

Attachment F

Monte Carlo Simulation Reports

FEATURE:			PROJECT:									
REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 2 Dam & Powerplant Removal Escalation Included SUMMARY ESTIMATE			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 2\Copco 2 - Full Removal Crystal Ball - with Escalation - 2011-04.xls\Copco 2 - 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	Construct and Remove Embankment Cofferdam-Right Side of Dam	8130	3,100	3,100	3,100	CY	\$70.00	\$85.00	\$130.00	\$217,000.00	\$263,500.00	\$403,000.00
	2	Furnish, Install and Remove Riprap	8130	465	465	465	CY	\$120.00	\$150.00	\$200.00	\$55,800.00	\$69,750.00	\$93,000.00
	3	Provide Dewatering behind Cofferdams	8130	1	1	1	LS	\$40,000.00	\$45,000.00	\$300,000.00	\$40,000.00	\$45,000.00	\$300,000.00
	4	Remove Water from behind Cofferdams	8130	241,000	241,000	241,000	GAL	\$0.01	\$0.01	\$0.01	\$2,410.00	\$2,410.00	\$2,410.00
	5	Construct and Remove Embankment Cofferdam-Left Side of Dam	8130	1,100	1,100	1,100	CY	\$70.00	\$85.00	\$130.00	\$77,000.00	\$93,500.00	\$143,000.00
	6	Furnish, Install and Remove Riprap	8130	250	250	250	CY	\$120.00	\$150.00	\$200.00	\$30,000.00	\$37,500.00	\$50,000.00
	7	Provide Dewatering behind Left Side Cofferdam	8130	1	1	1	LS	\$40,000.00	\$45,000.00	\$300,000.00	\$40,000.00	\$45,000.00	\$300,000.00
	8	Remove Water from behind Cofferdam	8130	36,000	36,000	36,000	GAL	\$0.04	\$0.05	\$0.08	\$1,440.00	\$1,800.00	\$2,880.00
	9	Remove Water from behind Tailrace Cofferdam	8130	400,000	400,000	400,000	GAL	\$0.01	\$0.01	\$0.01	\$4,000.00	\$4,000.00	\$4,000.00
	10	Provide Dewatering behind Tailrace Cofferdam	8130	1	1	1	LS	\$30,000.00	\$35,000.00	\$250,000.00	\$30,000.00	\$35,000.00	\$250,000.00
	11	Construct Embankment Cofferdam across Tailrace	8130	1,700	1,700	1,700	CY	\$70.00	\$85.00	\$130.00	\$119,000.00	\$144,500.00	\$221,000.00
	12	Construct 240-ft-long, 2-span concrete Bridge	8130	0	0	7,440	SF	\$200.00	\$300.00	\$600.00	\$0.00	\$0.00	\$4,464,000.00
	13	Remove and dispose of existing bridge	8130	0	0	1	LS	\$300,000.00	\$400,000.00	\$800,000.00	\$0.00	\$0.00	\$800,000.00
	14	Remove Concrete in Dam	8130	4,400	4,400	4,400	CY	\$270.00	\$315.00	\$500.00	\$1,188,000.00	\$1,386,000.00	\$2,200,000.00
	15	Remove concrete equipment slab from top of embankment wing dam on right abutment	8130	5	5	5	CY	\$170.00	\$215.00	\$380.00	\$850.00	\$1,075.00	\$1,900.00
	16	Remove Concrete Wingwall	8130	220	220	220	CY	\$170.00	\$215.00	\$380.00	\$37,400.00	\$47,300.00	\$83,600.00
	17	Right Abutment Removal - Random Fill	8313	1,200	1,200	1,200	CY	\$13.00	\$15.00	\$18.00	\$15,600.00	\$18,000.00	\$21,600.00
	18	Right Abutment Removal - Remove Hand Placed Riprap	8313	7,800	7,800	7,800	SF	\$0.85	\$1.00	\$1.30	\$6,630.00	\$7,800.00	\$10,140.00
	19	Right Abutment Removal - Gunite Curtain Wall	8313	210	210	210	CY	\$170.00	\$215.00	\$380.00	\$35,700.00	\$45,150.00	\$79,800.00
	20	Remove & Dispose - Hand Rails and Light Poles	8420	5,000	5,000	5,000	LBS	\$0.60	\$0.85	\$1.00	\$3,000.00	\$4,250.00	\$5,000.00
	21	Remove & Dispose - Radial Gates and Hoists	8420	66,000	66,000	66,000	LBS	\$0.60	\$0.85	\$1.00	\$39,600.00	\$56,100.00	\$66,000.00
	22	Remove & Dispose - 5-Raidal Gate stoplogs & slots (steel)	8420	95,800	95,800	95,800	LBS	\$0.60	\$0.85	\$1.00	\$57,480.00	\$81,430.00	\$95,800.00
	23	Remove & Dispose - Spillway intake 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
	24	Remove & Dispose - Spillway radial gate motors & control panel	8430	1	1	1	EA	\$900.00	\$1,000.00	\$1,500.00	\$900.00	\$1,000.00	\$1,500.00
	25	Remove & Dispose - Spillway trashrake motor, festoon cable & control panel	8430	1	1	1	EA	\$400.00	\$500.00	\$600.00	\$400.00	\$500.00	\$600.00
	26	Remove & Dispose - Distribution equipment , panelboards	8430	1	1	1	EA	\$4,000.00	\$4,500.00	\$5,000.00	\$4,000.00	\$4,500.00	\$5,000.00
	27	Remove Copper Shingles from Roof of Powerhouse	8130	7,000	7,000	7,000	SF	\$2.00	\$2.50	\$3.00	\$14,000.00	\$17,500.00	\$21,000.00
	28	Remove Powerhouse Concrete down to spring-line of turbine	8130	1,050	1,050	1,050	CY	\$270.00	\$350.00	\$1,000.00	\$283,500.00	\$367,500.00	\$1,050,000.00
	29	Remove Structural Steel items associated with Powerhouse	8130	220,000	220,000	220,000	LBS	\$0.60	\$0.85	\$1.00	\$132,000.00	\$187,000.00	\$220,000.00
	30	Remove Control House Concrete	8130	30	30	30	CY	\$170.00	\$215.00	\$380.00	\$5,100.00	\$6,450.00	\$11,400.00
	31	Remove Control House Structural Steel items	8130	3,500	3,500	3,500	LBS	\$0.60	\$0.85	\$1.00	\$2,100.00	\$2,975.00	\$3,500.00
	32	Remove Shop Building	8130	3,600	3,600	3,600	SF	\$55.00	\$60.00	\$65.00	\$198,000.00	\$216,000.00	\$234,000.00
	33	Remove & Dispose - 2- Govenor 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
	34	Remove & Dispose - Cooling water and bearing oil systems	8420	13,300	13,300	13,300	LBS	\$0.60	\$0.85	\$1.00	\$7,980.00	\$11,305.00	\$13,300.00
	35	Remove & Dispose - Oil / Water seperator tank and piping	8420	2,700	2,700	2,700	LBS	\$0.60	\$0.85	\$1.00	\$1,620.00	\$2,295.00	\$2,700.00
	36	Remove & Dispose - 12 - Cast Iron Columns	8420	54,000	54,000	54,000	LBS	\$0.60	\$0.85	\$1.00	\$32,400.00	\$45,900.00	\$54,000.00
	37	Remove & Dispose - 2 - Francis Turbines	8420	660,000	660,000	660,000	LBS	\$0.60	\$0.85	\$1.00	\$396,000.00	\$561,000.00	\$660,000.00
	38	Remove & Dispose - 2-40 Ton indoor crane	8420	140,000	140,000	140,000	LBS	\$0.60	\$0.85	\$1.00	\$84,000.00	\$119,000.00	\$140,000.00
	39	Remove & Dispose - Compressed Air systems	8420	1,000	1,000	1,000	LBS	\$0.60	\$0.85	\$1.00	\$600.00	\$850.00	\$1,000.00
	40	Remove & Dispose - 2 - CO2 systems	8420	2,100	2,100	2,100	LBS	\$0.60	\$0.85	\$1.00	\$1,260.00	\$1,785.00	\$2,100.00
	41	Remove & Dispose - Plant Water and Fire Protection	8420	3,100	3,100	3,100	LBS	\$0.60	\$0.85	\$1.00	\$1,860.00	\$2,635.00	\$3,100.00
	42	Remove & Dispose - Transformer Oil Fire protection	8420	6,500	6,500	6,500	LBS	\$0.60	\$0.85	\$1.00	\$3,900.00	\$5,525.00	\$6,500.00
	43	Remove & Dispose - Unwatering Piping	8420	32,000	32,000	32,000	LBS	\$0.60	\$0.85	\$1.00	\$19,200.00	\$27,200.00	\$32,000.00
	44	Remove & Dispose - Drainage Piping	8420	10,000	10,000	10,000	LBS	\$0.60	\$0.85	\$1.00	\$6,000.00	\$8,500.00	\$10,000.00
	45	Remove & Dispose - AC Generator, Indoor Vertical	8430	2	2	2	EA	\$120,000.00	\$125,000.00	\$130,000.00	\$240,000.00	\$250,000.00	\$260,000.00
	46	Remove & Dispose - Excitation equipment for 15 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
	47	Remove & Dispose - Surge protection equip. for 15 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

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			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 2\Copco 2 - Full Removal Crystal Ball - with Escalation - 2011-04.xls\Copco 2 - 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 - Neutral grounding equip. for 15 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
	49	Remove & Dispose - Generator Switchgear, 7.2kV-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
	50	Remove & Dispose - 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
	51	Remove & Dispose - 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
	52	Remove & Dispose - 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
	53	Remove & Dispose - 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
	54	Remove & Dispose - 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
	55	Remove & Dispose - 7 40-Ton Travelling Crane motors-hoist (2-30Hp*)	8430	1	1	1	EA	\$2,000.00	\$2,500.00	\$3,000.00	\$2,000.00	\$2,500.00	\$3,000.00
	56	Remove & Dispose - 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
	57	Remove & Dispose - 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
	58	Remove & Dispose - Step-up Transformers, outdoor, oil-filled, 1-phase, 10/20 MVA 6600/72000 volt	8430	0	0	0	EA				\$0.00	\$0.00	\$0.00
	59	Remove & Dispose - Step-up Transformers, outdoor, oil-filled, 1-phase, 10/20 MVA, 73800/230000 volt	8430	0	0	0	EA				\$0.00	\$0.00	\$0.00
	60	Remove & Dispose - Transmission Line No. 15	8430	0.14	0.14	0.14	MILE	\$25,000.00	\$30,000.00	\$40,000.00	\$3,500.00	\$4,200.00	\$5,600.00
	61	Remove Intake Structure Concrete	8130	1,500	1,500	1,500	CY	\$170.00	\$215.00	\$380.00	\$255,000.00	\$322,500.00	\$570,000.00
	62	Remove Concrete Items associated with 16-foot I.D. Wood Stave Pipe	8130	1,300	1,300	1,300	CY	\$170.00	\$215.00	\$380.00	\$221,000.00	\$279,500.00	\$494,000.00
	63	Place Concrete Plugs for Tunnels	8130	100	100	100	CY	\$1,100.00	\$1,200.00	\$1,300.00	\$110,000.00	\$120,000.00	\$130,000.00
	64	Remove Concrete Items associated with Penstocks D/S from Tunnel No. 2	8130	3,500	3,500	3,500	CY	\$170.00	\$215.00	\$380.00	\$595,000.00	\$752,500.00	\$1,330,000.00
	65	Remove and Dispose of Caterpillar Gate (steel)	8420	50,000	50,000	50,000	LBS	\$0.60	\$0.85	\$1.00	\$30,000.00	\$42,500.00	\$50,000.00
	66	Remove and Dispose of Trash rack and trash rake (steel)	8420	86,000	86,000	86,000	LBS	\$0.60	\$0.75	\$0.85	\$51,600.00	\$64,500.00	\$73,100.00
	67	Remove and Dispose of Stop Logs and slots for intake (steel)	8420	220,000	220,000	220,000	LBS	\$0.60	\$0.85	\$1.00	\$132,000.00	\$187,000.00	\$220,000.00
	68	Remove and Dispose of Wood Staves Soaked in Creosote	8420	1,100,000	1,100,000	1,100,000	LBS	\$0.65	\$0.70	\$0.85	\$715,000.00	\$770,000.00	\$935,000.00
	69	Remove and Dispose of Cradles (steel)	8420	290,000	290,000	290,000	LBS	\$0.60	\$0.85	\$1.00	\$174,000.00	\$246,500.00	\$290,000.00
	70	Remove and Dispose of Bands (steel)	8420	463,000	463,000	463,000	LBS	\$0.60	\$0.85	\$1.00	\$277,800.00	\$393,550.00	\$463,000.00
	71	Remove and Dispose of Penstock after bifurcation to butterfly valves	8420	860,000	860,000	860,000	LBS	\$0.60	\$0.85	\$1.00	\$516,000.00	\$731,000.00	\$860,000.00
	72	Remove and Dispose of Bifurcated vent pipes and support structure	8420	19,500	19,500	19,500	LBS	\$0.60	\$0.85	\$1.00	\$11,700.00	\$16,575.00	\$19,500.00
	73	Remove and Dispose of 2 - 138" Butterfly valves	8420	148,000	148,000	148,000	LBS	\$0.60	\$0.85	\$1.00	\$88,800.00	\$125,800.00	\$148,000.00
		Subtotal 1									\$6,739,830.00	\$8,436,910.00	\$18,102,530.00
		Mobilization (MPL ~ 5%; MP ~ 5%, MPH ~ 5%)		1	1	1	ls	\$340,000.00	\$420,000.00	\$910,000.00	\$340,000.00	\$420,000.00	\$910,000.00
		Subtotal 1 w/ mobilization									\$7,079,830.00	\$8,856,910.00	\$19,012,530.00
		Escalation to Notice to Proceed (NTP)		1	1	1	ls	\$1,136,602.00	\$3,048,036.00	\$10,162,062.00	\$1,136,602.00	\$3,048,036.00	\$10,162,062.00
		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	\$683,568.00	\$1,087,054.00	\$4,154,392.00	\$683,568.00	\$1,097,054.00	\$4,154,392.00
		APS = Allowance for Procurement		1	1	1	ls	\$0.00	\$0.00	\$671,016.00	\$0.00	\$0.00	\$671,016.00
		Strategies (if applicable) (MPL ~ 0%; MP ~ 0%; MPH ~ 2%)											
		CONTRACT COST									\$8,900,000.00	\$13,000,000.00	\$34,000,000.00
		Construction Contingencies (MPL ~ 18%; MP ~ 20%; MPH ~ 25%)		1	1	1	ls	\$1,600,000.00	\$2,500,000.00	\$9,000,000.00	\$1,600,000.00	\$2,500,000.00	\$9,000,000.00
		FIELD COST									\$10,500,000.00	\$15,500,000.00	\$43,000,000.00
		Non-Contract Cost (MPL ~ 52%; MP ~ 55%; MPH ~ 61%)		1	1	1	ls	\$5,500,000.00	\$8,500,000.00	\$26,000,000.00	\$5,500,000.00	\$8,500,000.00	\$26,000,000.00
		CONSTRUCTION COST									\$16,000,000.00	\$24,000,000.00	\$69,000,000.00

