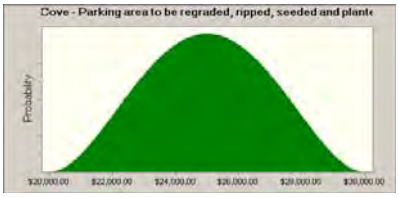
Mean	2.5	(=L107)
Std. Dev.	0.0	(=0.000001)



Assumption: 94 Mallard Cove - Parking area to be regraded, ripped, seeded and plant Cell: R107

BetaPERT distribution with parameters:

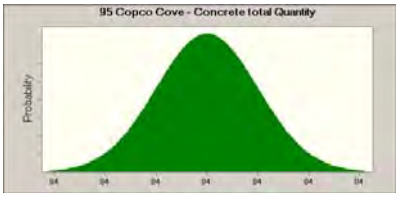
Minimum	$20,000.00	(=Q107)
Likeliest	$25,000.00	(=R107)
Maximum	$30,000.00	(=S107)



Assumption: 95 Copco Cove - Concrete total Quantity **Cell: L108**

Normal distribution with parameters:

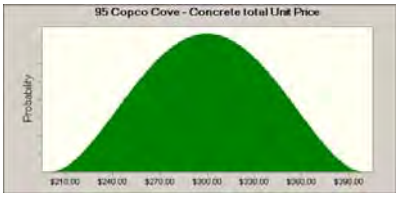
Mean	84	(=L108)
Std. Dev.	0	(=0.000001)



Assumption: 95 Copco Cove - Concrete total Unit Price **Cell: R108**

BetaPERT distribution with parameters:

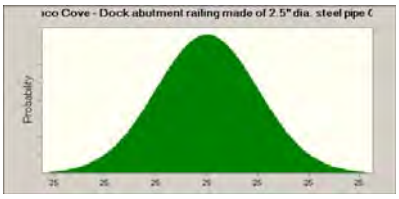
Minimum	$200.00	(=Q108)
Likeliest	$300.00	(=R108)
Maximum	$400.00	(=S108)



Assumption: 96 Copco Cove - Dock abutment railing made of 2.5" dia. steel pipe Quantity **Cell: L109**

Normal distribution with parameters:

Mean	25	(=L109)
Std. Dev.	0	(=0.000001)



Assumption: 96 Copco Cove - Dock abutment railing made of 2.5" dia. steel pipe Unit Price **Cell: R109**

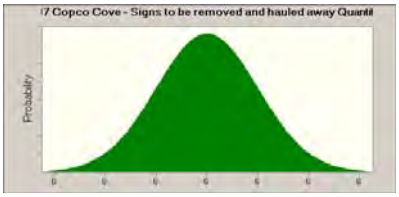
BetaPERT distribution with parameters:

Minimum	$35.00	(=Q109)
Likeliest	$40.00	(=R109)
Maximum	$45.00	(=S109)

Assumption: 97 Copco Cove - Signs to be removed and hauled away Quantity **Cell: L110**

Normal distribution with parameters:

Mean	6	(=L110)
Std. Dev.	0	(=0.000001)



Assumption: 97 Copco Cove - Signs to be removed and hauled away Unit Price **Cell: R110**

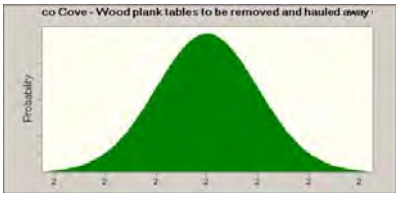
BetaPERT distribution with parameters:

Minimum	$250.00	(=Q110)
Likeliest	$300.00	(=R110)
Maximum	$350.00	(=S110)

Assumption: 98 Copco Cove - Wood plank tables to be removed and hauled away Quantity Cell: L111

Normal distribution with parameters:

Mean	2	(=L111)
Std. Dev.	0	(=0.000001)



Assumption: 98 Copco Cove - Wood plank tables to be removed and hauled away Unit Price Cell: R111

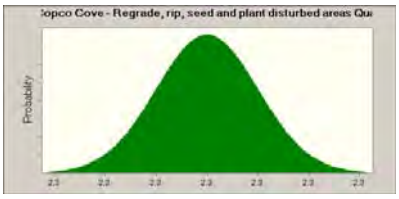
BetaPERT distribution with parameters:

Minimum	$90.00	(=Q111)
Likeliest	$100.00	(=R111)
Maximum	$120.00	(=S111)

Assumption: 99 Copco Cove - Regrade, rip, seed and plant disturbed areas Quantity Cell: L112

Normal distribution with parameters:

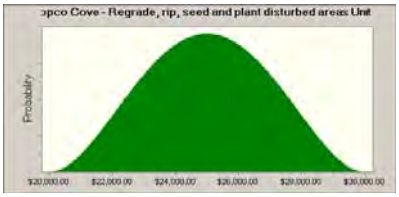
Mean	2.3	(=L112)
Std. Dev.	0.0	(=0.000001)



Assumption: 99 Copco Cove - Regrade, rip, seed and plant disturbed areas Unit Price **Cell: R112**

BetaPERT distribution with parameters:

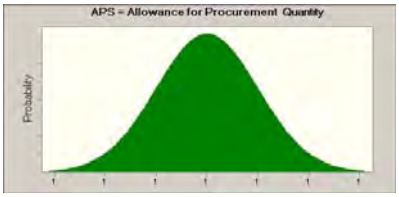
Minimum	$20,000.00	(=Q112)
Likeliest	$25,000.00	(=R112)
Maximum	$30,000.00	(=S112)



Assumption: APS = Allowance for Procurement Quantity **Cell: L121**

Normal distribution with parameters:

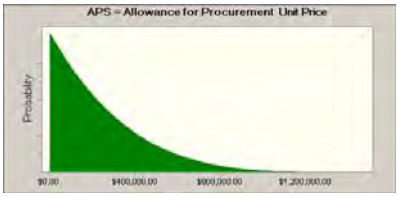
Mean	1	(=L121)
Std. Dev.	0	(=0.000001)



Assumption: APS = Allowance for Procurement Unit Price **Cell: R121**

BetaPERT distribution with parameters:

Minimum	$0.00	(=Q121)
Likeliest	$0.00	(=R121)
Maximum	$1,474,383.00	(=S121)



Assumption: Construction Contingencies Quantity **Cell: L124**

Normal distribution with parameters:

Mean	1	(=L124)
Std. Dev.	0	(=0.000001)

Assumption: Construction Contingencies Unit Price **Cell: R124**

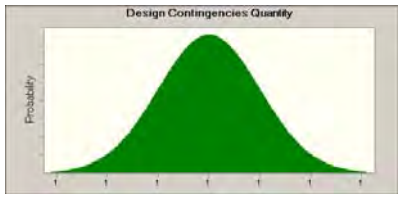
BetaPERT distribution with parameters:

Minimum	$6,000,000.00	(=Q124)
Likeliest	$9,000,000.00	(=R124)
Maximum	$19,000,000.00	(=S124)

Assumption: Design Contingencies Quantity **Cell: L120**

Normal distribution with parameters:

Mean	1	(=L120)
Std. Dev.	0	(=0.000001)



Assumption: Design Contingencies Unit Price **Cell: R120**

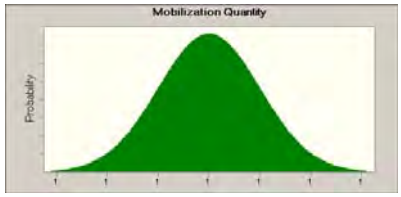
BetaPERT distribution with parameters:

Minimum	$2,796,615.00	(=Q120)
Likeliest	$3,594,415.00	(=R120)
Maximum	$9,421,992.00	(=S120)

Assumption: Mobilization Quantity **Cell: L115**

Normal distribution with parameters:

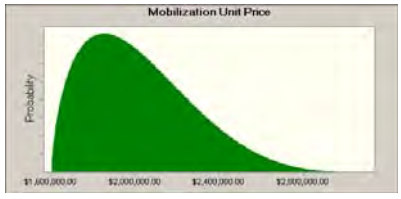
Mean	1	(=L115)
Std. Dev.	0	(=0.000001)



Assumption: Mobilization Unit Price **Cell: R115**

BetaPERT distribution with parameters:

Minimum	$1,600,000.00	(=Q115)
Likeliest	$1,850,000.00	(=R115)
Maximum	$3,100,000.00	(=S115)



Assumption: Non-Contract Cost Quantity **Cell: L126**

Normal distribution with parameters:

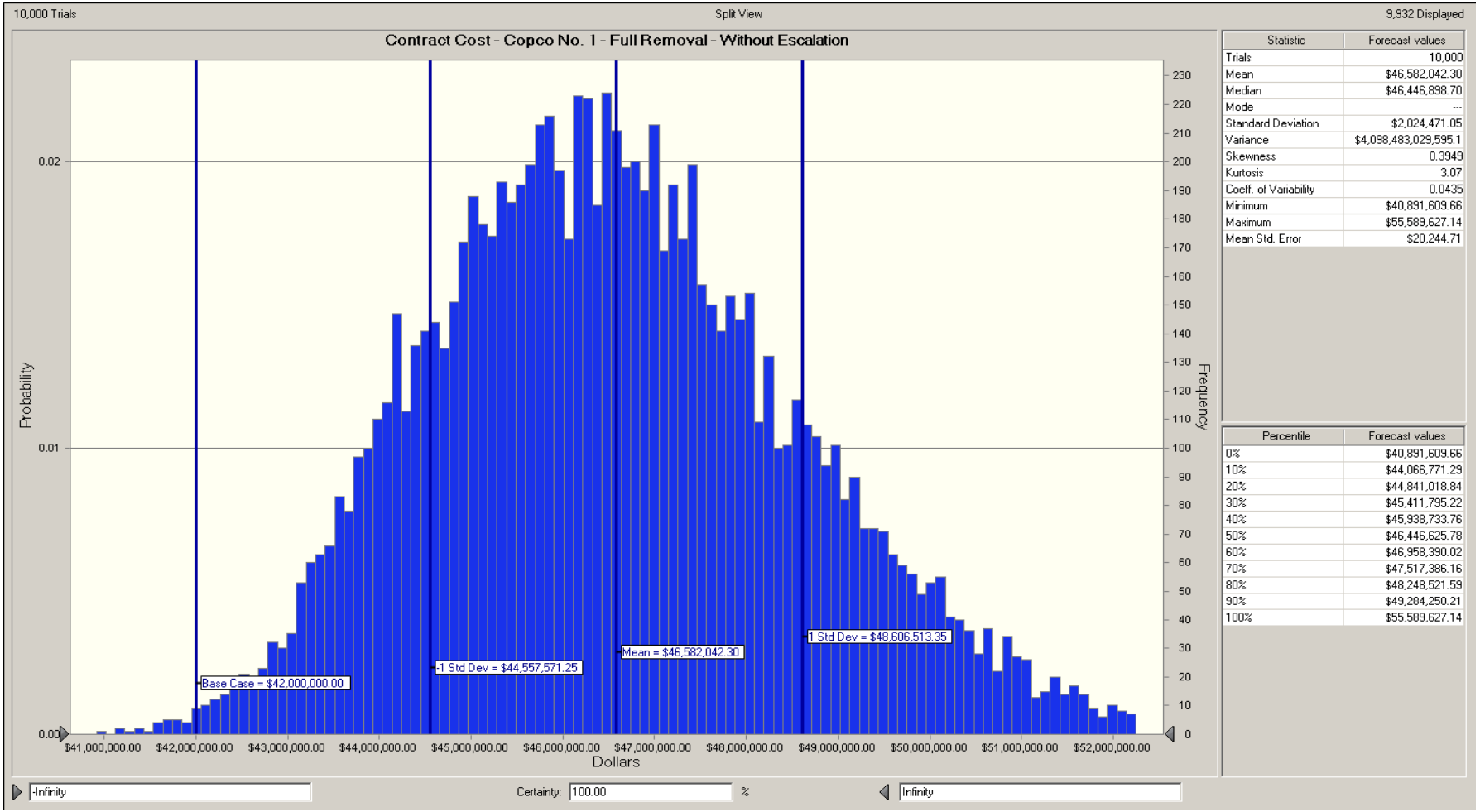
Mean	1	(=L126)
Std. Dev.	0	(=0.000001)

Assumption: Non-Contract Cost Unit Price **Cell: R126**

BetaPERT distribution with parameters:

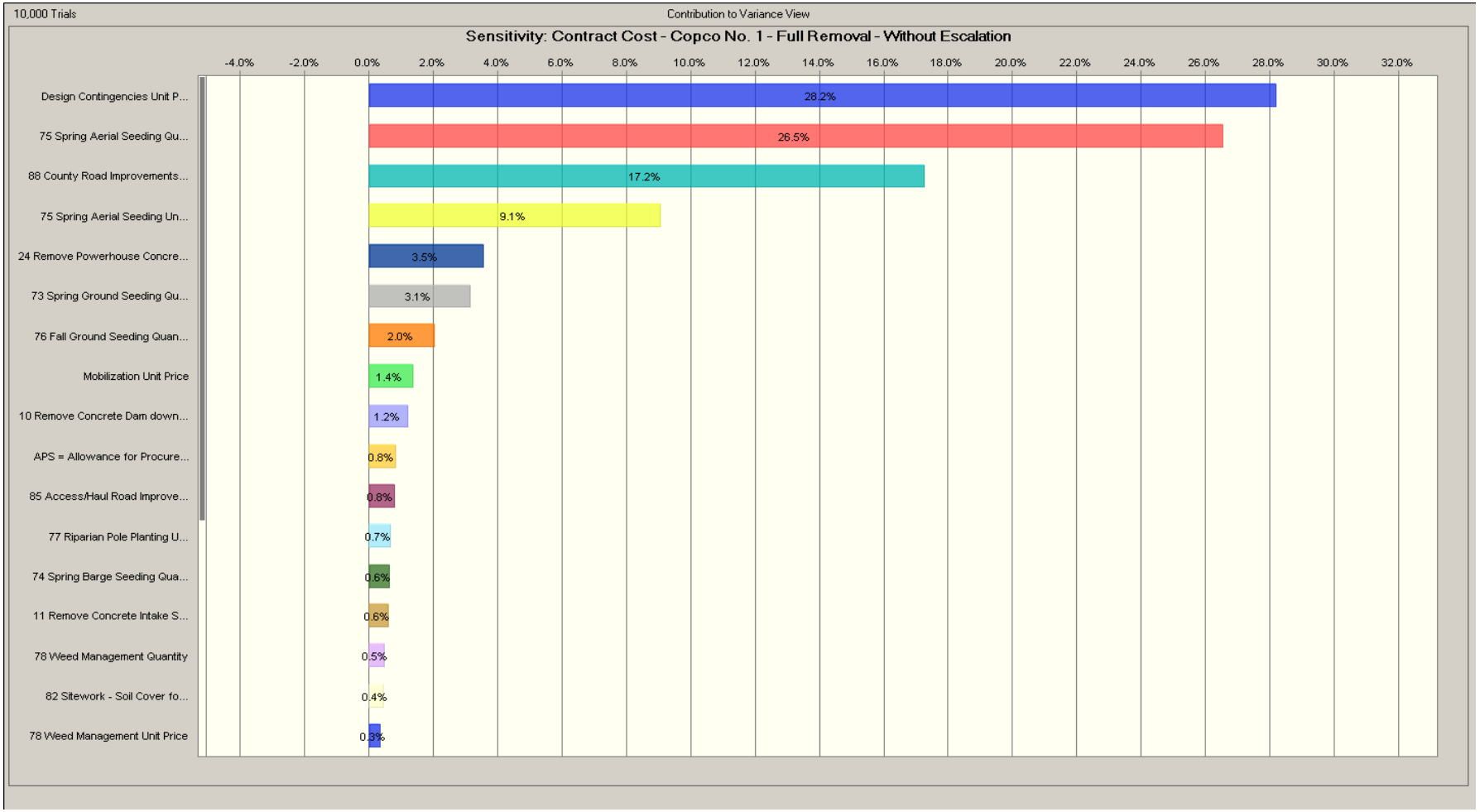
Minimum	$22,000,000.00	(=Q126)
Likeliest	$28,000,000.00	(=R126)
Maximum	$56,000,000.00	(=S126)

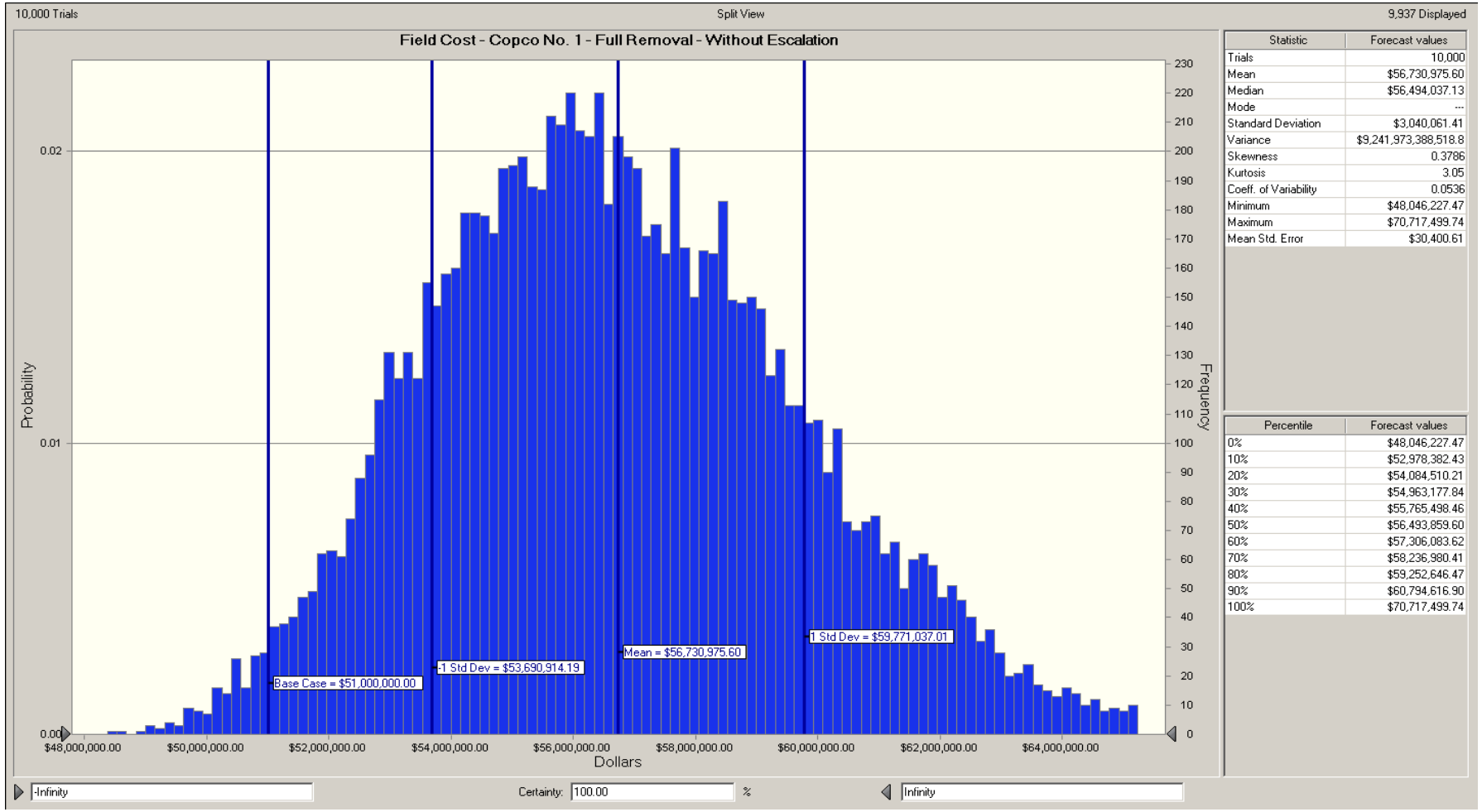
End of Assumptions



Statistic	Forecast values
Trials	10,000
Mean	$46,582,042.30
Median	$46,446,898.70
Mode	---
Standard Deviation	$2,024,471.05
Variance	$4,098,483,029,595.1
Skewness	0.3949
Kurtosis	3.07
Coeff. of Variability	0.0435
Minimum	$40,891,609.66
Maximum	$55,589,627.14
Mean Std. Error	$20,244.71

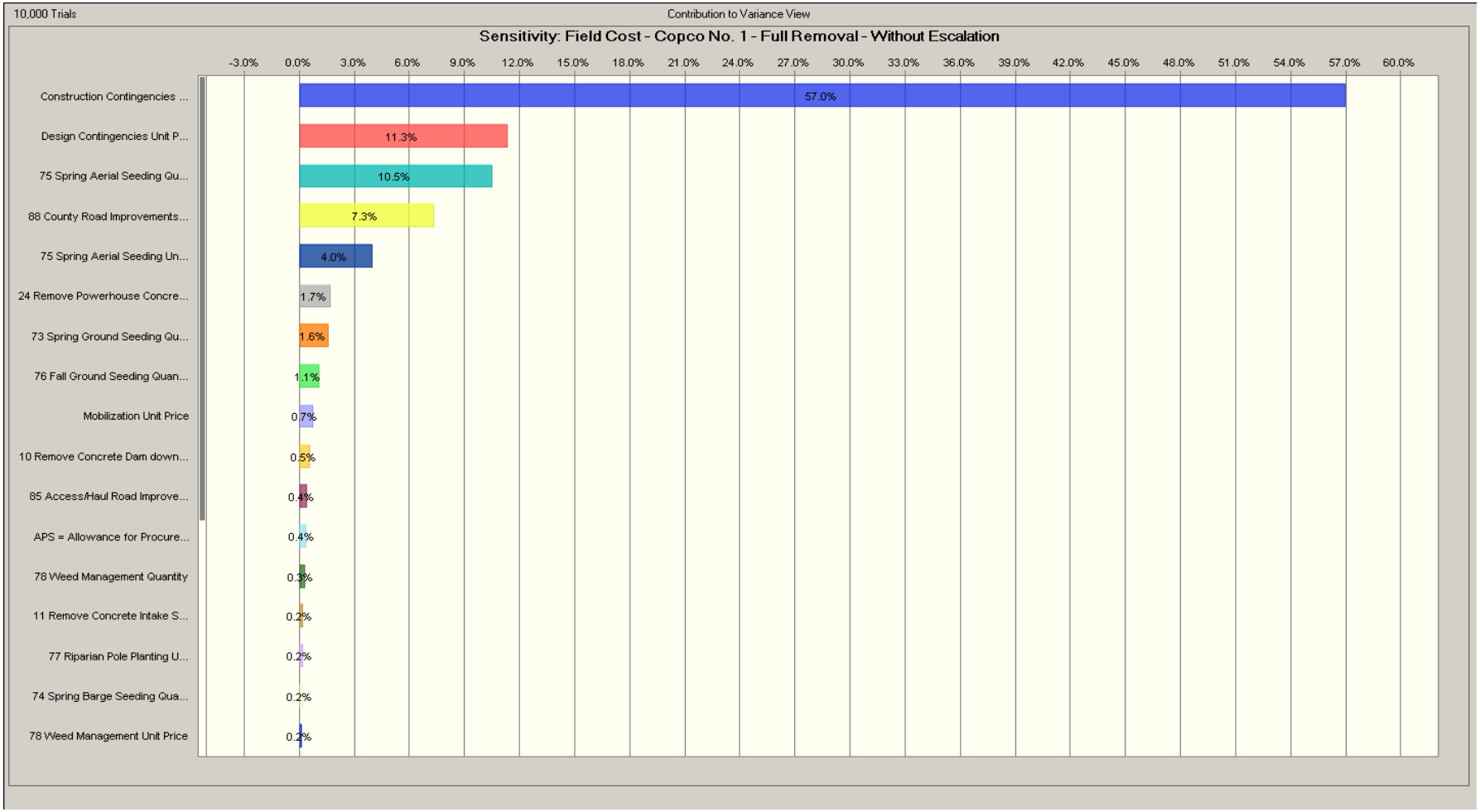
Percentile	Forecast values
0%	$40,891,609.66
10%	$44,066,771.29
20%	$44,841,018.84
30%	$45,411,795.22
40%	$45,938,733.76
50%	$46,446,625.78
60%	$46,958,390.02
70%	$47,517,386.16
80%	$48,248,521.59
90%	$49,204,250.21
100%	$55,589,627.14

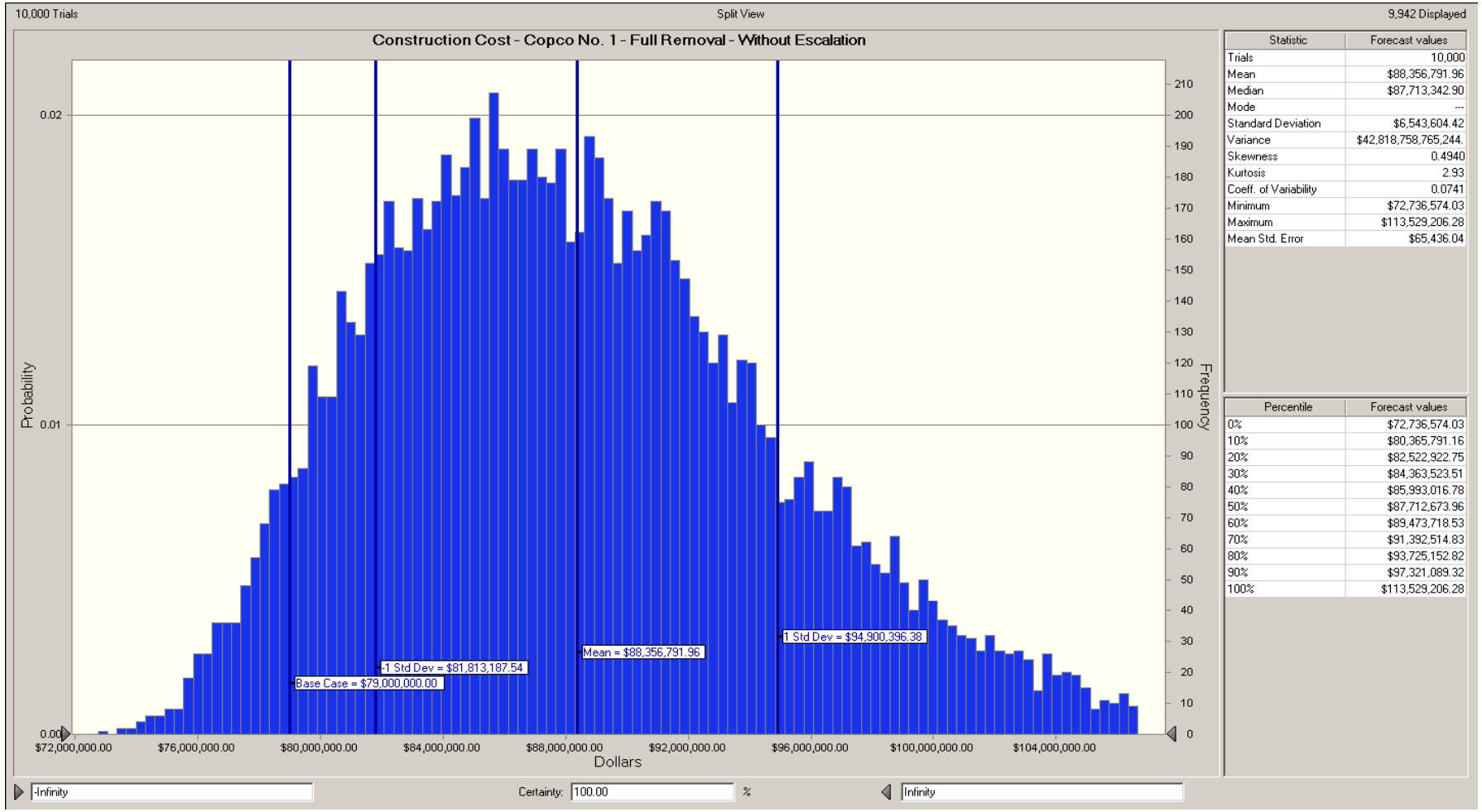

10,000 Trials
Contribution to Variance View
Sensitivity: Contract Cost - Copco No. 1 - Full Removal - Without Escalation
-4.0%
-2.0%
0.0%
2.0%
4.0%
6.0%
8.0%
10.0%
12.0%
14.0%
16.0%
18.0%
20.0%
22.0%
24.0%
26.0%
28.0%
30.0%
32.0%
Design Contingencies Unit P...
28.2%
75 Spring Aerial Seeding Qu...
26.5%
88 County Road Improvements...
17.2%
75 Spring Aerial Seeding Un...
9.1%
24 Remove Powerhouse Concre...
3.5%
73 Spring Ground Seeding Qu...
3.1%
76 Fall Ground Seeding Quan...
2.0%
Mobilization Unit Price
1.4%
10 Remove Concrete Dam down...
1.2%
APS = Allowance for Procure...
0.8%
85 Access/Haul Road Improve...
0.8%
77 Riparian Pole Planting U...
0.7%
74 Spring Barge Seeding Qua...
0.6%
11 Remove Concrete Intake S...
0.6%
78 Weed Management Quantity
0.5%
82 Sitework - Soil Cover fo...
0.4%
78 Weed Management Unit Price
0.3%



Statistic	Forecast values
Trials	10,000
Mean	$56,730,975.60
Median	$56,494,037.13
Mode	---
Standard Deviation	$3,040,061.41
Variance	$9,241,973,388,518.8
Skewness	0.3786
Kurtosis	3.05
Coeff. of Variability	0.0536
Minimum	$48,046,227.47
Maximum	$70,717,499.74
Mean Std. Error	$30,400.61

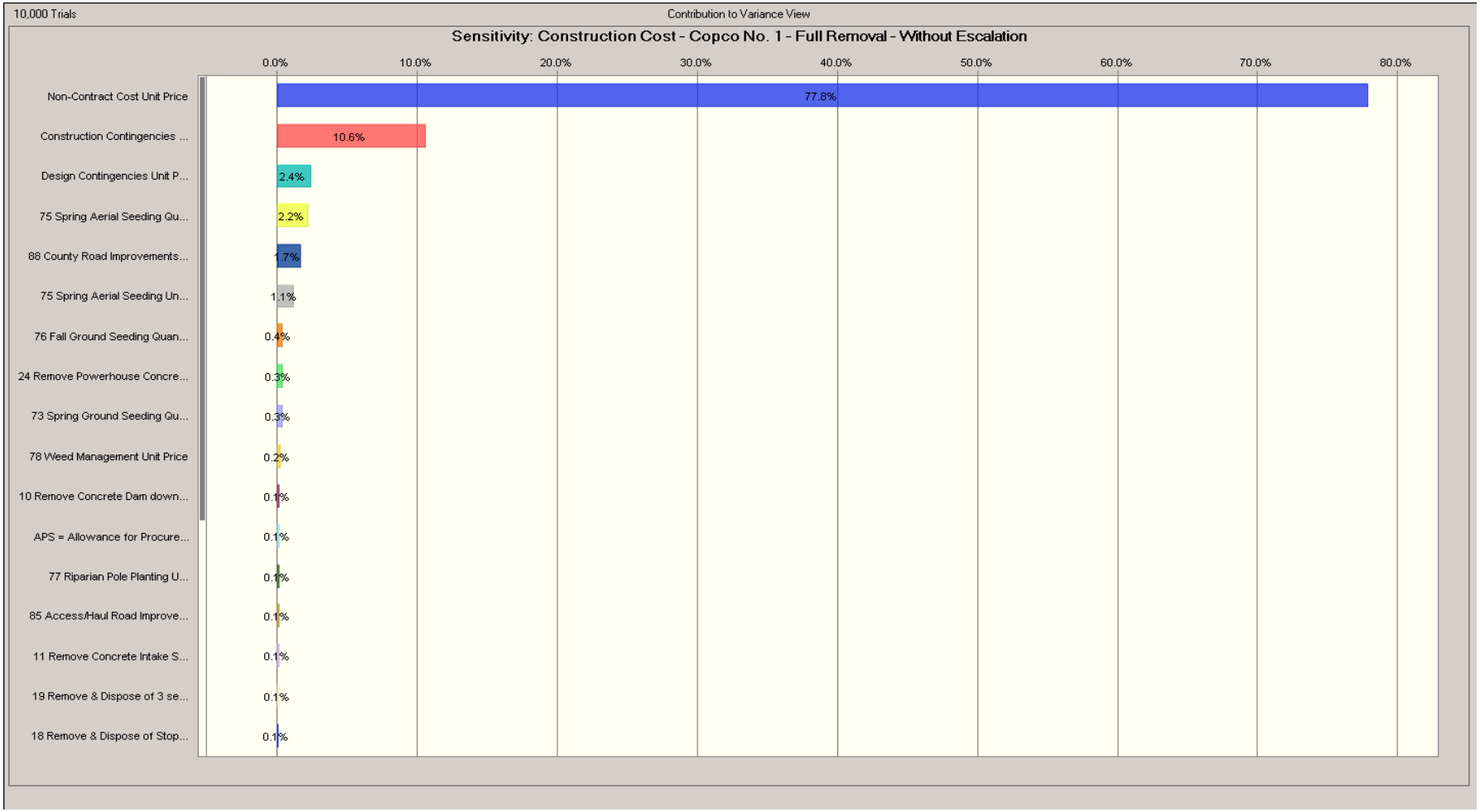
Percentile	Forecast values
0%	$48,046,227.47
10%	$52,978,382.43
20%	$54,084,510.21
30%	$54,963,177.84
40%	$55,765,498.46
50%	$56,493,859.60
60%	$57,306,083.62
70%	$58,236,980.41
80%	$59,252,646.47
90%	$60,794,616.90
100%	$70,717,499.74


10,000 Trials
Contribution to Variance View
Sensitivity: Field Cost - Copco No. 1 - Full Removal - Without Escalation
-3.0% 0.0% 3.0% 6.0% 9.0% 12.0% 15.0% 18.0% 21.0% 24.0% 27.0% 30.0% 33.0% 36.0% 39.0% 42.0% 45.0% 48.0% 51.0% 54.0% 57.0% 60.0%
Construction Contingencies ... 57.0%
Design Contingencies Unit P... 11.3%
75 Spring Aerial Seeding Qu... 10.5%
88 County Road Improvements... 7.3%
75 Spring Aerial Seeding Un... 4.0%
24 Remove Powerhouse Concre... 1.7%
73 Spring Ground Seeding Qu... 1.6%
76 Fall Ground Seeding Quan... 1.1%
Mobilization Unit Price 0.7%
10 Remove Concrete Dam down... 0.5%
85 Access/Haul Road Improve... 0.4%
APS = Allowance for Procure... 0.4%
78 Weed Management Quantity 0.3%
11 Remove Concrete Intake S... 0.2%
77 Riparian Pole Planting U... 0.2%
74 Spring Barge Seeding Qua... 0.2%
78 Weed Management Unit Price 0.2%



Statistic	Forecast values
Trials	10,000
Mean	$88,356,791.96
Median	$87,713,342.90
Mode	---
Standard Deviation	$6,543,604.42
Variance	$42,818,758,765,244.
Skewness	0.4940
Kurtosis	2.93
Coeff. of Variability	0.0741
Minimum	$72,736,574.03
Maximum	$113,529,206.28
Mean Std. Error	$65,436.04

Percentile	Forecast values
0%	$72,736,574.03
10%	$80,365,791.16
20%	$82,522,922.75
30%	$84,363,523.51
40%	$85,993,016.78
50%	$87,712,673.96
60%	$89,473,718.53
70%	$91,392,514.83
80%	$93,725,152.82
90%	$97,321,089.32
100%	$113,529,206.28


10,000 Trials
Contribution to Variance View
Sensitivity: Construction Cost - Copco No. 1 - Full Removal - Without Escalation
0.0%
10.0%
20.0%
30.0%
40.0%
50.0%
60.0%
70.0%
80.0%
Non-Contract Cost Unit Price
77.8%
Construction Contingencies ...
10.6%
Design Contingencies Unit P...
2.4%
75 Spring Aerial Seeding Qu...
2.2%
88 County Road Improvements...
1.7%
75 Spring Aerial Seeding Un...
1.1%
76 Fall Ground Seeding Quan...
0.4%
24 Remove Powerhouse Concre...
0.3%
73 Spring Ground Seeding Qu...
0.3%
78 Weed Management Unit Price
0.2%
10 Remove Concrete Dam down...
0.1%
APS = Allowance for Procure...
0.1%
77 Riparian Pole Planting U...
0.1%
85 Access/Haul Road Improve...
0.1%
11 Remove Concrete Intake S...
0.1%
19 Remove & Dispose of 3 se...
0.1%
18 Remove & Dispose of Stop...
0.1%

BUREAU OF RECLAMATION

ESTIMATE WORKSHEET

SHEET _1 _ OF _1 _

FEATURE:	PROJECT:
Klamath River Dams Removal Partial Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable Life Cycle - 50 Year Summary	Klamath River Oregon
	WOID: AF652 — ESTIMATE LEVEL: Feasibility
	REGION: MP — UNIT PRICE LEVEL: Jul-10
	FILE: U:\2011 Projects\Klamath\002 Completed Sheets\MP MPL MPH\01 - Copco 1\MP\[Copco 1 - MP - Probable.xlsx]Life Cycle Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		Periodic Costs - Year 1					$95,000.00
		Periodic Costs - Year 8					$32,566.50
		Periodic Costs - Year 17					$31,689.00
		Periodic Costs - Year 25					$16,380.90
		Periodic Costs - Year 33					$16,596.72
		Periodic Costs - Year 42					$8,239.50
		Periodic Costs - Year 50					0.00
		Annual Costs - Maintenance					$525,752.00
		(Assumes gov't service / construction contracts)					
		Subtotal 1					**$726,224.62**
		Mobilization	5%	+/-			$36,000.00
		Subtotal 1 with Mobilization					**$762,224.62**
		Escalation to Notice to Proceed (NTP), from Unit Price Level (July 2010) to NTP (July 2020),					$262,141.38
		at	3.00%	per year for	120	months.	
		Subtotal 2 = Subtotal 1 with Mobilization + Escalation to NTP					$1,024,366.00
		Design Contingencies	10%	+/-			$125,634.00
		Subtotal 3 = Subtotal 2 + Design Contingencies					$1,150,000.00
		Allowance for Procurement Strategies (APS)		+/-			
		Type of solicitation assumed: Competitive Request for Proposal					
		Subtotal 4 = Subtotal 3 + APS					$1,150,000.00
		CONTRACT COST					**$1,150,000.00**
		Construction Contingencies	20%	+/-			$200,000.00
		FIELD COST					**$1,350,000.00**
		Non-Contract Costs	30%	+/-			$400,000.00
		(Environmental Cultural / Mitigation ~ 7%,					
		Engineering Design ~ 5%, Maintenance Service Contract ~ 5%					
		Procurement ~ 2%, Inspections ~ 10%					
		and Closeout ~ 1%)					
		CONSTRUCTION COST					**$1,750,000.00**
		Note: intial estimate completed 4/17/11, revised non-contract costs 5/12/11, design contingencies costs 6/9/11					
		Ref.: For appropriate use and terminology, see Reclamation Manual, Directives and Standards FAC; 09-01, 09-02 and 09-03.					

QUANTITIES		PRICES	
BY Rick Benik	CHECKED Stephen Latham	BY Greg Akins	CHECKED 6/9/11
DATE PREPARED 03/24/11	PEER REVIEW / DATE Tom Hepler P.E. 3/25/11	DATE PREPARED 6/9/11	PEER REVIEW / DATE DCD 6/13/11

BUREAU OF RECLAMATION

ESTIMATE WORKSHEET

FEATURE:	PROJECT:
Klamath River Dams Removal Partial Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable Life Cycle	Klamath River Oregon
	WOID: AF652 — ESTIMATE LEVEL: Feasibility
	REGION: MP — UNIT PRICE LEVEL: Jul-10
	FILE: U:\2011 Projects\Klamath\002 Completed Sheets\MP MPL MPH\01 - Copco 1\MP\[Copco 1 - MP - Probable.xlsx]Template Sheet 1

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	1	Furnish, install, and maintain a 7-foot-high chain link fence along the west side of the powerhouse (assume two double 12ft wide gates for vehicle access) (assume replace two times)	86-68130	300	lf	$60.00	$18,000.00
	2	Repaint exposed portion of penstocks and vertical vents (Assume repaint 5 times) *Estimate assume minor paint repair ~ 2% area*	86-68130	8,900	ft2	$5.00	$44,500.00
	3	Remove paint on east side of powerhouse (assume paint contains heavy metals)	86-68130	1,300	ft2	$25.00	$32,500.00
		LIFE CYCLE SUBTOTAL					**$95,000.00**

QUANTITIES		PRICES	
BY Rick Benik	CHECKED Stephen Latham	BY Greg Akins	CHECKED 5/13/11
DATE PREPARED 03/21/11	PEER REVIEW / DATE Tom Hepler P.E. 3/24/11	DATE PREPARED 4/25/11	PEER REVIEW / DATE 5/13/11

BUREAU OF RECLAMATION

ESTIMATE WORKSHEET

FEATURE:	PROJECT:
Klamath River Dams Removal	Klamath River
Partial Removal Option	Oregon
Removal Site Maintenance	WOID: AF484 — ESTIMATE LEVEL: Feasibility
Most Probable	REGION: MP — UNIT PRICE LEVEL Jul-10
Life Cycle - 50 Year	FILE: U:\2011 Projects\Klamath\002 Completed Sheets\MP MPL MPH\01 - Copco 1\MP\[Copco 1 - MP - Probable.xlsx]Template Sheet 1
Operation and Maintenance - Periodic Costs	

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	1	**Site Maintenance - Annual: Copco 1 Site only***		1	LS	$25,000.00	$25,000.00
		Labor needed per year - threes sites:	86-68130	120	mdy**		
		3-Man maintenance crew					
		6 Months active inspection/maintenance					
		2 Weeks full time (1 month each spring)					
		4 Full days, 2 times each month (5 months)					
		Site maintenance required at JC Boyle, Copco 1 & Copco 2					
		Estimate prorated the time at each dam site based					
		on percent of total partial removal construction costs					
		Equipment needed per year	86-68130	40	dy***		
		1-Service truck					
		Includes compressor, welder, generator					
		and general tools					
		Estimate prorated the time at each dam site based					
		on percent of total partial removal construction costs					
		Materials needed per year (percentage of labor	86-68130	15%			
		& equipment)					
		Road maintenance needed per year (percentage	86-68130	10%			
		of labor & equipment)					
		**Total estimated cost for all 3 sites is approximately $160,000 annually:*					
		prorated ±15% for the Copco 1 site only					
		** Man days per year for 50 years					
		***Days per year for 50 years					
		SUBTOTAL THIS SHEET					**$25,000.00**

QUANTITIES		PRICES	
BY Rick Benik	CHECKED Stephen Latham	BY Greg Akins	CHECKED 5/13/11
DATE PREPARED 04/18/11	PEER REVIEW / DATE Tom Hepler P.E. 4/18/11	DATE PREPARED 4/25/11	PEER REVIEW / DATE 5/13/11

BUREAU OF RECLAMATION **ESTIMATE WORKSHEET** SHEET _1_ OF _1_

FEATURE:	PROJECT:
Klamath River Dams Removal **Partial Removal Option** **Copco No. 1 Dam & Powerplant Removal** **Most Probable High** **Life Cycle - 50 Year** **Summary**	**Klamath River** **Oregon**
	WOID: AF652 — **ESTIMATE LEVEL** Feasibility
	REGION MP — **UNIT PRICE LEVE** Jul-10
	FILE: U:\2011 Projects\Klamath\007 Crystal Ball\[Klamath Summary Cost Sheet_122310.xls]MPL_MP_MPH_Full

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		Periodic Costs - Year 1					$109,300.00
		Periodic Costs - Year 5					$43,628.33
		Periodic Costs - Year 10					$35,644.50
		Periodic Costs - Year 13					$11,529.77
		Periodic Costs - Year 15					$29,121.69
		Periodic Costs - Year 20					$23,792.37
		Periodic Costs - Year 25					$26,537.06
		Periodic Costs - Year 30					$15,881.69
		Periodic Costs - Year 35					$12,975.13
		Periodic Costs - Year 38					$4,196.99
		Periodic Costs - Year 40					$10,600.97
		Periodic Costs - Year 45					$8,660.95
		Periodic Costs - Year 50					0.00
		Annual Costs - Maintenance					$1,514,164.00
		(Assumes gov't service / construction contracts)					
		Subtotal 1					**$1,846,033.45**
		Mobilization	5%	+/-			$92,000.00
		Subtotal 1 with Mobilization					**$1,938,033.45**
		Escalation to Notice to Proceed (NTP): from Unit Price Level (July, 2010) to NTP (July, 2020)					$1,035,865.55
		at	4.375%	per year for	120	months.	
		Subtotal 2 = Subtotal 1 with Mobilization + Escalation to NTP					**$2,973,899.00**
		Design Contingencies	15%	+/-			$457,701.00
		Subtotal 3 = Subtotal 2 + Design Contingencies					**$3,431,600.00**
		Allowance for Procurement Strategies (APS)	2.0%	+/-			$68,400.00
		Type of solicitation assumed is: Selective Request for Proposal					
		Subtotal 4 = Subtotal 3 + APS					**$3,500,000.00**
		CONTRACT COST					**$3,500,000.00**
		Construction Contingencies	25%	+/-			$900,000.00
		FIELD COST					**$4,400,000.00**
		Non-Contract Costs	35%	+/-			$1,500,000.00
		(Environmental Cultural / Mitigation ~ 10%,					
		Engineering Design ~ 7%, Maintenance Service Contract ~ 5%					
		Procurement ~ 2%, Inspections ~ 10%					
		and Closeout ~ 1%)					
		CONSTRUCTION COST					**$5,900,000.00**
		Ref.: For appropriate use and terminology, see Reclamation Manual, Directives and Standards FAC; 09-01, 09-02 and 09-03.					

QUANTITIES		PRICES	
BY Rick Benik	**CHECKED** Stephen Latham	**BY** Greg Akins	**CHECKED** [illegible] 6/9/11
DATE PREPARED 03/24/11	**PEER REVIEW / DATE** Tom Hepler P.E. 3/25/11	**DATE PREPARED** 6/9/11	**PEER REVIEW / DATE** DCD 6/13/11

BUREAU OF RECLAMATION

ESTIMATE WORKSHEET

FEATURE:
Klamath River Dams Removal
Partial Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable High
Life Cycle - 50 Year
Operation and Maintenance - Initial Capital Costs

PROJECT:
Klamath River
Oregon

WOID:	AF652	ESTIMATE LEVEL:	Feasibility
REGION:	MP	UNIT PRICE LEVEL:	Jul-10

FILE: U:\2011 Projects\Klamath\002 Completed Sheets\MP MPL MPH\01 - Copco 1\MPH\[Copco 1 MPH - Probable.xlsx]Life Cycle Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	1	Furnish, install, and maintain a 7-foot-high chain	86-68130	300	lf	$50.00	$15,000.00
		link fence along the west side of the powerhouse					
		(assume two double 12ft wide gates for vehicle access)					
		(assume replace one time)					
	2	Repaint exposed portion of penstocks and	86-68130	8,900	ft2	$4.00	$35,600.00
		vertical vents					
		(Assume repaint 5 times)					
		Estimate assume minor existing ("lead") paint repair					
		during recoating ~ 2% area					
	3	Remove paint on east side of powerhouse	86-68130	1,300	ft2	$24.00	$31,200.00
		(assume paint contains heavy metals)					
		LIFE CYCLE SUBTOTAL					**$81,800.00**

QUANTITIES		PRICES	
BY: Rick Benik	CHECKED: Stephen Latham	BY: Greg Akins	CHECKED: 5/4/11
DATE PREPARED: 03/21/11	PEER REVIEW / DATE: Tom Hepler P.E. 3/24/11	DATE PREPARED: 5/4/11	PEER REVIEW / DATE: DCD 5/4/11

BUREAU OF RECLAMATION

ESTIMATE WORKSHEET

FEATURE:	PROJECT:
Klamath River Dams Removal Partial Removal Option Removal Site Maintenance Most Probable High Life Cycle - 50 Year Operation and Maintenance - Periodic Costs	Klamath River Oregon
	WOID: AF484 — ESTIMATE LEVEL: Feasibility
	REGION: MP — UNIT PRICE LEVEL Jul-10
	FILE: U:\2011 Projects\Klamath\002 Completed Sheets\MP MPL MPH\01 - Copco 1\MPH\[Copco 1 MPH - Probable.xlsx]O&M

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	1	**Site Maintenance - Annual: Copco 1 Site only***		1	LS	$72,000.00	$72,000.00
		Labor needed per year	86-68130	150	mdy**		
		3-Man maintenance crew					
		6 Months active inspection/maintenance					
		2 Weeks full time (1 month each spring)					
		4 Full days, 2 times each month (5 months)					
		Site maintenance required at JC Boyle, Copco 1 & Copco 2					
		Estimate prorated the time at each dam site based					
		on percent of total partial removal construction costs					
		Equipment needed per year	86-68130	50	dy***		
		1-Service truck					
		Includes compressor, welder, generator					
		and general tools					
		Estimate prorated the time at each dam site based					
		on percent of total partial removal construction costs					
		Materials needed per year (percentage of labor	86-68130	15%			
		& equipment)					
		Road maintenance needed per year (percentage	86-68130	10%			
		of labor & equipment)					
		**Total estimated cost for all 3 sites is approximately $462,000 annually:*					
		prorated ±15% for the Copco 1 site only					
		** Man days per year for 50 years					
		***Days per year for 50 years					
		SUBTOTAL THIS SHEET					**$72,000.00**

QUANTITIES		PRICES	
BY Rick Benik	CHECKED Stephen Latham	BY Greg Akins	CHECKED 5/4/11
DATE PREPARED 04/18/11	PEER REVIEW / DATE Tom Hepler P.E. 4/18/11	DATE PREPARED 5/4/11	PEER REVIEW / DATE DCD 5/4/11

BUREAU OF RECLAMATION **ESTIMATE WORKSHEET** SHEET _1 _ OF _1 _

FEATURE:	PROJECT:
Klamath River Dams Removal **Partial Removal Option** **Copco No. 1 Dam & Powerplant Removal** **Most Probable Low** **Life Cycle - 50 Year** **Summary**	**Klamath River** **Oregon** **WOID:** AF652 **ESTIMATE LEVEL:** Feasibility **REGION** MP **UNIT PRICE LEVEL** Jul-10 **FILE:** U:\2011 Projects\Klamath\002 Completed Sheets\MP MPL MPH\01 - Copco 1\MPL\[Copco 1 MPL - Probable.xlsx]Life Cycle Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		Periodic Costs - Year 1					$81,800.00
		Periodic Costs - Year 17					$17,906.80
		Periodic Costs - Year 25					$5,460.30
		Periodic Costs - Year 33					$9,378.46
		Periodic Costs - Year 50					0.00
		(Assumes gov't service / construction contracts)					
		Annual Costs - Maintenance					$357,511.00
		Subtotal 1					**$472,056.56**
		Mobilization	5%	+/-			$24,000.00
		Subtotal 1 with Mobilization					**$496,056.56**
		Escalation to Notice to Proceed (NTP): from Unit Price Level (July, 2010) to NTP (July, 2020)					$79,637.44
		at	1.5%	per year for	120	months.	
		Subtotal 2 = Subtotal 1 with Mobilization + Escalation to NTP					**$575,694.00**
		Design Contingencies	8%	+/-			$44,306.00
		Subtotal 3 = Subtotal 2 + Design Contingencies					**$620,000.00**
		Allowance for Procurement Strategies (APS)	0%	+/-			
		Type of solicitation assumed is: Full and open sealed bid competition					
		Subtotal 4 = Subtotal 3 + APS					**$620,000.00**
		CONTRACT COST					**$620,000.00**
		Construction Contingencies	18%	+/-			$110,000.00
		FIELD COST					**$730,000.00**
		Non-Contract Costs	25%	+/-			$180,000.00
		(Environmental Cultural / Mitigation ~ 5%, Engineering					
		Design ~ 4%, Maintenance Service Contract ~ 4%					
		Procurement ~ 1%, Inspections ~ 10%					
		and Closeout ~ 1%)					
		CONSTRUCTION COST					**$910,000.00**
		Ref.: For appropriate use and terminology, see Reclamation Manual, Directives and Standards FAC; 09-01, 09-02 and 09-03.					

QUANTITIES		PRICES	
BY Rick Benik	**CHECKED** Stephen Latham	**BY** Greg Akins	**CHECKED** 5/18/11
DATE PREPARED 03/24/11	**PEER REVIEW / DATE** Tom Hepler P.E. 3/25/11	**DATE PREPARED** 5/9/11	**PEER REVIEW / DATE** DCD 6/13/11

BUREAU OF RECLAMATION

ESTIMATE WORKSHEET

SHEET _1_ OF _1_

FEATURE:	PROJECT:
Klamath River Dams Removal Partial Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable Low Life Cycle - 50 Year Operation and Maintenance - Initial Capital Costs	Klamath River Oregon
	WOID: AF652 — ESTIMATE LEVEL: Feasibility
	REGION: MP — UNIT PRICE LEVEL: Jul-10
	FILE: U:\2011 Projects\Klamath\002 Completed Sheets\MP MPL MPH\03 - JC Boyle\MPH\[JC Boyle - MPH - Probable.xlsx]Sheet1

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	1	Furnish, install, and maintain a 7-foot-high chain	86-68130	300	lf	$50.00	$15,000.00
		link fence along the west side of the powerhouse					
		(assume two double 12ft wide gates for vehicle access)					
		(assume replace one time)					
	2	Repaint exposed portion of penstocks and	86-68130	8,900	ft2	$4.00	$35,600.00
		vertical vents					
		(Assume repaint 2 times)					
		Estimate assume minor existing ("lead") paint repair					
		during recoating ~ 2% area					
	3	Remove paint on east side of powerhouse	86-68130	1,300	ft2	$24.00	$31,200.00
		(assume paint contains heavy metals)					
		LIFE CYCLE SUBTOTAL					**$81,800.00**

QUANTITIES		PRICES	
BY Rick Benik	CHECKED Stephen Latham	BY Greg Akins	CHECKED Shawna Martin 5/4/11
DATE PREPARED 03/21/11	PEER REVIEW / DATE Tom Hepler P.E. 3/24/11	DATE PREPARED 5/4/11	PEER REVIEW / DATE DCD 5/4/11

BUREAU OF RECLAMATION

ESTIMATE WORKSHEET

FEATURE:
Klamath River Dams Removal
Partial Removal Option
Removal Site Maintenance
Most Probable Low
Life Cycle - 50 Year
Operation and Maintenance - Periodic Costs

PROJECT:
Klamath River
Oregon

WOID:	AF484	ESTIMATE LEVEL:	Feasibility
REGION:	MP	UNIT PRICE LEVEL	Jul-10

FILE: U:\2011 Projects\Klamath\002 Completed Sheets\MP MPL MPH\01 - Copco 1\MPL\[Copco 1 MPL - Probable.xlsx]O&M

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	1	**Site Maintenance - Annual: Copco 1 Site only***		1	LS	$17,000.00	$17,000.00
		Labor needed per year	86-68130	90	mdy**		
		3-Man maintenance crew					
		6 Months active inspection/maintenance					
		2 Weeks full time (1 month each spring)					
		2 Full days, 2 times each month (5 months)					
		Site maintenance required at JC Boyle,					
		Copco 1 & Copco 2					
		Estimate prorated the time at each dam site based					
		on percent of total partial MP removal construction costs					
		Equipment needed per year	86-68130	30	dy***		
		1-Service truck					
		Includes compressor, welder, generator					
		and general tools					
		Estimate prorated the time at each dam site based					
		on percent of total partial removal construction costs					
		Materials needed per year (percentage of labor	86-68130	15%			
		& equipment)					
		Road maintenance needed per year (percentage	86-68130	10%			
		of labor & equipment)					
		**Total estimated cost for all 3 sites is approximately $100,000 annually:*					
		prorated ±15% for the Copco 1 site only					
		** Man days per year for 50 years					
		***Days per year for 50 years					
		SUBTOTAL THIS SHEET					$17,000.00

QUANTITIES		PRICES	
BY Rick Benik	CHECKED Stephen Latham	BY Greg Akins	CHECKED Shawna MacGregor 5/4/11
DATE PREPARED 04/18/11	PEER REVIEW / DATE Tom Hepler P.E. 4/18/11	DATE PREPARED 5/4/11	PEER REVIEW / DATE DCA 5/4/11

BUREAU OF RECLAMATION **ESTIMATE WORKSHEET** SHEET _1 _ OF _1 _

FEATURE:	PROJECT:
Klamath River Dams Removal **Partial Removal Option** **Copco No. 1 Dam & Powerplant Removal** **Most Probable High- Escalation NOT Incuded** **Life Cycle - 50 Year** **Summary**	**Klamath River** **Oregon** **WOID:** AF652 **ESTIMATE LEVEL** Feasibility **REGION** MP **UNIT PRICE LEVE** Jul-10 **FILE:** U:\2011 Projects\Klamath\002 Completed Sheets\MP MPL MPH\01 - Copco 1\No escalation shts\[Copco 1 MPH - Probable.xlsx]Life Cycle Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		Periodic Costs - Year 1					$109,300.00
		Periodic Costs - Year 5					$43,628.33
		Periodic Costs - Year 10					$35,644.50
		Periodic Costs - Year 13					$11,529.77
		Periodic Costs - Year 15					$29,121.69
		Periodic Costs - Year 20					$23,792.37
		Periodic Costs - Year 25					$26,537.06
		Periodic Costs - Year 30					$15,881.69
		Periodic Costs - Year 35					$12,975.13
		Periodic Costs - Year 38					$4,196.99
		Periodic Costs - Year 40					$10,600.97
		Periodic Costs - Year 45					$8,660.95
		Periodic Costs - Year 50					0.00
		Annual Costs - Maintenance					$1,514,164.00
		(Assumes gov't service / construction contracts)					
		Subtotal 1					**$1,846,033.45**
		Mobilization	5%	+/-			$92,000.00
		Subtotal 1 with Mobilization					**$1,938,033.45**
		Escalation to Notice to Proceed (NTP): from Unit Price Level (July, 2010) to NTP (July, 2020)					
		at		per year for		months.	
		Subtotal 2 = Subtotal 1 with Mobilization + Escalation to NTP					**$1,938,033.45**
		Design Contingencies	15%	+/-			$317,391.55
		Subtotal 3 = Subtotal 2 + Design Contingencies					**$2,255,425.00**
		Allowance for Procurement Strategies (APS)	2.0%	+/-			$44,575.00
		Type of solicitation assumed is: Selective Request for Proposal					
		Subtotal 4 = Subtotal 3 + APS					**$2,300,000.00**
		CONTRACT COST					**$2,300,000.00**
		Construction Contingencies	25%	+/-			$500,000.00
		FIELD COST					**$2,800,000.00**
		Non-Contract Costs	35%	+/-			$1,000,000.00
		(Environmental Cultural / Mitigation ~ 10%,					
		Engineering Design ~ 7%, Maintenance Service Contract ~ 5%					
		Procurement ~ 2%, Inspections ~ 10%					
		and Closeout ~ 1%)					
		CONSTRUCTION COST					**$3,800,000.00**
		Ref.: For appropriate use and terminology, see Reclamation Manual, Directives and Standards FAC; 09-01, 09-02 and 09-03.					

QUANTITIES		PRICES	
BY Rick Benik	**CHECKED** Stephen Latham	**BY** Greg Akins	**CHECKED** 6/15/11
DATE PREPARED 03/24/11	**PEER REVIEW / DATE** Tom Hepler P.E. 3/25/11	**DATE PREPARED**	**PEER REVIEW / DATE** 6/15/11

BUREAU OF RECLAMATION

ESTIMATE WORKSHEET

SHEET _1_ OF _1_

FEATURE:	PROJECT:
Klamath River Dams Removal Partial Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable - Escalation NOT Incuded Life Cycle - 50 Year Summary	Klamath River Oregon
	WOID: AF652 — ESTIMATE LEVEL: Feasibility
	REGION: MP — UNIT PRICE LEVEL: Jul-10
	FILE: U:\2011 Projects\Klamath\002 Completed Sheets\MP MPL MPH\01 - Copco 1\No escalation shts\[Copco 1 - MP - Probable.xlsx]Life Cycle Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		Periodic Costs - Year 1					$95,000.00
		Periodic Costs - Year 8					$32,566.50
		Periodic Costs - Year 17					$31,689.00
		Periodic Costs - Year 25					$16,380.90
		Periodic Costs - Year 33					$16,596.72
		Periodic Costs - Year 42					$8,239.50
		Periodic Costs - Year 50					0.00
		Annual Costs - Maintenance					$525,752.00
		(Assumes gov't service / construction contracts)					
		Subtotal 1					**$726,224.62**
		Mobilization	5%	+/-			$36,000.00
		Subtotal 1 with Mobilization					**$762,224.62**
		Escalation to Notice to Proceed (NTP), from Unit Price Level (July 2010) to NTP (July 2020),					
		at		per year for		months.	
		Subtotal 2 = Subtotal 1 with Mobilization + Escalation to NTP					$762,224.62
		Design Contingencies	10%	+/-			$77,775.38
		Subtotal 3 = Subtotal 2 + Design Contingencies					$840,000.00
		Allowance for Procurement Strategies (APS)	0	+/-			
		Type of solicitation assumed: Competitive Request for Proposal					
		Subtotal 4 = Subtotal 3 + APS					$840,000.00
		CONTRACT COST					**$840,000.00**
		Construction Contingencies	20%	+/-			$160,000.00
		FIELD COST					**$1,000,000.00**
		Non-Contract Costs	30%	+/-			$500,000.00
		(Environmental Cultural / Mitigation ~ 7%,					
		Engineering Design ~ 5%, Maintenance Service Contract ~ 5%					
		Procurement ~ 2%, Inspections ~ 10%					
		and Closeout ~ 1%)					
		CONSTRUCTION COST					**$1,500,000.00**
		Note: intial estimate completed 4/17/11, revised non-contract costs 5/12/11, design contingencies costs 6/9/11					
		Ref.: For appropriate use and terminology, see Reclamation Manual, Directives and Standards FAC; 09-01, 09-02 and 09-03.					

QUANTITIES		PRICES	
BY Rick Benik	CHECKED Stephen Latham	BY Greg Akins	CHECKED 6/15/11
DATE PREPARED 03/24/11	PEER REVIEW / DATE Tom Hepler P.E. 3/25/11	DATE PREPARED	PEER REVIEW / DATE 6/15/11

BUREAU OF RECLAMATION **ESTIMATE WORKSHEET** SHEET _1 _ OF _1 _

FEATURE:	**PROJECT:**	
Klamath River Dams Removal	**Klamath River**	
Partial Removal Option	**Oregon**	
Copco No. 1 Dam & Powerplant Removal	**WOID:** AF652	**ESTIMATE LEVEL:** Feasibility
Most Probable Low- Escalation NOT Incuded	**REGION** MP	**UNIT PRICE LEVEL** Jul-10
Life Cycle - 50 Year	**FILE:** U:\2011 Projects\Klamath\002 Completed Sheets\MP MPL MPH\01 - Copco 1\No escalation shts\[Copco 1 MPL - Probable.xlsx]Life Cycle Summary	
Summary		

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		Periodic Costs - Year 1					$81,800.00
		Periodic Costs - Year 17					$17,906.80
		Periodic Costs - Year 25					$5,460.30
		Periodic Costs - Year 33					$9,378.46
		Periodic Costs - Year 50					0.00
		(Assumes gov't service / construction contracts)					
		Annual Costs - Maintenance					$357,511.00
		Subtotal 1					**$472,056.56**
		Mobilization	5%	+/-			$24,000.00
		Subtotal 1 with Mobilization					**$496,056.56**
		Escalation to Notice to Proceed (NTP): from Unit Price Level (July, 2010) to NTP (July, 2020)					$0.00
		at		per year for		months.	
		Subtotal 2 = Subtotal 1 with Mobilization + Escalation to NTP					**$496,056.56**
		Design Contingencies	8%	+/-			$43,943.44
		Subtotal 3 = Subtotal 2 + Design Contingencies					**$540,000.00**
		Allowance for Procurement Strategies (APS)	0%	+/-			
		Type of solicitation assumed is: Full and open sealed bid competition					
		Subtotal 4 = Subtotal 3 + APS					**$540,000.00**
		CONTRACT COST					**$540,000.00**
		Construction Contingencies	18%	+/-			$90,000.00
		FIELD COST					**$630,000.00**
		Non-Contract Costs	25%	+/-			$160,000.00
		(Environmental Cultural / Mitigation ~ 5%, Engineering					
		Design ~ 4%, Maintenance Service Contract ~ 4%					
		Procurement ~ 1%, Inspections ~ 10%					
		and Closeout ~ 1%)					
		CONSTRUCTION COST					**$790,000.00**
		Ref.: For appropriate use and terminology, see Reclamation Manual, Directives and Standards FAC; 09-01, 09-02 and 09-03.					

QUANTITIES		**PRICES**	
BY Rick Benik	**CHECKED** Stephen Latham	**BY** Greg Akins	**CHECKED** 6/15/11
DATE PREPARED 03/24/11	**PEER REVIEW / DATE** Tom Hepler P.E. 3/25/11	**DATE PREPARED**	**PEER REVIEW / DATE** DCD 6/15/11

BUREAU OF RECLAMATION

ESTIMATE WORKSHEET

FEATURE:

Klamath River Dams Removal
Partial Removal Option
Copco No. 1 Dam & Powerplant Removal
Escalation Included
SUMMARY ESTIMATE

PROJECT: Klamath River, Northern California/Southern Oregon

WOID: AF652 | **ESTIMATE LEVEL:** Feasibility

REGION: MP | **PRICE LEVEL:** Jul-2010

FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 1\[Copco 1 - Partial Removal Crystal Ball - with Escalation - 2011-04.xlsx]Copco 1 - Full - with Esc

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	MPL QUANTITY	MP QUANTITY	MPH QUANTITY	UNIT	MPL UNIT PRICE	MP UNIT PRICE	MPH UNIT PRICE	MPL TOTAL	MP TOTAL	MPH TOTAL
	1	Furnish, Install, and Remove Barge-Mounted Crane in Reservoir for Dam Removal	8130	1	1	1	LS	$340,000.00	$350,000.00	$370,000.00	$340,000.00	$350,000.00	$370,000.00
	2	Remove Sediment from Diversion Tunnel Intake to provide access	8130	30	30	30	CY	$1,700.00	$2,000.00	$3,000.00	$51,000.00	$60,000.00	$90,000.00
	3	Furnish, Install, and Remove Large Crane on Right Abutment	8130	1	1	1	LS				$0.00	$0.00	$0.00
	4	Remove Water from behind Tailrace Cofferdam	8130	0	0	0	GAL				$0.00	$0.00	$0.00
	5	Riprap Protection on Cofferdam	8130	0	0	0	CY				$0.00	$0.00	$0.00
	6	Provide Dewatering behind Tailrace Cofferdam	8130	0	0	0	LS				$0.00	$0.00	$0.00
	7	Remove Current Diversion Tunnel Plug	8130	195	195	195	CY	$1,400.00	$1,500.00	$1,800.00	$273,000.00	$292,500.00	$351,000.00
	8	Construct Embankment Cofferdam in Tailrace	8130	0	0	0	CY				$0.00	$0.00	$0.00
	9	Furnish, Install & Remove 3-6'x6' Fabricated Slide Gates	8420	40,500	40,500	40,500	LBS	$12.00	$15.00	$18.00	$486,000.00	$607,500.00	$729,000.00
	10	Remove Concrete Dam down to Elev. 2476	8130	36,000	36,000	36,000	CY	$290.00	$300.00	$320.00	$10,440,000.00	$10,800,000.00	$11,520,000.00
	11	Remove Concrete Intake Structure on Right Abutment	8130	0	0	0	CY				$0.00	$0.00	$0.00
	12	Remove Structural Steel from Spillway	8130	55,000	55,000	55,000	LBS	$0.70	$1.00	$1.50	$38,500.00	$55,000.00	$82,500.00
	13	Install Diversion Tunnel Plugs	8130	24	24	24	CY	$1,100.00	$1,200.00	$1,300.00	$26,400.00	$28,800.00	$31,200.00
	14	Remove Diversion Tunnel Control Structure Concrete	8130	0	0	0	CY				$0.00	$0.00	$0.00
	15	Remove & Dispose of Hand Rails	8420	11,000	11,000	11,000	LBS	$0.70	$1.00	$1.50	$7,700.00	$11,000.00	$16,500.00
	16	Remove & Dispose of Radial Gates	8420	140,500	140,500	140,500	LBS	$0.70	$1.00	$1.50	$98,350.00	$140,500.00	$210,750.00
	17	Remove & Dispose of Radial Gate stoplogs	8420	18,000	18,000	18,000	LBS	$0.70	$1.00	$1.50	$12,600.00	$18,000.00	$27,000.00
	18	Remove & Dispose of Stoplog hoist, track and supports	8420	26,000	26,000	26,000	LBS	$0.70	$1.00	$1.50	$18,200.00	$26,000.00	$39,000.00
	19	Remove & Dispose of 3 sections of 23' of 72"Ø steel lining (embedded)	8420	0	0	0	LBS				$0.00	$0.00	$0.00
	20	Remove & Dispose of 3 - 72" butterfly valves (embedded)	8420	0	0	0	LBS				$0.00	$0.00	$0.00
	21	Remove & Dispose of 3-72" flapper valves with remote mechanical	8420	78,000	78,000	78,000	LBS	$2.50	$3.00	$5.00	$195,000.00	$234,000.00	$390,000.00
	22	Remove & Dispose of Spillway gate motor & control panel	8430	1	1	1	EA	$900.00	$1,000.00	$1,500.00	$900.00	$1,000.00	$1,500.00
	23	Remove & Dispose of Distribution equipment , panelboards	8430	1	1	1	EA	$5,000.00	$6,000.00	$7,000.00	$5,000.00	$6,000.00	$7,000.00
	24	Remove Powerhouse Concrete down to top of rock under the Powerhouse	8130	0	0	0	CY				$0.00	$0.00	$0.00
	25	Remove Powerhouse Structural Steel	8130	0	0	0	LBS				$0.00	$0.00	$0.00
	26	Remove & Dispose of 2 - Governor oil systems	8420	0	0	0	LBS				$0.00	$0.00	$0.00
	27	Remove & Dispose of Cooling water and bearing oil systems	8420	0	0	0	LBS				$0.00	$0.00	$0.00
	28	Remove & Dispose of 4 - Horizontal Tandem Francis Turbines	8420	0	0	0	LBS				$0.00	$0.00	$0.00
	29	Remove & Dispose of 2 - 40 Ton indoor cranes	8420	0	0	0	LBS				$0.00	$0.00	$0.00
	30	Remove & Dispose of Compressed Air system	8420	0	0	0	LBS				$0.00	$0.00	$0.00
	31	Remove & Dispose of 2 - CO2 systems	8420	0	0	0	LBS				$0.00	$0.00	$0.00
	32	Remove & Dispose of Plant Water and Fire Protection	8420	0	0	0	LBS				$0.00	$0.00	$0.00
	33	Remove & Dispose of Transformer Oil Fire protection	8420	0	0	0	LBS				$0.00	$0.00	$0.00
	34	Remove & Dispose of Unwatering Piping	8420	0	0	0	LBS				$0.00	$0.00	$0.00
	35	Remove & Dispose of Drainage Piping	8420	0	0	0	LBS				$0.00	$0.00	$0.00
	35A	Remove Petroleum Products from Mechanical Equipment	8420	1,250	1,250	1,250	GAL	$9.00	$10.00	$12.00	$11,250.00	$12,500.00	$15,000.00
	36	Remove & Dispose of Horizontal AC Generator, Indoor Open Frame	8430	0	0	0	EA				$0.00	$0.00	$0.00
	37	Remove & Dispose of Excitation equipment for 12.5 MVA Generator	8430	0	0	0	EA				$0.00	$0.00	$0.00
	38	Remove & Dispose of Surge protection equip. for 12.5 MVA Generator	8430	0	0	0	EA				$0.00	$0.00	$0.00
	39	Remove & Dispose of Neutral grounding equip. for 12.5 MVA Generator	8430	0	0	0	EA				$0.00	$0.00	$0.00
	40	Remove & Dispose of Generator Switchgear, 5kV-includes unit breakers	8430	0	0	0	EA				$0.00	$0.00	$0.00
	41	Remove & Dispose of Station Service Switchgear, 600 volt -(5 sections)	8430	0	0	0	EA				$0.00	$0.00	$0.00
	42	Remove & Dispose of Unit and plant control switchboard	8430	0	0	0	EA				$0.00	$0.00	$0.00
	43	Remove & Dispose of Battery system	8430	1	1	1	EA	$9,000.00	$10,000.00	$12,000.00	$9,000.00	$10,000.00	$12,000.00
	44	Remove & Dispose of Raceways, Conduit and Cable	8430	0	0	0	EA				$0.00	$0.00	$0.00
	45	Remove & Dispose of Misc. power & control boards	8430	0	0	0	EA				$0.00	$0.00	$0.00
	46	Remove & Dispose of Step-up Transformers, indoor, oil-filled, 1-phase, 5000kVA	8430	0	0	0	EA				$0.00	$0.00	$0.00

ESTIMATE WORKSHEET

FEATURE:

Klamath River Dams Removal
Partial Removal Option
Copco No. 1 Dam & Powerplant Removal
Escalation Included
SUMMARY ESTIMATE

PROJECT: Klamath River, Northern California/Southern Oregon

WOID: AF652 | **ESTIMATE LEVEL:** Feasibility
REGION: MP | **PRICE LEVEL:** Jul-2010
FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 1\[Copco 1 - Partial Removal Crystal Ball - with Escalation - 2011-04.xlsx]Copco 1 - Full - with Esc

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	MPL QUANTITY	MP QUANTITY	MPH QUANTITY	UNIT	MPL UNIT PRICE	MP UNIT PRICE	MPH UNIT PRICE	MPL TOTAL	MP TOTAL	MPH TOTAL
	47	Remove & Dispose of Step-up Transformers, indoor, oil-filled, 1-phase, 4165 kVA	8430	0	0	0	EA				$0.00	$0.00	$0.00
	48	Remove & Dispose of Seven 40-Ton Travelling Crane motors - hoist	8430	0	0	0	EA				$0.00	$0.00	$0.00
	49	Remove & Dispose of 40-Ton Travelling Crane control equipment	8430	0	0	0	EA				$0.00	$0.00	$0.00
	50	Remove & Dispose of 40-Ton Travelling Crane Festoon Cable	8430	0	0	0	EA				$0.00	$0.00	$0.00
	51	Remove & Dispose of Four 15-Ton Overhead Crane motors - hoist	8430	0	0	0	EA				$0.00	$0.00	$0.00
	52	Remove & Dispose of 15-Ton Overhead Crane control equipment	8430	0	0	0	EA				$0.00	$0.00	$0.00
	53	Remove & Dispose of 15-Ton Overhead Crane Festoon Cable	8430	0	0	0	EA				$0.00	$0.00	$0.00
	53A	Remove Oil from Oiled-filled Step-up Transformers	8430	10,500	10,500	10,500	GAL	$9.00	$10.00	$12.00	$94,500.00	$105,000.00	$126,000.00
	54	Remove & Dispose of 69-kV circuit breakers, oil-filled, PCB	8430	2	2	2	EA	$2,500.00	$3,000.00	$3,500.00	$5,000.00	$6,000.00	$7,000.00
	55	Remove & Dispose of 69-kV disconnect switches, group-operated	8430	2	2	2	EA	$1,000.00	$1,500.00	$2,000.00	$2,000.00	$3,000.00	$4,000.00
	56	Remove & Dispose of 60-foot wood poles	8430	12	12	12	EA	$900.00	$1,000.00	$1,300.00	$10,800.00	$12,000.00	$15,600.00
	57	Remove & Dispose of 30-foot wood crossarms	8430	24	24	24	EA	$400.00	$500.00	$600.00	$9,600.00	$12,000.00	$14,400.00
	58	Remove & Dispose of 69-kV insulator strings	8430	12	12	12	EA	$300.00	$400.00	$500.00	$3,600.00	$4,800.00	$6,000.00
	59	Remove & Dispose of Transmission Line No. 3	8430	1.66	1.66	1.66	MILE	$25,000.00	$30,000.00	$40,000.00	$41,500.00	$49,800.00	$66,400.00
	60	Remove & Dispose of Transmission Line No. 15	8430	1.23	1.23	1.23	MILE	$25,000.00	$30,000.00	$40,000.00	$30,750.00	$36,900.00	$49,200.00
	61	Remove & Dispose of Transmission Line No. 26-1	8430	0.07	0.07	0.07	MILE	$25,000.00	$30,000.00	$40,000.00	$1,750.00	$2,100.00	$2,800.00
	62	Remove & Dispose of Transmission Line No. 26-2	8430	0.07	0.07	0.07	MILE	$25,000.00	$30,000.00	$40,000.00	$1,750.00	$2,100.00	$2,800.00
	63	Remove gate house #1 from top of dam	8130	0	0	0	SF				$0.00	$0.00	$0.00
	64	Remove gate house #2 from top of dam	8130	0	0	0	SF				$0.00	$0.00	$0.00
	65	Remove Concrete Items associated with 10 ft. diam. Penstocks, reinf. Concrete	8130	0	0	0	CY				$0.00	$0.00	$0.00
	66	Plug 14-foot diameter penstock with concrete	8130	0	0	0	CY				$0.00	$0.00	$0.00
	67	Remove & Dispose of 8 screens	8420	0	0	0	LBS				$0.00	$0.00	$0.00
	68	Remove & Dispose of 8 Water Gates	8420	0	0	0	LBS				$0.00	$0.00	$0.00
	69	Remove & Dispose of 3 - 30"Ø x 25' stand pipes	8420	0	0	0	LBS				$0.00	$0.00	$0.00
	70	Remove & Dispose of 14' Ø penstock pipe	8420	0	0	0	LBS				$0.00	$0.00	$0.00
	71	Remove & Dispose of 10' Ø penstock pipe	8140	0	0	0	LBS				$0.00	$0.00	$0.00
	72	Temporary Access Roads	8220	7	7	7	MILE	$60,000.00	$50,000.00	$100,000.00	$420,000.00	$350,000.00	$700,000.00
	73	Spring Ground Seeding	8220	420	420	0	ACRES	$3,000.00	$3,500.00	$4,000.00	$1,260,000.00	$1,470,000.00	$0.00
	74	Spring Barge Seeding	8220	82	82	0	ACRES	$5,000.00	$6,500.00	$8,000.00	$410,000.00	$533,000.00	$0.00
	75	Spring Aerial Seeding	8220	300	300	802	ACRES	$6,500.00	$7,500.00	$15,000.00	$1,950,000.00	$2,250,000.00	$12,030,000.00
	76	Fall Ground Seeding	8220	201	401	602	ACRES	$3,000.00	$3,500.00	$4,000.00	$603,000.00	$1,403,500.00	$2,408,000.00
	77	Riparian Pole Planting	8220	170	170	170	ACRES	$4,000.00	$8,500.00	$10,000.00	$680,000.00	$1,445,000.00	$1,700,000.00
	78	Weed Management	8220	201	401	602	ACRES	$1,000.00	$1,500.00	$2,000.00	$201,000.00	$601,500.00	$1,204,000.00
	79	Fall Ground Seeding	8220	321	321	321	ACRES	$3,000.00	$3,500.00	$4,000.00	$963,000.00	$1,123,500.00	$1,284,000.00
	80	Weed Management	8220	321	321	321	ACRES	$1,000.00	$1,500.00	$2,000.00	$321,000.00	$481,500.00	$642,000.00
	81	Sitework - Clear and Grub Disposal Area	8313	5.5	5.5	5.5	ACRES	$5,000.00	$6,000.00	$7,000.00	$27,500.00	$33,000.00	$38,500.00
	82	Sitework - Soil Cover for Disposal Area	8313	18,000	18,000	18,000	CY	$45.00	$50.00	$60.00	$810,000.00	$900,000.00	$1,080,000.00
	83	Access/Haul Road Improvements - Soil Excavation	8313	4,500	4,500	9,000	CY	$12.00	$13.00	$14.00	$54,000.00	$58,500.00	$126,000.00
	84	Access/Haul Road Improvements - Rock Excavation	8313	4,500	4,500	9,000	CY	$35.00	$40.00	$45.00	$157,500.00	$180,000.00	$405,000.00
	85	Access/Haul Road Improvements - Soil Backfill	8313	16,000	16,000	30,000	CY	$45.00	$50.00	$55.00	$720,000.00	$800,000.00	$1,650,000.00
	86	Access/Haul Road Improvements - 4" Gravel Surfacing	8313	0	320	320	TON	$80.00	$100.00	$120.00	$0.00	$32,000.00	$38,400.00
	87	County Road Improvements - Asphalt Overlay Repair - Juniper Road	8313	3	3	3	MILE	$35,000.00	$40,000.00	$350,000.00	$105,000.00	$120,000.00	$1,050,000.00
	88	County Road Improvements - Asphalt Overlay Repair - Copco Road	8313	19	19	19	MILE	$35,000.00	$40,000.00	$350,000.00	$665,000.00	$760,000.00	$6,650,000.00
	89	Mallard Cove - Concrete total	BLM	106	106	106	CY	$200.00	$300.00	$400.00	$21,200.00	$31,800.00	$42,400.00
	90	Mallard Cove - 25'x5' Dock made of composite decking and poly floats	BLM	1	1	1	EA	$2,000.00	$2,500.00	$3,000.00	$2,000.00	$2,500.00	$3,000.00
	91	Mallard Cove - 20'x5' Gangway w/ aluminum frame and railings	BLM	1	1	1	EA	$1,500.00	$2,000.00	$2,500.00	$1,500.00	$2,000.00	$2,500.00
	92	Mallard Cove - Signs to be removed and hauled away	BLM	6	6	6	EA	$250.00	$300.00	$350.00	$1,500.00	$1,800.00	$2,100.00
	93	Mallard Cove - Wood plank tables to be removed and hauled away	BLM	8	8	8	EA	$90.00	$100.00	$120.00	$720.00	$800.00	$960.00

BUREAU OF RECLAMATION

ESTIMATE WORKSHEET

FEATURE:

Klamath River Dams Removal
Partial Removal Option
Copco No. 1 Dam & Powerplant Removal
Escalation Included
SUMMARY ESTIMATE

PROJECT: Klamath River, Northern California/Southern Oregon

WOID: AF652 | **ESTIMATE LEVEL:** Feasibility
REGION: MP | **PRICE LEVEL:** Jul-2010
FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 1\[Copco 1 - Partial Removal Crystal Ball - without Escalation - 2011-04.xlsx]Copco 1 - Full - with Esc

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	MPL QUANTITY	MP QUANTITY	MPH QUANTITY	UNIT	MPL UNIT PRICE	MP UNIT PRICE	MPH UNIT PRICE	MPL TOTAL	MP TOTAL	MPH TOTAL
	94	Mallard Cove - Parking area to be regraded, ripped, seeded and planted	BLM	2.5	2.5	2.5	ACRES	$20,000.00	$25,000.00	$30,000.00	$50,000.00	$62,500.00	$75,000.00
	95	Copco Cove - Concrete total	BLM	84	84	84	CY	$200.00	$300.00	$400.00	$16,800.00	$25,200.00	$33,600.00
	96	Copco Cove - Dock abutment railing made of 2.5" dia. steel pipe	BLM	25	25	25	LF	$35.00	$40.00	$45.00	$875.00	$1,000.00	$1,125.00
	97	Copco Cove - Signs to be removed and hauled away	BLM	6	6	6	EA	$250.00	$300.00	$350.00	$1,500.00	$1,800.00	$2,100.00
	98	Copco Cove - Wood plank tables to be removed and hauled away	BLM	2	2	2	EA	$90.00	$100.00	$120.00	$180.00	$200.00	$240.00
	99	Copco Cove - Regrade, rip, seed and plant disturbed areas	BLM	2.3	2.3	2.3	ACRES	$20,000.00	$25,000.00	$30,000.00	$46,000.00	$57,500.00	$69,000.00
		Subtotal 1									$21,703,425.00	$25,615,100.00	$45,424,575.00
		Mobilization (MPL ~ 5%; MP ~ 5%; MPH ~ 5%)		1	1	1	ls	$1,100,000.00	$1,300,000.00	$2,300,000.00	$1,100,000.00	$1,300,000.00	$2,300,000.00
		Subtotal 1 w/ mobilization											
		Escalation to Notice to Proceed (NTP)		1	1	1	ls	$3,660,881.00	$9,256,544.00	$25,508,447.00	$3,660,881.00	$9,256,544.00	$25,508,447.00
		from Unit Price Level (July 2010) to NTP (Jan. 2020)											
		MPL - 1.5% / year for 10 yr.; MP - 3.0% /year for 10 yr.; MPH - 4.375% / year for 10 yr.											
		Design Contingencies (MPL ~ 8%; MP ~ 10%; MPH ~ 15%)		1	1	1	ls	$2,535,694.00	$3,828,356.00	$11,082,618.00	$2,535,694.00	$3,828,356.00	$11,082,618.00
		APS = Allowance for Procurement		1	1	1	ls	$0.00	$0.00	$1,684,360.00	$0.00	$0.00	$1,684,360.00
		Strategies (if applicable) (MPL ~ 0%; MP ~ 0%; MPH ~ 2%)											
		CONTRACT COST									**$29,000,000.00**	**$40,000,000.00**	**$86,000,000.00**
		Construction Contingencies (MPL ~ 18%; MP ~ 20%; MPH ~ 25%)		1	1	1	ls	$5,000,000.00	$8,000,000.00	$19,000,000.00	$5,000,000.00	$8,000,000.00	$19,000,000.00
		FIELD COST									**$34,000,000.00**	**$48,000,000.00**	**$105,000,000.00**
		Non-Contract Cost (MPL ~ 62%; MP ~ 65%; MPH ~ 71%)		1	1	1	ls	$21,000,000.00	$31,000,000.00	$75,000,000.00	$21,000,000.00	$31,000,000.00	$75,000,000.00
		CONSTRUCTION COST									**$55,000,000.00**	**$79,000,000.00**	**$180,000,000.00**

Notes: This estimate does not include non-contract costs and should not be used for funding purposes.
Reference documents RM D&S Cost Estimate (FAC 09-01) and RM D&S CCE and PCE (FAC 09-02)

QUANTITIES			PRICES		
BY	See Group Worksheets	CHECKED: See Group Worksheets	BY	Craig Grush, P.E.	CHECKED
DATE PREPARED	1/20/2011	PEER REVIEW: See Group Worksheets	DATE PREPARED	06/02/11	PEER REVIEW

06-02-11
DCR 6/3/11

Crystal Ball Report - Full
Simulation started on 6/8/2011 at 11:29:01
Simulation stopped on 6/8/2011 at 11:29:42

Run preferences:	
Number of trials run	10,000
Monte Carlo	
Seed	999
Precision control on	
Confidence level	95.00%
Run statistics:	
Total running time (sec)	40.97
Trials/second (average)	244
Random numbers per sec	29,288
Crystal Ball data:	
Assumptions	120
Correlations	0
Correlated groups	0
Decision variables	0
Forecasts	3

TECHNICAL SERVICE CENTER
ESTIMATING, SPECIFICATIONS
AND VALUE PROGRAM GROUP
UNIT PRICES BY Craig A. Grusy
DATE 6/8/2011

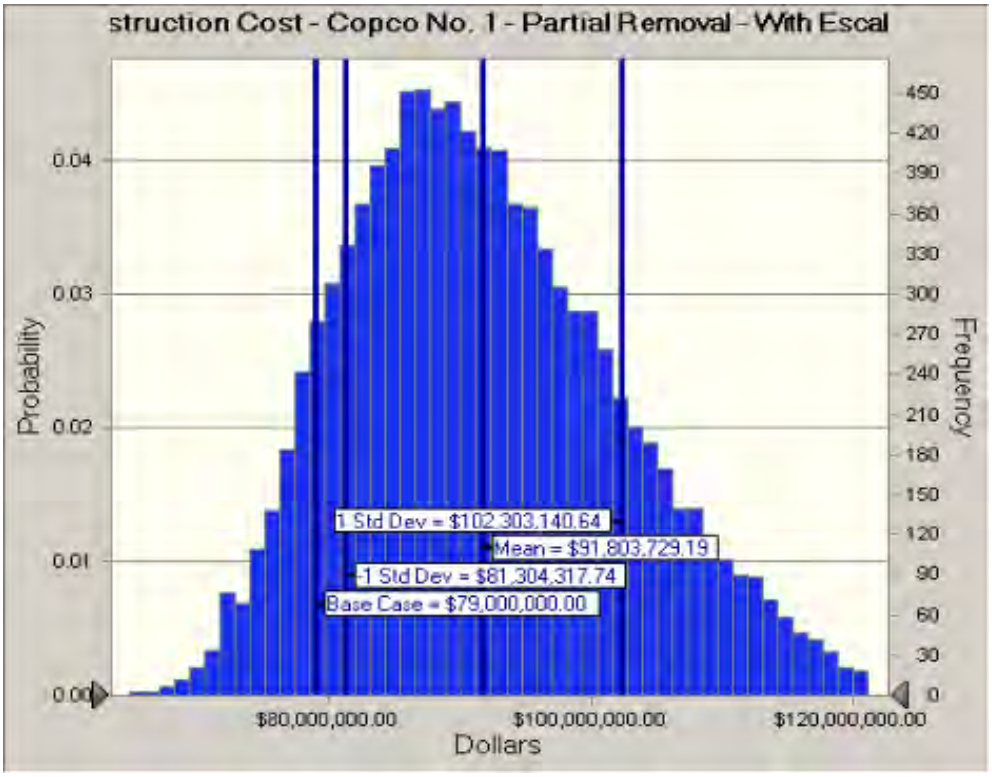
DATE	PEER REVIEWER(S)	CODE
6/9/11	Signature	8170
	Printed Name DAN MAY	
	Signature	
	Printed Name	
Author Initials	PEER REVIEW NOT REQUIRED	

Forecasts

Worksheet: [Copco 1 - Partial Removal Crystal Ball - with Escalation - 2011-04.xls]Copco 1 - P

Forecast: Construction Cost - Copco No. 1 - Partial Removal - With Escalation **Cell: U129**

Summary:
Entire range is from $64,716,429.93 to $136,702,828.02
Base case is $79,000,000.00
After 10,000 trials, the std. error of the mean is $104,994.11



Forecast: Construction Cost - Copco No. 1 - Partial Removal - With Escalation (cont'd) **Cell: U129**

Statistics:	Forecast values
Trials	10,000
Mean	$91,803,729.19
Median	$90,747,065.84
Mode	---
Standard Deviation	$10,499,411.45
Variance	$110,237,640,746,875.00
Skewness	0.4652
Kurtosis	2.93
Coeff. of Variability	0.1144
Minimum	$64,716,429.93
Maximum	$136,702,828.02
Range Width	$71,986,398.09
Mean Std. Error	$104,994.11

Percentiles:	Forecast values
0%	$64,716,429.93
10%	$78,977,795.18
20%	$82,646,692.21
30%	$85,496,692.58
40%	$88,040,879.15
50%	$90,745,874.53
60%	$93,509,038.17
70%	$96,714,006.79
80%	$100,634,155.90
90%	$106,248,808.79
100%	$136,702,828.02

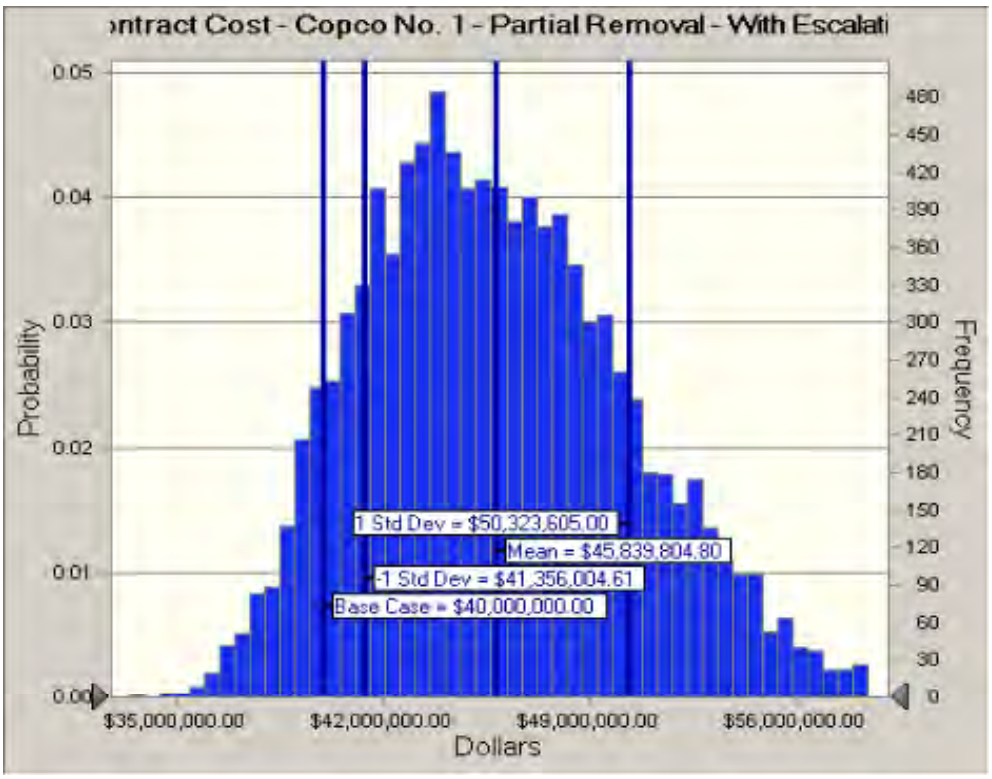
Forecast: Contract Cost - Copco No. 1 - Partial Removal - With Escalation **Cell: U125**

Summary:

Entire range is from $33,417,622.73 to $64,288,331.52

Base case is $40,000,000.00

After 10,000 trials, the std. error of the mean is $44,838.00



Forecast: Contract Cost - Copco No. 1 - Partial Removal - With Escalation (cont'd) Cell: U125

Statistics:	Forecast values
Trials	10,000
Mean	$45,839,804.80
Median	$45,458,808.12
Mode	---
Standard Deviation	$4,483,800.19
Variance	$20,104,464,188,579.10
Skewness	0.3946
Kurtosis	2.83
Coeff. of Variability	0.0978
Minimum	$33,417,622.73
Maximum	$64,288,331.52
Range Width	$30,870,708.79
Mean Std. Error	$44,838.00

Percentiles:	Forecast values
0%	$33,417,622.73
10%	$40,263,050.20
20%	$41,859,423.80
30%	$43,144,872.18
40%	$44,248,370.44
50%	$45,458,199.81
60%	$46,742,126.66
70%	$48,069,872.14
80%	$49,630,580.09
90%	$52,023,400.59
100%	$64,288,331.52

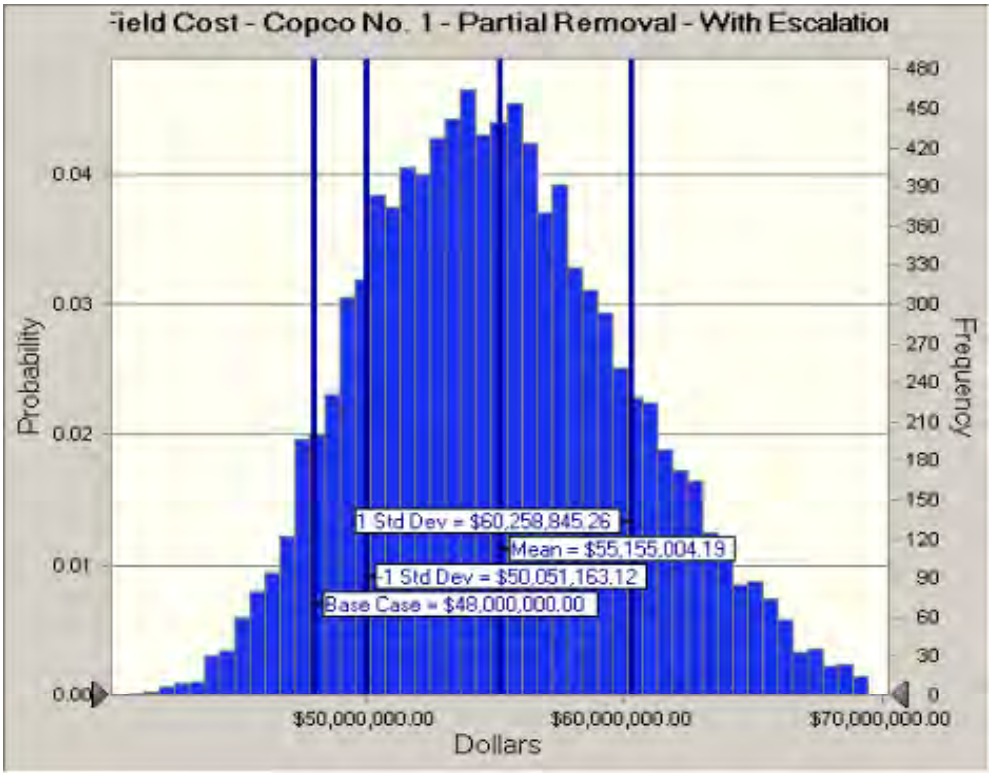
Forecast: Field Cost - Copco No. 1 - Partial Removal - With Escalation **Cell: U127**

Summary:

Entire range is from $40,846,678.88 to $75,189,774.10

Base case is $48,000,000.00

After 10,000 trials, the std. error of the mean is $51,038.41



Forecast: Field Cost - Copco No. 1 - Partial Removal - With Escalation (cont'd) **Cell: U127**

Statistics:	Forecast values
Trials	10,000
Mean	$55,155,004.19
Median	$54,829,780.66
Mode	---
Standard Deviation	$5,103,841.07
Variance	$26,049,193,626,001.30
Skewness	0.3524
Kurtosis	2.92
Coeff. of Variability	0.0925
Minimum	$40,846,678.88
Maximum	$75,189,774.10
Range Width	$34,343,095.22
Mean Std. Error	$51,038.41

Percentiles:	Forecast values
0%	$40,846,678.88
10%	$48,876,496.19
20%	$50,642,309.71
30%	$52,149,347.38
40%	$53,517,418.55
50%	$54,829,586.54
60%	$56,156,287.75
70%	$57,614,877.65
80%	$59,433,577.86
90%	$62,096,668.28
100%	$75,189,774.10

End of Forecasts

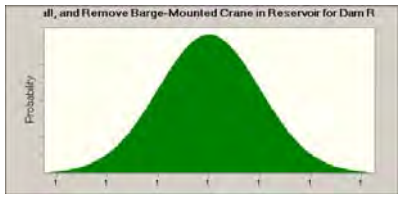
Assumptions

Worksheet: [Copco 1 - Partial Removal Crystal Ball - with Escalation - 2011-04.xls]Copco 1 - P

Assumption: 1 Furnish, Install, and Remove Barge-Mounted Crane in Reservoir for Dam R **Cell: L14**

Normal distribution with parameters:

Mean	1	(=L14)
Std. Dev.	0	(=0.000001)



Assumption: 1 Furnish, Install, and Remove Barge-Mounted Crane in Reservoir for Dam R **Cell: R14**

BetaPERT distribution with parameters:

Minimum	$340,000.00	(=Q14)
Likeliest	$350,000.00	(=R14)
Maximum	$370,000.00	(=S14)

Assumption: 10 Remove Concrete Dam down to Elev. 2476 Quantity **Cell: L23**

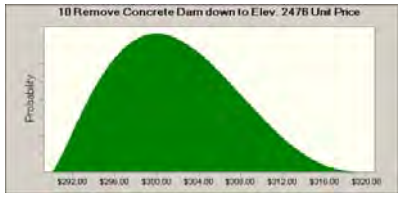
Normal distribution with parameters:

Mean	36,000	(=L23)
Std. Dev.	0	(=0.000001)

Assumption: 10 Remove Concrete Dam down to Elev. 2476 Unit Price **Cell: R23**

BetaPERT distribution with parameters:

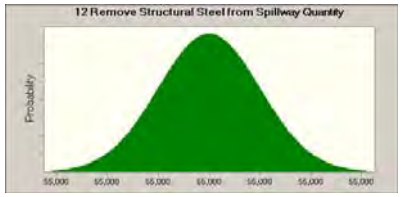
Minimum	$290.00	(=Q23)
Likeliest	$300.00	(=R23)
Maximum	$320.00	(=S23)



Assumption: 12 Remove Structural Steel from Spillway Quantity **Cell: L25**

Normal distribution with parameters:

Mean	55,000	(=L25)
Std. Dev.	0	(=0.000001)



Assumption: 12 Remove Structural Steel from Spillway Unit Price **Cell: R25**

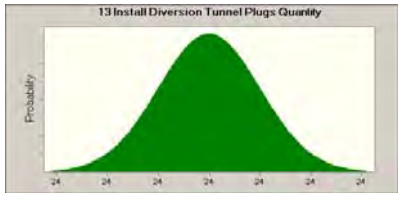
BetaPERT distribution with parameters:

Minimum	$0.70	(=Q25)
Likeliest	$1.00	(=R25)
Maximum	$1.50	(=S25)

Assumption: 13 Install Diversion Tunnel Plugs Quantity **Cell: L26**

Normal distribution with parameters:

Mean	24	(=L26)
Std. Dev.	0	(=0.000001)



Assumption: 13 Install Diversion Tunnel Plugs Unit Price **Cell: R26**

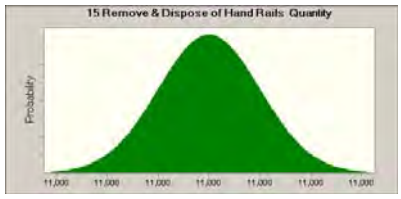
BetaPERT distribution with parameters:

Minimum	$1,100.00	(=Q26)
Likeliest	$1,200.00	(=R26)
Maximum	$1,300.00	(=S26)

Assumption: 15 Remove & Dispose of Hand Rails Quantity **Cell: L28**

Normal distribution with parameters:

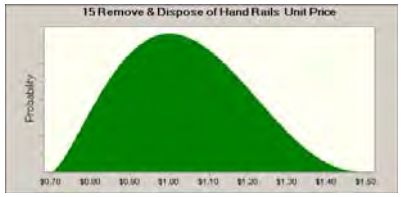
Mean	11,000	(=L28)
Std. Dev.	0	(=0.000001)



Assumption: 15 Remove & Dispose of Hand Rails Unit Price **Cell: R28**

BetaPERT distribution with parameters:

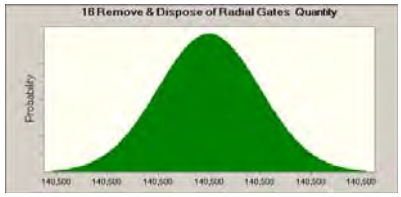
Minimum	$0.70	(=Q28)
Likeliest	$1.00	(=R28)
Maximum	$1.50	(=S28)



Assumption: 16 Remove & Dispose of Radial Gates Quantity **Cell: L29**

Normal distribution with parameters:

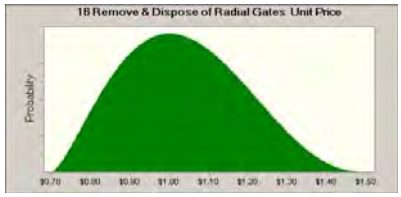
Mean	140,500	(=L29)
Std. Dev.	0	(=0.000001)



Assumption: 16 Remove & Dispose of Radial Gates Unit Price **Cell: R29**

BetaPERT distribution with parameters:

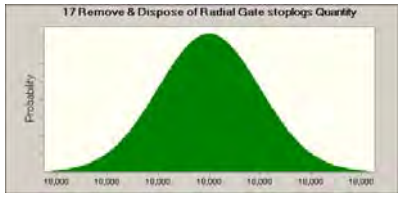
Minimum	$0.70	(=Q29)
Likeliest	$1.00	(=R29)
Maximum	$1.50	(=S29)



Assumption: 17 Remove & Dispose of Radial Gate stoplogs Quantity **Cell: L30**

Normal distribution with parameters:

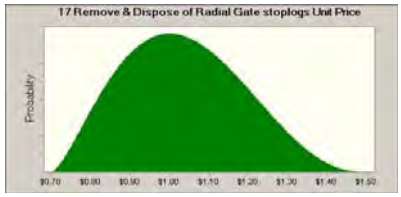
Mean	18,000	(=L30)
Std. Dev.	0	(=0.000001)



Assumption: 17 Remove & Dispose of Radial Gate stoplogs Unit Price **Cell: R30**

BetaPERT distribution with parameters:

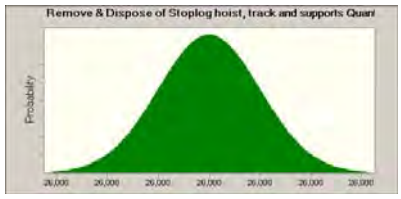
Minimum	$0.70	(=Q30)
Likeliest	$1.00	(=R30)
Maximum	$1.50	(=S30)



Assumption: 18 Remove & Dispose of Stoplog hoist, track and supports Quantity **Cell: L31**

Normal distribution with parameters:

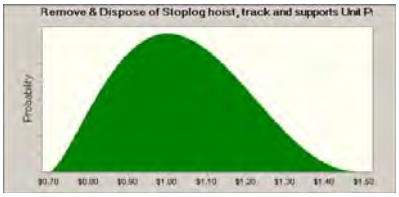
Mean	26,000	(=L31)
Std. Dev.	0	(=0.000001)



Assumption: 18 Remove & Dispose of Stoplog hoist, track and supports Unit Price **Cell: R31**

BetaPERT distribution with parameters:

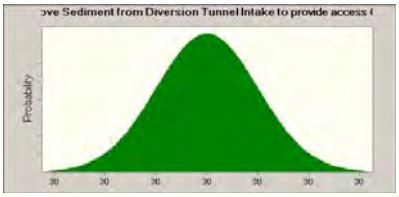
Minimum	$0.70	(=Q31)
Likeliest	$1.00	(=R31)
Maximum	$1.50	(=S31)



Assumption: 2 Remove Sediment from Diversion Tunnel Intake to provide access Quantity **Cell: L15**

Normal distribution with parameters:

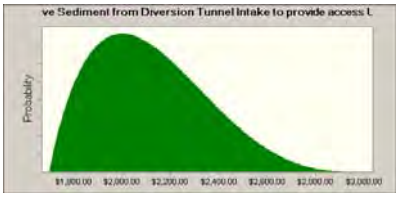
Mean	30	(=L15)
Std. Dev.	0	(=0.000001)



Assumption: 2 Remove Sediment from Diversion Tunnel Intake to provide access Unit Price **Cell: R15**

BetaPERT distribution with parameters:

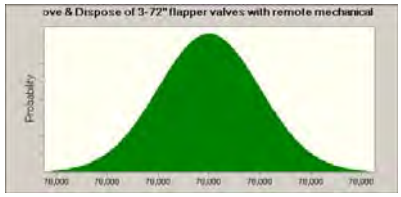
Minimum	$1,700.00	(=Q15)
Likeliest	$2,000.00	(=R15)
Maximum	$3,000.00	(=S15)



Assumption: 21 Remove & Dispose of 3-72" flapper valves with remote mechanical Quantity Cell: L34

Normal distribution with parameters:

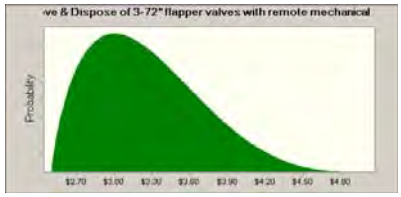
Mean	78,000	(=L34)
Std. Dev.	0	(=0.000001)



Assumption: 21 Remove & Dispose of 3-72" flapper valves with remote mechanical Unit: Cell: R34

BetaPERT distribution with parameters:

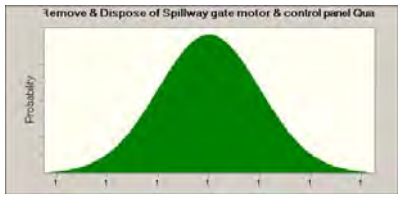
Minimum	$2.50	(=Q34)
Likeliest	$3.00	(=R34)
Maximum	$5.00	(=S34)



Assumption: 22 Remove & Dispose of Spillway gate motor & control panel Quantity Cell: L35

Normal distribution with parameters:

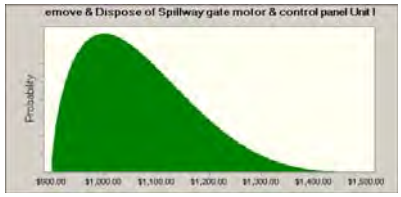
Mean	1	(=L35)
Std. Dev.	0	(=0.000001)



Assumption: 22 Remove & Dispose of Spillway gate motor & control panel Unit Price Cell: R35

BetaPERT distribution with parameters:

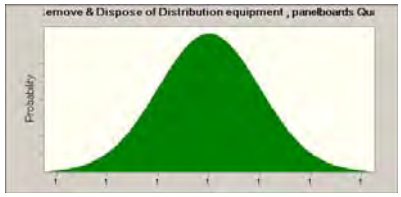
Minimum	$900.00	(=Q35)
Likeliest	$1,000.00	(=R35)
Maximum	$1,500.00	(=S35)



Assumption: 23 Remove & Dispose of Distribution equipment , panelboards Quantity Cell: L36

Normal distribution with parameters:

Mean	1	(=L36)
Std. Dev.	0	(=0.000001)



Assumption: 23 Remove & Dispose of Distribution equipment , panelboards Unit Price Cell: R36

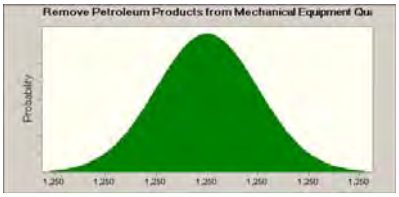
BetaPERT distribution with parameters:

Minimum	$5,000.00	(=Q36)
Likeliest	$6,000.00	(=R36)
Maximum	$7,000.00	(=S36)

Assumption: 35A Remove Petroleum Products from Mechanical Equipment Quantity **Cell: L49**

Normal distribution with parameters:

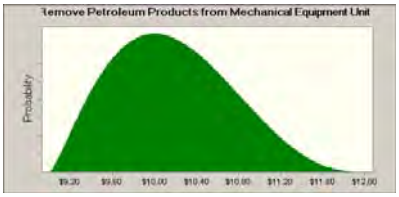
Mean	1,250	(=L49)
Std. Dev.	0	(=0.000001)



Assumption: 35A Remove Petroleum Products from Mechanical Equipment Unit Price **Cell: R49**

BetaPERT distribution with parameters:

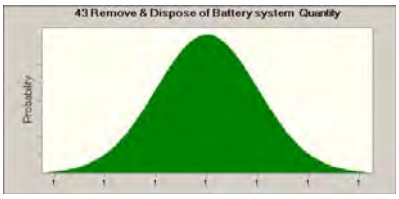
Minimum	$9.00	(=Q49)
Likeliest	$10.00	(=R49)
Maximum	$12.00	(=S49)



Assumption: 43 Remove & Dispose of Battery system Quantity **Cell: L57**

Normal distribution with parameters:

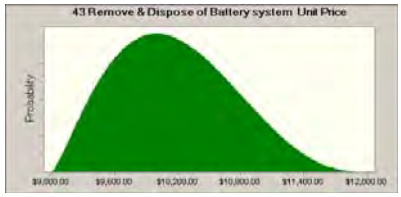
Mean	1	(=L57)
Std. Dev.	0	(=0.000001)



Assumption: 43 Remove & Dispose of Battery system Unit Price **Cell: R57**

BetaPERT distribution with parameters:

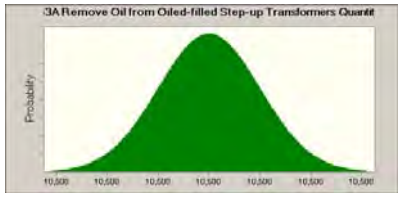
Minimum	$9,000.00	(=Q57)
Likeliest	$10,000.00	(=R57)
Maximum	$12,000.00	(=S57)



Assumption: 53A Remove Oil from Oiled-filled Step-up Transformers Quantity **Cell: L68**

Normal distribution with parameters:

Mean	10,500	(=L68)
Std. Dev.	0	(=0.000001)



Assumption: 53A Remove Oil from Oiled-filled Step-up Transformers Unit Price **Cell: R68**

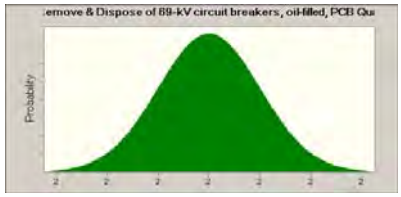
BetaPERT distribution with parameters:

Minimum	$9.00	(=Q68)
Likeliest	$10.00	(=R68)
Maximum	$12.00	(=S68)

Assumption: 54 Remove & Dispose of 69-kV circuit breakers, oil-filled, PCB QuantityCell: L69

Normal distribution with parameters:

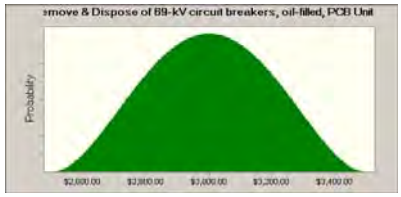
Mean	2	(=L69)
Std. Dev.	0	(=0.000001)



Assumption: 54 Remove & Dispose of 69-kV circuit breakers, oil-filled, PCB Unit PricCell: R69

BetaPERT distribution with parameters:

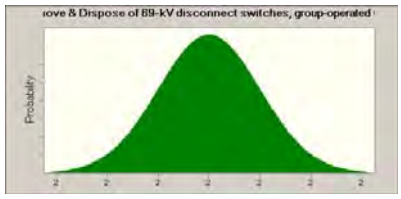
Minimum	$2,500.00	(=Q69)
Likeliest	$3,000.00	(=R69)
Maximum	$3,500.00	(=S69)



Assumption: 55 Remove & Dispose of 69-kV disconnect switches, group-operated QCell: L70

Normal distribution with parameters:

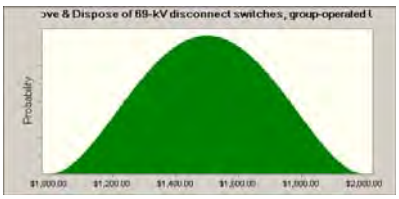
Mean	2	(=L70)
Std. Dev.	0	(=0.000001)



Assumption: 55 Remove & Dispose of 69-kV disconnect switches, group-operated Unit Price **Cell: R70**

BetaPERT distribution with parameters:

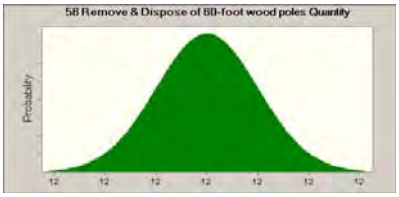
Minimum	$1,000.00	(=Q70)
Likeliest	$1,500.00	(=R70)
Maximum	$2,000.00	(=S70)



Assumption: 56 Remove & Dispose of 60-foot wood poles Quantity **Cell: L71**

Normal distribution with parameters:

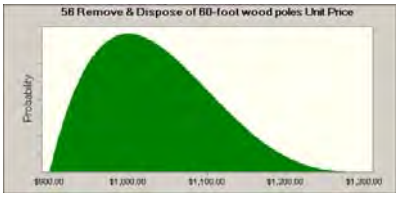
Mean	12	(=L71)
Std. Dev.	0	(=0.000001)



Assumption: 56 Remove & Dispose of 60-foot wood poles Unit Price **Cell: R71**

BetaPERT distribution with parameters:

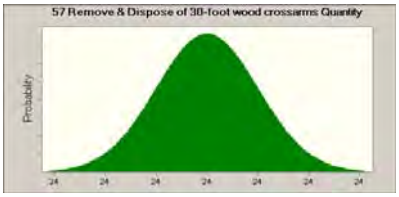
Minimum	$900.00	(=Q71)
Likeliest	$1,000.00	(=R71)
Maximum	$1,300.00	(=S71)



Assumption: 57 Remove & Dispose of 30-foot wood crossarms Quantity **Cell: L72**

Normal distribution with parameters:

Mean	24	(=L72)
Std. Dev.	0	(=0.000001)



Assumption: 57 Remove & Dispose of 30-foot wood crossarms Unit Price **Cell: R72**

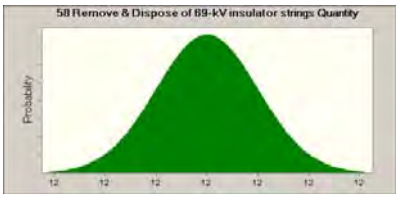
BetaPERT distribution with parameters:

Minimum	$400.00	(=Q72)
Likeliest	$500.00	(=R72)
Maximum	$600.00	(=S72)

Assumption: 58 Remove & Dispose of 69-kV insulator strings Quantity **Cell: L73**

Normal distribution with parameters:

Mean	12	(=L73)
Std. Dev.	0	(=0.000001)



Assumption: 58 Remove & Dispose of 69-kV insulator strings Unit Price **Cell: R73**

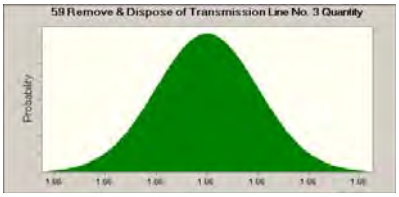
BetaPERT distribution with parameters:

Minimum	$300.00	(=Q73)
Likeliest	$400.00	(=R73)
Maximum	$500.00	(=S73)

Assumption: 59 Remove & Dispose of Transmission Line No. 3 Quantity **Cell: L74**

Normal distribution with parameters:

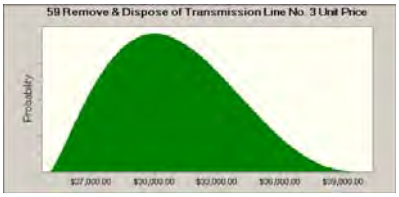
Mean	1.66	(=L74)
Std. Dev.	0.00	(=0.000001)



Assumption: 59 Remove & Dispose of Transmission Line No. 3 Unit Price **Cell: R74**

BetaPERT distribution with parameters:

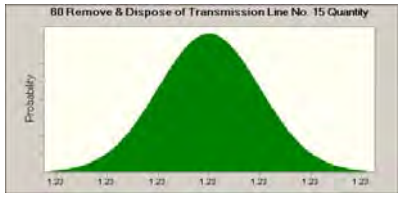
Minimum	$25,000.00	(=Q74)
Likeliest	$30,000.00	(=R74)
Maximum	$40,000.00	(=S74)



Assumption: 60 Remove & Dispose of Transmission Line No. 15 Quantity **Cell: L75**

Normal distribution with parameters:

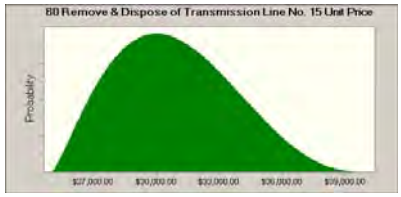
Mean	1.23	(=L75)
Std. Dev.	0.00	(=0.000001)



Assumption: 60 Remove & Dispose of Transmission Line No. 15 Unit Price **Cell: R75**

BetaPERT distribution with parameters:

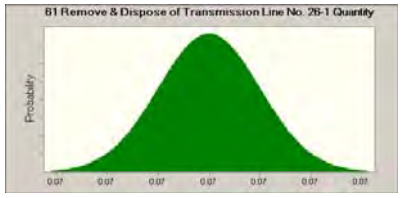
Minimum	$25,000.00	(=Q75)
Likeliest	$30,000.00	(=R75)
Maximum	$40,000.00	(=S75)



Assumption: 61 Remove & Dispose of Transmission Line No. 26-1 Quantity **Cell: L76**

Normal distribution with parameters:

Mean	0.07	(=L76)
Std. Dev.	0.00	(=0.000001)



Assumption: 61 Remove & Dispose of Transmission Line No. 26-1 Unit Price **Cell: R76**

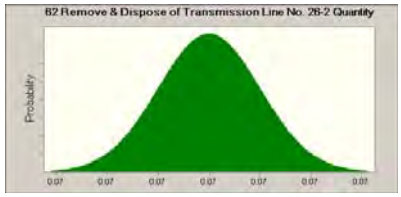
BetaPERT distribution with parameters:

Minimum	$25,000.00	(=Q76)
Likeliest	$30,000.00	(=R76)
Maximum	$40,000.00	(=S76)

Assumption: 62 Remove & Dispose of Transmission Line No. 26-2 Quantity **Cell: L77**

Normal distribution with parameters:

Mean	0.07	(=L77)
Std. Dev.	0.00	(=0.000001)



Assumption: 62 Remove & Dispose of Transmission Line No. 26-2 Unit Price **Cell: R77**

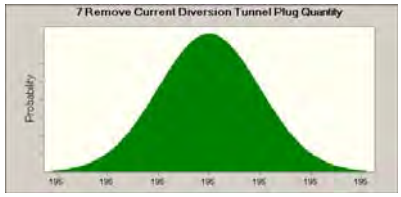
BetaPERT distribution with parameters:

Minimum	$25,000.00	(=Q77)
Likeliest	$30,000.00	(=R77)
Maximum	$40,000.00	(=S77)

Assumption: 7 Remove Current Diversion Tunnel Plug Quantity **Cell: L20**

Normal distribution with parameters:

Mean	195	(=L20)
Std. Dev.	0	(=0.000001)



Assumption: 7 Remove Current Diversion Tunnel Plug Unit Price **Cell: R20**

BetaPERT distribution with parameters:

Minimum	$1,400.00	(=Q20)
Likeliest	$1,500.00	(=R20)
Maximum	$1,800.00	(=S20)

Assumption: 72 Temporary Access Roads Quantity **Cell: L87**

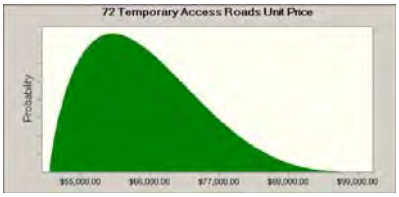
Normal distribution with parameters:

Mean	7	(=L87)
Std. Dev.	0	(=0.000001)

Assumption: 72 Temporary Access Roads Unit Price **Cell: R87**

BetaPERT distribution with parameters:

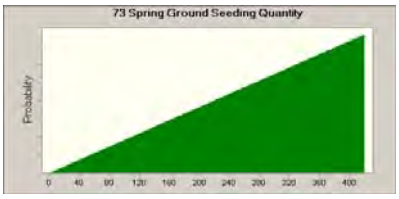
Minimum	$50,000.00	(=R87)
Likeliest	$60,000.00	(=Q87)
Maximum	$100,000.00	(=S87)



Assumption: 73 Spring Ground Seeding Quantity **Cell: L88**

Triangular distribution with parameters:

Minimum	0	(=M88)
Likeliest	420	(=L88)
Maximum	420	(=K88)



Assumption: 73 Spring Ground Seeding Unit Price **Cell: R88**

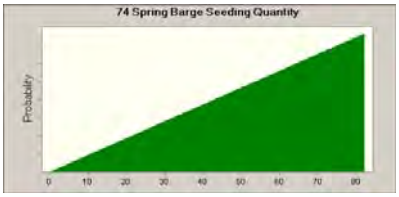
BetaPERT distribution with parameters:

Minimum	$3,000.00	(=Q88)
Likeliest	$3,500.00	(=R88)
Maximum	$4,000.00	(=S88)

Assumption: 74 Spring Barge Seeding Quantity **Cell: L89**

Triangular distribution with parameters:

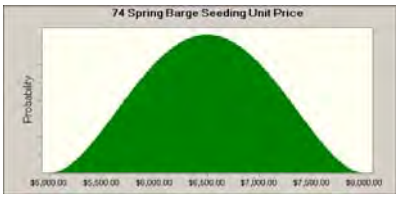
Minimum	0	(=M89)
Likeliest	82	(=L89)
Maximum	82	(=K89)



Assumption: 74 Spring Barge Seeding Unit Price **Cell: R89**

BetaPERT distribution with parameters:

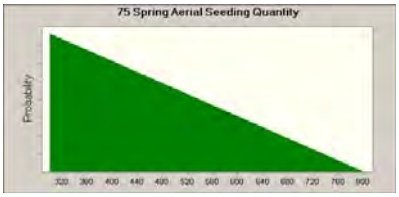
Minimum	$5,000.00	(=Q89)
Likeliest	$6,500.00	(=R89)
Maximum	$8,000.00	(=S89)



Assumption: 75 Spring Aerial Seeding Quantity **Cell: L90**

Triangular distribution with parameters:

Minimum	300	(=K90)
Likeliest	300	(=L90)
Maximum	802	(=M90)



Assumption: 75 Spring Aerial Seeding Unit Price **Cell: R90**

BetaPERT distribution with parameters:

Minimum	$6,500.00	(=Q90)
Likeliest	$7,500.00	(=R90)
Maximum	$15,000.00	(=S90)

Assumption: 76 Fall Ground Seeding Quantity **Cell: L91**

Triangular distribution with parameters:

Minimum	201	(=K91)
Likeliest	401	(=L91)
Maximum	602	(=M91)

Assumption: 76 Fall Ground Seeding Unit Price **Cell: R91**

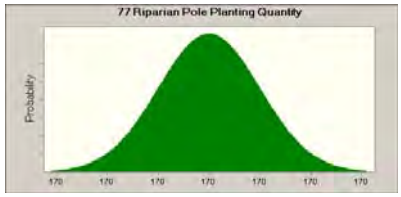
BetaPERT distribution with parameters:

Minimum	$3,000.00	(=Q91)
Likeliest	$3,500.00	(=R91)
Maximum	$4,000.00	(=S91)

Assumption: 77 Riparian Pole Planting Quantity **Cell: L92**

Normal distribution with parameters:

Mean	170	(=L92)
Std. Dev.	0	(=0.000001)



Assumption: 77 Riparian Pole Planting Unit Price **Cell: R92**

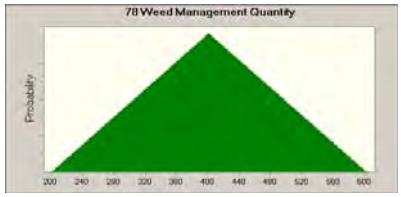
BetaPERT distribution with parameters:

Minimum	$4,000.00	(=Q92)
Likeliest	$8,500.00	(=R92)
Maximum	$10,000.00	(=S92)

Assumption: 78 Weed Management Quantity **Cell: L93**

Triangular distribution with parameters:

Minimum	201	(=K93)
Likeliest	401	(=L93)
Maximum	602	(=M93)



Assumption: 78 Weed Management Unit Price **Cell: R93**

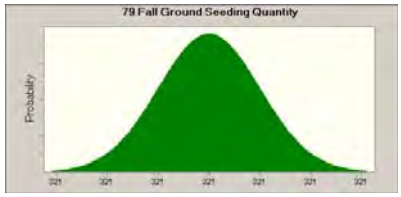
BetaPERT distribution with parameters:

Minimum	$1,000.00	(=Q93)
Likeliest	$1,500.00	(=R93)
Maximum	$2,000.00	(=S93)

Assumption: 79 Fall Ground Seeding Quantity **Cell: L94**

Normal distribution with parameters:

Mean	321	(=L94)
Std. Dev.	0	(=0.000001)



Assumption: 79 Fall Ground Seeding Unit Price **Cell: R94**

BetaPERT distribution with parameters:

Minimum	$3,000.00	(=Q94)
Likeliest	$3,500.00	(=R94)
Maximum	$4,000.00	(=S94)

Assumption: 80 Weed Management Quantity **Cell: L95**

Normal distribution with parameters:

Mean	321	(=L95)
Std. Dev.	0	(=0.000001)

Assumption: 80 Weed Management Unit Price **Cell: R95**

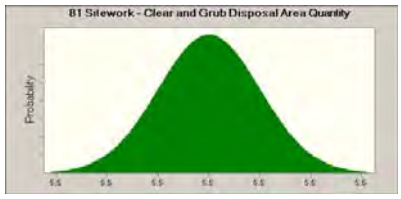
BetaPERT distribution with parameters:

Minimum	$1,000.00	(=Q95)
Likeliest	$1,500.00	(=R95)
Maximum	$2,000.00	(=S95)

Assumption: 81 Sitework - Clear and Grub Disposal Area Quantity **Cell: L96**

Normal distribution with parameters:

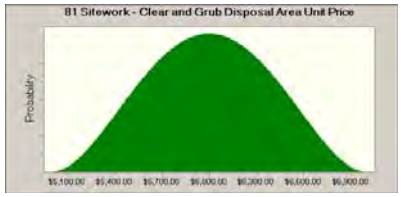
Mean	5.5	(=L96)
Std. Dev.	0.0	(=0.000001)



Assumption: 81 Sitework - Clear and Grub Disposal Area Unit Price **Cell: R96**

BetaPERT distribution with parameters:

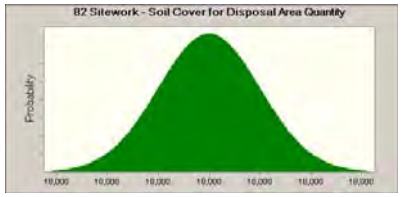
Minimum	$5,000.00	(=Q96)
Likeliest	$6,000.00	(=R96)
Maximum	$7,000.00	(=S96)



Assumption: 82 Sitework - Soil Cover for Disposal Area Quantity **Cell: L97**

Normal distribution with parameters:

Mean	18,000	(=L97)
Std. Dev.	0	(=0.000001)



Assumption: 82 Sitework - Soil Cover for Disposal Area Unit Price **Cell: R97**

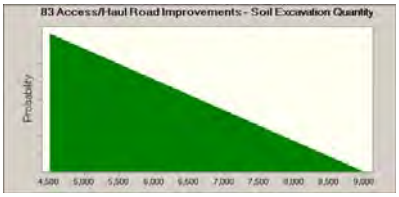
BetaPERT distribution with parameters:

Minimum	$45.00	(=Q97)
Likeliest	$50.00	(=R97)
Maximum	$60.00	(=S97)

Assumption: 83 Access/Haul Road Improvements - Soil Excavation Quantity **Cell: L98**

Triangular distribution with parameters:

Minimum	4,500	(=K98)
Likeliest	4,500	(=L98)
Maximum	9,000	(=M98)



Assumption: 83 Access/Haul Road Improvements - Soil Excavation Unit Price **Cell: R98**

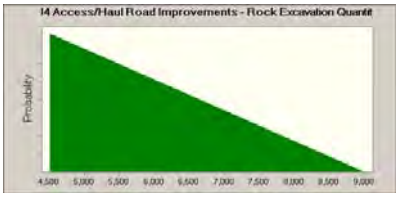
BetaPERT distribution with parameters:

Minimum	$12.00	(=Q98)
Likeliest	$13.00	(=R98)
Maximum	$14.00	(=S98)

Assumption: 84 Access/Haul Road Improvements - Rock Excavation Quantity **Cell: L99**

Triangular distribution with parameters:

Minimum	4,500	(=K99)
Likeliest	4,500	(=L99)
Maximum	9,000	(=M99)



Assumption: 84 Access/Haul Road Improvements - Rock Excavation Unit Price **Cell: R99**

BetaPERT distribution with parameters:

Minimum	$35.00	(=Q99)
Likeliest	$40.00	(=R99)
Maximum	$45.00	(=S99)

Assumption: 85 Access/Haul Road Improvements - Soil Backfill Quantity **Cell: L100**

Triangular distribution with parameters:

Minimum	16,000	(=K100)
Likeliest	16,000	(=L100)
Maximum	30,000	(=M100)

Assumption: 85 Access/Haul Road Improvements - Soil Backfill Unit Price **Cell: R100**

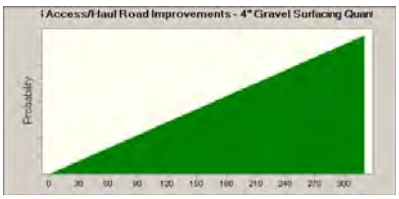
BetaPERT distribution with parameters:

Minimum	$45.00	(=Q100)
Likeliest	$50.00	(=R100)
Maximum	$55.00	(=S100)

Assumption: 86 Access/Haul Road Improvements - 4" Gravel Surfacing Quantity **Cell: L101**

Triangular distribution with parameters:

Minimum	0	(=K101)
Likeliest	320	(=L101)
Maximum	320	(=M101)



Assumption: 86 Access/Haul Road Improvements - 4" Gravel Surfacing Unit Price **Cell: R101**

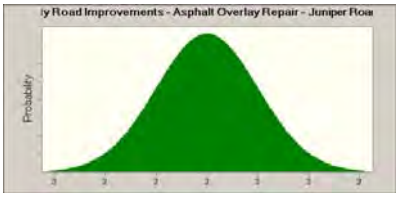
BetaPERT distribution with parameters:

Minimum	$80.00	(=Q101)
Likeliest	$100.00	(=R101)
Maximum	$120.00	(=S101)

Assumption: 87 County Road Improvements - Asphalt Overlay Repair - Juniper Road Qua **Cell: L102**

Normal distribution with parameters:

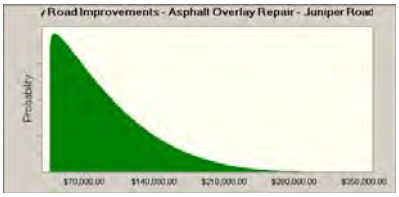
Mean	3	(=L102)
Std. Dev.	0	(=0.000001)



Assumption: 87 County Road Improvements - Asphalt Overlay Repair - Juniper Road **CellUnit R102**

BetaPERT distribution with parameters:

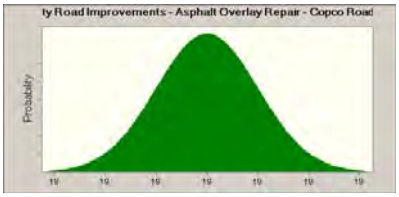
Minimum	$35,000.00	(=Q102)
Likeliest	$40,000.00	(=R102)
Maximum	$350,000.00	(=S102)



Assumption: 88 County Road Improvements - Asphalt Overlay Repair - Copco Road **CellUnit L103**

Normal distribution with parameters:

Mean	19	(=L103)
Std. Dev.	0	(=0.000001)



Assumption: 88 County Road Improvements - Asphalt Overlay Repair - Copco Road **CellUnit R103**

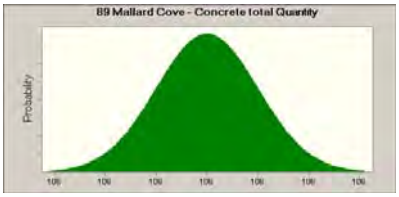
BetaPERT distribution with parameters:

Minimum	$35,000.00	(=Q103)
Likeliest	$40,000.00	(=R103)
Maximum	$350,000.00	(=S103)

Assumption: 89 Mallard Cove - Concrete total Quantity **Cell: L104**

Normal distribution with parameters:

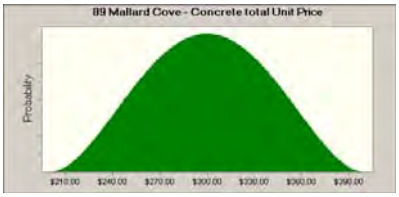
Mean	106	(=L104)
Std. Dev.	0	(=0.000001)



Assumption: 89 Mallard Cove - Concrete total Unit Price **Cell: R104**

BetaPERT distribution with parameters:

Minimum	$200.00	(=Q104)
Likeliest	$300.00	(=R104)
Maximum	$400.00	(=S104)



Assumption: 9 Furnish, Install & Remove 3-6'x6' Fabricated Slide Gates Quantity **Cell: L22**

Normal distribution with parameters:

Mean	40,500	(=L22)
Std. Dev.	0	(=0.000001)

Assumption: 9 Furnish, Install & Remove 3-6'x6' Fabricated Slide Gates Unit Price Cell: R22

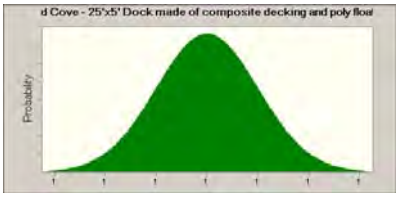
BetaPERT distribution with parameters:

Minimum	$12.00	(=Q22)
Likeliest	$15.00	(=R22)
Maximum	$18.00	(=S22)

Assumption: 90 Mallard Cove - 25'x5' Dock made of composite decking and poly floats Cell: Q105

Normal distribution with parameters:

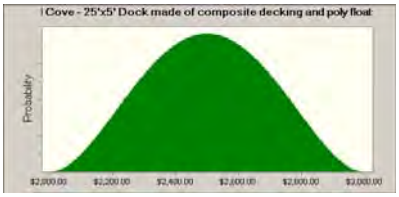
Mean	1	(=L105)
Std. Dev.	0	(=0.000001)



Assumption: 90 Mallard Cove - 25'x5' Dock made of composite decking and poly floats Cell: R105

BetaPERT distribution with parameters:

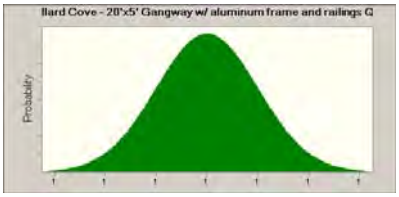
Minimum	$2,000.00	(=Q105)
Likeliest	$2,500.00	(=R105)
Maximum	$3,000.00	(=S105)



Assumption: 91 Mallard Cove - 20'x5' Gangway w/ aluminum frame and railings Quantity **Cell: L106**

Normal distribution with parameters:

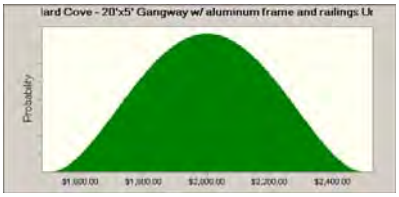
Mean	1	(=L106)
Std. Dev.	0	(=0.000001)



Assumption: 91 Mallard Cove - 20'x5' Gangway w/ aluminum frame and railings Unit Price **Cell: R106**

BetaPERT distribution with parameters:

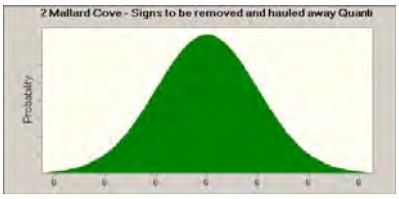
Minimum	$1,500.00	(=Q106)
Likeliest	$2,000.00	(=R106)
Maximum	$2,500.00	(=S106)



Assumption: 92 Mallard Cove - Signs to be removed and hauled away Quantity **Cell: L107**

Normal distribution with parameters:

Mean	6	(=L107)
Std. Dev.	0	(=0.000001)



Assumption: 92 Mallard Cove - Signs to be removed and hauled away Unit Price **Cell: R107**

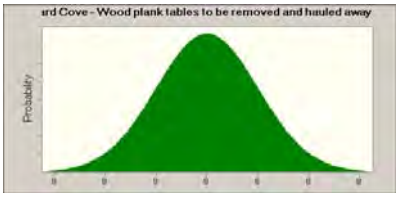
BetaPERT distribution with parameters:

Minimum	$250.00	(=Q107)
Likeliest	$300.00	(=R107)
Maximum	$350.00	(=S107)

Assumption: 93 Mallard Cove - Wood plank tables to be removed and hauled away Quantity **Cell: L108**

Normal distribution with parameters:

Mean	8	(=L108)
Std. Dev.	0	(=0.000001)



Assumption: 93 Mallard Cove - Wood plank tables to be removed and hauled away Unit Pri **Cell: R108**

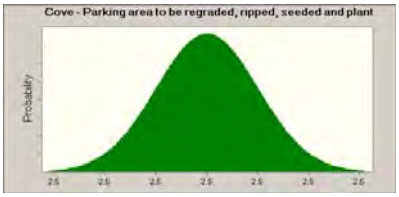
BetaPERT distribution with parameters:

Minimum	$90.00	(=Q108)
Likeliest	$100.00	(=R108)
Maximum	$120.00	(=S108)

Assumption: 94 Mallard Cove - Parking area to be regraded, ripped, seeded and plant **Cell: Q109**

Normal distribution with parameters:

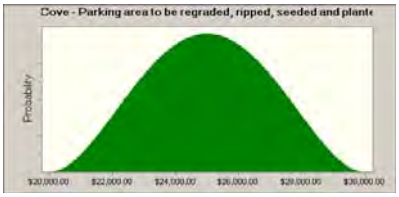
Mean	2.5	(=L109)
Std. Dev.	0.0	(=0.000001)



Assumption: 94 Mallard Cove - Parking area to be regraded, ripped, seeded and plant **Cell: R109**

BetaPERT distribution with parameters:

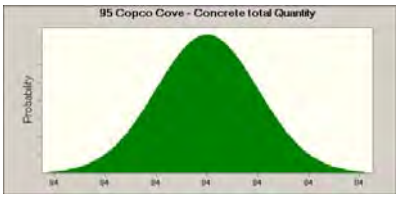
Minimum	$20,000.00	(=Q109)
Likeliest	$25,000.00	(=R109)
Maximum	$30,000.00	(=S109)



Assumption: 95 Copco Cove - Concrete total Quantity **Cell: L110**

Normal distribution with parameters:

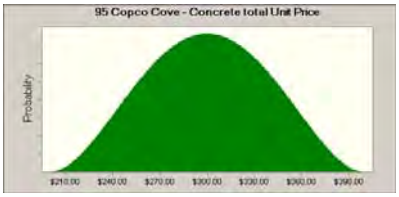
Mean	84	(=L110)
Std. Dev.	0	(=0.000001)



Assumption: 95 Copco Cove - Concrete total Unit Price **Cell: R110**

BetaPERT distribution with parameters:

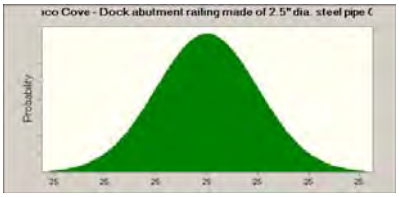
Minimum	$200.00	(=Q110)
Likeliest	$300.00	(=R110)
Maximum	$400.00	(=S110)



Assumption: 96 Copco Cove - Dock abutment railing made of 2.5" dia. steel pipe Quantity **Cell: L111**

Normal distribution with parameters:

Mean	25	(=L111)
Std. Dev.	0	(=0.000001)



Assumption: 96 Copco Cove - Dock abutment railing made of 2.5" dia. steel pipe Unit Price **Cell: R111**

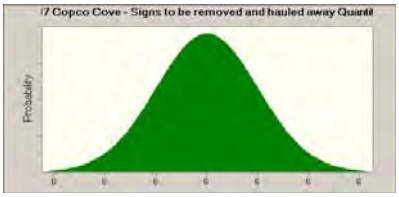
BetaPERT distribution with parameters:

Minimum	$35.00	(=Q111)
Likeliest	$40.00	(=R111)
Maximum	$45.00	(=S111)

Assumption: 97 Copco Cove - Signs to be removed and hauled away Quantity **Cell: L112**

Normal distribution with parameters:

Mean	6	(=L112)
Std. Dev.	0	(=0.000001)



Assumption: 97 Copco Cove - Signs to be removed and hauled away Unit Price **Cell: R112**

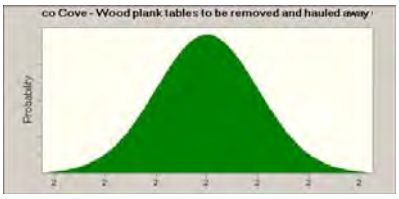
BetaPERT distribution with parameters:

Minimum	$250.00	(=Q112)
Likeliest	$300.00	(=R112)
Maximum	$350.00	(=S112)

Assumption: 98 Copco Cove - Wood plank tables to be removed and hauled away Quantity **Cell: L113**

Normal distribution with parameters:

Mean	2	(=L113)
Std. Dev.	0	(=0.000001)



Assumption: 98 Copco Cove - Wood plank tables to be removed and hauled away Unit Price **Cell: R113**

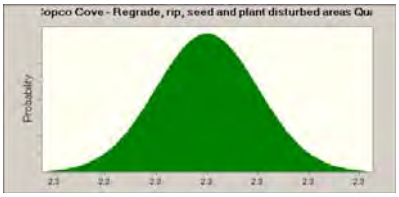
BetaPERT distribution with parameters:

Minimum	$90.00	(=Q113)
Likeliest	$100.00	(=R113)
Maximum	$120.00	(=S113)

Assumption: 99 Copco Cove - Regrade, rip, seed and plant disturbed areas Quantity **Cell: L114**

Normal distribution with parameters:

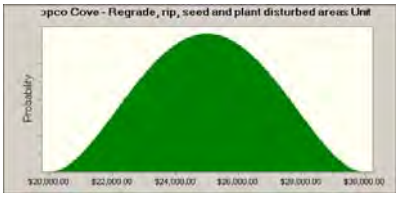
Mean	2.3	(=L114)
Std. Dev.	0.0	(=0.000001)



Assumption: 99 Copco Cove - Regrade, rip, seed and plant disturbed areas Unit Price **Cell: R114**

BetaPERT distribution with parameters:

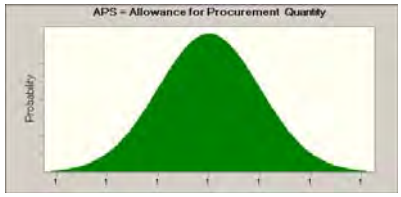
Minimum	$20,000.00	(=Q114)
Likeliest	$25,000.00	(=R114)
Maximum	$30,000.00	(=S114)



Assumption: APS = Allowance for Procurement Quantity **Cell: L123**

Normal distribution with parameters:

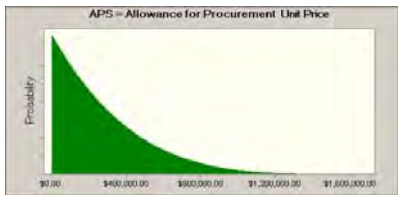
Mean	1	(=L123)
Std. Dev.	0	(=0.000001)



Assumption: APS = Allowance for Procurement Unit Price **Cell: R123**

BetaPERT distribution with parameters:

Minimum	$0.00	(=Q123)
Likeliest	$0.00	(=R123)
Maximum	$1,684,360.00	(=S123)



Assumption: Construction Contingencies Quantity **Cell: L126**

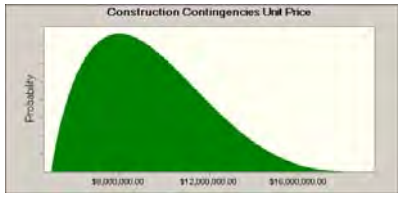
Normal distribution with parameters:

Mean	1	(=L126)
Std. Dev.	0	(=0.000001)

Assumption: Construction Contingencies Unit Price **Cell: R126**

BetaPERT distribution with parameters:

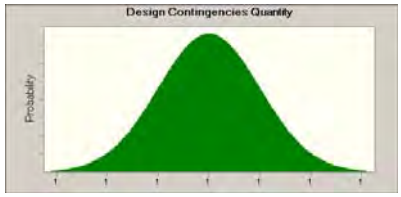
Minimum	$5,000,000.00	(=Q126)
Likeliest	$8,000,000.00	(=R126)
Maximum	$19,000,000.00	(=S126)



Assumption: Design Contingencies Quantity **Cell: L122**

Normal distribution with parameters:

Mean	1	(=L122)
Std. Dev.	0	(=0.000001)



Assumption: Design Contingencies Unit Price **Cell: R122**

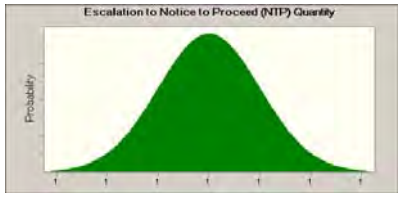
BetaPERT distribution with parameters:

Minimum	$2,535,694.00	(=Q122)
Likeliest	$3,828,356.00	(=R122)
Maximum	$11,082,618.00	(=S122)

Assumption: Escalation to Notice to Proceed (NTP) Quantity **Cell: L119**

Normal distribution with parameters:

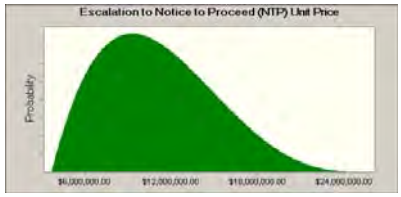
Mean	1	(=L119)
Std. Dev.	0	(=0.000001)



Assumption: Escalation to Notice to Proceed (NTP) Unit Price **Cell: R119**

BetaPERT distribution with parameters:

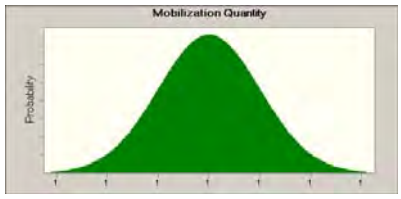
Minimum	$3,660,881.00	(=Q119)
Likeliest	$9,256,544.00	(=R119)
Maximum	$25,508,447.00	(=S119)



Assumption: Mobilization Quantity **Cell: L117**

Normal distribution with parameters:

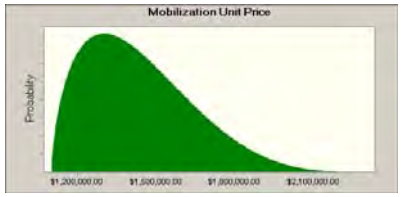
Mean	1	(=L117)
Std. Dev.	0	(=0.000001)



Assumption: Mobilization Unit Price **Cell: R117**

BetaPERT distribution with parameters:

Minimum	$1,100,000.00	(=Q117)
Likeliest	$1,300,000.00	(=R117)
Maximum	$2,300,000.00	(=S117)



Assumption: Non-Contract Cost Quantity **Cell: L128**

Normal distribution with parameters:

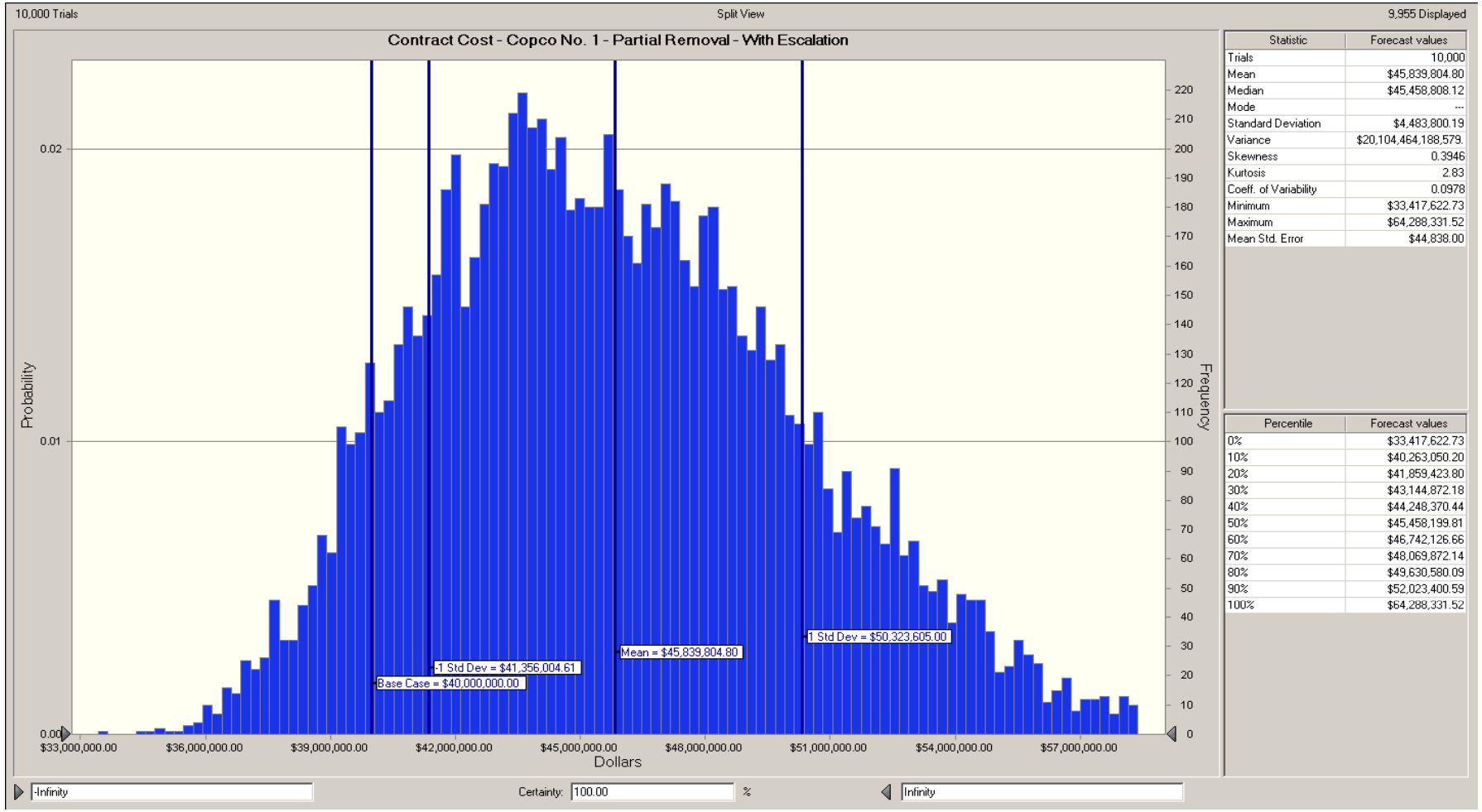
Mean	1	(=L128)
Std. Dev.	0	(=0.000001)

Assumption: Non-Contract Cost Unit Price **Cell: R128**

BetaPERT distribution with parameters:

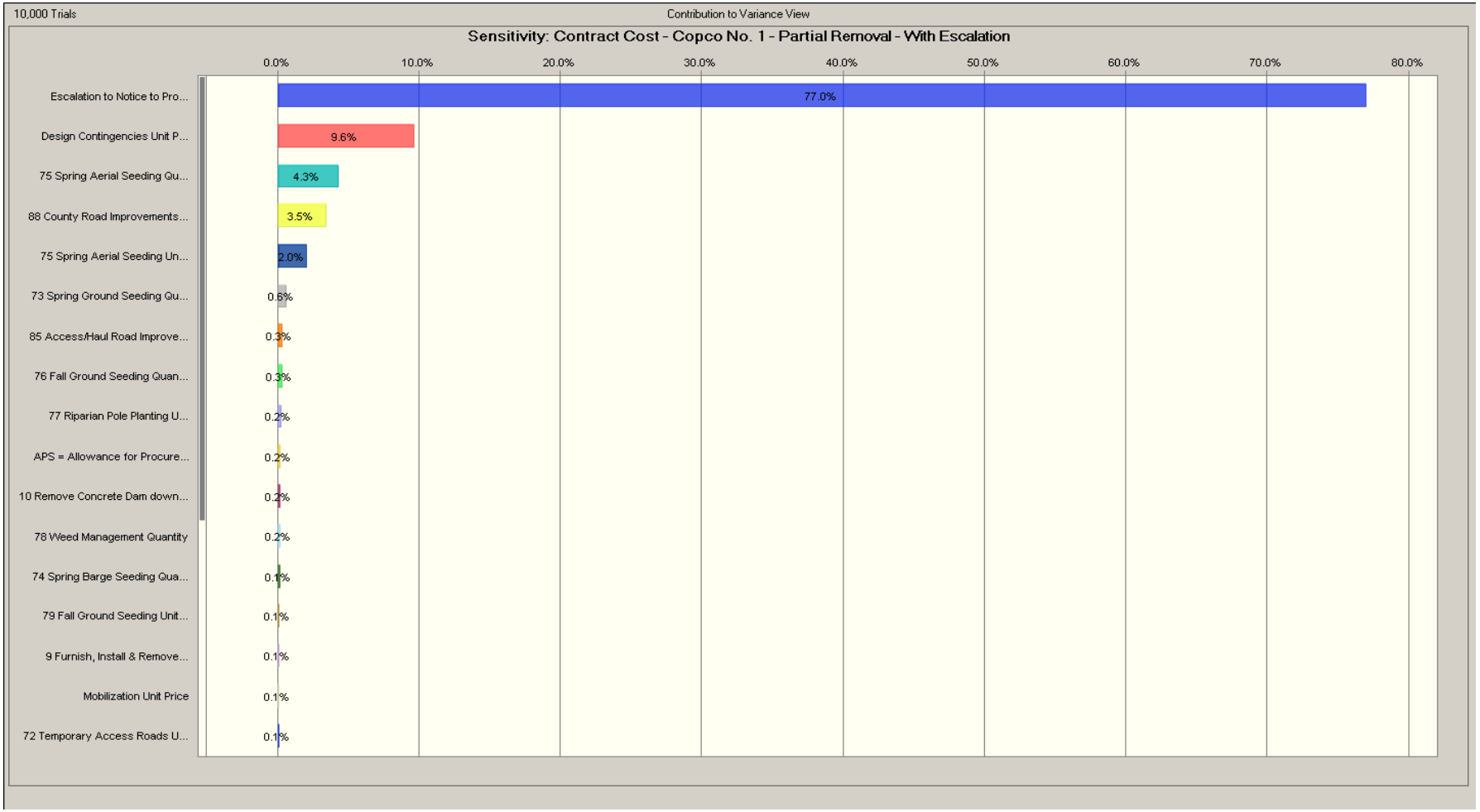
Minimum	$21,000,000.00	(=Q128)
Likeliest	$31,000,000.00	(=R128)
Maximum	$75,000,000.00	(=S128)

End of Assumptions

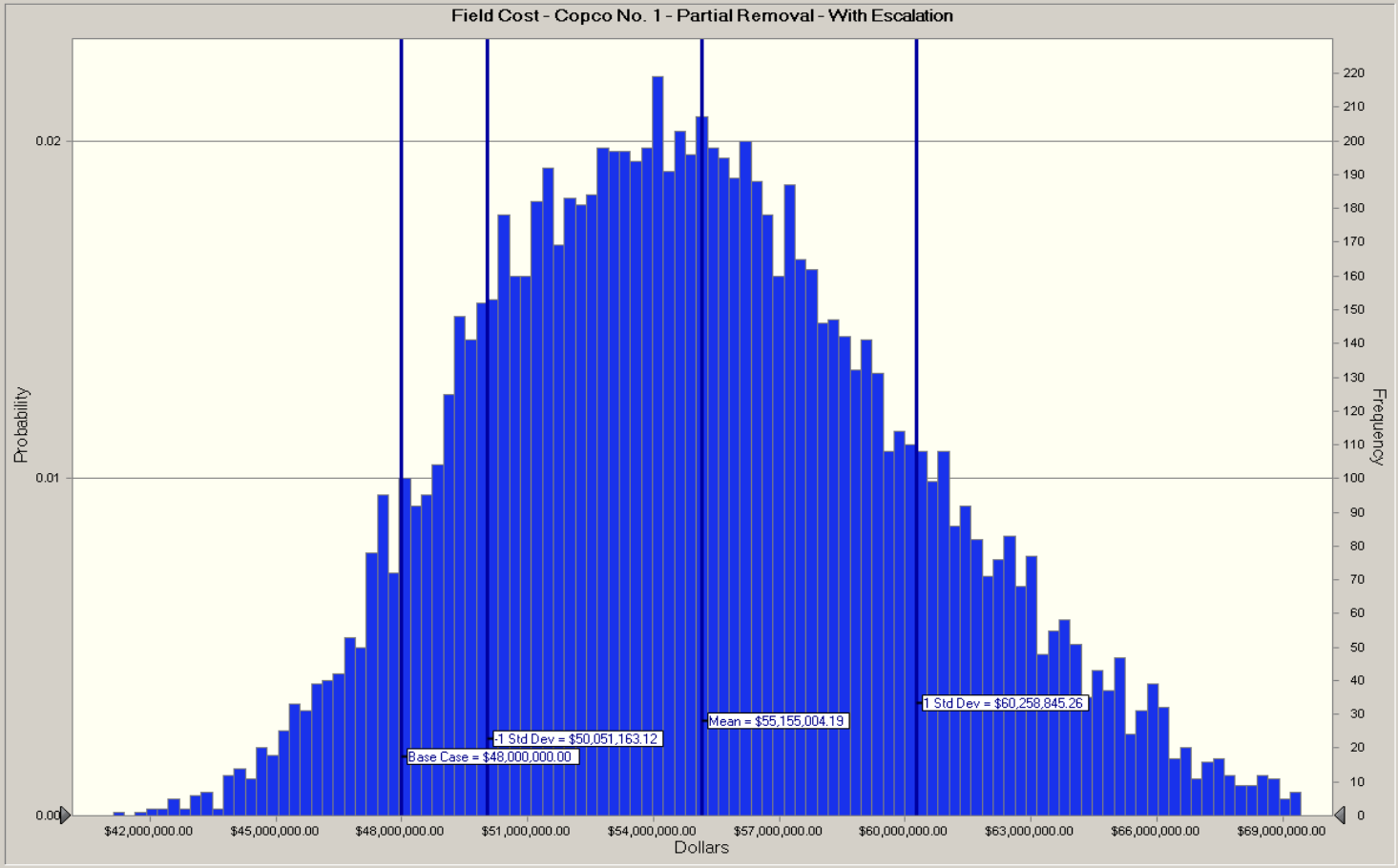


Statistic	Forecast values
Trials	10,000
Mean	$45,839,804.80
Median	$45,458,808.12
Mode	---
Standard Deviation	$4,483,800.19
Variance	$20,104,464,188,579.
Skewness	0.3946
Kurtosis	2.83
Coeff. of Variability	0.0978
Minimum	$33,417,622.73
Maximum	$64,288,331.52
Mean Std. Error	$44,838.00

Percentile	Forecast values
0%	$33,417,622.73
10%	$40,263,050.20
20%	$41,859,423.80
30%	$43,144,872.18
40%	$44,248,370.44
50%	$45,458,199.81
60%	$46,742,126.66
70%	$48,069,872.14
80%	$49,630,580.09
90%	$52,023,400.59
100%	$64,288,331.52


10,000 Trials
Contribution to Variance View
Sensitivity: Contract Cost - Copco No. 1 - Partial Removal - With Escalation
0.0%
10.0%
20.0%
30.0%
40.0%
50.0%
60.0%
70.0%
80.0%
Escalation to Notice to Pro...
77.0%
Design Contingencies Unit P...
9.6%
75 Spring Aerial Seeding Qu...
4.3%
88 County Road Improvements...
3.5%
75 Spring Aerial Seeding Un...
2.0%
73 Spring Ground Seeding Qu...
0.6%
85 Access/Haul Road Improve...
0.3%
76 Fall Ground Seeding Quan...
0.3%
77 Riparian Pole Planting U...
0.2%
APS = Allowance for Procure...
0.2%
10 Remove Concrete Dam down...
0.2%
78 Weed Management Quantity
0.2%
74 Spring Barge Seeding Qua...
0.1%
79 Fall Ground Seeding Unit...
0.1%
9 Furnish, Install & Remove...
0.1%
Mobilization Unit Price
0.1%
72 Temporary Access Roads U...
0.1%