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	05/25/11	PEER REVIEW	

Crystal Ball Report - Full

Simulation started on 6/8/2011 at 12:49:07
 Simulation stopped on 6/8/2011 at 12:49:59

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) 51.78
 Trials/second (average) 193
 Random numbers per sec 29,742

Crystal Ball data:

Assumptions 154
 Correlations 0
 Correlated groups 0
 Decision variables 0
 Forecasts 3

TECHNICAL SERVICE CENTER
 ESTIMATING, SPECIFICATIONS
 AND VALUE PROGRAM GROUP

UNIT PRICES BY Craig A. Grush
 DATE 6/9/2011

DATE	PEER REVIEWER(S)	CODE
6/9/11	<i>Dan Maas</i> Signature DAN MAAS Printed Name	8170
	Signature	
	Printed Name	
Author Initials		PEER REVIEW NOT REQUIRED

Forecasts

Worksheet: [Copco 2 - Full Removal Crystal Ball - with Escalation - 2011-04.xls]Copco 2 - Full

Forecast: Construction Cost - Copco No. 2 - Full Removal - With Escalation

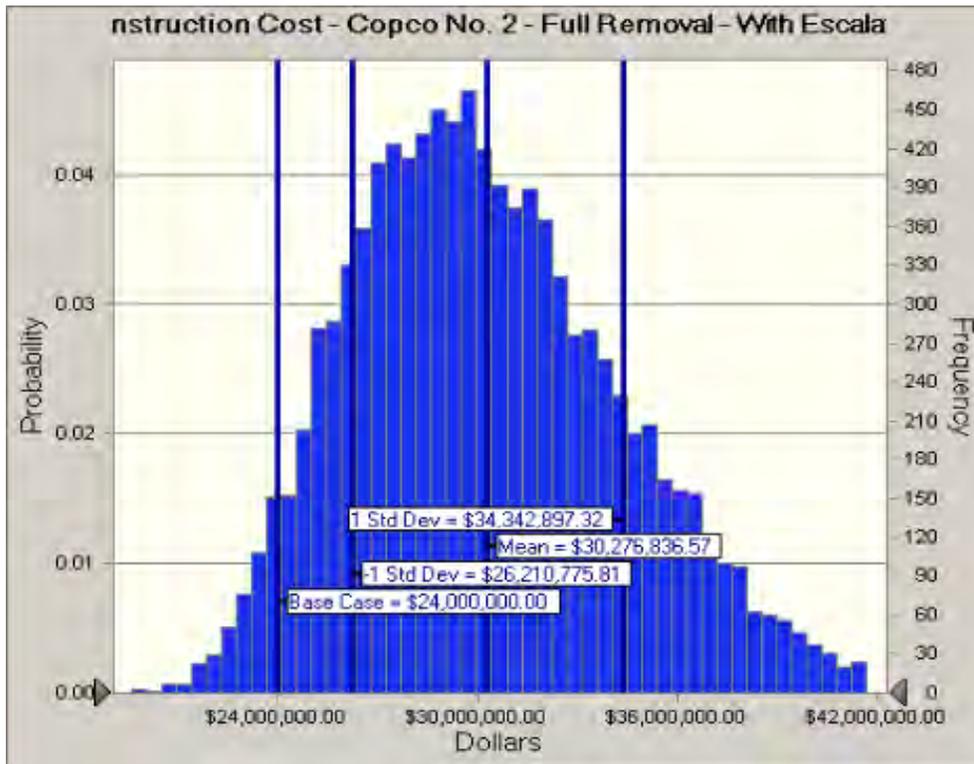
Cell: U101

Summary:

Entire range is from \$19,600,022.02 to \$46,617,455.61

Base case is \$24,000,000.00

After 10,000 trials, the std. error of the mean is \$40,660.61



Forecast: Construction Cost - Copco No. 2 - Full Removal - With Escalation (cont'd)Cell: U101

Statistics:	Forecast values
Trials	10,000
Mean	\$30,276,836.57
Median	\$29,852,759.55
Mode	---
Standard Deviation	\$4,066,060.76
Variance	\$16,532,850,088,294.10
Skewness	0.4595
Kurtosis	2.95
Coeff. of Variability	0.1343
Minimum	\$19,600,022.02
Maximum	\$46,617,455.61
Range Width	\$27,017,433.59
Mean Std. Error	\$40,660.61

Percentiles:	Forecast values
0%	\$19,600,022.02
10%	\$25,314,965.30
20%	\$26,732,187.90
30%	\$27,814,772.61
40%	\$28,875,989.65
50%	\$29,851,421.66
60%	\$30,950,921.89
70%	\$32,156,784.61
80%	\$33,724,473.97
90%	\$35,886,502.51
100%	\$46,617,455.61

Forecast: Contract Cost - Copco No. 2 - Full Removal - With Escalation

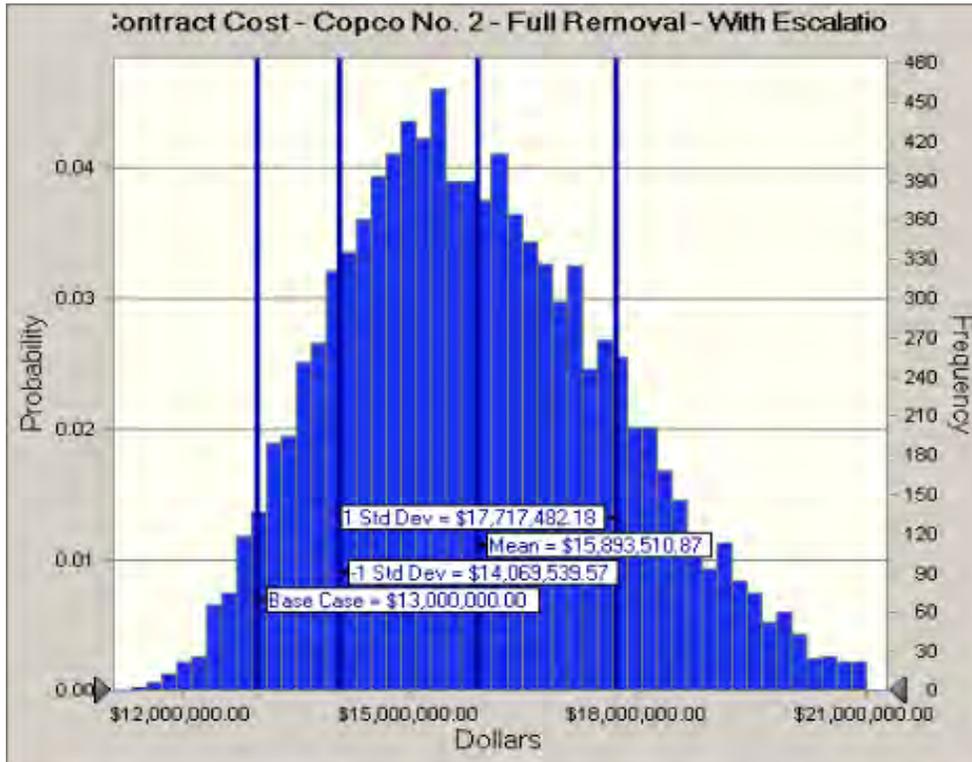
Cell: U97

Summary:

Entire range is from \$11,342,441.45 to \$22,813,757.17

Base case is \$13,000,000.00

After 10,000 trials, the std. error of the mean is \$18,239.71



Forecast: Contract Cost - Copco No. 2 - Full Removal - With Escalation (cont'd)

Cell: U97

Statistics:	Forecast values
Trials	10,000
Mean	\$15,893,510.87
Median	\$15,732,288.47
Mode	---
Standard Deviation	\$1,823,971.31
Variance	\$3,326,871,333,287.62
Skewness	0.3964
Kurtosis	2.84
Coeff. of Variability	0.1148
Minimum	\$11,342,441.45
Maximum	\$22,813,757.17
Range Width	\$11,471,315.72
Mean Std. Error	\$18,239.71

Percentiles:	Forecast values
0%	\$11,342,441.45
10%	\$13,640,753.26
20%	\$14,288,131.00
30%	\$14,798,788.08
40%	\$15,253,020.43
50%	\$15,731,934.56
60%	\$16,230,472.55
70%	\$16,794,134.43
80%	\$17,468,218.55
90%	\$18,358,651.26
100%	\$22,813,757.17

Forecast: Field Cost - Copco No. 2 - Full Removal - With Escalation

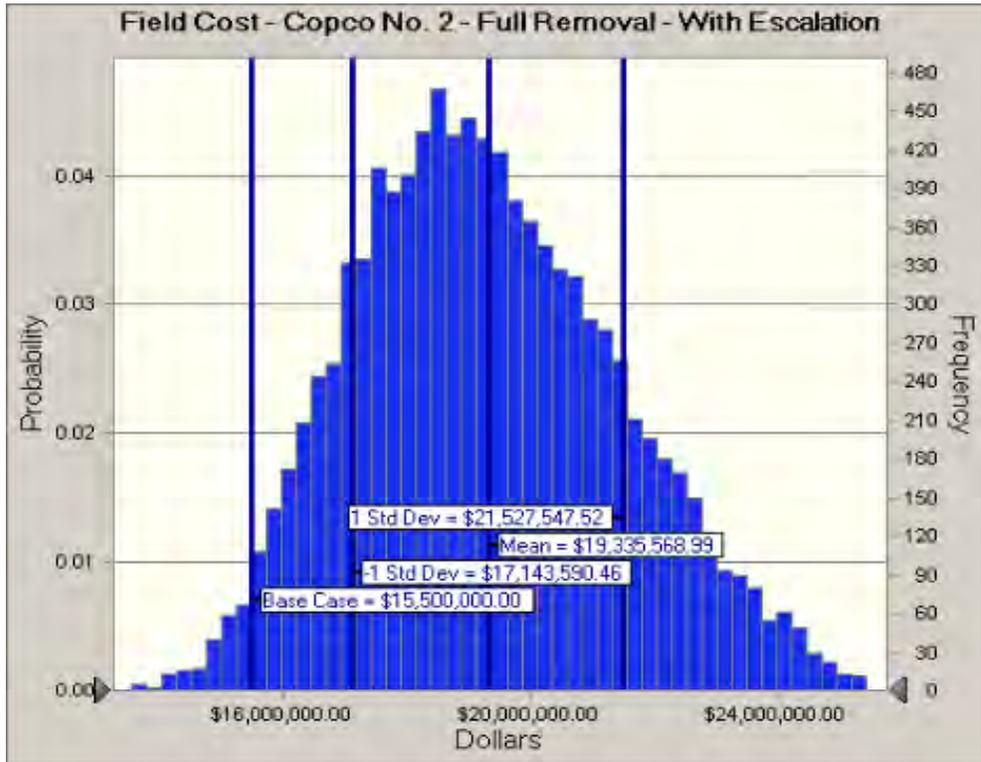
Cell: U99

Summary:

Entire range is from \$13,547,597.36 to \$27,683,965.73

Base case is \$15,500,000.00

After 10,000 trials, the std. error of the mean is \$21,919.79



Forecast: Field Cost - Copco No. 2 - Full Removal - With Escalation (cont'd)