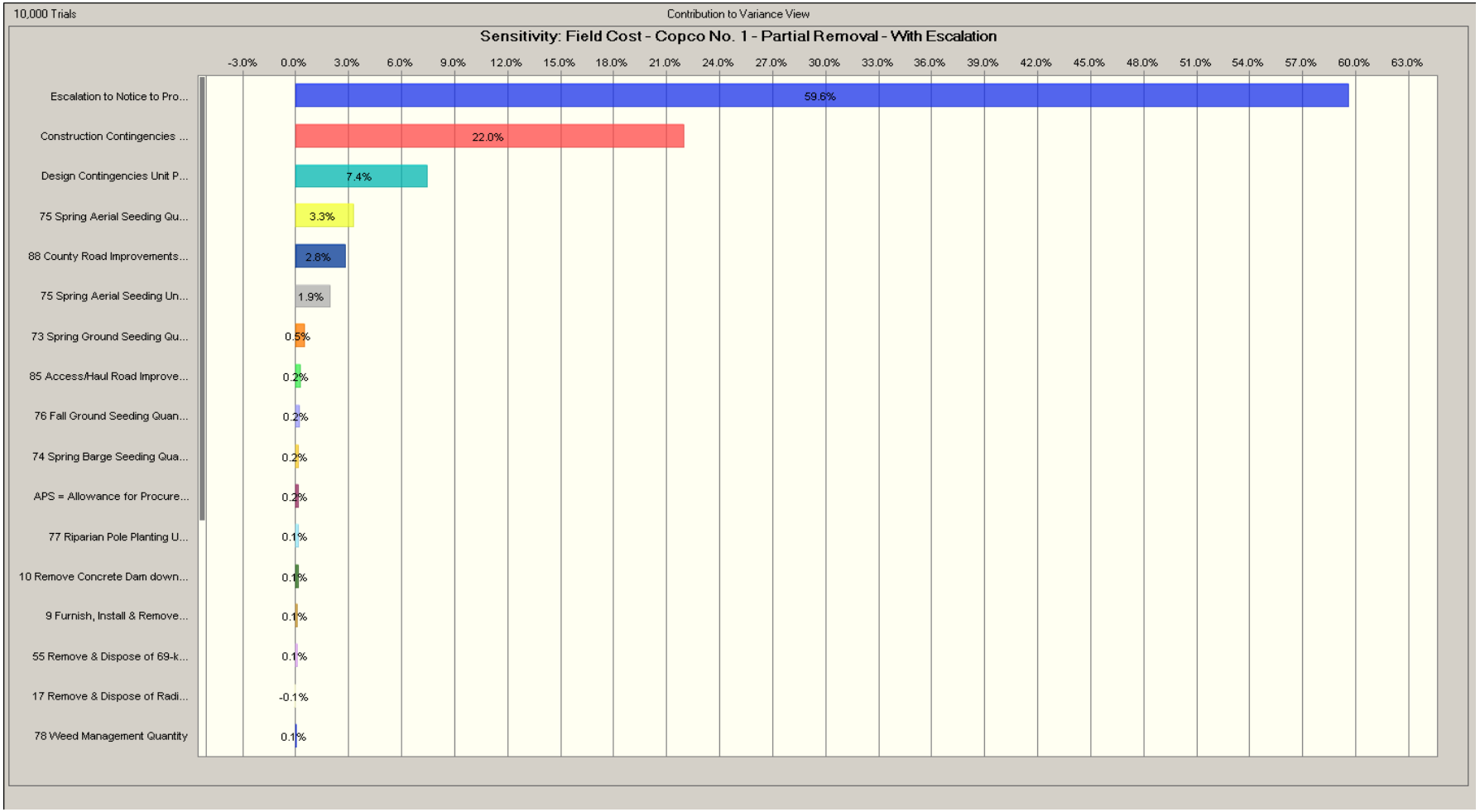
10,000 Trials | Split View | 9,949 Displayed

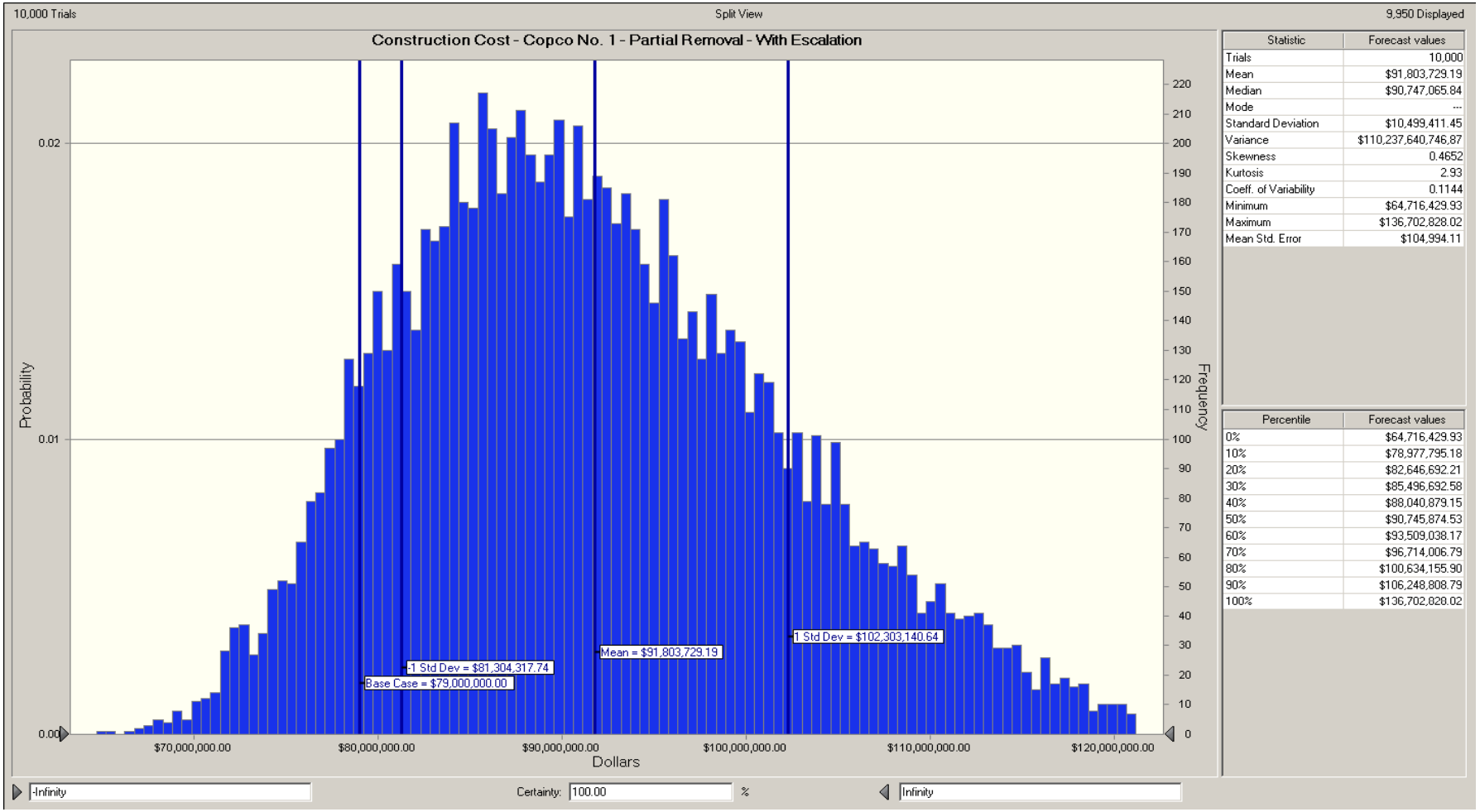


Statistic	Forecast values
Trials	10,000
Mean	$55,155,004.19
Median	$54,829,780.66
Mode	---
Standard Deviation	$5,103,841.07
Variance	$26,049,193,626,001.
Skewness	0.3524
Kurtosis	2.92
Coeff. of Variability	0.0925
Minimum	$40,846,678.88
Maximum	$75,189,774.10
Mean Std. Error	$51,038.41

Percentile	Forecast values
0%	$40,846,678.88
10%	$48,876,496.19
20%	$50,642,309.71
30%	$52,149,347.38
40%	$53,517,418.55
50%	$54,829,586.54
60%	$56,156,287.75
70%	$57,614,877.65
80%	$59,433,577.86
90%	$62,096,668.28
100%	$75,189,774.10

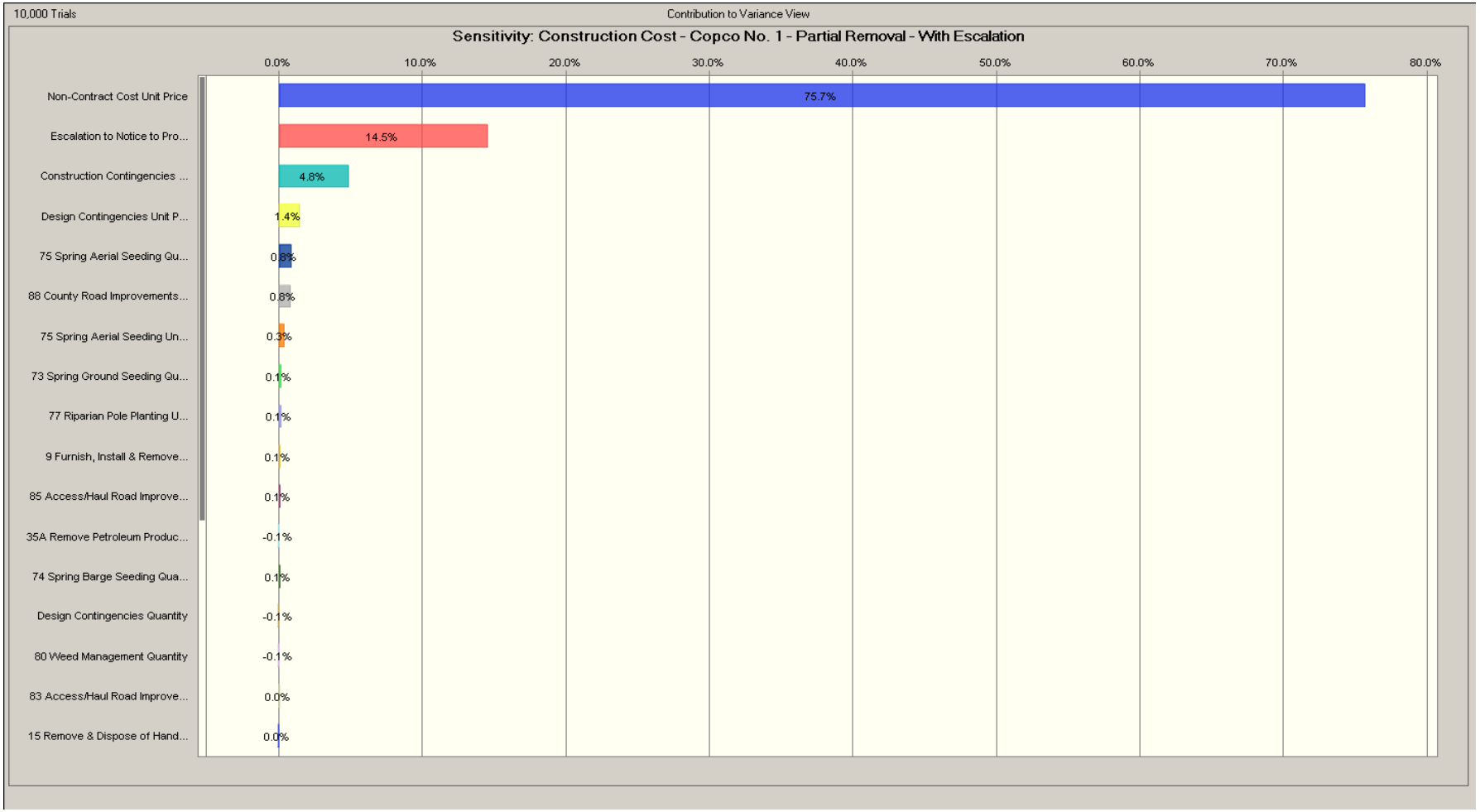
-Infinity | Certainty: 100.00 % | Infinity


10,000 Trials
Contribution to Variance View
Sensitivity: Field Cost - Copco No. 1 - Partial Removal - With Escalation
-3.0% 0.0% 3.0% 6.0% 9.0% 12.0% 15.0% 18.0% 21.0% 24.0% 27.0% 30.0% 33.0% 36.0% 39.0% 42.0% 45.0% 48.0% 51.0% 54.0% 57.0% 60.0% 63.0%
Escalation to Notice to Pro... 59.6%
Construction Contingencies ... 22.0%
Design Contingencies Unit P... 7.4%
75 Spring Aerial Seeding Qu... 3.3%
88 County Road Improvements... 2.8%
75 Spring Aerial Seeding Un... 1.9%
73 Spring Ground Seeding Qu... 0.5%
85 Access/Haul Road Improve... 0.2%
76 Fall Ground Seeding Quan... 0.2%
74 Spring Barge Seeding Qua... 0.2%
APS = Allowance for Procure... 0.2%
77 Riparian Pole Planting U... 0.1%
10 Remove Concrete Dam down... 0.1%
9 Furnish, Install & Remove... 0.1%
55 Remove & Dispose of 69-k... 0.1%
17 Remove & Dispose of Radi... -0.1%
78 Weed Management Quantity 0.1%



Statistic	Forecast values
Trials	10,000
Mean	$91,803,729.19
Median	$90,747,065.84
Mode	---
Standard Deviation	$10,499,411.45
Variance	$110,237,640,746.87
Skewness	0.4652
Kurtosis	2.93
Coeff. of Variability	0.1144
Minimum	$64,716,429.93
Maximum	$136,702,828.02
Mean Std. Error	$104,994.11

Percentile	Forecast values
0%	$64,716,429.93
10%	$78,977,795.18
20%	$82,646,692.21
30%	$85,496,692.58
40%	$88,040,879.15
50%	$90,745,874.53
60%	$93,509,038.17
70%	$96,714,006.79
80%	$100,634,155.90
90%	$106,248,808.79
100%	$136,702,828.02


10,000 Trials
Contribution to Variance View
Sensitivity: Construction Cost - Copco No. 1 - Partial Removal - With Escalation
0.0%
10.0%
20.0%
30.0%
40.0%
50.0%
60.0%
70.0%
80.0%
Non-Contract Cost Unit Price
75.7%
Escalation to Notice to Pro...
14.5%
Construction Contingencies ...
4.8%
Design Contingencies Unit P...
1.4%
75 Spring Aerial Seeding Qu...
0.8%
88 County Road Improvements...
0.8%
75 Spring Aerial Seeding Un...
0.3%
73 Spring Ground Seeding Qu...
0.1%
77 Riparian Pole Planting U...
0.1%
9 Furnish, Install & Remove...
0.1%
85 Access/Haul Road Improve...
0.1%
35A Remove Petroleum Produc...
-0.1%
74 Spring Barge Seeding Qua...
0.1%
Design Contingencies Quantity
-0.1%
80 Weed Management Quantity
-0.1%
83 Access/Haul Road Improve...
0.0%
15 Remove & Dispose of Hand...
0.0%

ESTIMATE WORKSHEET

FEATURE:

Klamath River Dams Removal
Partial Removal Option
Copco No. 1 Dam & Powerplant Removal
Escalation NOT Included
SUMMARY ESTIMATE

PROJECT: Klamath River, Northern California/Southern Oregon

WOID: AF652 | **ESTIMATE LEVEL:** Feasibility
REGION: MP | **PRICE LEVEL:** Jul-2010
FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 1\[Copco 1 - Partial Removal Crystal Ball - with Escalation - 2011-04.xlsx]Copco 1 - Full - with Esc

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	MPL QUANTITY	MP QUANTITY	MPH QUANTITY	UNIT	MPL UNIT PRICE	MP UNIT PRICE	MPH UNIT PRICE	MPL TOTAL	MP TOTAL	MPH TOTAL
	1	Furnish, Install, and Remove Barge-Mounted Crane in Reservoir for Dam Removal	8130	1	1	1	LS	$340,000.00	$350,000.00	$370,000.00	$340,000.00	$350,000.00	$370,000.00
	2	Remove Sediment from Diversion Tunnel Intake to provide access	8130	30	30	30	CY	$1,700.00	$2,000.00	$3,000.00	$51,000.00	$60,000.00	$90,000.00
	3	Furnish, Install, and Remove Large Crane on Right Abutment	8130	1	1	1	LS				$0.00	$0.00	$0.00
	4	Remove Water from behind Tailrace Cofferdam	8130	0	0	0	GAL				$0.00	$0.00	$0.00
	5	Riprap Protection on Cofferdam	8130	0	0	0	CY				$0.00	$0.00	$0.00
	6	Provide Dewatering behind Tailrace Cofferdam	8130	0	0	0	LS				$0.00	$0.00	$0.00
	7	Remove Current Diversion Tunnel Plug	8130	195	195	195	CY	$1,400.00	$1,500.00	$1,800.00	$273,000.00	$292,500.00	$351,000.00
	8	Construct Embankment Cofferdam in Tailrace	8130	0	0	0	CY				$0.00	$0.00	$0.00
	9	Furnish, Install & Remove 3-6'x6' Fabricated Slide Gates	8420	40,500	40,500	40,500	LBS	$12.00	$15.00	$18.00	$486,000.00	$607,500.00	$729,000.00
	10	Remove Concrete Dam down to Elev. 2476	8130	36,000	36,000	36,000	CY	$290.00	$300.00	$320.00	$10,440,000.00	$10,800,000.00	$11,520,000.00
	11	Remove Concrete Intake Structure on Right Abutment	8130	0	0	0	CY				$0.00	$0.00	$0.00
	12	Remove Structural Steel from Spillway	8130	55,000	55,000	55,000	LBS	$0.70	$1.00	$1.50	$38,500.00	$55,000.00	$82,500.00
	13	Install Diversion Tunnel Plugs	8130	24	24	24	CY	$1,100.00	$1,200.00	$1,300.00	$26,400.00	$28,800.00	$31,200.00
	14	Remove Diversion Tunnel Control Structure Concrete	8130	0	0	0	CY				$0.00	$0.00	$0.00
	15	Remove & Dispose of Hand Rails	8420	11,000	11,000	11,000	LBS	$0.70	$1.00	$1.50	$7,700.00	$11,000.00	$16,500.00
	16	Remove & Dispose of Radial Gates	8420	140,500	140,500	140,500	LBS	$0.70	$1.00	$1.50	$98,350.00	$140,500.00	$210,750.00
	17	Remove & Dispose of Radial Gate stoplogs	8420	18,000	18,000	18,000	LBS	$0.70	$1.00	$1.50	$12,600.00	$18,000.00	$27,000.00
	18	Remove & Dispose of Stoplog hoist, track and supports	8420	26,000	26,000	26,000	LBS	$0.70	$1.00	$1.50	$18,200.00	$26,000.00	$39,000.00
	19	Remove & Dispose of 3 sections of 23' of 72"Ø steel lining (embedded)	8420	0	0	0	LBS				$0.00	$0.00	$0.00
	20	Remove & Dispose of 3 - 72" butterfly valves (embedded)	8420	0	0	0	LBS				$0.00	$0.00	$0.00
	21	Remove & Dispose of 3-72" flapper valves with remote mechanical	8420	78,000	78,000	78,000	LBS	$2.50	$3.00	$5.00	$195,000.00	$234,000.00	$390,000.00
	22	Remove & Dispose of Spillway gate motor & control panel	8430	1	1	1	EA	$900.00	$1,000.00	$1,500.00	$900.00	$1,000.00	$1,500.00
	23	Remove & Dispose of Distribution equipment , panelboards	8430	1	1	1	EA	$5,000.00	$6,000.00	$7,000.00	$5,000.00	$6,000.00	$7,000.00
	24	Remove Powerhouse Concrete down to top of rock under the Powerhouse	8130	0	0	0	CY				$0.00	$0.00	$0.00
	25	Remove Powerhouse Structural Steel	8130	0	0	0	LBS				$0.00	$0.00	$0.00
	26	Remove & Dispose of 2 - Governor oil systems	8420	0	0	0	LBS				$0.00	$0.00	$0.00
	27	Remove & Dispose of Cooling water and bearing oil systems	8420	0	0	0	LBS				$0.00	$0.00	$0.00
	28	Remove & Dispose of 4 - Horizontal Tandem Francis Turbines	8420	0	0	0	LBS				$0.00	$0.00	$0.00
	29	Remove & Dispose of 2 - 40 Ton indoor cranes	8420	0	0	0	LBS				$0.00	$0.00	$0.00
	30	Remove & Dispose of Compressed Air system	8420	0	0	0	LBS				$0.00	$0.00	$0.00
	31	Remove & Dispose of 2 - CO2 systems	8420	0	0	0	LBS				$0.00	$0.00	$0.00
	32	Remove & Dispose of Plant Water and Fire Protection	8420	0	0	0	LBS				$0.00	$0.00	$0.00
	33	Remove & Dispose of Transformer Oil Fire protection	8420	0	0	0	LBS				$0.00	$0.00	$0.00
	34	Remove & Dispose of Unwatering Piping	8420	0	0	0	LBS				$0.00	$0.00	$0.00
	35	Remove & Dispose of Drainage Piping	8420	0	0	0	LBS				$0.00	$0.00	$0.00
	35A	Remove Petroleum Products from Mechanical Equipment	8420	1,250	1,250	1,250	GAL	$9.00	$10.00	$12.00	$11,250.00	$12,500.00	$15,000.00
	36	Remove & Dispose of Horizontal AC Generator, Indoor Open Frame	8430	0	0	0	EA				$0.00	$0.00	$0.00
	37	Remove & Dispose of Excitation equipment for 12.5 MVA Generator	8430	0	0	0	EA				$0.00	$0.00	$0.00
	38	Remove & Dispose of Surge protection equip. for 12.5 MVA Generator	8430	0	0	0	EA				$0.00	$0.00	$0.00
	39	Remove & Dispose of Neutral grounding equip. for 12.5 MVA Generator	8430	0	0	0	EA				$0.00	$0.00	$0.00
	40	Remove & Dispose of Generator Switchgear, 5kV-includes unit breakers	8430	0	0	0	EA				$0.00	$0.00	$0.00
	41	Remove & Dispose of Station Service Switchgear, 600 volt -(5 sections)	8430	0	0	0	EA				$0.00	$0.00	$0.00
	42	Remove & Dispose of Unit and plant control switchboard	8430	0	0	0	EA				$0.00	$0.00	$0.00
	43	Remove & Dispose of Battery system	8430	1	1	1	EA	$9,000.00	$10,000.00	$12,000.00	$9,000.00	$10,000.00	$12,000.00
	44	Remove & Dispose of Raceways, Conduit and Cable	8430	0	0	0	EA				$0.00	$0.00	$0.00
	45	Remove & Dispose of Misc. power & control boards	8430	0	0	0	EA				$0.00	$0.00	$0.00
	46	Remove & Dispose of Step-up Transformers, indoor, oil-filled, 1-phase, 5000kVA	8430	0	0	0	EA				$0.00	$0.00	$0.00

ESTIMATE WORKSHEET

FEATURE:

Klamath River Dams Removal
Partial Removal Option
Copco No. 1 Dam & Powerplant Removal
Escalation NOT Included
SUMMARY ESTIMATE

PROJECT: Klamath River, Northern California/Southern Oregon

WOID: AF652 | **ESTIMATE LEVEL:** Feasibility
REGION: MP | **PRICE LEVEL:** Jul-2010
FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 1\[Copco 1 - Partial Removal Crystal Ball - with Escalation - 2011-04.xlsx]Copco 1 - Full - with Esc

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	MPL QUANTITY	MP QUANTITY	MPH QUANTITY	UNIT	MPL UNIT PRICE	MP UNIT PRICE	MPH UNIT PRICE	MPL TOTAL	MP TOTAL	MPH TOTAL
	47	Remove & Dispose of Step-up Transformers, indoor, oil-filled, 1-phase, 4165 kVA	8430	0	0	0	EA				$0.00	$0.00	$0.00
	48	Remove & Dispose of Seven 40-Ton Travelling Crane motors - hoist	8430	0	0	0	EA				$0.00	$0.00	$0.00
	49	Remove & Dispose of 40-Ton Travelling Crane control equipment	8430	0	0	0	EA				$0.00	$0.00	$0.00
	50	Remove & Dispose of 40-Ton Travelling Crane Festoon Cable	8430	0	0	0	EA				$0.00	$0.00	$0.00
	51	Remove & Dispose of Four 15-Ton Overhead Crane motors - hoist	8430	0	0	0	EA				$0.00	$0.00	$0.00
	52	Remove & Dispose of 15-Ton Overhead Crane control equipment	8430	0	0	0	EA				$0.00	$0.00	$0.00
	53	Remove & Dispose of 15-Ton Overhead Crane Festoon Cable	8430	0	0	0	EA				$0.00	$0.00	$0.00
	53A	Remove Oil from Oiled-filled Step-up Transformers	8430	10,500	10,500	10,500	GAL	$9.00	$10.00	$12.00	$94,500.00	$105,000.00	$126,000.00
	54	Remove & Dispose of 69-kV circuit breakers, oil-filled, PCB	8430	2	2	2	EA	$2,500.00	$3,000.00	$3,500.00	$5,000.00	$6,000.00	$7,000.00
	55	Remove & Dispose of 69-kV disconnect switches, group-operated	8430	2	2	2	EA	$1,000.00	$1,500.00	$2,000.00	$2,000.00	$3,000.00	$4,000.00
	56	Remove & Dispose of 60-foot wood poles	8430	12	12	12	EA	$900.00	$1,000.00	$1,300.00	$10,800.00	$12,000.00	$15,600.00
	57	Remove & Dispose of 30-foot wood crossarms	8430	24	24	24	EA	$400.00	$500.00	$600.00	$9,600.00	$12,000.00	$14,400.00
	58	Remove & Dispose of 69-kV insulator strings	8430	12	12	12	EA	$300.00	$400.00	$500.00	$3,600.00	$4,800.00	$6,000.00
	59	Remove & Dispose of Transmission Line No. 3	8430	1.66	1.66	1.66	MILE	$25,000.00	$30,000.00	$40,000.00	$41,500.00	$49,800.00	$66,400.00
	60	Remove & Dispose of Transmission Line No. 15	8430	1.23	1.23	1.23	MILE	$25,000.00	$30,000.00	$40,000.00	$30,750.00	$36,900.00	$49,200.00
	61	Remove & Dispose of Transmission Line No. 26-1	8430	0.07	0.07	0.07	MILE	$25,000.00	$30,000.00	$40,000.00	$1,750.00	$2,100.00	$2,800.00
	62	Remove & Dispose of Transmission Line No. 26-2	8430	0.07	0.07	0.07	MILE	$25,000.00	$30,000.00	$40,000.00	$1,750.00	$2,100.00	$2,800.00
	63	Remove gate house #1 from top of dam	8130	0	0	0	SF				$0.00	$0.00	$0.00
	64	Remove gate house #2 from top of dam	8130	0	0	0	SF				$0.00	$0.00	$0.00
	65	Remove Concrete Items associated with 10 ft. diam. Penstocks, reinf. Concrete	8130	0	0	0	CY				$0.00	$0.00	$0.00
	66	Plug 14-foot diameter penstock with concrete	8130	0	0	0	CY				$0.00	$0.00	$0.00
	67	Remove & Dispose of 8 screens	8420	0	0	0	LBS				$0.00	$0.00	$0.00
	68	Remove & Dispose of 8 Water Gates	8420	0	0	0	LBS				$0.00	$0.00	$0.00
	69	Remove & Dispose of 3 - 30"Ø x 25' stand pipes	8420	0	0	0	LBS				$0.00	$0.00	$0.00
	70	Remove & Dispose of 14' Ø penstock pipe	8420	0	0	0	LBS				$0.00	$0.00	$0.00
	71	Remove & Dispose of 10' Ø penstock pipe	8140	0	0	0	LBS				$0.00	$0.00	$0.00
	72	Temporary Access Roads	8220	7	7	7	MILE	$60,000.00	$50,000.00	$100,000.00	$420,000.00	$350,000.00	$700,000.00
	73	Spring Ground Seeding	8220	420	420	0	ACRES	$3,000.00	$3,500.00	$4,000.00	$1,260,000.00	$1,470,000.00	$0.00
	74	Spring Barge Seeding	8220	82	82	0	ACRES	$5,000.00	$6,500.00	$8,000.00	$410,000.00	$533,000.00	$0.00
	75	Spring Aerial Seeding	8220	300	300	802	ACRES	$6,500.00	$7,500.00	$15,000.00	$1,950,000.00	$2,250,000.00	$12,030,000.00
	76	Fall Ground Seeding	8220	201	401	602	ACRES	$3,000.00	$3,500.00	$4,000.00	$603,000.00	$1,403,500.00	$2,408,000.00
	77	Riparian Pole Planting	8220	170	170	170	ACRES	$4,000.00	$8,500.00	$10,000.00	$680,000.00	$1,445,000.00	$1,700,000.00
	78	Weed Management	8220	201	401	602	ACRES	$1,000.00	$1,500.00	$2,000.00	$201,000.00	$601,500.00	$1,204,000.00
	79	Fall Ground Seeding	8220	321	321	321	ACRES	$3,000.00	$3,500.00	$4,000.00	$963,000.00	$1,123,500.00	$1,284,000.00
	80	Weed Management	8220	321	321	321	ACRES	$1,000.00	$1,500.00	$2,000.00	$321,000.00	$481,500.00	$642,000.00
	81	Sitework - Clear and Grub Disposal Area	8313	5.5	5.5	5.5	ACRES	$5,000.00	$6,000.00	$7,000.00	$27,500.00	$33,000.00	$38,500.00
	82	Sitework - Soil Cover for Disposal Area	8313	18,000	18,000	18,000	CY	$45.00	$50.00	$60.00	$810,000.00	$900,000.00	$1,080,000.00
	83	Access/Haul Road Improvements - Soil Excavation	8313	4,500	4,500	9,000	CY	$12.00	$13.00	$14.00	$54,000.00	$58,500.00	$126,000.00
	84	Access/Haul Road Improvements - Rock Excavation	8313	4,500	4,500	9,000	CY	$35.00	$40.00	$45.00	$157,500.00	$180,000.00	$405,000.00
	85	Access/Haul Road Improvements - Soil Backfill	8313	16,000	16,000	30,000	CY	$45.00	$50.00	$55.00	$720,000.00	$800,000.00	$1,650,000.00
	86	Access/Haul Road Improvements - 4" Gravel Surfacing	8313	0	320	320	TON	$80.00	$100.00	$120.00	$0.00	$32,000.00	$38,400.00
	87	County Road Improvements - Asphalt Overlay Repair - Juniper Road	8313	3	3	3	MILE	$35,000.00	$40,000.00	$350,000.00	$105,000.00	$120,000.00	$1,050,000.00
	88	County Road Improvements - Asphalt Overlay Repair - Copco Road	8313	19	19	19	MILE	$35,000.00	$40,000.00	$350,000.00	$665,000.00	$760,000.00	$6,650,000.00
	89	Mallard Cove - Concrete total	BLM	106	106	106	CY	$200.00	$300.00	$400.00	$21,200.00	$31,800.00	$42,400.00
	90	Mallard Cove - 25'x5' Dock made of composite decking and poly floats	BLM	1	1	1	EA	$2,000.00	$2,500.00	$3,000.00	$2,000.00	$2,500.00	$3,000.00
	91	Mallard Cove - 20'x5' Gangway w/ aluminum frame and railings	BLM	1	1	1	EA	$1,500.00	$2,000.00	$2,500.00	$1,500.00	$2,000.00	$2,500.00
	92	Mallard Cove - Signs to be removed and hauled away	BLM	6	6	6	EA	$250.00	$300.00	$350.00	$1,500.00	$1,800.00	$2,100.00
	93	Mallard Cove - Wood plank tables to be removed and hauled away	BLM	8	8	8	EA	$90.00	$100.00	$120.00	$720.00	$800.00	$960.00

BUREAU OF RECLAMATION

ESTIMATE WORKSHEET

FEATURE:

Klamath River Dams Removal
Partial Removal Option
Copco No. 1 Dam & Powerplant Removal
Escalation NOT Included
SUMMARY ESTIMATE

PROJECT: Klamath River, Northern California/Southern Oregon

WOID: AF652 **ESTIMATE LEVEL:** Feasibility
REGION: MP **PRICE LEVEL:** Jul-2010
FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 1\[Copco 1 - Partial Removal Crystal Ball - without Escalation - 2011-04.xlsx]Copco 1 - Full - with Esc

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	MPL QUANTITY	MP QUANTITY	MPH QUANTITY	UNIT	MPL UNIT PRICE	MP UNIT PRICE	MPH UNIT PRICE	MPL TOTAL	MP TOTAL	MPH TOTAL
	94	Mallard Cove - Parking area to be regraded, ripped, seeded and planted	BLM	2.5	2.5	2.5	ACRES	$20,000.00	$25,000.00	$30,000.00	$50,000.00	$62,500.00	$75,000.00
	95	Copco Cove - Concrete total	BLM	84	84	84	CY	$200.00	$300.00	$400.00	$16,800.00	$25,200.00	$33,600.00
	96	Copco Cove - Dock abutment railing made of 2.5" dia. steel pipe	BLM	25	25	25	LF	$35.00	$40.00	$45.00	$875.00	$1,000.00	$1,125.00
	97	Copco Cove - Signs to be removed and hauled away	BLM	6	6	6	EA	$250.00	$300.00	$350.00	$1,500.00	$1,800.00	$2,100.00
	98	Copco Cove - Wood plank tables to be removed and hauled away	BLM	2	2	2	EA	$90.00	$100.00	$120.00	$180.00	$200.00	$240.00
	99	Copco Cove - Regrade, rip, seed and plant disturbed areas	BLM	2.3	2.3	2.3	ACRES	$20,000.00	$25,000.00	$30,000.00	$46,000.00	$57,500.00	$69,000.00
		Subtotal 1									$21,703,425.00	$25,615,100.00	$45,424,575.00
		Mobilization (MPL ~ 5%; MP ~ 5%; MPH ~ 5%)		1	1	1	ls	$1,100,000.00	$1,300,000.00	$2,300,000.00	$1,100,000.00	$1,300,000.00	$2,300,000.00
		Subtotal 1 w/ mobilization											
		Escalation to Notice to Proceed (NTP)									$0.00	$0.00	$0.00
		NOT INCLUDED											
		Design Contingencies (MPL ~ 8%; MP ~ 10%; MPH ~ 15%)		1	1	1	ls	$2,196,575.00	$3,084,900.00	$7,177,760.00	$2,196,575.00	$3,084,900.00	$7,177,760.00
		APS = Allowance for Procurement		1	1	1	ls	$0.00	$0.00	$1,097,665.00	$0.00	$0.00	$1,097,665.00
		Strategies (if applicable) (MPL ~ 0%; MP ~ 0%; MPH ~ 2%)											
		CONTRACT COST									**$25,000,000.00**	**$30,000,000.00**	**$56,000,000.00**
		Construction Contingencies (MPL ~ 18%; MP ~ 20%; MPH ~ 25%)		1	1	1	ls	$4,000,000.00	$6,000,000.00	$14,000,000.00	$4,000,000.00	$6,000,000.00	$14,000,000.00
		FIELD COST									**$29,000,000.00**	**$36,000,000.00**	**$70,000,000.00**
		Non-Contract Cost (MPL ~ 62%; MP ~ 65%; MPH ~ 71%)		1	1	1	ls	$18,000,000.00	$23,000,000.00	$50,000,000.00	$18,000,000.00	$23,000,000.00	$50,000,000.00
		CONSTRUCTION COST									**$47,000,000.00**	**$59,000,000.00**	**$120,000,000.00**

Notes: This estimate does not include non-contract costs and should not be used for funding purposes.
Reference documents RM D&S Cost Estimate (FAC 09-01) and RM D&S CCE and PCE (FAC 09-02)

QUANTITIES			PRICES		
BY	See Group Worksheets	CHECKED: See Group Worksheets	BY	Craig Grush, P.E.	CHECKED
DATE PREPARED	1/20/2011	PEER REVIEW: See Group Worksheets	DATE PREPARED	06/02/11	PEER REVIEW

06-02-11
6/3/11

Crystal Ball Report - Full
Simulation started on 6/8/2011 at 11:54:02
Simulation stopped on 6/8/2011 at 11:54:44

Run preferences:	
Number of trials run	10,000
Monte Carlo	
Seed	999
Precision control on	
Confidence level	95.00%
Run statistics:	
Total running time (sec)	41.17
Trials/second (average)	243
Random numbers per sec	28,663
Crystal Ball data:	
Assumptions	118
Correlations	0
Correlated groups	0
Decision variables	0
Forecasts	3

TECHNICAL SERVICE CENTER
ESTIMATING, SPECIFICATIONS
AND VALUE PROGRAM GROUP
UNIT PRICES BY Craig A. Grusy
DATE 6/8/2011

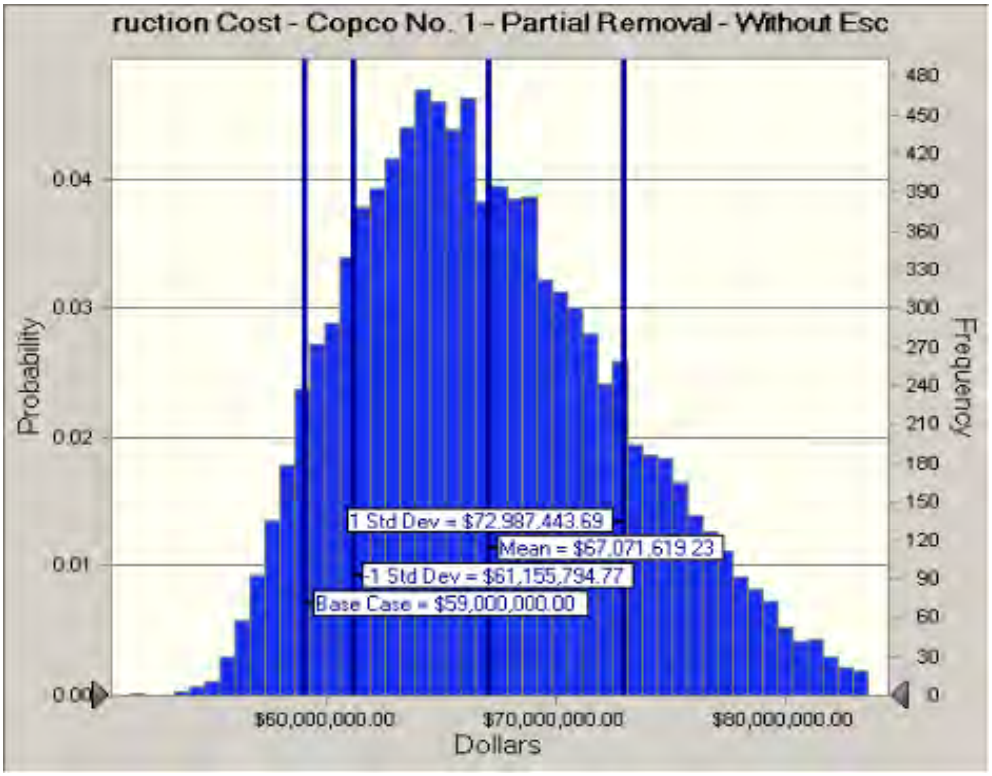
DATE	PEER REVIEWER(S)	CODE
6/9/11	Signature DAN MAY Printed Name	8170
	Signature Printed Name	
Author Initials	PEER REVIEW NOT REQUIRED	

Forecasts

Worksheet: [Copco 1 - Partial Removal Crystal Ball - without Escalation - 2011-04.xls]Copco 1

Forecast: Construction Cost - Copco No. 1 - Partial Removal - Without Escalation Cell: U129

Summary:
Entire range is from $51,342,861.93 to $90,638,468.04
Base case is $59,000,000.00
After 10,000 trials, the std. error of the mean is $59,158.24



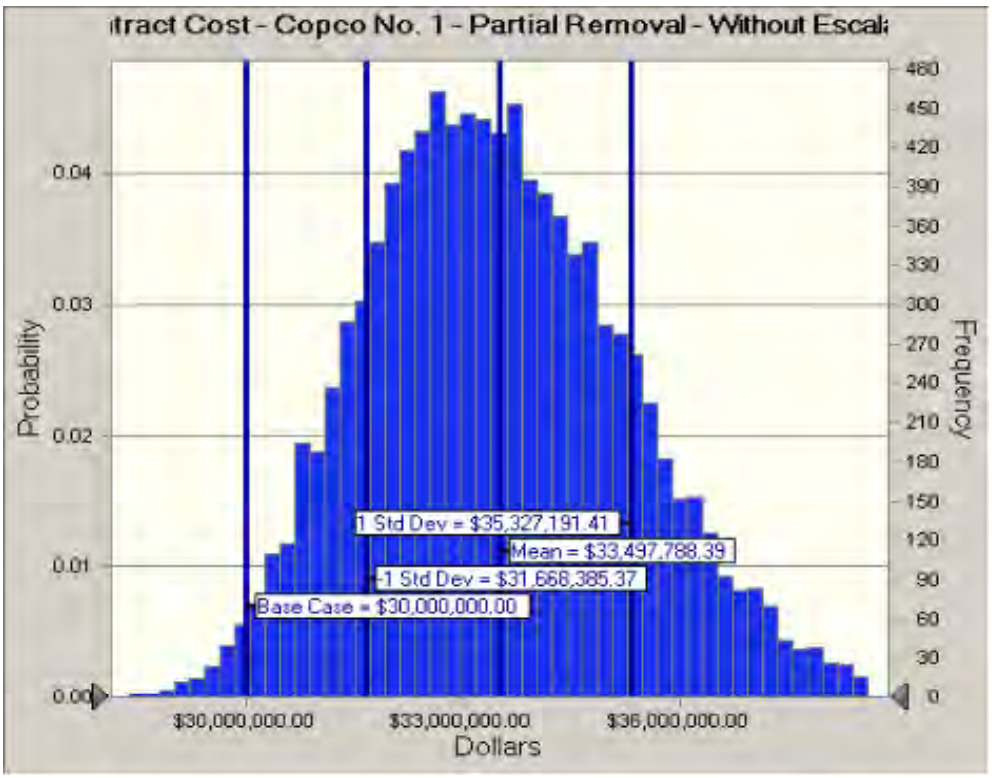
Forecast: Construction Cost - Copco No. 1 - Partial Removal - Without Escalation (cont'd) **Cell: U129**

Statistics:	Forecast values
Trials	10,000
Mean	$67,071,619.23
Median	$66,341,698.50
Mode	---
Standard Deviation	$5,915,824.46
Variance	$34,996,979,085,265.10
Skewness	0.5224
Kurtosis	2.95
Coeff. of Variability	0.0882
Minimum	$51,342,861.93
Maximum	$90,638,468.04
Range Width	$39,295,606.11
Mean Std. Error	$59,158.24

Percentiles:	Forecast values
0%	$51,342,861.93
10%	$59,864,919.45
20%	$61,841,766.75
30%	$63,442,111.71
40%	$64,887,834.65
50%	$66,339,421.44
60%	$68,022,724.21
70%	$69,825,928.90
80%	$72,117,139.42
90%	$75,317,490.46
100%	$90,638,468.04

Forecast: Contract Cost - Copco No. 1 - Partial Removal - Without Escalation **Cell: U125**

Summary:
Entire range is from $28,189,145.50 to $40,757,494.90
Base case is $30,000,000.00
After 10,000 trials, the std. error of the mean is $18,294.03



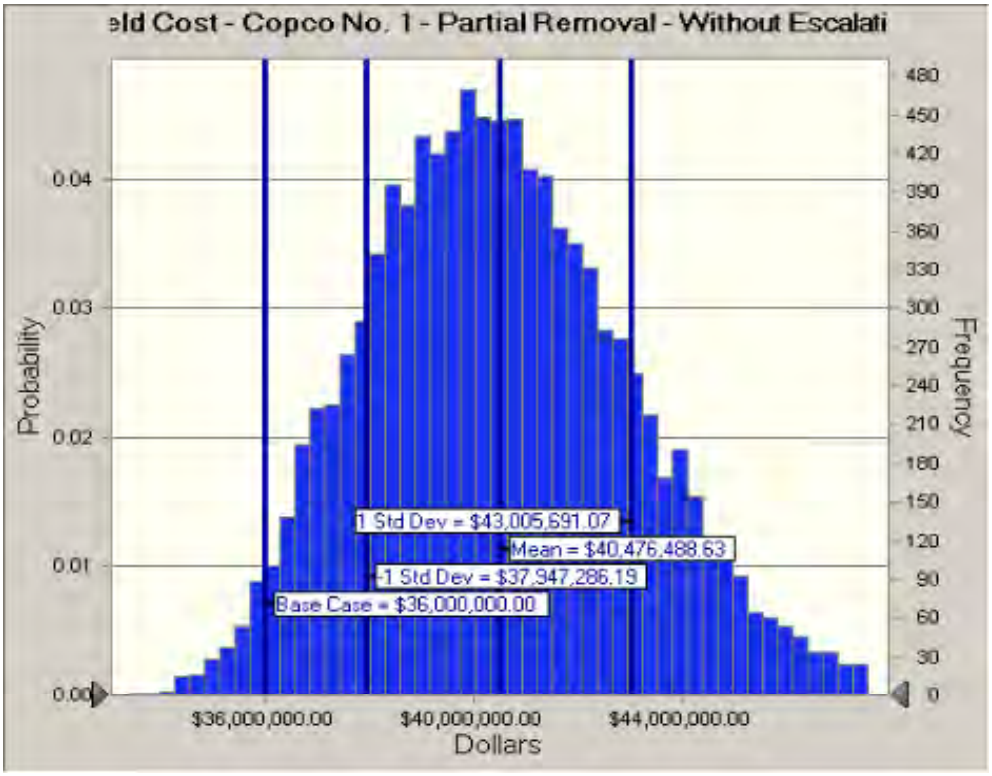
Forecast: Contract Cost - Copco No. 1 - Partial Removal - Without Escalation (cont'd) Cell: U125

Statistics:	Forecast values
Trials	10,000
Mean	$33,497,788.39
Median	$33,374,726.65
Mode	---
Standard Deviation	$1,829,403.02
Variance	$3,346,715,407,656.47
Skewness	0.3606
Kurtosis	3.02
Coeff. of Variability	0.0546
Minimum	$28,189,145.50
Maximum	$40,757,494.90
Range Width	$12,568,349.40
Mean Std. Error	$18,294.03

Percentiles:	Forecast values
0%	$28,189,145.50
10%	$31,245,112.94
20%	$31,920,140.66
30%	$32,436,587.32
40%	$32,902,335.45
50%	$33,374,635.79
60%	$33,853,099.97
70%	$34,395,434.23
80%	$35,034,582.01
90%	$35,911,319.76
100%	$40,757,494.90

Forecast: Field Cost - Copco No. 1 - Partial Removal - Without Escalation **Cell: U127**

Summary:
Entire range is from $32,994,863.44 to $50,620,368.46
Base case is $36,000,000.00
After 10,000 trials, the std. error of the mean is $25,292.02



Forecast: Field Cost - Copco No. 1 - Partial Removal - Without Escalation (cont'd) Cell: U127

Statistics:	Forecast values
Trials	10,000
Mean	$40,476,488.63
Median	$40,322,462.90
Mode	---
Standard Deviation	$2,529,202.44
Variance	$6,396,864,996,901.06
Skewness	0.3286
Kurtosis	2.94
Coeff. of Variability	0.0625
Minimum	$32,994,863.44
Maximum	$50,620,368.46
Range Width	$17,625,505.02
Mean Std. Error	$25,292.02

Percentiles:	Forecast values
0%	$32,994,863.44
10%	$37,275,871.90
20%	$38,286,050.95
30%	$39,019,073.79
40%	$39,689,837.01
50%	$40,322,127.12
60%	$40,978,921.88
70%	$41,709,018.12
80%	$42,611,949.03
90%	$43,868,343.10
100%	$50,620,368.46

End of Forecasts

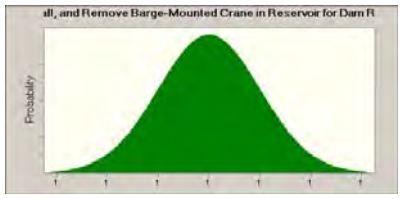
Assumptions

Worksheet: [Copco 1 - Partial Removal Crystal Ball - without Escalation - 2011-04.xls]Copco 1

Assumption: 1 Furnish, Install, and Remove Barge-Mounted Crane in Reservoir for Dam R **Cell: L14**

Normal distribution with parameters:

Mean	1	(=L14)
Std. Dev.	0	(=0.000001)



Assumption: 1 Furnish, Install, and Remove Barge-Mounted Crane in Reservoir for Dam R **Cell: R14**

BetaPERT distribution with parameters:

Minimum	$340,000.00	(=Q14)
Likeliest	$350,000.00	(=R14)
Maximum	$370,000.00	(=S14)

Assumption: 10 Remove Concrete Dam down to Elev. 2476 Quantity **Cell: L23**

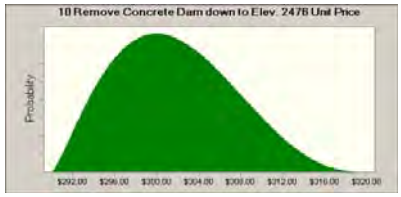
Normal distribution with parameters:

Mean	36,000	(=L23)
Std. Dev.	0	(=0.000001)

Assumption: 10 Remove Concrete Dam down to Elev. 2476 Unit Price **Cell: R23**

BetaPERT distribution with parameters:

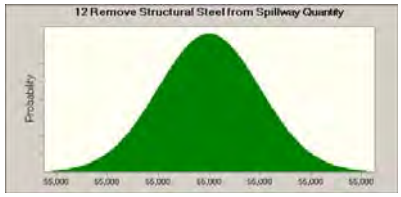
Minimum	$290.00	(=Q23)
Likeliest	$300.00	(=R23)
Maximum	$320.00	(=S23)



Assumption: 12 Remove Structural Steel from Spillway Quantity **Cell: L25**

Normal distribution with parameters:

Mean	55,000	(=L25)
Std. Dev.	0	(=0.000001)



Assumption: 12 Remove Structural Steel from Spillway Unit Price **Cell: R25**

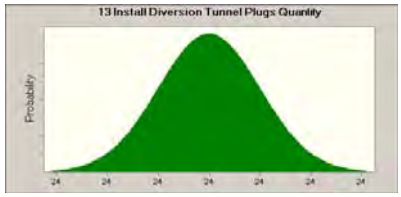
BetaPERT distribution with parameters:

Minimum	$0.70	(=Q25)
Likeliest	$1.00	(=R25)
Maximum	$1.50	(=S25)

Assumption: 13 Install Diversion Tunnel Plugs Quantity **Cell: L26**

Normal distribution with parameters:

Mean	24	(=L26)
Std. Dev.	0	(=0.000001)



Assumption: 13 Install Diversion Tunnel Plugs Unit Price **Cell: R26**

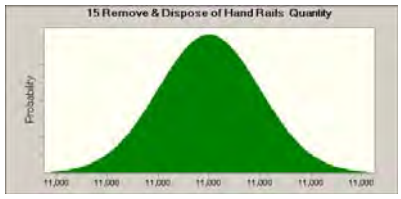
BetaPERT distribution with parameters:

Minimum	$1,100.00	(=Q26)
Likeliest	$1,200.00	(=R26)
Maximum	$1,300.00	(=S26)

Assumption: 15 Remove & Dispose of Hand Rails Quantity **Cell: L28**

Normal distribution with parameters:

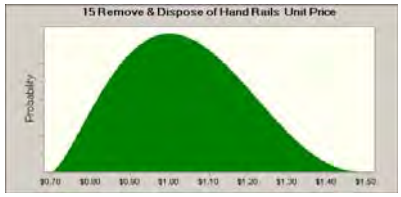
Mean	11,000	(=L28)
Std. Dev.	0	(=0.000001)



Assumption: 15 Remove & Dispose of Hand Rails Unit Price **Cell: R28**

BetaPERT distribution with parameters:

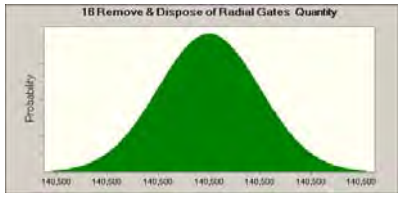
Minimum	$0.70	(=Q28)
Likeliest	$1.00	(=R28)
Maximum	$1.50	(=S28)



Assumption: 16 Remove & Dispose of Radial Gates Quantity **Cell: L29**

Normal distribution with parameters:

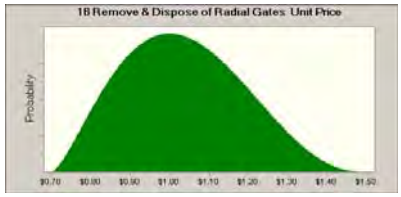
Mean	140,500	(=L29)
Std. Dev.	0	(=0.000001)



Assumption: 16 Remove & Dispose of Radial Gates Unit Price **Cell: R29**

BetaPERT distribution with parameters:

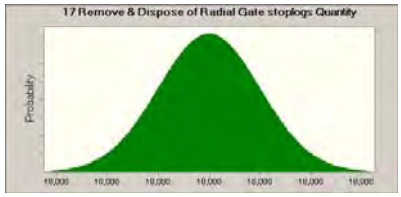
Minimum	$0.70	(=Q29)
Likeliest	$1.00	(=R29)
Maximum	$1.50	(=S29)



Assumption: 17 Remove & Dispose of Radial Gate stoplogs Quantity **Cell: L30**

Normal distribution with parameters:

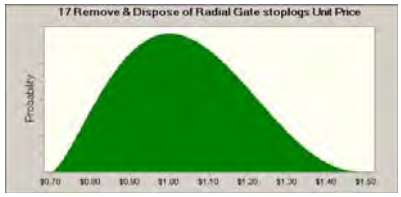
Mean	18,000	(=L30)
Std. Dev.	0	(=0.000001)



Assumption: 17 Remove & Dispose of Radial Gate stoplogs Unit Price **Cell: R30**

BetaPERT distribution with parameters:

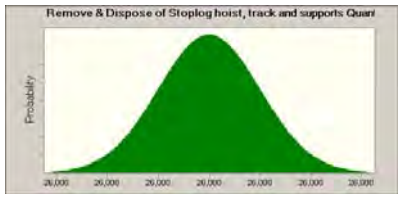
Minimum	$0.70	(=Q30)
Likeliest	$1.00	(=R30)
Maximum	$1.50	(=S30)



Assumption: 18 Remove & Dispose of Stoplog hoist, track and supports Quantity **Cell: L31**

Normal distribution with parameters:

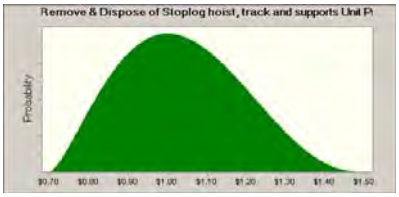
Mean	26,000	(=L31)
Std. Dev.	0	(=0.000001)



Assumption: 18 Remove & Dispose of Stoplog hoist, track and supports Unit Price **Cell: R31**

BetaPERT distribution with parameters:

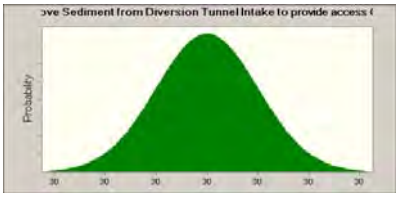
Minimum	$0.70	(=Q31)
Likeliest	$1.00	(=R31)
Maximum	$1.50	(=S31)



Assumption: 2 Remove Sediment from Diversion Tunnel Intake to provide access Quantity **Cell: L15**

Normal distribution with parameters:

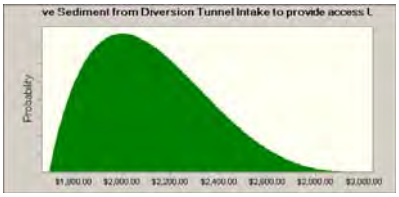
Mean	30	(=L15)
Std. Dev.	0	(=0.000001)



Assumption: 2 Remove Sediment from Diversion Tunnel Intake to provide access Unit Price **Cell: R15**

BetaPERT distribution with parameters:

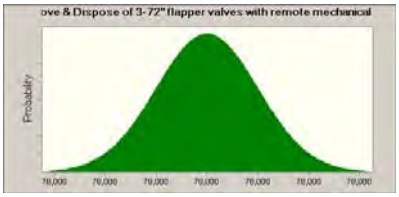
Minimum	$1,700.00	(=Q15)
Likeliest	$2,000.00	(=R15)
Maximum	$3,000.00	(=S15)



Assumption: 21 Remove & Dispose of 3-72" flapper valves with remote mechanical Quantity Cell: L34

Normal distribution with parameters:

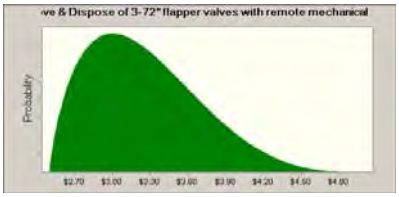
Mean	78,000	(=L34)
Std. Dev.	0	(=0.000001)



Assumption: 21 Remove & Dispose of 3-72" flapper valves with remote mechanical Unit: Cell: R34

BetaPERT distribution with parameters:

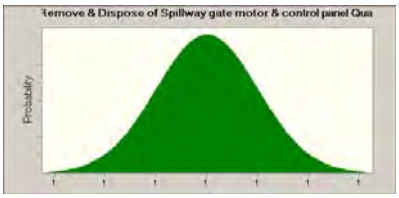
Minimum	$2.50	(=Q34)
Likeliest	$3.00	(=R34)
Maximum	$5.00	(=S34)



Assumption: 22 Remove & Dispose of Spillway gate motor & control panel Quantity Cell: L35

Normal distribution with parameters:

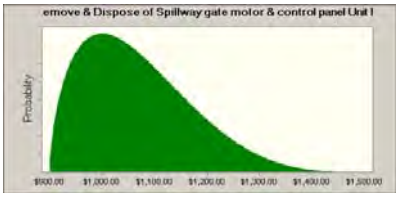
Mean	1	(=L35)
Std. Dev.	0	(=0.000001)



Assumption: 22 Remove & Dispose of Spillway gate motor & control panel Unit Price **Cell: R35**

BetaPERT distribution with parameters:

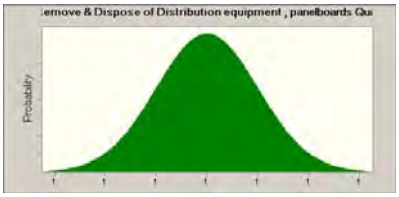
Minimum	$900.00	(=Q35)
Likeliest	$1,000.00	(=R35)
Maximum	$1,500.00	(=S35)



Assumption: 23 Remove & Dispose of Distribution equipment , panelboards Quantity **Cell: L36**

Normal distribution with parameters:

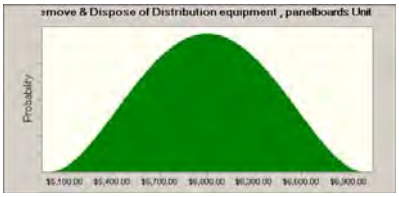
Mean	1	(=L36)
Std. Dev.	0	(=0.000001)



Assumption: 23 Remove & Dispose of Distribution equipment , panelboards Unit Price **Cell: R36**

BetaPERT distribution with parameters:

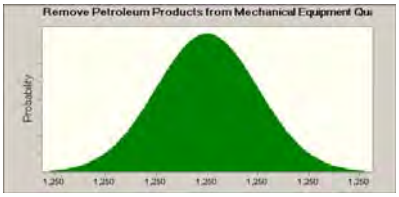
Minimum	$5,000.00	(=Q36)
Likeliest	$6,000.00	(=R36)
Maximum	$7,000.00	(=S36)



Assumption: 35A Remove Petroleum Products from Mechanical Equipment Quantity **Cell: L49**

Normal distribution with parameters:

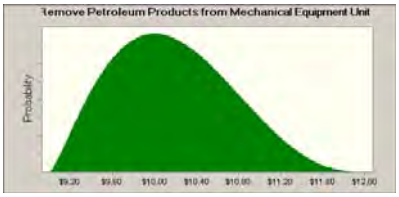
Mean	1,250	(=L49)
Std. Dev.	0	(=0.000001)



Assumption: 35A Remove Petroleum Products from Mechanical Equipment Unit Price **Cell: R49**

BetaPERT distribution with parameters:

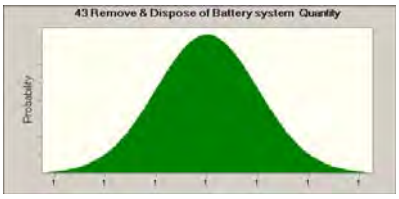
Minimum	$9.00	(=Q49)
Likeliest	$10.00	(=R49)
Maximum	$12.00	(=S49)



Assumption: 43 Remove & Dispose of Battery system Quantity **Cell: L57**

Normal distribution with parameters:

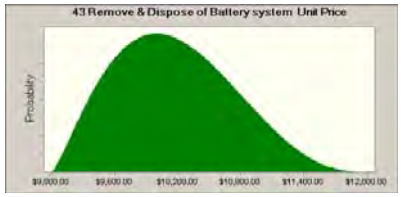
Mean	1	(=L57)
Std. Dev.	0	(=0.000001)



Assumption: 43 Remove & Dispose of Battery system Unit Price **Cell: R57**

BetaPERT distribution with parameters:

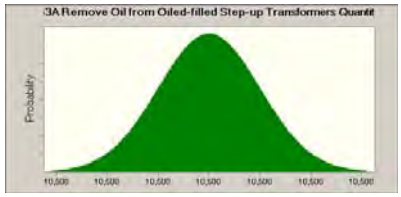
Minimum	$9,000.00	(=Q57)
Likeliest	$10,000.00	(=R57)
Maximum	$12,000.00	(=S57)



Assumption: 53A Remove Oil from Oiled-filled Step-up Transformers Quantity **Cell: L68**

Normal distribution with parameters:

Mean	10,500	(=L68)
Std. Dev.	0	(=0.000001)



Assumption: 53A Remove Oil from Oiled-filled Step-up Transformers Unit Price **Cell: R68**

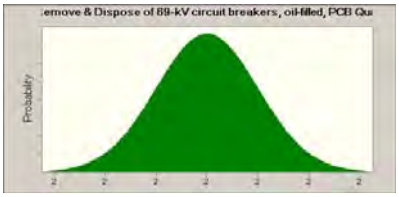
BetaPERT distribution with parameters:

Minimum	$9.00	(=Q68)
Likeliest	$10.00	(=R68)
Maximum	$12.00	(=S68)

Assumption: 54 Remove & Dispose of 69-kV circuit breakers, oil-filled, PCB QuantityCell: L69

Normal distribution with parameters:

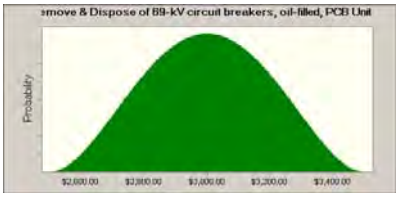
Mean	2	(=L69)
Std. Dev.	0	(=0.000001)



Assumption: 54 Remove & Dispose of 69-kV circuit breakers, oil-filled, PCB Unit PriceCell: R69

BetaPERT distribution with parameters:

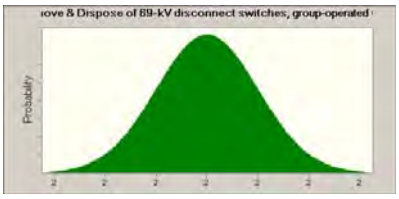
Minimum	$2,500.00	(=Q69)
Likeliest	$3,000.00	(=R69)
Maximum	$3,500.00	(=S69)



Assumption: 55 Remove & Dispose of 69-kV disconnect switches, group-operated QuantityCell: L70

Normal distribution with parameters:

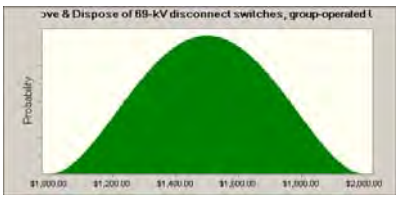
Mean	2	(=L70)
Std. Dev.	0	(=0.000001)



Assumption: 55 Remove & Dispose of 69-kV disconnect switches, group-operated Unit Price **Cell: R70**

BetaPERT distribution with parameters:

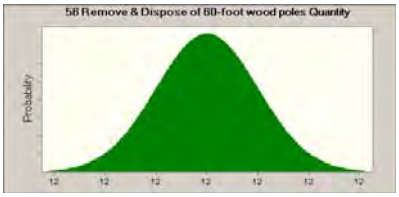
Minimum	$1,000.00	(=Q70)
Likeliest	$1,500.00	(=R70)
Maximum	$2,000.00	(=S70)



Assumption: 56 Remove & Dispose of 60-foot wood poles Quantity **Cell: L71**

Normal distribution with parameters:

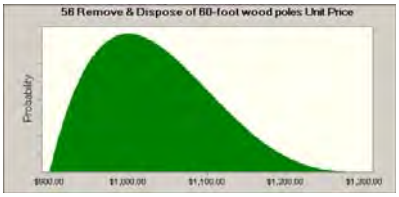
Mean	12	(=L71)
Std. Dev.	0	(=0.000001)



Assumption: 56 Remove & Dispose of 60-foot wood poles Unit Price **Cell: R71**

BetaPERT distribution with parameters:

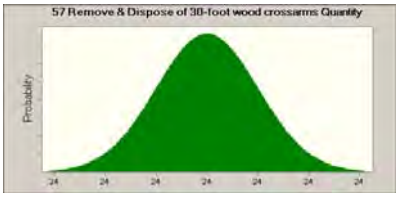
Minimum	$900.00	(=Q71)
Likeliest	$1,000.00	(=R71)
Maximum	$1,300.00	(=S71)



Assumption: 57 Remove & Dispose of 30-foot wood crossarms Quantity **Cell: L72**

Normal distribution with parameters:

Mean	24	(=L72)
Std. Dev.	0	(=0.000001)



Assumption: 57 Remove & Dispose of 30-foot wood crossarms Unit Price **Cell: R72**

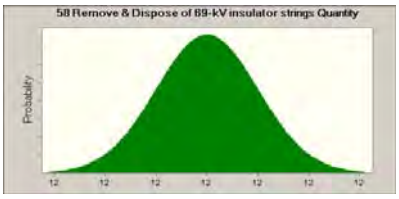
BetaPERT distribution with parameters:

Minimum	$400.00	(=Q72)
Likeliest	$500.00	(=R72)
Maximum	$600.00	(=S72)

Assumption: 58 Remove & Dispose of 69-kV insulator strings Quantity **Cell: L73**

Normal distribution with parameters:

Mean	12	(=L73)
Std. Dev.	0	(=0.000001)



Assumption: 58 Remove & Dispose of 69-kV insulator strings Unit Price **Cell: R73**

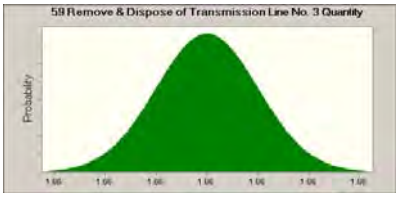
BetaPERT distribution with parameters:

Minimum	$300.00	(=Q73)
Likeliest	$400.00	(=R73)
Maximum	$500.00	(=S73)

Assumption: 59 Remove & Dispose of Transmission Line No. 3 Quantity **Cell: L74**

Normal distribution with parameters:

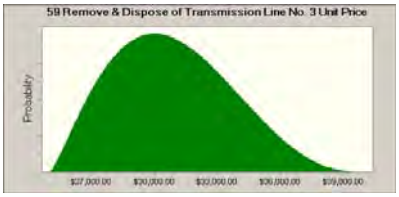
Mean	1.66	(=L74)
Std. Dev.	0.00	(=0.000001)



Assumption: 59 Remove & Dispose of Transmission Line No. 3 Unit Price **Cell: R74**

BetaPERT distribution with parameters:

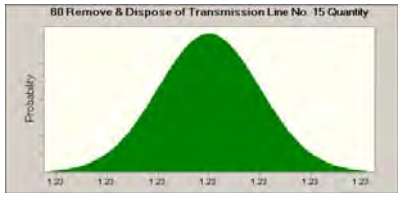
Minimum	$25,000.00	(=Q74)
Likeliest	$30,000.00	(=R74)
Maximum	$40,000.00	(=S74)



Assumption: 60 Remove & Dispose of Transmission Line No. 15 Quantity **Cell: L75**

Normal distribution with parameters:

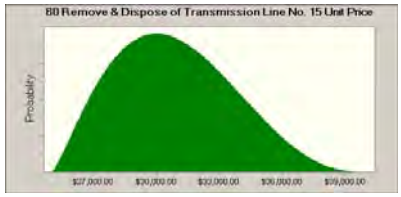
Mean	1.23	(=L75)
Std. Dev.	0.00	(=0.000001)



Assumption: 60 Remove & Dispose of Transmission Line No. 15 Unit Price **Cell: R75**

BetaPERT distribution with parameters:

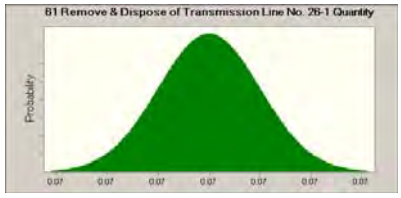
Minimum	$25,000.00	(=Q75)
Likeliest	$30,000.00	(=R75)
Maximum	$40,000.00	(=S75)



Assumption: 61 Remove & Dispose of Transmission Line No. 26-1 Quantity **Cell: L76**

Normal distribution with parameters:

Mean	0.07	(=L76)
Std. Dev.	0.00	(=0.000001)



Assumption: 61 Remove & Dispose of Transmission Line No. 26-1 Unit Price **Cell: R76**

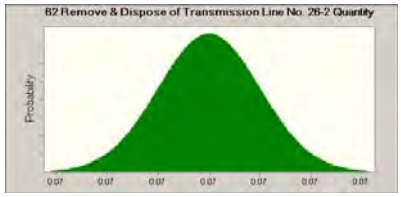
BetaPERT distribution with parameters:

Minimum	$25,000.00	(=Q76)
Likeliest	$30,000.00	(=R76)
Maximum	$40,000.00	(=S76)

Assumption: 62 Remove & Dispose of Transmission Line No. 26-2 Quantity **Cell: L77**

Normal distribution with parameters:

Mean	0.07	(=L77)
Std. Dev.	0.00	(=0.000001)



Assumption: 62 Remove & Dispose of Transmission Line No. 26-2 Unit Price **Cell: R77**

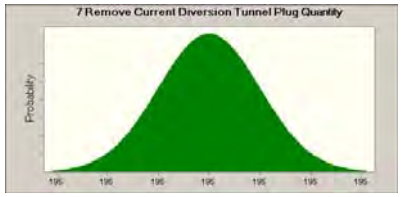
BetaPERT distribution with parameters:

Minimum	$25,000.00	(=Q77)
Likeliest	$30,000.00	(=R77)
Maximum	$40,000.00	(=S77)

Assumption: 7 Remove Current Diversion Tunnel Plug Quantity **Cell: L20**

Normal distribution with parameters:

Mean	195	(=L20)
Std. Dev.	0	(=0.000001)



Assumption: 7 Remove Current Diversion Tunnel Plug Unit Price **Cell: R20**

BetaPERT distribution with parameters:

Minimum	$1,400.00	(=Q20)
Likeliest	$1,500.00	(=R20)
Maximum	$1,800.00	(=S20)

Assumption: 72 Temporary Access Roads Quantity **Cell: L87**

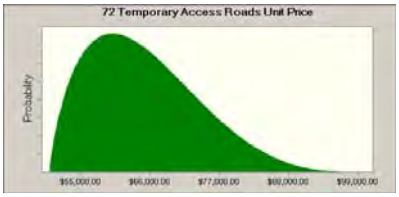
Normal distribution with parameters:

Mean	7	(=L87)
Std. Dev.	0	(=0.000001)

Assumption: 72 Temporary Access Roads Unit Price **Cell: R87**

BetaPERT distribution with parameters:

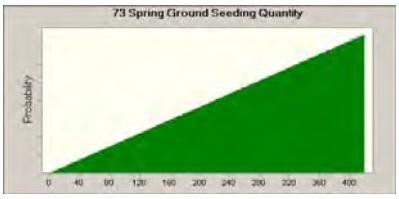
Minimum	$50,000.00	(=R87)
Likeliest	$60,000.00	(=Q87)
Maximum	$100,000.00	(=S87)



Assumption: 73 Spring Ground Seeding Quantity **Cell: L88**

Triangular distribution with parameters:

Minimum	0	(=M88)
Likeliest	420	(=L88)
Maximum	420	(=K88)



Assumption: 73 Spring Ground Seeding Unit Price **Cell: R88**

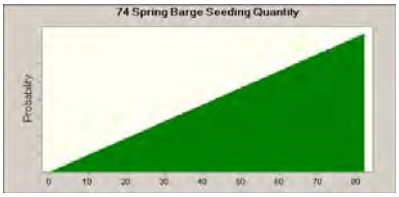
BetaPERT distribution with parameters:

Minimum	$3,000.00	(=Q88)
Likeliest	$3,500.00	(=R88)
Maximum	$4,000.00	(=S88)

Assumption: 74 Spring Barge Seeding Quantity **Cell: L89**

Triangular distribution with parameters:

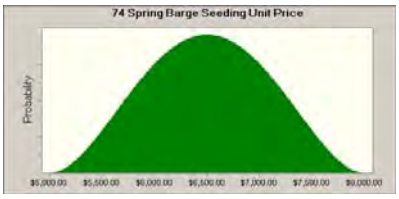
Minimum	0	(=M89)
Likeliest	82	(=L89)
Maximum	82	(=K89)



Assumption: 74 Spring Barge Seeding Unit Price **Cell: R89**

BetaPERT distribution with parameters:

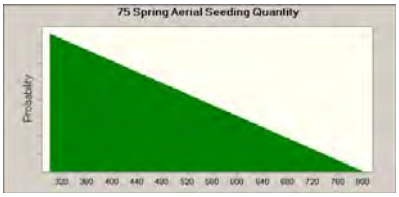
Minimum	$5,000.00	(=Q89)
Likeliest	$6,500.00	(=R89)
Maximum	$8,000.00	(=S89)



Assumption: 75 Spring Aerial Seeding Quantity **Cell: L90**

Triangular distribution with parameters:

Minimum	300	(=K90)
Likeliest	300	(=L90)
Maximum	802	(=M90)



Assumption: 75 Spring Aerial Seeding Unit Price **Cell: R90**

BetaPERT distribution with parameters:

Minimum	$6,500.00	(=Q90)
Likeliest	$7,500.00	(=R90)
Maximum	$15,000.00	(=S90)

Assumption: 76 Fall Ground Seeding Quantity **Cell: L91**

Triangular distribution with parameters:

Minimum	201	(=K91)
Likeliest	401	(=L91)
Maximum	602	(=M91)

Assumption: 76 Fall Ground Seeding Unit Price **Cell: R91**

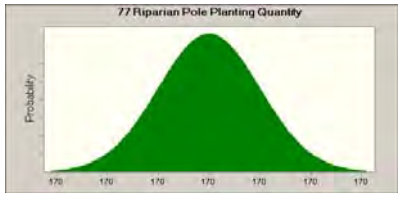
BetaPERT distribution with parameters:

Minimum	$3,000.00	(=Q91)
Likeliest	$3,500.00	(=R91)
Maximum	$4,000.00	(=S91)

Assumption: 77 Riparian Pole Planting Quantity **Cell: L92**

Normal distribution with parameters:

Mean	170	(=L92)
Std. Dev.	0	(=0.000001)



Assumption: 77 Riparian Pole Planting Unit Price **Cell: R92**

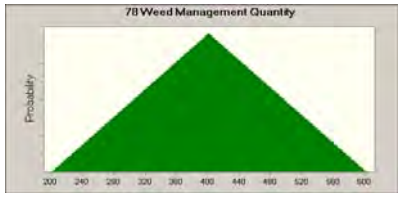
BetaPERT distribution with parameters:

Minimum	$4,000.00	(=Q92)
Likeliest	$8,500.00	(=R92)
Maximum	$10,000.00	(=S92)

Assumption: 78 Weed Management Quantity **Cell: L93**

Triangular distribution with parameters:

Minimum	201	(=K93)
Likeliest	401	(=L93)
Maximum	602	(=M93)



Assumption: 78 Weed Management Unit Price **Cell: R93**

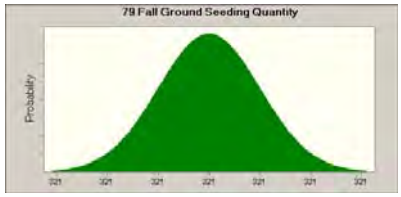
BetaPERT distribution with parameters:

Minimum	$1,000.00	(=Q93)
Likeliest	$1,500.00	(=R93)
Maximum	$2,000.00	(=S93)

Assumption: 79 Fall Ground Seeding Quantity **Cell: L94**

Normal distribution with parameters:

Mean	321	(=L94)
Std. Dev.	0	(=0.000001)



Assumption: 79 Fall Ground Seeding Unit Price **Cell: R94**

BetaPERT distribution with parameters:

Minimum	$3,000.00	(=Q94)
Likeliest	$3,500.00	(=R94)
Maximum	$4,000.00	(=S94)

Assumption: 80 Weed Management Quantity **Cell: L95**

Normal distribution with parameters:

Mean	321	(=L95)
Std. Dev.	0	(=0.000001)

Assumption: 80 Weed Management Unit Price **Cell: R95**

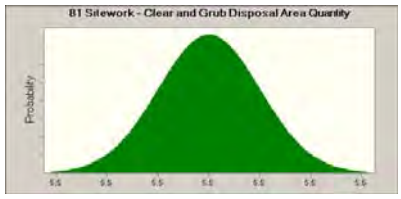
BetaPERT distribution with parameters:

Minimum	$1,000.00	(=Q95)
Likeliest	$1,500.00	(=R95)
Maximum	$2,000.00	(=S95)

Assumption: 81 Sitework - Clear and Grub Disposal Area Quantity **Cell: L96**

Normal distribution with parameters:

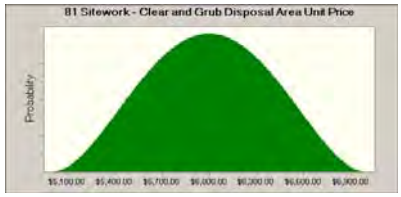
Mean	5.5	(=L96)
Std. Dev.	0.0	(=0.000001)



Assumption: 81 Sitework - Clear and Grub Disposal Area Unit Price **Cell: R96**

BetaPERT distribution with parameters:

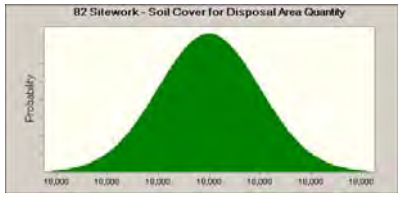
Minimum	$5,000.00	(=Q96)
Likeliest	$6,000.00	(=R96)
Maximum	$7,000.00	(=S96)



Assumption: 82 Sitework - Soil Cover for Disposal Area Quantity **Cell: L97**

Normal distribution with parameters:

Mean	18,000	(=L97)
Std. Dev.	0	(=0.000001)



Assumption: 82 Sitework - Soil Cover for Disposal Area Unit Price **Cell: R97**

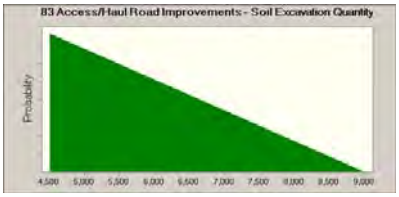
BetaPERT distribution with parameters:

Minimum	$45.00	(=Q97)
Likeliest	$50.00	(=R97)
Maximum	$60.00	(=S97)

Assumption: 83 Access/Haul Road Improvements - Soil Excavation Quantity **Cell: L98**

Triangular distribution with parameters:

Minimum	4,500	(=K98)
Likeliest	4,500	(=L98)
Maximum	9,000	(=M98)



Assumption: 83 Access/Haul Road Improvements - Soil Excavation Unit Price **Cell: R98**

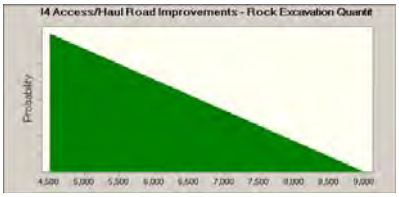
BetaPERT distribution with parameters:

Minimum	$12.00	(=Q98)
Likeliest	$13.00	(=R98)
Maximum	$14.00	(=S98)

Assumption: 84 Access/Haul Road Improvements - Rock Excavation Quantity **Cell: L99**

Triangular distribution with parameters:

Minimum	4,500	(=K99)
Likeliest	4,500	(=L99)
Maximum	9,000	(=M99)



Assumption: 84 Access/Haul Road Improvements - Rock Excavation Unit Price **Cell: R99**

BetaPERT distribution with parameters:

Minimum	$35.00	(=Q99)
Likeliest	$40.00	(=R99)
Maximum	$45.00	(=S99)

Assumption: 85 Access/Haul Road Improvements - Soil Backfill Quantity **Cell: L100**

Triangular distribution with parameters:

Minimum	16,000	(=K100)
Likeliest	16,000	(=L100)
Maximum	30,000	(=M100)

Assumption: 85 Access/Haul Road Improvements - Soil Backfill Unit Price **Cell: R100**

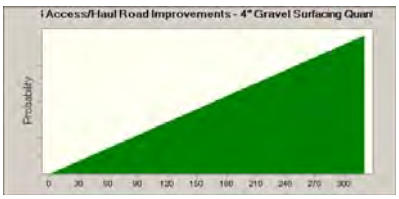
BetaPERT distribution with parameters:

Minimum	$45.00	(=Q100)
Likeliest	$50.00	(=R100)
Maximum	$55.00	(=S100)

Assumption: 86 Access/Haul Road Improvements - 4" Gravel Surfacing Quantity **Cell: L101**

Triangular distribution with parameters:

Minimum	0	(=K101)
Likeliest	320	(=L101)
Maximum	320	(=M101)



Assumption: 86 Access/Haul Road Improvements - 4" Gravel Surfacing Unit Price **Cell: R101**

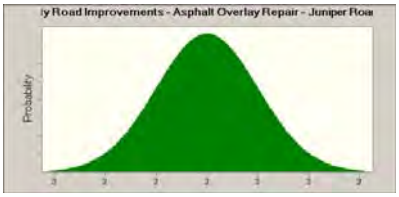
BetaPERT distribution with parameters:

Minimum	$80.00	(=Q101)
Likeliest	$100.00	(=R101)
Maximum	$120.00	(=S101)

Assumption: 87 County Road Improvements - Asphalt Overlay Repair - Juniper Road Qua **Cell: L102**

Normal distribution with parameters:

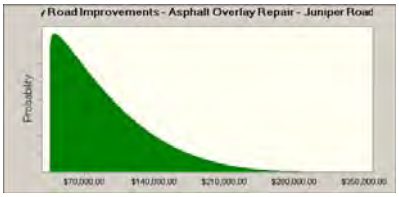
Mean	3	(=L102)
Std. Dev.	0	(=0.000001)



Assumption: 87 County Road Improvements - Asphalt Overlay Repair - Juniper Road **CellUnR102**

BetaPERT distribution with parameters:

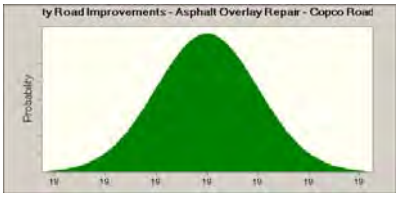
Minimum	$35,000.00	(=Q102)
Likeliest	$40,000.00	(=R102)
Maximum	$350,000.00	(=S102)



Assumption: 88 County Road Improvements - Asphalt Overlay Repair - Copco Road **CellL103**

Normal distribution with parameters:

Mean	19	(=L103)
Std. Dev.	0	(=0.000001)



Assumption: 88 County Road Improvements - Asphalt Overlay Repair - Copco Road **CellUnR103**

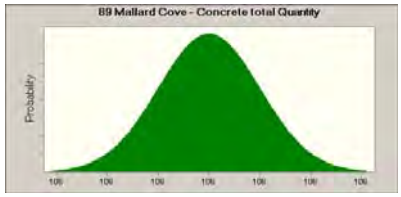
BetaPERT distribution with parameters:

Minimum	$35,000.00	(=Q103)
Likeliest	$40,000.00	(=R103)
Maximum	$350,000.00	(=S103)

Assumption: 89 Mallard Cove - Concrete total Quantity **Cell: L104**

Normal distribution with parameters:

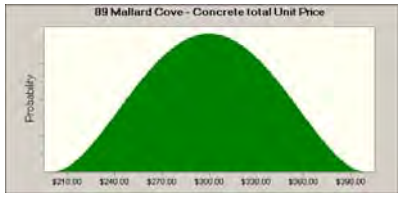
Mean	106	(=L104)
Std. Dev.	0	(=0.000001)



Assumption: 89 Mallard Cove - Concrete total Unit Price **Cell: R104**

BetaPERT distribution with parameters:

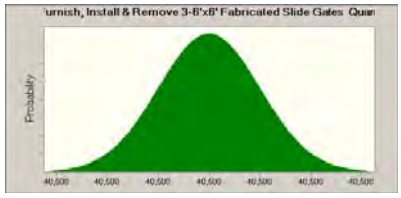
Minimum	$200.00	(=Q104)
Likeliest	$300.00	(=R104)
Maximum	$400.00	(=S104)



Assumption: 9 Furnish, Install & Remove 3-6'x6' Fabricated Slide Gates Quantity **Cell: L22**

Normal distribution with parameters:

Mean	40,500	(=L22)
Std. Dev.	0	(=0.000001)



Assumption: 9 Furnish, Install & Remove 3-6'x6' Fabricated Slide Gates Unit Price Cell: R22

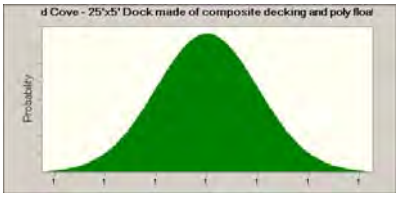
BetaPERT distribution with parameters:

Minimum	$12.00	(=Q22)
Likeliest	$15.00	(=R22)
Maximum	$18.00	(=S22)

Assumption: 90 Mallard Cove - 25'x5' Dock made of composite decking and poly floats Cell: Q105

Normal distribution with parameters:

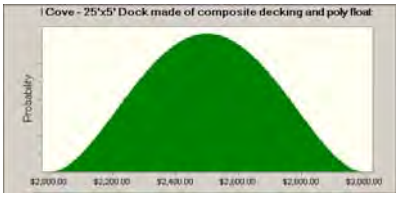
Mean	1	(=L105)
Std. Dev.	0	(=0.000001)



Assumption: 90 Mallard Cove - 25'x5' Dock made of composite decking and poly floats Cell: R105

BetaPERT distribution with parameters:

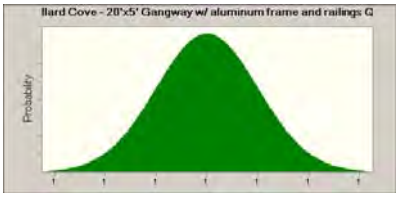
Minimum	$2,000.00	(=Q105)
Likeliest	$2,500.00	(=R105)
Maximum	$3,000.00	(=S105)



Assumption: 91 Mallard Cove - 20'x5' Gangway w/ aluminum frame and railings Quantity **Cell: L106**

Normal distribution with parameters:

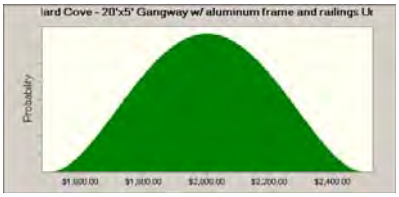
Mean	1	(=L106)
Std. Dev.	0	(=0.000001)



Assumption: 91 Mallard Cove - 20'x5' Gangway w/ aluminum frame and railings Unit Price **Cell: R106**

BetaPERT distribution with parameters:

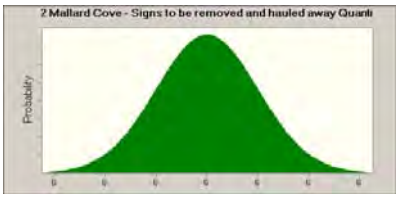
Minimum	$1,500.00	(=Q106)
Likeliest	$2,000.00	(=R106)
Maximum	$2,500.00	(=S106)



Assumption: 92 Mallard Cove - Signs to be removed and hauled away Quantity **Cell: L107**

Normal distribution with parameters:

Mean	6	(=L107)
Std. Dev.	0	(=0.000001)



Assumption: 92 Mallard Cove - Signs to be removed and hauled away Unit Price **Cell: R107**

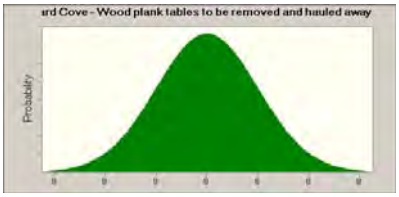
BetaPERT distribution with parameters:

Minimum	$250.00	(=Q107)
Likeliest	$300.00	(=R107)
Maximum	$350.00	(=S107)

Assumption: 93 Mallard Cove - Wood plank tables to be removed and hauled away Quantity **Cell: L108**

Normal distribution with parameters:

Mean	8	(=L108)
Std. Dev.	0	(=0.000001)



Assumption: 93 Mallard Cove - Wood plank tables to be removed and hauled away Unit Pri **Cell: R108**

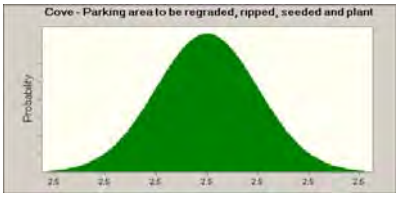
BetaPERT distribution with parameters:

Minimum	$90.00	(=Q108)
Likeliest	$100.00	(=R108)
Maximum	$120.00	(=S108)

Assumption: 94 Mallard Cove - Parking area to be regraded, ripped, seeded and plant **Cell: Q109**

Normal distribution with parameters:

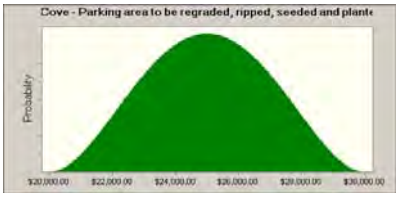
Mean	2.5	(=L109)
Std. Dev.	0.0	(=0.000001)



Assumption: 94 Mallard Cove - Parking area to be regraded, ripped, seeded and plant **Cell: R109**

BetaPERT distribution with parameters:

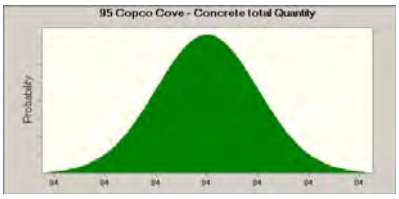
Minimum	$20,000.00	(=Q109)
Likeliest	$25,000.00	(=R109)
Maximum	$30,000.00	(=S109)



Assumption: 95 Copco Cove - Concrete total Quantity **Cell: L110**

Normal distribution with parameters:

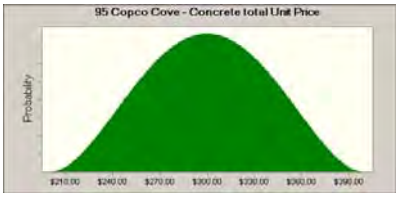
Mean	84	(=L110)
Std. Dev.	0	(=0.000001)



Assumption: 95 Copco Cove - Concrete total Unit Price **Cell: R110**

BetaPERT distribution with parameters:

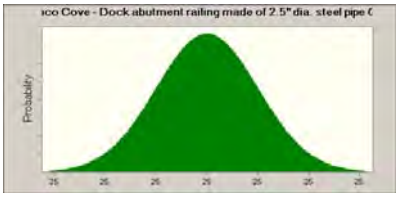
Minimum	$200.00	(=Q110)
Likeliest	$300.00	(=R110)
Maximum	$400.00	(=S110)



Assumption: 96 Copco Cove - Dock abutment railing made of 2.5" dia. steel pipe Quantity **Cell: L111**

Normal distribution with parameters:

Mean	25	(=L111)
Std. Dev.	0	(=0.000001)



Assumption: 96 Copco Cove - Dock abutment railing made of 2.5" dia. steel pipe Unit Price **Cell: R111**

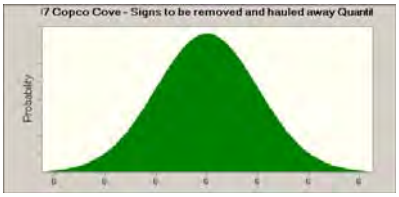
BetaPERT distribution with parameters:

Minimum	$35.00	(=Q111)
Likeliest	$40.00	(=R111)
Maximum	$45.00	(=S111)

Assumption: 97 Copco Cove - Signs to be removed and hauled away Quantity **Cell: L112**

Normal distribution with parameters:

Mean	6	(=L112)
Std. Dev.	0	(=0.000001)



Assumption: 97 Copco Cove - Signs to be removed and hauled away Unit Price **Cell: R112**

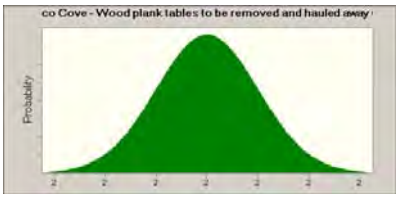
BetaPERT distribution with parameters:

Minimum	$250.00	(=Q112)
Likeliest	$300.00	(=R112)
Maximum	$350.00	(=S112)

Assumption: 98 Copco Cove - Wood plank tables to be removed and hauled away Quantity **Cell: L113**

Normal distribution with parameters:

Mean	2	(=L113)
Std. Dev.	0	(=0.000001)



Assumption: 98 Copco Cove - Wood plank tables to be removed and hauled away Unit Pri Cell: R113

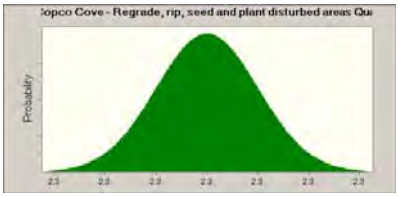
BetaPERT distribution with parameters:

Minimum	$90.00	(=Q113)
Likeliest	$100.00	(=R113)
Maximum	$120.00	(=S113)

Assumption: 99 Copco Cove - Regrade, rip, seed and plant disturbed areas Quantity Cell: L114

Normal distribution with parameters:

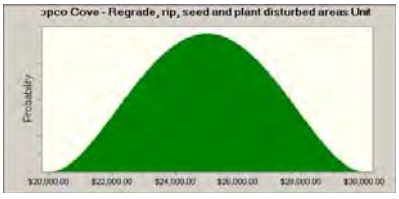
Mean	2.3	(=L114)
Std. Dev.	0.0	(=0.000001)



Assumption: 99 Copco Cove - Regrade, rip, seed and plant disturbed areas Unit Price Cell: R114

BetaPERT distribution with parameters:

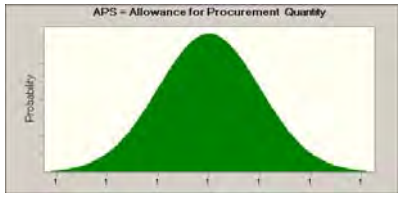
Minimum	$20,000.00	(=Q114)
Likeliest	$25,000.00	(=R114)
Maximum	$30,000.00	(=S114)



Assumption: APS = Allowance for Procurement Quantity **Cell: L123**

Normal distribution with parameters:

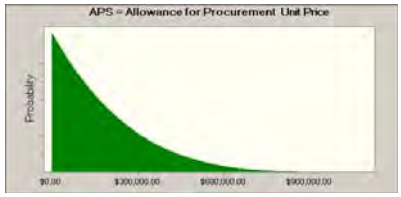
Mean	1	(=L123)
Std. Dev.	0	(=0.000001)



Assumption: APS = Allowance for Procurement Unit Price **Cell: R123**

BetaPERT distribution with parameters:

Minimum	$0.00	(=Q123)
Likeliest	$0.00	(=R123)
Maximum	$1,097,665.00	(=S123)



Assumption: Construction Contingencies Quantity **Cell: L126**

Normal distribution with parameters:

Mean	1	(=L126)
Std. Dev.	0	(=0.000001)

Assumption: Construction Contingencies Unit Price **Cell: R126**

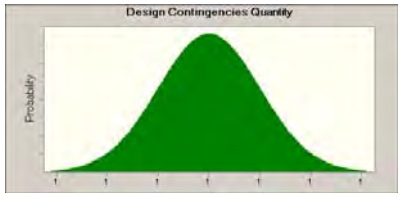
BetaPERT distribution with parameters:

Minimum	$4,000,000.00	(=Q126)
Likeliest	$6,000,000.00	(=R126)
Maximum	$14,000,000.00	(=S126)

Assumption: Design Contingencies Quantity **Cell: L122**

Normal distribution with parameters:

Mean	1	(=L122)
Std. Dev.	0	(=0.000001)



Assumption: Design Contingencies Unit Price **Cell: R122**

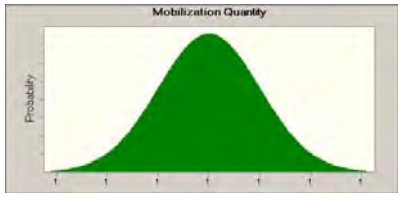
BetaPERT distribution with parameters:

Minimum	$2,196,575.00	(=Q122)
Likeliest	$3,084,900.00	(=R122)
Maximum	$7,177,760.00	(=S122)

Assumption: Mobilization Quantity **Cell: L117**

Normal distribution with parameters:

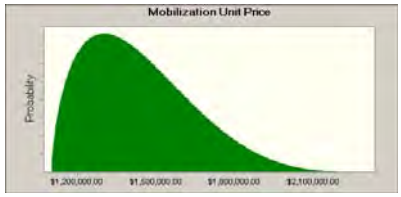
Mean	1	(=L117)
Std. Dev.	0	(=0.000001)



Assumption: Mobilization Unit Price **Cell: R117**

BetaPERT distribution with parameters:

Minimum	$1,100,000.00	(=Q117)
Likeliest	$1,300,000.00	(=R117)
Maximum	$2,300,000.00	(=S117)



Assumption: Non-Contract Cost Quantity **Cell: L128**

Normal distribution with parameters:

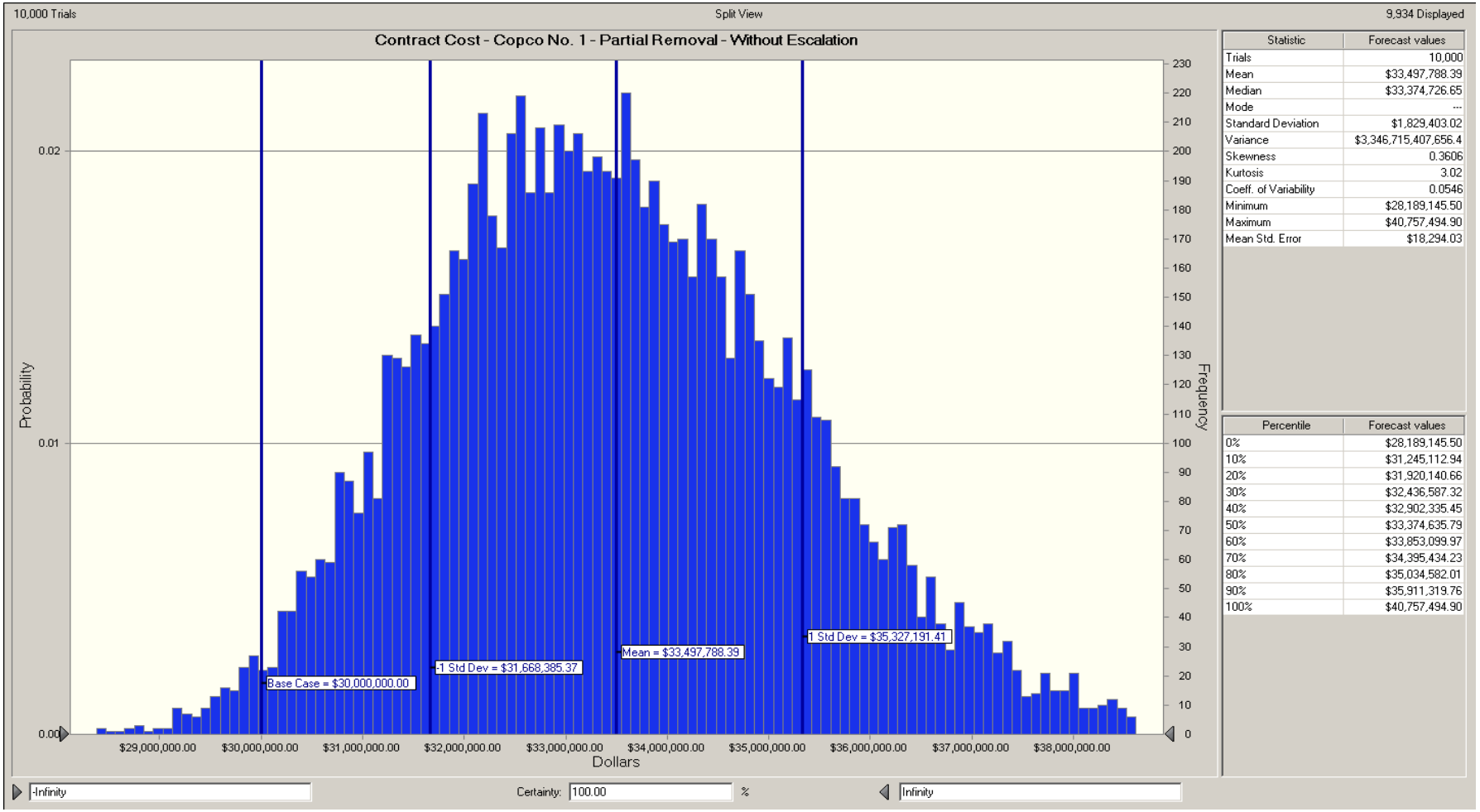
Mean	1	(=L128)
Std. Dev.	0	(=0.000001)

Assumption: Non-Contract Cost Unit Price **Cell: R128**

BetaPERT distribution with parameters:

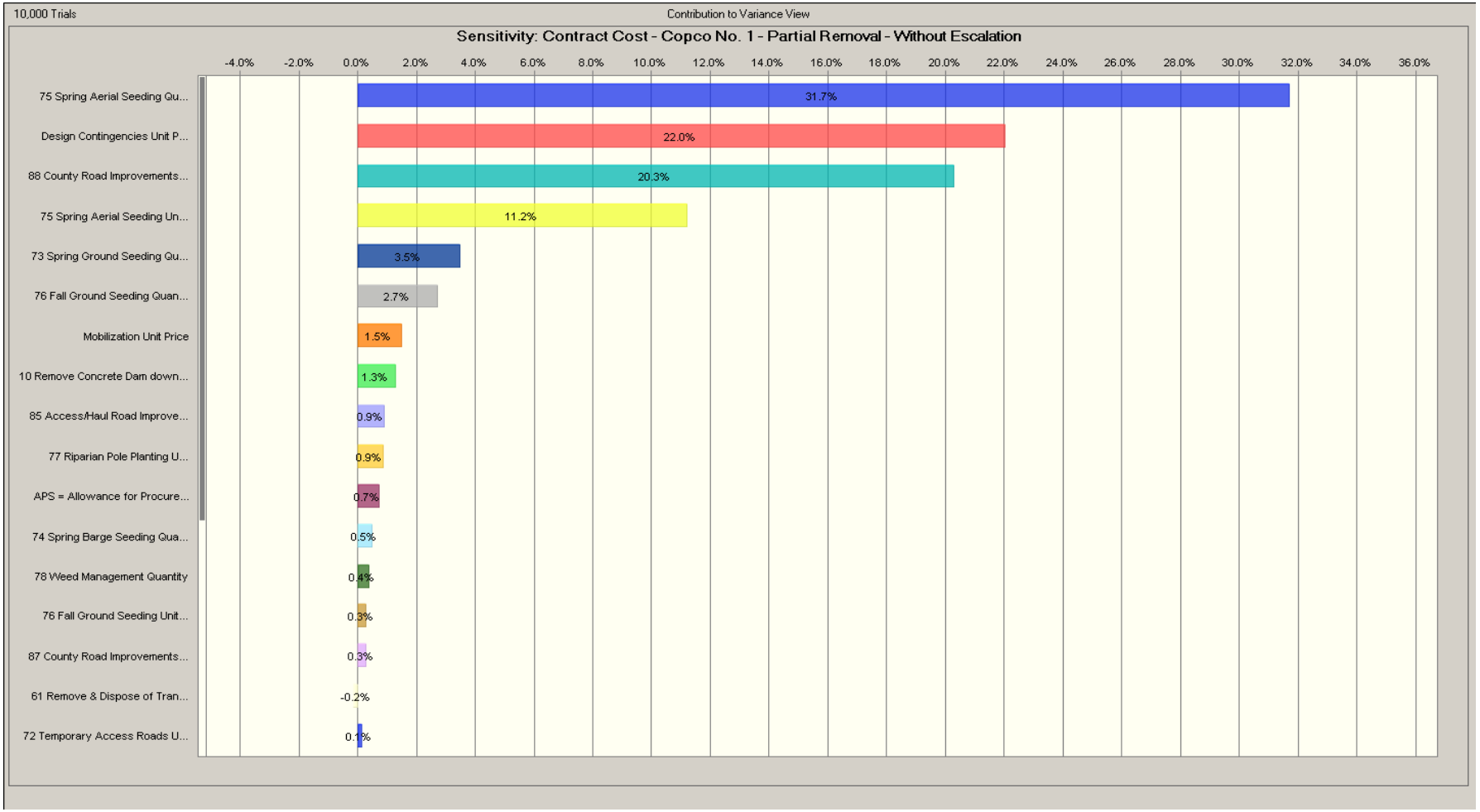
Minimum	$18,000,000.00	(=Q128)
Likeliest	$23,000,000.00	(=R128)
Maximum	$50,000,000.00	(=S128)

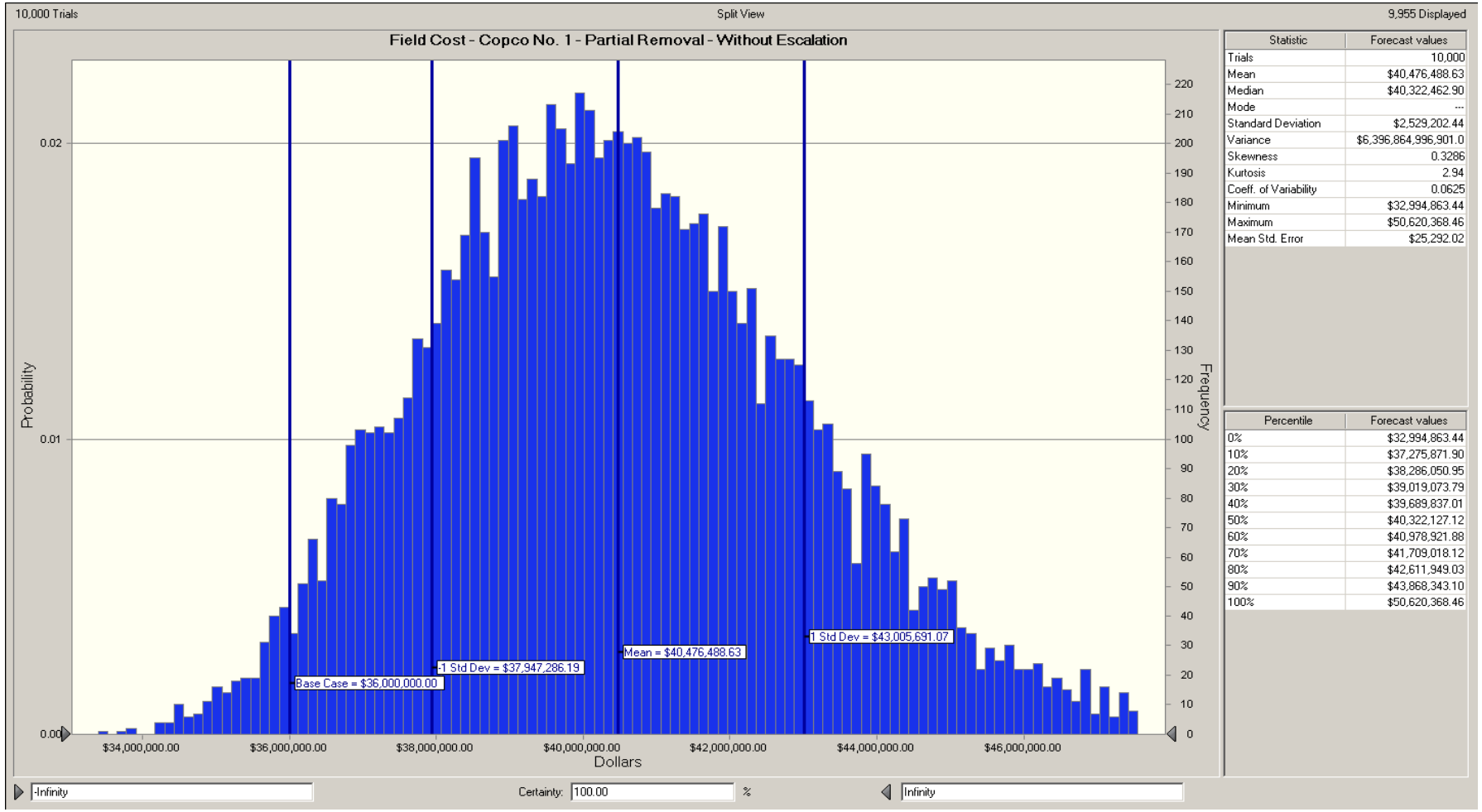
End of Assumptions



Statistic	Forecast values
Trials	10,000
Mean	$33,497,788.39
Median	$33,374,726.65
Mode	---
Standard Deviation	$1,829,403.02
Variance	$3,346,715,407,656.4
Skewness	0.3606
Kurtosis	3.02
Coeff. of Variability	0.0546
Minimum	$28,189,145.50
Maximum	$40,757,494.90
Mean Std. Error	$18,294.03

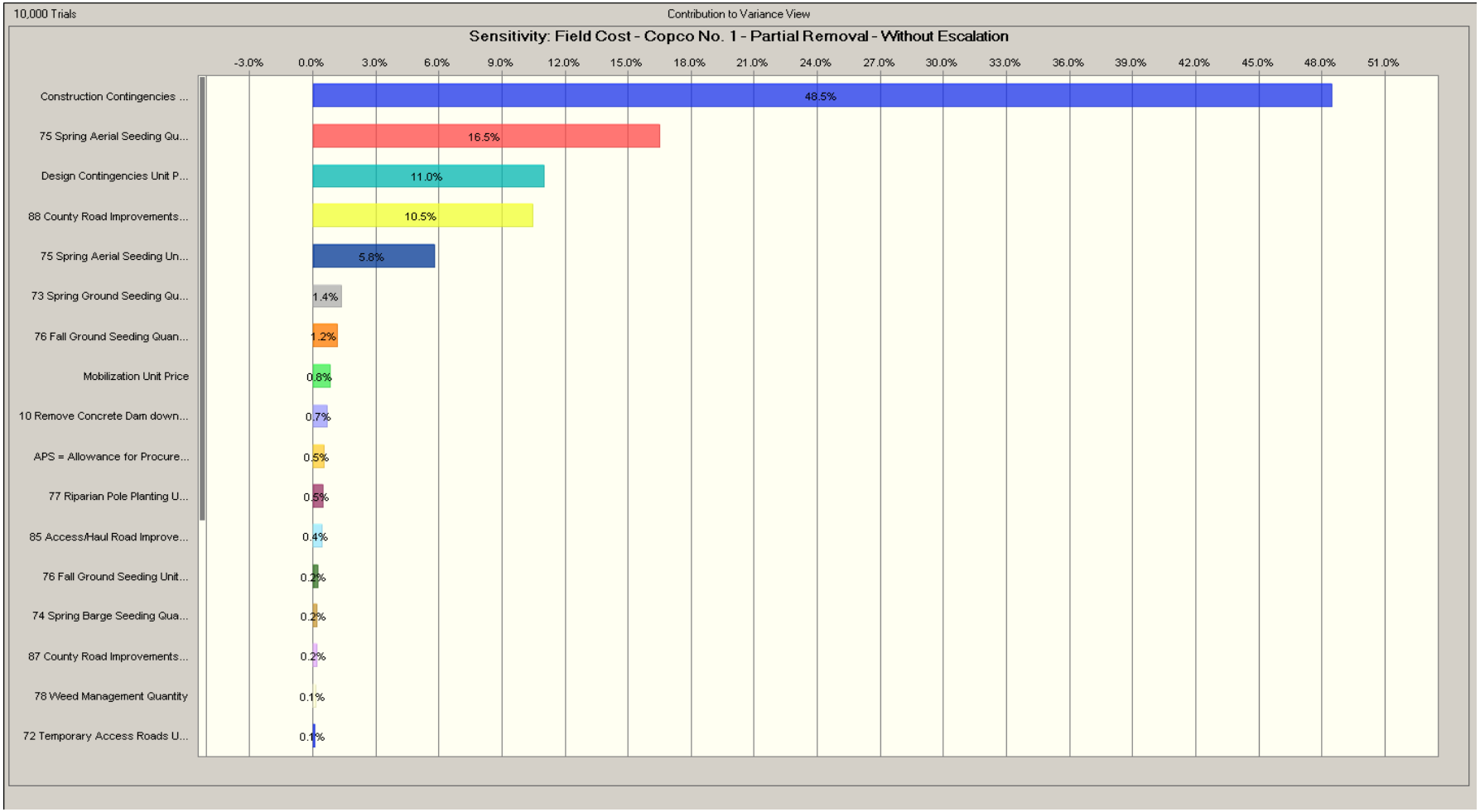
Percentile	Forecast values
0%	$28,189,145.50
10%	$31,245,112.94
20%	$31,920,140.66
30%	$32,436,587.32
40%	$32,902,335.45
50%	$33,374,635.79
60%	$33,853,099.97
70%	$34,395,434.23
80%	$35,034,582.01
90%	$35,911,319.76
100%	$40,757,494.90

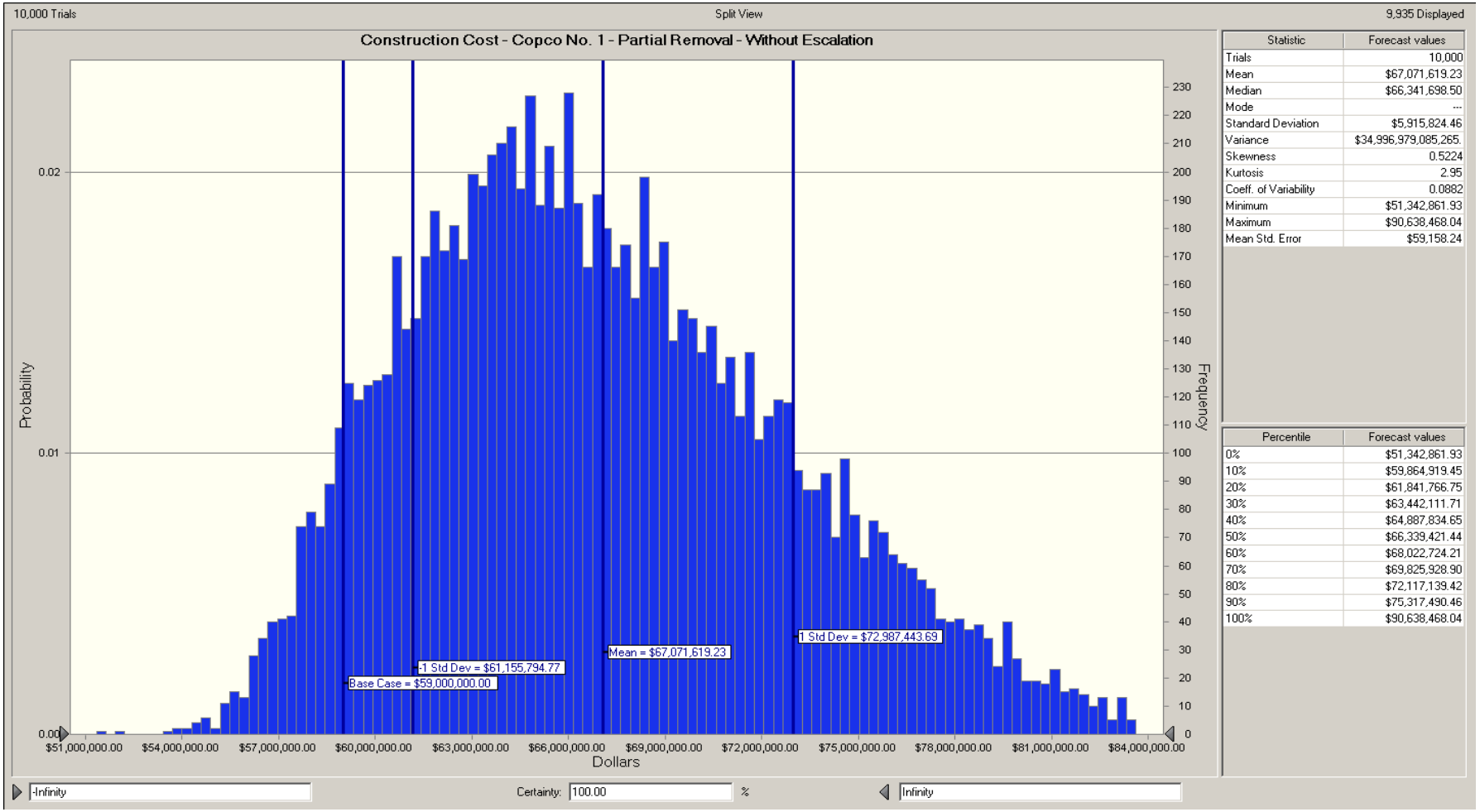

10,000 Trials
Contribution to Variance View
Sensitivity: Contract Cost - Copco No. 1 - Partial Removal - Without Escalation
-4.0%
-2.0%
0.0%
2.0%
4.0%
6.0%
8.0%
10.0%
12.0%
14.0%
16.0%
18.0%
20.0%
22.0%
24.0%
26.0%
28.0%
30.0%
32.0%
34.0%
36.0%
75 Spring Aerial Seeding Qu...
31.7%
Design Contingencies Unit P...
22.0%
88 County Road Improvements...
20.3%
75 Spring Aerial Seeding Un...
11.2%
73 Spring Ground Seeding Qu...
3.5%
76 Fall Ground Seeding Quan...
2.7%
Mobilization Unit Price
1.5%
10 Remove Concrete Dam down...
1.3%
85 Access/Haul Road Improve...
0.9%
77 Riparian Pole Planting U...
0.9%
APS = Allowance for Procure...
0.7%
74 Spring Barge Seeding Qua...
0.5%
78 Weed Management Quantity
0.4%
76 Fall Ground Seeding Unit...
0.3%
87 County Road Improvements...
0.3%
61 Remove & Dispose of Tran...
-0.2%
72 Temporary Access Roads U...
0.1%



Statistic	Forecast values
Trials	10,000
Mean	$40,476,488.63
Median	$40,322,462.90
Mode	---
Standard Deviation	$2,529,202.44
Variance	$6,396,864,996,901.0
Skewness	0.3286
Kurtosis	2.94
Coeff. of Variability	0.0625
Minimum	$32,994,863.44
Maximum	$50,620,368.46
Mean Std. Error	$25,292.02

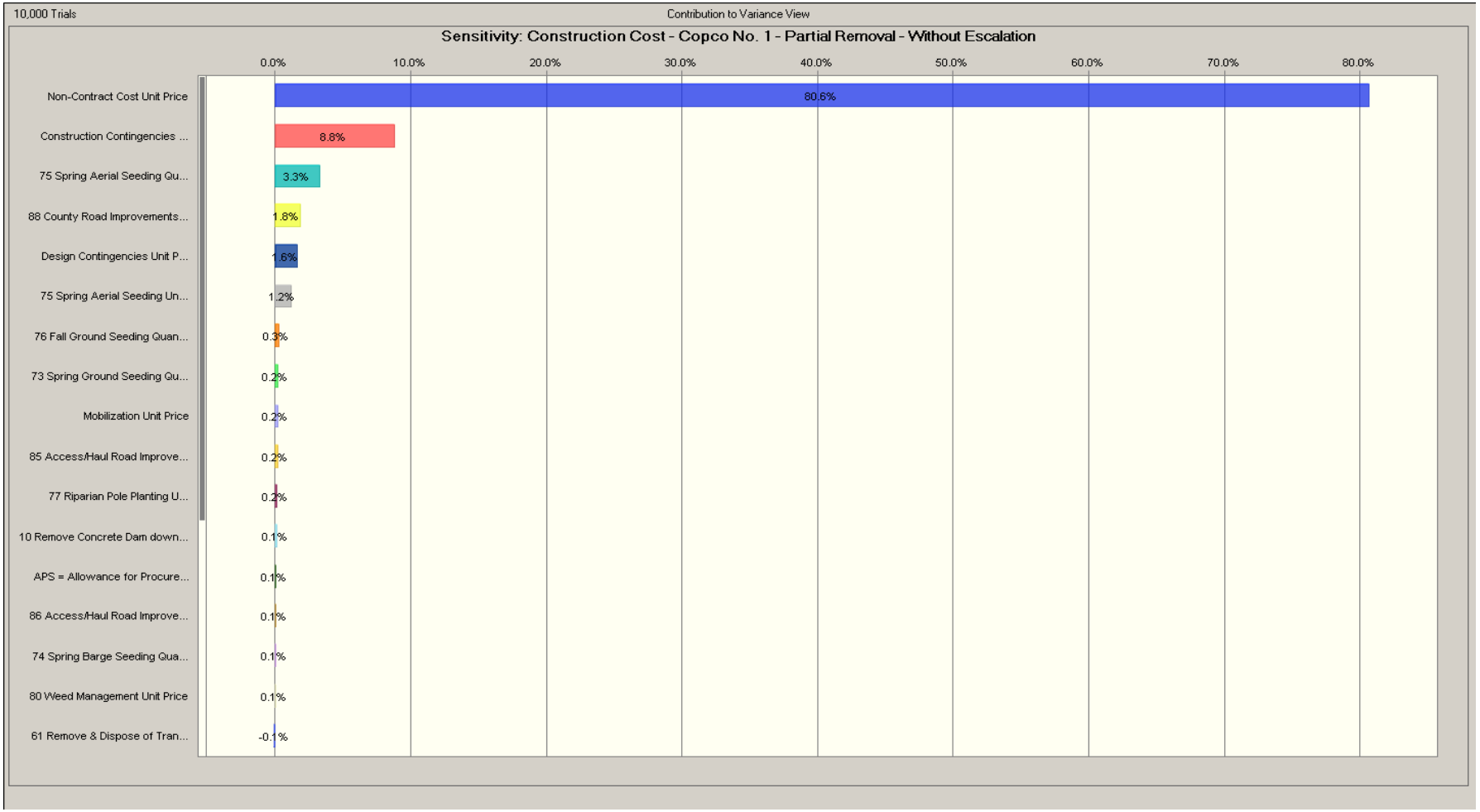
Percentile	Forecast values
0%	$32,994,863.44
10%	$37,275,871.90
20%	$38,286,050.95
30%	$39,019,073.79
40%	$39,689,837.01
50%	$40,322,127.12
60%	$40,978,921.88
70%	$41,709,018.12
80%	$42,611,949.03
90%	$43,868,343.10
100%	$50,620,368.46


10,000 Trials
Contribution to Variance View
Sensitivity: Field Cost - Copco No. 1 - Partial Removal - Without Escalation
-3.0%
0.0%
3.0%
6.0%
9.0%
12.0%
15.0%
18.0%
21.0%
24.0%
27.0%
30.0%
33.0%
36.0%
39.0%
42.0%
45.0%
48.0%
51.0%
Construction Contingencies ...
48.5%
75 Spring Aerial Seeding Qu...
16.5%
Design Contingencies Unit P...
11.0%
88 County Road Improvements...
10.5%
75 Spring Aerial Seeding Un...
5.8%
73 Spring Ground Seeding Qu...
1.4%
76 Fall Ground Seeding Quan...
1.2%
Mobilization Unit Price
0.8%
10 Remove Concrete Dam down...
0.7%
APS = Allowance for Procure...
0.5%
77 Riparian Pole Planting U...
0.5%
85 Access/Haul Road Improve...
0.4%
76 Fall Ground Seeding Unit...
0.2%
74 Spring Barge Seeding Qua...
0.2%
87 County Road Improvements...
0.2%
78 Weed Management Quantity
0.1%
72 Temporary Access Roads U...
0.1%



Statistic	Forecast values
Trials	10,000
Mean	$67,071,619.23
Median	$66,341,698.50
Mode	---
Standard Deviation	$5,915,824.46
Variance	$34,996,979,085,265.
Skewness	0.5224
Kurtosis	2.95
Coeff. of Variability	0.0882
Minimum	$51,342,861.93
Maximum	$90,638,468.04
Mean Std. Error	$59,158.24

Percentile	Forecast values
0%	$51,342,861.93
10%	$59,864,919.45
20%	$61,841,766.75
30%	$63,442,111.71
40%	$64,887,834.65
50%	$66,339,421.44
60%	$68,022,724.21
70%	$69,825,928.90
80%	$72,117,139.42
90%	$75,317,490.46
100%	$90,638,468.04


10,000 Trials
Contribution to Variance View
Sensitivity: Construction Cost - Copco No. 1 - Partial Removal - Without Escalation
0.0%
10.0%
20.0%
30.0%
40.0%
50.0%
60.0%
70.0%
80.0%
Non-Contract Cost Unit Price
80.6%
Construction Contingencies ...
8.8%
75 Spring Aerial Seeding Qu...
3.3%
88 County Road Improvements...
1.8%
Design Contingencies Unit P...
1.6%
75 Spring Aerial Seeding Un...
1.2%
76 Fall Ground Seeding Quan...
0.3%
73 Spring Ground Seeding Qu...
0.2%
Mobilization Unit Price
0.2%
85 Access/Haul Road Improve...
0.2%
77 Riparian Pole Planting U...
0.2%
10 Remove Concrete Dam down...
0.1%
APS = Allowance for Procure...
0.1%
86 Access/Haul Road Improve...
0.1%
74 Spring Barge Seeding Qua...
0.1%
80 Weed Management Unit Price
0.1%
61 Remove & Dispose of Tran...
-0.1%

BUREAU OF RECLAMATION

ESTIMATE WORKSHEET

FEATURE:

Klamath River Dams Removal
Partial Removal Option
Copco No. 1 Dam & Powerplant Removal
Escalation Included
Life Cycle
SUMMARY ESTIMATE

PROJECT:

Klamath River
Oregon

WOID: AF652 | **ESTIMATE LEVEL:** Feasibility
REGION MP | **PRICE LEVEL:** Jul-10
FILE: U:\2011 Projects\Klamath\007 Crystal Ball\1\01\with escalation\[01 Copco 1 Crystal Ball Spreadsheet - with escalation.xlsx]Construction costs sensitivity

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	MPL QUANTITY	MP QUANTITY	MPH QUANTITY	UNIT	MPL UNIT PRICE	MP UNIT PRICE	MPH UNIT PRICE	MPL TOTAL	MP TOTAL	MPH TOTAL
	PI 1	Periodic Costs - Year 1	86-68130	1	1	1	LS	$81,800.00	$95,000.00	$109,300.00	$81,800.00	$95,000.00	$109,300.00
	PI 2	Periodic Costs - Year 5	86-68130	0	0	1	LS	$43,628.33	$43,628.33	$43,628.33	$0.00	$0.00	$43,628.33
	PI 3	Periodic Costs - Year 8	86-68130	0	1	0	LS	$32,566.50	$32,566.50	$32,566.50	$0.00	$32,566.50	$0.00
	PI 4	Periodic Costs - Year 10	86-68130	0	0	1	LS	$35,644.50	$35,644.50	$35,644.50	$0.00	$0.00	$35,644.50
	PI 5	Periodic Costs - Year 13	86-68130	0	0	1	LS	$11,529.77	$11,529.77	$11,529.77	$0.00	$0.00	$11,529.77
	PI 6	Periodic Costs - Year 15	86-68130	0	0	1	LS	$29,121.69	$29,121.69	$29,121.69	$0.00	$0.00	$29,121.69
	PI 7	Periodic Costs - Year 17	86-68130	1	1	0	LS	$17,906.80	$31,689.00	$31,689.00	$17,906.80	$31,689.00	$0.00
	PI 8	Periodic Costs - Year 20	86-68130	0	0	1	LS	$23,792.37	$23,792.37	$23,792.37	$0.00	$0.00	$23,792.37
	PI 9	Periodic Costs - Year 25	86-68130	1	1	1	LS	$5,460.30	$16,380.90	$26,537.06	$5,460.30	$16,380.90	$26,537.06
	PI 10	Periodic Costs - Year 30	86-68130	0	0	1	LS	$15,881.69	$15,881.69	$15,881.69	$0.00	$0.00	$15,881.69
	PI 11	Periodic Costs - Year 33	86-68130	1	1	0	LS	$9,378.46	$16,596.72	$16,596.72	$9,378.46	$16,596.72	$0.00
	PI 12	Periodic Costs - Year 35	86-68130	0	0	1	LS	$12,975.13	$12,975.13	$12,975.13	$0.00	$0.00	$12,975.13
	PI 13	Periodic Costs - Year 38	86-68130	0	0	1	LS	$4,196.99	$4,196.99	$4,196.99	$0.00	$0.00	$4,196.99
	PI 14	Periodic Costs - Year 40	86-68130	0	0	1	LS	$10,600.97	$10,600.97	$10,600.97	$0.00	$0.00	$10,600.97
	PI 15	Periodic Costs - Year 42	86-68130	0	1	0	LS	$8,239.50	$8,239.50	$8,239.50	$0.00	$8,239.50	$0.00
	PI 16	Periodic Costs - Year 45	86-68130	0	0	1	LS	$8,660.95	$8,660.95	$8,660.95	$0.00	$0.00	$8,660.95
	PI 17	Annual Costs - Maintenance	86-68130	1	1	1	LS	$357,511.00	$525,752.00	$1,514,164.00	$357,511.00	$525,752.00	$1,514,164.00
		Subtotal 1									$472,056.56	$726,224.62	$1,846,033.45
		Mobilization		1	1	1	LS	$24,000.00	$36,000.00	$92,000.00	$24,000.00	$36,000.00	$92,000.00
		Subtotal 1 w/ mobilization									**$496,056.56**	**$762,224.62**	**$1,938,033.45**
		Escalation to Notice to Proceed (NTP)		1	1	1	LS	$79,637.44	$262,141.38	$1,035,865.55	$79,637.44	$262,141.38	$1,035,865.55
		Design Contingencies		1	1	1	LS	$44,306.00	$125,634.00	$457,701.00	$44,306.00	$125,634.00	$457,701.00
		APS = Allowance for		0	0	1	LS	$0.00	$0.00	$68,400.00	$0.00	$0.00	$68,400.00
		Procurement Strategies (if applicable)											
		CONTRACT COST									**$620,000.00**	**$1,150,000.00**	**$3,500,000.00**
		Construction Contingencies		1	1	1	LS	$110,000.00	$200,000.00	$900,000.00	$110,000.00	$200,000.00	$900,000.00
		FIELD COST									**$730,000.00**	**$1,350,000.00**	**$4,400,000.00**
		Non-Contract Costs		1	1	1	LS	$180,000.00	$400,000.00	$1,500,000.00	$180,000.00	$400,000.00	$1,500,000.00
		CONSTRUCTION COST									**$910,000.00**	**$1,750,000.00**	**$5,900,000.00**

Notes:
Reference documents RM D&S Cost Estimate (FAC 09-01) and RM D&S CCE and PCE (FAC 09-02)

QUANTITIES			PRICES		
BY	Rick Benik	CHECKED: Stephen Latham	BY	Greg Akins	CHECKED 6/14/11
DATE PREPARED	3/24/2011	PEER REVIEW: Tom Hepler P.E.	DATE PREPARED	06/15/11	PEER REVIEW 6-15-11

Crystal Ball Report - Full
Simulation started on 6/15/2011 at 11:54:19
Simulation stopped on 6/15/2011 at 11:54:33

Run preferences:	
Number of trials run	10,000
Monte Carlo	
Seed	999
Precision control on	
Confidence level	95.00%
Run statistics:	
Total running time (sec)	15.10
Trials/second (average)	662
Random numbers per sec	30,473
Crystal Ball data:	
Assumptions	46
Correlations	0
Correlated groups	0
Decision variables	0
Forecasts	3

TECHNICAL SERVICE CENTER
ESTIMATING, SPECIFICATIONS
AND VALUE PROGRAM GROUP
UNIT PRICES BY
DATE 6/15/11

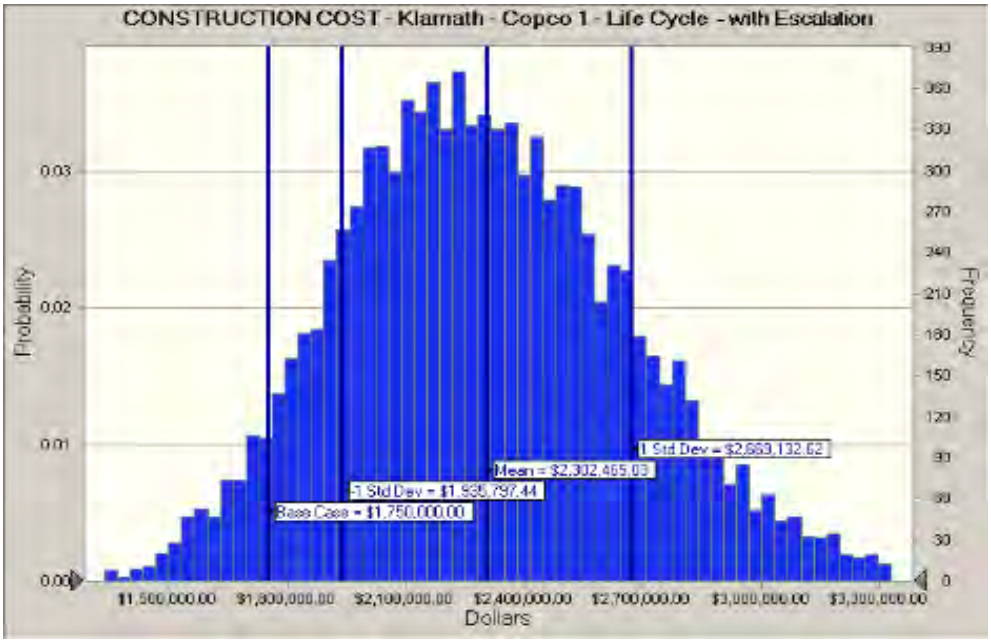
DATE	PEER REVIEWER(S)	CODE
6/15/2011	Signature	86-68170
	Craig A. Grush Printed Name	
	Signature	
Author Initials	Printed Name	
	PEER REVIEW NOT REQUIRED	

Forecasts

Worksheet: [01 Copco 1 Crystal Ball Spreadsheet - with escalation.xlsx]SUMMARY 480 FP

Forecast: CONSTRUCTION COST - Klamath - Copco 1 - Life Cycle – with Escalation **Cell: U40**

Summary:
Entire range is from $1,336,130.38 to $3,863,570.60
Base case is $1,750,000.00
After 10,000 trials, the std. error of the mean is $3,666.68



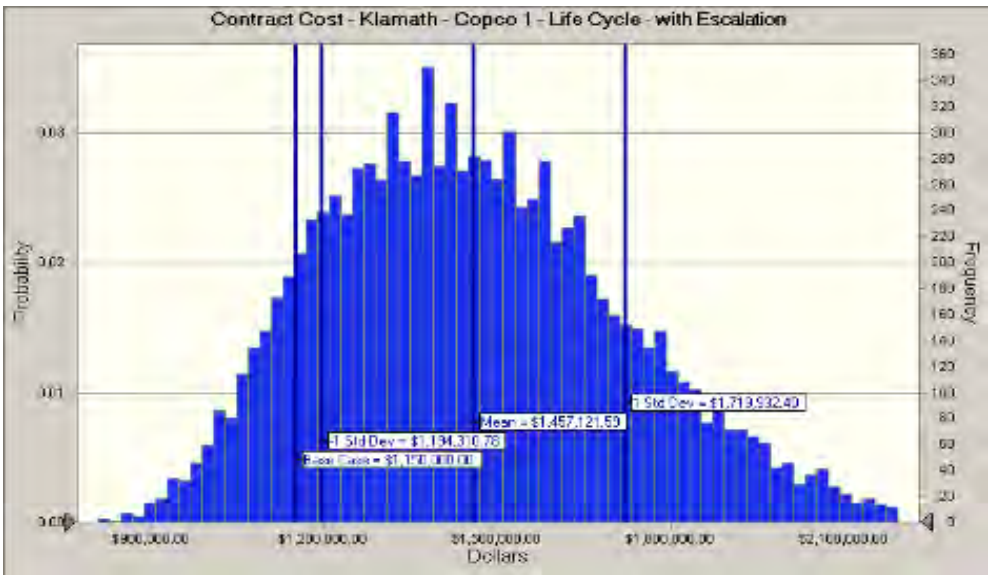
Forecast: CONSTRUCTION COST - Klamath - Copco 1 - Life Cycle – with Escalation (contd) **Cell: U40**

Statistics:	Forecast values
Trials	10,000
Mean	$2,302,465.03
Median	$2,279,080.40
Mode	---
Standard Deviation	$366,667.59
Variance	################
Skewness	0.3293
Kurtosis	3.02
Coeff. of Variability	0.1593
Minimum	$1,336,130.38
Maximum	$3,863,570.60
Range Width	$2,527,440.21
Mean Std. Error	$3,666.68

Percentiles:	Forecast values
0%	$1,336,130.38
10%	$1,845,298.35
20%	$1,987,501.80
30%	$2,092,813.26
40%	$2,184,358.79
50%	$2,279,078.58
60%	$2,377,378.65
70%	$2,484,879.58
80%	$2,612,755.48
90%	$2,785,337.64
100%	$3,863,570.60

Forecast: Contract Cost - Klamath - Copco 1 - Life Cycle – with Escalation **Cell: U36**

Summary:
Entire range is from $806,264.78 to $2,614,580.14
Base case is $1,150,000.00
After 10,000 trials, the std. error of the mean is $2,628.11



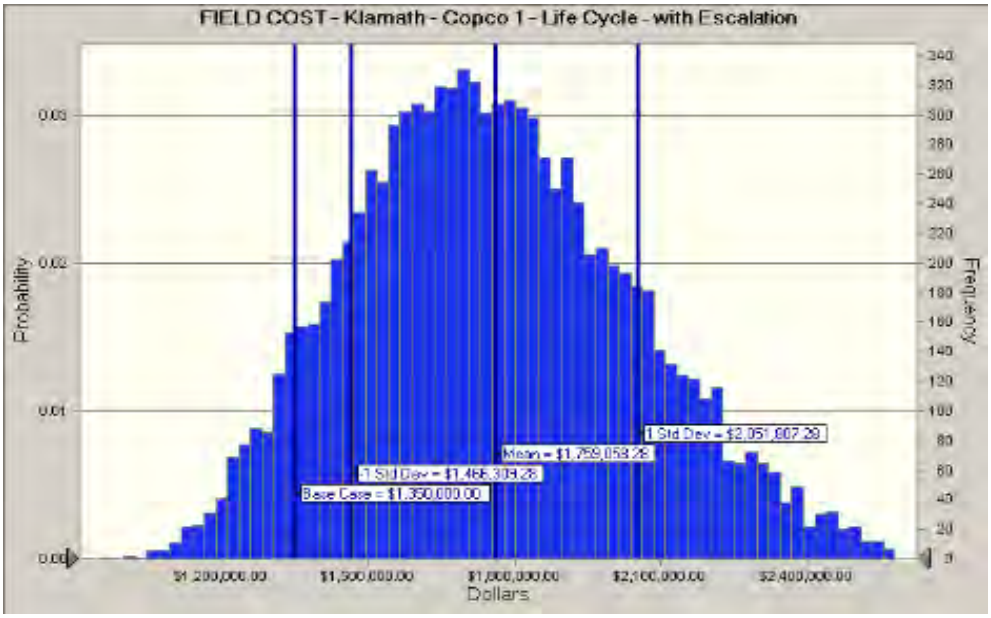
Statistics:	Forecast values
Trials	10,000
Mean	$1,457,121.59
Median	$1,434,870.23
Mode	---
Standard Deviation	$262,810.81
Variance	################
Skewness	0.4412
Kurtosis	2.99
Coeff. of Variability	0.1804
Minimum	$806,264.78
Maximum	$2,614,580.14
Range Width	$1,808,315.36
Mean Std. Error	$2,628.11

Forecast: Contract Cost - Klamath - Copco 1 - Life Cycle – with Escalation (cont'd) **Cell: U36**

Percentiles:	Forecast values
0%	$806,264.78
10%	$1,131,910.15
20%	$1,221,488.96
30%	$1,300,311.56
40%	$1,369,706.43
50%	$1,434,777.55
60%	$1,508,145.65
70%	$1,582,977.02
80%	$1,674,301.77
90%	$1,812,313.99
100%	$2,614,580.14

Forecast: FIELD COST - Klamath - Copco 1 - Life Cycle – with Escalation **Cell: U38**

Summary:
Entire range is from $952,232.53 to $2,936,368.25
Base case is $1,350,000.00
After 10,000 trials, the std. error of the mean is $2,927.49



Statistics:	Forecast values
Trials	10,000
Mean	$1,759,058.28
Median	$1,737,769.61
Mode	---
Standard Deviation	$292,749.00
Variance	################
Skewness	0.3864
Kurtosis	3.03
Coeff. of Variability	0.1664
Minimum	$952,232.53
Maximum	$2,936,368.25
Range Width	$1,984,135.73
Mean Std. Error	$2,927.49

Forecast: FIELD COST - Klamath - Copco 1 - Life Cycle – with Escalation (cont'd) **Cell: U38**

Percentiles:	Forecast values
0%	$952,232.53
10%	$1,391,165.31
20%	$1,504,715.23
30%	$1,589,262.80
40%	$1,664,550.49
50%	$1,737,736.04
60%	$1,814,496.40
70%	$1,900,192.70
80%	$2,005,043.59
90%	$2,150,431.61
100%	$2,936,368.25

End of Forecasts

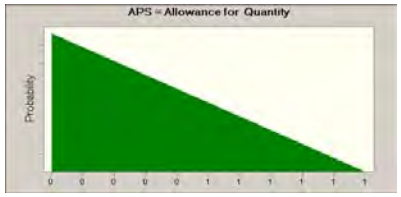
Assumptions

Worksheet: [01 Copco 1 Crystal Ball Spreadsheet - with escalation.xlsx]SUMMARY 480 FP

Assumption: APS = Allowance for Quantity **Cell: L34**

Triangular distribution with parameters:

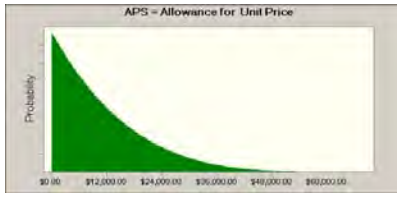
Minimum	0	(=K34)
Likeliest	0	(=L34)
Maximum	1	(=M34)



Assumption: APS = Allowance for Unit Price **Cell: R34**

BetaPERT distribution with parameters:

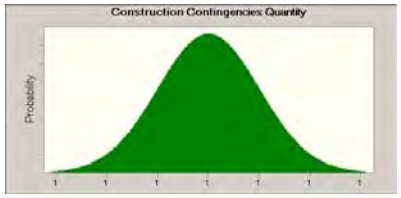
Minimum	$0.00	(=Q34)
Likeliest	$0.00	(=R34)
Maximum	$68,400.00	(=S34)



Assumption: Construction Contingencies Quantity **Cell: L37**

Normal distribution with parameters:

Mean	1	(=L37)
Std. Dev.	0	



Assumption: Construction Contingencies Unit Price **Cell: R37**

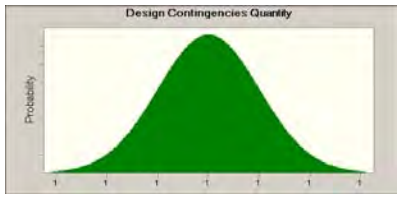
BetaPERT distribution with parameters:

Minimum	$110,000.00	(=Q37)
Likeliest	$200,000.00	(=R37)
Maximum	$900,000.00	(=S37)

Assumption: Design Contingencies Quantity **Cell: L33**

Normal distribution with parameters:

Mean	1	(=L33)
Std. Dev.	0	



Assumption: Design Contingencies Unit Price **Cell: R33**

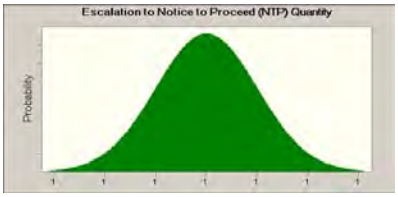
BetaPERT distribution with parameters:

Minimum	$44,306.00	(=Q33)
Likeliest	$125,634.00	(=R33)
Maximum	$457,701.00	(=S33)

Assumption: Escalation to Notice to Proceed (NTP) Quantity **Cell: L32**

Normal distribution with parameters:

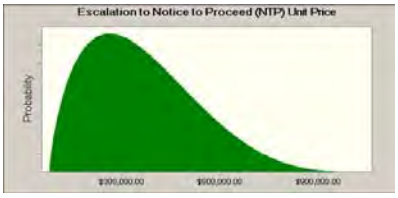
Mean	1	(=L32)
Std. Dev.	0	



Assumption: Escalation to Notice to Proceed (NTP) Unit Price **Cell: R32**

BetaPERT distribution with parameters:

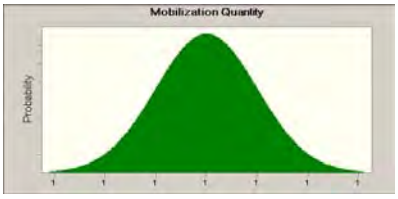
Minimum	$79,637.44	(=Q32)
Likeliest	$262,141.38	(=R32)
Maximum	$1,035,865.55	(=S32)



Assumption: Mobilization Quantity **Cell: L30**

Normal distribution with parameters:

Mean	1	(=L30)
Std. Dev.	0	



Assumption: MobilizationUnit Price **Cell: R30**

BetaPERT distribution with parameters:

Minimum	$24,000.00	(=Q30)
Likeliest	$36,000.00	(=R30)
Maximum	$92,000.00	(=S30)

Assumption: Non-Contract Costs Quantity **Cell: L39**

Normal distribution with parameters:

Mean	1	(=L39)
Std. Dev.	0	

Assumption: Non-Contract Costs Unit Price **Cell: R39**

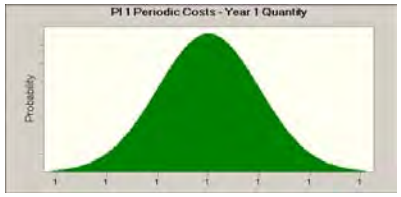
BetaPERT distribution with parameters:

Minimum	$180,000.00	(=Q39)
Likeliest	$400,000.00	(=R39)
Maximum	$1,500,000.00	(=S39)

Assumption: PI 1 Periodic Costs - Year 1 Quantity **Cell: L12**

Normal distribution with parameters:

Mean	1	(=L12)
Std. Dev.	0	



Assumption: PI 1 Periodic Costs - Year 1Unit Price **Cell: R12**

BetaPERT distribution with parameters:

Minimum	$81,800.00	(=Q12)
Likeliest	$95,000.00	(=R12)
Maximum	$109,300.00	(=S12)

Assumption: PI 10 Periodic Costs - Year 30 Quantity **Cell: L21**

Triangular distribution with parameters:

Minimum	0	(=K21)
Likeliest	0	(=L21)
Maximum	1	(=M21)

Assumption: PI 10 Periodic Costs - Year 30 Unit Price **Cell: R21**

Normal distribution with parameters:

Mean	$15,881.69	(=R21)
Std. Dev.	$0.00	

Assumption: PI 11 Periodic Costs - Year 33 Quantity **Cell: L22**

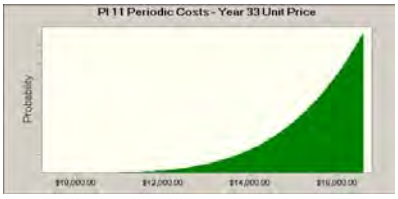
Triangular distribution with parameters:

Minimum	0	(=M22)
Likeliest	1	(=K22)
Maximum	1	(=L22)

Assumption: PI 11 Periodic Costs - Year 33 Unit Price **Cell: R22**

BetaPERT distribution with parameters:

Minimum	$9,378.46	(=Q22)
Likeliest	$16,596.72	(=R22)
Maximum	$16,596.72	(=S22)



Assumption: PI 12 Periodic Costs - Year 35 Quantity **Cell: L23**

Triangular distribution with parameters:

Minimum	0	(=K23)
Likeliest	0	(=L23)
Maximum	1	(=M23)

Assumption: PI 12 Periodic Costs - Year 35 Unit Price **Cell: R23**

Normal distribution with parameters:

Mean	$12,975.13	(=R23)
Std. Dev.	$0.00	

Assumption: PI 13 Periodic Costs - Year 38 Quantity **Cell: L24**

Triangular distribution with parameters:

Minimum	0	(=K24)
Likeliest	0	(=L24)
Maximum	1	(=M24)

Assumption: PI 13 Periodic Costs - Year 38 Unit Price **Cell: R24**

Normal distribution with parameters:

Mean	$4,196.99	(=R24)
Std. Dev.	$0.00	

Assumption: PI 14 Periodic Costs - Year 40 Quantity **Cell: L25**

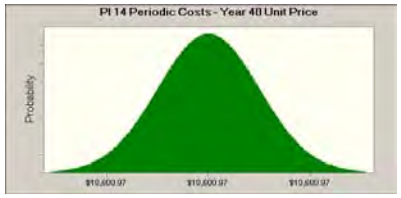
Triangular distribution with parameters:

Minimum	0	(=K25)
Likeliest	0	(=L25)
Maximum	1	(=M25)

Assumption: PI 14 Periodic Costs - Year 40 Unit Price **Cell: R25**

Normal distribution with parameters:

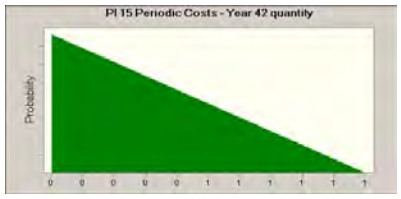
Mean	$10,600.97	(=R25)
Std. Dev.	$0.00	



Assumption: PI 15 Periodic Costs - Year 42 quantity **Cell: L26**

Triangular distribution with parameters:

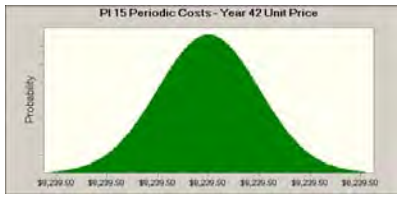
Minimum	0	(=K26)
Likeliest	0	(=M26)
Maximum	1	(=L26)



Assumption: PI 15 Periodic Costs - Year 42 Unit Price **Cell: R26**

Normal distribution with parameters:

Mean	$8,239.50	(=R26)
Std. Dev.	$0.00	



Assumption: PI 16 Periodic Costs - Year 45 Quantity **Cell: L27**

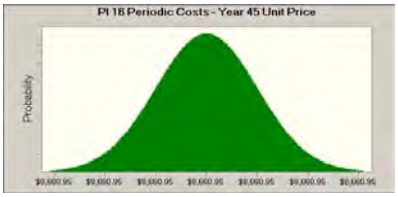
Triangular distribution with parameters:

Minimum	0	(=K27)
Likeliest	0	(=L27)
Maximum	1	(=M27)

Assumption: PI 16 Periodic Costs - Year 45 Unit Price — Cell: R27

Normal distribution with parameters:

Mean	$8,660.95	(=R27)
Std. Dev.	$0.00	



Assumption: PI 17 Annual Costs - Maintenance Quantity — Cell: L28

Normal distribution with parameters:

Mean	1	(=L28)
Std. Dev.	0	

Assumption: PI 17 Annual Costs - Maintenance Unit Price — Cell: R28

BetaPERT distribution with parameters:

Minimum	$357,511.00	(=Q28)
Likeliest	$525,752.00	(=R28)
Maximum	$1,514,164.00	(=S28)

Assumption: PI 2 Periodic Costs - Year 5 Quantity **Cell: L13**

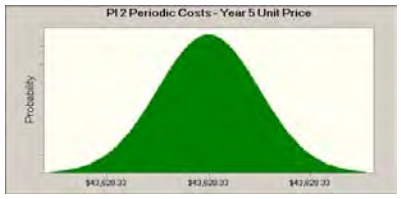
Triangular distribution with parameters:

Minimum	0	(=K13)
Likeliest	0	(=L13)
Maximum	1	(=M13)

Assumption: PI 2 Periodic Costs - Year 5 Unit Price **Cell: R13**

Normal distribution with parameters:

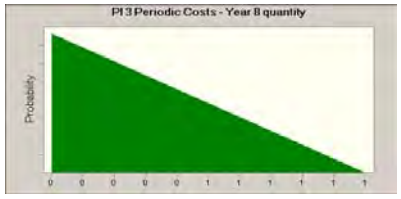
Mean	$43,628.33	(=R13)
Std. Dev.	$0.00	(=0.00001)



Assumption: PI 3 Periodic Costs - Year 8 quantity **Cell: L14**

Triangular distribution with parameters:

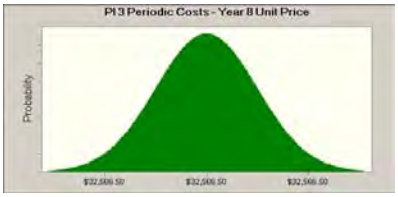
Minimum	0	(=K14)
Likeliest	0	(=M14)
Maximum	1	(=L14)



Assumption: PI 3 Periodic Costs - Year 8 Unit Price **Cell: R14**

Normal distribution with parameters:

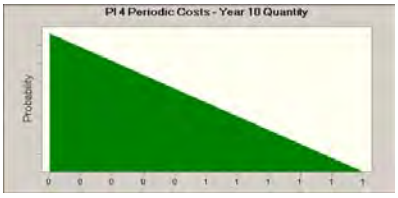
Mean	$32,566.50	(=R14)
Std. Dev.	$0.00	(=0.00001)



Assumption: PI 4 Periodic Costs - Year 10 Quantity **Cell: L15**

Triangular distribution with parameters:

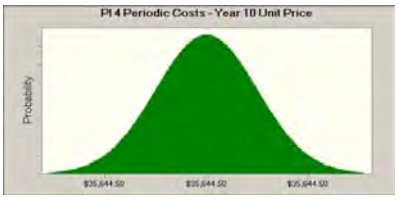
Minimum	0	(=K15)
Likeliest	0	(=L15)
Maximum	1	(=M15)



Assumption: PI 4 Periodic Costs - Year 10 Unit Price **Cell: R15**

Normal distribution with parameters:

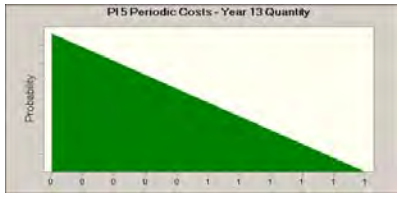
Mean	$35,644.50	(=R15)
Std. Dev.	$0.00	(=0.00001)



Assumption: PI 5 Periodic Costs - Year 13 Quantity **Cell: L16**

Triangular distribution with parameters:

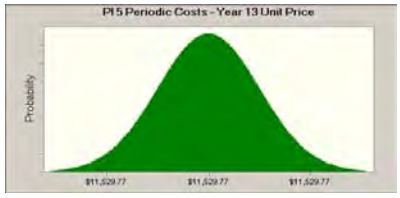
Minimum	0	(=K16)
Likeliest	0	(=L16)
Maximum	1	(=M16)



Assumption: PI 5 Periodic Costs - Year 13 Unit Price **Cell: R16**

Normal distribution with parameters:

Mean	$11,529.77	(=R16)
Std. Dev.	$0.00	(=0.00001)



Assumption: PI 6 Periodic Costs - Year 15 Quantity **Cell: L17**

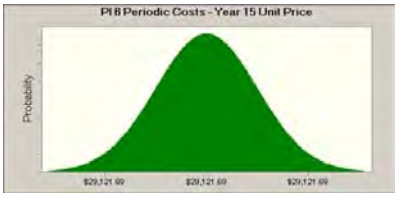
Triangular distribution with parameters:

Minimum	0	(=K17)
Likeliest	0	(=L17)
Maximum	1	(=M17)

Assumption: PI 6 Periodic Costs - Year 15 Unit Price **Cell: R17**

Normal distribution with parameters:

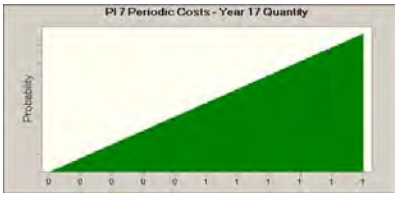
Mean	$29,121.69	(=R17)
Std. Dev.	$0.00	(=0.00001)



Assumption: PI 7 Periodic Costs - Year 17 Quantity **Cell: L18**

Triangular distribution with parameters:

Minimum	0	(=M18)
Likeliest	1	(=K18)
Maximum	1	(=L18)



Assumption: PI 7 Periodic Costs - Year 17Unit Price **Cell: R18**

BetaPERT distribution with parameters:

Minimum	$17,906.80	(=Q18)
Likeliest	$31,689.00	(=R18)
Maximum	$31,689.00	(=S18)

Assumption: PI 8 Periodic Costs - Year 20 Quantity **Cell: L19**

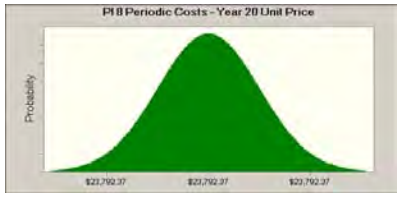
Triangular distribution with parameters:

Minimum	0	(=K19)
Likeliest	0	(=L19)
Maximum	1	(=M19)

Assumption: PI 8 Periodic Costs - Year 20 Unit Price **Cell: R19**

Normal distribution with parameters:

Mean	$23,792.37	(=R19)
Std. Dev.	$0.00	



Assumption: PI 9 Periodic Costs - Year 25 Quantity **Cell: L20**

Normal distribution with parameters:

Mean	1	(=L20)
Std. Dev.	0	

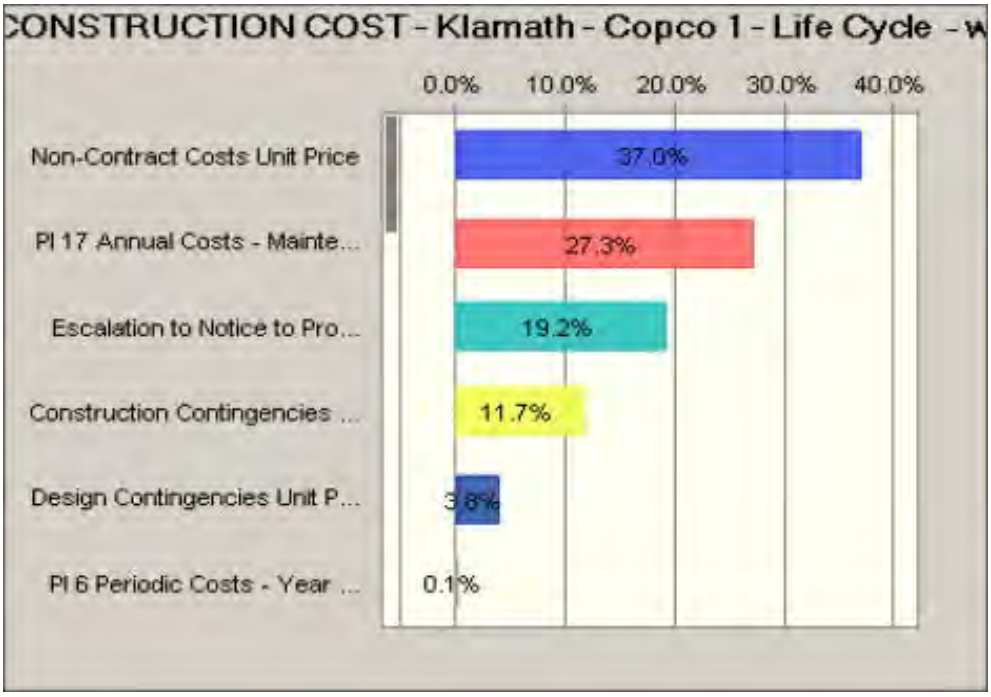
Assumption: PI 9 Periodic Costs - Year 25 Unit Price **Cell: R20**

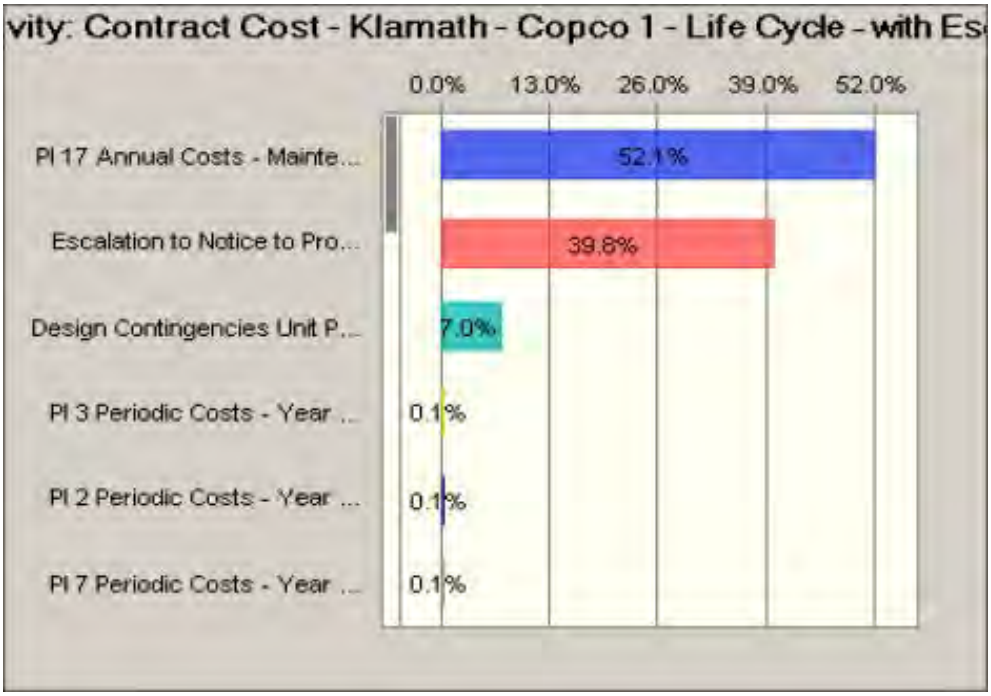
BetaPERT distribution with parameters:

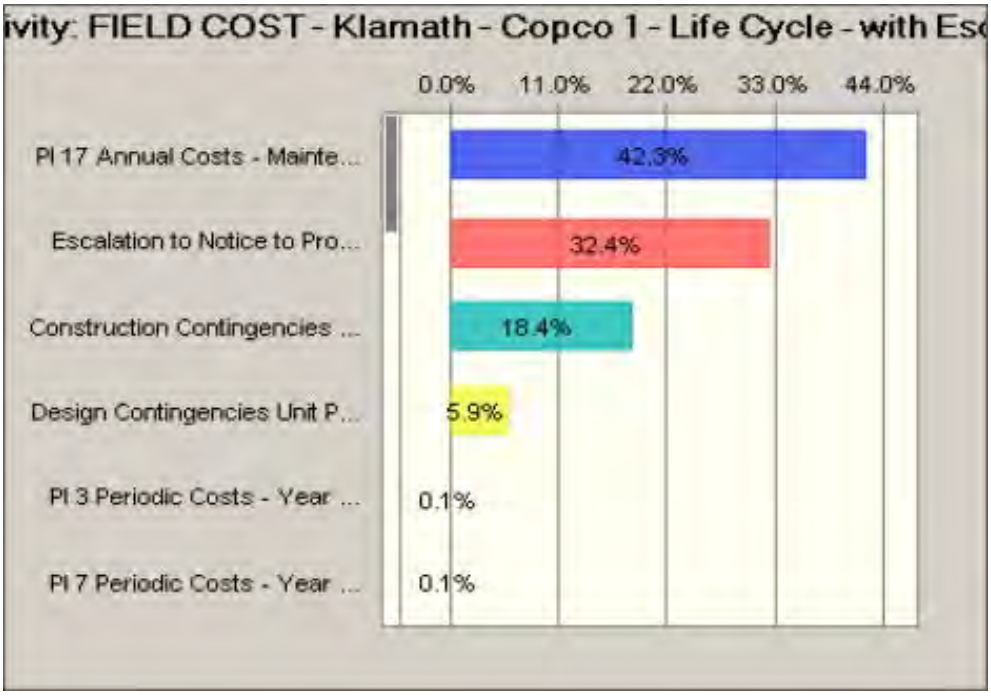
Minimum	$5,460.30	(=Q20)
Likeliest	$16,380.90	(=R20)
Maximum	$26,537.06	(=S20)

End of Assumptions

Sensitivity Charts




vity: Contract Cost - Klamath - Copco 1 - Life Cycle - with Es
0.0%
13.0%
26.0%
39.0%
52.0%
Pl 17 Annual Costs - Mainte...
52.1%
Escalation to Notice to Pro...
39.8%
Design Contingencies Unit P...
7.0%
Pl 3 Periodic Costs - Year ...
0.1%
Pl 2 Periodic Costs - Year ...
0.1%
Pl 7 Periodic Costs - Year ...
0.1%

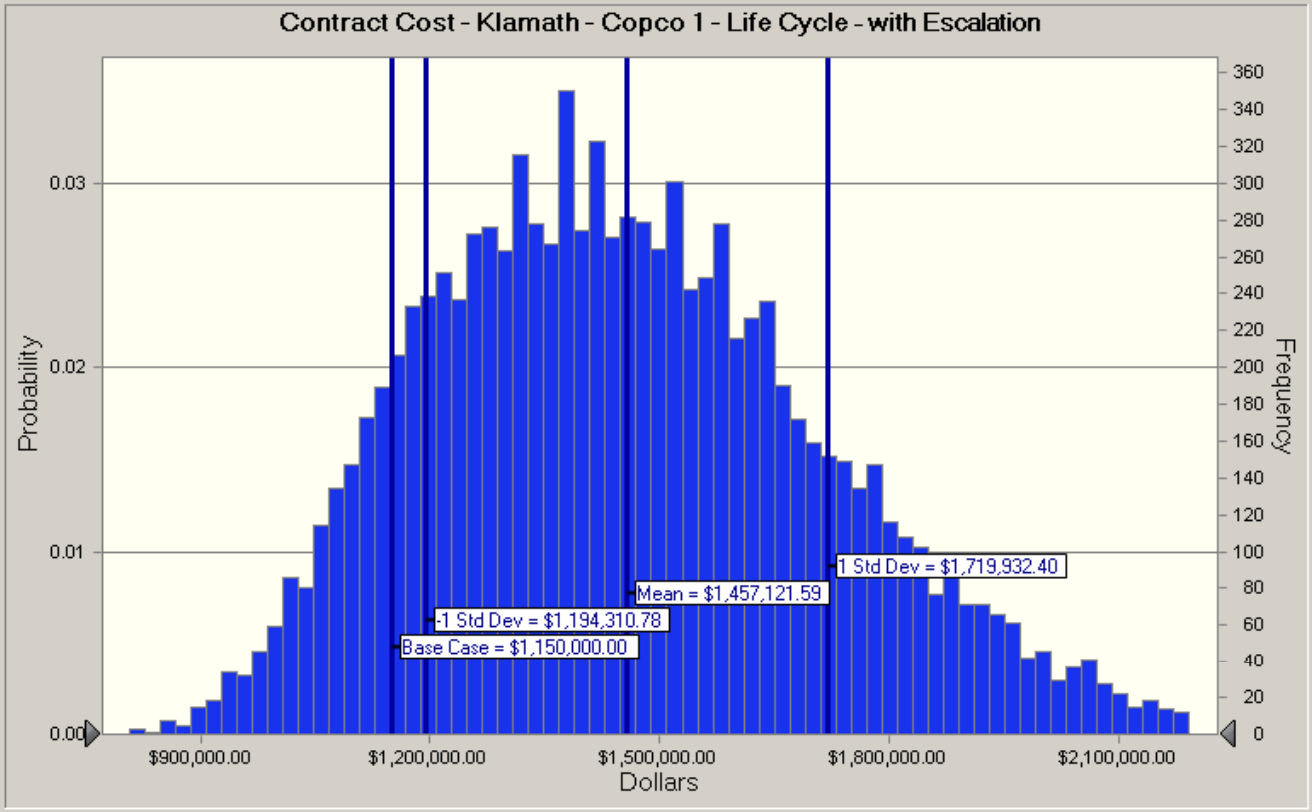

ivity: FIELD COST - Klamath - Copco 1 - Life Cycle - with Esc
0.0%
11.0%
22.0%
33.0%
44.0%
Pl 17 Annual Costs - Mainte...
42.3%
Escalation to Notice to Pro...
32.4%
Construction Contingencies ...
18.4%
Design Contingencies Unit P...
5.9%
Pl 3 Periodic Costs - Year ...
0.1%
Pl 7 Periodic Costs - Year ...
0.1%

No target forecast has been specified

No target forecast has been specified

End of Sensitivity Charts

10,000 Trials | Split View | 9,949 Displayed

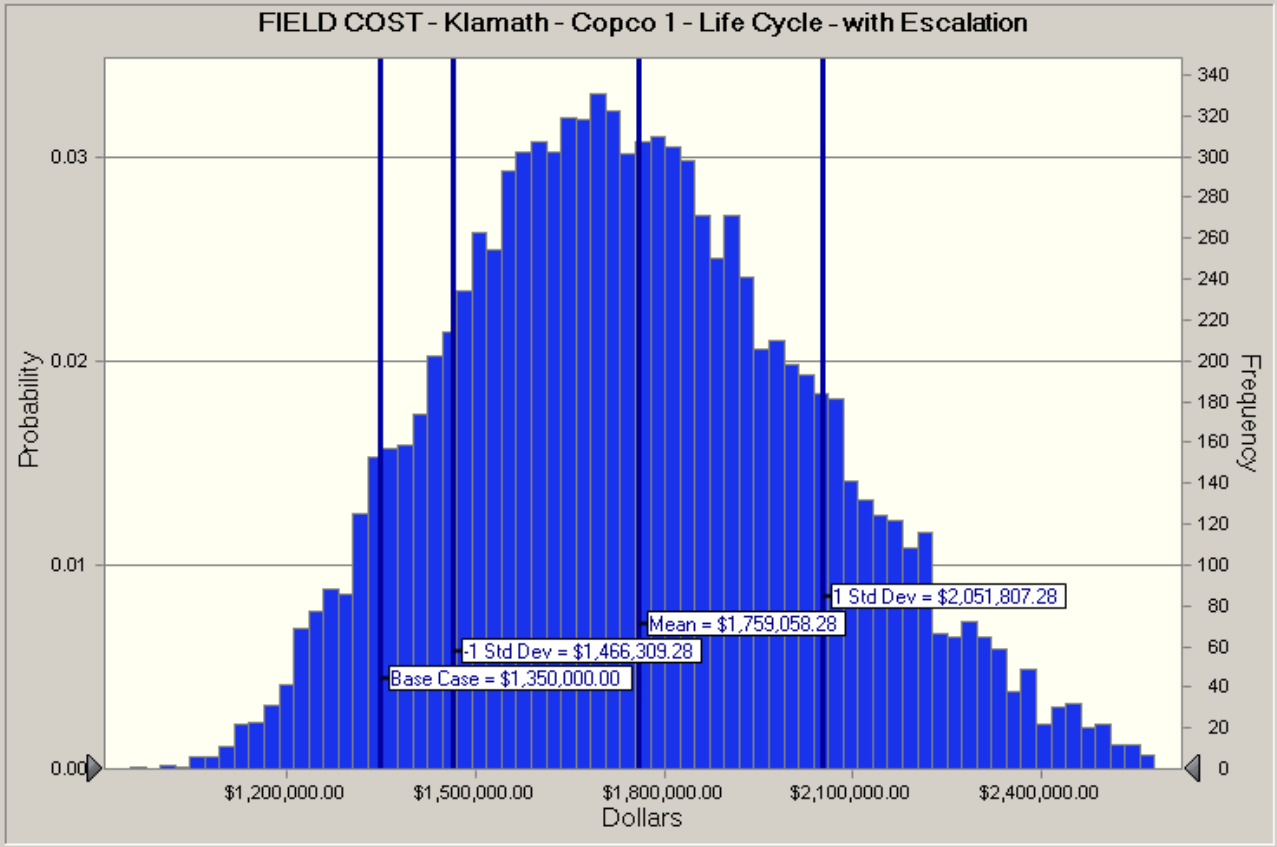


Statistic	Forecast values
Trials	10,000
Mean	$1,457,121.59
Median	$1,434,870.23
Mode	---
Standard Deviation	$262,810.81
Variance	$69,069,522,020.44
Skewness	0.4412
Kurtosis	2.99
Coeff. of Variability	0.1804
Minimum	$806,264.78
Maximum	$2,614,580.14
Mean Std. Error	$2,628.11

Percentile	Forecast values
0%	$806,264.78
10%	$1,131,910.15
20%	$1,221,488.96
30%	$1,300,311.56
40%	$1,369,706.43
50%	$1,434,777.55
60%	$1,508,145.65
70%	$1,582,977.02
80%	$1,674,301.77
90%	$1,812,313.99
100%	$2,614,580.14

-Infinity | Certainty: 100.00 % | Infinity

10,000 Trials | Split View | 9,933 Displayed

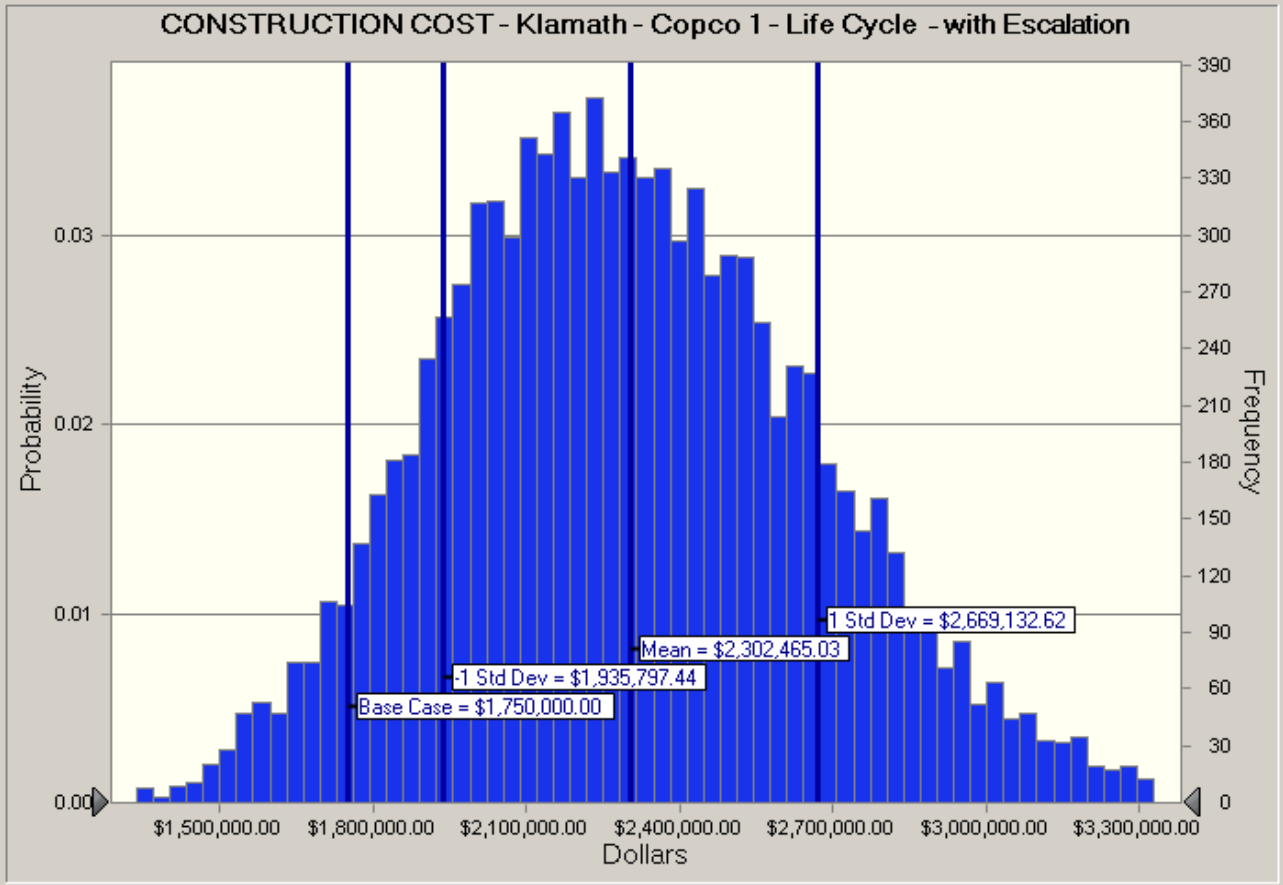


Statistic	Forecast values
Trials	10,000
Mean	$1,759,058.28
Median	$1,737,769.61
Mode	---
Standard Deviation	$292,749.00
Variance	$85,701,976,384.14
Skewness	0.3864
Kurtosis	3.03
Coeff. of Variability	0.1664
Minimum	$952,232.53
Maximum	$2,936,368.25
Mean Std. Error	$2,927.49

Percentile	Forecast values
0%	$952,232.53
10%	$1,391,165.31
20%	$1,504,715.23
30%	$1,589,262.80
40%	$1,664,550.49
50%	$1,737,736.04
60%	$1,814,496.40
70%	$1,900,192.70
80%	$2,005,043.59
90%	$2,150,431.61
100%	$2,936,368.25

-Infinity | Certainty: 100.00 % | Infinity

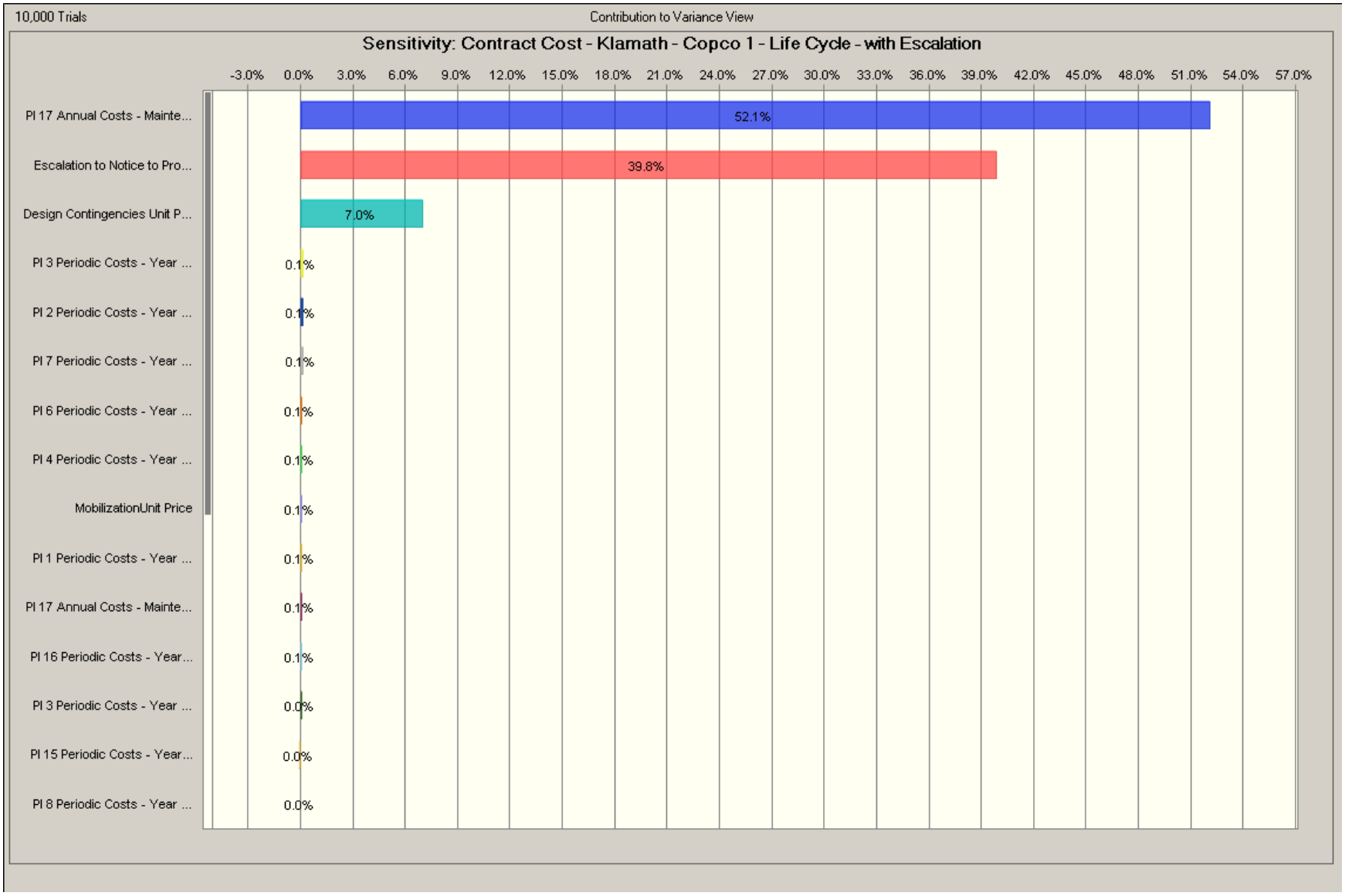
10,000 Trials | Split View | 9,947 Displayed

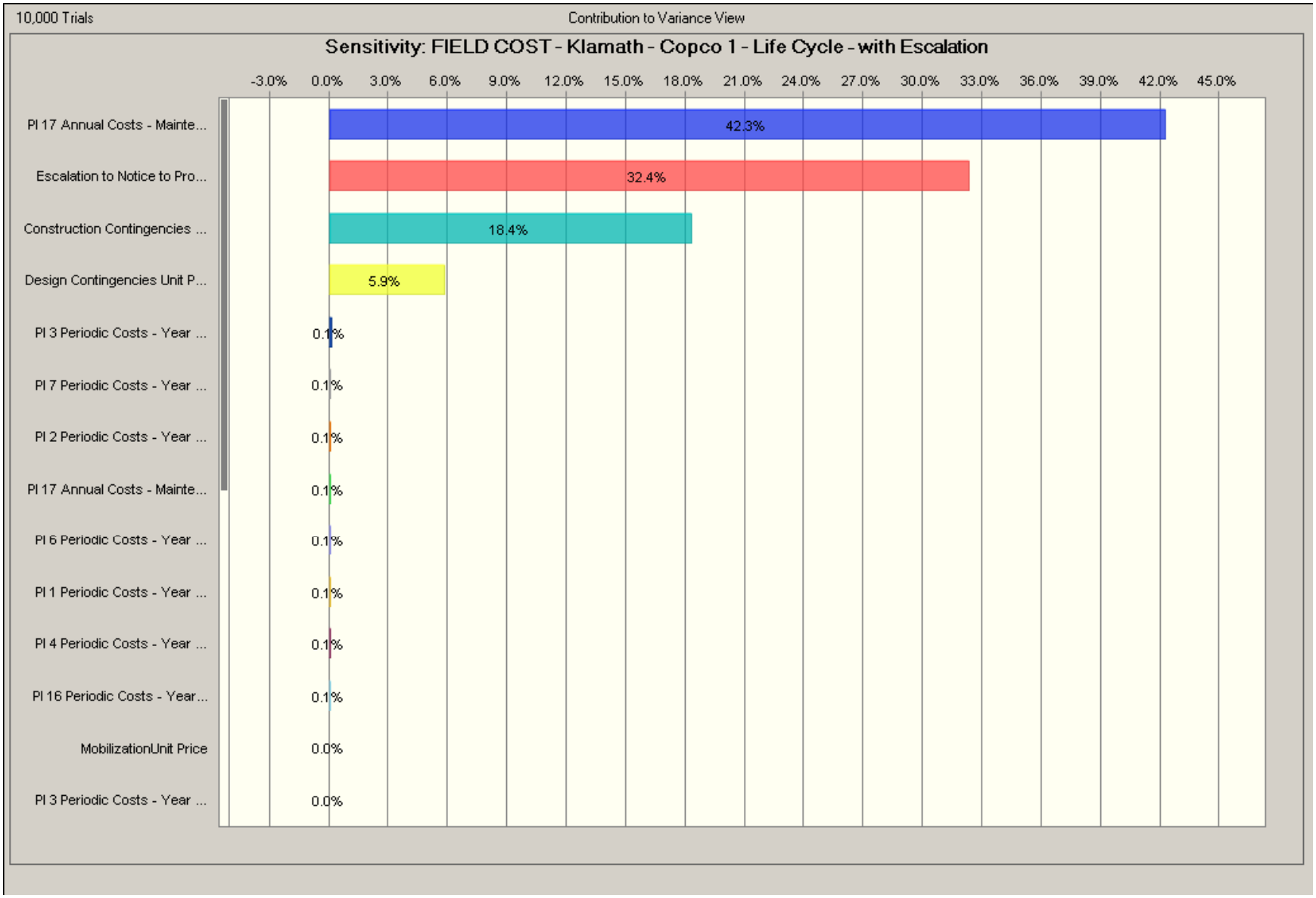


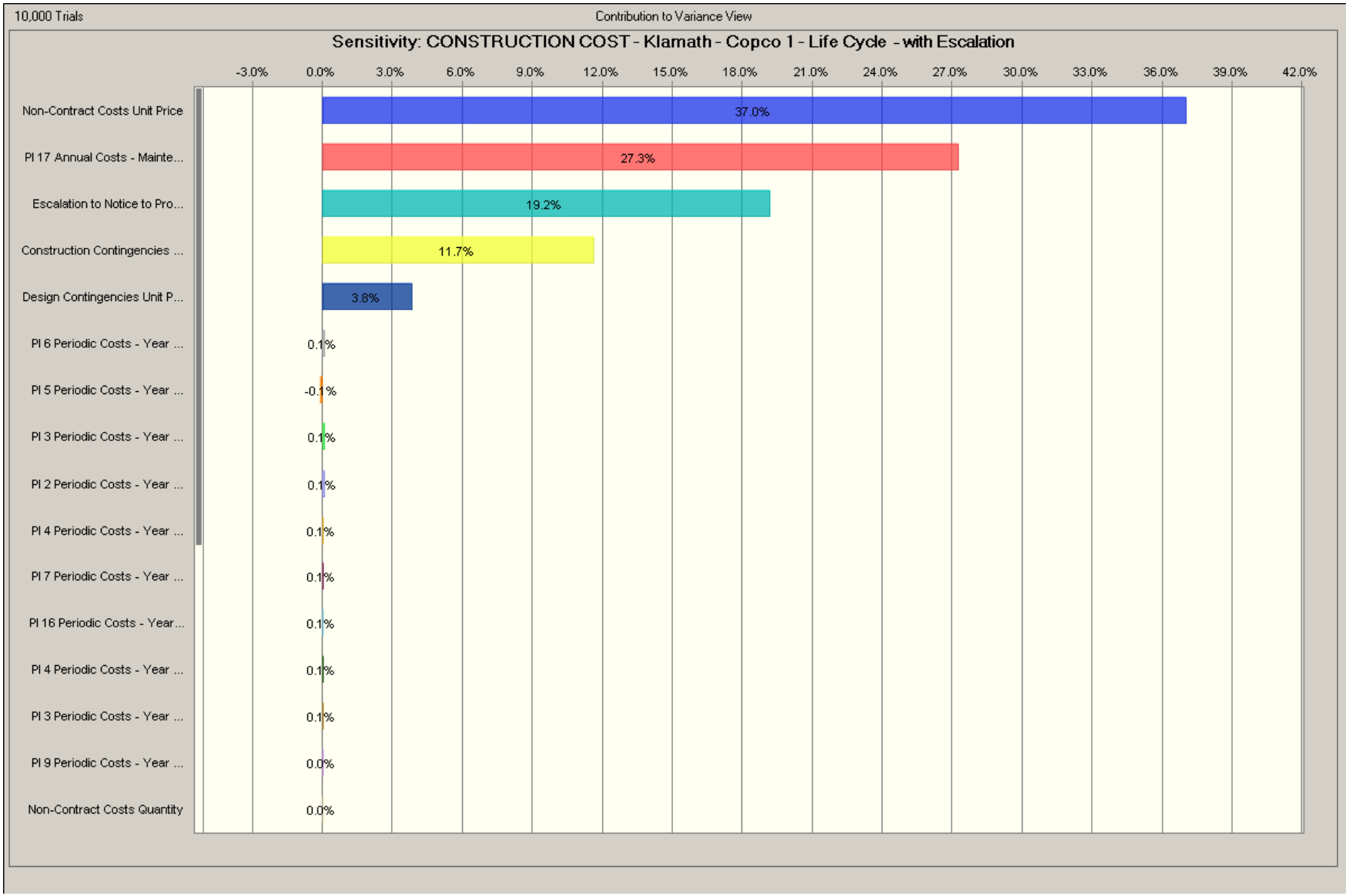
Statistic	Forecast values
Trials	10,000
Mean	$2,302,465.03
Median	$2,279,080.40
Mode	---
Standard Deviation	$366,667.59
Variance	$134,445,121,676.01
Skewness	0.3293
Kurtosis	3.02
Coeff. of Variability	0.1593
Minimum	$1,336,130.38
Maximum	$3,863,570.60
Mean Std. Error	$3,666.68

Percentile	Forecast values
0%	$1,336,130.38
10%	$1,845,298.35
20%	$1,987,501.80
30%	$2,092,813.26
40%	$2,184,358.79
50%	$2,279,078.58
60%	$2,377,378.65
70%	$2,484,879.58
80%	$2,612,755.48
90%	$2,785,337.64
100%	$3,863,570.60

-Infinity | Certainty: 100.00 % | Infinity


10,000 Trials
Contribution to Variance View
Sensitivity: Contract Cost - Klamath - Copco 1 - Life Cycle - with Escalation
-3.0% 0.0% 3.0% 6.0% 9.0% 12.0% 15.0% 18.0% 21.0% 24.0% 27.0% 30.0% 33.0% 36.0% 39.0% 42.0% 45.0% 48.0% 51.0% 54.0% 57.0%
PI 17 Annual Costs - Mainte...
52.1%
Escalation to Notice to Pro...
39.8%
Design Contingencies Unit P...
7.0%
PI 3 Periodic Costs - Year ...
0.1%
PI 2 Periodic Costs - Year ...
0.1%
PI 7 Periodic Costs - Year ...
0.1%
PI 6 Periodic Costs - Year ...
0.1%
PI 4 Periodic Costs - Year ...
0.1%
MobilizationUnit Price
0.1%
PI 1 Periodic Costs - Year ...
0.1%
PI 17 Annual Costs - Mainte...
0.1%
PI 16 Periodic Costs - Year...
0.1%
PI 3 Periodic Costs - Year ...
0.0%
PI 15 Periodic Costs - Year...
0.0%
PI 8 Periodic Costs - Year ...
0.0%


10,000 Trials
Contribution to Variance View
Sensitivity: FIELD COST - Klamath - Copco 1 - Life Cycle - with Escalation
-3.0%
0.0%
3.0%
6.0%
9.0%
12.0%
15.0%
18.0%
21.0%
24.0%
27.0%
30.0%
33.0%
36.0%
39.0%
42.0%
45.0%
PI 17 Annual Costs - Mainte...
42.3%
Escalation to Notice to Pro...
32.4%
Construction Contingencies ...
18.4%
Design Contingencies Unit P...
5.9%
PI 3 Periodic Costs - Year ...
0.1%
PI 7 Periodic Costs - Year ...
0.1%
PI 2 Periodic Costs - Year ...
0.1%
PI 17 Annual Costs - Mainte...
0.1%
PI 6 Periodic Costs - Year ...
0.1%
PI 1 Periodic Costs - Year ...
0.1%
PI 4 Periodic Costs - Year ...
0.1%
PI 16 Periodic Costs - Year...
0.1%
MobilizationUnit Price
0.0%
PI 3 Periodic Costs - Year ...
0.0%


10,000 Trials
Contribution to Variance View
Sensitivity: CONSTRUCTION COST - Klamath - Copco 1 - Life Cycle - with Escalation
-3.0%
0.0%
3.0%
6.0%
9.0%
12.0%
15.0%
18.0%
21.0%
24.0%
27.0%
30.0%
33.0%
36.0%
39.0%
42.0%
Non-Contract Costs Unit Price
37.0%
Pl 17 Annual Costs - Mainte...
27.3%
Escalation to Notice to Pro...
19.2%
Construction Contingencies ...
11.7%
Design Contingencies Unit P...
3.8%
Pl 6 Periodic Costs - Year ...
0.1%
Pl 5 Periodic Costs - Year ...
-0.1%
Pl 3 Periodic Costs - Year ...
0.1%
Pl 2 Periodic Costs - Year ...
0.1%
Pl 4 Periodic Costs - Year ...
0.1%
Pl 7 Periodic Costs - Year ...
0.1%
Pl 16 Periodic Costs - Year...
0.1%
Pl 4 Periodic Costs - Year ...
0.1%
Pl 3 Periodic Costs - Year ...
0.1%
Pl 9 Periodic Costs - Year ...
0.0%
Non-Contract Costs Quantity
0.0%

BUREAU OF RECLAMATION

ESTIMATE WORKSHEET

FEATURE:
Klamath River Dams Removal
Partial Removal Option
Copco No. 1 Dam & Powerplant Removal
Escalation NOT Included
Life Cycle
SUMMARY ESTIMATE

PROJECT:
Klamath River
Oregon

WOID: AF652 | **ESTIMATE LEVEL:** Feasibility
REGION MP | **PRICE LEVEL:** Jul-10
FILE: U:\2011 Projects\Klamath\007 Crystal Ball\1\01\without escalation\[01 Copco 1 Crystal Ball Spreadsheet - wo esc.xlsx]SUMMARY 480 FP

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	MPL QUANTITY	MP QUANTITY	MPH QUANTITY	UNIT	MPL UNIT PRICE	MP UNIT PRICE	MPH UNIT PRICE	MPL TOTAL	MP TOTAL	MPH TOTAL
	PI 1	Periodic Costs - Year 1	86-68130	1	1	1	LS	$81,800.00	$95,000.00	$109,300.00	$81,800.00	$95,000.00	$109,300.00
	PI 2	Periodic Costs - Year 5	86-68130	0	0	1	LS	$43,628.33	$43,628.33	$43,628.33	$0.00	$0.00	$43,628.33
	PI 3	Periodic Costs - Year 8	86-68130	0	1	0	LS	$32,566.50	$32,566.50	$32,566.50	$0.00	$32,566.50	$0.00
	PI 4	Periodic Costs - Year 10	86-68130	0	0	1	LS	$35,644.50	$35,644.50	$35,644.50	$0.00	$0.00	$35,644.50
	PI 5	Periodic Costs - Year 13	86-68130	0	0	1	LS	$11,529.77	$11,529.77	$11,529.77	$0.00	$0.00	$11,529.77
	PI 6	Periodic Costs - Year 15	86-68130	0	0	1	LS	$29,121.69	$29,121.69	$29,121.69	$0.00	$0.00	$29,121.69
	PI 7	Periodic Costs - Year 17	86-68130	1	1	0	LS	$17,906.80	$31,689.00	$31,689.00	$17,906.80	$31,689.00	$0.00
	PI 8	Periodic Costs - Year 20	86-68130	0	0	1	LS	$23,792.37	$23,792.37	$23,792.37	$0.00	$0.00	$23,792.37
	PI 9	Periodic Costs - Year 25	86-68130	1	1	1	LS	$5,460.30	$16,380.90	$26,537.06	$5,460.30	$16,380.90	$26,537.06
	PI 10	Periodic Costs - Year 30	86-68130	0	0	1	LS	$15,881.69	$15,881.69	$15,881.69	$0.00	$0.00	$15,881.69
	PI 11	Periodic Costs - Year 33	86-68130	1	1	0	LS	$9,378.46	$16,596.72	$16,596.72	$9,378.46	$16,596.72	$0.00
	PI 12	Periodic Costs - Year 35	86-68130	0	0	1	LS	$12,975.13	$12,975.13	$12,975.13	$0.00	$0.00	$12,975.13
	PI 13	Periodic Costs - Year 38	86-68130	0	0	1	LS	$4,196.99	$4,196.99	$4,196.99	$0.00	$0.00	$4,196.99
	PI 14	Periodic Costs - Year 40	86-68130	0	0	1	LS	$10,600.97	$10,600.97	$10,600.97	$0.00	$0.00	$10,600.97
	PI 15	Periodic Costs - Year 42	86-68130	0	1	0	LS	$8,239.50	$8,239.50	$8,239.50	$0.00	$8,239.50	$0.00
	PI 16	Periodic Costs - Year 45	86-68130	0	0	1	LS	$8,660.95	$8,660.95	$8,660.95	$0.00	$0.00	$8,660.95
	PI 17	Annual Costs - Maintenance	86-68130	1	1	1	LS	$357,511.00	$525,752.00	$1,514,164.00	$357,511.00	$525,752.00	$1,514,164.00
		Subtotal 1						$472,056.56			$472,056.56	$726,224.62	$1,846,033.45
		Mobilization		1	1	1	LS	$24,000.00	$36,000.00	$92,000.00	$24,000.00	$36,000.00	$92,000.00
		Subtotal 1 w/ mobilization									**$496,056.56**	**$762,224.62**	**$1,938,033.45**
		Escalation to Notice to Proceed (NTP) - None Included									$0.00	$0.00	$0.00
		Design Contingencies		1	1	1	LS	$43,943.44	$77,775.38	$317,391.55	$43,943.44	$77,775.38	$317,391.55
		APS = Allowance for		0	0	1	LS	$0.00	$0.00	$44,575.00	$0.00	$0.00	$44,575.00
		Procurement Strategies (if applicable)											
		CONTRACT COST									**$540,000.00**	**$840,000.00**	**$2,300,000.00**
		Construction Contingencies		1	1	1	LS	$90,000.00	$160,000.00	$500,000.00	$90,000.00	$160,000.00	$500,000.00
		FIELD COST									**$630,000.00**	**$1,000,000.00**	**$2,800,000.00**
		Non-Contract Costs		1	1	1	LS	$160,000.00	$500,000.00	$1,000,000.00	$160,000.00	$500,000.00	$1,000,000.00
		CONSTRUCTION COST									**$790,000.00**	**$1,500,000.00**	**$3,800,000.00**

Notes:
Reference documents RM D&S Cost Estimate (FAC 09-01) and RM D&S CCE and PCE (FAC 09-02)

QUANTITIES			PRICES		
BY	Rick Benik	CHECKED: Stephen Latham	BY	Greg Akins	CHECKED
DATE PREPARED	3/24/2011	PEER REVIEW: Tom Hepler P.E.	DATE PREPARED	06/15/11	PEER REVIEW

Crystal Ball Report - Full
Simulation started on 6/15/2011 at 10:01:13
Simulation stopped on 6/15/2011 at 10:01:28

Run preferences:	
Number of trials run	10,000
Monte Carlo	
Seed	999
Precision control on	
Confidence level	95.00%
Run statistics:	
Total running time (sec)	14.78
Trials/second (average)	676
Random numbers per sec	29,761
Crystal Ball data:	
Assumptions	44
Correlations	0
Correlated groups	0
Decision variables	0
Forecasts	3

TECHNICAL SERVICE CENTER
ESTIMATING, SPECIFICATIONS
AND VALUE PROGRAM GROUP

UNIT PRICES BY _____

DATE 6/15/11

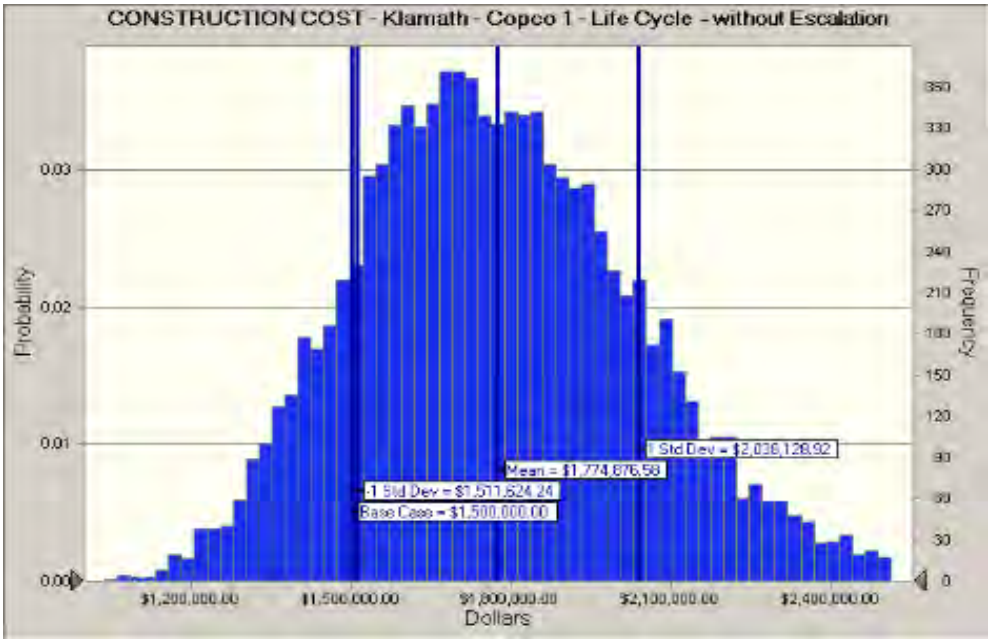
DATE	PEER REVIEWER(S)	CODE
6/15/2011	Signature	86-68170
	Craig A. Grush Printed Name	
	Signature	
	Printed Name	
Author Initials	PEER REVIEW NOT REQUIRED	

Forecasts

Worksheet: [01 Copco 1 Crystal Ball Spreadsheet - wo esc.xlsx]SUMMARY 480 FP

Forecast: CONSTRUCTION COST - Klamath - Copco 1 - Life Cycle – without Escalation Cell: U40

Summary:
Entire range is from $1,019,320.29 to $2,775,567.70
Base case is $1,500,000.00
After 10,000 trials, the std. error of the mean is $2,632.52



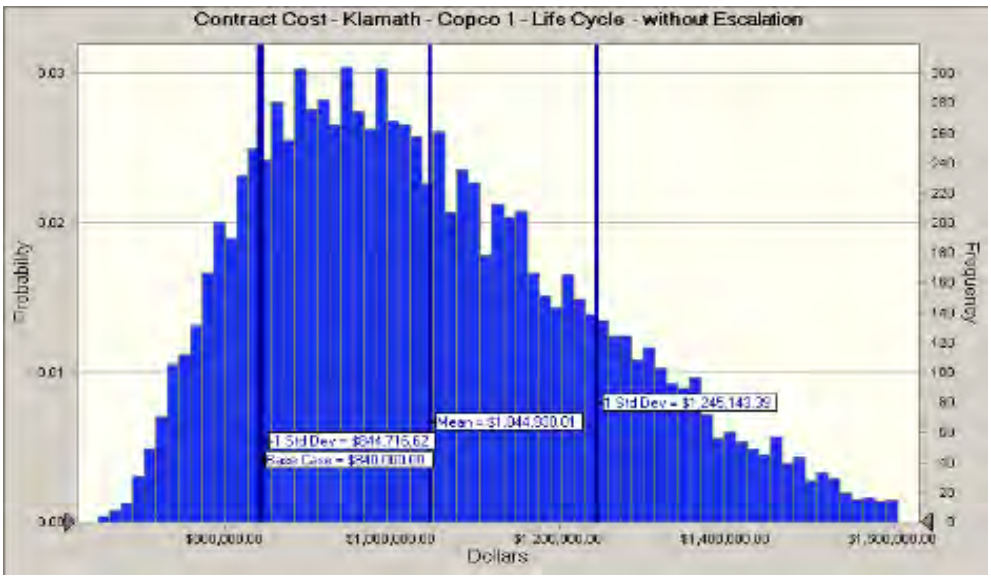
Forecast: CONSTRUCTION COST - Klamath - Copco 1 - Life Cycle – without Escalation (cont'd) **Cell: J40**

Statistics:	Forecast values
Trials	10,000
Mean	$1,774,876.58
Median	$1,757,361.03
Mode	---
Standard Deviation	$263,252.34
Variance	################
Skewness	0.3216
Kurtosis	2.93
Coeff. of Variability	0.1483
Minimum	$1,019,320.29
Maximum	$2,775,567.70
Range Width	$1,756,247.41
Mean Std. Error	$2,632.52

Percentiles:	Forecast values
0%	$1,019,320.29
10%	$1,445,279.54
20%	$1,548,397.17
30%	$1,622,808.45
40%	$1,690,721.40
50%	$1,757,347.47
60%	$1,829,255.46
70%	$1,905,272.32
80%	$1,995,700.06
90%	$2,121,251.65
100%	$2,775,567.70

Forecast: Contract Cost - Klamath - Copco 1 - Life Cycle – without Escalation **Cell: U36**

Summary:
Entire range is from $647,433.20 to $1,866,869.55
Base case is $840,000.00
After 10,000 trials, the std. error of the mean is $2,002.13



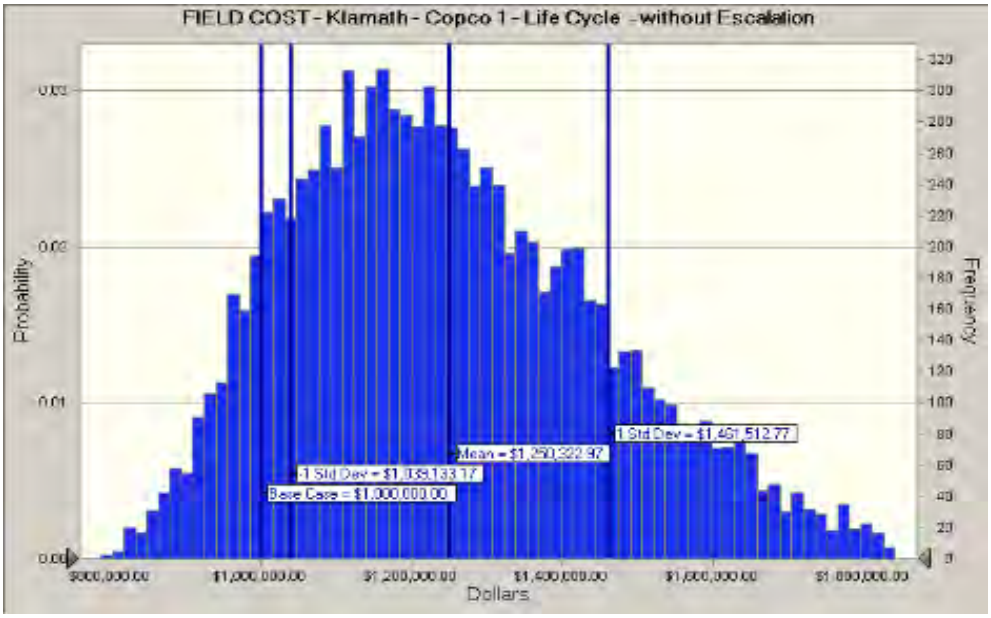
Statistics:	Forecast values
Trials	10,000
Mean	$1,044,930.01
Median	$1,014,193.46
Mode	---
Standard Deviation	$200,213.38
Variance	################
Skewness	0.6348
Kurtosis	2.97
Coeff. of Variability	0.1916
Minimum	$647,433.20
Maximum	$1,866,869.55
Range Width	$1,219,436.35
Mean Std. Error	$2,002.13

Forecast: Contract Cost - Klamath - Copco 1 - Life Cycle – without Escalation (cont'd) **Cell: U36**

Percentiles:	Forecast values
0%	$647,433.20
10%	$808,361.05
20%	$864,927.21
30%	$915,212.81
40%	$964,863.72
50%	$1,014,181.79
60%	$1,070,492.49
70%	$1,136,424.41
80%	$1,216,570.88
90%	$1,327,521.92
100%	$1,866,869.55

Forecast: FIELD COST - Klamath - Copco 1 - Life Cycle – without Escalation **Cell: U38**

Summary:
Entire range is from $786,920.83 to $2,183,728.12
Base case is $1,000,000.00
After 10,000 trials, the std. error of the mean is $2,111.90



Statistics:	Forecast values
Trials	10,000
Mean	$1,250,322.97
Median	$1,223,906.92
Mode	---
Standard Deviation	$211,189.80
Variance	################
Skewness	0.5561
Kurtosis	3.00
Coeff. of Variability	0.1689
Minimum	$786,920.83
Maximum	$2,183,728.12
Range Width	$1,396,807.28
Mean Std. Error	$2,111.90

Forecast: FIELD COST - Klamath - Copco 1 - Life Cycle – without Escalation (cont'd) **Cell: U38**

Percentiles:	Forecast values
0%	$786,920.83
10%	$996,946.93
20%	$1,063,411.60
30%	$1,119,952.56
40%	$1,171,334.37
50%	$1,223,890.48
60%	$1,280,021.32
70%	$1,348,274.27
80%	$1,427,136.75
90%	$1,543,744.97
100%	$2,183,728.12

End of Forecasts

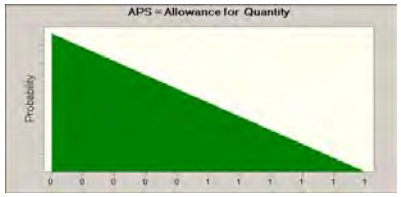
Assumptions

Worksheet: [01 Copco 1 Crystal Ball Spreadsheet - wo esc.xlsx]SUMMARY 480 FP

Assumption: APS = Allowance for Quantity — Cell: L34

Triangular distribution with parameters:

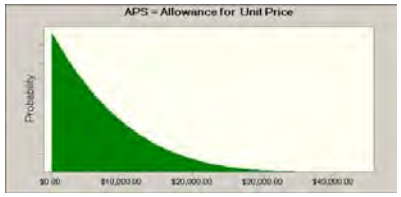
Minimum	0	(=K34)
Likeliest	0	(=L34)
Maximum	1	(=M34)



Assumption: APS = Allowance for Unit Price — Cell: R34

BetaPERT distribution with parameters:

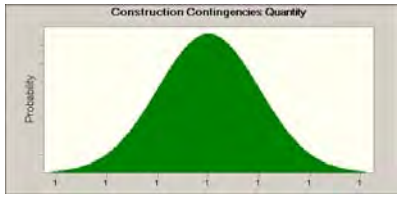
Minimum	$0.00	(=Q34)
Likeliest	$0.00	(=R34)
Maximum	$44,575.00	(=S34)



Assumption: Construction Contingencies Quantity — Cell: L37

Normal distribution with parameters:

Mean	1	(=L37)
Std. Dev.	0	

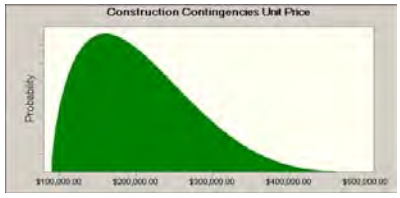


Assumption: Construction Contingencies Unit Price

Cell: R37

BetaPERT distribution with parameters:

Minimum	$90,000.00	(=Q37)
Likeliest	$160,000.00	(=R37)
Maximum	$500,000.00	(=S37)



Assumption: Design Contingencies Quantity

Cell: L33

Normal distribution with parameters:

Mean	1	(=L33)
Std. Dev.	0	

Assumption: Design Contingencies Unit Price

Cell: R33

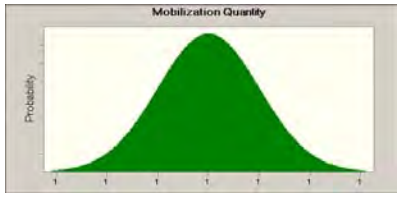
BetaPERT distribution with parameters:

Minimum	$43,943.44	(=Q33)
Likeliest	$77,775.38	(=R33)
Maximum	$317,391.55	(=S33)

Assumption: Mobilization Quantity **Cell: L30**

Normal distribution with parameters:

Mean	1	(=L30)
Std. Dev.	0	



Assumption: Mobilization Unit Price **Cell: R30**

BetaPERT distribution with parameters:

Minimum	$24,000.00	(=Q30)
Likeliest	$36,000.00	(=R30)
Maximum	$92,000.00	(=S30)

Assumption: Non-Contract Costs Quantity **Cell: L39**

Normal distribution with parameters:

Mean	1	(=L39)
Std. Dev.	0	

Assumption: Non-Contract Costs Unit Price **Cell: R39**

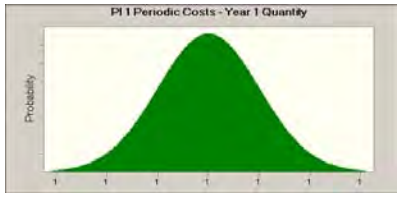
BetaPERT distribution with parameters:

Minimum	$160,000.00	(=Q39)
Likeliest	$500,000.00	(=R39)
Maximum	$1,000,000.00	(=S39)

Assumption: PI 1 Periodic Costs - Year 1 Quantity **Cell: L12**

Normal distribution with parameters:

Mean	1	(=L12)
Std. Dev.	0	



Assumption: PI 1 Periodic Costs - Year 1 Unit Price **Cell: R12**

BetaPERT distribution with parameters:

Minimum	$81,800.00	(=Q12)
Likeliest	$95,000.00	(=R12)
Maximum	$109,300.00	(=S12)

Assumption: PI 10 Periodic Costs - Year 30 Quantity **Cell: L21**

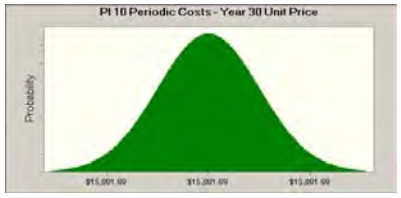
Triangular distribution with parameters:

Minimum	0	(=K21)
Likeliest	0	(=L21)
Maximum	1	(=M21)

Assumption: PI 10 Periodic Costs - Year 30 Unit Price **Cell: R21**

Normal distribution with parameters:

Mean	$15,881.69	(=R21)
Std. Dev.	$0.00	



Assumption: PI 11 Periodic Costs - Year 33 Quantity **Cell: L22**

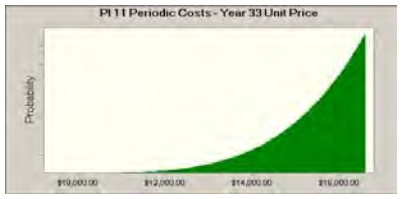
Triangular distribution with parameters:

Minimum	0	(=M22)
Likeliest	1	(=K22)
Maximum	1	(=L22)

Assumption: PI 11 Periodic Costs - Year 33 Unit Price **Cell: R22**

BetaPERT distribution with parameters:

Minimum	$9,378.46	(=Q22)
Likeliest	$16,596.72	(=R22)
Maximum	$16,596.72	(=S22)



Assumption: PI 12 Periodic Costs - Year 35 Quantity **Cell: L23**

Triangular distribution with parameters:

Minimum	0	(=K23)
Likeliest	0	(=L23)
Maximum	1	(=M23)

Assumption: PI 12 Periodic Costs - Year 35 Unit Price **Cell: R23**

Normal distribution with parameters:

Mean	$12,975.13	(=R23)
Std. Dev.	$0.00	

Assumption: PI 13 Periodic Costs - Year 38 Quantity **Cell: L24**

Triangular distribution with parameters:

Minimum	0	(=K24)
Likeliest	0	(=L24)
Maximum	1	(=M24)

Assumption: PI 13 Periodic Costs - Year 38 Unit Price **Cell: R24**

Normal distribution with parameters:

Mean	$4,196.99	(=R24)
Std. Dev.	$0.00	

Assumption: PI 14 Periodic Costs - Year 40 Quantity **Cell: L25**

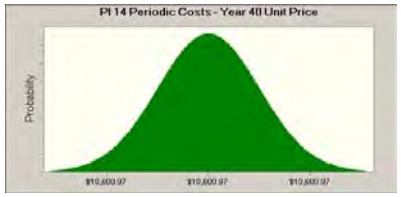
Triangular distribution with parameters:

Minimum	0	(=K25)
Likeliest	0	(=L25)
Maximum	1	(=M25)

Assumption: PI 14 Periodic Costs - Year 40 Unit Price **Cell: R25**

Normal distribution with parameters:

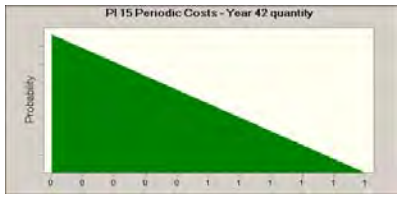
Mean	$10,600.97	(=R25)
Std. Dev.	$0.00	



Assumption: PI 15 Periodic Costs - Year 42 quantity **Cell: L26**

Triangular distribution with parameters:

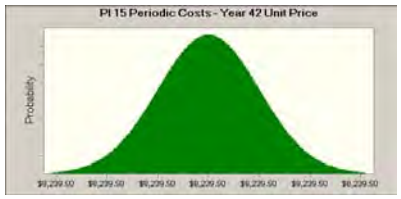
Minimum	0	(=K26)
Likeliest	0	(=M26)
Maximum	1	(=L26)



Assumption: PI 15 Periodic Costs - Year 42 Unit Price **Cell: R26**

Normal distribution with parameters:

Mean	$8,239.50	(=R26)
Std. Dev.	$0.00	



Assumption: PI 16 Periodic Costs - Year 45 Quantity **Cell: L27**

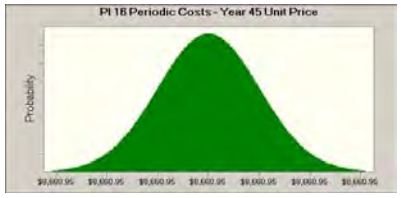
Triangular distribution with parameters:

Minimum	0	(=K27)
Likeliest	0	(=L27)
Maximum	1	(=M27)

Assumption: PI 16 Periodic Costs - Year 45 Unit Price **Cell: R27**

Normal distribution with parameters:

Mean	$8,660.95	(=R27)
Std. Dev.	$0.00	



Assumption: PI 17 Annual Costs - Maintenance Quantity **Cell: L28**

Normal distribution with parameters:

Mean	1	(=L28)
Std. Dev.	0	

Assumption: PI 17 Annual Costs - Maintenance Unit Price **Cell: R28**

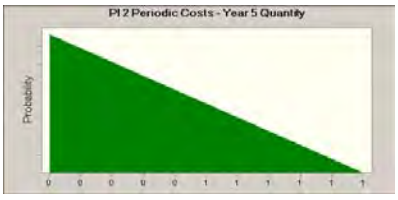
BetaPERT distribution with parameters:

Minimum	$357,511.00	(=Q28)
Likeliest	$525,752.00	(=R28)
Maximum	$1,514,164.00	(=S28)

Assumption: PI 2 Periodic Costs - Year 5 Quantity **Cell: L13**

Triangular distribution with parameters:

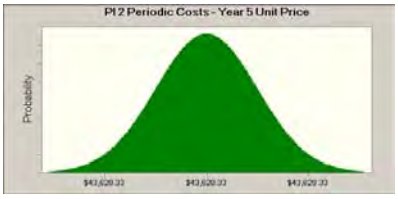
Minimum	0	(=K13)
Likeliest	0	(=L13)
Maximum	1	(=M13)



Assumption: PI 2 Periodic Costs - Year 5 Unit Price **Cell: R13**

Normal distribution with parameters:

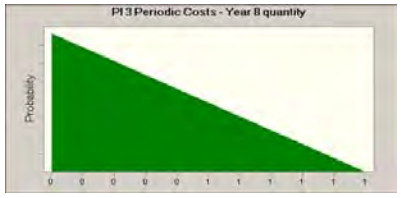
Mean	$43,628.33	(=R13)
Std. Dev.	$0.00	(=0.00001)



Assumption: PI 3 Periodic Costs - Year 8 quantity **Cell: L14**

Triangular distribution with parameters:

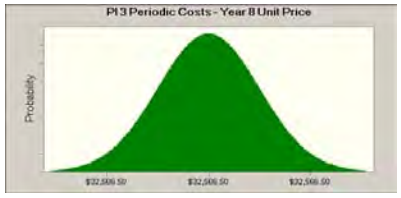
Minimum	0	(=K14)
Likeliest	0	(=M14)
Maximum	1	(=L14)



Assumption: PI 3 Periodic Costs - Year 8 Unit Price **Cell: R14**

Normal distribution with parameters:

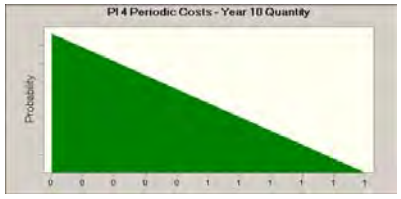
Mean	$32,566.50	(=R14)
Std. Dev.	$0.00	(=0.00001)



Assumption: PI 4 Periodic Costs - Year 10 Quantity **Cell: L15**

Triangular distribution with parameters:

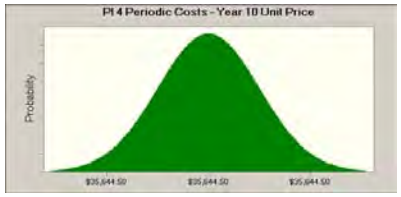
Minimum	0	(=K15)
Likeliest	0	(=L15)
Maximum	1	(=M15)



Assumption: PI 4 Periodic Costs - Year 10 Unit Price **Cell: R15**

Normal distribution with parameters:

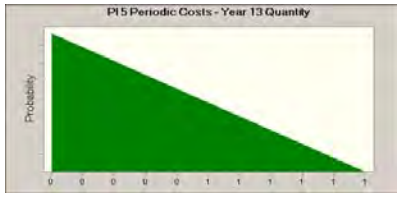
Mean	$35,644.50	(=R15)
Std. Dev.	$0.00	(=0.00001)



Assumption: PI 5 Periodic Costs - Year 13 Quantity **Cell: L16**

Triangular distribution with parameters:

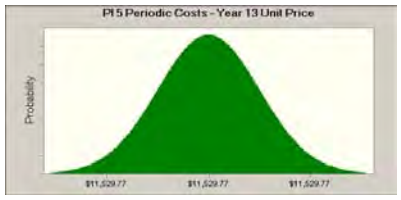
Minimum	0	(=K16)
Likeliest	0	(=L16)
Maximum	1	(=M16)



Assumption: PI 5 Periodic Costs - Year 13 Unit Price **Cell: R16**

Normal distribution with parameters:

Mean	$11,529.77	(=R16)
Std. Dev.	$0.00	(=0.00001)



Assumption: PI 6 Periodic Costs - Year 15 Quantity **Cell: L17**

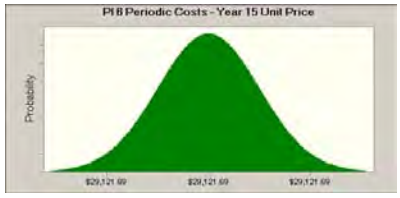
Triangular distribution with parameters:

Minimum	0	(=K17)
Likeliest	0	(=L17)
Maximum	1	(=M17)

Assumption: PI 6 Periodic Costs - Year 15 Unit Price **Cell: R17**

Normal distribution with parameters:

Mean	$29,121.69	(=R17)
Std. Dev.	$0.00	(=0.00001)



Assumption: PI 7 Periodic Costs - Year 17 Quantity **Cell: L18**

Triangular distribution with parameters:

Minimum	0	(=M18)
Likeliest	1	(=K18)
Maximum	1	(=L18)

Assumption: PI 7 Periodic Costs - Year 17 Unit Price **Cell: R18**

BetaPERT distribution with parameters:

Minimum	$17,906.80	(=Q18)
Likeliest	$31,689.00	(=R18)
Maximum	$31,689.00	(=S18)

Assumption: PI 8 Periodic Costs - Year 20 Quantity **Cell: L19**

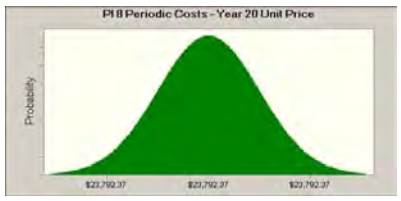
Triangular distribution with parameters:

Minimum	0	(=K19)
Likeliest	0	(=L19)
Maximum	1	(=M19)

Assumption: PI 8 Periodic Costs - Year 20 Unit Price **Cell: R19**

Normal distribution with parameters:

Mean	$23,792.37	(=R19)
Std. Dev.	$0.00	



Assumption: PI 9 Periodic Costs - Year 25 Quantity **Cell: L20**

Normal distribution with parameters:

Mean	1	(=L20)
Std. Dev.	0	

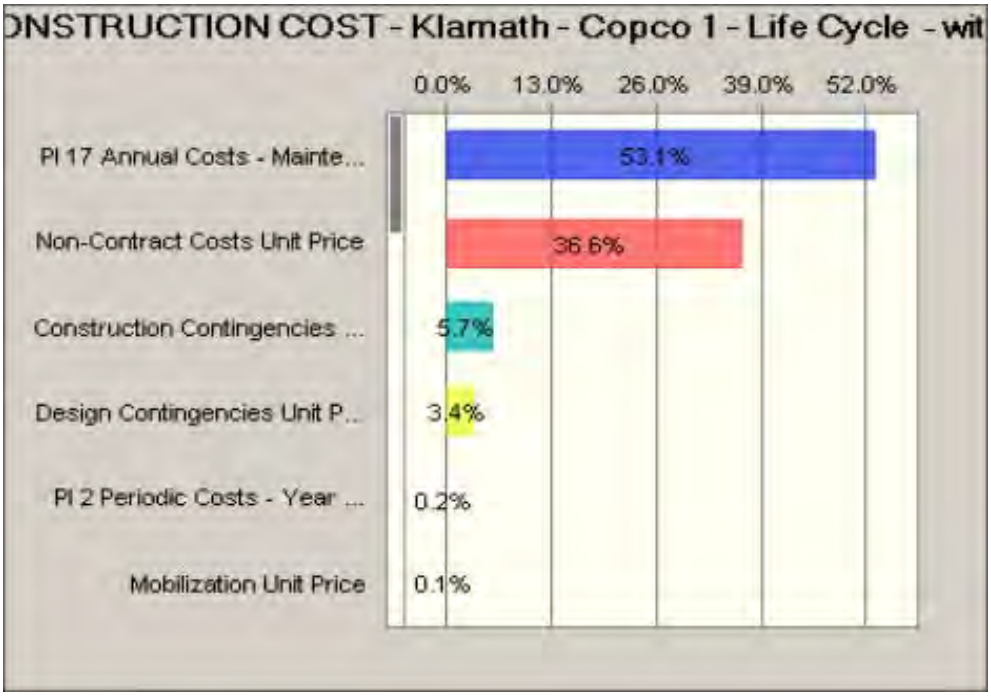
Assumption: PI 9 Periodic Costs - Year 25Unit Price **Cell: R20**

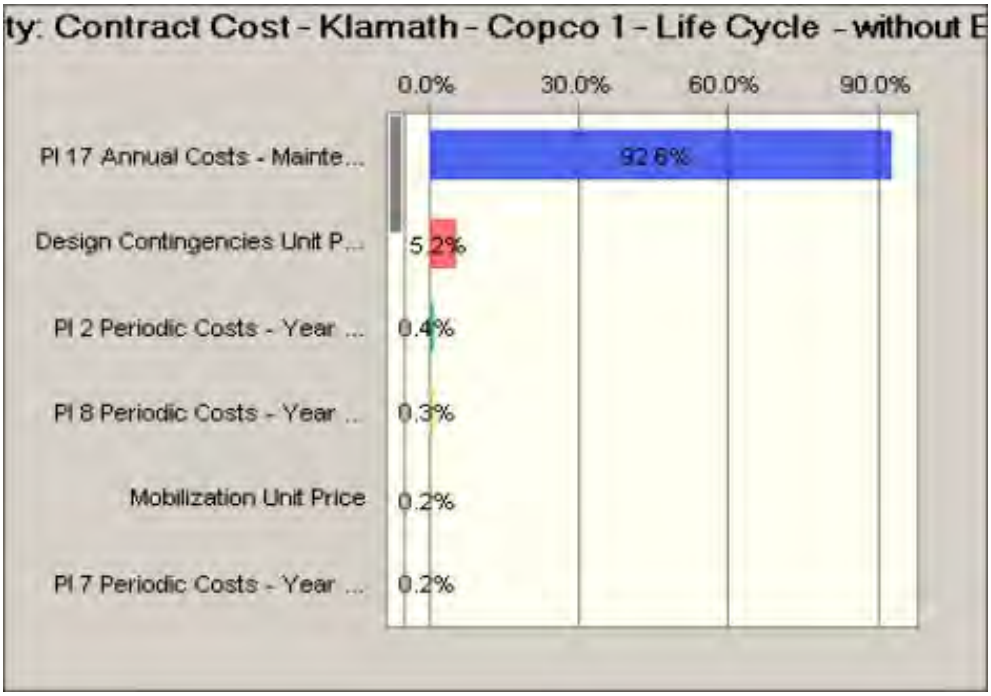
BetaPERT distribution with parameters:

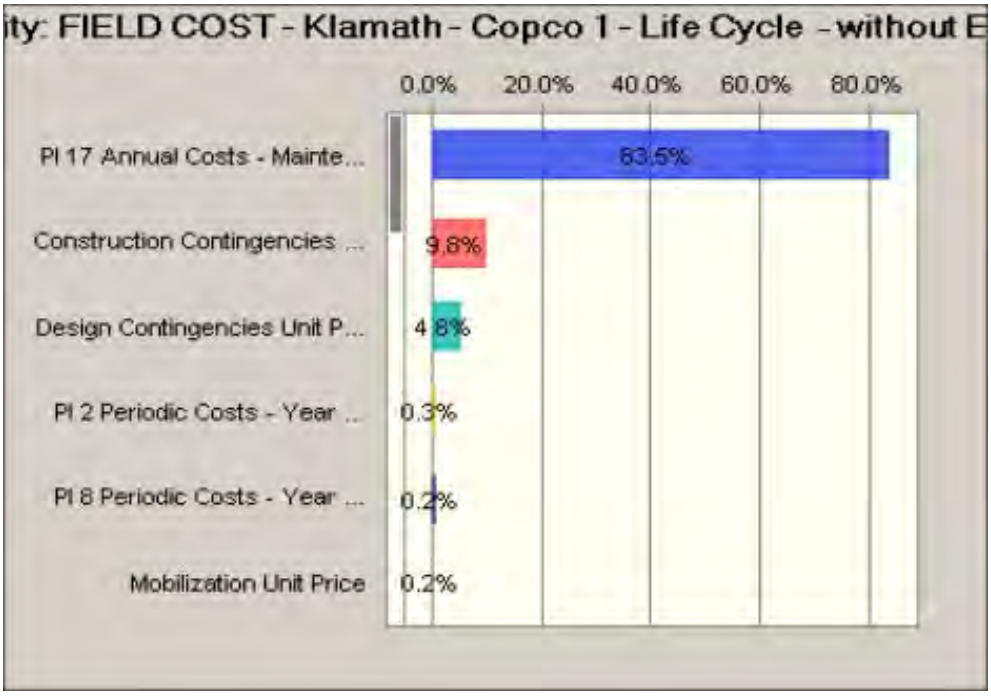
Minimum	$5,460.30	(=Q20)
Likeliest	$16,380.90	(=R20)
Maximum	$26,537.06	(=S20)

End of Assumptions

Sensitivity Charts




ty: Contract Cost - Klamath - Copco 1 - Life Cycle - without E
0.0%
30.0%
60.0%
90.0%
Pl 17 Annual Costs - Mainte...
92.6%
Design Contingencies Unit P...
5.2%
Pl 2 Periodic Costs - Year ...
0.4%
Pl 8 Periodic Costs - Year ...
0.3%
Mobilization Unit Price
0.2%
Pl 7 Periodic Costs - Year ...
0.2%


ity: FIELD COST - Klamath - Copco 1 - Life Cycle - without E
0.0%
20.0%
40.0%
60.0%
80.0%
Pl 17 Annual Costs - Mainte...
83.5%
Construction Contingencies ...
9.8%
Design Contingencies Unit P...
4.8%
Pl 2 Periodic Costs - Year ...
0.3%
Pl 8 Periodic Costs - Year ...
0.2%
Mobilization Unit Price
0.2%

No target forecast has been specified

No target forecast has been specified

End of Sensitivity Charts

BUREAU OF RECLAMATION

ESTIMATE WORKSHEET

FEATURE:
REVISION #1
Klamath River Dams Removal
Full Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable
Diversion and Care

PROJECT:
Klamath River
Northern California/Southern Oregon

WOID:	AF484	**ESTIMATE LEVEL:**	Feasibility
REGION:	MP	**UNIT PRICE LEVEL:**	July-2010

FILE: C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 1\[Klamath Dams Removal - COPCO 1 - Full Removal Option - REV#1 - MP Feas Est - 4-2011.xlsx]Diversion & Care

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
	1	Furnish, Install, and Remove Barge-Mounted	86-68130	1	ls		$350,000.00
		Crane in Reservoir for Dam Removal.					
		Barge taken from Iron Gate Reservoir.					
		Barge is used to modify diversion tunnel intake structure.					
		Barge is also used to remove spillway gates, piers, bridge and concrete in spillway crest.					
		Barge is located on reservoir for approximately 5 months.					
	2	Remove Sediment from Diversion Tunnel Intake	86-68130	30	cy	$2,000.00	$60,000.00
		to provide access.					
		Requires removing sediment 115 feet deep using clamshell or suction dredge.					
	3	Furnish, Install, and Remove Large Crane on	86-68130	1	ls	Included in the mobilization item	
		Right Abutment.					
		Crane used to deliver equipment and materials and to remove waste materials as required.					
		Crane in place for 4 months.					
	4	Remove Water from behind Tailrace Cofferdam.	86-68130	200,000	gals	$0.01	$2,000.00
		Unwatering of tailrace for removal of the powerhouse in the dry.					
		Assume 3 inch portable trash pump operating for 1 day.					
	5	Riprap Protection on Cofferdam.	86-68130	260	cy	$150.00	$39,000.00
		Riprap protects cofferdam from diversion tunnel releases.					
	6	Provide Dewatering behind Tailrace Cofferdam	86-68130	1	ls		$35,000.00
		for removal of Powerhouse in the dry.					
		Assume 3 inch portable trash pump operating for approximately 3 months.					
		SUBTOTAL THIS SHEET					**$486,000.00**

QUANTITIES		PRICES	
BY Rick Benik	**CHECKED** Jonathan East	**BY** Craig A. Grush, P.E.	**CHECKED** CAG 4/14/11
DATE PREPARED 10/26/10	**PEER REVIEW / DATE** Tom Hepler P.E. 10/26/10	**DATE PREPARED** 04/14/11	**PEER REVIEW / DATE** DEH 4/14/11

ESTIMATE WORKSHEET

FEATURE:	PROJECT:
REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable Diversion and Care	Klamath River Northern California/Southern Oregon
	WOID: AF484 — ESTIMATE LEVEL: Feasibility
	REGION: MP — UNIT PRICE LEVEL: July-2010
	FILE: C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 1\[Klamath Dams Removal - COPCO 1 - Full Removal Option - REV#1 - MP Feas Est - 4-2011.xlsx]Diversion & Care

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
	7	Remove Current Diversion Tunnel Plug	86-68130	195	yd3	$1,500.00	$292,500.00
		Plug located in the middle of the tunnel					
		Reinforced concrete					
		Tunnel work					
	8	Construct Embankment Cofferdam in Tailrace	86-68130	1,700	yd3	$85.00	$144,500.00
		to remove Powerhouse in dry.					
		Assumes 10 ft wide crest with 2:1 side slopes, approximately 250 ft long and up to 12 ft high.					
		Embankment material taken from Iron Gate Dam Removal, approximately 10 mile haul distance.					
		SUBTOTAL THIS SHEET					**$437,000.00**

QUANTITIES		PRICES	
BY Jonathan East	CHECKED Sheena Barnes	BY Craig A. Grush, P.E.	CHECKED cmm 4/14/11
DATE PREPARED 10/26/10	PEER REVIEW / DATE Rick Benik P.E. 10/26/10	DATE PREPARED 04/14/11	PEER REVIEW / DATE DCN 4/14/11

ESTIMATE WORKSHEET

FEATURE:
REVISION #1
Klamath River Dams Removal
Full Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable
Diversion and Care

PROJECT:
Klamath River
Northern California/Southern Oregon

WOID:	AF484	**ESTIMATE LEVEL:**	Feasibility
REGION:	MP	**UNIT PRICE LEVEL:**	July-2010

FILE: C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 1\[Klamath Dams Removal - COPCO 1 - Full Removal Option - REV#1 - MP Feas Est - 4-2011.xlsx]Diversion & Care

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		MECHANICAL	86-68420				
		Furnish, Install and Remove the following					
		necessary for the removal of Copco #1 Dam.					
	9	3-6'x6' Fabricated Slide Gates with 120 ft. head					
		Total slide gate weight approximately: 12,500 lbs. ea.		40,500	lbs	$15.00	$607,500.00
		Includes operators, stems, guides, and remote controls.					
		Installation requires a dive depth of 115 ft.					
		DIVERSION AND CARE SUBTOTAL					**$1,530,500.00**

QUANTITIES		PRICES	
BY T. J. Turnage	**CHECKED** K. Converse	**BY** Craig A. Grush, P.E.	**CHECKED** aam 4/14/11
DATE PREPARED 10/28/10	**PEER REVIEW / DATE** Dan Drake 10/29/2010	**DATE PREPARED** 04/14/11	**PEER REVIEW / DATE** DCD 4/14/11

FEATURE:	PROJECT:
REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable Dam	Klamath River Northern California/Southern Oregon
	WOID: AF484 — ESTIMATE LEVEL: Feasibility
	REGION: MP — UNIT PRICE LEVEL: July-2010
	FILE: C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 1\[Klamath Dams Removal - COPCO 1 - Full Removal Option - REV#1 - MP Feas Est - 4-2011.xlsx]Diversion & Care

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
		Concrete and Structural Steel Items:					
	10	Remove Concrete Dam down to Elev. 2476	86-68130	36,000	yd3	$300.00	$10,800,000.00
		Elev. 2476 represents original streambed channel at downstream face of dam.					
		Concrete in foundation to remain. Spillway crest at Elev. 2593.5.					
		Includes concrete in dam, spillway crest, piers (390 cy), bridge					
		deck (72 cy) and left abutment. Concrete is reinforced.					
		Requires notching of concrete dam under head below approximately Elev. 2536					
		for an average water year. Approx. 17,000 cy of concrete in dam above El. 2536.					
		Assume ten notches, 12 ft deep, alternating sides with five on each side for					
		removal of final 60 feet of dam.					
		Each notch overlaps the previous alternating notch in 6 foot lifts.					
		Each notch is approximately 20 ft wide with an average 6 ft thickness to be					
		removed by blasting below reservoir surface.					
	11	Remove Concrete Intake Structure on Right	86-68130	21,000	yd3	$350.00	$7,350,000.00
		Abutment					
		Includes concrete in gate houses and headworks for units 1 and 2.					
	12	Remove Structural Steel from Spillway	86-68130	55,000	lbs	$1.00	$55,000.00
		Includes rails, misc. steel					
		Does not include spillway gates					
		Assume contains paint with heavy metals.					
		By barge and crane					
	13	Install Diversion Tunnel Plugs	86-68130	30	yd3	$1,200.00	$36,000.00
		Plug upstream (6 cy) and downstream ends					
		Assume 2' thick each					
	14	Remove Diversion Tunnel Control Structure	86-68130	350	yd3	$215.00	$75,250.00
		Concrete					
		Includes guide boxes					
		Assume reinforced					
		SUBTOTAL THIS SHEET					**$18,316,250.00**

QUANTITIES		PRICES	
BY Jonathan East	CHECKED Sheena Barnes	BY Craig A. Grush, P.E.	CHECKED Cmm 4/14/11
DATE PREPARED 11/01/10	PEER REVIEW / DATE Rick Benik P.E. 11/1/10	DATE PREPARED 04/14/11	PEER REVIEW / DATE DCN 4/14/11

FEATURE:	PROJECT:		
REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable Dam	Klamath River Northern California/Southern Oregon		
	WOID: AF484	ESTIMATE LEVEL:	Feasibility
	REGION: MP	UNIT PRICE LEVEL:	July-2010
	FILE: C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 1\[Klamath Dams Removal - COPCO 1 - Full Removal Option - REV#1 - MP Feas Est - 4-2011.xlsx]Diversion & Care		

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		MECHANICAL					
		Remove and dispose of the following					
		equipment at Dam:					
	15	Hand Rails	86-68420	11,000	lb	$1.00	$11,000.00
		(Assume contains paint with heavy metals)					
		By barge and crane					
	16	Radial Gates	86-68420	140,500	lb	$1.00	$140,500.00
		13 radial gates, wall and sillplates and 3-hoists		Revised 8.26.10 TJT			
		(Assume contains paint with heavy metals & petroleum products)					
		By barge and crane					
	17	Radial Gate stoplogs	86-68420	18,000	lb	$1.00	$18,000.00
		8 stop logs and 13 sets of guides					
		(Assume contains paint with heavy metals & petroleum products)					
		By barge and crane					
	18	Stoplog hoist, track and supports	86-68420	26,000	lb	$1.00	$26,000.00
		(Assume contains paint with heavy metals & petroleum products)					
		By barge and crane					
		Remove and dispose of the following					
		equipment at the waste tunnel:					
	19	3 sections of 23' of 72"Ø steel lining (embedded)	86-68420	54,000	lb	$0.85	$45,900.00
		(Assume contains paint with heavy metals)					
	20	3 - 72" butterfly valves (embedded)	86-68420	55,000	lb	$0.85	$46,750.00
		(Assume contains paint with heavy metals & petroleum products)					
	21	3-72" flapper valves with remote mechanical	86-68420	78,000	lb	$3.00	$234,000.00
		control (embedded)					
		(Assume contains paint with heavy metals)					
		Removal requires a dive depth of 115 ft.					
		SUBTOTAL THIS SHEET					**$522,150.00**

QUANTITIES		PRICES	
BY K. Converse 10/28/10	CHECKED T Turnage	BY Craig A. Grush, P.E.	CHECKED CAG 4/14/11
DATE PREPARED	PEER REVIEW / DATE Dan Drake 10/29/2010	DATE PREPARED 04/14/11	PEER REVIEW / DATE DCD 4/14/11

ESTIMATE WORKSHEET

FEATURE:
REVISION #1
Klamath River Dams Removal
Full Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable
Dam

PROJECT:
Klamath River
Northern California/Southern Oregon

WOID:	AF484	ESTIMATE LEVEL:	Feasibility
REGION:	MP	UNIT PRICE LEVEL:	July-2010

FILE: C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 1\[Klamath Dams Removal - COPCO 1 - Full Removal Option - REV#1 - MP Feas Est - 4-2011.xlsx]Diversion & Care

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		ELECTRICAL					
		Remove and dispose of the following					
		equipment at Spillway:					
	22	Spillway gate motor & control panel	86-68430	1	EA	$1,000.00	$1,000.00
		Total weight approximately: 500 lbs.					
	23	Distribution equipment , panelboards	86-68430	1	EA	$6,000.00	$6,000.00
		Total weight approximately: 500 lbs.					
		DAM SUBTOTAL					**$18,845,400.00**

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY Craig A. Grush, P.E.	CHECKED 4/14/11
DATE PREPARED 11/01/10	PEER REVIEW / DATE L. Rossi 11/1/10	DATE PREPARED 04/14/11	PEER REVIEW / DATE 4/14/11

ESTIMATE WORKSHEET

FEATURE:
REVISION #1
Klamath River Dams Removal
Full Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable
Powerhouse, Switchyard, and Transmission Line

PROJECT:
Klamath River
Northern California/Southern Oregon

WOID:	AF484	ESTIMATE LEVEL:	Feasibility
REGION:	MP	UNIT PRICE LEVEL:	July-2010

FILE: C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 1\[Klamath Dams Removal - COPCO 1 - Full Removal Option - REV#1 - MP Feas Est - 4-2011.xlsx]Diversion & Care

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
		Concrete and Structural Steel Items:					
	24	Remove Powerhouse Concrete down to top of rock					
		under the PH, Elev. 2482.75 (USGS datum).	86-68130	3,100	yd3	$350.00	$1,085,000.00
		Local datum is converted to USGS datum by					
		adding 2411 feet. (Elev. 71.75 + 2411 = Elev. 2482.75.)					
		All concrete is reinforced.					
		Includes all exterior & interior walls, columns, &					
		beams, and concrete in foundations for transformers					
	25	Remove Powerhouse Structural Steel	86-68130	110,000	lbs	$0.85	$93,500.00
		Roof truss members, purlins, and crane rail					
		Assume contains paint with heavy metals.					
		SUBTOTAL THIS SHEET					**$1,178,500.00**

QUANTITIES		PRICES	
BY Jonathan East	CHECKED Sheena Barnes	BY Craig A. Grush, P.E.	CHECKED CAG 4/14/11
DATE PREPARED 11/01/10	PEER REVIEW / DATE Rick Benik P.E. 11/1/10	DATE PREPARED 04/14/11	PEER REVIEW / DATE NCW 4/14/11

ESTIMATE WORKSHEET

FEATURE:
REVISION #1
Klamath River Dams Removal
Full Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable
Powerhouse, Switchyard, and Transmission Line

PROJECT:
Klamath River
Northern California/Southern Oregon

WOID:	AF484	ESTIMATE LEVEL:	Feasibility
REGION:	MP	UNIT PRICE LEVEL:	July-2010

FILE: C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 1\[Klamath Dams Removal - COPCO 1 - Full Removal Option - REV#1 - MP Feas Est - 4-2011.xlsx]Diversion & Care

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		MECHANICAL					
		Remove and dispose of the following					
		equipment at the Power House:					
	26	2 - Governor oil systems	86-68420	38,000	lb	$0.85	$32,300.00
		governor, sump tanks, accumulator tank, piping					
		(Assume contains paint with heavy metals & petroleum products)					
	27	Cooling water and bearing oil systems	86-68420	11,000	lb	$0.85	$9,350.00
		(Assume contains paint with heavy metals & petroleum products)					
		(encased in concrete)					
	28	4 - Horizontal Tandem Francis Turbines	86-68420	452,000	lb	$0.85	$384,200.00
		(includes runner, scroll case, draft tube and shaft)					
		(Assume contains paint with heavy metals & petroleum products)					
	29	2 - 40 Ton indoor cranes	86-68420	140,000	lb	$0.85	$119,000.00
		Includes crane and rail, not steel rail base					
		(Assume contains paint with heavy metals & petroleum products)					
	30	Compressed Air system	86-68420	1,000	lb	$0.85	$850.00
		(Assume contains paint with heavy metals & petroleum products)					
	31	2 - CO2 systems	86-68420	3,100	lb	$0.85	$2,635.00
		(Assume contains paint with heavy metals & petroleum products)					
	32	Plant Water and Fire Protection	86-68420	2,600	lb	$0.85	$2,210.00
		(Assume contains paint with heavy metals)					
		SUBTOTAL THIS SHEET					**$550,545.00**

QUANTITIES		PRICES	
BY K. Converse	CHECKED T Turnage	BY Craig A. Grush, P.E.	CHECKED CAG 4/14/11
DATE PREPARED 10/28/10	PEER REVIEW / DATE Dan Drake 10/29/2010	DATE PREPARED 04/14/11	PEER REVIEW / DATE DCD 4/14/11

BUREAU OF RECLAMATION

ESTIMATE WORKSHEET

FEATURE:
REVISION #1
Klamath River Dams Removal
Full Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable
Powerhouse, Switchyard, and Transmission Line