Cell: U99

Statistics:	Forecast values
Trials	10,000
Mean	\$19,335,568.99
Median	\$19,151,240.09
Mode	---
Standard Deviation	\$2,191,978.53
Variance	\$4,804,769,888,090.42
Skewness	0.3803
Kurtosis	2.92
Coeff. of Variability	0.1134
Minimum	\$13,547,597.36
Maximum	\$27,683,965.73
Range Width	\$14,136,368.38
Mean Std. Error	\$21,919.79

Percentiles:	Forecast values
0%	\$13,547,597.36
10%	\$16,615,926.69
20%	\$17,429,404.48
30%	\$18,046,141.40
40%	\$18,590,021.91
50%	\$19,150,042.77
60%	\$19,737,270.05
70%	\$20,405,701.80
80%	\$21,196,522.40
90%	\$22,313,891.28
100%	\$27,683,965.73

End of Forecasts

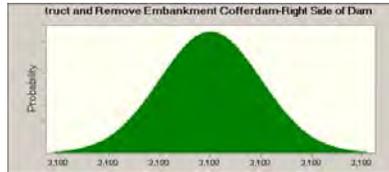
Assumptions

Worksheet: [Copco 2 - Full Removal Crystal Ball - with Escalation - 2011-04.xls]Copco 2 - Full

Assumption: 1 Construct and Remove Embankment Cofferdam-Right Side of Dam Quantity **Cell: L14**

Normal distribution with parameters:

Mean 3,100 (=L14)
 Std. Dev. 0 (=0.000001)



Assumption: 1 Construct and Remove Embankment Cofferdam-Right Side of Dam Unit Price **Cell: R14**

BetaPERT distribution with parameters:

Minimum \$70.00 (=Q14)
 Likeliest \$85.00 (=R14)
 Maximum \$130.00 (=S14)

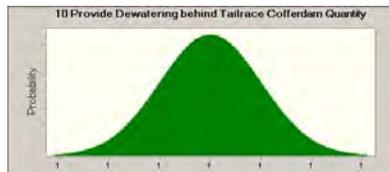


Assumption: 10 Provide Dewatering behind Tailrace Cofferdam Quantity

Cell: L23

Normal distribution with parameters:

Mean 1 (=L23)
 Std. Dev. 0 (=0.000001)



Assumption: 10 Provide Dewatering behind Tailrace Cofferdam Unit Price

Cell: R23

BetaPERT distribution with parameters:

Minimum	\$30,000.00	(=Q23)
Likeliest	\$35,000.00	(=R23)
Maximum	\$250,000.00	(=S23)

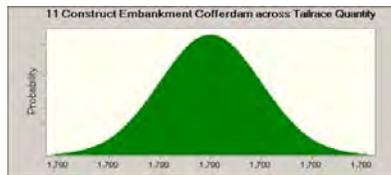


Assumption: 11 Construct Embankment Cofferdam across Tailrace Quantity

Cell: L24

Normal distribution with parameters:

Mean	1,700	(=L24)
Std. Dev.	0	(=0.000001)

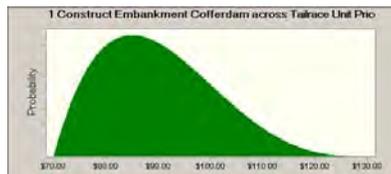


Assumption: 11 Construct Embankment Cofferdam across Tailrace Unit Price

Cell: R24

BetaPERT distribution with parameters:

Minimum	\$70.00	(=Q24)
Likeliest	\$85.00	(=R24)
Maximum	\$130.00	(=S24)

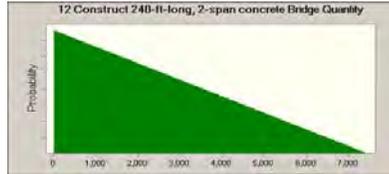


Assumption: 12 Construct 240-ft-long, 2-span concrete Bridge Quantity

Cell: L25

Triangular distribution with parameters:

Minimum	0	(=K25)
Likeliest	0	(=L25)
Maximum	7,440	(=M25)

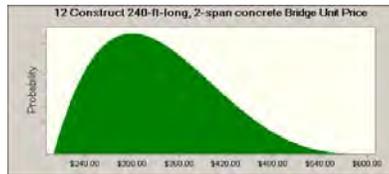


Assumption: 12 Construct 240-ft-long, 2-span concrete Bridge Unit Price

Cell: R25

BetaPERT distribution with parameters:

Minimum	\$200.00	(=Q25)
Likeliest	\$300.00	(=R25)
Maximum	\$600.00	(=S25)



Assumption: 13 Remove and dispose of existing bridge Quantity

Cell: L26

Triangular distribution with parameters:

Minimum	0	(=K26)
Likeliest	0	(=L26)
Maximum	1	(=M26)

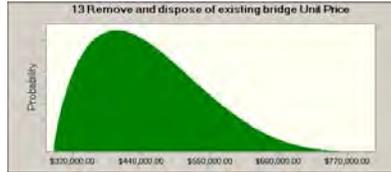


Assumption: 13 Remove and dispose of existing bridge Unit Price

Cell: R26

BetaPERT distribution with parameters:

Minimum	\$300,000.00	(=Q26)
Likeliest	\$400,000.00	(=R26)
Maximum	\$800,000.00	(=S26)



Assumption: 14 Remove Concrete in Dam Quantity

Cell: L27

Normal distribution with parameters:

Mean	4,400	(=L27)
Std. Dev.	0	(=0.000001)

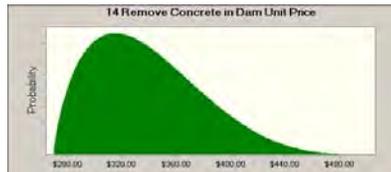


Assumption: 14 Remove Concrete in Dam Unit Price

Cell: R27

BetaPERT distribution with parameters:

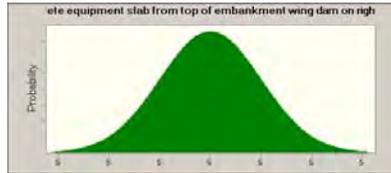
Minimum	\$270.00	(=Q27)
Likeliest	\$315.00	(=R27)
Maximum	\$500.00	(=S27)



Assumption: 15 Remove concrete equipment slab from top of embankment wing dam on right **Cell: L28**

Normal distribution with parameters:

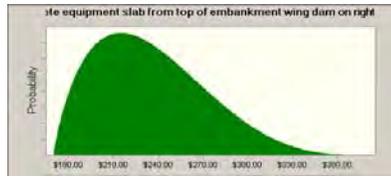
Mean 5 (=L28)
 Std. Dev. 0 (=0.000001)



Assumption: 15 Remove concrete equipment slab from top of embankment wing dam on right **Cell: R28**

BetaPERT distribution with parameters:

Minimum \$170.00 (=Q28)
 Likeliest \$215.00 (=R28)
 Maximum \$380.00 (=S28)



Assumption: 16 Remove Concrete Wingwall Quantity

Cell: L29

Normal distribution with parameters:

Mean 220 (=L29)
 Std. Dev. 0 (=0.000001)

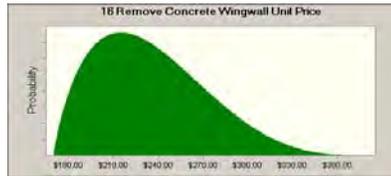


Assumption: 16 Remove Concrete Wingwall Unit Price

Cell: R29

BetaPERT distribution with parameters:

Minimum	\$170.00	(=Q29)
Likeliest	\$215.00	(=R29)
Maximum	\$380.00	(=S29)

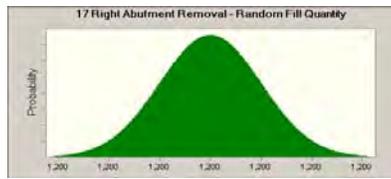


Assumption: 17 Right Abutment Removal - Random Fill Quantity

Cell: L30

Normal distribution with parameters:

Mean	1,200	(=L30)
Std. Dev.	0	(=0.000001)



Assumption: 17 Right Abutment Removal - Random Fill Unit Price

Cell: R30

BetaPERT distribution with parameters:

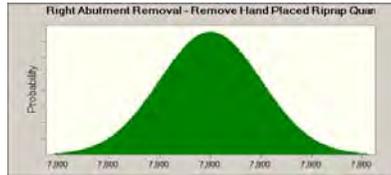
Minimum	\$13.00	(=Q30)
Likeliest	\$15.00	(=R30)
Maximum	\$18.00	(=S30)



Assumption: 18 Right Abutment Removal - Remove Hand Placed Riprap Quantity Cell: L31

Normal distribution with parameters:

Mean	7,800	(=L31)
Std. Dev.	0	(=0.000001)



Assumption: 18 Right Abutment Removal - Remove Hand Placed Riprap Unit Price Cell: R31

BetaPERT distribution with parameters:

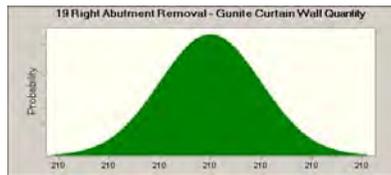
Minimum	\$0.85	(=Q31)
Likeliest	\$1.00	(=R31)
Maximum	\$1.30	(=S31)



Assumption: 19 Right Abutment Removal - Gunite Curtain Wall Quantity Cell: L32

Normal distribution with parameters:

Mean	210	(=L32)
Std. Dev.	0	(=0.000001)



Assumption: 19 Right Abutment Removal - Gunite Curtain Wall Unit Price

Cell: R32

BetaPERT distribution with parameters:

Minimum	\$170.00	(=Q32)
Likeliest	\$215.00	(=R32)
Maximum	\$380.00	(=S32)

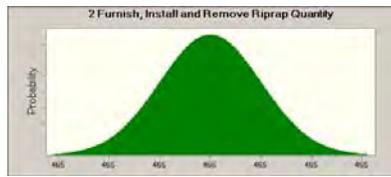


Assumption: 2 Furnish, Install and Remove Riprap Quantity

Cell: L15

Normal distribution with parameters:

Mean	465	(=L15)
Std. Dev.	0	(=0.000001)



Assumption: 2 Furnish, Install and Remove Riprap Unit Price

Cell: R15

BetaPERT distribution with parameters:

Minimum	\$120.00	(=Q15)
Likeliest	\$150.00	(=R15)
Maximum	\$200.00	(=S15)

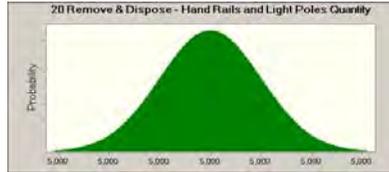


Assumption: 20 Remove & Dispose - Hand Rails and Light Poles Quantity

Cell: L33

Normal distribution with parameters:

Mean 5,000 (=L33)
 Std. Dev. 0 (=0.000001)

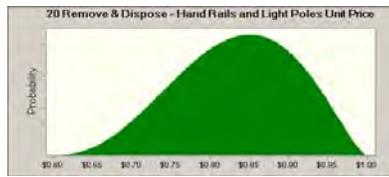


Assumption: 20 Remove & Dispose - Hand Rails and Light Poles Unit Price

Cell: R33

BetaPERT distribution with parameters:

Minimum \$0.60 (=Q33)
 Likeliest \$0.85 (=R33)
 Maximum \$1.00 (=S33)

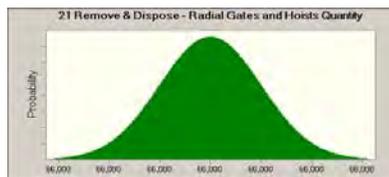


Assumption: 21 Remove & Dispose - Radial Gates and Hoists Quantity

Cell: L34

Normal distribution with parameters:

Mean 66,000 (=L34)
 Std. Dev. 0 (=0.000001)

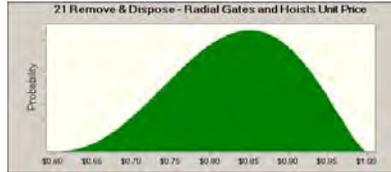


Assumption: 21 Remove & Dispose - Radial Gates and Hoists Unit Price

Cell: R34

BetaPERT distribution with parameters:

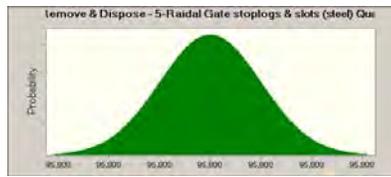
Minimum	\$0.60	(=Q34)
Likeliest	\$0.85	(=R34)
Maximum	\$1.00	(=S34)



Assumption: 22 Remove & Dispose - 5-Raidal Gate stoplogs & slots (steel) Quantity Cell: L35

Normal distribution with parameters:

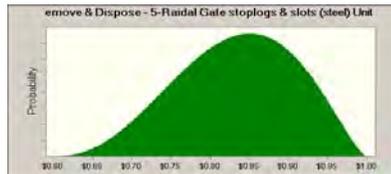
Mean	95,800	(=L35)
Std. Dev.	0	(=0.000001)



Assumption: 22 Remove & Dispose - 5-Raidal Gate stoplogs & slots (steel) Unit Price Cell: R35

BetaPERT distribution with parameters:

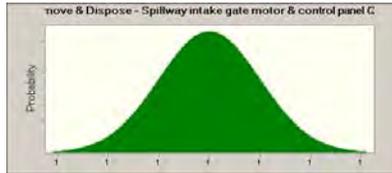
Minimum	\$0.60	(=Q35)
Likeliest	\$0.85	(=R35)
Maximum	\$1.00	(=S35)



Assumption: 23 Remove & Dispose - Spillway intake gate motor & control panel Quantity L36

Normal distribution with parameters:

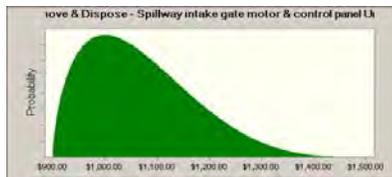
Mean	1	(=L36)
Std. Dev.	0	(=0.000001)



Assumption: 23 Remove & Dispose - Spillway intake gate motor & control panel Unit Price R36

BetaPERT distribution with parameters:

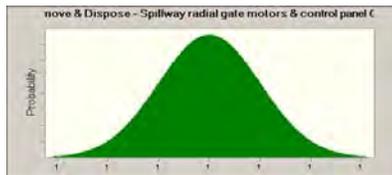
Minimum	\$900.00	(=Q36)
Likeliest	\$1,000.00	(=R36)
Maximum	\$1,500.00	(=S36)



Assumption: 24 Remove & Dispose - Spillway radial gate motors & control panel Quantity L37

Normal distribution with parameters:

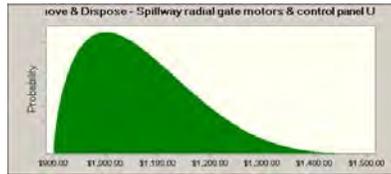
Mean	1	(=L37)
Std. Dev.	0	(=0.000001)



Assumption: 24 Remove & Dispose - Spillway radial gate motors & control panel Unit C1137

BetaPERT distribution with parameters:

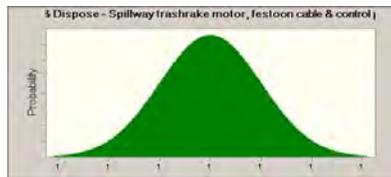
Minimum	\$900.00	(=Q37)
Likeliest	\$1,000.00	(=R37)
Maximum	\$1,500.00	(=S37)



Assumption: 25 Remove & Dispose - Spillway trashrake motor, festoon cable & control panel L38

Normal distribution with parameters:

Mean	1	(=L38)
Std. Dev.	0	(=0.000001)



Assumption: 25 Remove & Dispose - Spillway trashrake motor, festoon cable & control panel R38

BetaPERT distribution with parameters:

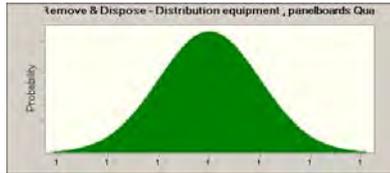
Minimum	\$400.00	(=Q38)
Likeliest	\$500.00	(=R38)
Maximum	\$600.00	(=S38)



Assumption: 26 Remove & Dispose - Distribution equipment , panelboards Quantity Cell: L39

Normal distribution with parameters:

Mean	1	(=L39)
Std. Dev.	0	(=0.000001)



Assumption: 26 Remove & Dispose - Distribution equipment , panelboards Unit Price Cell: R39

BetaPERT distribution with parameters:

Minimum	\$4,000.00	(=Q39)
Likeliest	\$4,500.00	(=R39)
Maximum	\$5,000.00	(=S39)

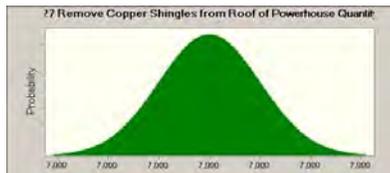


Assumption: 27 Remove Copper Shingles from Roof of Powerhouse Quantity Cell: L40

Cell: L40

Normal distribution with parameters:

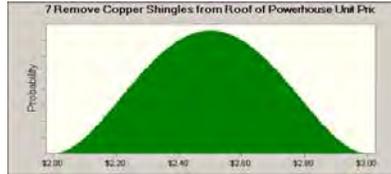
Mean	7,000	(=L40)
Std. Dev.	0	(=0.000001)



Assumption: 27 Remove Copper Shingles from Roof of Powerhouse Unit Price Cell: R40

BetaPERT distribution with parameters:

Minimum	\$2.00	(=Q40)
Likeliest	\$2.50	(=R40)
Maximum	\$3.00	(=S40)



Assumption: 28 Remove Powerhouse Concrete down to spring-line of turbine Quantity Cell: L41

Normal distribution with parameters:

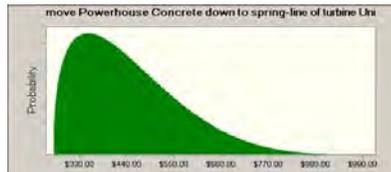
Mean	1,050	(=L41)
Std. Dev.	0	(=0.000001)



Assumption: 28 Remove Powerhouse Concrete down to spring-line of turbine Unit Price Cell: R41

BetaPERT distribution with parameters:

Minimum	\$270.00	(=Q41)
Likeliest	\$350.00	(=R41)
Maximum	\$1,000.00	(=S41)



Assumption: 29 Remove Structural Steel items associated with Powerhouse Quantity Cell: L42

Normal distribution with parameters:

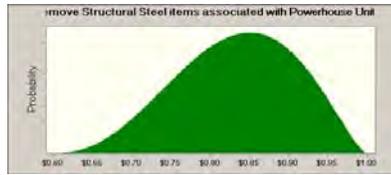
Mean	220,000	(=L42)
Std. Dev.	0	(=0.000001)



Assumption: 29 Remove Structural Steel items associated with Powerhouse Unit Price Cell: R42

BetaPERT distribution with parameters:

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

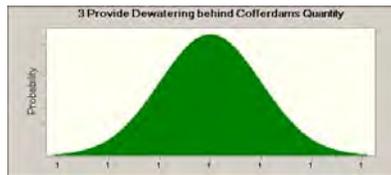


Assumption: 3 Provide Dewatering behind Cofferdams Quantity

Cell: L16

Normal distribution with parameters:

Mean	1	(=L16)
Std. Dev.	0	(=0.000001)

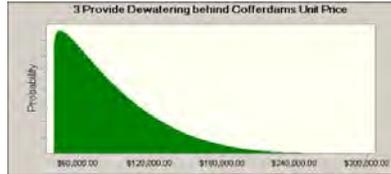


Assumption: 3 Provide Dewatering behind Cofferdams Unit Price

Cell: R16

BetaPERT distribution with parameters:

Minimum	\$40,000.00	(=Q16)
Likeliest	\$45,000.00	(=R16)
Maximum	\$300,000.00	(=S16)



Assumption: 30 Remove Control House Concrete Quantity

Cell: L43

Normal distribution with parameters:

Mean	30	(=L43)
Std. Dev.	0	(=0.000001)

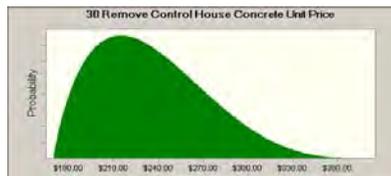


Assumption: 30 Remove Control House Concrete Unit Price

Cell: R43

BetaPERT distribution with parameters:

Minimum	\$170.00	(=Q43)
Likeliest	\$215.00	(=R43)
Maximum	\$380.00	(=S43)



Assumption: 31 Remove Control House Structural Steel items Quantity

Cell: L44

Normal distribution with parameters:

Mean	3,500	(=L44)
Std. Dev.	0	(=0.000001)



Assumption: 31 Remove Control House Structural Steel items Unit Price

Cell: R44

BetaPERT distribution with parameters:

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



Assumption: 32 Remove Shop Building Quantity

Cell: L45

Normal distribution with parameters:

Mean	3,600	(=L45)
Std. Dev.	0	(=0.000001)



Assumption: 32 Remove Shop Building Unit Price

Cell: R45

BetaPERT distribution with parameters:

Minimum	\$55.00	(=Q45)
Likeliest	\$60.00	(=R45)
Maximum	\$65.00	(=S45)

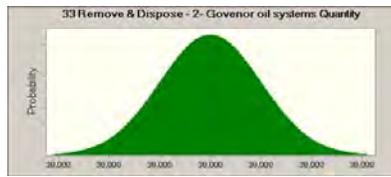


Assumption: 33 Remove & Dispose - 2- Govenor oil systems Quantity

Cell: L46

Normal distribution with parameters:

Mean	38,000	(=L46)
Std. Dev.	0	(=0.000001)

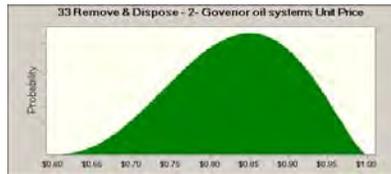


Assumption: 33 Remove & Dispose - 2- Govenor oil systems Unit Price

Cell: R46

BetaPERT distribution with parameters:

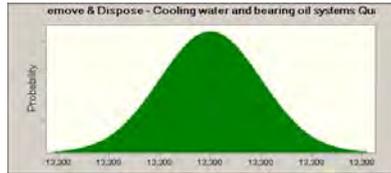
Minimum	\$0.60	(=Q46)
Likeliest	\$0.85	(=R46)
Maximum	\$1.00	(=S46)



Assumption: 34 Remove & Dispose - Cooling water and bearing oil systems Quantity Cell: L47

Normal distribution with parameters:

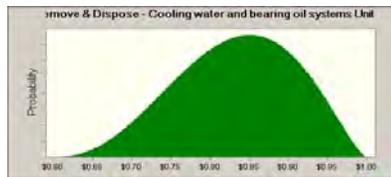
Mean	13,300	(=L47)
Std. Dev.	0	(=0.000001)



Assumption: 34 Remove & Dispose - Cooling water and bearing oil systems Unit Price Cell: R47

BetaPERT distribution with parameters:

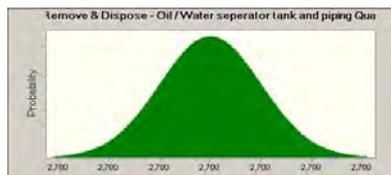
Minimum	\$0.60	(=Q47)
Likeliest	\$0.85	(=R47)
Maximum	\$1.00	(=S47)



Assumption: 35 Remove & Dispose - Oil / Water seperator tank and piping Quantity Cell: L48

Normal distribution with parameters:

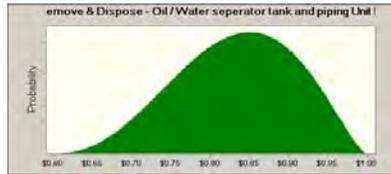
Mean	2,700	(=L48)
Std. Dev.	0	(=0.000001)



Assumption: 35 Remove & Dispose - Oil / Water separator tank and 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 - 12 - Cast Iron Columns Quantity

Cell: L49

Normal distribution with parameters:

Mean	54,000	(=L49)
Std. Dev.	0	(=0.000001)



Assumption: 36 Remove & Dispose - 12 - Cast Iron Columns Unit Price

Cell: R49

BetaPERT distribution with parameters:

Minimum	\$0.60	(=Q49)
Likeliest	\$0.85	(=R49)
Maximum	\$1.00	(=S49)

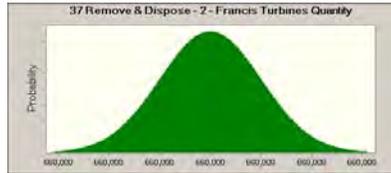


Assumption: 37 Remove & Dispose - 2 - Francis Turbines Quantity

Cell: L50

Normal distribution with parameters:

Mean	660,000	(=L50)
Std. Dev.	0	(=0.000001)

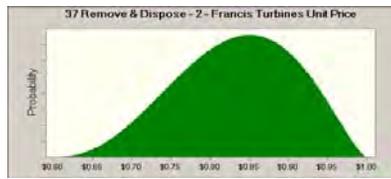


Assumption: 37 Remove & Dispose - 2 - Francis Turbines Unit Price

Cell: R50

BetaPERT distribution with parameters:

Minimum	\$0.60	(=Q50)
Likeliest	\$0.85	(=R50)
Maximum	\$1.00	(=S50)



Assumption: 38 Remove & Dispose - 2-40 Ton indoor crane Quantity

Cell: L51

Normal distribution with parameters:

Mean	140,000	(=L51)
Std. Dev.	0	(=0.000001)



Assumption: 38 Remove & Dispose - 2-40 Ton indoor crane Unit Price

Cell: R51

BetaPERT distribution with parameters:

Minimum	\$0.60	(=Q51)
Likeliest	\$0.85	(=R51)
Maximum	\$1.00	(=S51)

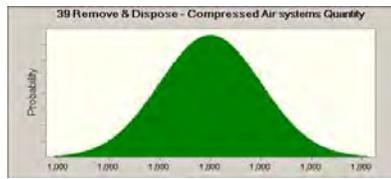


Assumption: 39 Remove & Dispose - Compressed Air systems Quantity

Cell: L52

Normal distribution with parameters:

Mean	1,000	(=L52)
Std. Dev.	0	(=0.000001)



Assumption: 39 Remove & Dispose - Compressed Air systems Unit Price

Cell: R52

BetaPERT distribution with parameters:

Minimum	\$0.60	(=Q52)
Likeliest	\$0.85	(=R52)
Maximum	\$1.00	(=S52)



Assumption: 4 Remove Water from behind Cofferdams Quantity

Cell: L17

Normal distribution with parameters:

Mean 241,000 (=L17)
Std. Dev. 0 (=0.000001)

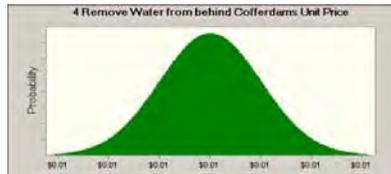


Assumption: 4 Remove Water from behind Cofferdams Unit Price

Cell: R17

Normal distribution with parameters:

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

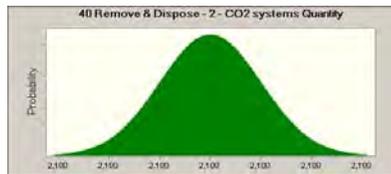


Assumption: 40 Remove & Dispose - 2 - CO2 systems Quantity

Cell: L53

Normal distribution with parameters:

Mean 2,100 (=L53)
Std. Dev. 0 (=0.000001)

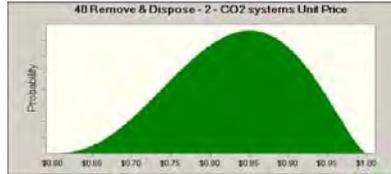


Assumption: 40 Remove & Dispose - 2 - CO2 systems Unit Price

Cell: R53

BetaPERT distribution with parameters:

Minimum	\$0.60	(=Q53)
Likeliest	\$0.85	(=R53)
Maximum	\$1.00	(=S53)

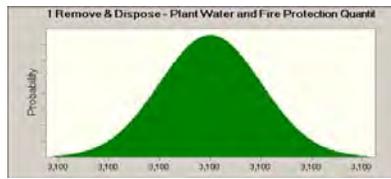


Assumption: 41 Remove & Dispose - Plant Water and Fire Protection Quantity

Cell: L54

Normal distribution with parameters:

Mean	3,100	(=L54)
Std. Dev.	0	(=0.000001)



Assumption: 41 Remove & Dispose - Plant Water and Fire Protection Unit Price

Cell: R54

BetaPERT distribution with parameters:

Minimum	\$0.60	(=Q54)
Likeliest	\$0.85	(=R54)
Maximum	\$1.00	(=S54)

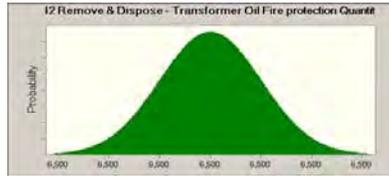


Assumption: 42 Remove & Dispose - Transformer Oil Fire protection Quantity

Cell: L55

Normal distribution with parameters:

Mean	6,500	(=L55)
Std. Dev.	0	(=0.000001)

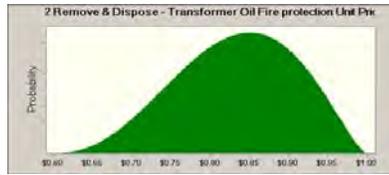


Assumption: 42 Remove & Dispose - Transformer Oil Fire protection Unit Price

Cell: R55

BetaPERT distribution with parameters:

Minimum	\$0.60	(=Q55)
Likeliest	\$0.85	(=R55)
Maximum	\$1.00	(=S55)



Assumption: 43 Remove & Dispose - Unwatering Piping Quantity

Cell: L56

Normal distribution with parameters:

Mean	32,000	(=L56)
Std. Dev.	0	(=0.000001)



Assumption: 43 Remove & Dispose - Unwatering Piping Unit Price

Cell: R56

BetaPERT distribution with parameters:

Minimum	\$0.60	(=Q56)
Likeliest	\$0.85	(=R56)
Maximum	\$1.00	(=S56)

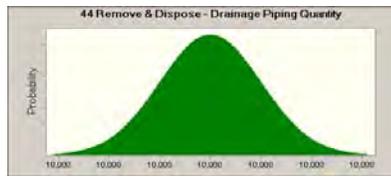


Assumption: 44 Remove & Dispose - Drainage Piping Quantity

Cell: L57

Normal distribution with parameters:

Mean	10,000	(=L57)
Std. Dev.	0	(=0.000001)

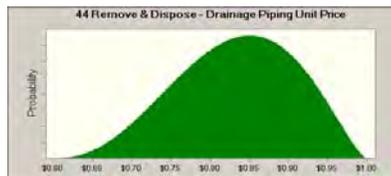


Assumption: 44 Remove & Dispose - Drainage Piping Unit Price

Cell: R57

BetaPERT distribution with parameters:

Minimum	\$0.60	(=Q57)
Likeliest	\$0.85	(=R57)
Maximum	\$1.00	(=S57)

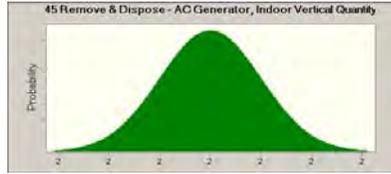


Assumption: 45 Remove & Dispose - AC Generator, Indoor Vertical Quantity

Cell: L58

Normal distribution with parameters:

Mean	2	(=L58)
Std. Dev.	0	(=0.000001)

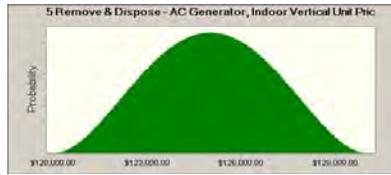


Assumption: 45 Remove & Dispose - AC Generator, Indoor Vertical Unit Price

Cell: R58

BetaPERT distribution with parameters:

Minimum	\$120,000.00	(=Q58)
Likeliest	\$125,000.00	(=R58)
Maximum	\$130,000.00	(=S58)

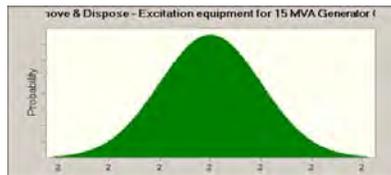


Assumption: 46 Remove & Dispose - Excitation equipment for 15 MVA Generator Quantity

Cell: L59

Normal distribution with parameters:

Mean	2	(=L59)
Std. Dev.	0	(=0.000001)



Assumption: 46 Remove & Dispose - Excitation equipment for 15 MVA Generator Unit R59

BetaPERT distribution with parameters:

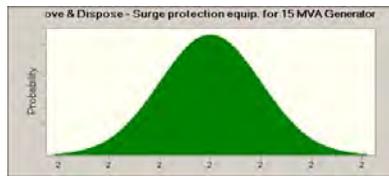
Minimum	\$5,000.00	(=Q59)
Likeliest	\$6,000.00	(=R59)
Maximum	\$7,000.00	(=S59)



Assumption: 47 Remove & Dispose - Surge protection equip. for 15 MVA Generator Unit L60

Normal distribution with parameters:

Mean	2	(=L60)
Std. Dev.	0	(=0.000001)



Assumption: 47 Remove & Dispose - Surge protection equip. for 15 MVA Generator Unit R60

BetaPERT distribution with parameters:

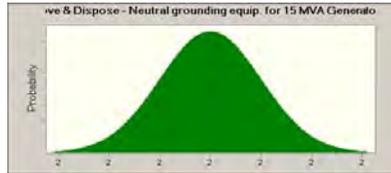
Minimum	\$1,500.00	(=Q60)
Likeliest	\$2,000.00	(=R60)
Maximum	\$3,000.00	(=S60)



Assumption: 48 Remove & Dispose - Neutral grounding equip. for 15 MVA Generator Unit R61

Normal distribution with parameters:

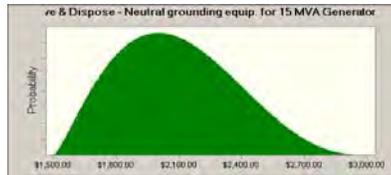
Mean	2	(=L61)
Std. Dev.	0	(=0.000001)



Assumption: 48 Remove & Dispose - Neutral grounding equip. for 15 MVA Generator Unit R61

BetaPERT distribution with parameters:

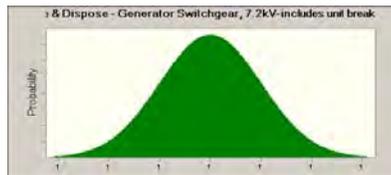
Minimum	\$1,500.00	(=Q61)
Likeliest	\$2,000.00	(=R61)
Maximum	\$3,000.00	(=S61)



Assumption: 49 Remove & Dispose - Generator Switchgear, 7.2kV-includes unit breaker L62

Normal distribution with parameters:

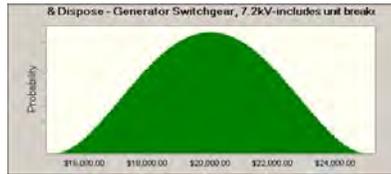
Mean	1	(=L62)
Std. Dev.	0	(=0.000001)



Assumption: 49 Remove & Dispose - Generator Switchgear, 7.2kV-includes unit breaker R62

BetaPERT distribution with parameters:

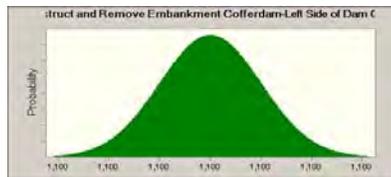
Minimum	\$15,000.00	(=Q62)
Likeliest	\$20,000.00	(=R62)
Maximum	\$25,000.00	(=S62)



Assumption: 5 Construct and Remove Embankment Cofferdam-Left Side of Dam Quality L18

Normal distribution with parameters:

Mean	1,100	(=L18)
Std. Dev.	0	(=0.000001)



Assumption: 5 Construct and Remove Embankment Cofferdam-Left Side of Dam Unit Price R18

BetaPERT distribution with parameters:

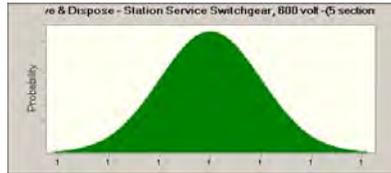
Minimum	\$70.00	(=Q18)
Likeliest	\$85.00	(=R18)
Maximum	\$130.00	(=S18)



Assumption: 50 Remove & Dispose - Station Service Switchgear, 600 volt -(5 sections) Cell: L63

Normal distribution with parameters:

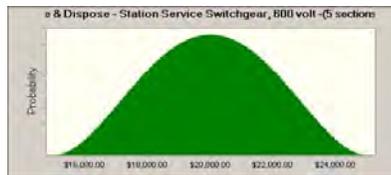
Mean	1	(=L63)
Std. Dev.	0	(=0.000001)



Assumption: 50 Remove & Dispose - Station Service Switchgear, 600 volt -(5 sections) Cell: L63

BetaPERT distribution with parameters:

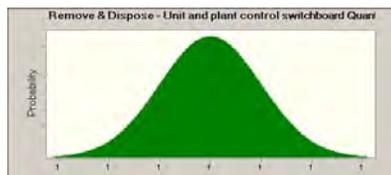
Minimum	\$15,000.00	(=Q63)
Likeliest	\$20,000.00	(=R63)
Maximum	\$25,000.00	(=S63)



Assumption: 51 Remove & Dispose - Unit and plant control switchboard Quantity Cell: L64

Normal distribution with parameters:

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



Assumption: 51 Remove & Dispose - Unit and plant control switchboard Unit Price Cell: R64

BetaPERT distribution with parameters:

Minimum	\$14,000.00	(=Q64)
Likeliest	\$15,000.00	(=R64)
Maximum	\$17,000.00	(=S64)

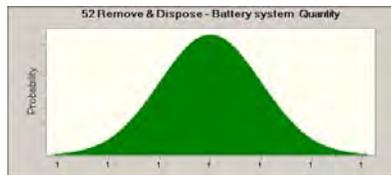


Assumption: 52 Remove & Dispose - Battery system Quantity

Cell: L65

Normal distribution with parameters:

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

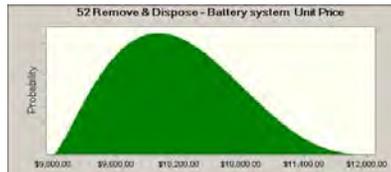


Assumption: 52 Remove & Dispose - Battery system Unit Price

Cell: R65

BetaPERT distribution with parameters:

Minimum	\$9,000.00	(=Q65)
Likeliest	\$10,000.00	(=R65)
Maximum	\$12,000.00	(=S65)

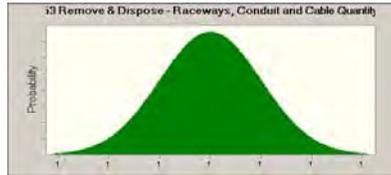


Assumption: 53 Remove & Dispose - Raceways, Conduit and Cable Quantity

Cell: L66

Normal distribution with parameters:

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



Assumption: 53 Remove & Dispose - Raceways, Conduit and Cable Unit Price

Cell: R66

BetaPERT distribution with parameters:

Minimum	\$14,000.00	(=Q66)
Likeliest	\$15,000.00	(=R66)
Maximum	\$17,000.00	(=S66)