PROJECT:
Klamath River
Northern California/Southern Oregon

WOID:	AF484	ESTIMATE LEVEL:	Feasibility
REGION:	MP	UNIT PRICE LEVEL:	July-2010

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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		MECHANICAL					
	33	Transformer Oil Fire protection	86-68420	5,400	lb	$0.85	$4,590.00
		(Assume contains paint with heavy metals & petroleum products)					
	34	Unwatering Piping	86-68420	27,000	lb	$0.85	$22,950.00
		(Assume contains paint with heavy metals)					
	35	Drainage Piping	86-68420	5,000	lb	$0.85	$4,250.00
		(Assume contains paint with heavy metals)					
		SUBTOTAL THIS SHEET					**$31,790.00**

QUANTITIES		PRICES	
BY K. Converse	CHECKED T Turnage	BY Craig A. Grush, P.E.	CHECKED amm 4/14/11
DATE PREPARED 10/28/10	PEER REVIEW / DATE Dan Drake 10/29/2010	DATE PREPARED 04/14/11	PEER REVIEW / DATE DCD 4/14/11

FEATURE:	PROJECT:
REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable Powerhouse, Switchyard, and Transmission Line	Klamath River Northern California/Southern Oregon

WOID:	AF484	ESTIMATE LEVEL:	Feasibility
REGION:	MP	UNIT PRICE LEVEL:	July-2010
FILE:	C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 1\[Klamath Dams Removal - COPCO 1 - Full Removal Option - REV#1 - MP Feas Est - 4-2011.xlsx]Diversion & Care		

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		ELECTRICAL					
		Remove and dispose of the following					
		equipment in the Powerplant:					
	36	Horizontal AC Generator, Indoor Open Frame	86-68430	2	EA	$35,000.00	$70,000.00
		Unit 1 & 2 ea: 12.5 MVA (10 MW); 0.8PF, 2,300V,					
		200 RPM, 3 Ph, including rotating exciter					
		Total weight each approximately: 123,500 lbs.					
		Stator: 32,250 lbs., Rotor: 55,000 lbs.					
		Base: 17,000 lbs., Exciter Assembly: 7,550 lbs.					
		Heaviest lift: 55,000 lbs.					
	37	Excitation equipment for 12.5 MVA Generator	86-68430	2	EA	$6,000.00	$12,000.00
		(2 sections)Total weight approximately: 1,000 lbs.					
	38	Surge protection equip. for 12.5 MVA Generator	86-68430	2	EA	$2,000.00	$4,000.00
		Total weight approximately: 800 lbs.					
	39	Neutral grounding equip. for 12.5 MVA Generator	86-68430	2	EA	$2,000.00	$4,000.00
		includes transformer					
		Total weight approximately: 500 lbs.					
	40	Generator Switchgear, 5kV-includes unit breakers	86-68430	1	EA	$20,000.00	$20,000.00
		(6 Sections @ 400 lbs each section)					
		3 ft x 3 ft x 90 inches high					
		Total weight approximately: 2,400 lbs.					
	41	Station Service Switchgear, 600 volt -(5 sections)	86-68430	1	EA	$20,000.00	$20,000.00
		(400 lbs each section), 3 ft x 3ft x 90 inches high					
		Total weight approximately: 2,000 lbs.					
		SUBTOTAL THIS SHEET					**$130,000.00**

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY Craig A. Grush, P.E.	CHECKED cmm 4/14/11
DATE PREPARED 11/01/10	PEER REVIEW / DATE L. Rossi 11/1/10	DATE PREPARED 04/14/11	PEER REVIEW / DATE DCA 4/14/11

FEATURE:	PROJECT:		
REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable Powerhouse, Switchyard, and Transmission Line	Klamath River Northern California/Southern Oregon		
	WOID: AF484	ESTIMATE LEVEL:	Feasibility
	REGION: MP	UNIT PRICE LEVEL:	July-2010
	FILE: C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 1\[Klamath Dams Removal - COPCO 1 - Full Removal Option - REV#1 - MP Feas Est - 4-2011.xlsx]Diversion & Care		

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		ELECTRICAL					
		Remove and dispose of the following					
		equipment in the Powerplant:					
	42	Unit and plant control switchboard	86-68430	1	EA	$15,000.00	$15,000.00
		5 cubicles (200 lbs each), 2ft x 2ft x 90 in. high					
		Total weight approximately: 1,000 lbs.					
	43	Battery system - assume 60 batteries, charger,	86-68430	1	EA	$10,000.00	$10,000.00
		racks and supports.					
		Total weight approximately: 2,500 lbs.					
	44	Raceways, Conduit and Cable	86-68430	1	EA	$15,000.00	$15,000.00
		(approx. 3000 lin. Ft. power & control cable,					
		1000 lin. Ft. conduit, 200 lin. Ft. cabletray)					
		Total weight approximately: 8,000 lbs.					
	45	Misc. power & control boards	86-68430	1	EA	$5,000.00	$5,000.00
		10 boards (50 lbs each) 3ft x 2 ft x 9 in					
		Total weight approximately: 500 lbs.					
	46	Step-up Transformers, indoor, oil-filled, 1-phase,	86-68430	3	EA	$50,000.00	$150,000.00
		5,000 kVA, 2,300/72,000 volt					
		Total weight approximately each: 31,500 lbs.					
	47	Step-up Transformers, indoor, oil-filled, 1-phase,	86-68430	3	EA	$50,000.00	$150,000.00
		4,165 kVA, 2,300/72,000 volt					
		Total weight approximately each: 31,500 lbs.					
	48	Seven 40-Ton Travelling Crane motors - hoist	86-68430	1	EA	$2,500.00	$2,500.00
		(2-30Hp*), hoist trolley (7.5Hp*), gantry (4-15Hp*)					
		(Hp* Approx.) Total weight approximately: 600 lbs.					
		SUBTOTAL THIS SHEET					**$347,500.00**

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY Craig A. Grush, P.E.	CHECKED cmm 4/14/11
DATE PREPARED 11/01/10	PEER REVIEW / DATE L. Rossi 11/1/10	DATE PREPARED 04/14/11	PEER REVIEW / DATE NCD 4/14/11

FEATURE:	PROJECT:
REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable Powerhouse, Switchyard, and Transmission Line	Klamath River Northern California/Southern Oregon
	WOID: AF484 — ESTIMATE LEVEL: Feasibility
	REGION: MP — UNIT PRICE LEVEL: July-2010
	FILE: C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 1\[Klamath Dams Removal - COPCO 1 - Full Removal Option - REV#1 - MP Feas Est - 4-2011.xlsx]Diversion & Care

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		ELECTRICAL					
		Remove and dispose of the following					
		equipment in the Powerplant:					
	49	40-Ton Travelling Crane control equipment	86-68430	1	EA	$10,000.00	$10,000.00
		(5 cubicles), Total weight approximately: 500 lbs.					
	50	40-Ton Travelling Crane Festoon Cable	86-68430	1	EA	$1,500.00	$1,500.00
		(approx. 200 lin. Ft. cable)					
		Total weight approximately: 800 lbs.					
	51	Four 15-Ton Overhead Crane motors - hoist	86-68430	1	EA	$1,000.00	$1,000.00
		(10Hp*), hoist trolley (5Hp*), gantry (2-5Hp*)					
		(Hp* Approx.) Total weight approximately: 350 lbs.					
	52	15-Ton Overhead Crane control equipment	86-68430	1	EA	$300.00	$300.00
		(1 cubicle), Total weight approximately: 100 lbs.					
	53	15-Ton Overhead Crane Festoon Cable	86-68430	1	EA	$500.00	$500.00
		(approx. 100 lin. Ft. cable)					
		Total weight approximately: 250 lbs.					
		SUBTOTAL THIS SHEET					**$13,300.00**

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY Craig A. Grush, P.E.	CHECKED CMG 4/14/11
DATE PREPARED 11/01/10	PEER REVIEW / DATE L. Rossi 11/1/10	DATE PREPARED 04/14/11	PEER REVIEW / DATE RCR 4/14/11

FEATURE:	PROJECT:		
REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable Powerhouse, Switchyard, and Transmission Line	Klamath River Northern California/Southern Oregon		
	WOID: AF484	ESTIMATE LEVEL:	Feasibility
	REGION: MP	UNIT PRICE LEVEL:	July-2010
	FILE: C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 1\[Klamath Dams Removal - COPCO 1 - Full Removal Option - REV#1 - MP Feas Est - 4-2011.xlsx]Diversion & Care		

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		ELECTRICAL					
		Remove and dispose of the following					
		equipment in the Switchyard:					
		All equipment is on wood-pole structures					
	54	69-kV circuit breakers, oil-filled, PCB	86-68430	2	EA	$3,000.00	$6,000.00
	55	69-kV disconnect switches, group-operated	86-68430	2	EA	$1,500.00	$3,000.00
	56	60-foot wood poles	86-68430	12	EA	$1,000.00	$12,000.00
	57	30-foot wood crossarms	86-68430	24	EA	$500.00	$12,000.00
	58	69-kV insulator strings	86-68430	12	EA	$400.00	$4,800.00
		Remove and dispose of the following					
		wood-pole transmission lines:					
	59	Transmission Line No. 3	86-68430	1.66	mile	$30,000.00	$49,800.00
		From Copco No. 1 switchyard to Fall Creek					
		266.8 ACSR, 69-kV					
	60	Transmission Line No. 15	86-68430	1.23	mile	$30,000.00	$36,900.00
		From Copco No. 1 switchyard to Copco No. 2					
		266.8 ACSR, 69-kV					
	61	Transmission Line No. 26-1	86-68430	0.07	mile	$30,000.00	$2,100.00
		From Copco No. 1 powerhouse to					
		Copco No. 1 switchyard					
		2/0 copper, 69-kV					
	62	Transmission Line No. 26-2	86-68430	0.07	mile	$30,000.00	$2,100.00
		From Copco No. 1 powerhouse to					
		Copco No. 1 switchyard					
		2/0 copper, 69-kV					
		POWERHOUSE, SWITCHYARD, & TRANS LINE SUBTOTAL					**$2,380,335.00**

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY Craig A. Grush, P.E.	CHECKED CMM 4/14/11
DATE PREPARED 11/01/10	PEER REVIEW / DATE L. Rossi 11/1/10	DATE PREPARED 04/14/11	PEER REVIEW / DATE DCN 4/14/11

FEATURE:	PROJECT:
REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable Penstock	Klamath River Northern California/Southern Oregon
	WOID: AF484 — ESTIMATE LEVEL: Feasibility
	REGION: MP — UNIT PRICE LEVEL: July-2010
	FILE: C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 1\[Klamath Dams Removal - COPCO 1 - Full Removal Option - REV#1 - MP Feas Est - 4-2011.xlsx]Diversion & Care

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
		Concrete and Structural Steel Items:					
	63	Remove gate house #1 from top of dam	86-68130	570	ft2	$60.00	$34,200.00
	64	Remove gate house #2 from top of dam	86-68130	690	ft2	$60.00	$41,400.00
	65	Remove Concrete Items associated with 10-foot diameter Penstocks, concrete is reinforced	86-68130	1,050	yd3	$215.00	$225,750.00
	66	Plug 14-foot diameter penstock with concrete Plug upstream and downstream ends *Assume 2' thick each*	86-68130	23	yd3	$1,200.00	$27,600.00
		SUBTOTAL THIS SHEET					**$328,950.00**

QUANTITIES		PRICES	
BY Jonathan East	CHECKED Sheena Barnes	BY Craig A. Grush, P.E.	CHECKED CAG 4/14/11
DATE PREPARED 10/26/10	PEER REVIEW / DATE Rick Benik P.E. 10/26/10	DATE PREPARED 04/14/11	PEER REVIEW / DATE NCD 4/14/11

BUREAU OF RECLAMATION

ESTIMATE WORKSHEET

FEATURE:
REVISION #1
Klamath River Dams Removal
Full Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable
Penstock

PROJECT:
Klamath River
Northern California/Southern Oregon

WOID:	AF484	ESTIMATE LEVEL:	Feasibility
REGION:	MP	UNIT PRICE LEVEL:	July-2010

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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		MECHANICAL					
		Remove and dispose of the following					
		equipment at the intake:					
	67	8 screens	86-68420	18,000	lb	$0.85	$15,300.00
		(Assume contains paint with heavy metals)					
	68	8 Water Gates	86-68420	18,000	lb	$0.85	$15,300.00
		(Assume contains paint with heavy metals)					
	69	3 - 30"Ø x 25' stand pipes	86-68420	6,000	lb	$0.85	$5,100.00
		(Assume contains paint with heavy metals)					
	70	14' Ø penstock pipe	86-68420	256,000	lb	$0.85	$217,600.00
		(includes encased and open air intake up to underground portion-Revised 9/14/2010)					
		(Assume contains paint with heavy metals)					
	71	10' Ø penstock pipe	86-68420	270,000	lb	$0.85	$229,500.00
		(includes intake and main conduit)					
		(Assume contains paint with heavy metals)					
		PENSTOCK SUBTOTAL					**$811,750.00**

QUANTITIES		PRICES	
BY K. Converse	CHECKED T Turnage	BY Craig A. Grush, P.E.	CHECKED CMM 4/14/11
DATE PREPARED 10/28/10	PEER REVIEW / DATE Dan Drake 10/29/2010	DATE PREPARED 04/14/11	PEER REVIEW / DATE DCD 4/14/11

ESTIMATE WORKSHEET

FEATURE:
REVISION #1
Klamath River Dams Removal
Full Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable
Reservoir Vegetative Restoration

PROJECT:
Klamath River
Northern California/Southern Oregon

WOID:	AF484	ESTIMATE LEVEL:	Appraisal
REGION:	MP	UNIT PRICE LEVEL:	July-2010

FILE: C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 1\[Klamath Dams Removal - COPCO 1 - Full Removal Option - REV#1 - MP Feas Est - 4-2011.xlsx]Diversion & Care

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
	72	Temporary Access Roads	86-68140	7.0	Miles	$50,000.00	$350,000.00
		Blade primitive road as necessary in dry					
		reservoir sediment for one time use by					
		hydroseeding equipment. Existing					
		topography is relatively flat with no					
		significant excavation nor embankment					
		anticipated.					
		SUBTOTAL THIS SHEET					**$350,000.00**

QUANTITIES		PRICES	
BY Mark Leavitt	CHECKED Gemperline, Joseph M	BY Craig A. Grush, P.E.	CHECKED cmm 4/14/11
DATE PREPARED 11/01/10	PEER REVIEW / DATE Dave Edwards 11/1/10	DATE PREPARED 04/14/11	PEER REVIEW / DATE DED 4/14/11

ESTIMATE WORKSHEET

FEATURE:
REVISION #1
Klamath River Dams Removal
Full Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable
Reservoir Vegetative Restoration

PROJECT:
Klamath River
Northern California/Southern Oregon

WOID:	AF484	ESTIMATE LEVEL:	Feasibility
REGION:	MP	UNIT PRICE LEVEL:	July-2010

FILE: C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 1\[Klamath Dams Removal - COPCO 1 - Full Removal Option - REV#1 - MP Feas Est - 4-2011.xlsx]Diversion & Care

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		WATER AND ENVIRONMENTAL					
	73	SPRING GROUND SEEDING: 420 acres	86-68220	420	Acres	$3,500.00	$1,470,000.00
		Idaho fescue (Festuca idahoensis)	1680	lbs PLS			
		Blue wildrye (Elymus glaucus)	1680	lbs PLS			
		Small fescue (Vulpia microstachys)	1680	lbs PLS			
		Bluebunch wheatgrass (Pseudoroegneria spicata)	2520	lbs PLS			
		Sandberg bluegrass (Poa secunda)	210	lbs PLS			
		Spike bentgrass (Agrostis exarata)	105	lbs PLS			
		Western needlegrass (Achnatherum occidentale)	1680	lbs PLS			
		California brome (Bromus carinatus)	3360	lbs PLS			
		Squirreltail (Elymus elymoides)	1680	lbs PLS			
		Wood mulch	840000	lbs			
		Tackifier	50400	lbs			
	74	SPRING BARGE SEEDING: 82 acres	86-68220	82	Acres	$6,500.00	$533,000.00
		Idaho fescue (Festuca idahoensis)	328	lbs PLS			
		Blue wildrye (Elymus glaucus)	328	lbs PLS			
		Small fescue (Vulpia microstachys)	328	lbs PLS			
		Bluebunch wheatgrass (Pseudoroegneria spicata)	492	lbs PLS			
		Sandberg bluegrass (Poa secunda)	41	lbs PLS			
		Spike bentgrass (Agrostis exarata)	21	lbs PLS			
		Western needlegrass (Achnatherum occidentale)	328	lbs PLS			
		California brome (Bromus carinatus)	656	lbs PLS			
		Squirreltail (Elymus elymoides)	328	lbs PLS			
		Wood mulch	164000	lbs			
		Tackifier	9840	lbs			
		SUBTOTAL THIS SHEET					**$2,003,000.00**

QUANTITIES		PRICES	
BY O'Meara, Scott A	CHECKED Greimann, Blair P	BY Craig A. Grush, P.E.	CHECKED cmm 4/14/11
DATE PREPARED 04/12/11	PEER REVIEW / DATE 04/12/11	DATE PREPARED 04/14/11	PEER REVIEW / DATE DCD 4/14/11

ESTIMATE WORKSHEET

FEATURE:
REVISION #1
Klamath River Dams Removal
Full Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable
Reservoir Vegetative Restoration

PROJECT:
Klamath River
Northern California/Southern Oregon

WOID:	AF484	ESTIMATE LEVEL:	Feasibility
REGION:	MP	UNIT PRICE LEVEL:	July-2010

FILE: C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 1\[Klamath Dams Removal - COPCO 1 - Full Removal Option - REV#1 - MP Feas Est - 4-2011.xlsx]Diversion & Care

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		WATER AND ENVIRONMENTAL					
	75	SPRING AERIAL SEEDING: 300 acres	86-68220	300	Acres	$7,500.00	$2,250,000.00
		Idaho fescue (Festuca idahoensis)	1200	lbs PLS			
		Blue wildrye (Elymus glaucus)	1200	lbs PLS			
		Small fescue (Vulpia microstachys)	1200	lbs PLS			
		Bluebunch wheatgrass (Pseudoroegneria spicata)	1800	lbs PLS			
		Sandberg bluegrass (Poa secunda)	150	lbs PLS			
		Spike bentgrass (Agrostis exarata)	75	lbs PLS			
		Western needlegrass (Achnatherum occidentale)	1200	lbs PLS			
		California brome (Bromus carinatus)	2400	lbs PLS			
		Squirreltail (Elymus elymoides)	1200	lbs PLS			
		Wood mulch	600000	lbs			
		Tackifier	36000	lbs			
	76	FALL GROUND SEEDING: 401 acres	86-68220	401	Acres	$3,500.00	$1,403,500.00
		Idaho fescue (Festuca idahoensis)	1604	lbs PLS			
		Blue wildrye (Elymus glaucus)	1604	lbs PLS			
		Small fescue (Vulpia microstachys)	1604	lbs PLS			
		Bluebunch wheatgrass (Pseudoroegneria spicata)	2406	lbs PLS			
		Sandberg bluegrass (Poa secunda)	201	lbs PLS			
		Spike bentgrass (Agrostis exarata)	100	lbs PLS			
		Western needlegrass (Achnatherum occidentale)	1604	lbs PLS			
		California brome (Bromus carinatus)	3208	lbs PLS			
		Squirreltail (Elymus elymoides)	1604	lbs PLS			
		Wood mulch	123385	lbs			
		Tackifier	7403	lbs			
		SUBTOTAL THIS SHEET					**$3,653,500.00**

QUANTITIES		PRICES	
BY O'Meara, Scott A	CHECKED Greimann, Blair P	BY Craig A. Grush, P.E.	CHECKED cmm 4/14/11
DATE PREPARED 04/12/11	PEER REVIEW / DATE 04/12/11	DATE PREPARED 04/14/11	PEER REVIEW / DATE DCA 4/14/11

ESTIMATE WORKSHEET

FEATURE:
REVISION #1
Klamath River Dams Removal
Full Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable
Reservoir Vegetative Restoration

PROJECT:
Klamath River
Northern California/Southern Oregon

WOID:	AF484	ESTIMATE LEVEL:	Feasibility
REGION:	MP	UNIT PRICE LEVEL:	July-2010

FILE: C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 1\[Klamath Dams Removal - COPCO 1 - Full Removal Option - REV#1 - MP Feas Est - 4-2011.xlsx]Diversion & Care

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		WATER AND ENVIRONMENTAL					
	77	RIPARIAN POLE PLANTING: 170 acres	86-68220	170	Acres	$8,500.00	$1,445,000.00
		Narrowleaf willow (Salix exigua)	71400	cutting			
		Arroyo willow (Salix lasiolepis)	11900	cutting			
		Shining willow (Salix lucida)	11900	cutting			
		Three-leaf sumac (Rhus trilobata)	11900	cutting			
		Western serviceberry (Amelanchier alnifolia)	5950	cutting			
		Chokecherry (Prunus virginiana)	5950	transplant			
		Herbivore screen	119000	each			
		Chemical herbivore deterent	2380	gal			
		Polymer	375	lbs			
	78	WEED MANAGEMENT: 401 acres	86-68220	401	Acres	$1,500.00	$601,500.00
		Herbicide, post-emergent	802	lbs AI			
		MAINTENANCE TREATMENTS ON 10% OF THE RESTORATION AREAS PER YEAR OVER 4 YEARS, POST-RESTORATION					
	79	FALL GROUND SEEDING: 321 acres	86-68220	321	Acres	$3,500.00	$1,123,500.00
		Idaho fescue (Festuca idahoensis)	1283	lbs PLS			
		Blue wildrye (Elymus glaucus)	1283	lbs PLS			
		Small fescue (Vulpia microstachys)	1283	lbs PLS			
		Bluebunch wheatgrass (Pseudoroegneria spicata)	1925	lbs PLS			
		Sandberg bluegrass (Poa secunda)	160	lbs PLS			
		Spike bentgrass (Agrostis exarata)	80	lbs PLS			
		Western needlegrass (Achnatherum occidentale)	1283	lbs PLS			
		California brome (Bromus carinatus)	2566	lbs PLS			
		Squirreltail (Elymus elymoides)	1283	lbs PLS			
		Wood mulch	641600	lbs			
		Tackifier	38496	lbs			
	80	WEED MANAGEMENT: 321 acres	86-68220	321	Acres	$1,500.00	$481,500.00
		Herbicide, post-emergent	30	lbs AI			
	RESERVOIR VEGETATIVE RESTORATION SUBTOTAL						**$9,658,000.00**

QUANTITIES		PRICES	
BY O'Meara, Scott A	CHECKED Greimann, Blair P	BY Craig A. Grush, P.E.	CHECKED CAG 4/14/11
DATE PREPARED 04/12/11	PEER REVIEW / DATE 04/12/11	DATE PREPARED 04/14/11	PEER REVIEW / DATE DCA 4/14/11

FEATURE:	PROJECT:
REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable Road Improvements	Klamath River Northern California/Southern Oregon
	WOID: AF484 — ESTIMATE LEVEL: Feasibility
	REGION: MP — UNIT PRICE LEVEL: July-2010
	FILE: C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 1\[Klamath Dams Removal - COPCO 1 - Full Removal Option - REV#1 - MP Feas Est - 4-2011.xlsx]Diversion & Care

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		GEOTECHNICAL					
		These quantities represent the work required					
		to prepare a disposal site and improve the					
		haul road to the disposal site for Copco 1					
		and Copco 2. In addition it provides the					
		length of county road required to be					
		repaired after construction.					
		General Sitework Copco 1 And Copco 2					
	81	Clear and Grub Disposal Area	86-68313	7	acre	$6,000.00	$42,000.00
		Estimated haul distance 1 mile.					
		Disposed concrete estimated to be 10' deep					
		and traffic compacted (50% bulking factor).					
		For Copco 1 and Copco 2					
	82	Soil Cover for Disposal Area	86-68313	23,000	yd3	$50.00	$1,150,000.00
		Access/Haul Road Improvements					
		maximum 12% grades					
		4 reaches required improvement					
	83	Soil Excavation	86-68313	4,500	yd3	$13.00	$58,500.00
	84	Rock Excavation	86-68313	4,500	yd3	$40.00	$180,000.00
	85	Soil Backfill	86-68313	16,000	yd3	$50.00	$800,000.00
	86	4" Gravel Surfacing	86-68313	320	ton	$100.00	$32,000.00
		50% contingency for excavation					
		100% contingency for backfill					
		County Road Improvements					
	87	Asphalt Overlay Repair - Juniper Road	86-68313	3	mi	$40,000.00	$120,000.00
	88	Asphalt Overlay Repair - Copco Road	86-68313	19	mi	$40,000.00	$760,000.00
		Assume the 2 lane county road from I-5 to					
		the Copco Dams will be overlayed after					
		construction with chip seal.					
		ROAD IMPROVEMENTS SUBTOTAL					**$3,142,500.00**

QUANTITIES		PRICES	
BY Randy Kuzniakowski	CHECKED Tuti Tierney	BY Craig A. Grush, P.E.	CHECKED CAG 4/14/11
DATE PREPARED 11/01/10	PEER REVIEW / DATE Daniel W. Osmun 11/1/10	DATE PREPARED 04/14/11	PEER REVIEW / DATE DWO 4/14/11

FEATURE:	PROJECT:
REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable Recreational Facilities to be Removed	Klamath River Northern California/Southern Oregon
	WOID: AF484 — ESTIMATE LEVEL: Feasibility
	REGION: MP — UNIT PRICE LEVEL: July-2010
	FILE: C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 1\[Klamath Dams Removal - COPCO 1 - Full Removal Option - REV#1 - MP Feas Est - 4-2011.xlsx]Diversion & Care

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		Mallard Cove					
	89	Concrete total	BLM	106	CY	$300.00	$31,800.00
		Boat ramp: 100'x25'x1' (93 CY)					
		Dock abutment: 6'x8'x3' (6 CY)					
		8 Concrete wheel stops (0.5 CY)					
		4 Campfire ring foundations (1 CY)					
		6 Concrete sign bases (3 CY)					
		3 Concrete fire rings (2 CY)					
	90	25'x5' Dock made of composite decking and	BLM	1	EA	$2,500.00	$2,500.00
		poly floats					
	91	20'x5' Gangway w/ aluminum frame and railings	BLM	1	EA	$2,000.00	$2,000.00
	92	Signs to be removed and hauled away	BLM	6	EA	$300.00	$1,800.00
	93	Wood plank tables to be removed and hauled	BLM	8	EA	$100.00	$800.00
		away					
	94	Parking area to be regraded, ripped, seeded and	BLM	2.5	ACRE	$25,000.00	$62,500.00
		planted this area is made of fill about 6 ft deep					
		Copco Cove					
	95	Concrete total	BLM	84	CY	$300.00	$25,200.00
		Boat ramp: 80'x25'x1' (74 CY)					
		Dock abutment: 14'x5'x3' (8 CY)					
		6 Concrete sign bases (2 CY)					
	96	Dock abutment railing made of 2.5" dia. steel pipe	BLM	25	LF	$40.00	$1,000.00
	97	Signs to be removed and hauled away	BLM	6	EA	$300.00	$1,800.00
	98	Wood plank tables to be removed and hauled	BLM	2	EA	$100.00	$200.00
		away					
	99	Regrade, rip, seed and plant disturbed areas	BLM	2.3	ACRE	$25,000.00	$57,500.00
RECREATIONAL FACILITIES REMOVAL SUBTOTAL							**$187,100.00**

QUANTITIES		PRICES	
BY Renee Snyder (BLM)	CHECKED Sheena Barnes	BY Craig A. Grush, P.E.	CHECKED CAG 4/14/11
DATE PREPARED 10/26/10	PEER REVIEW / DATE Rick Benik P.E. 10/26/10	DATE PREPARED 04/14/11	PEER REVIEW / DATE DCD 4/14/11

BUREAU OF RECLAMATION

ESTIMATE WORKSHEET

FEATURE:	PROJECT:
REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable SUMMARY	Klamath River Northern California/Southern Oregon
	WOID: AF484 — ESTIMATE LEVEL: Feasibility
	REGION: MP — UNIT PRICE LEVEL: July-2010
	FILE: C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 1\[Klamath Dams Removal - COPCO 1 - Full Removal Option - REV#1 - MP Feas Est - 4-2011.xlsx]Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		Sediment Removal (assumes by natural erosion)		1,453,800	CY	$0.00	$0.00
		Diversion and Care					$1,530,500.00
		Dam Removal					$18,845,400.00
		Powerhouse/Switchyard/Transmission Line Removal					$2,380,335.00
		Penstock Removal					$811,750.00
		Reservoir Vegetative Restoration					$9,658,000.00
		Road Improvements					$3,142,500.00
		Recreational Facilities to be Removed					$187,100.00
		Subtotal					**$36,555,585.00**
		Mobilization	5%	+/-			$1,850,000.00
		Subtotal 1 with Mobilization					**$38,405,585.00**
		Escalation to Notice to Proceed (NTP), from July 2010 to July 2020					$13,208,310.00
		(assumes 3%/yr compounding over 10 years)					
		Subtotal 2 = Subtotal 1 with Mobilization + Escalation to NTP					$51,613,895.00
		Design Contingencies	10%	+/-			$5,386,105.00
		Allowance for Procurement Strategies (APS)	0%	+/-			
		Type of solicitation assumed is: Competitive RFP					
		CONTRACT COST					**$57,000,000.00**
		Construction Contingencies	20%	+/-			$11,000,000.00
		FIELD COST					**$68,000,000.00**
		Non-Contract Costs:	55%	+/-			$37,000,000.00
		(Environmental & Cultural Resources					
		Mitigation ~ 35%, Design Data Collection ~ 1%,					
		Engineering Design ~ 4%, Permitting ~ 3%,					
		Procurement ~ 1%, Construction Management					
		~ 10%, and Closeout ~ 1%)					
		CONSTRUCTION COST					**$105,000,000.00**
		Ref.: For appropriate use and terminology, see Reclamation Manual, Directives and Standards FAC; 09-01, 09-02 and 09-03.					

QUANTITIES		PRICES	
BY Refer to Previous Sheets	CHECKED Refer to Previous Sheets	BY Craig A. Grush, P.E.	CHECKED 04-18-11
DATE PREPARED	PEER REVIEW / DATE Refer to Previous Sheets	DATE PREPARED 04/18/11	PEER REVIEW / DATE ACD 4/20/11

ESTIMATE WORKSHEET

FEATURE:	PROJECT:
REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable High Diversion and Care	Klamath River Northern California/Southern Oregon
	WOID: AF652 — ESTIMATE LEVEL: Feasibility
	REGION: MP — UNIT PRICE LEVEL: July-2010
	FILE: C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 1\[Klamath Dams Removal - COPCO 1 - Full Removal Option - REV#1 - MPH Feas Est - 4-2011.xlsx]Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
	1	Furnish, Install, and Remove Barge-Mounted	86-68130	1	ls		$370,000.00
		Crane in Reservoir for Dam Removal.					
		Barge taken from Iron Gate Reservoir.					
		Barge is used to modify diversion tunnel intake structure.					
		Barge is also used to remove spillway gates, piers, bridge and concrete in spillway crest.					
		Barge is located on reservoir for approximately 5 months.					
	2	Remove Sediment from Diversion Tunnel Intake	86-68130	30	cy	$3,000.00	$90,000.00
		to provide access.					
		Requires removing sediment 115 feet deep using clamshell or suction dredge.					
	3	Furnish, Install, and Remove Large Crane on	86-68130	1	ls	Included in the mobilization item	
		Right Abutment.					
		Crane used to deliver equipment and materials and to remove waste materials as required.					
		Crane in place for 4 months.					
	4	Remove Water from behind Tailrace Cofferdam.	86-68130	200,000	gals	$0.01	$2,000.00
		Unwatering of tailrace for removal of the powerhouse in the dry.					
		Assume 3 inch portable trash pump operating for 1 day.					
	5	Riprap Protection on Cofferdam.	86-68130	260	cy	$200.00	$52,000.00
		Riprap protects cofferdam from diversion tunnel releases.					
	6	Provide Dewatering behind Tailrace Cofferdam	86-68130	1	ls		$200,000.00
		for removal of Powerhouse in the dry.					
		Assume 3 inch portable trash pump operating for approximately 3 months.					
		SUBTOTAL THIS SHEET					**$714,000.00**

QUANTITIES		PRICES	
BY Rick Benik	CHECKED Jonathan East	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 10/26/10	PEER REVIEW / DATE Tom Hepler P.E. 10/26/10	DATE PREPARED 05/31/11	PEER REVIEW / DATE 6/3/11

ESTIMATE WORKSHEET

FEATURE:	PROJECT:
REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable High Diversion and Care	Klamath River Northern California/Southern Oregon
	WOID: AF652 — ESTIMATE LEVEL: Feasibility
	REGION: MP — UNIT PRICE LEVEL: July-2010
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
	7	Remove Current Diversion Tunnel Plug	86-68130	195	yd3	$1,800.00	$351,000.00
		Plug located in the middle of the tunnel					
		Reinforced concrete					
		Tunnel work					
	8	Construct Embankment Cofferdam in Tailrace	86-68130	1,700	yd3	$130.00	$221,000.00
		to remove Powerhouse in dry.					
		Assumes 10 ft wide crest with 2:1 side slopes, approximately 250 ft long and up to 12 ft high.					
		Embankment material taken from Iron Gate Dam Removal, approximately 10 mile haul distance.					
		SUBTOTAL THIS SHEET					**$572,000.00**

QUANTITIES		PRICES	
BY Jonathan East	CHECKED Sheena Barnes	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 10/26/10	PEER REVIEW / DATE Rick Benik P.E. 10/26/10	DATE PREPARED 05/31/11	PEER REVIEW / DATE 6/3/11

ESTIMATE WORKSHEET

FEATURE:	PROJECT:
REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable High Diversion and Care	Klamath River Northern California/Southern Oregon
	WOID: AF652 — ESTIMATE LEVEL: Feasibility
	REGION: MP — UNIT PRICE LEVEL: July-2010
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		MECHANICAL	86-68420				
		Furnish, Install and Remove the following					
		necessary for the removal of Copco #1 Dam.					
	9	3-6'x6' Fabricated Slide Gates with 120 ft. head					
		Total slide gate weight approximately: 12,500 lbs. ea.		40,500	lbs	$18.00	$729,000.00
		Includes operators, stems, guides, and remote controls.					
		Installation requires a dive depth of 115 ft.					
		DIVERSION AND CARE SUBTOTAL					**$2,015,000.00**

QUANTITIES		PRICES	
BY T. J. Turnage	CHECKED K. Converse	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 10/28/10	PEER REVIEW / DATE Dan Drake 10/29/2010	DATE PREPARED 05/31/11	PEER REVIEW / DATE 6/3/11

FEATURE:	PROJECT:
REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable High Dam	Klamath River Northern California/Southern Oregon
	WOID: AF652 — ESTIMATE LEVEL: Feasibility
	REGION: MP — UNIT PRICE LEVEL: July-2010
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
		Concrete and Structural Steel Items:					
	10	Remove Concrete Dam down to Elev. 2476	86-68130	36,000	yd3	$320.00	$11,520,000.00
		Elev. 2476 represents original streambed channel at downstream face of dam.					
		Concrete in foundation to remain. Spillway crest at Elev. 2593.5.					
		Includes concrete in dam, spillway crest, piers (390 cy), bridge					
		deck (72 cy) and left abutment. Concrete is reinforced.					
		Requires notching of concrete dam under head below spillway crest					
		for a wet water year.					
		Assume twenty notches, 12 ft deep, alternating sides with ten on each side for					
		removal of approximately 120 feet of dam.					
		Each notch overlaps the previous alternating notch in 6 foot lifts.					
		Each notch is approximately 20 ft wide with an average 6 ft thickness to be					
		removed by blasting below reservoir surface.					
	11	Remove Concrete Intake Structure on Right	86-68130	21,000	yd3	$390.00	$8,190,000.00
		Abutment					
		Includes concrete in gate houses and headworks for units 1 and 2.					
	12	Remove Structural Steel from Spillway	86-68130	55,000	lbs	$1.50	$82,500.00
		Includes rails, misc. steel					
		Does not include spillway gates					
		Assume contains paint with heavy metals.					
		By barge and crane					
	13	Install Diversion Tunnel Plugs	86-68130	30	yd3	$1,300.00	$39,000.00
		Plug upstream (6 cy) and downstream ends					
		Assume 2' thick each					
	14	Remove Diversion Tunnel Control Structure	86-68130	350	yd3	$380.00	$133,000.00
		Concrete					
		Includes guide boxes					
		Assume reinforced					
		SUBTOTAL THIS SHEET					**$19,964,500.00**

QUANTITIES		PRICES	
BY Jonathan East	CHECKED Sheena Barnes	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 11/01/10	PEER REVIEW / DATE Rick Benik P.E. 11/1/10	DATE PREPARED 05/31/11	PEER REVIEW / DATE RCB 6/3/11

FEATURE:	PROJECT:
REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable High Dam	Klamath River Northern California/Southern Oregon
	WOID: AF652 — ESTIMATE LEVEL: Feasibility
	REGION: MP — UNIT PRICE LEVEL: July-2010
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		MECHANICAL					
		Remove and dispose of the following					
		equipment at Dam:					
	15	Hand Rails	86-68420	11,000	lb	$1.50	$16,500.00
		(Assume contains paint with heavy metals)					
		By barge and crane					
	16	Radial Gates	86-68420	140,500	lb	$1.50	$210,750.00
		13 radial gates, wall and sillplates and 3-hoists		Revised 8.26.10 TJT			
		(Assume contains paint with heavy metals & petroleum products)					
		By barge and crane					
	17	Radial Gate stoplogs	86-68420	18,000	lb	$1.50	$27,000.00
		8 stop logs and 13 sets of guides					
		(Assume contains paint with heavy metals & petroleum products)					
		By barge and crane					
	18	Stoplog hoist, track and supports	86-68420	26,000	lb	$1.50	$39,000.00
		(Assume contains paint with heavy metals & petroleum products)					
		By barge and crane					
		Remove and dispose of the following					
		equipment at the waste tunnel:					
	19	3 sections of 23' of 72"Ø steel lining (embedded)	86-68420	54,000	lb	$1.00	$54,000.00
		(Assume contains paint with heavy metals and/or asbestos)					
	20	3 - 72" butterfly valves (embedded)	86-68420	55,000	lb	$5.00	$275,000.00
		(Assume contains paint with heavy metals, petroleum products, and/or asbestos)					
		Removal requires a dive depth of 115 ft.					
	21	3-72" flapper valves with remote mechanical	86-68420	78,000	lb	$5.00	$390,000.00
		control (embedded)					
		(Assume contains paint with heavy metals and/or asbestos)					
		Removal requires a dive depth of 115 ft.					
		SUBTOTAL THIS SHEET					**$1,012,250.00**

QUANTITIES		PRICES	
BY K. Converse	CHECKED T Turnage	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 10/28/10	PEER REVIEW / DATE Dan Drake 10/29/2010	DATE PREPARED 05/31/11	PEER REVIEW / DATE 6/3/11

ESTIMATE WORKSHEET

FEATURE:	PROJECT:
REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable High Dam	Klamath River Northern California/Southern Oregon
	WOID: AF652 — ESTIMATE LEVEL: Feasibility
	REGION: MP — UNIT PRICE LEVEL: July-2010
	FILE: C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 1\[Klamath Dams Removal - COPCO 1 - Full Removal Option - REV#1 - MPH Feas Est - 4-2011.xlsx]Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		ELECTRICAL					
		Remove and dispose of the following equipment at Spillway:					
	22	Spillway gate motor & control panel	86-68430	1	EA	$1,500.00	$1,500.00
		Total weight approximately: 500 lbs.					
	23	Distribution equipment , panelboards	86-68430	1	EA	$7,000.00	$7,000.00
		Total weight approximately: 500 lbs.					
		DAM SUBTOTAL					**$20,985,250.00**

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 11/01/10	PEER REVIEW / DATE L. Rossi 11/1/10	DATE PREPARED 05/31/11	PEER REVIEW / DATE 6/3/11

ESTIMATE WORKSHEET

FEATURE:	PROJECT:		
REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable High Powerhouse, Switchyard, and Transmission Line	Klamath River Northern California/Southern Oregon		
	WOID: AF652	ESTIMATE LEVEL:	Feasibility
	REGION: MP	UNIT PRICE LEVEL:	July-2010
	FILE: C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 1\[Klamath Dams Removal - COPCO 1 - Full Removal Option - REV#1 - MPH Feas Est - 4-2011.xlsx]Summary		

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
		Concrete and Structural Steel Items:					
	24	Remove Powerhouse Concrete down to top of rock					
		under the PH, Elev. 2482.75 (USGS datum).	86-68130	3,100	yd3	$1,000.00	$3,100,000.00
		Local datum is converted to USGS datum by					
		adding 2411 feet. (Elev. 71.75 + 2411 = Elev. 2482.75.)					
		All concrete is reinforced.					
		Includes all exterior & interior walls, columns, &					
		beams, and concrete in foundations for transformers					
	25	Remove Powerhouse Structural Steel	86-68130	110,000	lbs	$1.00	$110,000.00
		Roof truss members, purlins, and crane rail					
		Assume contains paint with heavy metals.					
		SUBTOTAL THIS SHEET					**$3,210,000.00**

QUANTITIES		PRICES	
BY Jonathan East	CHECKED Sheena Barnes	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 11/01/10	PEER REVIEW / DATE Rick Benik P.E. 11/1/10	DATE PREPARED 05/31/11	PEER REVIEW / DATE 6/3/11

ESTIMATE WORKSHEET

FEATURE:	PROJECT:		
REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable High Powerhouse, Switchyard, and Transmission Line	Klamath River Northern California/Southern Oregon		
	WOID: AF652	ESTIMATE LEVEL:	Feasibility
	REGION: MP	UNIT PRICE LEVEL:	July-2010
	FILE: C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 1\[Klamath Dams Removal - COPCO 1 - Full Removal Option - REV#1 - MPH Feas Est - 4-2011.xlsx]Summary		

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		MECHANICAL					
		Remove and dispose of the following					
		equipment at the Power House:					
	26	2 - Governor oil systems	86-68420	38,000	lb	$1.00	$38,000.00
		governor, sump tanks, accumulator tank, piping					
		(Assume contains paint with heavy metals & petroleum products)					
	27	Cooling water and bearing oil systems	86-68420	11,000	lb	$1.00	$11,000.00
		(Assume contains paint with heavy metals & petroleum products)					
		(encased in concrete)					
	28	4 - Horizontal Tandem Francis Turbines	86-68420	452,000	lb	$1.00	$452,000.00
		(includes runner, scroll case, draft tube and shaft)					
		(Assume contains paint with heavy metals, petroleum products, and/or asbestos)					
	29	2 - 40 Ton indoor cranes	86-68420	140,000	lb	$1.00	$140,000.00
		Includes crane and rail, not steel rail base					
		(Assume contains paint with heavy metals & petroleum products)					
	30	Compressed Air system	86-68420	1,000	lb	$1.00	$1,000.00
		(Assume contains paint with heavy metals & petroleum products)					
	31	2 - CO2 systems	86-68420	3,100	lb	$1.00	$3,100.00
		(Assume contains paint with heavy metals & petroleum products)					
	32	Plant Water and Fire Protection	86-68420	2,600	lb	$1.00	$2,600.00
		(Assume contains paint with heavy metals)					
		SUBTOTAL THIS SHEET					**$647,700.00**

QUANTITIES		PRICES	
BY K. Converse	CHECKED T Turnage	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 10/28/10	PEER REVIEW / DATE Dan Drake 10/29/2010	DATE PREPARED 05/31/11	PEER REVIEW / DATE 6/3/11

ESTIMATE WORKSHEET

FEATURE:	PROJECT:		
REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable High Powerhouse, Switchyard, and Transmission Line	Klamath River Northern California/Southern Oregon		
	WOID: AF652	ESTIMATE LEVEL:	Feasibility
	REGION: MP	UNIT PRICE LEVEL:	July-2010
	FILE: C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 1\[Klamath Dams Removal - COPCO 1 - Full Removal Option - REV#1 - MPH Feas Est - 4-2011.xlsx]Summary		

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		MECHANICAL					
	33	Transformer Oil Fire protection	86-68420	5,400	lb	$1.00	$5,400.00
		(Assume contains paint with heavy metals & petroleum products)					
	34	Unwatering Piping	86-68420	27,000	lb	$1.00	$27,000.00
		(Assume contains paint with heavy metals)					
	35	Drainage Piping	86-68420	5,000	lb	$1.00	$5,000.00
		(Assume contains paint with heavy metals)					
		SUBTOTAL THIS SHEET					**$37,400.00**

QUANTITIES		PRICES	
BY K. Converse	CHECKED T Turnage	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 10/28/10	PEER REVIEW / DATE Dan Drake 10/29/2010	DATE PREPARED 05/31/11	PEER REVIEW / DATE DCD 6/3/11

FEATURE:	PROJECT:		
REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable High Powerhouse, Switchyard, and Transmission Line	Klamath River Northern California/Southern Oregon		
	WOID: AF652	ESTIMATE LEVEL:	Feasibility
	REGION: MP	UNIT PRICE LEVEL:	July-2010
	FILE: C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 1\[Klamath Dams Removal - COPCO 1 - Full Removal Option - REV#1 - MPH Feas Est - 4-2011.xlsx]Summary		

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		ELECTRICAL					
		Remove and dispose of the following					
		equipment in the Powerplant:					
	36	Horizontal AC Generator, Indoor Open Frame	86-68430	2	EA	$40,000.00	$80,000.00
		Unit 1 & 2 ea: 12.5 MVA (10 MW); 0.8PF, 2,300V,					
		200 RPM, 3 Ph, including rotating exciter					
		Total weight each approximately: 123,500 lbs.					
		Stator: 32,250 lbs., Rotor: 55,000 lbs.					
		Base: 17,000 lbs., Exciter Assembly: 7,550 lbs.					
		Heaviest lift: 55,000 lbs.					
	37	Excitation equipment for 12.5 MVA Generator	86-68430	2	EA	$7,000.00	$14,000.00
		(2 sections)Total weight approximately: 1,000 lbs.					
	38	Surge protection equip. for 12.5 MVA Generator	86-68430	2	EA	$3,000.00	$6,000.00
		Total weight approximately: 800 lbs.					
	39	Neutral grounding equip. for 12.5 MVA Generator	86-68430	2	EA	$3,000.00	$6,000.00
		includes transformer					
		Total weight approximately: 500 lbs.					
	40	Generator Switchgear, 5kV-includes unit breakers	86-68430	1	EA	$25,000.00	$25,000.00
		(6 Sections @ 400 lbs each section)					
		3 ft x 3 ft x 90 inches high					
		Total weight approximately: 2,400 lbs.					
	41	Station Service Switchgear, 600 volt -(5 sections)	86-68430	1	EA	$25,000.00	$25,000.00
		(400 lbs each section), 3 ft x 3ft x 90 inches high					
		Total weight approximately: 2,000 lbs.					
		SUBTOTAL THIS SHEET					**$156,000.00**

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 11/01/10	PEER REVIEW / DATE L. Rossi 11/1/10	DATE PREPARED 05/31/11	PEER REVIEW / DATE DCD 6/3/11

FEATURE:	PROJECT:
REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable High Powerhouse, Switchyard, and Transmission Line	Klamath River Northern California/Southern Oregon

WOID:	AF652	ESTIMATE LEVEL:	Feasibility
REGION:	MP	UNIT PRICE LEVEL:	July-2010
FILE:	C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 1\[Klamath Dams Removal - COPCO 1 - Full Removal Option - REV#1 - MPH Feas Est - 4-2011.xlsx]Summary		

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		ELECTRICAL					
		Remove and dispose of the following					
		equipment in the Powerplant:					
	42	Unit and plant control switchboard	86-68430	1	EA	$17,000.00	$17,000.00
		5 cubicles (200 lbs each), 2ft x 2ft x 90 in. high					
		Total weight approximately: 1,000 lbs.					
	43	Battery system - assume 60 batteries, charger,	86-68430	1	EA	$12,000.00	$12,000.00
		racks and supports.					
		Total weight approximately: 2,500 lbs.					
	44	Raceways, Conduit and Cable	86-68430	1	EA	$17,000.00	$17,000.00
		(approx. 3000 lin. Ft. power & control cable,					
		1000 lin. Ft. conduit, 200 lin. Ft. cabletray)					
		Total weight approximately: 8,000 lbs.					
	45	Misc. power & control boards	86-68430	1	EA	$7,000.00	$7,000.00
		10 boards (50 lbs each) 3ft x 2 ft x 9 in					
		Total weight approximately: 500 lbs.					
	46	Step-up Transformers, indoor, oil-filled, 1-phase,	86-68430	3	EA	$60,000.00	$180,000.00
		5,000 kVA, 2,300/72,000 volt					
		Total weight approximately each: 31,500 lbs.					
	47	Step-up Transformers, indoor, oil-filled, 1-phase,	86-68430	3	EA	$60,000.00	$180,000.00
		4,165 kVA, 2,300/72,000 volt					
		Total weight approximately each: 31,500 lbs.					
	48	Seven 40-Ton Travelling Crane motors - hoist	86-68430	1	EA	$3,000.00	$3,000.00
		(2-30Hp*), hoist trolley (7.5Hp*), gantry (4-15Hp*)					
		(Hp* Approx.) Total weight approximately: 600 lbs.					
		SUBTOTAL THIS SHEET					**$416,000.00**

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 11/01/10	PEER REVIEW / DATE L. Rossi 11/1/10	DATE PREPARED 05/31/11	PEER REVIEW / DATE NCD 6/3/11

FEATURE:	PROJECT:		
REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable High Powerhouse, Switchyard, and Transmission Line	Klamath River Northern California/Southern Oregon		
	WOID: AF652	ESTIMATE LEVEL:	Feasibility
	REGION: MP	UNIT PRICE LEVEL:	July-2010
	FILE: C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 1\[Klamath Dams Removal - COPCO 1 - Full Removal Option - REV#1 - MPH Feas Est - 4-2011.xlsx]Summary		

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		ELECTRICAL					
		Remove and dispose of the following					
		equipment in the Powerplant:					
	49	40-Ton Travelling Crane control equipment	86-68430	1	EA	$12,000.00	$12,000.00
		(5 cubicles), Total weight approximately: 500 lbs.					
	50	40-Ton Travelling Crane Festoon Cable	86-68430	1	EA	$2,000.00	$2,000.00
		(approx. 200 lin. Ft. cable)					
		Total weight approximately: 800 lbs.					
	51	Four 15-Ton Overhead Crane motors - hoist	86-68430	1	EA	$1,300.00	$1,300.00
		(10Hp*), hoist trolley (5Hp*), gantry (2-5Hp*)					
		(Hp* Approx.) Total weight approximately: 350 lbs.					
	52	15-Ton Overhead Crane control equipment	86-68430	1	EA	$350.00	$350.00
		(1 cubicle), Total weight approximately: 100 lbs.					
	53	15-Ton Overhead Crane Festoon Cable	86-68430	1	EA	$600.00	$600.00
		(approx. 100 lin. Ft. cable)					
		Total weight approximately: 250 lbs.					
		SUBTOTAL THIS SHEET					**$16,250.00**

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 11/01/10	PEER REVIEW / DATE L. Rossi 11/1/10	DATE PREPARED 05/31/11	PEER REVIEW / DATE DCD 6/3/11

ESTIMATE WORKSHEET

FEATURE:	PROJECT:
REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable High Powerhouse, Switchyard, and Transmission Line	Klamath River Northern California/Southern Oregon

WOID:	AF652	ESTIMATE LEVEL:	Feasibility
REGION:	MP	UNIT PRICE LEVEL:	July-2010
FILE:	C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 1\[Klamath Dams Removal - COPCO 1 - Full Removal Option - REV#1 - MPH Feas Est - 4-2011.xlsx]Summary		

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		ELECTRICAL					
		Remove and dispose of the following					
		equipment in the Switchyard:					
		All equipment is on wood-pole structures					
	54	69-kV circuit breakers, oil-filled, PCB	86-68430	2	EA	$3,500.00	$7,000.00
	55	69-kV disconnect switches, group-operated	86-68430	2	EA	$2,000.00	$4,000.00
	56	60-foot wood poles	86-68430	12	EA	$1,300.00	$15,600.00
	57	30-foot wood crossarms	86-68430	24	EA	$600.00	$14,400.00
	58	69-kV insulator strings	86-68430	12	EA	$500.00	$6,000.00
		Remove and dispose of the following					
		wood-pole transmission lines:					
	59	Transmission Line No. 3	86-68430	1.66	mile	$40,000.00	$66,400.00
		From Copco No. 1 switchyard to Fall Creek					
		266.8 ACSR, 69-kV					
	60	Transmission Line No. 15	86-68430	1.23	mile	$40,000.00	$49,200.00
		From Copco No. 1 switchyard to Copco No. 2					
		266.8 ACSR, 69-kV					
	61	Transmission Line No. 26-1	86-68430	0.07	mile	$40,000.00	$2,800.00
		From Copco No. 1 powerhouse to					
		Copco No. 1 switchyard					
		2/0 copper, 69-kV					
	62	Transmission Line No. 26-2	86-68430	0.07	mile	$40,000.00	$2,800.00
		From Copco No. 1 powerhouse to					
		Copco No. 1 switchyard					
		2/0 copper, 69-kV					
		POWERHOUSE, SWITCHYARD, & TRANS LINE SUBTOTAL					**$4,651,550.00**

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 11/01/10	PEER REVIEW / DATE L. Rossi 11/1/10	DATE PREPARED 05/31/11	PEER REVIEW / DATE 6/3/11

ESTIMATE WORKSHEET

FEATURE:
REVISION #1
Klamath River Dams Removal
Full Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable High
Penstock

PROJECT:
Klamath River
Northern California/Southern Oregon

WOID:	AF652	ESTIMATE LEVEL:	Feasibility
REGION:	MP	UNIT PRICE LEVEL:	July-2010

FILE: C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 1\[Klamath Dams Removal - COPCO 1 - Full Removal Option - REV#1 - MPH Feas Est - 4-2011.xlsx]Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
		Concrete and Structural Steel Items:					
	63	Remove gate house #1 from top of dam	86-68130	570	ft2	$65.00	$37,050.00
	64	Remove gate house #2 from top of dam	86-68130	690	ft2	$65.00	$44,850.00
	65	Remove Concrete Items associated with 10-foot diameter Penstocks, concrete is reinforced	86-68130	1,050	yd3	$380.00	$399,000.00
	66	Plug 14-foot diameter penstock with concrete	86-68130	23	yd3	$1,500.00	$34,500.00
		Plug upstream and downstream ends					
		Assume 2' thick each					
		SUBTOTAL THIS SHEET					**$515,400.00**

QUANTITIES		PRICES	
BY Jonathan East	CHECKED Sheena Barnes	BY Craig A. Grush, P.E.	CHECKED DN 06-01-11
DATE PREPARED 10/26/10	PEER REVIEW / DATE Rick Benik P.E. 10/26/10	DATE PREPARED 05/31/11	PEER REVIEW / DATE DCQ 6/3/11

ESTIMATE WORKSHEET

FEATURE:	PROJECT:
REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable High Penstock	Klamath River Northern California/Southern Oregon
WOID: AF652	ESTIMATE LEVEL: Feasibility
REGION: MP	UNIT PRICE LEVEL: July-2010
FILE: C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 1\[Klamath Dams Removal - COPCO 1 - Full Removal Option - REV#1 - MPH Feas Est - 4-2011.xlsx]Summary	

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		MECHANICAL					
		Remove and dispose of the following					
		equipment at the intake:					
	67	8 screens	86-68420	18,000	lb	$1.00	$18,000.00
		(Assume contains paint with heavy metals and/or asbestos)					
	68	8 Water Gates	86-68420	18,000	lb	$1.00	$18,000.00
		(Assume contains paint with heavy metals and/or asbestos)					
	69	3 - 30"Ø x 25' stand pipes	86-68420	6,000	lb	$1.00	$6,000.00
		(Assume contains paint with heavy metals and/or asbestos)					
	70	14' Ø penstock pipe	86-68420	256,000	lb	$1.00	$256,000.00
		(includes encased and open air intake up to underground portion-Revised 9/14/2010)					
		(Assume contains paint with heavy metals and/or asbestos)					
	71	10' Ø penstock pipe	86-68420	270,000	lb	$1.00	$270,000.00
		(includes intake and main conduit)					
		(Assume contains paint with heavy metals and/or asbestos)					
		PENSTOCK SUBTOTAL					**$1,083,400.00**

QUANTITIES		PRICES	
BY K. Converse	CHECKED T Turnage	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 10/28/10	PEER REVIEW / DATE Dan Drake 10/29/2010	DATE PREPARED 05/31/11	PEER REVIEW / DATE 6/3/11

ESTIMATE WORKSHEET

FEATURE:
REVISION #1
Klamath River Dams Removal
Full Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable High
Reservoir Vegetative Restoration

PROJECT:
Klamath River
Northern California/Southern Oregon

WOID:	AF652	ESTIMATE LEVEL:	Appraisal
REGION:	MP	UNIT PRICE LEVEL:	July-2010

FILE: C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 1\[Klamath Dams Removal - COPCO 1 - Full Removal Option - REV#1 - MPH Feas Est - 4-2011.xlsx]Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
	72	Temporary Access Roads	86-68140	7.0	Miles	$100,000.00	$700,000.00
		Blade primitive road as necessary in dry reservoir sediment for one time use by hydroseeding equipment. Existing topography is relatively flat with no significant excavation nor embankment anticipated.					
		SUBTOTAL THIS SHEET					**$700,000.00**

QUANTITIES		PRICES	
BY Mark Leavitt	CHECKED Gemperline, Joseph M	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 11/01/10	PEER REVIEW / DATE Dave Edwards 11/1/10	DATE PREPARED 05/31/11	PEER REVIEW / DATE 6/3/11

ESTIMATE WORKSHEET

FEATURE:
REVISION #1
Klamath River Dams Removal
Full Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable High
Reservoir Vegetative Restoration

PROJECT:
Klamath River
Northern California/Southern Oregon

WOID:	AF652	ESTIMATE LEVEL:	Feasibility
REGION:	MP	UNIT PRICE LEVEL:	July-2010

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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		WATER AND ENVIRONMENTAL					
	73	SPRING GROUND SEEDING:	86-68220	0	Acres	$4,000.00	
	74	SPRING BARGE SEEDING:	86-68220	0	Acres	$8,000.00	
		SUBTOTAL THIS SHEET					

QUANTITIES		PRICES	
BY O'Meara, Scott A	CHECKED Greimann, Blair P	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 04/12/11	PEER REVIEW / DATE 04/12/11	DATE PREPARED 05/31/11	PEER REVIEW / DATE 6/3/11

ESTIMATE WORKSHEET

FEATURE:
REVISION #1
Klamath River Dams Removal
Full Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable High
Reservoir Vegetative Restoration

PROJECT:
Klamath River
Northern California/Southern Oregon

WOID:	AF652	ESTIMATE LEVEL:	Feasibility
REGION:	MP	UNIT PRICE LEVEL:	July-2010

FILE: C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 1\[Klamath Dams Removal - COPCO 1 - Full Removal Option - REV#1 - MPH Feas Est - 4-2011.xlsx]Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		WATER AND ENVIRONMENTAL					
	75	SPRING AERIAL SEEDING:	86-68220	802	Acres	$15,000.00	$12,030,000.00
		Idaho fescue (Festuca idahoensis)	3208	lbs PLS			
		Blue wildrye (Elymus glaucus)	3208	lbs PLS			
		Small fescue (Vulpia microstachys)	3208	lbs PLS			
		Bluebunch wheatgrass (Pseudoroegneria spicata)	4812	lbs PLS			
		Sandberg bluegrass (Poa secunda)	401	lbs PLS			
		Spike bentgrass (Agrostis exarata)	201	lbs PLS			
		Western needlegrass (Achnatherum occidentale)	3208	lbs PLS			
		California brome (Bromus carinatus)	6416	lbs PLS			
		Squirreltail (Elymus elymoides)	3208	lbs PLS			
		Wood mulch	1604000	lbs			
		Tackifier	96240	lbs			
	76	FALL GROUND SEEDING:	86-68220	602	Acres	$4,000.00	$2,408,000.00
		Idaho fescue (Festuca idahoensis)	2406	lbs PLS			
		Blue wildrye (Elymus glaucus)	2406	lbs PLS			
		Small fescue (Vulpia microstachys)	2406	lbs PLS			
		Bluebunch wheatgrass (Pseudoroegneria spicata)	3609	lbs PLS			
		Sandberg bluegrass (Poa secunda)	301	lbs PLS			
		Spike bentgrass (Agrostis exarata)	150	lbs PLS			
		Western needlegrass (Achnatherum occidentale)	2406	lbs PLS			
		California brome (Bromus carinatus)	4812	lbs PLS			
		Squirreltail (Elymus elymoides)	2406	lbs PLS			
		Wood mulch	185077	lbs			
		Tackifier	11105	lbs			
		SUBTOTAL THIS SHEET					**$14,438,000.00**

QUANTITIES		PRICES	
BY O'Meara, Scott A	CHECKED Greimann, Blair P	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 04/12/11	PEER REVIEW / DATE 04/12/11	DATE PREPARED 05/31/11	PEER REVIEW / DATE 6/3/11

ESTIMATE WORKSHEET

FEATURE:
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Klamath River
Northern California/Southern Oregon

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		WATER AND ENVIRONMENTAL					
	77	RIPARIAN POLE PLANTING: (1,000 ea/acre)	86-68220	170	Acres	$10,000.00	$1,700,000.00
		Narrowleaf willow (Salix exigua)	102000	cutting			
		Arroyo willow (Salix lasiolepis)	17000	cutting			
		Shining willow (Salix lucida)	17000	cutting			
		Three-leaf sumac (Rhus trilobata)	17000	cutting			
		Western serviceberry (Amelanchier alnifolia)	8500	cutting			
		Chokecherry (Prunus virginiana)	8500	transplant			
		Herbivore screen	170000	each			
		Chemical herbivore deterent	3400	gal			
		Polymer	536	lbs			
	78	WEED MANAGEMENT:	86-68220	602	Acres	$2,000.00	$1,204,000.00
		Herbicide, post-emergent	1203	lbs AI			
		MAINTENANCE TREATMENTS ON 10% OF THE RESTORATION AREAS PER YEAR OVER 4 YEARS, POST-RESTORATION					
	79	FALL GROUND SEEDING:	86-68220	321	Acres	$4,000.00	$1,284,000.00
		Idaho fescue (Festuca idahoensis)	1283	lbs PLS			
		Blue wildrye (Elymus glaucus)	1283	lbs PLS			
		Small fescue (Vulpia microstachys)	1283	lbs PLS			
		Bluebunch wheatgrass (Pseudoroegneria spicata)	1925	lbs PLS			
		Sandberg bluegrass (Poa secunda)	160	lbs PLS			
		Spike bentgrass (Agrostis exarata)	80	lbs PLS			
		Western needlegrass (Achnatherum occidentale)	1283	lbs PLS			
		California brome (Bromus carinatus)	2566	lbs PLS			
		Squirreltail (Elymus elymoides)	1283	lbs PLS			
		Wood mulch	641600	lbs			
		Tackifier	38496	lbs			
	80	WEED MANAGEMENT:	86-68220	321	Acres	$2,000.00	$642,000.00
		Herbicide, post-emergent	30	lbs AI			
	RESERVOIR VEGETATIVE RESTORATION SUBTOTAL						**$19,968,000.00**

QUANTITIES		PRICES	
BY O'Meara, Scott A	CHECKED Greimann, Blair P	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 04/12/11	PEER REVIEW / DATE 04/12/11	DATE PREPARED 05/31/11	PEER REVIEW / DATE 6/3/11

ESTIMATE WORKSHEET

FEATURE:	PROJECT:
REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable High Road Improvements	Klamath River Northern California/Southern Oregon
	WOID: AF652 — ESTIMATE LEVEL: Feasibility
	REGION: MP — UNIT PRICE LEVEL: July-2010
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		GEOTECHNICAL					
		These quantities represent the work required					
		to prepare a disposal site and improve the					
		haul road to the disposal site for Copco 1					
		and Copco 2. In addition it provides the					
		length of county road required to be					
		repaired after construction.					
		General Sitework Copco 1 And Copco 2					
	81	Clear and Grub Disposal Area	86-68313	7	acre	$7,000.00	$49,000.00
		Estimated haul distance 1 mile.					
		Disposed concrete estimated to be 10' deep					
		and traffic compacted (50% bulking factor).					
		For Copco 1 and Copco 2					
	82	Soil Cover for Disposal Area	86-68313	35,000	yd3	$60.00	$2,100,000.00
		Access/Haul Road Improvements					
		maximum 12% grades					
		4 reaches required improvement					
	83	Soil Excavation	86-68313	9,000	yd3	$14.00	$126,000.00
	84	Rock Excavation	86-68313	9,000	yd3	$45.00	$405,000.00
	85	Soil Backfill	86-68313	30,000	yd3	$55.00	$1,650,000.00
	86	4" Gravel Surfacing	86-68313	320	ton	$120.00	$38,400.00
		50% contingency for excavation					
		100% contingency for backfill					
		County Road Improvements					
	87	Asphalt Overlay Repair - Juniper Road	86-68313	3	mi	$350,000.00	$1,050,000.00
	88	Asphalt Overlay Repair - Copco Road	86-68313	19	mi	$350,000.00	$6,650,000.00
		Assume the 2 lane county road from I-5 to					
		the Copco Dams will be overlayed after					
		construction with 3" asphalt.					
		ROAD IMPROVEMENTS SUBTOTAL					**$12,068,400.00**

QUANTITIES		PRICES	
BY Randy Kuzniakowski	CHECKED Tuti Tierney	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 11/01/10	PEER REVIEW / DATE Daniel W. Osmun 11/1/10	DATE PREPARED 05/31/11	PEER REVIEW / DATE DCO 6/3/11

ESTIMATE WORKSHEET

FEATURE:	PROJECT:
REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable High Recreational Facilities to be Removed	Klamath River Northern California/Southern Oregon
	WOID: AF652 — ESTIMATE LEVEL: Feasibility
	REGION: MP — UNIT PRICE LEVEL: July-2010
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		Mallard Cove					
	89	Concrete total	BLM	106	CY	$400.00	$42,400.00
		Boat ramp: 100'x25'x1' (93 CY)					
		Dock abutment: 6'x8'x3' (6 CY)					
		8 Concrete wheel stops (0.5 CY)					
		4 Campfire ring foundations (1 CY)					
		6 Concrete sign bases (3 CY)					
		3 Concrete fire rings (2 CY)					
	90	25'x5' Dock made of composite decking and	BLM	1	EA	$3,000.00	$3,000.00
		poly floats					
	91	20'x5' Gangway w/ aluminum frame and railings	BLM	1	EA	$2,500.00	$2,500.00
	92	Signs to be removed and hauled away	BLM	6	EA	$350.00	$2,100.00
	93	Wood plank tables to be removed and hauled	BLM	8	EA	$120.00	$960.00
		away					
	94	Parking area to be regraded, ripped, seeded and	BLM	2.5	ACRE	$30,000.00	$75,000.00
		planted this area is made of fill about 6 ft deep					
		Copco Cove					
	95	Concrete total	BLM	84	CY	$400.00	$33,600.00
		Boat ramp: 80'x25'x1' (74 CY)					
		Dock abutment: 14'x5'x3' (8 CY)					
		6 Concrete sign bases (2 CY)					
	96	Dock abutment railing made of 2.5" dia. steel pipe	BLM	25	LF	$45.00	$1,125.00
	97	Signs to be removed and hauled away	BLM	6	EA	$350.00	$2,100.00
	98	Wood plank tables to be removed and hauled	BLM	2	EA	$120.00	$240.00
		away					
	99	Regrade, rip, seed and plant disturbed areas	BLM	2.3	ACRE	$30,000.00	$69,000.00
RECREATIONAL FACILITIES REMOVAL SUBTOTAL THIS SHEET							**$232,025.00**

QUANTITIES		PRICES	
BY Renee Snyder (BLM)	CHECKED Sheena Barnes	BY Craig A. Grush, P.E.	CHECKED DV 06-01-11
DATE PREPARED 10/26/10	PEER REVIEW / DATE Rick Benik P.E. 10/26/10	DATE PREPARED 05/31/11	PEER REVIEW / DATE DCD 6/3/11

ESTIMATE WORKSHEET

FEATURE:
REVISION #1
Klamath River Dams Removal
Full Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable High
SUMMARY

PROJECT:
Klamath River
Northern California/Southern Oregon

WOID:	AF652	**ESTIMATE LEVEL:**	Feasibility
REGION:	MP	**UNIT PRICE LEVEL:**	July-2010

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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		Sediment Removal (assumes by natural erosion)		1,453,800	CY	$0.00	$0.00
		Diversion and Care					$2,015,000.00
		Dam Removal					$20,985,250.00
		Powerhouse/Switchyard/Transmission Line Removal					$4,651,550.00
		Penstock Removal					$1,083,400.00
		Reservoir Vegetative Restoration					$19,968,000.00
		Road Improvements					$12,068,400.00
		Recreational Facilities to be Removed					$232,025.00
		Subtotal					**$61,003,625.00**
		Mobilization	5%	+/-			$3,100,000.00
		Subtotal 1 with Mobilization					**$64,103,625.00**
		Escalation to Notice to Proceed (NTP), from July 2010 to July 2020					$34,262,933.00
		(assumes 4.375%/yr compounding over 10 years)					
		Subtotal 2 = Subtotal 1 with Mobilization + Escalation to NTP					$98,366,558.00
		Design Contingencies	15%	+/-			$14,371,011.00
		Allowance for Procurement Strategies (APS)	2%	+/-			$2,262,431.00
		Type of solicitation assumed is: Competitive RFP					
		CONTRACT COST					**$115,000,000.00**
		Construction Contingencies	25%	+/-			$30,000,000.00
		FIELD COST					**$145,000,000.00**
		Non-Contract Costs:	61%	+/-			$85,000,000.00
		(Environmental & Cultural Resources					
		Mitigation ~ 35%, Design Data Collection ~ 2%,					
		Engineering Design ~ 6%, Permitting ~ 4%,					
		Procurement ~ 2%, Construction Management					
		~ 11%, and Closeout ~ 1%)					
		CONSTRUCTION COST					**$230,000,000.00**
		Ref.: For appropriate use and terminology, see Reclamation Manual, Directives and Standards FAC; 09-01, 09-02 and 09-03.					