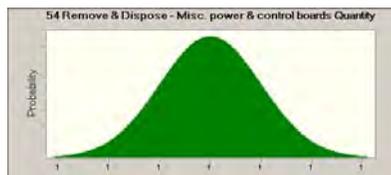


Assumption: 54 Remove & Dispose - Misc. power & control boards Quantity

Cell: L67

Normal distribution with parameters:

Mean	1	(=L67)
Std. Dev.	0	(=0.000001)

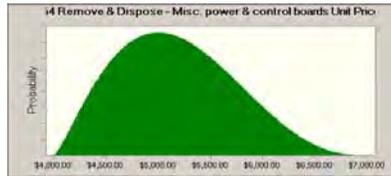


Assumption: 54 Remove & Dispose - Misc. power & control boards Unit Price

Cell: R67

BetaPERT distribution with parameters:

Minimum	\$4,000.00	(=Q67)
Likeliest	\$5,000.00	(=R67)
Maximum	\$7,000.00	(=S67)

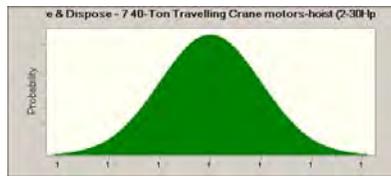


Assumption: 55 Remove & Dispose - 7 40-Ton Travelling Crane motors-hoist (2-30Hp) Unit Price

Cell: L68

Normal distribution with parameters:

Mean	1	(=L68)
Std. Dev.	0	(=0.000001)



Assumption: 55 Remove & Dispose - 7 40-Ton Travelling Crane motors-hoist (2-30Hp) Unit Price

Cell: R68

BetaPERT distribution with parameters:

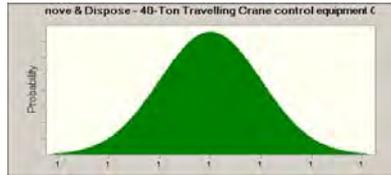
Minimum	\$2,000.00	(=Q68)
Likeliest	\$2,500.00	(=R68)
Maximum	\$3,000.00	(=S68)



Assumption: 56 Remove & Dispose - 40-Ton Travelling Crane control equipment Quantity L69

Normal distribution with parameters:

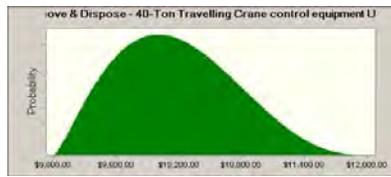
Mean 1 (=L69)
 Std. Dev. 0 (=0.000001)



Assumption: 56 Remove & Dispose - 40-Ton Travelling Crane control equipment Unit Cost R69

BetaPERT distribution with parameters:

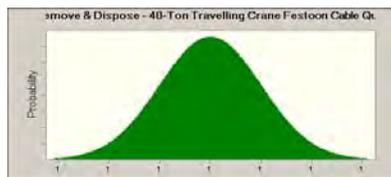
Minimum \$9,000.00 (=Q69)
 Likeliest \$10,000.00 (=R69)
 Maximum \$12,000.00 (=S69)



Assumption: 57 Remove & Dispose - 40-Ton Travelling Crane Festoon Cable Quantity Cell: L70

Normal distribution with parameters:

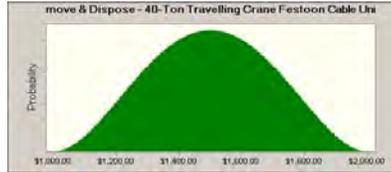
Mean 1 (=L70)
 Std. Dev. 0 (=0.000001)



Assumption: 57 Remove & Dispose - 40-Ton Travelling Crane Festoon Cable Unit Price **Cell: R70**

BetaPERT distribution with parameters:

Minimum	\$1,000.00	(=Q70)
Likeliest	\$1,500.00	(=R70)
Maximum	\$2,000.00	(=S70)

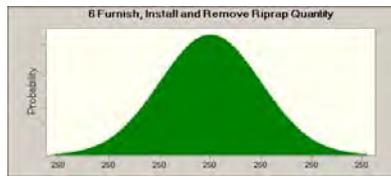


Assumption: 6 Furnish, Install and Remove Riprap Quantity

Cell: L19

Normal distribution with parameters:

Mean	250	(=L19)
Std. Dev.	0	(=0.000001)

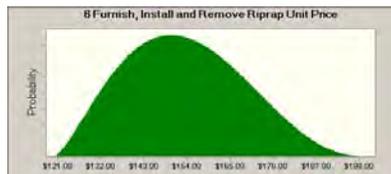


Assumption: 6 Furnish, Install and Remove Riprap Unit Price

Cell: R19

BetaPERT distribution with parameters:

Minimum	\$120.00	(=Q19)
Likeliest	\$150.00	(=R19)
Maximum	\$200.00	(=S19)

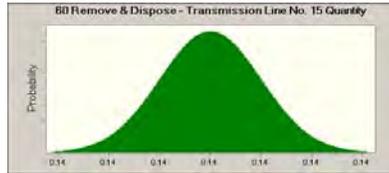


Assumption: 60 Remove & Dispose - Transmission Line No. 15 Quantity

Cell: L73

Normal distribution with parameters:

Mean	0.14	(=L73)
Std. Dev.	0.00	(=0.000001)

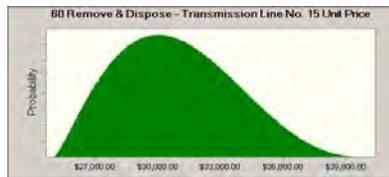


Assumption: 60 Remove & Dispose - Transmission Line No. 15 Unit Price

Cell: R73

BetaPERT distribution with parameters:

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

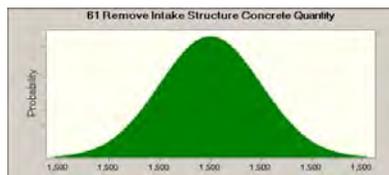


Assumption: 61 Remove Intake Structure Concrete Quantity

Cell: L74

Normal distribution with parameters:

Mean	1,500	(=L74)
Std. Dev.	0	(=0.000001)



Assumption: 61 Remove Intake Structure Concrete Unit Price

Cell: R74

BetaPERT distribution with parameters:

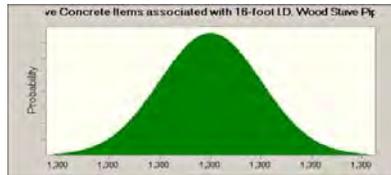
Minimum	\$170.00	(=Q74)
Likeliest	\$215.00	(=R74)
Maximum	\$380.00	(=S74)



Assumption: 62 Remove Concrete Items associated with 16-foot I.D. Wood Stave Pipe

Normal distribution with parameters:

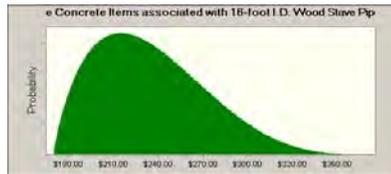
Mean	1,300	(=L75)
Std. Dev.	0	(=0.000001)



Assumption: 62 Remove Concrete Items associated with 16-foot I.D. Wood Stave Pipe

BetaPERT distribution with parameters:

Minimum	\$170.00	(=Q75)
Likeliest	\$215.00	(=R75)
Maximum	\$380.00	(=S75)

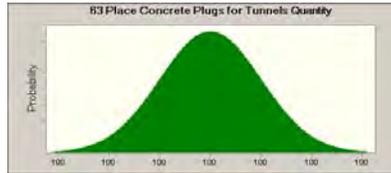


Assumption: 63 Place Concrete Plugs for Tunnels Quantity

Cell: L76

Normal distribution with parameters:

Mean	100	(=L76)
Std. Dev.	0	(=0.000001)



Assumption: 63 Place Concrete Plugs for Tunnels Unit Price

Cell: R76

BetaPERT distribution with parameters:

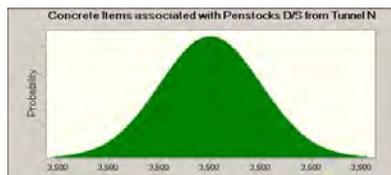
Minimum	\$1,100.00	(=Q76)
Likeliest	\$1,200.00	(=R76)
Maximum	\$1,300.00	(=S76)



Assumption: 64 Remove Concrete Items associated with Penstocks D/S from Tunnel No. 1

Normal distribution with parameters:

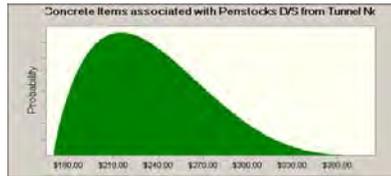
Mean	3,500	(=L77)
Std. Dev.	0	(=0.000001)



Assumption: 64 Remove Concrete Items associated with Penstocks D/S from Tunnel No. 277

BetaPERT distribution with parameters:

Minimum	\$170.00	(=Q77)
Likeliest	\$215.00	(=R77)
Maximum	\$380.00	(=S77)

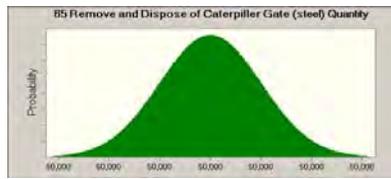


Assumption: 65 Remove and Dispose of Caterpillar Gate (steel) Quantity

Cell: L78

Normal distribution with parameters:

Mean	50,000	(=L78)
Std. Dev.	0	(=0.000001)

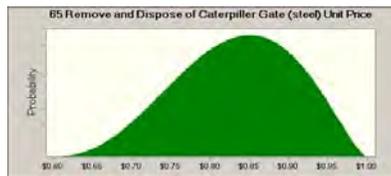


Assumption: 65 Remove and Dispose of Caterpillar Gate (steel) Unit Price

Cell: R78

BetaPERT distribution with parameters:

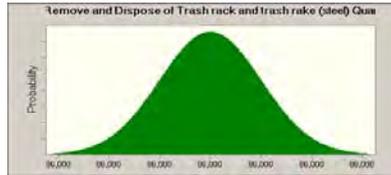
Minimum	\$0.60	(=Q78)
Likeliest	\$0.85	(=R78)
Maximum	\$1.00	(=S78)



Assumption: 66 Remove and Dispose of Trash rack and trash rake (steel) Quantity Cell: L79

Normal distribution with parameters:

Mean	86,000	(=L79)
Std. Dev.	0	(=0.000001)



Assumption: 66 Remove and Dispose of Trash rack and trash rake (steel) Unit Price Cell: R79

BetaPERT distribution with parameters:

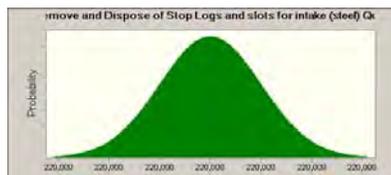
Minimum	\$0.60	(=Q79)
Likeliest	\$0.75	(=R79)
Maximum	\$0.85	(=S79)



Assumption: 67 Remove and Dispose of Stop Logs and slots for intake (steel) Quantity Cell: L80

Normal distribution with parameters:

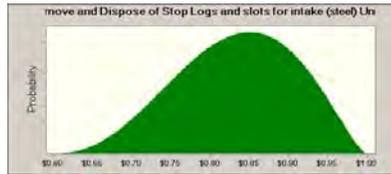
Mean	220,000	(=L80)
Std. Dev.	0	(=0.000001)



Assumption: 67 Remove and Dispose of Stop Logs and slots for intake (steel) Unit Price: R80

BetaPERT distribution with parameters:

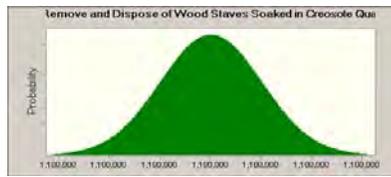
Minimum	\$0.60	(=Q80)
Likeliest	\$0.85	(=R80)
Maximum	\$1.00	(=S80)



Assumption: 68 Remove and Dispose of Wood Staves Soaked in Creosote Quantity Cell: L81

Normal distribution with parameters:

Mean	1,100,000	(=L81)
Std. Dev.	0	(=0.000001)



Assumption: 68 Remove and Dispose of Wood Staves Soaked in Creosote Unit Price: R81

BetaPERT distribution with parameters:

Minimum	\$0.65	(=Q81)
Likeliest	\$0.70	(=R81)
Maximum	\$0.85	(=S81)

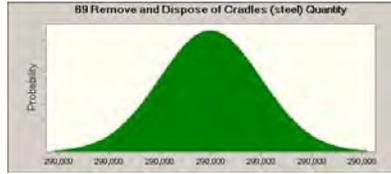


Assumption: 69 Remove and Dispose of Cradles (steel) Quantity

Cell: L82

Normal distribution with parameters:

Mean	290,000	(=L82)
Std. Dev.	0	(=0.000001)

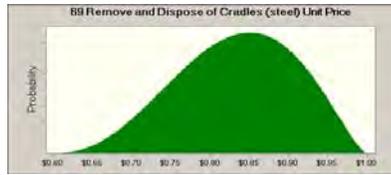


Assumption: 69 Remove and Dispose of Cradles (steel) Unit Price

Cell: R82

BetaPERT distribution with parameters:

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



Assumption: 7 Provide Dewatering behind Left Side Cofferdam Quantity

Cell: L20

Normal distribution with parameters:

Mean	1	(=L20)
Std. Dev.	0	(=0.000001)



Assumption: 7 Provide Dewatering behind Left Side Cofferdam Unit Price

Cell: R20

BetaPERT distribution with parameters:

Minimum	\$40,000.00	(=Q20)
Likeliest	\$45,000.00	(=R20)
Maximum	\$300,000.00	(=S20)

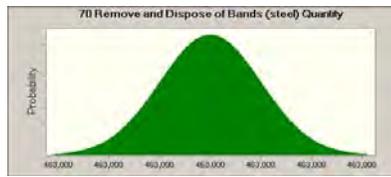


Assumption: 70 Remove and Dispose of Bands (steel) Quantity

Cell: L83

Normal distribution with parameters:

Mean	463,000	(=L83)
Std. Dev.	0	(=0.000001)

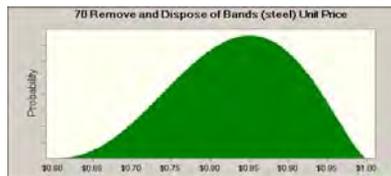


Assumption: 70 Remove and Dispose of Bands (steel) Unit Price

Cell: R83

BetaPERT distribution with parameters:

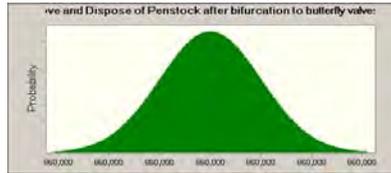
Minimum	\$0.60	(=Q83)
Likeliest	\$0.85	(=R83)
Maximum	\$1.00	(=S83)



Assumption: 71 Remove and Dispose of Penstock after bifurcation to butterfly valves **Cell L84**

Normal distribution with parameters:

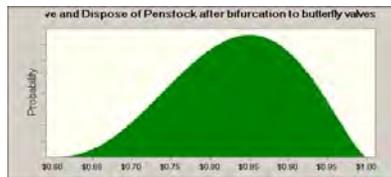
Mean 860,000 (=L84)
 Std. Dev. 0 (=0.000001)



Assumption: 71 Remove and Dispose of Penstock after bifurcation to butterfly valves **Cell R84**

BetaPERT distribution with parameters:

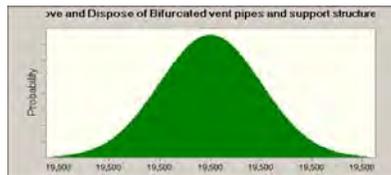
Minimum \$0.60 (=Q84)
 Likeliest \$0.85 (=R84)
 Maximum \$1.00 (=S84)



Assumption: 72 Remove and Dispose of Bifurcated vent pipes and support structure **Cell L85**

Normal distribution with parameters:

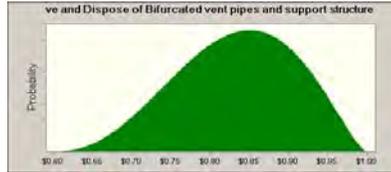
Mean 19,500 (=L85)
 Std. Dev. 0 (=0.000001)



Assumption: 72 Remove and Dispose of Bifurcated vent pipes and support structure **Cell: R85**

BetaPERT distribution with parameters:

Minimum	\$0.60	(=Q85)
Likeliest	\$0.85	(=R85)
Maximum	\$1.00	(=S85)

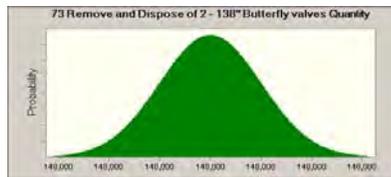


Assumption: 73 Remove and Dispose of 2 - 138" Butterfly valves Quantity

Cell: L86

Normal distribution with parameters:

Mean	148,000	(=L86)
Std. Dev.	0	(=0.000001)

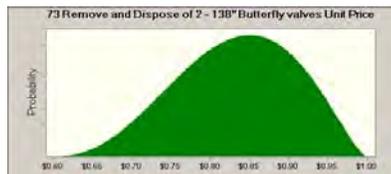


Assumption: 73 Remove and Dispose of 2 - 138" Butterfly valves Unit Price

Cell: R86

BetaPERT distribution with parameters:

Minimum	\$0.60	(=Q86)
Likeliest	\$0.85	(=R86)
Maximum	\$1.00	(=S86)



Assumption: 8 Remove Water from behind Cofferdam Quantity

Cell: L21

Normal distribution with parameters:

Mean	36,000	(=L21)
Std. Dev.	0	(=0.000001)



Assumption: 8 Remove Water from behind Cofferdam Unit Price

Cell: R21

BetaPERT distribution with parameters:

Minimum	\$0.04	(=Q21)
Likeliest	\$0.05	(=R21)
Maximum	\$0.08	(=S21)

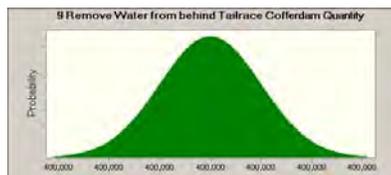


Assumption: 9 Remove Water from behind Tailrace Cofferdam Quantity

Cell: L22

Normal distribution with parameters:

Mean	400,000	(=L22)
Std. Dev.	0	(=0.000001)

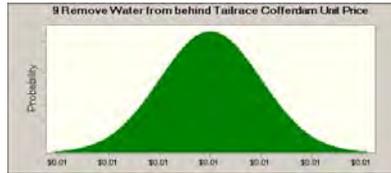


Assumption: 9 Remove Water from behind Tailrace Cofferdam Unit Price

Cell: R22

Normal distribution with parameters:

Mean	\$0.01	(=R22)
Std. Dev.	\$0.00	(=0.000001)

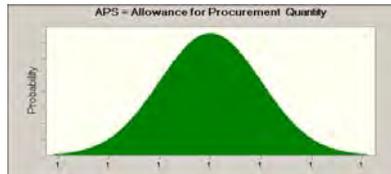


Assumption: APS = Allowance for Procurement Quantity

Cell: L95

Normal distribution with parameters:

Mean	1	(=L95)
Std. Dev.	0	(=0.000001)



Assumption: APS = Allowance for Procurement Unit Price

Cell: R95

BetaPERT distribution with parameters:

Minimum	\$0.00	(=Q95)
Likeliest	\$0.00	(=R95)
Maximum	\$671,016.00	(=S95)

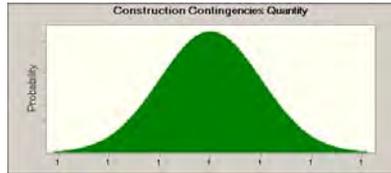


Assumption: Construction Contingencies Quantity

Cell: L98

Normal distribution with parameters:

Mean	1	(=L98)
Std. Dev.	0	(=0.000001)



Assumption: Construction Contingencies Unit Price

Cell: R98

BetaPERT distribution with parameters:

Minimum	\$1,600,000.00	(=Q98)
Likeliest	\$2,500,000.00	(=R98)
Maximum	\$9,000,000.00	(=S98)



Assumption: Design Contingencies Quantity

Cell: L94

Normal distribution with parameters:

Mean	1	(=L94)
Std. Dev.	0	(=0.000001)



Assumption: Design Contingencies Unit Price

Cell: R94

BetaPERT distribution with parameters:

Minimum	\$683,568.00	(=Q94)
Likeliest	\$1,097,054.00	(=R94)
Maximum	\$4,154,392.00	(=S94)

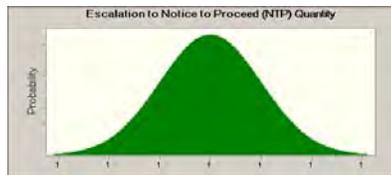


Assumption: Escalation to Notice to Proceed (NTP) Quantity

Cell: L91

Normal distribution with parameters:

Mean	1	(=L91)
Std. Dev.	0	(=0.000001)

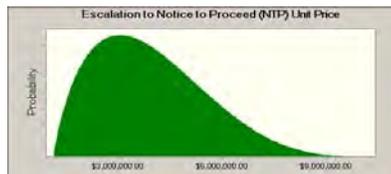


Assumption: Escalation to Notice to Proceed (NTP) Unit Price

Cell: R91

BetaPERT distribution with parameters:

Minimum	\$1,136,602.00	(=Q91)
Likeliest	\$3,046,036.00	(=R91)
Maximum	\$10,162,062.00	(=S91)

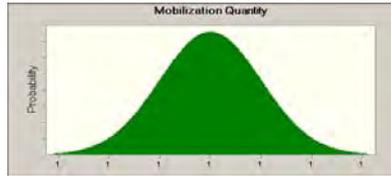


Assumption: Mobilization Quantity

Cell: L89

Normal distribution with parameters:

Mean	1	(=L89)
Std. Dev.	0	(=0.000001)



Assumption: Mobilization Unit Price

Cell: R89

BetaPERT distribution with parameters:

Minimum	\$340,000.00	(=Q89)
Likeliest	\$420,000.00	(=R89)
Maximum	\$910,000.00	(=S89)



Assumption: Non-Contract Cost Quantity

Cell: L100

Normal distribution with parameters:

Mean	1	(=L100)
Std. Dev.	0	(=0.000001)



Assumption: Non-Contract Cost Unit Price

Cell: R100

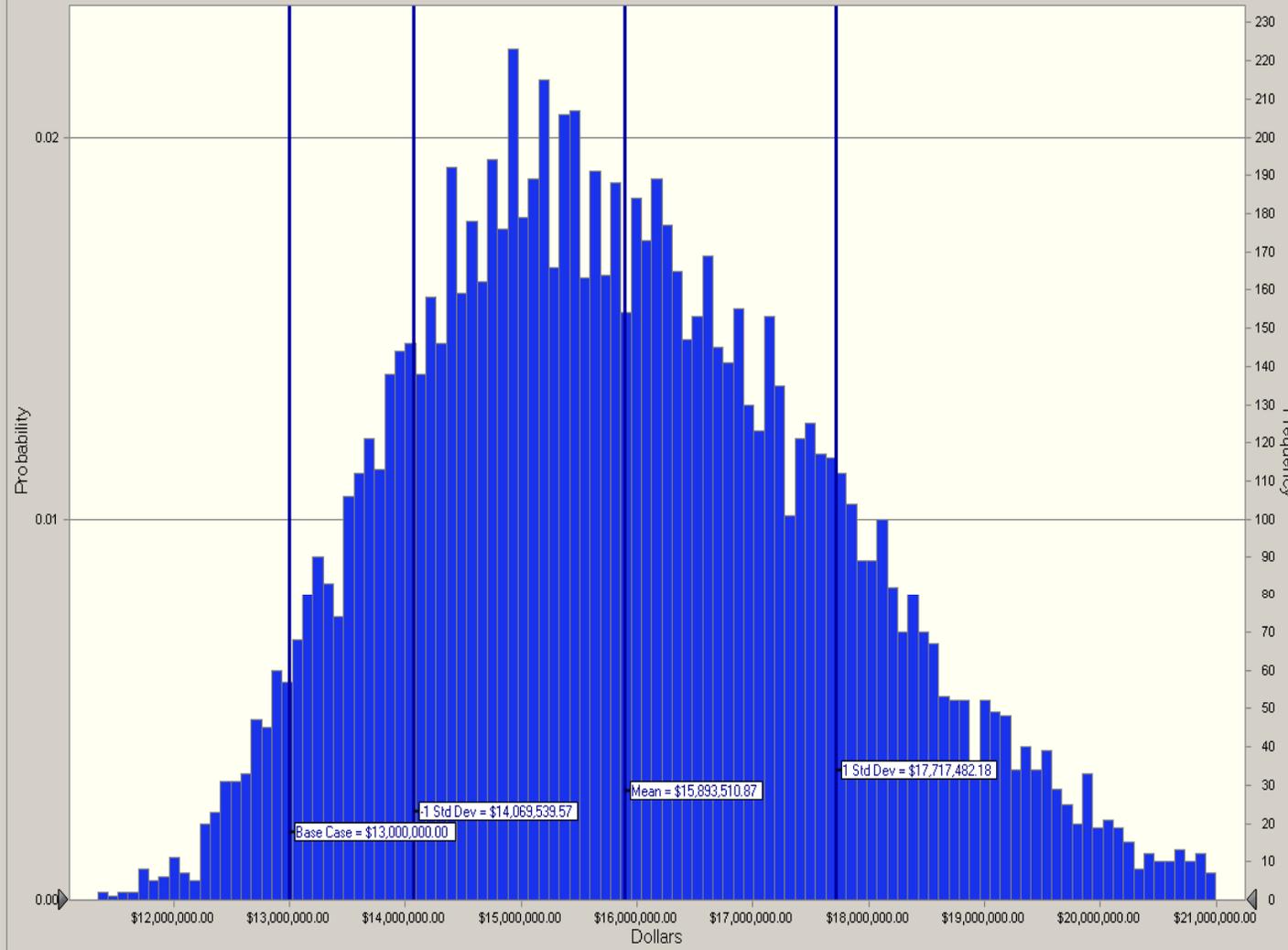
BetaPERT distribution with parameters:

Minimum	\$5,500,000.00	(=Q100)
Likeliest	\$8,500,000.00	(=R100)
Maximum	\$26,000,000.00	(=S100)