QUANTITIES		PRICES	
BY Refer to Previous Sheets	**CHECKED** Refer to Previous Sheets	**BY** Craig A. Grush, P.E.	**CHECKED** 06-01-11
DATE PREPARED	**PEER REVIEW / DATE** Refer to Previous Sheets	**DATE PREPARED** 05/31/11	**PEER REVIEW / DATE** 6/3/11

BUREAU OF RECLAMATION

ESTIMATE WORKSHEET

FEATURE:
REVISION #1
Klamath River Dams Removal
Full Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable Low
Diversion and Care

PROJECT:
Klamath River
Northern California/Southern Oregon

WOID:	AF652	ESTIMATE LEVEL:	Feasibility
REGION:	MP	UNIT PRICE LEVEL:	July-2010

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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
	1	Furnish, Install, and Remove Barge-Mounted	86-68130	1	ls		$340,000.00
		Crane in Reservoir for Dam Removal.					
		Barge taken from Iron Gate Reservoir.					
		Barge is used to modify diversion tunnel intake structure.					
		Barge is also used to remove spillway gates, piers, bridge and concrete in spillway crest.					
		Barge is located on reservoir for approximately 5 months.					
	2	Remove Sediment from Diversion Tunnel Intake	86-68130	30	cy	$1,700.00	$51,000.00
		to provide access.					
		Requires removing sediment 115 feet deep using clamshell or suction dredge.					
	3	Furnish, Install, and Remove Large Crane on	86-68130	1	ls	Included in the mobilization item	
		Right Abutment.					
		Crane used to deliver equipment and materials and to remove waste materials as required.					
		Crane in place for 4 months.					
	4	Remove Water from behind Tailrace Cofferdam.	86-68130	200,000	gals	$0.01	$2,000.00
		Unwatering of tailrace for removal of the powerhouse in the dry.					
		Assume 3 inch portable trash pump operating for 1 day.					
	5	Riprap Protection on Cofferdam.	86-68130	260	cy	$120.00	$31,200.00
		Riprap protects cofferdam from diversion tunnel releases.					
	6	Provide Dewatering behind Tailrace Cofferdam	86-68130	1	ls		$30,000.00
		for removal of Powerhouse in the dry.					
		Assume 3 inch portable trash pump operating for approximately 3 months.					
		SUBTOTAL THIS SHEET					**$454,200.00**

QUANTITIES		PRICES	
BY Rick Benik	CHECKED Jonathan East	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 10/26/10	PEER REVIEW / DATE Tom Hepler P.E. 10/26/10	DATE PREPARED 05/31/11	PEER REVIEW / DATE DCD 6/3/11

BUREAU OF RECLAMATION

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Diversion and Care

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Northern California/Southern Oregon

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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
	7	Remove Current Diversion Tunnel Plug	86-68130	195	yd3	$1,400.00	$273,000.00
		Plug located in the middle of the tunnel					
		Reinforced concrete					
		Tunnel work					
	8	Construct Embankment Cofferdam in Tailrace	86-68130	1,700	yd3	$70.00	$119,000.00
		to remove Powerhouse in dry.					
		Assumes 10 ft wide crest with 2:1 side slopes, approximately 250 ft long and up to 12 ft high.					
		Embankment material taken from Iron Gate Dam Removal, approximately 10 mile haul distance.					
		SUBTOTAL THIS SHEET					**$392,000.00**

QUANTITIES		PRICES	
BY Jonathan East	CHECKED Sheena Barnes	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 10/26/10	PEER REVIEW / DATE Rick Benik P.E. 10/26/10	DATE PREPARED 05/31/11	PEER REVIEW / DATE DCD 6/3/11

BUREAU OF RECLAMATION

ESTIMATE WORKSHEET

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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		MECHANICAL	86-68420				
		Furnish, Install and Remove the following					
		necessary for the removal of Copco #1 Dam.					
	9	3-6'x6' Fabricated Slide Gates with 120 ft. head					
		Total slide gate weight approximately: 12,500 lbs. ea.		40,500	lbs	$12.00	$486,000.00
		Includes operators, stems, guides, and remote controls.					
		Installation requires a dive depth of 115 ft.					
		DIVERSION AND CARE SUBTOTAL					**$1,332,200.00**

QUANTITIES		PRICES	
BY T. J. Turnage	CHECKED K. Converse	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 10/28/10	PEER REVIEW / DATE Dan Drake 10/29/2010	DATE PREPARED 05/31/11	PEER REVIEW / DATE DCD 6/3/11

ESTIMATE WORKSHEET

FEATURE:	PROJECT:		
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
		Concrete and Structural Steel Items:					
	10	Remove Concrete Dam down to Elev. 2476	86-68130	36,000	yd3	$290.00	$10,440,000.00
		Elev. 2476 represents original streambed channel at downstream face of dam.					
		Concrete in foundation to remain. Spillway crest at Elev. 2593.5.					
		Includes concrete in dam, spillway crest, piers (390 cy), bridge					
		deck (72 cy) and left abutment. Concrete is reinforced.					
		Requires notching of concrete dam under head below approximately Elev. 2536					
		for a dry water year. Approximately 17,000 cy of concrete in dam above El. 2536.					
		Assume ten notches, 12 ft deep, alternating sides with five on each side for					
		removal of final 60 feet of dam.					
		Each notch overlaps the previous alternating notch in 6 foot lifts.					
		Each notch is approximately 20 ft wide with an average 6 ft thickness to be					
		removed by blasting below reservoir surface.					
	11	Remove Concrete Intake Structure on Right	86-68130	21,000	yd3	$340.00	$7,140,000.00
		Abutment					
		Includes concrete in gate houses and headworks for units 1 and 2.					
	12	Remove Structural Steel from Spillway	86-68130	55,000	lbs	$0.70	$38,500.00
		Includes rails, misc. steel					
		Does not include spillway gates					
		By barge and crane					
	13	Install Diversion Tunnel Plugs	86-68130	30	yd3	$1,100.00	$33,000.00
		Plug upstream (6 cy) and downstream ends					
		Assume 2' thick each					
	14	Remove Diversion Tunnel Control Structure	86-68130	350	yd3	$170.00	$59,500.00
		Concrete					
		Includes guide boxes					
		Assume reinforced					
		SUBTOTAL THIS SHEET					**$17,711,000.00**

QUANTITIES		PRICES	
BY Jonathan East	CHECKED Sheena Barnes	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 10/26/10	PEER REVIEW / DATE Rick Benik P.E. 10/26/10	DATE PREPARED 05/31/11	PEER REVIEW / DATE ACD 6/3/11

FEATURE:	PROJECT:
REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable Low Dam	Klamath River Northern California/Southern Oregon
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		MECHANICAL					
		Remove and dispose of the following					
		equipment at Dam:					
	15	Hand Rails	86-68420	11,000	lb	$0.70	$7,700.00
		By barge and crane					
	16	Radial Gates	86-68420	140,500	lb	$0.70	$98,350.00
		13 radial gates, wall and sillplates and 3-hoists		Revised 8.26.10 TJT			
		By barge and crane					
	17	Radial Gate stoplogs	86-68420	18,000	lb	$0.70	$12,600.00
		8 stop logs and 13 sets of guides					
		By barge and crane					
	18	Stoplog hoist, track and supports	86-68420	26,000	lb	$0.70	$18,200.00
		By barge and crane					
		Remove and dispose of the following	86-68420				
		equipment at the waste tunnel:					
	19	3 sections of 23' of 72"Ø steel lining (embedded)	86-68420	54,000	lb	$0.60	$32,400.00
	20	3 - 72" butterfly valves (embedded)	86-68420	55,000	lb	$0.60	$33,000.00
	21	3-72" flapper valves with remote mechanical	86-68420	78,000	lb	$2.50	$195,000.00
		control (embedded)					
		Removal requires a dive depth of 115 ft.					
		SUBTOTAL THIS SHEET					**$397,250.00**

QUANTITIES		PRICES	
BY K. Converse	CHECKED T Turnage	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 10/28/10	PEER REVIEW / DATE Dan Drake 10/29/2010	DATE PREPARED 05/31/11	PEER REVIEW / DATE 6/3/11

ESTIMATE WORKSHEET

FEATURE:
REVISION #1
Klamath River Dams Removal
Full Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable Low
Dam

PROJECT:
Klamath River
Northern California/Southern Oregon

WOID:	AF652	ESTIMATE LEVEL:	Feasibility
REGION:	MP	UNIT PRICE LEVEL:	July-2010

FILE: C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 1\[Klamath Dams Removal - COPCO 1 - Full Removal Option - REV#1 - MPL Feas Est - 4-2011.xlsx]Road Improvements

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		ELECTRICAL					
		Remove and dispose of the following equipment at Spillway:					
	22	Spillway gate motor & control panel	86-68430	1	EA	$900.00	$900.00
		Total weight approximately: 500 lbs.					
	23	Distribution equipment , panelboards	86-68430	1	EA	$5,000.00	$5,000.00
		Total weight approximately: 500 lbs.					
		DAM SUBTOTAL					**$18,114,150.00**

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 11/01/10	PEER REVIEW / DATE L. Rossi 11/1/10	DATE PREPARED 05/31/11	PEER REVIEW / DATE 6/3/11

ESTIMATE WORKSHEET

FEATURE:	PROJECT:
REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable Low Powerhouse, Switchyard, and Transmission Line	Klamath River Northern California/Southern Oregon

WOID:	AF652	ESTIMATE LEVEL:	Feasibility
REGION:	MP	UNIT PRICE LEVEL:	July-2010
FILE:	C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 1\[Klamath Dams Removal - COPCO 1 - Full Removal Option - REV#1 - MPL Feas Est - 4-2011.xlsx]Road Improvements		

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
		Concrete and Structural Steel Items:					
	24	Remove Powerhouse Concrete down to top of rock					
		under the PH, Elev. 2482.75 (USGS datum).	86-68130	3,100	yd3	$270.00	$837,000.00
		Local datum is converted to USGS datum by					
		adding 2411 feet. (Elev. 71.75 + 2411 = Elev. 2482.75.)					
		All concrete is reinforced.					
		Includes all exterior & interior walls, columns, &					
		beams, and concrete in foundations for transformers					
	25	Remove Powerhouse Structural Steel	86-68130	110,000	lbs	$0.60	$66,000.00
		Roof truss members, purlins, and crane rail					
		SUBTOTAL THIS SHEET					**$903,000.00**

QUANTITIES		PRICES	
BY Jonathan East	CHECKED Sheena Barnes	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 10/26/10	PEER REVIEW / DATE Rick Benik P.E. 10/26/10	DATE PREPARED 05/31/11	PEER REVIEW / DATE DCD 6/3/11

BUREAU OF RECLAMATION

ESTIMATE WORKSHEET

FEATURE:
REVISION #1
Klamath River Dams Removal
Full Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable Low
Powerhouse, Switchyard, and Transmission Line

PROJECT:
Klamath River
Northern California/Southern Oregon

WOID:	AF652	ESTIMATE LEVEL:	Feasibility
REGION:	MP	UNIT PRICE LEVEL:	July-2010

FILE: C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 1\[Klamath Dams Removal - COPCO 1 - Full Removal Option - REV#1 - MPL Feas Est - 4-2011.xlsx]Road Improvements

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		MECHANICAL					
		Remove and dispose of the following					
		equipment at the Power House:					
	26	2 - Governor oil systems	86-68420	38,000	lb	$0.60	$22,800.00
		governor, sump tanks, accumulator tank, piping					
	27	Cooling water and bearing oil systems	86-68420	11,000	lb	$0.60	$6,600.00
		(encased in concrete)					
	28	4 - Horizontal Tandem Francis Turbines	86-68420	452,000	lb	$0.60	$271,200.00
		(includes runner, scroll case, draft tube and shaft)					
	29	2 - 40 Ton indoor cranes	86-68420	140,000	lb	$0.60	$84,000.00
		Includes crane and rail, not steel rail base					
	30	Compressed Air system	86-68420	1,000	lb	$0.60	$600.00
	31	2 - CO2 systems	86-68420	3,100	lb	$0.60	$1,860.00
	32	Plant Water and Fire Protection	86-68420	2,600	lb	$0.60	$1,560.00
		SUBTOTAL THIS SHEET					**$388,620.00**

QUANTITIES		PRICES	
BY K. Converse	CHECKED T Turnage	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 10/28/10	PEER REVIEW / DATE Dan Drake 10/29/2010	DATE PREPARED 05/31/11	PEER REVIEW / DATE DCD 6/3/11

BUREAU OF RECLAMATION

ESTIMATE WORKSHEET

FEATURE:
REVISION #1
Klamath River Dams Removal
Full Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable Low
Powerhouse, Switchyard, and Transmission Line

PROJECT:
Klamath River
Northern California/Southern Oregon

WOID:	AF652	ESTIMATE LEVEL:	Feasibility
REGION:	MP	UNIT PRICE LEVEL:	July-2010

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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		MECHANICAL					
	33	Transformer Oil Fire protection	86-68420	5,400	lb	$0.60	$3,240.00
	34	Unwatering Piping	86-68420	27,000	lb	$0.60	$16,200.00
	35	Drainage Piping	86-68420	5,000	lb	$0.60	$3,000.00
		SUBTOTAL THIS SHEET					**$22,440.00**

QUANTITIES		PRICES	
BY K. Converse	CHECKED T Turnage	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 10/28/10	PEER REVIEW / DATE Dan Drake 10/29/2010	DATE PREPARED 05/31/11	PEER REVIEW / DATE DCD 6/3/11

ESTIMATE WORKSHEET

FEATURE:
REVISION #1
Klamath River Dams Removal
Full Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable Low
Powerhouse, Switchyard, and Transmission Line

PROJECT:
Klamath River
Northern California/Southern Oregon

WOID:	AF652	ESTIMATE LEVEL:	Feasibility
REGION:	MP	UNIT PRICE LEVEL:	July-2010

FILE: C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 1\[Klamath Dams Removal - COPCO 1 - Full Removal Option - REV#1 - MPL Feas Est - 4-2011.xlsx]Road Improvements

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		ELECTRICAL					
		Remove and dispose of the following					
		equipment in the Powerplant:					
	36	Horizontal AC Generator, Indoor Open Frame	86-68430	2	EA	$30,000.00	$60,000.00
		Unit 1 & 2 ea: 12.5 MVA (10 MW); 0.8PF, 2,300V,					
		200 RPM, 3 Ph, including rotating exciter					
		Total weight each approximately: 123,500 lbs.					
		Stator: 32,250 lbs., Rotor: 55,000 lbs.					
		Base: 17,000 lbs., Exciter Assembly: 7,550 lbs.					
		Heaviest lift: 55,000 lbs.					
	37	Excitation equipment for 12.5 MVA Generator	86-68430	2	EA	$5,000.00	$10,000.00
		(2 sections)Total weight approximately: 1,000 lbs.					
	38	Surge protection equip. for 12.5 MVA Generator	86-68430	2	EA	$1,500.00	$3,000.00
		Total weight approximately: 800 lbs.					
	39	Neutral grounding equip. for 12.5 MVA Generator	86-68430	2	EA	$1,500.00	$3,000.00
		includes transformer					
		Total weight approximately: 500 lbs.					
	40	Generator Switchgear, 5kV-includes unit breakers	86-68430	1	EA	$15,000.00	$15,000.00
		(6 Sections @ 400 lbs each section)					
		3 ft x 3 ft x 90 inches high					
		Total weight approximately: 2,400 lbs.					
	41	Station Service Switchgear, 600 volt -(5 sections)	86-68430	1	EA	$15,000.00	$15,000.00
		(400 lbs each section), 3 ft x 3ft x 90 inches high					
		Total weight approximately: 2,000 lbs.					
		SUBTOTAL THIS SHEET					**$106,000.00**

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 11/01/10	PEER REVIEW / DATE L. Rossi 11/1/10	DATE PREPARED 05/31/11	PEER REVIEW / DATE DCW 6/3/11

ESTIMATE WORKSHEET

FEATURE:
REVISION #1
Klamath River Dams Removal
Full Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable Low
Powerhouse, Switchyard, and Transmission Line

PROJECT:
Klamath River
Northern California/Southern Oregon

WOID:	AF652	ESTIMATE LEVEL:	Feasibility
REGION:	MP	UNIT PRICE LEVEL:	July-2010

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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		ELECTRICAL					
		Remove and dispose of the following equipment in the Powerplant:					
	42	Unit and plant control switchboard 5 cubicles (200 lbs each), 2ft x 2ft x 90 in. high Total weight approximately: 1,000 lbs.	86-68430	1	EA	$14,000.00	$14,000.00
	43	Battery system - assume 60 batteries, charger, racks and supports. Total weight approximately: 2,500 lbs.	86-68430	1	EA	$9,000.00	$9,000.00
	44	Raceways, Conduit and Cable (approx. 3000 lin. Ft. power & control cable, 1000 lin. Ft. conduit, 200 lin. Ft. cabletray) Total weight approximately: 8,000 lbs.	86-68430	1	EA	$14,000.00	$14,000.00
	45	Misc. power & control boards 10 boards (50 lbs each) 3ft x 2 ft x 9 in Total weight approximately: 500 lbs.	86-68430	1	EA	$4,000.00	$4,000.00
	46	Step-up Transformers, indoor, oil-filled, 1-phase, 5,000 kVA, 2,300/72,000 volt Total weight approximately each: 31,500 lbs.	86-68430	3	EA	$40,000.00	$120,000.00
	47	Step-up Transformers, indoor, oil-filled, 1-phase, 4,165 kVA, 2,300/72,000 volt Total weight approximately each: 31,500 lbs.	86-68430	3	EA	$40,000.00	$120,000.00
	48	Seven 40-Ton Travelling Crane motors - hoist (2-30Hp*), hoist trolley (7.5Hp*), gantry (4-15Hp*) (Hp* Approx.) Total weight approximately: 600 lbs.	86-68430	1	EA	$2,000.00	$2,000.00
		SUBTOTAL THIS SHEET					**$283,000.00**

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 11/01/10	PEER REVIEW / DATE L. Rossi 11/1/10	DATE PREPARED 05/31/11	PEER REVIEW / DATE DCD 6/3/11

ESTIMATE WORKSHEET

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Full Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable Low
Powerhouse, Switchyard, and Transmission Line

PROJECT:
Klamath River
Northern California/Southern Oregon

WOID:	AF652	ESTIMATE LEVEL:	Feasibility
REGION:	MP	UNIT PRICE LEVEL:	July-2010

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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		ELECTRICAL					
		Remove and dispose of the following equipment in the Powerplant:					
	49	40-Ton Travelling Crane control equipment (5 cubicles), Total weight approximately: 500 lbs.	86-68430	1	EA	$9,000.00	$9,000.00
	50	40-Ton Travelling Crane Festoon Cable (approx. 200 lin. Ft. cable) Total weight approximately: 800 lbs.	86-68430	1	EA	$1,000.00	$1,000.00
	51	Four 15-Ton Overhead Crane motors - hoist (10Hp*), hoist trolley (5Hp*), gantry (2-5Hp*) (Hp* Approx.) Total weight approximately: 350 lbs.	86-68430	1	EA	$900.00	$900.00
	52	15-Ton Overhead Crane control equipment (1 cubicle), Total weight approximately: 100 lbs.	86-68430	1	EA	$250.00	$250.00
	53	15-Ton Overhead Crane Festoon Cable (approx. 100 lin. Ft. cable) Total weight approximately: 250 lbs.	86-68430	1	EA	$400.00	$400.00
		SUBTOTAL THIS SHEET					**$11,550.00**

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 11/01/10	PEER REVIEW / DATE L. Rossi 11/1/10	DATE PREPARED 05/31/11	PEER REVIEW / DATE 6/3/11

ESTIMATE WORKSHEET

FEATURE:
REVISION #1
Klamath River Dams Removal
Full Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable Low
Powerhouse, Switchyard, and Transmission Line

PROJECT:
Klamath River
Northern California/Southern Oregon

WOID:	AF652	ESTIMATE LEVEL:	Feasibility
REGION:	MP	UNIT PRICE LEVEL:	July-2010

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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		ELECTRICAL					
		Remove and dispose of the following equipment in the Switchyard:					
		All equipment is on wood-pole structures					
	54	69-kV circuit breakers, oil-filled, PCB	86-68430	2	EA	$2,500.00	$5,000.00
	55	69-kV disconnect switches, group-operated	86-68430	2	EA	$1,000.00	$2,000.00
	56	60-foot wood poles	86-68430	12	EA	$900.00	$10,800.00
	57	30-foot wood crossarms	86-68430	24	EA	$400.00	$9,600.00
	58	69-kV insulator strings	86-68430	12	EA	$300.00	$3,600.00
		Remove and dispose of the following wood-pole transmission lines:					
	59	Transmission Line No. 3	86-68430	1.66	mile	$25,000.00	$41,500.00
		From Copco No. 1 switchyard to Fall Creek					
		266.8 ACSR, 69-kV					
	60	Transmission Line No. 15	86-68430	1.23	mile	$25,000.00	$30,750.00
		From Copco No. 1 switchyard to Copco No. 2					
		266.8 ACSR, 69-kV					
	61	Transmission Line No. 26-1	86-68430	0.07	mile	$25,000.00	$1,750.00
		From Copco No. 1 powerhouse to					
		Copco No. 1 switchyard					
		2/0 copper, 69-kV					
	62	Transmission Line No. 26-2	86-68430	0.07	mile	$25,000.00	$1,750.00
		From Copco No. 1 powerhouse to					
		Copco No. 1 switchyard					
		2/0 copper, 69-kV					
		POWERHOUSE, SWITCHYARD, & TRANS LINE SUBTOTAL					**$1,821,360.00**

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 11/01/10	PEER REVIEW / DATE L. Rossi 11/1/10	DATE PREPARED 05/31/11	PEER REVIEW / DATE DCD 6/3/11

BUREAU OF RECLAMATION

ESTIMATE WORKSHEET

FEATURE:
REVISION #1
Klamath River Dams Removal
Full Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable Low
Penstock

PROJECT:
Klamath River
Northern California/Southern Oregon

WOID:	AF652	**ESTIMATE LEVEL:**	Feasibility
REGION:	MP	**UNIT PRICE LEVEL:**	July-2010

FILE: C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 1\[Klamath Dams Removal - COPCO 1 - Full Removal Option - REV#1 - MPL Feas Est - 4-2011.xlsx]Road Improvements

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
		Concrete and Structural Steel Items:					
	63	Remove gate house #1 from top of dam	86-68130	570	ft2	$55.00	$31,350.00
	64	Remove gate house #2 from top of dam	86-68130	690	ft2	$55.00	$37,950.00
	65	Remove Concrete Items associated with 10-foot diameter Penstocks, concrete is reinforced	86-68130	1,050	yd3	$170.00	$178,500.00
	66	Plug 14-foot diameter penstock with concrete	86-68130	23	yd3	$1,100.00	$25,300.00
		Plug upstream and downstream ends					
		Assume 2' thick each					
		SUBTOTAL THIS SHEET					**$273,100.00**

QUANTITIES		PRICES	
BY Jonathan East	**CHECKED** Sheena Barnes	**BY** Craig A. Grush, P.E.	**CHECKED** 06-01-11
DATE PREPARED 10/26/10	**PEER REVIEW / DATE** Rick Benik P.E. 10/26/10	**DATE PREPARED** 05/31/11	**PEER REVIEW / DATE** 6/3/11

ESTIMATE WORKSHEET

FEATURE:
REVISION #1
Klamath River Dams Removal
Full Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable Low
Penstock

PROJECT:
Klamath River
Northern California/Southern Oregon

WOID:	AF652	ESTIMATE LEVEL:	Feasibility
REGION:	MP	UNIT PRICE LEVEL:	July-2010

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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		MECHANICAL					
		Remove and dispose of the following					
		equipment at the intake:					
	67	8 screens	86-68420	18,000	lb	$0.60	$10,800.00
	68	8 Water Gates	86-68420	18,000	lb	$0.60	$10,800.00
	69	3 - 30"Ø x 25' stand pipes	86-68420	6,000	lb	$0.60	$3,600.00
	70	14' Ø penstock pipe	86-68420	256,000	lb	$0.60	$153,600.00
		(includes encased and open air intake up to underground portion-Revised 9/14/2010)					
	71	10' Ø penstock pipe	86-68420	270,000	lb	$0.60	$162,000.00
		(includes intake and main conduit)					
		PENSTOCK SUBTOTAL					**$613,900.00**

QUANTITIES		PRICES	
BY K. Converse	CHECKED T Turnage	BY Craig A. Grush, P.E.	CHECKED DOV 06-01-11
DATE PREPARED 10/28/10	PEER REVIEW / DATE Dan Drake 10/29/2010	DATE PREPARED 05/31/11	PEER REVIEW / DATE DCD 6/3/11

ESTIMATE WORKSHEET

FEATURE:
REVISION #1
Klamath River Dams Removal
Full Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable Low
Reservoir Vegetative Restoration

PROJECT:
Klamath River
Northern California/Southern Oregon

WOID:	AF652	ESTIMATE LEVEL:	Appraisal
REGION:	MP	UNIT PRICE LEVEL:	July-2010

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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
	72	Temporary Access Roads	86-68140	7.0	Miles	$60,000.00	$420,000.00
		Blade primitive road as necessary in dry reservoir sediment for one time use by hydroseeding equipment. Existing topography is relatively flat with no significant excavation nor embankment anticipated.					
		SUBTOTAL THIS SHEET					**$420,000.00**

QUANTITIES		PRICES	
BY Mark Leavitt	CHECKED Gemperline, Joseph M	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 11/01/10	PEER REVIEW / DATE Dave Edwards 11/1/10	DATE PREPARED 05/31/11	PEER REVIEW / DATE DCE 6/3/11

ESTIMATE WORKSHEET

FEATURE:
REVISION #1
Klamath River Dams Removal
Full Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable Low
Reservoir Vegetative Restoration

PROJECT:
Klamath River
Northern California/Southern Oregon

WOID:	AF484	ESTIMATE LEVEL:	Feasibility
REGION:	MP	UNIT PRICE LEVEL:	July-2010

FILE: C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 1\[Klamath Dams Removal - COPCO 1 - Full Removal Option - REV#1 - MPL Feas Est - 4-2011.xlsx]Res Reveg

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		WATER AND ENVIRONMENTAL					
	73	SPRING GROUND SEEDING:	86-68220	420	Acres	$3,000.00	$1,260,000.00
		Idaho fescue (Festuca idahoensis)	1680	lbs PLS			
		Blue wildrye (Elymus glaucus)	1680	lbs PLS			
		Small fescue (Vulpia microstachys)	1680	lbs PLS			
		Bluebunch wheatgrass (Pseudoroegneria spicata)	2520	lbs PLS			
		Sandberg bluegrass (Poa secunda)	210	lbs PLS			
		Spike bentgrass (Agrostis exarata)	105	lbs PLS			
		Western needlegrass (Achnatherum occidentale)	1680	lbs PLS			
		California brome (Bromus carinatus)	3360	lbs PLS			
		Squirreltail (Elymus elymoides)	1680	lbs PLS			
		Wood mulch	840000	lbs			
		Tackifier	50400	lbs			
	74	SPRING BARGE SEEDING:	86-68220	82	Acres	$5,000.00	$410,000.00
		Idaho fescue (Festuca idahoensis)	328	lbs PLS			
		Blue wildrye (Elymus glaucus)	328	lbs PLS			
		Small fescue (Vulpia microstachys)	328	lbs PLS			
		Bluebunch wheatgrass (Pseudoroegneria spicata)	492	lbs PLS			
		Sandberg bluegrass (Poa secunda)	41	lbs PLS			
		Spike bentgrass (Agrostis exarata)	21	lbs PLS			
		Western needlegrass (Achnatherum occidentale)	328	lbs PLS			
		California brome (Bromus carinatus)	656	lbs PLS			
		Squirreltail (Elymus elymoides)	328	lbs PLS			
		Wood mulch	164000	lbs			
		Tackifier	9840	lbs			
		SUBTOTAL THIS SHEET					**$1,670,000.00**

QUANTITIES		PRICES	
BY O'Meara, Scott A	CHECKED Greimann, Blair P	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 04/12/11	PEER REVIEW / DATE 04/12/11	DATE PREPARED 05/31/11	PEER REVIEW / DATE DCD 6/3/11

ESTIMATE WORKSHEET

FEATURE:
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Klamath River Dams Removal
Full Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable Low
Reservoir Vegetative Restoration

PROJECT:
Klamath River
Northern California/Southern Oregon

WOID:	AF484	ESTIMATE LEVEL:	Feasibility
REGION:	MP	UNIT PRICE LEVEL:	July-2010

FILE: C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 1\[Klamath Dams Removal - COPCO 1 - Full Removal Option - REV#1 - MPL Feas Est - 4-2011.xlsx]Res Reveg

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		WATER AND ENVIRONMENTAL					
	75	SPRING AERIAL SEEDING:	86-68220	300	Acres	$6,500.00	$1,950,000.00
		Idaho fescue (Festuca idahoensis)	1200	lbs PLS			
		Blue wildrye (Elymus glaucus)	1200	lbs PLS			
		Small fescue (Vulpia microstachys)	1200	lbs PLS			
		Bluebunch wheatgrass (Pseudoroegneria spicata)	1800	lbs PLS			
		Sandberg bluegrass (Poa secunda)	150	lbs PLS			
		Spike bentgrass (Agrostis exarata)	75	lbs PLS			
		Western needlegrass (Achnatherum occidentale)	1200	lbs PLS			
		California brome (Bromus carinatus)	2400	lbs PLS			
		Squirreltail (Elymus elymoides)	1200	lbs PLS			
		Wood mulch	600000	lbs			
		Tackifier	36000	lbs			
	76	FALL GROUND SEEDING:	86-68220	201	Acres	$3,000.00	$603,000.00
		Idaho fescue (Festuca idahoensis)	802	lbs PLS			
		Blue wildrye (Elymus glaucus)	802	lbs PLS			
		Small fescue (Vulpia microstachys)	802	lbs PLS			
		Bluebunch wheatgrass (Pseudoroegneria spicata)	1203	lbs PLS			
		Sandberg bluegrass (Poa secunda)	100	lbs PLS			
		Spike bentgrass (Agrostis exarata)	50	lbs PLS			
		Western needlegrass (Achnatherum occidentale)	802	lbs PLS			
		California brome (Bromus carinatus)	1604	lbs PLS			
		Squirreltail (Elymus elymoides)	802	lbs PLS			
		Wood mulch	61692	lbs			
		Tackifier	3702	lbs			
		SUBTOTAL THIS SHEET					**$2,553,000.00**

QUANTITIES		PRICES	
BY O'Meara, Scott A	CHECKED Greimann, Blair P	BY Craig A. Grush, P.E.	CHECKED DW 06-01-11
DATE PREPARED 04/12/11	PEER REVIEW / DATE 04/12/11	DATE PREPARED 05/31/11	PEER REVIEW / DATE DCA 6/3/11

ESTIMATE WORKSHEET

FEATURE:
REVISION #1
Klamath River Dams Removal
Full Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable Low
Reservoir Vegetative Restoration

PROJECT:
Klamath River
Northern California/Southern Oregon

WOID:	AF484	ESTIMATE LEVEL:	Feasibility
REGION:	MP	UNIT PRICE LEVEL:	July-2010

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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		WATER AND ENVIRONMENTAL					
	77	RIPARIAN POLE PLANTING: (400 ea/acre)	86-68220	170	Acres	$4,000.00	$680,000.00
		Narrowleaf willow (Salix exigua)	40800	cutting			
		Arroyo willow (Salix lasiolepis)	6800	cutting			
		Shining willow (Salix lucida)	6800	cutting			
		Three-leaf sumac (Rhus trilobata)	6800	cutting			
		Western serviceberry (Amelanchier alnifolia)	3400	cutting			
		Chokecherry (Prunus virginiana)	3400	transplant			
		Herbivore screen	68000	each			
		Chemical herbivore deterent	1360	gal			
		Polymer	214	lbs			
	78	WEED MANAGEMENT:	86-68220	201	Acres	$1,000.00	$201,000.00
		Herbicide, post-emergent	401	lbs AI			
		MAINTENANCE TREATMENTS ON 10% OF THE RESTORATION AREAS PER YEAR OVER 4 YEARS, POST-RESTORATION					
	79	FALL GROUND SEEDING:	86-68220	321	Acres	$3,000.00	$963,000.00
		Idaho fescue (Festuca idahoensis)	1283	lbs PLS			
		Blue wildrye (Elymus glaucus)	1283	lbs PLS			
		Small fescue (Vulpia microstachys)	1283	lbs PLS			
		Bluebunch wheatgrass (Pseudoroegneria spicata)	1925	lbs PLS			
		Sandberg bluegrass (Poa secunda)	160	lbs PLS			
		Spike bentgrass (Agrostis exarata)	80	lbs PLS			
		Western needlegrass (Achnatherum occidentale)	1283	lbs PLS			
		California brome (Bromus carinatus)	2566	lbs PLS			
		Squirreltail (Elymus elymoides)	1283	lbs PLS			
		Wood mulch	641600	lbs			
		Tackifier	38496	lbs			
	80	WEED MANAGEMENT:	86-68220	321	Acres	$1,000.00	$321,000.00
		Herbicide, post-emergent	30	lbs AI			
	RESERVOIR VEGETATIVE RESTORATION SUBTOTAL						**$6,808,000.00**

QUANTITIES		PRICES	
BY O'Meara, Scott A	CHECKED Greimann, Blair P	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 04/12/11	PEER REVIEW / DATE 04/12/11	DATE PREPARED 05/31/11	PEER REVIEW / DATE 6/3/11

ESTIMATE WORKSHEET

FEATURE:
REVISION #1
Klamath River Dams Removal
Full Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable Low
Road Improvements

PROJECT:
Klamath River
Northern California/Southern Oregon

WOID:	AF652	ESTIMATE LEVEL:	Feasibility
REGION:	MP	UNIT PRICE LEVEL:	July-2010

FILE: C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 1\[Klamath Dams Removal - COPCO 1 - Full Removal Option - REV#1 - MPL Feas Est - 4-2011.xlsx]Road Improvements

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		GEOTECHNICAL					
		These quantities represent the work required					
		to prepare a disposal site and improve the					
		haul road to the disposal site for Copco 1					
		and Copco 2. In addition it provides the					
		length of county road required to be					
		repaired after construction.					
		General Sitework Copco 1 And Copco 2					
	81	Clear and Grub Disposal Area	86-68313	7	acre	$5,000.00	$35,000.00
		Estimated haul distance 1 mile.					
		Disposed concrete estimated to be 10' deep					
		and traffic compacted (50% bulking factor).					
		For Copco 1 and Copco 2					
	82	Soil Cover for Disposal Area	86-68313	23,000	yd3	$45.00	$1,035,000.00
		Access/Haul Road Improvements					
		maximum 12% grades					
		4 reaches required improvement					
	83	Soil Excavation	86-68313	4,500	yd3	$12.00	$54,000.00
	84	Rock Excavation	86-68313	4,500	yd3	$35.00	$157,500.00
	85	Soil Backfill	86-68313	16,000	yd3	$45.00	$720,000.00
	86	4" Gravel Surfacing	86-68313	0	ton	$80.00	
		50% contingency for excavation					
		100% contingency for backfill					
		County Road Improvements					
	87	Asphalt Overlay Repair - Juniper Road	86-68313	3	mi	$35,000.00	$105,000.00
	88	Asphalt Overlay Repair - Copco Road	86-68313	19	mi	$35,000.00	$665,000.00
		Assume the 2 lane county road from I-5 to					
		the Copco Dams will be overlayed after					
		construction with chip seal.					
		ROAD IMPROVEMENTS SUBTOTAL					**$2,771,500.00**

QUANTITIES		PRICES	
BY Randy Kuzniakowski	CHECKED Tuti Tierney	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 11/01/10	PEER REVIEW / DATE Daniel W. Osmun 11/1/10	DATE PREPARED 05/31/11	PEER REVIEW / DATE DCO 6/3/11

ESTIMATE WORKSHEET

FEATURE:
REVISION #1
Klamath River Dams Removal
Full Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable Low
Recreational Facilities to be Removed

PROJECT:
Klamath River
Northern California/Southern Oregon

WOID:	AF652	ESTIMATE LEVEL:	Feasibility
REGION:	MP	UNIT PRICE LEVEL:	July-2010

FILE: C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 1\[Klamath Dams Removal - COPCO 1 - Full Removal Option - REV#1 - MPL Feas Est - 4-2011.xlsx]Road Improvements

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		Mallard Cove					
	89	Concrete total	BLM	106	CY	$200.00	$21,200.00
		Boat ramp: 100'x25'x1' (93 CY)					
		Dock abutment: 6'x8'x3' (6 CY)					
		8 Concrete wheel stops (0.5 CY)					
		4 Campfire ring foundations (1 CY)					
		6 Concrete sign bases (3 CY)					
		3 Concrete fire rings (2 CY)					
	90	25'x5' Dock made of composite decking and poly floats	BLM	1	EA	$2,000.00	$2,000.00
	91	20'x5' Gangway w/ aluminum frame and railings	BLM	1	EA	$1,500.00	$1,500.00
	92	Signs to be removed and hauled away	BLM	6	EA	$250.00	$1,500.00
	93	Wood plank tables to be removed and hauled away	BLM	8	EA	$90.00	$720.00
	94	Parking area to be regraded, ripped, seeded and planted this area is made of fill about 6 ft deep	BLM	2.5	ACRE	$20,000.00	$50,000.00
		Copco Cove					
	95	Concrete total	BLM	84	CY	$200.00	$16,800.00
		Boat ramp: 80'x25'x1' (74 CY)					
		Dock abutment: 14'x5'x3' (8 CY)					
		6 Concrete sign bases (2 CY)					
	96	Dock abutment railing made of 2.5" dia. steel pipe	BLM	25	LF	$35.00	$875.00
	97	Signs to be removed and hauled away	BLM	6	EA	$250.00	$1,500.00
	98	Wood plank tables to be removed and hauled away	BLM	2	EA	$90.00	$180.00
	99	Regrade, rip, seed and plant disturbed areas	BLM	2.3	ACRE	$20,000.00	$46,000.00
RECREATIONAL FACILITIES REMOVAL SUBTOTAL THIS SHEET							**$142,275.00**

QUANTITIES		PRICES	
BY Renee Snyder (BLM)	CHECKED Sheena Barnes	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 10/26/10	PEER REVIEW / DATE Rick Benik P.E. 10/26/10	DATE PREPARED 05/31/11	PEER REVIEW / DATE DCD 6/3/11

ESTIMATE WORKSHEET

FEATURE:
REVISION #1
Klamath River Dams Removal
Full Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable Low
SUMMARY

PROJECT:
Klamath River
Northern California/Southern Oregon

WOID:	AF652	ESTIMATE LEVEL:	Feasibility
REGION:	MP	UNIT PRICE LEVEL:	July-2010

FILE: C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 1\[Klamath Dams Removal - COPCO 1 - Full Removal Option - REV#1 - MPL Feas Est - 4-2011.xlsx]Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		Sediment Removal (assumes by natural erosion)		1,453,800	CY	$0.00	$0.00
		Diversion and Care					$1,332,200.00
		Dam Removal					$18,114,150.00
		Powerhouse/Switchyard/Transmission Line Removal					$1,821,360.00
		Penstock Removal					$613,900.00
		Reservoir Vegetative Restoration					$6,808,000.00
		Road Improvements					$2,771,500.00
		Recreational Facilities to be Removed					$142,275.00
		Subtotal					**$31,603,385.00**
		Mobilization	5%	+/-			$1,600,000.00
		Subtotal 1 with Mobilization					**$33,203,385.00**
		Escalation to Notice to Proceed (NTP), from July 2010 to July 2020					$5,330,499.00
		(assumes 1.5%/yr compounding over 10 years)					
		Subtotal 2 = Subtotal 1 with Mobilization + Escalation to NTP					$38,533,884.00
		Design Contingencies	8%	+/-			$3,466,116.00
		Allowance for Procurement Strategies (APS)	0%	+/-			
		Type of solicitation assumed is: Competitive RFP					
		CONTRACT COST					**$42,000,000.00**
		Construction Contingencies	18%	+/-			$7,000,000.00
		FIELD COST					**$49,000,000.00**
		Non-Contract Costs:	52%	+/-			$25,000,000.00
		(Environmental & Cultural Resources					
		Mitigation ~ 35%, Design Data Collection ~ 1%,					
		Engineering Design ~ 3%, Permitting ~ 2%,					
		Procurement ~ 1%, Construction Management					
		~ 9%, and Closeout ~ 1%)					
		CONSTRUCTION COST					**$74,000,000.00**
		Ref.: For appropriate use and terminology, see Reclamation Manual, Directives and Standards FAC; 09-01, 09-02 and 09-03.					

QUANTITIES		PRICES	
BY Refer to Previous Sheets	CHECKED Refer to Previous Sheets	BY Craig A. Brush, P.E.	CHECKED 06-01-11
DATE PREPARED	PEER REVIEW / DATE Refer to Previous Sheets	DATE PREPARED 05/31/11	PEER REVIEW / DATE DCD 6/3/11

ESTIMATE WORKSHEET

FEATURE:

Klamath River Dams Removal
Partial Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable
Diversion and Care

PROJECT:

Klamath River
Northern California/Southern Oregon

WOID:	AF121	ESTIMATE LEVEL:	Feasibility
REGION:	MP	UNIT PRICE LEVEL:	July-2010

FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 1\[Klamath Dams Removal - COPCO 1 - Partial Removal Option - MP Feas Est - 4-2011.xlsx]Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
	1	Furnish, Install, and Remove Barge-Mounted	86-68130	1	ls		$350,000.00
		Crane in Reservoir for Dam Removal.					
		Barge taken from Iron Gate Reservoir.					
		Barge is used to modify diversion tunnel intake structure.					
		Barge is also used to remove spillway gates, piers, bridge and concrete in spillway crest.					
		Barge is located on reservoir for approximately 5 months.					
	2	Remove Sediment from Diversion Tunnel Intake	86-68130	30	cy	$2,000.00	$60,000.00
		to provide access.					
		Requires removing sediment 115 feet deep using clamshell or suction dredge.					
	3	Furnish, Install, and Remove Large Crane on	86-68130	1	ls	Included in the mobilization item	
		Right Abutment.					
		Crane used to deliver equipment and materials and to remove waste materials as required.					
		Crane in place for 4 months.					
	4	~~Remove Water from behind Tailrace Cofferdam.~~	~~86-68130~~	~~200,000~~	~~gals~~		DELEED
		~~Unwatering of tailrace for removal of the powerhouse in the dry.~~					
		~~Assume 3 inch portable trash pump operating for 1 day.~~					
	5	~~Riprap Protection on Cofferdam.~~	~~86-68130~~	~~260~~	~~cy~~		DELEED
		~~Riprap protects cofferdam from diversion tunnel releases.~~					
	6	~~Provide Dewatering behind Tailrace Cofferdam~~	~~86-68130~~	~~1~~	~~ls~~		DELEED
		~~for removal of Powerhouse in the dry.~~					
		~~Assume 3 inch portable trash pump operating for approximately 3 months.~~					
		SUBTOTAL THIS SHEET					**$410,000.00**

QUANTITIES		PRICES	
BY Rick Benik	CHECKED Jonathan East	BY Craig A. Grush, P.E.	CHECKED 04-22-11
DATE PREPARED 11/18/10	PEER REVIEW / DATE Tom Hepler P.E. 12/9/10	DATE PREPARED 04/22/11	PEER REVIEW / DATE DDD 4/22/11

ESTIMATE WORKSHEET

FEATURE:

Klamath River Dams Removal
Partial Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable
Diversion and Care

PROJECT:
Klamath River
Northern California/Southern Oregon

WOID:	AF121	**ESTIMATE LEVEL:**	**Feasibility**
REGION:	MP	**UNIT PRICE LEVEL:**	**July-2010**

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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
	7	Remove Current Diversion Tunnel Plug	86-68130	195	yd3	$1,500.00	$292,500.00
		Plug located in the middle of the tunnel					
		Reinforced concrete					
		Tunnel work					
	8	~~Construct Embankment Cofferdam in Tailrace~~	~~86-68130~~	~~1,700~~	~~yd3~~		DELETED
		~~to remove Powerhouse in dry.~~					
		~~Assumes 10 ft wide crest with 2:1 side slopes, approximately 250 ft long and up to 12 ft high.~~					
		~~*Embankment material taken from Iron Gate Dam Removal, approximately 10 mile haul distance.*~~					
		SUBTOTAL THIS SHEET					**$292,500.00**

QUANTITIES		PRICES	
BY Jonathan East	**CHECKED** Sheena Barnes	**BY** Craig A. Grush, P.E.	**CHECKED** 04-22-11
DATE PREPARED 11/18/10	**PEER REVIEW / DATE** Rick Benik P.E. 12/9/10	**DATE PREPARED** 04/22/11	**PEER REVIEW / DATE** 4/22/11

ESTIMATE WORKSHEET

FEATURE:

Klamath River Dams Removal
Partial Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable
Diversion and Care

PROJECT:

Klamath River
Northern California/Southern Oregon

WOID:	AF121	**ESTIMATE LEVEL:**	Feasibility
REGION:	MP	**UNIT PRICE LEVEL:**	July-2010

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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		MECHANICAL	86-68420				
		Furnish, Install and Remove the following					
		necessary for the removal of Copco #1 Dam.					
	9	3-6'x6' Fabricated Slide Gates with 120 ft. head					
		Total slide gate weight approximately: 12,500 lbs. ea.		40,500	lbs	$15.00	$607,500.00
		Includes operators, stems, guides, and remote controls.					
		Installation requires a dive depth of 115 ft.					
		DIVERSION AND CARE SUBTOTAL					**$1,310,000.00**

QUANTITIES		PRICES	
BY T. J. Turnage	**CHECKED** K. Converse	**BY** Craig A. Grush, P.E.	**CHECKED** 04-22-11
DATE PREPARED 11/18/10	**PEER REVIEW / DATE** Dan Drake 12/16/2010	**DATE PREPARED** 04/22/11	**PEER REVIEW / DATE** DCD 4/22/11

ESTIMATE WORKSHEET

FEATURE:

Klamath River Dams Removal
Partial Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable
Dam

PROJECT:

Klamath River
Northern California/Southern Oregon

WOID:	AF121	**ESTIMATE LEVEL:**	Feasibility
REGION:	MP	**UNIT PRICE LEVEL:**	July-2010

FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 1\[Klamath Dams Removal - COPCO 1 - Partial Removal Option - MP Feas Est - 4-2011.xlsx]Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
		Concrete and Structural Steel Items:					
	10	Remove Concrete Dam down to Elev. 2476	86-68130	36,000	yd3	$300.00	$10,800,000.00
		Elev. 2476 represents original streambed channel at downstream face of dam.					
		Concrete in foundation to remain. Spillway crest at Elev. 2593.5.					
		Includes concrete in dam, spillway crest, piers (390 cy), bridge					
		deck (72 cy) and left abutment. Concrete is reinforced.					
		Requires notching of concrete dam under head below approximately Elev. 2536					
		for an average water year. Approx. 17,000 cy of concrete in dam above El. 2536.					
		Assume ten notches, 12 ft deep, alternating sides with five on each side for					
		removal of final 60 feet of dam.					
		Each notch overlaps the previous alternating notch in 6 foot lifts.					
		Each notch is approximately 20 ft wide with an average 6 ft thickness to be					
		removed by blasting below reservoir surface.					
	~~11~~	~~Remove Concrete Intake Structure on Right~~	~~86-68130~~	~~21,000~~	~~yd3~~		DELETED
		~~Abutment~~					
		~~*Includes concrete in gate houses and headworks for units 1 and 2.*~~					
	12	Remove Structural Steel from Spillway	86-68130	55,000	lbs	$1.00	$55,000.00
		Includes rails, misc. steel					
		Does not include spillway gates					
		Assume contains paint with heavy metals.					
		By barge and crane					
	13	Install Diversion Tunnel Plugs	86-68130	24	yd3	$1,200.00	$28,800.00
		Plug ~~upstream (6 cy) and~~ downstream ends					
		Assume 2' thick ~~each~~					
	~~14~~	~~Remove Diversion Tunnel Control Structure~~	~~86-68130~~	~~350~~	~~yd3~~		DELETED
		~~Concrete~~					
		~~*Includes guide boxes*~~					
		~~*Assume reinforced*~~					
		SUBTOTAL THIS SHEET					**$10,883,800.00**

QUANTITIES		PRICES	
BY Jonathan East	**CHECKED** Sheena Barnes	**BY** Craig A. Grush, P.E.	**CHECKED** SN 04-22-11
DATE PREPARED 02/22/11	**PEER REVIEW / DATE** Rick Benik P.E. 2/22/11	**DATE PREPARED** 04/22/11	**PEER REVIEW / DATE** DCD 4/22/11

FEATURE:	PROJECT:
Klamath River Dams Removal Partial Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable Dam	Klamath River Northern California/Southern Oregon
	WOID: AF121 — ESTIMATE LEVEL: Feasibility
	REGION: MP — UNIT PRICE LEVEL: July-2010
	FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 1\[Klamath Dams Removal - COPCO 1 - Partial Removal Option - MP Feas Est - 4-2011.xlsx]Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		MECHANICAL					
		Remove and dispose of the following					
		equipment at Dam:					
	15	Hand Rails	86-68420	11,000	lb	$1.00	$11,000.00
		(Assume contains paint with heavy metals)					
		By barge and crane					
	16	Radial Gates	86-68420	140,500	lb	$1.00	$140,500.00
		13 radial gates, wall and sillplates and 3-hoists		Revised 8.26.10 TJT			
		(Assume contains paint with heavy metals & petroleum products)					
		By barge and crane					
	17	Radial Gate stoplogs	86-68420	18,000	lb	$1.00	$18,000.00
		8 stop logs and 13 sets of guides					
		(Assume contains paint with heavy metals & petroleum products)					
		By barge and crane					
	18	Stoplog hoist, track and supports	86-68420	26,000	lb	$1.00	$26,000.00
		(Assume contains paint with heavy metals & petroleum products)					
		By barge and crane					
		Remove and dispose of the following					
		equipment at the waste tunnel:					
	~~19~~	~~3 sections of 23' of 72"Ø steel lining (embedded)~~	~~86-68420~~	~~54,000~~	~~lb~~		DELETED
		~~(Assume contains paint with heavy metals)~~					
	~~20~~	~~3 - 72" butterfly valves (embedded)~~	~~86-68420~~	~~55,000~~	~~lb~~		DELETED
		~~(Assume contains paint with heavy metals & petroleum products)~~					
	21	3-72" flapper valves with remote mechanical	86-68420	78,000	lb	$3.00	$234,000.00
		control ~~(embedded)~~					
		(Assume contains paint with heavy metals)					
		Removal requires a dive depth of 115 ft.					
		SUBTOTAL THIS SHEET					**$429,500.00**

QUANTITIES		PRICES	
BY K. Converse 10/28/10	CHECKED T Turnage	BY Craig A. Grush, P.E.	CHECKED 04-22-11
DATE PREPARED November 18, 2010	PEER REVIEW / DATE Dan Drake 12/16/2010	DATE PREPARED 04/22/11	PEER REVIEW / DATE 4/22/11

ESTIMATE WORKSHEET

FEATURE:

Klamath River Dams Removal
Partial Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable
Dam

PROJECT:

Klamath River
Northern California/Southern Oregon

WOID:	AF121	**ESTIMATE LEVEL:**	Feasibility
REGION:	MP	**UNIT PRICE LEVEL:**	July-2010

FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 1\[Klamath Dams Removal - COPCO 1 - Partial Removal Option - MP Feas Est - 4-2011.xlsx]Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		ELECTRICAL					
		Remove and dispose of the following					
		equipment at Spillway:					
	22	Spillway gate motor & control panel	86-68430	1	EA	$1,000.00	$1,000.00
		Total weight approximately: 500 lbs.					
	23	Distribution equipment , panelboards	86-68430	1	EA	$6,000.00	$6,000.00
		Total weight approximately: 500 lbs.					
		DAM SUBTOTAL					**$11,320,300.00**

QUANTITIES		PRICES	
BY D. Berk	**CHECKED** T. Griess	**BY** Craig A. Grush, P.E.	**CHECKED** DW 04-22-11
DATE PREPARED 11/18/10	**PEER REVIEW / DATE** L. Rossi 12/9/10	**DATE PREPARED** 04/22/11	**PEER REVIEW / DATE** DCO 4/22/11

ESTIMATE WORKSHEET

FEATURE:

Klamath River Dams Removal
Partial Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable
Powerhouse, Switchyard, and Transmission Line

PROJECT:

Klamath River
Northern California/Southern Oregon

WOID:	AF121	ESTIMATE LEVEL:	Feasibility
REGION:	MP	UNIT PRICE LEVEL:	July-2010

FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 1\[Klamath Dams Removal - COPCO 1 - Partial Removal Option - MP Feas Est - 4-2011.xlsx]Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
		Concrete and Structural Steel Items:					
	~~24~~	~~Remove Powerhouse Concrete down to top of rock~~					
		~~under the PH, Elev. 2482.75 (USGS datum).~~	~~86-68130~~	~~3,100~~	~~yd3~~		DELETED
		~~Local datum is converted to USGS datum by~~					
		~~adding 2411 feet. (Elev. 71.75 + 2411 = Elev. 2482.75.)~~					
		~~All concrete is reinforced.~~					
		~~Includes all exterior & interior walls, columns, &~~					
		~~beams, and concrete in foundations for transformers~~					
	~~25~~	~~Remove Powerhouse Structural Steel~~	~~86-68130~~	~~110,000~~	~~lbs~~		DELETED
		~~Roof truss members, purlins, and crane rail~~					
		~~Assume contains paint with heavy metals.~~					
		SUBTOTAL THIS SHEET					

QUANTITIES		PRICES	
BY Jonathan East	CHECKED Sheena Barnes	BY Craig A. Grush, P.E.	CHECKED 04-22-11
DATE PREPARED 11/18/10	PEER REVIEW / DATE Rick Benik P.E. 12/9/10	DATE PREPARED 04/22/11	PEER REVIEW / DATE DCA 4/22/11

ESTIMATE WORKSHEET

FEATURE:

Klamath River Dams Removal
Partial Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable
Powerhouse, Switchyard, and Transmission Line

PROJECT:

Klamath River
Northern California/Southern Oregon

WOID:	AF121	ESTIMATE LEVEL:	Feasibility
REGION:	MP	UNIT PRICE LEVEL:	July-2010

FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 1\[Klamath Dams Removal - COPCO 1 - Partial Removal Option - MP Feas Est - 4-2011.xlsx]Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		MECHANICAL					
		Remove and dispose of the following					
		equipment at the Power House:					
	~~26~~	~~2 - Governor oil systems~~	~~86-68420~~	~~38,000~~	~~lb~~		DELETED
		~~governor, sump tanks, accumulator tank, piping~~					
		~~(Assume contains paint with heavy metals & petroleum products)~~					
	~~27~~	~~Cooling water and bearing oil systems~~	~~86-68420~~	~~11,000~~	~~lb~~		DELETED
		~~(Assume contains paint with heavy metals & petroleum products)~~					
		~~(encased in concrete)~~					
	~~28~~	~~4 - Horizontal Tandem Francis Turbines~~	~~86-68420~~	~~452,000~~	~~lb~~		DELETED
		~~(includes runner, scroll case, draft tube and shaft)~~					
		~~(Assume contains paint with heavy metals & petroleum products)~~					
	~~29~~	~~2 - 40 Ton indoor cranes~~	~~86-68420~~	~~140,000~~	~~lb~~		DELETED
		~~Includes crane and rail, not steel rail base~~					
		~~(Assume contains paint with heavy metals & petroleum products)~~					
	~~30~~	~~Compressed Air system~~	~~86-68420~~	~~1,000~~	~~lb~~		DELETED
		~~(Assume contains paint with heavy metals & petroleum products)~~					
	~~31~~	~~2 - CO2 systems~~	~~86-68420~~	~~3,100~~	~~lb~~		DELETED
		~~(Assume contains paint with heavy metals & petroleum products)~~					
	~~32~~	~~Plant Water and Fire Protection~~	~~86-68420~~	~~2,600~~	~~lb~~		DELETED
		~~(Assume contains paint with heavy metals)~~					
		SUBTOTAL THIS SHEET					

QUANTITIES		PRICES	
BY K. Converse	CHECKED T Turnage	BY Craig A. Grush, P.E.	CHECKED DA 04-22-11
DATE PREPARED 12/08/10	PEER REVIEW / DATE Dan Drake 12/16/2010	DATE PREPARED 04/22/11	PEER REVIEW / DATE DCD 4/22/11

ESTIMATE WORKSHEET

FEATURE:

Klamath River Dams Removal
Partial Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable
Powerhouse, Switchyard, and Transmission Line

PROJECT:

Klamath River
Northern California/Southern Oregon

WOID:	AF121	ESTIMATE LEVEL:	Feasibility
REGION:	MP	UNIT PRICE LEVEL:	July-2010

FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 1\[Klamath Dams Removal - COPCO 1 - Partial Removal Option - MP Feas Est - 4-2011.xlsx]Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		MECHANICAL					
	~~33~~	~~Transformer Oil Fire protection~~	~~86-68420~~	~~5,400~~	~~lb~~		DELETED
		~~(Assume contains paint with heavy metals & petroleum products)~~					
	~~34~~	~~Unwatering Piping~~	~~86-68420~~	~~27,000~~	~~lb~~		DELETED
		~~(Assume contains paint with heavy metals)~~					
	~~35~~	~~Drainage Piping~~	~~86-68420~~	~~5,000~~	~~lb~~		DELETED
		~~(Assume contains paint with heavy metals)~~					
	35A	Remove Petroleum Products from Mechanical					
		Equipment.	86-68420	1,250	gal	$10.00	$12,500.00
		Includes quantities for the following equipment:					
		From Item 28, Units 1 & 2, both east & west turbine bearings and generator bearings.					
		DTE heavy oil, 280 gal. per unit, 560 gal. total.					
		From Item 26, Units 1 & 2, governor oil sumps and accumulator tanks.					
		Hydraulic oil, 340 gal. per unit, 680 gal. total.					
		The remaining items contain petroleum products in amounts too small to be considered					
		for this level of estimate.					
		SUBTOTAL THIS SHEET					**$12,500.00**

QUANTITIES		PRICES	
BY K. Converse	CHECKED T Turnage	BY Craig A. Grush, P.E.	CHECKED 04-22-11
DATE PREPARED 12/08/10	PEER REVIEW / DATE Dan Drake 12/16/2010	DATE PREPARED 04/22/11	PEER REVIEW / DATE DCD 4/22/11

FEATURE:	PROJECT:
Klamath River Dams Removal Partial Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable Powerhouse, Switchyard, and Transmission Line	Klamath River Northern California/Southern Oregon
	WOID: AF121 — ESTIMATE LEVEL: Feasibility
	REGION: MP — UNIT PRICE LEVEL: July-2010
	FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 1\[Klamath Dams Removal - COPCO 1 - Partial Removal Option - MP Feas Est - 4-2011.xlsx]Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		ELECTRICAL					
		Remove and dispose of the following equipment in the Powerplant:					
	~~36~~	~~Horizontal AC Generator, Indoor Open Frame~~	~~86-68430~~	~~2~~	~~EA~~		DELETED
		~~Unit 1 & 2 ea: 12.5 MVA (10 MW); 0.8PF, 2,300V,~~					
		~~200 RPM, 3 Ph, including rotating exciter~~					
		~~Total weight each approximately: 123,500 lbs.~~					
		~~Stator: 32,250 lbs., Rotor: 55,000 lbs.~~					
		~~Base: 17,000 lbs., Exciter Assembly: 7,550 lbs.~~					
		~~Heaviest lift: 55,000 lbs.~~					
	~~37~~	~~Excitation equipment for 12.5 MVA Generator~~	~~86-68430~~	~~2~~	~~EA~~		DELETED
		~~(2 sections)Total weight approximately: 1,000 lbs.~~					
	~~38~~	~~Surge protection equip. for 12.5 MVA Generator~~	~~86-68430~~	~~2~~	~~EA~~		DELETED
		~~Total weight approximately: 800 lbs.~~					
	~~39~~	~~Neutral grounding equip. for 12.5 MVA Generator~~	~~86-68430~~	~~2~~	~~EA~~		DELETED
		~~includes transformer~~					
		~~Total weight approximately: 500 lbs.~~					
	~~40~~	~~Generator Switchgear, 5kV-includes unit breakers~~	~~86-68430~~	~~1~~	~~EA~~		DELETED
		~~(6 Sections @ 400 lbs each section)~~					
		~~3 ft x 3 ft x 90 inches high~~					
		~~Total weight approximately: 2,400 lbs.~~					
	~~41~~	~~Station Service Switchgear, 600 volt -(5 sections)~~	~~86-68430~~	~~1~~	~~EA~~		DELETED
		~~(400 lbs each section), 3 ft x 3ft x 90 inches high~~					
		~~Total weight approximately: 2,000 lbs.~~					
		SUBTOTAL THIS SHEET					

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY Craig A. Grush, P.E.	CHECKED 04-22-11
DATE PREPARED 12/08/10	PEER REVIEW / DATE L. Rossi 12/9/10	DATE PREPARED 04/22/11	PEER REVIEW / DATE DCD 4/22/11

ESTIMATE WORKSHEET

FEATURE:

Klamath River Dams Removal
Partial Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable
Powerhouse, Switchyard, and Transmission Line

PROJECT:

Klamath River
Northern California/Southern Oregon

WOID:	AF121	ESTIMATE LEVEL:	Feasibility
REGION:	MP	UNIT PRICE LEVEL:	July-2010

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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		ELECTRICAL					
		Remove and dispose of the following equipment in the Powerplant:					
	42	~~Unit and plant control switchboard~~ ~~5 cubicles (200 lbs each), 2ft x 2ft x 90 in. high~~ ~~Total weight approximately: 1,000 lbs.~~	~~86-68430~~	~~1~~	~~EA~~		DELETED
	43	Battery system - assume 60 batteries, charger, racks and supports. Total weight approximately: 2,500 lbs.	86-68430	1	EA	$10,000.00	$10,000.00
	44	~~Raceways, Conduit and Cable~~ ~~(approx. 3000 lin. Ft. power & control cable, 1000 lin. Ft. conduit, 200 lin. Ft. cabletray)~~ ~~Total weight approximately: 8,000 lbs.~~	~~86-68430~~	~~1~~	~~EA~~		DELETED
	45	~~Misc. power & control boards~~ ~~10 boards (50 lbs each) 3ft x 2 ft x 9 in~~ ~~Total weight approximately: 500 lbs.~~	~~86-68430~~	~~1~~	~~EA~~		DELETED
	46	~~Step-up Transformers, indoor, oil-filled, 1-phase, 5,000 kVA, 2,300/72,000 volt~~ ~~Total weight approximately each: 31,500 lbs.~~	~~86-68430~~	~~3~~	~~EA~~		DELETED
	47	~~Step-up Transformers, indoor, oil-filled, 1-phase, 4,165 kVA, 2,300/72,000 volt~~ ~~Total weight approximately each: 31,500 lbs.~~	~~86-68430~~	~~3~~	~~EA~~		DELETED
	48	~~Seven 40-Ton Travelling Crane motors - hoist (2-30Hp*), hoist trolley (7.5Hp*), gantry (4-15Hp*) (Hp* Approx.) Total weight approximately: 600 lbs.~~	~~86-68430~~	~~1~~	~~EA~~		DELETED
		SUBTOTAL THIS SHEET					**$10,000.00**

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY Craig A. Grush, P.E.	CHECKED DK 04-22-11
DATE PREPARED 12/08/10	PEER REVIEW / DATE L. Rossi 12/9/10	DATE PREPARED 04/22/11	PEER REVIEW / DATE DCD 4/22/11

ESTIMATE WORKSHEET

FEATURE:	PROJECT:			
Klamath River Dams Removal Partial Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable Powerhouse, Switchyard, and Transmission Line	Klamath River Northern California/Southern Oregon			
	WOID:	AF121	ESTIMATE LEVEL:	Feasibility
	REGION:	MP	UNIT PRICE LEVEL:	July-2010
	FILE:	C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 1\[Klamath Dams Removal - COPCO 1 - Partial Removal Option - MP Feas Est - 4-2011.xlsx]Summary		

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		ELECTRICAL					
		Remove and dispose of the following equipment in the Powerplant:					
	~~49~~	~~40-Ton Travelling Crane control equipment (5 cubicles), Total weight approximately: 500 lbs.~~	~~86-68430~~	~~1~~	~~EA~~		DELETED
	~~50~~	~~40-Ton Travelling Crane Festoon Cable (approx. 200 lin. Ft. cable) Total weight approximately: 800 lbs.~~	~~86-68430~~	~~1~~	~~EA~~		DELETED
	~~51~~	~~Four 15-Ton Overhead Crane motors - hoist (10Hp*), hoist trolley (5Hp*), gantry (2-5Hp*) (Hp* Approx.) Total weight approximately: 350 lbs.~~	~~86-68430~~	~~1~~	~~EA~~		DELETED
	~~52~~	~~15-Ton Overhead Crane control equipment (1 cubicle), Total weight approximately: 100 lbs.~~	~~86-68430~~	~~1~~	~~EA~~		DELETED
	~~53~~	~~15-Ton Overhead Crane Festoon Cable (approx. 100 lin. Ft. cable) Total weight approximately: 250 lbs.~~	~~86-68430~~	~~1~~	~~EA~~		DELETED
	53A	Remove Oil from Oil-filled Step-up Transformers.	86-68430	10,500	gal	$10.00	$105,000.00
		From Item 46, four transformers (includes one spare) @ 1,500 gallons each.					
		From Item 47, four transformers (includes one spare) @ 1,175 gallons each.					
		SUBTOTAL THIS SHEET					**$105,000.00**

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY Craig A. Grush, P.E.	CHECKED 04-22-11
DATE PREPARED 12/08/10	PEER REVIEW / DATE L. Rossi 12/9/10	DATE PREPARED 04/22/11	PEER REVIEW / DATE DCD 4/22/11

ESTIMATE WORKSHEET

FEATURE:

Klamath River Dams Removal
Partial Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable
Powerhouse, Switchyard, and Transmission Line

PROJECT:
Klamath River
Northern California/Southern Oregon

WOID:	**AF121**	**ESTIMATE LEVEL:**	**Feasibility**
REGION:	**MP**	**UNIT PRICE LEVEL:**	**July-2010**

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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		ELECTRICAL					
		Remove and dispose of the following					
		equipment in the Switchyard:					
		All equipment is on wood-pole structures					
	54	69-kV circuit breakers, oil-filled, PCB	86-68430	2	EA	$3,000.00	$6,000.00
	55	69-kV disconnect switches, group-operated	86-68430	2	EA	$1,500.00	$3,000.00
	56	60-foot wood poles	86-68430	12	EA	$1,000.00	$12,000.00
	57	30-foot wood crossarms	86-68430	24	EA	$500.00	$12,000.00
	58	69-kV insulator strings	86-68430	12	EA	$400.00	$4,800.00
		Remove and dispose of the following					
		wood-pole transmission lines:					
	59	Transmission Line No. 3	86-68430	1.66	mile	$30,000.00	$49,800.00
		From Copco No. 1 switchyard to Fall Creek					
		266.8 ACSR, 69-kV					
	60	Transmission Line No. 15	86-68430	1.23	mile	$30,000.00	$36,900.00
		From Copco No. 1 switchyard to Copco No. 2					
		266.8 ACSR, 69-kV					
	61	Transmission Line No. 26-1	86-68430	0.07	mile	$30,000.00	$2,100.00
		From Copco No. 1 powerhouse to					
		Copco No. 1 switchyard					
		2/0 copper, 69-kV					
	62	Transmission Line No. 26-2	86-68430	0.07	mile	$30,000.00	$2,100.00
		From Copco No. 1 powerhouse to					
		Copco No. 1 switchyard					
		2/0 copper, 69-kV					
		POWERHOUSE, SWITCHYARD, & TRANS LINE SUBTOTAL					**$256,200.00**

QUANTITIES		PRICES	
BY D. Berk	**CHECKED** T. Griess	**BY** Craig A. Grush, P.E.	**CHECKED** 04-22-11
DATE PREPARED 12/08/10	**PEER REVIEW / DATE** L. Rossi 12/9/10	**DATE PREPARED** 04/22/11	**PEER REVIEW / DATE** 4/22/11

ESTIMATE WORKSHEET

FEATURE:

Klamath River Dams Removal
Partial Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable
Penstock

PROJECT:

Klamath River
Northern California/Southern Oregon

WOID:	AF121	**ESTIMATE LEVEL:**	Feasibility
REGION:	MP	**UNIT PRICE LEVEL:**	July-2010

FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 1\[Klamath Dams Removal - COPCO 1 - Partial Removal Option - MP Feas Est - 4-2011.xlsx]Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
		Concrete and Structural Steel Items:					
	~~63~~	~~Remove gate house #1 from top of dam~~	~~86-68130~~	~~570~~	~~ft2~~		DELETED
	~~64~~	~~Remove gate house #2 from top of dam~~	~~86-68130~~	~~690~~	~~ft2~~		DELETED
	~~65~~	~~Remove Concrete Items associated with 10-foot diameter Penstocks, concrete is reinforced~~	~~86-68130~~	~~1,050~~	~~yd3~~		DELETED
	~~66~~	~~Plug 14-foot diameter penstock with concrete~~	~~86-68130~~	~~23~~	~~yd3~~		DELETED
		~~Plug upstream and downstream ends~~					
		~~*Assume 2' thick each*~~					
		SUBTOTAL THIS SHEET					

QUANTITIES		PRICES	
BY Jonathan East	**CHECKED** Sheena Barnes	**BY** Craig A. Grush, P.E.	**CHECKED** 04-22-11
DATE PREPARED 12/08/10	**PEER REVIEW / DATE** Rick Benik P.E. 12/9/10	**DATE PREPARED** 04/22/11	**PEER REVIEW / DATE** DCD 4/22/11

ESTIMATE WORKSHEET

FEATURE:

Klamath River Dams Removal
Partial Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable
Penstock

PROJECT:

Klamath River
Northern California/Southern Oregon

WOID:	AF121	ESTIMATE LEVEL:	Feasibility
REGION:	MP	UNIT PRICE LEVEL:	July-2010

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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		MECHANICAL					
		Remove and dispose of the following					
		equipment at the intake:					
	~~67~~	~~8 screens~~	~~86-68420~~	~~18,000~~	~~lb~~		DELETED
		~~(Assume contains paint with heavy metals)~~					
	~~68~~	~~8 Water Gates~~	~~86-68420~~	~~18,000~~	~~lb~~		DELETED
		~~(Assume contains paint with heavy metals)~~					
	~~69~~	~~3 - 30"Ø x 25' stand pipes~~	~~86-68420~~	~~6,000~~	~~lb~~		DELETED
		~~(Assume contains paint with heavy metals)~~					
	~~70~~	~~14' Ø penstock pipe~~	~~86-68420~~	~~256,000~~	~~lb~~		DELETED
		~~(includes encased and open air intake up to underground portion-Revised 9/14/2010)~~					
		~~(Assume contains paint with heavy metals)~~					
	~~71~~	~~10' Ø penstock pipe~~	~~86-68420~~	~~270,000~~	~~lb~~		DELETED
		~~(includes intake and main conduit)~~					
		~~(Assume contains paint with heavy metals)~~					
		PENSTOCK SUBTOTAL					

QUANTITIES		PRICES	
BY K. Converse	CHECKED T Turnage	BY Craig A. Grush, P.E.	CHECKED 04-22-11
DATE PREPARED 11/19/10	PEER REVIEW / DATE Dan Drake 12/16/2010	DATE PREPARED 04/22/11	PEER REVIEW / DATE DED 4/22/11

BUREAU OF RECLAMATION

ESTIMATE WORKSHEET

FEATURE:

Klamath River Dams Removal
Partial Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable
Reservoir Vegetative Restoration

PROJECT:

Klamath River
Northern California/Southern Oregon

WOID:	AF121	**ESTIMATE LEVEL:**	Appraisal
REGION:	MP	**UNIT PRICE LEVEL:**	July-2010

FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 1\[Klamath Dams Removal - COPCO 1 - Partial Removal Option - MP Feas Est - 4-2011.xlsx]Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
	72	Temporary Access Roads	86-68140	7.0	Miles	$50,000.00	$350,000.00
		Blade primitive road as necessary in dry reservoir sediment for one time use by hydroseeding equipment. Existing topography is relatively flat with no significant excavation nor embankment anticipated.					
		SUBTOTAL THIS SHEET					**$350,000.00**

QUANTITIES		PRICES	
BY Mark Leavitt	**CHECKED** Gemperline, Joseph M	**BY** Craig A. Grush, P.E.	**CHECKED** 04-22-11
DATE PREPARED 11/18/10	**PEER REVIEW / DATE** Dave Edwards 12/14/10	**DATE PREPARED** 04/22/11	**PEER REVIEW / DATE** 4/22/11

ESTIMATE WORKSHEET

FEATURE:

Klamath River Dams Removal
Partial Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable
Reservoir Vegetative Restoration

PROJECT:

Klamath River
Northern California/Southern Oregon

WOID:	AF121	**ESTIMATE LEVEL:**	Feasibility
REGION:	MP	**UNIT PRICE LEVEL:**	July-2010

FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 1\[Klamath Dams Removal - COPCO 1 - Partial Removal Option - MP Feas Est - 4-2011.xlsx]Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		WATER AND ENVIRONMENTAL					
	73	SPRING GROUND SEEDING: 420 acres	86-68220	420	Acres	$3,500.00	$1,470,000.00
		Idaho fescue (Festuca idahoensis)	1680	lbs PLS			
		Blue wildrye (Elymus glaucus)	1680	lbs PLS			
		Small fescue (Vulpia microstachys)	1680	lbs PLS			
		Bluebunch wheatgrass (Pseudoroegneria spicata)	2520	lbs PLS			
		Sandberg bluegrass (Poa secunda)	210	lbs PLS			
		Spike bentgrass (Agrostis exarata)	105	lbs PLS			
		Western needlegrass (Achnatherum occidentale)	1680	lbs PLS			
		California brome (Bromus carinatus)	3360	lbs PLS			
		Squirreltail (Elymus elymoides)	1680	lbs PLS			
		Wood mulch	840000	lbs			
		Tackifier	50400	lbs			
	74	SPRING BARGE SEEDING: 82 acres	86-68220	82	Acres	$6,500.00	$533,000.00
		Idaho fescue (Festuca idahoensis)	328	lbs PLS			
		Blue wildrye (Elymus glaucus)	328	lbs PLS			
		Small fescue (Vulpia microstachys)	328	lbs PLS			
		Bluebunch wheatgrass (Pseudoroegneria spicata)	492	lbs PLS			
		Sandberg bluegrass (Poa secunda)	41	lbs PLS			
		Spike bentgrass (Agrostis exarata)	21	lbs PLS			
		Western needlegrass (Achnatherum occidentale)	328	lbs PLS			
		California brome (Bromus carinatus)	656	lbs PLS			
		Squirreltail (Elymus elymoides)	328	lbs PLS			
		Wood mulch	164000	lbs			
		Tackifier	9840	lbs			
		SUBTOTAL THIS SHEET					**$2,003,000.00**

QUANTITIES		PRICES	
BY O'Meara, Scott A	**CHECKED** Greimann, Blair P 2/28/11	**BY** Craig A. Grush, P.E.	**CHECKED** 04-22-11
DATE PREPARED 02/03/11	**PEER REVIEW / DATE**	**DATE PREPARED** 04/22/11	**PEER REVIEW / DATE** 4/22/11

ESTIMATE WORKSHEET

FEATURE:

Klamath River Dams Removal
Partial Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable
Reservoir Vegetative Restoration

PROJECT:

Klamath River
Northern California/Southern Oregon

WOID:	AF121	**ESTIMATE LEVEL:**	Feasibility
REGION:	MP	**UNIT PRICE LEVEL:**	July-2010

FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 1\[Klamath Dams Removal - COPCO 1 - Partial Removal Option - MP Feas Est - 4-2011.xlsx]Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		WATER AND ENVIRONMENTAL					
	75	SPRING AERIAL SEEDING: 300 acres	86-68220	300	Acres	$7,500.00	$2,250,000.00
		Idaho fescue (Festuca idahoensis)	1200	lbs PLS			
		Blue wildrye (Elymus glaucus)	1200	lbs PLS			
		Small fescue (Vulpia microstachys)	1200	lbs PLS			
		Bluebunch wheatgrass (Pseudoroegneria spicata)	1800	lbs PLS			
		Sandberg bluegrass (Poa secunda)	150	lbs PLS			
		Spike bentgrass (Agrostis exarata)	75	lbs PLS			
		Western needlegrass (Achnatherum occidentale)	1200	lbs PLS			
		California brome (Bromus carinatus)	2400	lbs PLS			
		Squirreltail (Elymus elymoides)	1200	lbs PLS			
		Wood mulch	600000	lbs			
		Tackifier	36000	lbs			
	76	FALL GROUND SEEDING: 401 acres	86-68220	401	Acres	$3,500.00	$1,403,500.00
		Idaho fescue (Festuca idahoensis)	1604	lbs PLS			
		Blue wildrye (Elymus glaucus)	1604	lbs PLS			
		Small fescue (Vulpia microstachys)	1604	lbs PLS			
		Bluebunch wheatgrass (Pseudoroegneria spicata)	2406	lbs PLS			
		Sandberg bluegrass (Poa secunda)	201	lbs PLS			
		Spike bentgrass (Agrostis exarata)	100	lbs PLS			
		Western needlegrass (Achnatherum occidentale)	1604	lbs PLS			
		California brome (Bromus carinatus)	3208	lbs PLS			
		Squirreltail (Elymus elymoides)	1604	lbs PLS			
		Wood mulch	123385	lbs			
		Tackifier	7403	lbs			
		SUBTOTAL THIS SHEET					**$3,653,500.00**

QUANTITIES		PRICES	
BY O'Meara, Scott A	**CHECKED** Greimann, Blair P 2/28/11	**BY** Craig A. Grush, P.E.	**CHECKED** DW 04-22-11
DATE PREPARED 02/03/11	**PEER REVIEW / DATE**	**DATE PREPARED** 04/22/11	**PEER REVIEW / DATE** DCO 4/22/11

ESTIMATE WORKSHEET

FEATURE:

Klamath River Dams Removal
Partial Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable
Reservoir Vegetative Restoration

PROJECT:

Klamath River
Northern California/Southern Oregon

WOID:	AF121	**ESTIMATE LEVEL:**	Feasibility
REGION:	MP	**UNIT PRICE LEVEL:**	July-2010

FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 1\[Klamath Dams Removal - COPCO 1 - Partial Removal Option - MP Feas Est - 4-2011.xlsx]Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		WATER AND ENVIRONMENTAL					
	77	RIPARIAN POLE PLANTING: 170 acres	86-68220	170	Acres	$8,500.00	$1,445,000.00
		Narrowleaf willow (Salix exigua)	71400	cutting			
		Arroyo willow (Salix lasiolepis)	11900	cutting			
		Shining willow (Salix lucida)	11900	cutting			
		Three-leaf sumac (Rhus trilobata)	11900	cutting			
		Western serviceberry (Amelanchier alnifolia)	5950	cutting			
		Chokecherry (Prunus virginiana)	5950	transplant			
		Herbivore screen	119000	each			
		Chemical herbivore deterent	2380	gal			
		Polymer	375	lbs			
	78	WEED MANAGEMENT: 401 acres	86-68220	401	Acres	$1,500.00	$601,500.00
		Herbicide, post-emergent	802	lbs AI			
		MAINTENANCE TREATMENTS ON 10% OF THE RESTORATION AREAS PER YEAR OVER 4 YEARS, POST-RESTORATION					
	79	FALL GROUND SEEDING: 321 acres	86-68220	321	Acres	$3,500.00	$1,123,500.00
		Idaho fescue (Festuca idahoensis)	1283	lbs PLS			
		Blue wildrye (Elymus glaucus)	1283	lbs PLS			
		Small fescue (Vulpia microstachys)	1283	lbs PLS			
		Bluebunch wheatgrass (Pseudoroegneria spicata)	1925	lbs PLS			
		Sandberg bluegrass (Poa secunda)	160	lbs PLS			
		Spike bentgrass (Agrostis exarata)	80	lbs PLS			
		Western needlegrass (Achnatherum occidentale)	1283	lbs PLS			
		California brome (Bromus carinatus)	2566	lbs PLS			
		Squirreltail (Elymus elymoides)	1283	lbs PLS			
		Wood mulch	641600	lbs			
		Tackifier	38496	lbs			
	80	WEED MANAGEMENT: 321 acres	86-68220	321	Acres	$1,500.00	$481,500.00
		Herbicide, post-emergent	30	lbs AI			
	RESERVOIR VEGETATIVE RESTORATION SUBTOTAL						**$9,658,000.00**

QUANTITIES		PRICES	
BY O'Meara, Scott A	**CHECKED** Greimann, Blair P	**BY** Craig A. Grush, P.E.	**CHECKED** 04-22-11
DATE PREPARED 04/12/11	**PEER REVIEW / DATE** Greimann, Blair P 4/12/11	**DATE PREPARED** 04/22/11	**PEER REVIEW / DATE** 4/22/11

ESTIMATE WORKSHEET

FEATURE:

Klamath River Dams Removal
Partial Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable
Road Improvements

PROJECT:

Klamath River
Northern California/Southern Oregon

WOID:	AF121	**ESTIMATE LEVEL:**	Feasibility
REGION:	MP	**UNIT PRICE LEVEL:**	July-2010

FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 1\[Klamath Dams Removal - COPCO 1 - Partial Removal Option - MP Feas Est - 4-2011.xlsx]Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		GEOTECHNICAL					
		These quantities represent the work required					
		to prepare a disposal site and improve the					
		haul road to the disposal site for Copco 1					
		and Copco 2. In addition it provides the					
		length of county road required to be					
		repaired after construction.					
		General Sitework Copco 1 And Copco 2					
	81	Clear and Grub Disposal Area	86-68313	5.5	acre	$6,000.00	$33,000.00
		Estimated haul distance 1 mile.					
		Disposed concrete estimated to be 10' deep					
		and traffic compacted (50% bulking factor).					
		For Copco 1 and Copco 2					
	82	Soil Cover for Disposal Area	86-68313	18,000	yd3	$50.00	$900,000.00
		Access/Haul Road Improvements					
		maximum 12% grades					
		4 reaches required improvement					
	83	Soil Excavation	86-68313	4,500	yd3	$13.00	$58,500.00
	84	Rock Excavation	86-68313	4,500	yd3	$40.00	$180,000.00
	85	Soil Backfill	86-68313	16,000	yd3	$50.00	$800,000.00
	86	4" Gravel Surfacing	86-68313	320	ton	$100.00	$32,000.00
		50% contingency for excavation					
		100% contingency for backfill					
		County Road Improvements					
	87	Asphalt Overlay Repair - Juniper Road	86-68313	3	mi	$40,000.00	$120,000.00
	88	Asphalt Overlay Repair - Copco Road	86-68313	19	mi	$40,000.00	$760,000.00
		Assume the 2 lane county road from I-5 to					
		the Copco Dams will be overlayed after					
		construction with chip seal.					
		ROAD IMPROVEMENTS SUBTOTAL					**$2,883,500.00**

QUANTITIES		PRICES	
BY Randy Kuzniakowski	**CHECKED** Tuti Tierney	**BY** Craig A. Grush, P.E.	**CHECKED** DW 04-22-11
DATE PREPARED 11/29/10	**PEER REVIEW / DATE** Daniel W. Osmun 12/9/10	**DATE PREPARED** 04/22/11	**PEER REVIEW / DATE** DCN 4/22/11

ESTIMATE WORKSHEET

FEATURE:

Klamath River Dams Removal
Partial Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable
Recreational Facilities to be Removed

PROJECT:
Klamath River
Northern California/Southern Oregon

WOID:	AF121	**ESTIMATE LEVEL:**	Feasibility
REGION:	MP	**UNIT PRICE LEVEL:**	July-2010

FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 1\[Klamath Dams Removal - COPCO 1 - Partial Removal Option - MP Feas Est - 4-2011.xlsx]Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		Mallard Cove					
	89	Concrete total	BLM	106	CY	$300.00	$31,800.00
		Boat ramp: 100'x25'x1' (93 CY)					
		Dock abutment: 6'x8'x3' (6 CY)					
		8 Concrete wheel stops (0.5 CY)					
		4 Campfire ring foundations (1 CY)					
		6 Concrete sign bases (3 CY)					
		3 Concrete fire rings (2 CY)					
	90	25'x5' Dock made of composite decking and	BLM	1	EA	$2,500.00	$2,500.00
		poly floats					
	91	20'x5' Gangway w/ aluminum frame and railings	BLM	1	EA	$2,000.00	$2,000.00
	92	Signs to be removed and hauled away	BLM	6	EA	$300.00	$1,800.00
	93	Wood plank tables to be removed and hauled	BLM	8	EA	$100.00	$800.00
		away					
	94	Parking area to be regraded, ripped, seeded and	BLM	2.5	ACRE	$25,000.00	$62,500.00
		planted this area is made of fill about 6 ft deep					
		Copco Cove					
	95	Concrete total	BLM	84	CY	$300.00	$25,200.00
		Boat ramp: 80'x25'x1' (74 CY)					
		Dock abutment: 14'x5'x3' (8 CY)					
		6 Concrete sign bases (2 CY)					
	96	Dock abutment railing made of 2.5" dia. steel pipe	BLM	25	LF	$40.00	$1,000.00
	97	Signs to be removed and hauled away	BLM	6	EA	$300.00	$1,800.00
	98	Wood plank tables to be removed and hauled	BLM	2	EA	$100.00	$200.00
		away					
	99	Regrade, rip, seed and plant disturbed areas	BLM	2.3	ACRE	$25,000.00	$57,500.00
		RECREATIONAL FACILITIES REMOVAL SUBTOTAL					**$187,100.00**

QUANTITIES		PRICES	
BY Renee Snyder (BLM)	**CHECKED** Sheena Barnes	**BY** Craig A. Grush, P.E.	**CHECKED** 04-22-11
DATE PREPARED 11/19/10	**PEER REVIEW / DATE** Rick Benik P.E. 12/9/10	**DATE PREPARED** 04/22/11	**PEER REVIEW / DATE** 4/22/11

BUREAU OF RECLAMATION

ESTIMATE WORKSHEET

FEATURE:

Klamath River Dams Removal
Partial Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable
SUMMARY

PROJECT:
Klamath River
Northern California/Southern Oregon

WOID:	AF484	**ESTIMATE LEVEL:**	Feasibility
REGION:	MP	**UNIT PRICE LEVEL:**	July-2010

FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 1\[Klamath Dams Removal - COPCO 1 - Partial Removal Option - MP Feas Est - 4-2011.xlsx]Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		Sediment Removal (assumes by natural erosion)		1,453,800	CY	$0.00	$0.00
		Diversion and Care					$1,310,000.00
		Dam Removal					$11,320,300.00
		Powerhouse/Switchyard/Transmission Line Removal					$256,200.00
		Penstock Removal					$0.00
		Reservoir Vegetative Restoration					$9,658,000.00
		Road Improvements					$2,883,500.00
		Recreational Facilities to be Removed					$187,100.00
		Subtotal					**$25,615,100.00**
		Mobilization	5%	+/-			$1,300,000.00
		Subtotal 1 with Mobilization					**$26,915,100.00**
		Escalation to Notice to Proceed (NTP), from July 2010 to July 2020					$9,256,544.00
		(assumes 3%/yr compounding over 10 years)					
		Subtotal 2 = Subtotal 1 with Mobilization + Escalation to NTP					$36,171,644.00
		Design Contingencies	10%	+/-			$3,828,356.00
		Allowance for Procurement Strategies (APS)	0%	+/-			
		Type of solicitation assumed is: Competitive RFP					
		CONTRACT COST					**$40,000,000.00**
		Construction Contingencies	20%	+/-			$8,000,000.00
		FIELD COST					**$48,000,000.00**
		Non-Contract Costs:	65%	+/-			$31,000,000.00
		(Environmental & Cultural Resources					
		Mitigation ~ 45%, Design Data Collection ~ 1%,					
		Engineering Design ~ 4%, Permitting ~ 3%,					
		Procurement ~ 1%, Construction Management					
		~ 10%, and Closeout ~ 1%)					
		CONSTRUCTION COST					**$79,000,000.00**
		Ref.: For appropriate use and terminology, see Reclamation Manual, Directives and Standards FAC; 09-01, 09-02 and 09-03.					

QUANTITIES		PRICES	
BY Refer to Previous Sheets	**CHECKED** Refer to Previous Sheets	**BY** Craig A. Grush, P.E.	**CHECKED** 04-22-11
DATE PREPARED	**PEER REVIEW / DATE** Refer to Previous Sheets	**DATE PREPARED** 04/22/11	**PEER REVIEW / DATE** DCD 4/22/11

BUREAU OF RECLAMATION

ESTIMATE WORKSHEET

FEATURE:	PROJECT:
Klamath River Dams Removal Partial Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable High Diversion and Care	Klamath River Northern California/Southern Oregon
	WOID: AF652 — ESTIMATE LEVEL: Feasibility
	REGION: MP — UNIT PRICE LEVEL: July-2010
	FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 1\[Klamath Dams Removal - COPCO 1 - Partial Removal Option - MPH Feas Est - 4-2011.xlsx]Diversion & Care

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
	1	Furnish, Install, and Remove Barge-Mounted	86-68130	1	ls		$370,000.00
		Crane in Reservoir for Dam Removal.					
		Barge taken from Iron Gate Reservoir.					
		Barge is used to modify diversion tunnel intake structure.					
		Barge is also used to remove spillway gates, piers, bridge and concrete in spillway crest.					
		Barge is located on reservoir for approximately 5 months.					
	2	Remove Sediment from Diversion Tunnel Intake	86-68130	30	cy	$3,000.00	$90,000.00
		to provide access.					
		Requires removing sediment 115 feet deep using clamshell or suction dredge.					
	3	Furnish, Install, and Remove Large Crane on	86-68130	1	ls	Included in the mobilization item	
		Right Abutment.					
		Crane used to deliver equipment and materials and to remove waste materials as required.					
		Crane in place for 4 months.					
	~~4~~	~~Remove Water from behind Tailrace Cofferdam.~~	~~86-68130~~	~~200,000~~	~~gals~~		DELETED
		~~Unwatering of tailrace for removal of the powerhouse in the dry.~~					
		~~Assume 3 inch portable trash pump operating for 1 day.~~					
	~~5~~	~~Riprap Protection on Cofferdam.~~	~~86-68130~~	~~260~~	~~cy~~		DELETED
		~~Riprap protects cofferdam from diversion tunnel releases.~~					
	~~6~~	~~Provide Dewatering behind Tailrace Cofferdam~~	~~86-68130~~	~~1~~	~~ls~~		DELETED
		~~for removal of Powerhouse in the dry.~~					
		~~Assume 3 inch portable trash pump operating for approximately 3 months.~~					
		SUBTOTAL THIS SHEET					**$460,000.00**

QUANTITIES		PRICES	
BY Rick Benik	CHECKED Jonathan East	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 11/18/10	PEER REVIEW / DATE Tom Hepler P.E. 12/9/10	DATE PREPARED 06/01/11	PEER REVIEW / DATE 6/3/11

ESTIMATE WORKSHEET

FEATURE:	PROJECT:
Klamath River Dams Removal Partial Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable High Diversion and Care	Klamath River Northern California/Southern Oregon
	WOID: AF652 — ESTIMATE LEVEL: Feasibility
	REGION: MP — UNIT PRICE LEVEL: July-2010
	FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 1\[Klamath Dams Removal - COPCO 1 - Partial Removal Option - MPH Feas Est - 4-2011.xlsx]Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
	7	Remove Current Diversion Tunnel Plug	86-68130	195	yd3	$1,800.00	$351,000.00
		Plug located in the middle of the tunnel					
		Reinforced concrete					
		Tunnel work					
	~~8~~	~~Construct Embankment Cofferdam in Tailrace~~	~~86-68130~~	~~1,700~~	~~yd3~~		DELETED
		~~to remove Powerhouse in dry.~~					
		~~Assumes 10 ft wide crest with 2:1 side slopes, approximately 250 ft long and up to 12 ft high.~~					
		~~*Embankment material taken from Iron Gate Dam Removal, approximately 10 mile haul distance.*~~					
		SUBTOTAL THIS SHEET					**$351,000.00**

QUANTITIES		PRICES	
BY Jonathan East	CHECKED Sheena Barnes	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 11/18/10	PEER REVIEW / DATE Rick Benik P.E. 12/9/10	DATE PREPARED 06/01/11	PEER REVIEW / DATE 6/3/11

ESTIMATE WORKSHEET

FEATURE:	PROJECT:
Klamath River Dams Removal Partial Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable High Diversion and Care	Klamath River Northern California/Southern Oregon
	WOID: AF652 — ESTIMATE LEVEL: Feasibility
	REGION: MP — UNIT PRICE LEVEL: July-2010
	FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 1\[Klamath Dams Removal - COPCO 1 - Partial Removal Option - MPH Feas Est - 4-2011.xlsx]Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		MECHANICAL	86-68420				
		Furnish, Install and Remove the following					
		necessary for the removal of Copco #1 Dam.					
	9	3-6'x6' Fabricated Slide Gates with 120 ft. head					
		Total slide gate weight approximately: 12,500 lbs. ea.		40,500	lbs	$18.00	$729,000.00
		Includes operators, stems, guides, and remote controls.					
		Installation requires a dive depth of 115 ft.					
		DIVERSION AND CARE SUBTOTAL					**$1,540,000.00**

QUANTITIES		PRICES	
BY T. J. Turnage	CHECKED K. Converse	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 11/18/10	PEER REVIEW / DATE Dan Drake 12/16/2010	DATE PREPARED 06/01/11	PEER REVIEW / DATE DCD 6/3/11

ESTIMATE WORKSHEET

FEATURE:	PROJECT:
Klamath River Dams Removal Partial Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable High Dam	Klamath River Northern California/Southern Oregon
	WOID: AF652 — ESTIMATE LEVEL: Feasibility
	REGION: MP — UNIT PRICE LEVEL: July-2010
	FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 1\[Klamath Dams Removal - COPCO 1 - Partial Removal Option - MPH Feas Est - 4-2011.xlsx]Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
		Concrete and Structural Steel Items:					
	10	Remove Concrete Dam down to Elev. 2476	86-68130	36,000	yd3	$320.00	$11,520,000.00
		Elev. 2476 represents original streambed channel at downstream face of dam.					
		Concrete in foundation to remain. Spillway crest at Elev. 2593.5.					
		Includes concrete in dam, spillway crest, piers (390 cy), bridge					
		deck (72 cy) and left abutment. Concrete is reinforced.					
		Requires notching of concrete dam under head below spillway crest					
		for a wet water year.					
		Assume twenty notches, 12 ft deep, alternating sides with ten on each side for					
		removal of approximately 120 feet of dam.					
		Each notch overlaps the previous alternating notch in 6 foot lifts.					
		Each notch is approximately 20 ft wide with an average 6 ft thickness to be					
		removed by blasting below reservoir surface.					
	~~11~~	~~Remove Concrete Intake Structure on Right~~	~~86-68130~~	~~21,000~~	~~yd3~~		DELETED
		~~Abutment~~					
		~~*Includes concrete in gate houses and headworks for units 1 and 2.*~~					
	12	Remove Structural Steel from Spillway	86-68130	55,000	lbs	$1.50	$82,500.00
		Includes rails, misc. steel					
		Does not include spillway gates					
		Assume contains paint with heavy metals.					
		By barge and crane					
	13	Install Diversion Tunnel Plugs	86-68130	24	yd3	$1,300.00	$31,200.00
		Plug ~~upstream (6 cy) and~~ downstream ends					
		Assume 2' thick ~~each~~					
	~~14~~	~~Remove Diversion Tunnel Control Structure~~	~~86-68130~~	~~350~~	~~yd3~~		DELETED
		~~Concrete~~					
		~~*Includes guide boxes*~~					
		~~*Assume reinforced*~~					
		SUBTOTAL THIS SHEET					**$11,633,700.00**

QUANTITIES		PRICES	
BY Jonathan East	CHECKED Sheena Barnes	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 02/22/11	PEER REVIEW / DATE Rick Benik P.E. 2/22/11	DATE PREPARED 06/01/11	PEER REVIEW / DATE 6/3/11

FEATURE:	PROJECT:
Klamath River Dams Removal Partial Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable High Dam	Klamath River Northern California/Southern Oregon
	WOID: AF652 — ESTIMATE LEVEL: Feasibility
	REGION: MP — UNIT PRICE LEVEL: July-2010
	FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 1\[Klamath Dams Removal - COPCO 1 - Partial Removal Option - MPH Feas Est - 4-2011.xlsx]Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		MECHANICAL					
		Remove and dispose of the following					
		equipment at Dam:					
	15	Hand Rails	86-68420	11,000	lb	$1.50	$16,500.00
		(Assume contains paint with heavy metals)					
		By barge and crane					
	16	Radial Gates	86-68420	140,500	lb	$1.50	$210,750.00
		13 radial gates, wall and sillplates and 3-hoists		Revised 8.26.10 TJT			
		(Assume contains paint with heavy metals & petroleum products)					
		By barge and crane					
	17	Radial Gate stoplogs	86-68420	18,000	lb	$1.50	$27,000.00
		8 stop logs and 13 sets of guides					
		(Assume contains paint with heavy metals & petroleum products)					
		By barge and crane					
	18	Stoplog hoist, track and supports	86-68420	26,000	lb	$1.50	$39,000.00
		(Assume contains paint with heavy metals & petroleum products)					
		By barge and crane					
		Remove and dispose of the following					
		equipment at the waste tunnel:					
	~~19~~	~~3 sections of 23' of 72"Ø steel lining (embedded)~~	~~86-68420~~	~~54,000~~	~~lb~~		DELETED
		~~(Assume contains paint with heavy metals)~~					
	~~20~~	~~3 - 72" butterfly valves (embedded)~~	~~86-68420~~	~~55,000~~	~~lb~~		DELETED
		~~(Assume contains paint with heavy metals & petroleum products)~~					
	21	3-72" flapper valves with remote mechanical	86-68420	78,000	lb	$5.00	$390,000.00
		control ~~(embedded)~~					
		(Assume contains paint with heavy metals)					
		Removal requires a dive depth of 115 ft.					
		SUBTOTAL THIS SHEET					**$683,250.00**

QUANTITIES		PRICES	
BY K. Converse 10/28/10	CHECKED T Turnage	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED November 18, 2010	PEER REVIEW / DATE Dan Drake 12/16/2010	DATE PREPARED 06/01/11	PEER REVIEW / DATE DCD 6/3/11

ESTIMATE WORKSHEET

FEATURE:	PROJECT:
Klamath River Dams Removal Partial Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable High Dam	Klamath River Northern California/Southern Oregon
	WOID: AF652 — ESTIMATE LEVEL: Feasibility
	REGION: MP — UNIT PRICE LEVEL: July-2010
	FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 1\[Klamath Dams Removal - COPCO 1 - Partial Removal Option - MPH Feas Est - 4-2011.xlsx]Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		ELECTRICAL					
		Remove and dispose of the following equipment at Spillway:					
	22	Spillway gate motor & control panel	86-68430	1	EA	$1,500.00	$1,500.00
		Total weight approximately: 500 lbs.					
	23	Distribution equipment , panelboards	86-68430	1	EA	$7,000.00	$7,000.00
		Total weight approximately: 500 lbs.					
		DAM SUBTOTAL					**$12,325,450.00**

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 11/18/10	PEER REVIEW / DATE L. Rossi 12/9/10	DATE PREPARED 06/01/11	PEER REVIEW / DATE 6/3/11

ESTIMATE WORKSHEET

FEATURE:	PROJECT:
Klamath River Dams Removal Partial Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable High Powerhouse, Switchyard, and Transmission Line	Klamath River Northern California/Southern Oregon

WOID:	AF652	ESTIMATE LEVEL:	Feasibility
REGION:	MP	UNIT PRICE LEVEL:	July-2010
FILE:	C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 1\[Klamath Dams Removal - COPCO 1 - Partial Removal Option - MPH Feas Est - 4-2011.xlsx]Summary		

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
		Concrete and Structural Steel Items:					
	~~24~~	~~Remove Powerhouse Concrete down to top of rock~~					
		~~under the PH, Elev. 2482.75 (USGS datum).~~	~~86-68130~~	~~3,100~~	~~yd3~~		DELETED
		~~Local datum is converted to USGS datum by~~					
		~~adding 2411 feet. (Elev. 71.75 + 2411 = Elev. 2482.75.)~~					
		~~All concrete is reinforced.~~					
		~~Includes all exterior & interior walls, columns, &~~					
		~~beams, and concrete in foundations for transformers~~					
	~~25~~	~~Remove Powerhouse Structural Steel~~	~~86-68130~~	~~110,000~~	~~lbs~~		DELETED
		~~Roof truss members, purlins, and crane rail~~					
		~~Assume contains paint with heavy metals.~~					
		SUBTOTAL THIS SHEET					

QUANTITIES		PRICES	
BY Jonathan East	CHECKED Sheena Barnes	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 11/18/10	PEER REVIEW / DATE Rick Benik P.E. 12/9/10	DATE PREPARED 06/01/11	PEER REVIEW / DATE 6/3/11

ESTIMATE WORKSHEET

FEATURE:	PROJECT:
Klamath River Dams Removal Partial Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable High Powerhouse, Switchyard, and Transmission Line	Klamath River Northern California/Southern Oregon
	WOID: AF652 — ESTIMATE LEVEL: Feasibility
	REGION: MP — UNIT PRICE LEVEL: July-2010
	FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 1\[Klamath Dams Removal - COPCO 1 - Partial Removal Option - MPH Feas Est - 4-2011.xlsx]Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		MECHANICAL					
		Remove and dispose of the following					
		equipment at the Power House:					
	~~26~~	~~2 - Governor oil systems~~	~~86-68420~~	~~38,000~~	~~lb~~		DELETED
		~~governor, sump tanks, accumulator tank, piping~~					
		~~(Assume contains paint with heavy metals & petroleum products)~~					
	~~27~~	~~Cooling water and bearing oil systems~~	~~86-68420~~	~~11,000~~	~~lb~~		DELETED
		~~(Assume contains paint with heavy metals & petroleum products)~~					
		~~(encased in concrete)~~					
	~~28~~	~~4 - Horizontal Tandem Francis Turbines~~	~~86-68420~~	~~452,000~~	~~lb~~		DELETED
		~~(includes runner, scroll case, draft tube and shaft)~~					
		~~(Assume contains paint with heavy metals & petroleum products)~~					
	~~29~~	~~2 - 40 Ton indoor cranes~~	~~86-68420~~	~~140,000~~	~~lb~~		DELETED
		~~Includes crane and rail, not steel rail base~~					
		~~(Assume contains paint with heavy metals & petroleum products)~~					
	~~30~~	~~Compressed Air system~~	~~86-68420~~	~~1,000~~	~~lb~~		DELETED
		~~(Assume contains paint with heavy metals & petroleum products)~~					
	~~31~~	~~2 - CO2 systems~~	~~86-68420~~	~~3,100~~	~~lb~~		DELETED
		~~(Assume contains paint with heavy metals & petroleum products)~~					
	~~32~~	~~Plant Water and Fire Protection~~	~~86-68420~~	~~2,600~~	~~lb~~		DELETED
		~~(Assume contains paint with heavy metals)~~					
		SUBTOTAL THIS SHEET					

QUANTITIES		PRICES	
BY K. Converse	CHECKED T Turnage	BY Craig A. Grush, P.E.	CHECKED DN 06-01-11
DATE PREPARED 12/08/10	PEER REVIEW / DATE Dan Drake 12/16/2010	DATE PREPARED 06/01/11	PEER REVIEW / DATE DCD 6/3/11

ESTIMATE WORKSHEET

FEATURE:	PROJECT:
Klamath River Dams Removal Partial Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable High Powerhouse, Switchyard, and Transmission Line	Klamath River Northern California/Southern Oregon
	WOID: AF652 — ESTIMATE LEVEL: Feasibility
	REGION: MP — UNIT PRICE LEVEL: July-2010
	FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 1\[Klamath Dams Removal - COPCO 1 - Partial Removal Option - MPH Feas Est - 4-2011.xlsx]Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		MECHANICAL					
	~~33~~	~~Transformer Oil Fire protection~~	~~86-68420~~	~~5,400~~	~~lb~~		DELETED
		~~(Assume contains paint with heavy metals & petroleum products)~~					
	~~34~~	~~Unwatering Piping~~	~~86-68420~~	~~27,000~~	~~lb~~		DELETED
		~~(Assume contains paint with heavy metals)~~					
	~~35~~	~~Drainage Piping~~	~~86-68420~~	~~5,000~~	~~lb~~		DELETED
		~~(Assume contains paint with heavy metals)~~					
	35A	Remove Petroleum Products from Mechanical					
		Equipment.	86-68420	1,250	gal	$12.00	$15,000.00
		Includes quantities for the following equipment:					
		From Item 28, Units 1 & 2, both east & west turbine bearings and generator bearings.					
		DTE heavy oil, 280 gal. per unit, 560 gal. total.					
		From Item 26, Units 1 & 2, governor oil sumps and accumulator tanks.					
		Hydraulic oil, 340 gal. per unit, 680 gal. total.					
		The remaining items contain petroleum products in amounts too small to be considered					
		for this level of estimate.					
		SUBTOTAL THIS SHEET					**$15,000.00**

QUANTITIES		PRICES	
BY K. Converse	CHECKED T Turnage	BY Craig A. Grush, P.E.	CHECKED DW 06-01-11
DATE PREPARED 12/08/10	PEER REVIEW / DATE Dan Drake 12/16/2010	DATE PREPARED 06/01/11	PEER REVIEW / DATE DEW 6/3/11

FEATURE:	PROJECT:
Klamath River Dams Removal Partial Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable High Powerhouse, Switchyard, and Transmission Line	Klamath River Northern California/Southern Oregon
	WOID: AF652 — ESTIMATE LEVEL: Feasibility
	REGION: MP — UNIT PRICE LEVEL: July-2010
	FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 1\[Klamath Dams Removal - COPCO 1 - Partial Removal Option - MPH Feas Est - 4-2011.xlsx]Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		ELECTRICAL					
		Remove and dispose of the following equipment in the Powerplant:					
	~~36~~	~~Horizontal AC Generator, Indoor Open Frame~~	~~86-68430~~	~~2~~	~~EA~~		DELETED
		~~Unit 1 & 2 ea: 12.5 MVA (10 MW); 0.8PF, 2,300V,~~					
		~~200 RPM, 3 Ph, including rotating exciter~~					
		~~Total weight each approximately: 123,500 lbs.~~					
		~~Stator: 32,250 lbs., Rotor: 55,000 lbs.~~					
		~~Base: 17,000 lbs., Exciter Assembly: 7,550 lbs.~~					
		~~Heaviest lift: 55,000 lbs.~~					
	~~37~~	~~Excitation equipment for 12.5 MVA Generator~~	~~86-68430~~	~~2~~	~~EA~~		DELETED
		~~(2 sections)Total weight approximately: 1,000 lbs.~~					
	~~38~~	~~Surge protection equip. for 12.5 MVA Generator~~	~~86-68430~~	~~2~~	~~EA~~		DELETED
		~~Total weight approximately: 800 lbs.~~					
	~~39~~	~~Neutral grounding equip. for 12.5 MVA Generator~~	~~86-68430~~	~~2~~	~~EA~~		DELETED
		~~includes transformer~~					
		~~Total weight approximately: 500 lbs.~~					
	~~40~~	~~Generator Switchgear, 5kV-includes unit breakers~~	~~86-68430~~	~~1~~	~~EA~~		DELETED
		~~(6 Sections @ 400 lbs each section)~~					
		~~3 ft x 3 ft x 90 inches high~~					
		~~Total weight approximately: 2,400 lbs.~~					
	~~41~~	~~Station Service Switchgear, 600 volt (5 sections)~~	~~86-68430~~	~~1~~	~~EA~~		DELETED
		~~(400 lbs each section), 3 ft x 3ft x 90 inches high~~					
		~~Total weight approximately: 2,000 lbs.~~					
		SUBTOTAL THIS SHEET					

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY Craig A. Grush, P.E.	CHECKED DW 06-01-11
DATE PREPARED 12/08/10	PEER REVIEW / DATE L. Rossi 12/9/10	DATE PREPARED 06/01/11	PEER REVIEW / DATE DEW 6/3/11

FEATURE:	PROJECT:
Klamath River Dams Removal Partial Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable High Powerhouse, Switchyard, and Transmission Line	Klamath River Northern California/Southern Oregon
	WOID: AF652 — ESTIMATE LEVEL: Feasibility
	REGION: MP — UNIT PRICE LEVEL: July-2010
	FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 1\[Klamath Dams Removal - COPCO 1 - Partial Removal Option - MPH Feas Est - 4-2011.xlsx]Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		ELECTRICAL					
		Remove and dispose of the following equipment in the Powerplant:					
	~~42~~	~~Unit and plant control switchboard 5 cubicles (200 lbs each), 2ft x 2ft x 90 in. high Total weight approximately: 1,000 lbs.~~	~~86-68430~~	~~1~~	~~EA~~		DELETED
	43	Battery system - assume 60 batteries, charger, racks and supports. Total weight approximately: 2,500 lbs.	86-68430	1	EA	$12,000.00	$12,000.00
	~~44~~	~~Raceways, Conduit and Cable (approx. 3000 lin. Ft. power & control cable, 1000 lin. Ft. conduit, 200 lin. Ft. cabletray) Total weight approximately: 8,000 lbs.~~	~~86-68430~~	~~1~~	~~EA~~		DELETED
	~~45~~	~~Misc. power & control boards 10 boards (50 lbs each) 3ft x 2 ft x 9 in Total weight approximately: 500 lbs.~~	~~86-68430~~	~~1~~	~~EA~~		DELETED
	~~46~~	~~Step-up Transformers, indoor, oil-filled, 1-phase, 5,000 kVA, 2,300/72,000 volt Total weight approximately each: 31,500 lbs.~~	~~86-68430~~	~~3~~	~~EA~~		DELETED
	~~47~~	~~Step-up Transformers, indoor, oil-filled, 1-phase, 4,165 kVA, 2,300/72,000 volt Total weight approximately each: 31,500 lbs.~~	~~86-68430~~	~~3~~	~~EA~~		DELETED
	~~48~~	~~Seven 40-Ton Travelling Crane motors - hoist (2-30Hp*), hoist trolley (7.5Hp*), gantry (4-15Hp*) (Hp* Approx.) Total weight approximately: 600 lbs.~~	~~86-68430~~	~~1~~	~~EA~~		DELETED
		SUBTOTAL THIS SHEET					**$12,000.00**

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 12/08/10	PEER REVIEW / DATE L. Rossi 12/9/10	DATE PREPARED 06/01/11	PEER REVIEW / DATE 6/3/11

ESTIMATE WORKSHEET

FEATURE:	PROJECT:
Klamath River Dams Removal Partial Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable High Powerhouse, Switchyard, and Transmission Line	Klamath River Northern California/Southern Oregon
	WOID: AF652 — ESTIMATE LEVEL: Feasibility
	REGION: MP — UNIT PRICE LEVEL: July-2010
	FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 1\[Klamath Dams Removal - COPCO 1 - Partial Removal Option - MPH Feas Est - 4-2011.xlsx]Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		ELECTRICAL					
		Remove and dispose of the following equipment in the Powerplant:					
	~~49~~	~~40-Ton Travelling Crane control equipment (5 cubicles), Total weight approximately: 500 lbs.~~	~~86-68430~~	~~1~~	~~EA~~		DELETED
	~~50~~	~~40-Ton Travelling Crane Festoon Cable (approx. 200 lin. Ft. cable) Total weight approximately: 800 lbs.~~	~~86-68430~~	~~1~~	~~EA~~		DELETED
	~~51~~	~~Four 15-Ton Overhead Crane motors - hoist (10Hp*), hoist trolley (5Hp*), gantry (2-5Hp*) (Hp* Approx.) Total weight approximately: 350 lbs.~~	~~86-68430~~	~~1~~	~~EA~~		DELETED
	~~52~~	~~15-Ton Overhead Crane control equipment (1 cubicle), Total weight approximately: 100 lbs.~~	~~86-68430~~	~~1~~	~~EA~~		DELETED
	~~53~~	~~15-Ton Overhead Crane Festoon Cable (approx. 100 lin. Ft. cable) Total weight approximately: 250 lbs.~~	~~86-68430~~	~~1~~	~~EA~~		DELETED
	53A	Remove Oil from Oil-filled Step-up Transformers.	86-68430	10,500	gal	$12.00	$126,000.00
		From Item 46, four transformers (includes one spare) @ 1,500 gallons each.					
		From Item 47, four transformers (includes one spare) @ 1,175 gallons each.					
		SUBTOTAL THIS SHEET					**$126,000.00**

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 12/08/10	PEER REVIEW / DATE L. Rossi 12/9/10	DATE PREPARED 06/01/11	PEER REVIEW / DATE 6/3/11

ESTIMATE WORKSHEET

FEATURE:

Klamath River Dams Removal
Partial Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable High
Powerhouse, Switchyard, and Transmission Line

PROJECT:
Klamath River
Northern California/Southern Oregon

WOID:	**AF652**	**ESTIMATE LEVEL:**	**Feasibility**
REGION:	**MP**	**UNIT PRICE LEVEL:**	**July-2010**

FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 1\[Klamath Dams Removal - COPCO 1 - Partial Removal Option - MPH Feas Est - 4-2011.xlsx]Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		ELECTRICAL					
		Remove and dispose of the following					
		equipment in the Switchyard:					
		All equipment is on wood-pole structures					
	54	69-kV circuit breakers, oil-filled, PCB	86-68430	2	EA	$3,500.00	$7,000.00
	55	69-kV disconnect switches, group-operated	86-68430	2	EA	$2,000.00	$4,000.00
	56	60-foot wood poles	86-68430	12	EA	$1,300.00	$15,600.00
	57	30-foot wood crossarms	86-68430	24	EA	$600.00	$14,400.00
	58	69-kV insulator strings	86-68430	12	EA	$500.00	$6,000.00
		Remove and dispose of the following					
		wood-pole transmission lines:					
	59	Transmission Line No. 3	86-68430	1.66	mile	$40,000.00	$66,400.00
		From Copco No. 1 switchyard to Fall Creek					
		266.8 ACSR, 69-kV					
	60	Transmission Line No. 15	86-68430	1.23	mile	$40,000.00	$49,200.00
		From Copco No. 1 switchyard to Copco No. 2					
		266.8 ACSR, 69-kV					
	61	Transmission Line No. 26-1	86-68430	0.07	mile	$40,000.00	$2,800.00
		From Copco No. 1 powerhouse to					
		Copco No. 1 switchyard					
		2/0 copper, 69-kV					
	62	Transmission Line No. 26-2	86-68430	0.07	mile	$40,000.00	$2,800.00
		From Copco No. 1 powerhouse to					
		Copco No. 1 switchyard					
		2/0 copper, 69-kV					
POWERHOUSE, SWITCHYARD, & TRANS LINE SUBTOTAL							**$321,200.00**

QUANTITIES		PRICES	
BY D. Berk	**CHECKED** T. Griess	**BY** Craig A. Grush, P.E.	**CHECKED** 06-01-11
DATE PREPARED 12/08/10	**PEER REVIEW / DATE** L. Rossi 12/9/10	**DATE PREPARED** 06/01/11	**PEER REVIEW / DATE** 6/3/11

ESTIMATE WORKSHEET

FEATURE:	PROJECT:
Klamath River Dams Removal Partial Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable High Penstock	Klamath River Northern California/Southern Oregon
	WOID: AF652 — ESTIMATE LEVEL: Feasibility
	REGION: MP — UNIT PRICE LEVEL: July-2010
	FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 1\[Klamath Dams Removal - COPCO 1 - Partial Removal Option - MPH Feas Est - 4-2011.xlsx]Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
		Concrete and Structural Steel Items:					
	~~63~~	~~Remove gate house #1 from top of dam~~	~~86-68130~~	~~570~~	~~ft2~~		DELETED
	~~64~~	~~Remove gate house #2 from top of dam~~	~~86-68130~~	~~690~~	~~ft2~~		DELETED
	~~65~~	~~Remove Concrete Items associated with 10-foot diameter Penstocks, concrete is reinforced~~	~~86-68130~~	~~1,050~~	~~yd3~~		DELETED
	~~66~~	~~Plug 14-foot diameter penstock with concrete~~ ~~Plug upstream and downstream ends~~ ~~*Assume 2' thick each*~~	~~86-68130~~	~~23~~	~~yd3~~		DELETED
		SUBTOTAL THIS SHEET					

QUANTITIES		PRICES	
BY Jonathan East	CHECKED Sheena Barnes	BY Craig A. Grush, P.E.	CHECKED DW 06-01-11
DATE PREPARED 12/08/10	PEER REVIEW / DATE Rick Benik P.E. 12/9/10	DATE PREPARED 06/01/11	PEER REVIEW / DATE NCA 6/3/11

ESTIMATE WORKSHEET

FEATURE:	PROJECT:
Klamath River Dams Removal Partial Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable High Penstock	Klamath River Northern California/Southern Oregon
	WOID: AF652 — ESTIMATE LEVEL: Feasibility
	REGION: MP — UNIT PRICE LEVEL: July-2010
	FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 1\[Klamath Dams Removal - COPCO 1 - Partial Removal Option - MPH Feas Est - 4-2011.xlsx]Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		MECHANICAL					
		Remove and dispose of the following					
		equipment at the intake:					
	~~67~~	~~8 screens~~	~~86-68420~~	~~18,000~~	~~lb~~		DELETED
		~~(Assume contains paint with heavy metals)~~					
	~~68~~	~~8 Water Gates~~	~~86-68420~~	~~18,000~~	~~lb~~		DELETED
		~~(Assume contains paint with heavy metals)~~					
	~~69~~	~~3 - 30"Ø x 25' stand pipes~~	~~86-68420~~	~~6,000~~	~~lb~~		DELETED
		~~(Assume contains paint with heavy metals)~~					
	~~70~~	~~14' Ø penstock pipe~~	~~86-68420~~	~~256,000~~	~~lb~~		DELETED
		~~(includes encased and open air intake up to underground portion-Revised 9/14/2010)~~					
		~~(Assume contains paint with heavy metals)~~					
	~~71~~	~~10' Ø penstock pipe~~	~~86-68420~~	~~270,000~~	~~lb~~		DELETED
		~~(includes intake and main conduit)~~					
		~~(Assume contains paint with heavy metals)~~					
		PENSTOCK SUBTOTAL					

QUANTITIES		PRICES	
BY K. Converse	CHECKED T Turnage	BY Craig A. Grush, P.E.	CHECKED DW 06-01-11
DATE PREPARED 11/19/10	PEER REVIEW / DATE Dan Drake 12/16/2010	DATE PREPARED 06/01/11	PEER REVIEW / DATE DCD 6/3/11

ESTIMATE WORKSHEET

FEATURE:

Klamath River Dams Removal
Partial Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable High
Reservoir Vegetative Restoration

PROJECT:

Klamath River
Northern California/Southern Oregon

WOID:	AF652	**ESTIMATE LEVEL:**	Appraisal
REGION:	MP	**UNIT PRICE LEVEL:**	July-2010

FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 1\[Klamath Dams Removal - COPCO 1 - Partial Removal Option - MPH Feas Est - 4-2011.xlsx]Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
	72	Temporary Access Roads	86-68140	7.0	Miles	$100,000.00	$700,000.00
		Blade primitive road as necessary in dry reservoir sediment for one time use by hydroseeding equipment. Existing topography is relatively flat with no significant excavation nor embankment anticipated.					
		SUBTOTAL THIS SHEET					**$700,000.00**

QUANTITIES		PRICES	
BY Mark Leavitt	**CHECKED** Gemperline, Joseph M	**BY** Craig A. Grush, P.E.	**CHECKED** 06-01-11
DATE PREPARED 11/01/10	**PEER REVIEW / DATE** Dave Edwards 11/1/10	**DATE PREPARED** 06/01/11	**PEER REVIEW / DATE** 6/3/11

BUREAU OF RECLAMATION

ESTIMATE WORKSHEET

FEATURE:	PROJECT:
Klamath River Dams Removal Partial Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable High Reservoir Vegetative Restoration	Klamath River Northern California/Southern Oregon
	WOID: AF652 — ESTIMATE LEVEL: Feasibility
	REGION: MP — UNIT PRICE LEVEL: July-2010
	FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 1\[Klamath Dams Removal - COPCO 1 - Partial Removal Option - MPH Feas Est - 4-2011.xlsx]Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		WATER AND ENVIRONMENTAL					
	73	SPRING GROUND SEEDING:	86-68220	0	Acres	$4,000.00	
	74	SPRING BARGE SEEDING:	86-68220	0	Acres	$8,000.00	
		SUBTOTAL THIS SHEET					

QUANTITIES		PRICES	
BY O'Meara, Scott A	CHECKED Greimann, Blair P	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 04/12/11	PEER REVIEW / DATE 04/12/11	DATE PREPARED 06/01/11	PEER REVIEW / DATE DCL 6/3/11

ESTIMATE WORKSHEET

FEATURE:	PROJECT:
Klamath River Dams Removal Partial Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable High Reservoir Vegetative Restoration	Klamath River Northern California/Southern Oregon
	WOID: AF652 — ESTIMATE LEVEL: Feasibility
	REGION: MP — UNIT PRICE LEVEL: July-2010
	FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 1\[Klamath Dams Removal - COPCO 1 - Partial Removal Option - MPH Feas Est - 4-2011.xlsx]Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		WATER AND ENVIRONMENTAL					
	75	SPRING AERIAL SEEDING:	86-68220	802	Acres	$15,000.00	$12,030,000.00
		Idaho fescue (Festuca idahoensis)	3208	lbs PLS			
		Blue wildrye (Elymus glaucus)	3208	lbs PLS			
		Small fescue (Vulpia microstachys)	3208	lbs PLS			
		Bluebunch wheatgrass (Pseudoroegneria spicata)	4812	lbs PLS			
		Sandberg bluegrass (Poa secunda)	401	lbs PLS			
		Spike bentgrass (Agrostis exarata)	201	lbs PLS			
		Western needlegrass (Achnatherum occidentale)	3208	lbs PLS			
		California brome (Bromus carinatus)	6416	lbs PLS			
		Squirreltail (Elymus elymoides)	3208	lbs PLS			
		Wood mulch	1604000	lbs			
		Tackifier	96240	lbs			
	76	FALL GROUND SEEDING:	86-68220	602	Acres	$4,000.00	$2,408,000.00
		Idaho fescue (Festuca idahoensis)	2406	lbs PLS			
		Blue wildrye (Elymus glaucus)	2406	lbs PLS			
		Small fescue (Vulpia microstachys)	2406	lbs PLS			
		Bluebunch wheatgrass (Pseudoroegneria spicata)	3609	lbs PLS			
		Sandberg bluegrass (Poa secunda)	301	lbs PLS			
		Spike bentgrass (Agrostis exarata)	150	lbs PLS			
		Western needlegrass (Achnatherum occidentale)	2406	lbs PLS			
		California brome (Bromus carinatus)	4812	lbs PLS			
		Squirreltail (Elymus elymoides)	2406	lbs PLS			
		Wood mulch	185077	lbs			
		Tackifier	11105	lbs			
		SUBTOTAL THIS SHEET					**$14,438,000.00**

QUANTITIES		PRICES	
BY O'Meara, Scott A	CHECKED Greimann, Blair P	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 04/12/11	PEER REVIEW / DATE 04/12/11	DATE PREPARED 06/01/11	PEER REVIEW / DATE 6/3/11

ESTIMATE WORKSHEET

FEATURE:

Klamath River Dams Removal
Partial Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable High
Reservoir Vegetative Restoration

PROJECT:
Klamath River
Northern California/Southern Oregon

WOID:	**AF652**	**ESTIMATE LEVEL:**	**Feasibility**
REGION:	**MP**	**UNIT PRICE LEVEL:**	**July-2010**

FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 1\[Klamath Dams Removal - COPCO 1 - Partial Removal Option - MPH Feas Est - 4-2011.xlsx]Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		WATER AND ENVIRONMENTAL					
	77	RIPARIAN POLE PLANTING: (1,000 ea/acre)	86-68220	170	Acres	$10,000.00	$1,700,000.00
		Narrowleaf willow (Salix exigua)	102000	cutting			
		Arroyo willow (Salix lasiolepis)	17000	cutting			
		Shining willow (Salix lucida)	17000	cutting			
		Three-leaf sumac (Rhus trilobata)	17000	cutting			
		Western serviceberry (Amelanchier alnifolia)	8500	cutting			
		Chokecherry (Prunus virginiana)	8500	transplant			
		Herbivore screen	170000	each			
		Chemical herbivore deterent	3400	gal			
		Polymer	536	lbs			
	78	WEED MANAGEMENT:	86-68220	602	Acres	$2,000.00	$1,204,000.00
		Herbicide, post-emergent	1203	lbs AI			
		MAINTENANCE TREATMENTS ON 10% OF THE RESTORATION AREAS PER YEAR OVER 4 YEARS, POST-RESTORATION					
	79	FALL GROUND SEEDING:	86-68220	321	Acres	$4,000.00	$1,284,000.00
		Idaho fescue (Festuca idahoensis)	1283	lbs PLS			
		Blue wildrye (Elymus glaucus)	1283	lbs PLS			
		Small fescue (Vulpia microstachys)	1283	lbs PLS			
		Bluebunch wheatgrass (Pseudoroegneria spicata)	1925	lbs PLS			
		Sandberg bluegrass (Poa secunda)	160	lbs PLS			
		Spike bentgrass (Agrostis exarata)	80	lbs PLS			
		Western needlegrass (Achnatherum occidentale)	1283	lbs PLS			
		California brome (Bromus carinatus)	2566	lbs PLS			
		Squirreltail (Elymus elymoides)	1283	lbs PLS			
		Wood mulch	641600	lbs			
		Tackifier	38496	lbs			
	80	WEED MANAGEMENT:	86-68220	321	Acres	$2,000.00	$642,000.00
		Herbicide, post-emergent	30	lbs AI			
	RESERVOIR VEGETATIVE RESTORATION SUBTOTAL						**$19,968,000.00**

QUANTITIES		**PRICES**	
BY O'Meara, Scott A	**CHECKED** Greimann, Blair P	**BY** Craig A. Grush, P.E.	**CHECKED** DW 06-01-11
DATE PREPARED 04/12/11	**PEER REVIEW / DATE** 04/12/11	**DATE PREPARED** 06/01/11	**PEER REVIEW / DATE** DCW 6/3/11

ESTIMATE WORKSHEET

FEATURE:	PROJECT:
Klamath River Dams Removal Partial Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable High Road Improvements	Klamath River Northern California/Southern Oregon
	WOID: AF652 — ESTIMATE LEVEL: Feasibility
	REGION: MP — UNIT PRICE LEVEL: July-2010
	FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 1\[Klamath Dams Removal - COPCO 1 - Partial Removal Option - MPH Feas Est - 4-2011.xlsx]Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		GEOTECHNICAL					
		These quantities represent the work required					
		to prepare a disposal site and improve the					
		haul road to the disposal site for Copco 1					
		and Copco 2. In addition it provides the					
		length of county road required to be					
		repaired after construction.					
		General Sitework Copco 1 And Copco 2					
	81	Clear and Grub Disposal Area	86-68313	5.5	acre	$7,000.00	$38,500.00
		Estimated haul distance 1 mile.					
		Disposed concrete estimated to be 10' deep					
		and traffic compacted (50% bulking factor).					
		For Copco 1 and Copco 2					
	82	Soil Cover for Disposal Area	86-68313	18,000	yd3	$60.00	$1,080,000.00
		Access/Haul Road Improvements					
		maximum 12% grades					
		4 reaches required improvement					
	83	Soil Excavation	86-68313	9,000	yd3	$14.00	$126,000.00
	84	Rock Excavation	86-68313	9,000	yd3	$45.00	$405,000.00
	85	Soil Backfill	86-68313	30,000	yd3	$55.00	$1,650,000.00
	86	4" Gravel Surfacing	86-68313	320	ton	$120.00	$38,400.00
		50% contingency for excavation					
		100% contingency for backfill					
		County Road Improvements					
	87	Asphalt Overlay Repair - Juniper Road	86-68313	3	mi	$350,000.00	$1,050,000.00
	88	Asphalt Overlay Repair - Copco Road	86-68313	19	mi	$350,000.00	$6,650,000.00
		Assume the 2 lane county road from I-5 to					
		the Copco Dams will be overlayed after					
		construction with 3" asphalt.					
		ROAD IMPROVEMENTS SUBTOTAL					**$11,037,900.00**

QUANTITIES		PRICES	
BY Randy Kuzniakowski	CHECKED Tuti Tierney	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 11/29/10	PEER REVIEW / DATE Daniel W. Osmun 12/9/10	DATE PREPARED 06/01/11	PEER REVIEW / DATE DCO 6/3/11

ESTIMATE WORKSHEET

FEATURE:

Klamath River Dams Removal
Partial Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable High
Recreational Facilities to be Removed

PROJECT:
Klamath River
Northern California/Southern Oregon

WOID:	**AF652**	**ESTIMATE LEVEL:**	**Feasibility**
REGION:	**MP**	**UNIT PRICE LEVEL:**	**July-2010**

FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 1\[Klamath Dams Removal - COPCO 1 - Partial Removal Option - MPH Feas Est - 4-2011.xlsx]Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		Mallard Cove					
	89	Concrete total	BLM	106	CY	$400.00	$42,400.00
		Boat ramp: 100'x25'x1' (93 CY)					
		Dock abutment: 6'x8'x3' (6 CY)					
		8 Concrete wheel stops (0.5 CY)					
		4 Campfire ring foundations (1 CY)					
		6 Concrete sign bases (3 CY)					
		3 Concrete fire rings (2 CY)					
	90	25'x5' Dock made of composite decking and	BLM	1	EA	$3,000.00	$3,000.00
		poly floats					
	91	20'x5' Gangway w/ aluminum frame and railings	BLM	1	EA	$2,500.00	$2,500.00
	92	Signs to be removed and hauled away	BLM	6	EA	$350.00	$2,100.00
	93	Wood plank tables to be removed and hauled	BLM	8	EA	$120.00	$960.00
		away					
	94	Parking area to be regraded, ripped, seeded and	BLM	2.5	ACRE	$30,000.00	$75,000.00
		planted this area is made of fill about 6 ft deep					
		Copco Cove					
	95	Concrete total	BLM	84	CY	$400.00	$33,600.00
		Boat ramp: 80'x25'x1' (74 CY)					
		Dock abutment: 14'x5'x3' (8 CY)					
		6 Concrete sign bases (2 CY)					
	96	Dock abutment railing made of 2.5" dia. steel pipe	BLM	25	LF	$45.00	$1,125.00
	97	Signs to be removed and hauled away	BLM	6	EA	$350.00	$2,100.00
	98	Wood plank tables to be removed and hauled	BLM	2	EA	$120.00	$240.00
		away					
	99	Regrade, rip, seed and plant disturbed areas	BLM	2.3	ACRE	$30,000.00	$69,000.00
	RECREATIONAL FACILITIES REMOVAL SUBTOTAL						**$232,025.00**

QUANTITIES		PRICES	
BY Renee Snyder (BLM)	**CHECKED** Sheena Barnes	**BY** Craig A. Grush, P.E.	**CHECKED** 06-01-11
DATE PREPARED 11/19/10	**PEER REVIEW / DATE** Rick Benik P.E. 12/9/10	**DATE PREPARED** 06/01/11	**PEER REVIEW / DATE** 6/3/11

BUREAU OF RECLAMATION

ESTIMATE WORKSHEET

FEATURE:	PROJECT:
Klamath River Dams Removal Partial Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable High SUMMARY	Klamath River Northern California/Southern Oregon
	WOID: AF652 — ESTIMATE LEVEL: Feasibility
	REGION: MP — UNIT PRICE LEVEL: July-2010
	FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 1\[Klamath Dams Removal - COPCO 1 - Partial Removal Option - MPH Feas Est - 4-2011.xlsx]Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		Sediment Removal (assumes by natural erosion)		1,453,800	CY	$0.00	$0.00
		Diversion and Care					$1,540,000.00
		Dam Removal					$12,325,450.00
		Powerhouse/Switchyard/Transmission Line Removal					$321,200.00
		Penstock Removal					$0.00
		Reservoir Vegetative Restoration					$19,968,000.00
		Road Improvements					$11,037,900.00
		Recreational Facilities to be Removed					$232,025.00
		Subtotal					**$45,424,575.00**
		Mobilization	5%	+/-			$2,300,000.00
		Subtotal 1 with Mobilization					**$47,724,575.00**
		Escalation to Notice to Proceed (NTP), from July 2010 to July 2020					$25,508,447.00
		(assumes 4.375%/yr compounding over 10 years)					
		Subtotal 2 = Subtotal 1 with Mobilization + Escalation to NTP					$73,233,022.00
		Design Contingencies	15%	+/-			$11,082,618.00
		Allowance for Procurement Strategies (APS)	2%	+/-			$1,684,360.00
		Type of solicitation assumed is: Competitive RFP					
		CONTRACT COST					**$86,000,000.00**
		Construction Contingencies	25%	+/-			$19,000,000.00
		FIELD COST					**$105,000,000.00**
		Non-Contract Costs:	71%	+/-			$75,000,000.00
		(Environmental & Cultural Resources					
		Mitigation ~ 45%, Design Data Collection ~ 2%,					
		Engineering Design ~ 6%, Permitting ~ 4%,					
		Procurement ~ 2%, Construction Management					
		~ 11%, and Closeout ~ 1%)					
		CONSTRUCTION COST					**$180,000,000.00**
		Ref.: For appropriate use and terminology, see Reclamation Manual, Directives and Standards FAC; 09-01, 09-02 and 09-03.					

QUANTITIES		PRICES	
BY Refer to Previous Sheets	CHECKED Refer to Previous Sheets	BY Craig A. Grush, P.E.	CHECKED DW 06-01-11
DATE PREPARED	PEER REVIEW / DATE Refer to Previous Sheets	DATE PREPARED 06/01/11	PEER REVIEW / DATE DCA 6/3/11

BUREAU OF RECLAMATION

ESTIMATE WORKSHEET

FEATURE:	PROJECT:
Klamath River Dams Removal Partial Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable Low Diversion and Care	Klamath River Northern California/Southern Oregon
	WOID: AF652 — ESTIMATE LEVEL: Feasibility
	REGION: MP — UNIT PRICE LEVEL: July-2010
	FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 1\[Klamath Dams Removal - COPCO 1 - Partial Removal Option - MPL Feas Est - 4-2011.xlsx]Diversion & Care

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
	1	Furnish, Install, and Remove Barge-Mounted	86-68130	1	ls		$340,000.00
		Crane in Reservoir for Dam Removal.					
		Barge taken from Iron Gate Reservoir.					
		Barge is used to modify diversion tunnel intake structure.					
		Barge is also used to remove spillway gates, piers, bridge and concrete in spillway crest.					
		Barge is located on reservoir for approximately 5 months.					
	2	Remove Sediment from Diversion Tunnel Intake	86-68130	30	cy	$1,700.00	$51,000.00
		to provide access.					
		Requires removing sediment 115 feet deep using clamshell or suction dredge.					
	3	Furnish, Install, and Remove Large Crane on	86-68130	1	ls	Included in the mobilization item	
		Right Abutment.					
		Crane used to deliver equipment and materials and to remove waste materials as required.					
		Crane in place for 4 months.					
	4	~~Remove Water from behind Tailrace Cofferdam.~~	~~86-68130~~	~~200,000~~	~~gals~~		DELETED
		~~Unwatering of tailrace for removal of the powerhouse in the dry.~~					
		~~Assume 3 inch portable trash pump operating for 1 day.~~					
	~~5~~	~~Riprap Protection on Cofferdam.~~	~~86-68130~~	~~260~~	~~cy~~		DELETED
		~~Riprap protects cofferdam from diversion tunnel releases.~~					
	~~6~~	~~Provide Dewatering behind Tailrace Cofferdam~~	~~86-68130~~	~~1~~	~~ls~~		DELETED
		~~for removal of Powerhouse in the dry.~~					
		~~Assume 3 inch portable trash pump operating for approximately 3 months.~~					
		SUBTOTAL THIS SHEET					**$391,000.00**

QUANTITIES		PRICES	
BY Rick Benik	CHECKED Jonathan East	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 11/18/10	PEER REVIEW / DATE Tom Hepler P.E. 12/9/10	DATE PREPARED 06/01/11	PEER REVIEW / DATE DCA 6/3/11

ESTIMATE WORKSHEET

FEATURE:	PROJECT:
Klamath River Dams Removal Partial Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable Low Diversion and Care	Klamath River Northern California/Southern Oregon
	WOID: AF652 — ESTIMATE LEVEL: Feasibility
	REGION: MP — UNIT PRICE LEVEL: July-2010
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
	7	Remove Current Diversion Tunnel Plug	86-68130	195	yd3	$1,400.00	$273,000.00
		Plug located in the middle of the tunnel					
		Reinforced concrete					
		Tunnel work					
	~~8~~	~~Construct Embankment Cofferdam in Tailrace~~	~~86-68130~~	~~1,700~~	~~yd3~~		DELETED
		~~to remove Powerhouse in dry.~~					
		~~Assumes 10 ft wide crest with 2:1 side slopes, approximately 250 ft long and up to 12 ft high.~~					
		~~*Embankment material taken from Iron Gate Dam Removal, approximately 10 mile haul distance.*~~					
		SUBTOTAL THIS SHEET					**$273,000.00**

QUANTITIES		PRICES	
BY Jonathan East	CHECKED Sheena Barnes	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 11/18/10	PEER REVIEW / DATE Rick Benik P.E. 12/9/10	DATE PREPARED 06/01/11	PEER REVIEW / DATE DCD 6/3/11

ESTIMATE WORKSHEET

FEATURE:	PROJECT:
Klamath River Dams Removal Partial Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable Low Diversion and Care	Klamath River Northern California/Southern Oregon
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		MECHANICAL	86-68420				
		Furnish, Install and Remove the following					
		necessary for the removal of Copco #1 Dam.					
	9	3-6'x6' Fabricated Slide Gates with 120 ft. head					
		Total slide gate weight approximately: 12,500 lbs. ea.		40,500	lbs	$12.00	$486,000.00
		Includes operators, stems, guides, and remote controls.					
		Installation requires a dive depth of 115 ft.					
		DIVERSION AND CARE SUBTOTAL					**$1,150,000.00**

QUANTITIES		PRICES	
BY T. J. Turnage	CHECKED K. Converse	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 11/18/10	PEER REVIEW / DATE Dan Drake 12/16/2010	DATE PREPARED 06/01/11	PEER REVIEW / DATE 6/3/11

FEATURE:	PROJECT:
Klamath River Dams Removal Partial Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable Low Dam	Klamath River Northern California/Southern Oregon
	WOID: AF652 — ESTIMATE LEVEL: Feasibility
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
		Concrete and Structural Steel Items:					
	10	Remove Concrete Dam down to Elev. 2476	86-68130	36,000	yd3	$290.00	$10,440,000.00
		Elev. 2476 represents original streambed channel at downstream face of dam.					
		Concrete in foundation to remain. Spillway crest at Elev. 2593.5.					
		Includes concrete in dam, spillway crest, piers (390 cy), bridge					
		deck (72 cy) and left abutment. Concrete is reinforced.					
		Requires notching of concrete dam under head below approximately Elev. 2536					
		for a dry water year. Approx. 17,000 cy of concrete in dam above El. 2536.					
		Assume ten notches, 12 ft deep, alternating sides with five on each side for					
		removal of final 60 feet of dam.					
		Each notch overlaps the previous alternating notch in 6 foot lifts.					
		Each notch is approximately 20 ft wide with an average 6 ft thickness to be					
		removed by blasting below reservoir surface.					
	~~11~~	~~Remove Concrete Intake Structure on Right~~	~~86-68130~~	~~21,000~~	~~yd3~~		DELETED
		~~Abutment~~					
		~~*Includes concrete in gate houses and headworks for units 1 and 2.*~~					
	12	Remove Structural Steel from Spillway	86-68130	55,000	lbs	$0.70	$38,500.00
		Includes rails, misc. steel					
		Does not include spillway gates					
		Assume contains paint with heavy metals.					
		By barge and crane					
	13	Install Diversion Tunnel Plugs	86-68130	24	yd3	$1,100.00	$26,400.00
		Plug ~~upstream (6 cy) and~~ downstream ends					
		Assume 2' thick ~~each~~					
	~~14~~	~~Remove Diversion Tunnel Control Structure~~	~~86-68130~~	~~350~~	~~yd3~~		DELETED
		~~Concrete~~					
		~~*Includes guide boxes*~~					
		~~*Assume reinforced*~~					
		SUBTOTAL THIS SHEET					**$10,504,900.00**

QUANTITIES		PRICES	
BY Jonathan East	CHECKED Sheena Barnes	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 02/22/11	PEER REVIEW / DATE Rick Benik P.E. 2/22/11	DATE PREPARED 06/01/11	PEER REVIEW / DATE DCB 6/3/11

FEATURE:	PROJECT:
Klamath River Dams Removal Partial Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable Low Dam	Klamath River Northern California/Southern Oregon
	WOID: AF652 — ESTIMATE LEVEL: Feasibility
	REGION: MP — UNIT PRICE LEVEL: July-2010
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		MECHANICAL					
		Remove and dispose of the following					
		equipment at Dam:					
	15	Hand Rails	86-68420	11,000	lb	$0.70	$7,700.00
		(Assume contains paint with heavy metals)					
		By barge and crane					
	16	Radial Gates	86-68420	140,500	lb	$0.70	$98,350.00
		13 radial gates, wall and sillplates and 3-hoists		Revised 8.26.10 TJT			
		(Assume contains paint with heavy metals & petroleum products)					
		By barge and crane					
	17	Radial Gate stoplogs	86-68420	18,000	lb	$0.70	$12,600.00
		8 stop logs and 13 sets of guides					
		(Assume contains paint with heavy metals & petroleum products)					
		By barge and crane					
	18	Stoplog hoist, track and supports	86-68420	26,000	lb	$0.70	$18,200.00
		(Assume contains paint with heavy metals & petroleum products)					
		By barge and crane					
		Remove and dispose of the following					
		equipment at the waste tunnel:					
	~~19~~	~~3 sections of 23' of 72"Ø steel lining (embedded)~~	~~86-68420~~	~~54,000~~	~~lb~~		DELETED
		~~(Assume contains paint with heavy metals)~~					
	~~20~~	~~3 - 72" butterfly valves (embedded)~~	~~86-68420~~	~~55,000~~	~~lb~~		DELETED
		~~(Assume contains paint with heavy metals & petroleum products)~~					
	21	3-72" flapper valves with remote mechanical	86-68420	78,000	lb	$2.50	$195,000.00
		control ~~(embedded)~~					
		(Assume contains paint with heavy metals)					
		Removal requires a dive depth of 115 ft.					
		SUBTOTAL THIS SHEET					**$331,850.00**

QUANTITIES		PRICES	
BY K. Converse 10/28/10	CHECKED T Turnage	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED November 18, 2010	PEER REVIEW / DATE Dan Drake 12/16/2010	DATE PREPARED 06/01/11	PEER REVIEW / DATE DCD 6/3/11

ESTIMATE WORKSHEET

FEATURE:	PROJECT:
Klamath River Dams Removal Partial Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable Low Dam	Klamath River Northern California/Southern Oregon
	WOID: AF652 — ESTIMATE LEVEL: Feasibility
	REGION: MP — UNIT PRICE LEVEL: July-2010
	FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 1\[Klamath Dams Removal - COPCO 1 - Partial Removal Option - MPL Feas Est - 4-2011.xlsx]Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		ELECTRICAL					
		Remove and dispose of the following equipment at Spillway:					
	22	Spillway gate motor & control panel	86-68430	1	EA	$900.00	$900.00
		Total weight approximately: 500 lbs.					
	23	Distribution equipment , panelboards	86-68430	1	EA	$5,000.00	$5,000.00
		Total weight approximately: 500 lbs.					
		DAM SUBTOTAL					**$10,842,650.00**

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY Craig A. Grush, P.E.	CHECKED DCW 06-01-11
DATE PREPARED 11/18/10	PEER REVIEW / DATE L. Rossi 12/9/10	DATE PREPARED 06/01/11	PEER REVIEW / DATE DCW 6/3/11

ESTIMATE WORKSHEET

FEATURE:	PROJECT:
Klamath River Dams Removal Partial Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable Low Powerhouse, Switchyard, and Transmission Line	Klamath River Northern California/Southern Oregon
	WOID: AF652 — ESTIMATE LEVEL: Feasibility
	REGION: MP — UNIT PRICE LEVEL: July-2010
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
		Concrete and Structural Steel Items:					
	~~24~~	~~Remove Powerhouse Concrete down to top of rock~~					
		~~under the PH, Elev. 2482.75 (USGS datum).~~	~~86-68130~~	~~3,100~~	~~yd3~~		DELETED
		~~Local datum is converted to USGS datum by~~					
		~~adding 2411 feet. (Elev. 71.75 + 2411 = Elev. 2482.75.)~~					
		~~All concrete is reinforced.~~					
		~~Includes all exterior & interior walls, columns, &~~					
		~~beams, and concrete in foundations for transformers~~					
	~~25~~	~~Remove Powerhouse Structural Steel~~	~~86-68130~~	~~110,000~~	~~lbs~~		DELETED
		~~Roof truss members, purlins, and crane rail~~					
		~~Assume contains paint with heavy metals.~~					
		SUBTOTAL THIS SHEET					

QUANTITIES		PRICES	
BY Jonathan East	CHECKED Sheena Barnes	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 11/18/10	PEER REVIEW / DATE Rick Benik P.E. 12/9/10	DATE PREPARED 06/01/11	PEER REVIEW / DATE 6/3/11

ESTIMATE WORKSHEET

FEATURE:	PROJECT:
Klamath River Dams Removal Partial Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable Low Powerhouse, Switchyard, and Transmission Line	Klamath River Northern California/Southern Oregon
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		MECHANICAL					
		Remove and dispose of the following					
		equipment at the Power House:					
	~~26~~	~~2 - Governor oil systems~~	~~86-68420~~	~~38,000~~	~~lb~~		DELETED
		~~governor, sump tanks, accumulator tank, piping~~					
		~~(Assume contains paint with heavy metals & petroleum products)~~					
	~~27~~	~~Cooling water and bearing oil systems~~	~~86-68420~~	~~11,000~~	~~lb~~		DELETED
		~~(Assume contains paint with heavy metals & petroleum products)~~					
		~~(encased in concrete)~~					
	~~28~~	~~4 - Horizontal Tandem Francis Turbines~~	~~86-68420~~	~~452,000~~	~~lb~~		DELETED
		~~(includes runner, scroll case, draft tube and shaft)~~					
		~~(Assume contains paint with heavy metals & petroleum products)~~					
	~~29~~	~~2 - 40 Ton indoor cranes~~	~~86-68420~~	~~140,000~~	~~lb~~		DELETED
		~~Includes crane and rail, not steel rail base~~					
		~~(Assume contains paint with heavy metals & petroleum products)~~					
	~~30~~	~~Compressed Air system~~	~~86-68420~~	~~1,000~~	~~lb~~		DELETED
		~~(Assume contains paint with heavy metals & petroleum products)~~					
	~~31~~	~~2 - CO2 systems~~	~~86-68420~~	~~3,100~~	~~lb~~		DELETED
		~~(Assume contains paint with heavy metals & petroleum products)~~					
	~~32~~	~~Plant Water and Fire Protection~~	~~86-68420~~	~~2,600~~	~~lb~~		DELETED
		~~(Assume contains paint with heavy metals)~~					
		SUBTOTAL THIS SHEET					

QUANTITIES		PRICES	
BY K. Converse	CHECKED T Turnage	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 12/08/10	PEER REVIEW / DATE Dan Drake 12/16/2010	DATE PREPARED 06/01/11	PEER REVIEW / DATE DCD 6/3/11

ESTIMATE WORKSHEET

FEATURE:	PROJECT:
Klamath River Dams Removal Partial Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable Low Powerhouse, Switchyard, and Transmission Line	Klamath River Northern California/Southern Oregon
	WOID: AF652 — ESTIMATE LEVEL: Feasibility
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		MECHANICAL					
	~~33~~	~~Transformer Oil Fire protection~~	~~86-68420~~	~~5,400~~	~~lb~~		DELETED
		~~(Assume contains paint with heavy metals & petroleum products)~~					
	~~34~~	~~Unwatering Piping~~	~~86-68420~~	~~27,000~~	~~lb~~		DELETED
		~~(Assume contains paint with heavy metals)~~					
	~~35~~	~~Drainage Piping~~	~~86-68420~~	~~5,000~~	~~lb~~		DELETED
		~~(Assume contains paint with heavy metals)~~					
	35A	Remove Petroleum Products from Mechanical					
		Equipment.	86-68420	1,250	gal	$9.00	$11,250.00
		Includes quantities for the following equipment:					
		From Item 28, Units 1 & 2, both east & west turbine bearings and generator bearings.					
		DTE heavy oil, 280 gal. per unit, 560 gal. total.					
		From Item 26, Units 1 & 2, governor oil sumps and accumulator tanks.					
		Hydraulic oil, 340 gal. per unit, 680 gal. total.					
		The remaining items contain petroleum products in amounts too small to be considered					
		for this level of estimate.					
		SUBTOTAL THIS SHEET					**$11,250.00**

QUANTITIES		PRICES	
BY K. Converse	CHECKED T Turnage	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 12/08/10	PEER REVIEW / DATE Dan Drake 12/16/2010	DATE PREPARED 06/01/11	PEER REVIEW / DATE DCD 6/3/11

FEATURE:	PROJECT:
Klamath River Dams Removal Partial Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable Low Powerhouse, Switchyard, and Transmission Line	Klamath River Northern California/Southern Oregon
	WOID: AF652 — ESTIMATE LEVEL: Feasibility
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		ELECTRICAL					
		Remove and dispose of the following equipment in the Powerplant:					
	~~36~~	~~Horizontal AC Generator, Indoor Open Frame~~	~~86-68430~~	~~2~~	~~EA~~		DELETED
		~~Unit 1 & 2 ea: 12.5 MVA (10 MW); 0.8PF, 2,300V,~~					
		~~200 RPM, 3 Ph, including rotating exciter~~					
		~~Total weight each approximately: 123,500 lbs.~~					
		~~Stator: 32,250 lbs., Rotor: 55,000 lbs.~~					
		~~Base: 17,000 lbs., Exciter Assembly: 7,550 lbs.~~					
		~~Heaviest lift: 55,000 lbs.~~					
	~~37~~	~~Excitation equipment for 12.5 MVA Generator~~	~~86-68430~~	~~2~~	~~EA~~		DELETED
		~~(2 sections)Total weight approximately: 1,000 lbs.~~					
	~~38~~	~~Surge protection equip. for 12.5 MVA Generator~~	~~86-68430~~	~~2~~	~~EA~~		DELETED
		~~Total weight approximately: 800 lbs.~~					
	~~39~~	~~Neutral grounding equip. for 12.5 MVA Generator~~	~~86-68430~~	~~2~~	~~EA~~		DELETED
		~~includes transformer~~					
		~~Total weight approximately: 500 lbs.~~					
	~~40~~	~~Generator Switchgear, 5kV-includes unit breakers~~	~~86-68430~~	~~1~~	~~EA~~		DELETED
		~~(6 Sections @ 400 lbs each section)~~					
		~~3 ft x 3 ft x 90 inches high~~					
		~~Total weight approximately: 2,400 lbs.~~					
	~~41~~	~~Station Service Switchgear, 600 volt -(5 sections)~~	~~86-68430~~	~~1~~	~~EA~~		DELETED
		~~(400 lbs each section), 3 ft x 3ft x 90 inches high~~					
		~~Total weight approximately: 2,000 lbs.~~					
		SUBTOTAL THIS SHEET					

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 12/08/10	PEER REVIEW / DATE L. Rossi 12/9/10	DATE PREPARED 06/01/11	PEER REVIEW / DATE 6/3/11

FEATURE:	PROJECT:
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		ELECTRICAL					
		Remove and dispose of the following equipment in the Powerplant:					
	~~42~~	~~Unit and plant control switchboard~~	~~86-68430~~	~~1~~	~~EA~~		DELETED
		~~5 cubicles (200 lbs each), 2ft x 2ft x 90 in. high~~					
		~~Total weight approximately: 1,000 lbs.~~					
	43	Battery system - assume 60 batteries, charger,	86-68430	1	EA	$9,000.00	$9,000.00
		racks and supports.					
		Total weight approximately: 2,500 lbs.					
	~~44~~	~~Raceways, Conduit and Cable~~	~~86-68430~~	~~1~~	~~EA~~		DELETED
		~~(approx. 3000 lin. Ft. power & control cable,~~					
		~~1000 lin. Ft. conduit, 200 lin. Ft. cabletray)~~					
		~~Total weight approximately: 8,000 lbs.~~					
	~~45~~	~~Misc. power & control boards~~	~~86-68430~~	~~1~~	~~EA~~		DELETED
		~~10 boards (50 lbs each) 3ft x 2 ft x 9 in~~					
		~~Total weight approximately: 500 lbs.~~					
	~~46~~	~~Step-up Transformers, indoor, oil-filled, 1-phase,~~	~~86-68430~~	~~3~~	~~EA~~		DELETED
		~~5,000 kVA, 2,300/72,000 volt~~					
		~~Total weight approximately each: 31,500 lbs.~~					
	~~47~~	~~Step-up Transformers, indoor, oil-filled, 1-phase,~~	~~86-68430~~	~~3~~	~~EA~~		DELETED
		~~4,165 kVA, 2,300/72,000 volt~~					
		~~Total weight approximately each: 31,500 lbs.~~					
	~~48~~	~~Seven 40-Ton Travelling Crane motors - hoist~~	~~86-68430~~	~~1~~	~~EA~~		DELETED
		~~(2-30Hp*), hoist trolley (7.5Hp*), gantry (4-15Hp*)~~					
		~~(Hp* Approx.) Total weight approximately: 600 lbs.~~					
		SUBTOTAL THIS SHEET					**$9,000.00**

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 12/08/10	PEER REVIEW / DATE L. Rossi 12/9/10	DATE PREPARED 06/01/11	PEER REVIEW / DATE 6/3/11

FEATURE:	PROJECT:
Klamath River Dams Removal Partial Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable Low Powerhouse, Switchyard, and Transmission Line	Klamath River Northern California/Southern Oregon
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	REGION: MP — UNIT PRICE LEVEL: July-2010
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		ELECTRICAL					
		Remove and dispose of the following equipment in the Powerplant:					
	~~49~~	~~40-Ton Travelling Crane control equipment (5 cubicles), Total weight approximately: 500 lbs.~~	~~86-68430~~	~~1~~	~~EA~~		DELETED
	~~50~~	~~40-Ton Travelling Crane Festoon Cable (approx. 200 lin. Ft. cable) Total weight approximately: 800 lbs.~~	~~86-68430~~	~~1~~	~~EA~~		DELETED
	~~51~~	~~Four 15-Ton Overhead Crane motors - hoist (10Hp*), hoist trolley (5Hp*), gantry (2-5Hp*) (Hp* Approx.) Total weight approximately: 350 lbs.~~	~~86-68430~~	~~1~~	~~EA~~		DELETED
	~~52~~	~~15-Ton Overhead Crane control equipment (1 cubicle), Total weight approximately: 100 lbs.~~	~~86-68430~~	~~1~~	~~EA~~		DELETED
	~~53~~	~~15-Ton Overhead Crane Festoon Cable (approx. 100 lin. Ft. cable) Total weight approximately: 250 lbs.~~	~~86-68430~~	~~1~~	~~EA~~		DELETED
	53A	Remove Oil from Oil-filled Step-up Transformers.	86-68430	10,500	gal	$9.00	$94,500.00
		From Item 46, four transformers (includes one spare) @ 1,500 gallons each.					
		From Item 47, four transformers (includes one spare) @ 1,175 gallons each.					
		SUBTOTAL THIS SHEET					**$94,500.00**

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 12/08/10	PEER REVIEW / DATE L. Rossi 12/9/10	DATE PREPARED 06/01/11	PEER REVIEW / DATE 6/3/11

FEATURE:	PROJECT:
Klamath River Dams Removal Partial Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable Low Powerhouse, Switchyard, and Transmission Line	Klamath River Northern California/Southern Oregon
	WOID: AF652 — ESTIMATE LEVEL: Feasibility
	REGION: MP — UNIT PRICE LEVEL: July-2010
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		ELECTRICAL					
		Remove and dispose of the following equipment in the Switchyard:					
		All equipment is on wood-pole structures					
	54	69-kV circuit breakers, oil-filled, PCB	86-68430	2	EA	$2,500.00	$5,000.00
	55	69-kV disconnect switches, group-operated	86-68430	2	EA	$1,000.00	$2,000.00
	56	60-foot wood poles	86-68430	12	EA	$900.00	$10,800.00
	57	30-foot wood crossarms	86-68430	24	EA	$400.00	$9,600.00
	58	69-kV insulator strings	86-68430	12	EA	$300.00	$3,600.00
		Remove and dispose of the following wood-pole transmission lines:					
	59	Transmission Line No. 3	86-68430	1.66	mile	$25,000.00	$41,500.00
		From Copco No. 1 switchyard to Fall Creek					
		266.8 ACSR, 69-kV					
	60	Transmission Line No. 15	86-68430	1.23	mile	$25,000.00	$30,750.00
		From Copco No. 1 switchyard to Copco No. 2					
		266.8 ACSR, 69-kV					
	61	Transmission Line No. 26-1	86-68430	0.07	mile	$25,000.00	$1,750.00
		From Copco No. 1 powerhouse to					
		Copco No. 1 switchyard					
		2/0 copper, 69-kV					
	62	Transmission Line No. 26-2	86-68430	0.07	mile	$25,000.00	$1,750.00
		From Copco No. 1 powerhouse to					
		Copco No. 1 switchyard					
		2/0 copper, 69-kV					
		POWERHOUSE, SWITCHYARD, & TRANS LINE SUBTOTAL					**$221,500.00**

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 12/08/10	PEER REVIEW / DATE L. Rossi 12/9/10	DATE PREPARED 06/01/11	PEER REVIEW / DATE 6/3/11

ESTIMATE WORKSHEET

FEATURE:	PROJECT:
Klamath River Dams Removal Partial Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable Low Penstock	Klamath River Northern California/Southern Oregon
	WOID: AF652 — ESTIMATE LEVEL: Feasibility
	REGION: MP — UNIT PRICE LEVEL: July-2010
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
		Concrete and Structural Steel Items:					
	~~63~~	~~Remove gate house #1 from top of dam~~	~~86-68130~~	~~570~~	~~ft2~~		DELETED
	~~64~~	~~Remove gate house #2 from top of dam~~	~~86-68130~~	~~690~~	~~ft2~~		DELETED
	~~65~~	~~Remove Concrete Items associated with 10-foot diameter Penstocks, concrete is reinforced~~	~~86-68130~~	~~1,050~~	~~yd3~~		DELETED
	~~66~~	~~Plug 14-foot diameter penstock with concrete~~ ~~Plug upstream and downstream ends~~ ~~*Assume 2' thick each*~~	~~86-68130~~	~~23~~	~~yd3~~		DELETED
		SUBTOTAL THIS SHEET					

QUANTITIES		PRICES	
BY Jonathan East	CHECKED Sheena Barnes	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 12/08/10	PEER REVIEW / DATE Rick Benik P.E. 12/9/10	DATE PREPARED 06/01/11	PEER REVIEW / DATE DCD 6/3/11

ESTIMATE WORKSHEET

FEATURE:	PROJECT:
Klamath River Dams Removal Partial Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable Low Penstock	Klamath River Northern California/Southern Oregon
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		MECHANICAL					
		Remove and dispose of the following					
		equipment at the intake:					
	~~67~~	~~8 screens~~	~~86-68420~~	~~18,000~~	~~lb~~		DELETED
		~~(Assume contains paint with heavy metals)~~					
	~~68~~	~~8 Water Gates~~	~~86-68420~~	~~18,000~~	~~lb~~		DELETED
		~~(Assume contains paint with heavy metals)~~					
	~~69~~	~~3 - 30"Ø x 25' stand pipes~~	~~86-68420~~	~~6,000~~	~~lb~~		DELETED
		~~(Assume contains paint with heavy metals)~~					
	~~70~~	~~14' Ø penstock pipe~~	~~86-68420~~	~~256,000~~	~~lb~~		DELETED
		~~(includes encased and open air intake up to underground portion-Revised 9/14/2010)~~					
		~~(Assume contains paint with heavy metals)~~					
	~~71~~	~~10' Ø penstock pipe~~	~~86-68420~~	~~270,000~~	~~lb~~		DELETED
		~~(includes intake and main conduit)~~					
		~~(Assume contains paint with heavy metals)~~					
		PENSTOCK SUBTOTAL					

QUANTITIES		PRICES	
BY K. Converse	CHECKED T Turnage	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 11/19/10	PEER REVIEW / DATE Dan Drake 12/16/2010	DATE PREPARED 06/01/11	PEER REVIEW / DATE DCD 6/3/11

ESTIMATE WORKSHEET

FEATURE:	PROJECT:
Klamath River Dams Removal Partial Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable Low Reservoir Vegetative Restoration	Klamath River Northern California/Southern Oregon
	WOID: AF652 — ESTIMATE LEVEL: Appraisal
	REGION: MP — UNIT PRICE LEVEL: July-2010
	FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 1\[Klamath Dams Removal - COPCO 1 - Partial Removal Option - MPL Feas Est - 4-2011.xlsx]Res Reveg

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
	72	Temporary Access Roads	86-68140	7.0	Miles	$60,000.00	$420,000.00
		Blade primitive road as necessary in dry reservoir sediment for one time use by hydroseeding equipment. Existing topography is relatively flat with no significant excavation nor embankment anticipated.					
		SUBTOTAL THIS SHEET					**$420,000.00**

QUANTITIES		PRICES	
BY Mark Leavitt	CHECKED Gemperline, Joseph M	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 11/01/10	PEER REVIEW / DATE Dave Edwards 11/1/10	DATE PREPARED 06/01/11	PEER REVIEW / DATE DCE 6/3/11

ESTIMATE WORKSHEET

FEATURE:	PROJECT:
Klamath River Dams Removal Partial Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable Low Reservoir Vegetative Restoration	Klamath River Northern California/Southern Oregon
	WOID: AF484 — ESTIMATE LEVEL: Feasibility
	REGION: MP — UNIT PRICE LEVEL: July-2010
	FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 1\[Klamath Dams Removal - COPCO 1 - Partial Removal Option - MPL Feas Est - 4-2011.xlsx]Res Reveg

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		WATER AND ENVIRONMENTAL					
	73	SPRING GROUND SEEDING:	86-68220	420	Acres	$3,000.00	$1,260,000.00
		Idaho fescue (Festuca idahoensis)	1680	lbs PLS			
		Blue wildrye (Elymus glaucus)	1680	lbs PLS			
		Small fescue (Vulpia microstachys)	1680	lbs PLS			
		Bluebunch wheatgrass (Pseudoroegneria spicata)	2520	lbs PLS			
		Sandberg bluegrass (Poa secunda)	210	lbs PLS			
		Spike bentgrass (Agrostis exarata)	105	lbs PLS			
		Western needlegrass (Achnatherum occidentale)	1680	lbs PLS			
		California brome (Bromus carinatus)	3360	lbs PLS			
		Squirreltail (Elymus elymoides)	1680	lbs PLS			
		Wood mulch	840000	lbs			
		Tackifier	50400	lbs			
	74	SPRING BARGE SEEDING:	86-68220	82	Acres	$5,000.00	$410,000.00
		Idaho fescue (Festuca idahoensis)	328	lbs PLS			
		Blue wildrye (Elymus glaucus)	328	lbs PLS			
		Small fescue (Vulpia microstachys)	328	lbs PLS			
		Bluebunch wheatgrass (Pseudoroegneria spicata)	492	lbs PLS			
		Sandberg bluegrass (Poa secunda)	41	lbs PLS			
		Spike bentgrass (Agrostis exarata)	21	lbs PLS			
		Western needlegrass (Achnatherum occidentale)	328	lbs PLS			
		California brome (Bromus carinatus)	656	lbs PLS			
		Squirreltail (Elymus elymoides)	328	lbs PLS			
		Wood mulch	164000	lbs			
		Tackifier	9840	lbs			
		SUBTOTAL THIS SHEET					**$1,670,000.00**

QUANTITIES		PRICES	
BY O'Meara, Scott A	CHECKED Greimann, Blair P	BY Craig A. Grush, P.E.	CHECKED DW 06-01-11
DATE PREPARED 04/12/11	PEER REVIEW / DATE 04/12/11	DATE PREPARED 06/01/11	PEER REVIEW / DATE DCA 6/3/11

ESTIMATE WORKSHEET

FEATURE:

Klamath River Dams Removal
Partial Removal Option
Copco No. 1 Dam & Powerplant Removal
Most Probable Low
Reservoir Vegetative Restoration

PROJECT:
Klamath River
Northern California/Southern Oregon

WOID:	**AF484**	**ESTIMATE LEVEL:**	**Feasibility**
REGION:	**MP**	**UNIT PRICE LEVEL:**	**July-2010**

FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 1\[Klamath Dams Removal - COPCO 1 - Partial Removal Option - MPL Feas Est - 4-2011.xlsx]Res Reveg

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		WATER AND ENVIRONMENTAL					
	75	SPRING AERIAL SEEDING:	86-68220	300	Acres	$6,500.00	$1,950,000.00
		Idaho fescue (Festuca idahoensis)	1200	lbs PLS			
		Blue wildrye (Elymus glaucus)	1200	lbs PLS			
		Small fescue (Vulpia microstachys)	1200	lbs PLS			
		Bluebunch wheatgrass (Pseudoroegneria spicata)	1800	lbs PLS			
		Sandberg bluegrass (Poa secunda)	150	lbs PLS			
		Spike bentgrass (Agrostis exarata)	75	lbs PLS			
		Western needlegrass (Achnatherum occidentale)	1200	lbs PLS			
		California brome (Bromus carinatus)	2400	lbs PLS			
		Squirreltail (Elymus elymoides)	1200	lbs PLS			
		Wood mulch	600000	lbs			
		Tackifier	36000	lbs			
	76	FALL GROUND SEEDING:	86-68220	201	Acres	$3,000.00	$603,000.00
		Idaho fescue (Festuca idahoensis)	802	lbs PLS			
		Blue wildrye (Elymus glaucus)	802	lbs PLS			
		Small fescue (Vulpia microstachys)	802	lbs PLS			
		Bluebunch wheatgrass (Pseudoroegneria spicata)	1203	lbs PLS			
		Sandberg bluegrass (Poa secunda)	100	lbs PLS			
		Spike bentgrass (Agrostis exarata)	50	lbs PLS			
		Western needlegrass (Achnatherum occidentale)	802	lbs PLS			
		California brome (Bromus carinatus)	1604	lbs PLS			
		Squirreltail (Elymus elymoides)	802	lbs PLS			
		Wood mulch	61692	lbs			
		Tackifier	3702	lbs			
		SUBTOTAL THIS SHEET					**$2,553,000.00**

QUANTITIES		**PRICES**	
BY O'Meara, Scott A	**CHECKED** Greimann, Blair P	**BY** Craig A. Grush, P.E.	**CHECKED** 06-01-11
DATE PREPARED 04/12/11	**PEER REVIEW / DATE** 04/12/11	**DATE PREPARED** 06/01/11	**PEER REVIEW / DATE** DCQ 6/3/11

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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		WATER AND ENVIRONMENTAL					
	77	RIPARIAN POLE PLANTING: (400 ea/acre)	86-68220	170	Acres	$4,000.00	$680,000.00
		Narrowleaf willow (Salix exigua)	40800	cutting			
		Arroyo willow (Salix lasiolepis)	6800	cutting			
		Shining willow (Salix lucida)	6800	cutting			
		Three-leaf sumac (Rhus trilobata)	6800	cutting			
		Western serviceberry (Amelanchier alnifolia)	3400	cutting			
		Chokecherry (Prunus virginiana)	3400	transplant			
		Herbivore screen	68000	each			
		Chemical herbivore deterent	1360	gal			
		Polymer	214	lbs			
	78	WEED MANAGEMENT:	86-68220	201	Acres	$1,000.00	$201,000.00
		Herbicide, post-emergent	401	lbs AI			
		MAINTENANCE TREATMENTS ON 10% OF THE RESTORATION AREAS PER YEAR OVER 4 YEARS, POST-RESTORATION					
	79	FALL GROUND SEEDING:	86-68220	321	Acres	$3,000.00	$963,000.00
		Idaho fescue (Festuca idahoensis)	1283	lbs PLS			
		Blue wildrye (Elymus glaucus)	1283	lbs PLS			
		Small fescue (Vulpia microstachys)	1283	lbs PLS			
		Bluebunch wheatgrass (Pseudoroegneria spicata)	1925	lbs PLS			
		Sandberg bluegrass (Poa secunda)	160	lbs PLS			
		Spike bentgrass (Agrostis exarata)	80	lbs PLS			
		Western needlegrass (Achnatherum occidentale)	1283	lbs PLS			
		California brome (Bromus carinatus)	2566	lbs PLS			
		Squirreltail (Elymus elymoides)	1283	lbs PLS			
		Wood mulch	641600	lbs			
		Tackifier	38496	lbs			
	80	WEED MANAGEMENT:	86-68220	321	Acres	$1,000.00	$321,000.00
		Herbicide, post-emergent	30	lbs AI			
	RESERVOIR VEGETATIVE RESTORATION SUBTOTAL						**$6,808,000.00**

QUANTITIES		**PRICES**	
BY O'Meara, Scott A	**CHECKED** Greimann, Blair P	**BY** Craig A. Grosh, P.E.	**CHECKED** 06-01-11
DATE PREPARED 04/12/11	**PEER REVIEW / DATE** 04/12/11	**DATE PREPARED** 06/01/11	**PEER REVIEW / DATE** 6/3/11

BUREAU OF RECLAMATION

ESTIMATE WORKSHEET

FEATURE:	PROJECT:
Klamath River Dams Removal Partial Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable Low Road Improvements	Klamath River Northern California/Southern Oregon
	WOID: AF652 — ESTIMATE LEVEL: Feasibility
	REGION: MP — UNIT PRICE LEVEL: July-2010
	FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 1\[Klamath Dams Removal - COPCO 1 - Partial Removal Option - MPL Feas Est - 4-2011.xlsx]Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		GEOTECHNICAL					
		These quantities represent the work required					
		to prepare a disposal site and improve the					
		haul road to the disposal site for Copco 1					
		and Copco 2. In addition it provides the					
		length of county road required to be					
		repaired after construction.					
		General Sitework Copco 1 And Copco 2					
	81	Clear and Grub Disposal Area	86-68313	5.5	acre	$5,000.00	$27,500.00
		Estimated haul distance 1 mile.					
		Disposed concrete estimated to be 10' deep					
		and traffic compacted (50% bulking factor).					
		For Copco 1 and Copco 2					
	82	Soil Cover for Disposal Area	86-68313	18,000	yd3	$45.00	$810,000.00
		Access/Haul Road Improvements					
		maximum 12% grades					
		4 reaches required improvement					
	83	Soil Excavation	86-68313	4,500	yd3	$12.00	$54,000.00
	84	Rock Excavation	86-68313	4,500	yd3	$35.00	$157,500.00
	85	Soil Backfill	86-68313	16,000	yd3	$45.00	$720,000.00
	86	4" Gravel Surfacing	86-68313	0	ton	$80.00	
		50% contingency for excavation					
		100% contingency for backfill					
		County Road Improvements					
	87	Asphalt Overlay Repair - Juniper Road	86-68313	3	mi	$35,000.00	$105,000.00
	88	Asphalt Overlay Repair - Copco Road	86-68313	19	mi	$35,000.00	$665,000.00
		Assume the 2 lane county road from I-5 to					
		the Copco Dams will be overlayed after					
		construction with chip seal.					
		ROAD IMPROVEMENTS SUBTOTAL					**$2,539,000.00**

QUANTITIES		PRICES	
BY Randy Kuzniakowski	CHECKED Tuti Tierney	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 11/29/10	PEER REVIEW / DATE Daniel W. Osmun 12/9/10	DATE PREPARED 06/01/11	PEER REVIEW / DATE DCO 6/3/11

BUREAU OF RECLAMATION

ESTIMATE WORKSHEET

FEATURE:	PROJECT:
Klamath River Dams Removal Partial Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable Low Recreational Facilities to be Removed	Klamath River Northern California/Southern Oregon
	WOID: AF652 — ESTIMATE LEVEL: Feasibility
	REGION: MP — UNIT PRICE LEVEL: July-2010
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		Mallard Cove					
	89	Concrete total	BLM	106	CY	$200.00	$21,200.00
		Boat ramp: 100'x25'x1' (93 CY)					
		Dock abutment: 6'x8'x3' (6 CY)					
		8 Concrete wheel stops (0.5 CY)					
		4 Campfire ring foundations (1 CY)					
		6 Concrete sign bases (3 CY)					
		3 Concrete fire rings (2 CY)					
	90	25'x5' Dock made of composite decking and poly floats	BLM	1	EA	$2,000.00	$2,000.00
	91	20'x5' Gangway w/ aluminum frame and railings	BLM	1	EA	$1,500.00	$1,500.00
	92	Signs to be removed and hauled away	BLM	6	EA	$250.00	$1,500.00
	93	Wood plank tables to be removed and hauled away	BLM	8	EA	$90.00	$720.00
	94	Parking area to be regraded, ripped, seeded and planted this area is made of fill about 6 ft deep	BLM	2.5	ACRE	$20,000.00	$50,000.00
		Copco Cove					
	95	Concrete total	BLM	84	CY	$200.00	$16,800.00
		Boat ramp: 80'x25'x1' (74 CY)					
		Dock abutment: 14'x5'x3' (8 CY)					
		6 Concrete sign bases (2 CY)					
	96	Dock abutment railing made of 2.5" dia. steel pipe	BLM	25	LF	$35.00	$875.00
	97	Signs to be removed and hauled away	BLM	6	EA	$250.00	$1,500.00
	98	Wood plank tables to be removed and hauled away	BLM	2	EA	$90.00	$180.00
	99	Regrade, rip, seed and plant disturbed areas	BLM	2.3	ACRE	$20,000.00	$46,000.00
		RECREATIONAL FACILITIES REMOVAL SUBTOTAL					**$142,275.00**

QUANTITIES		PRICES	
BY Renee Snyder (BLM)	CHECKED Sheena Barnes	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED 11/19/10	PEER REVIEW / DATE Rick Benik P.E. 12/9/10	DATE PREPARED 06/01/11	PEER REVIEW / DATE 6/3/11

BUREAU OF RECLAMATION

ESTIMATE WORKSHEET

FEATURE:	PROJECT:
Klamath River Dams Removal Partial Removal Option Copco No. 1 Dam & Powerplant Removal Most Probable Low SUMMARY	Klamath River Northern California/Southern Oregon
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		Sediment Removal (assumes by natural erosion)		1,453,800	CY	$0.00	$0.00
		Diversion and Care					$1,150,000.00
		Dam Removal					$10,842,650.00
		Powerhouse/Switchyard/Transmission Line Removal					$221,500.00
		Penstock Removal					$0.00
		Reservoir Vegetative Restoration					$6,808,000.00
		Road Improvements					$2,539,000.00
		Recreational Facilities to be Removed					$142,275.00
		Subtotal					**$21,703,425.00**
		Mobilization	5%	+/-			$1,100,000.00
		Subtotal 1 with Mobilization					**$22,803,425.00**
		Escalation to Notice to Proceed (NTP), from July 2010 to July 2020					$3,660,881.00
		(assumes 1.5%/yr compounding over 10 years)					
		Subtotal 2 = Subtotal 1 with Mobilization + Escalation to NTP					$26,464,306.00
		Design Contingencies	8%	+/-			$2,535,694.00
		Allowance for Procurement Strategies (APS)	0%	+/-			
		Type of solicitation assumed is: Competitive RFP					
		CONTRACT COST					**$29,000,000.00**
		Construction Contingencies	18%	+/-			$5,000,000.00
		FIELD COST					**$34,000,000.00**
		Non-Contract Costs:	62%	+/-			$21,000,000.00
		(Environmental & Cultural Resources					
		Mitigation ~ 45%, Design Data Collection ~ 1%,					
		Engineering Design ~ 3%, Permitting ~ 2%,					
		Procurement ~ 1%, Construction Management					
		~ 9%, and Closeout ~ 1%)					
		CONSTRUCTION COST					**$55,000,000.00**
		Ref.: For appropriate use and terminology, see Reclamation Manual, Directives and Standards FAC; 09-01, 09-02 and 09-03.					

QUANTITIES		PRICES	
BY Refer to Previous Sheets	CHECKED Refer to Previous Sheets	BY Craig A. Grush, P.E.	CHECKED 06-01-11
DATE PREPARED	PEER REVIEW / DATE Refer to Previous Sheets	DATE PREPARED 06/01/11	PEER REVIEW / DATE 6/3/11