End of Assumptions

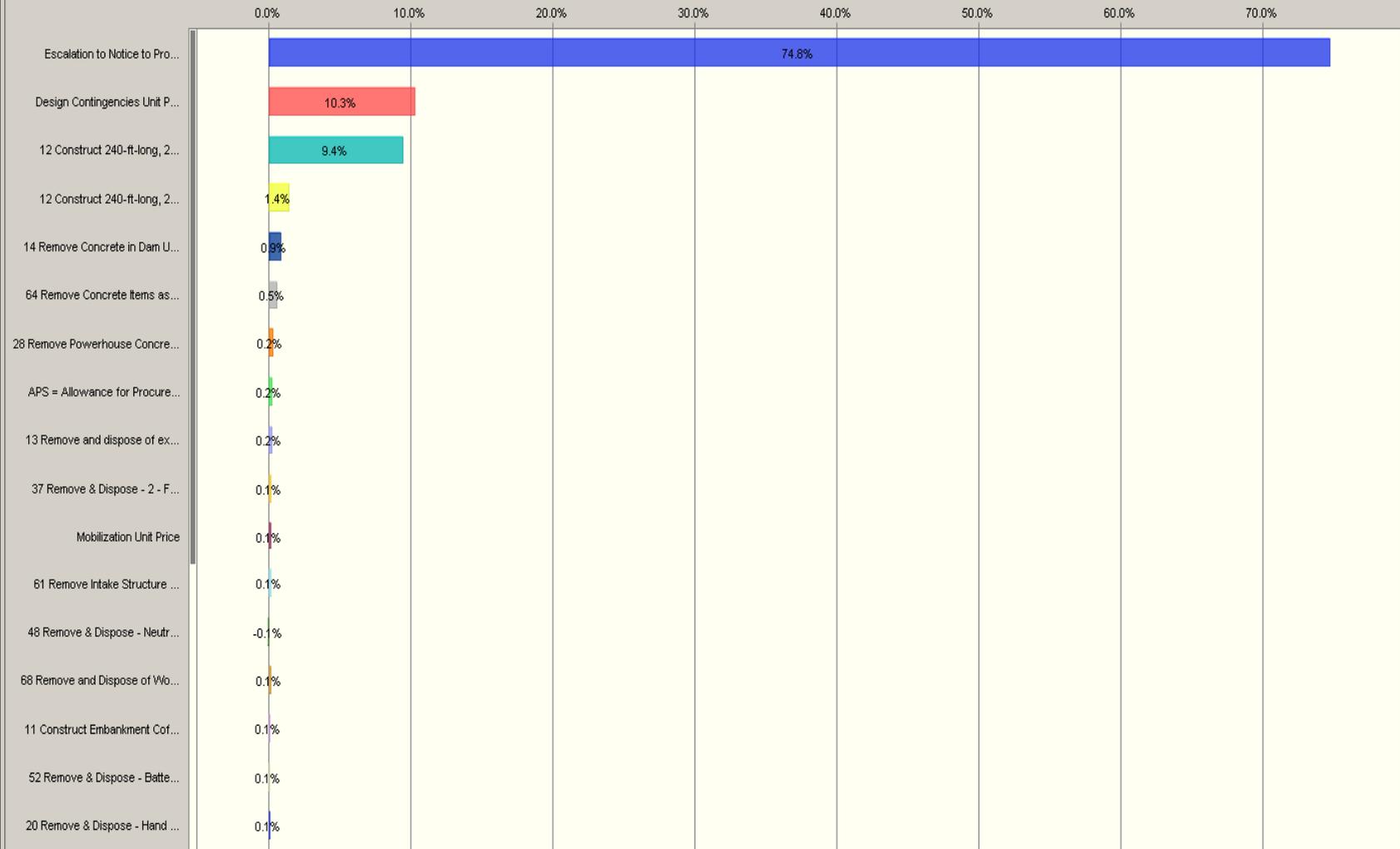
Contract Cost - Copco No. 2 - Full Removal - With Escalation



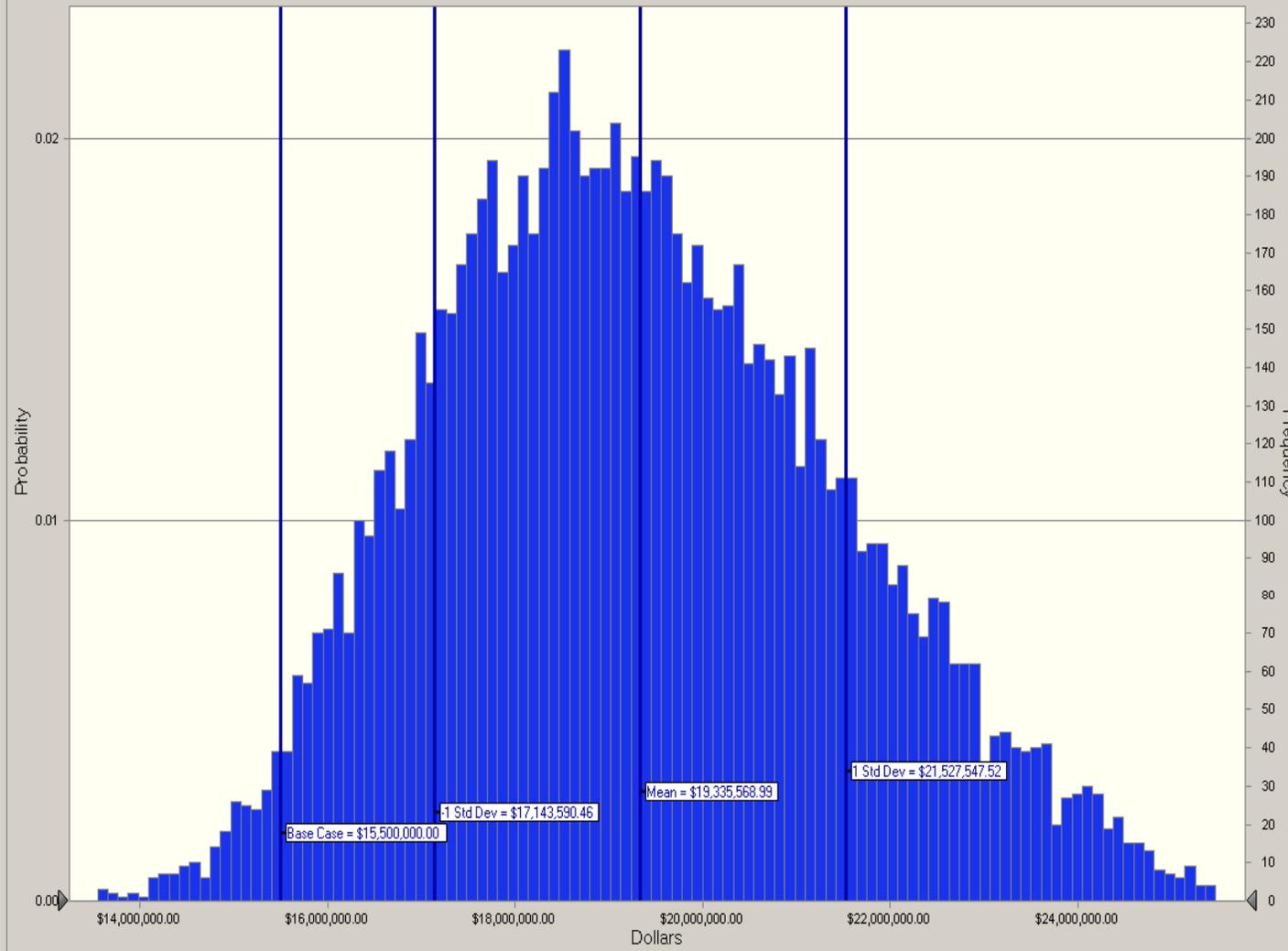
Statistic	Forecast values
Trials	10,000
Mean	\$15,893,510.87
Median	\$15,732,288.47
Mode	...
Standard Deviation	\$1,823,971.31
Variance	\$3,326,871,333,287.6
Skewness	0.3964
Kurtosis	2.84
Coeff. of Variability	0.1148
Minimum	\$11,342,441.45
Maximum	\$22,813,757.17
Mean Std. Error	\$18,239.71

Percentile	Forecast values
0%	\$11,342,441.45
10%	\$13,640,753.26
20%	\$14,288,131.00
30%	\$14,798,788.08
40%	\$15,253,020.43
50%	\$15,731,934.56
60%	\$16,230,472.55
70%	\$16,794,134.43
80%	\$17,468,218.55
90%	\$18,358,651.26
100%	\$22,813,757.17

Sensitivity: Contract Cost - Copco No. 2 - Full Removal - With Escalation



Field Cost - Copco No. 2 - Full Removal - With Escalation



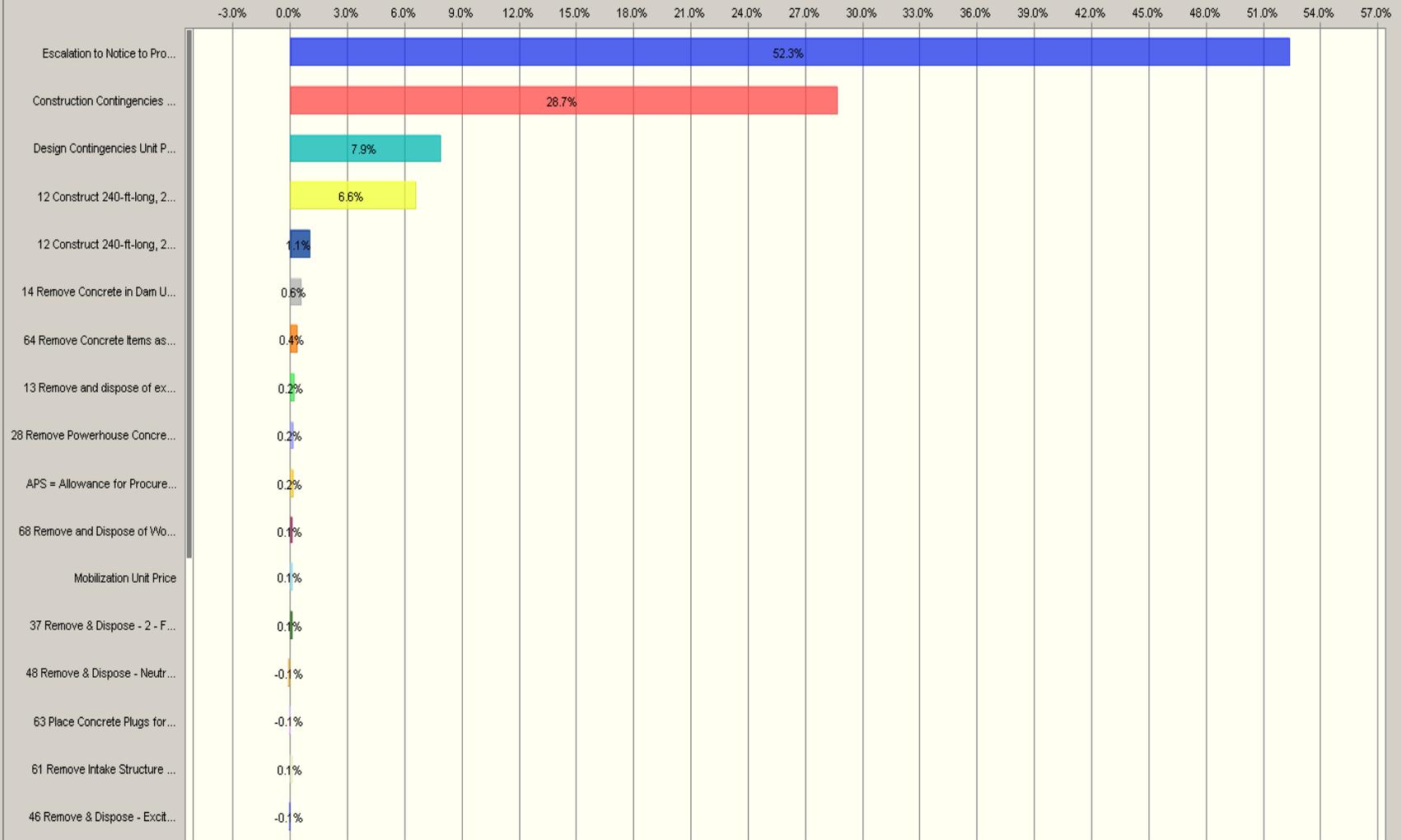
Statistic	Forecast values
Trials	10,000
Mean	\$19,335,568.99
Median	\$19,151,240.09
Mode	...
Standard Deviation	\$2,191,978.53
Variance	\$4,804,769,888,090.4
Skewness	0.3803
Kurtosis	2.92
Coeff. of Variability	0.1134
Minimum	\$13,547,597.36
Maximum	\$27,683,965.73
Mean Std. Error	\$21,919.79

Percentile	Forecast values
0%	\$13,547,597.36
10%	\$16,615,926.69
20%	\$17,429,404.48
30%	\$18,046,141.40
40%	\$18,590,021.91
50%	\$19,150,042.77
60%	\$19,737,270.05
70%	\$20,405,701.80
80%	\$21,196,522.40
90%	\$22,313,891.28
100%	\$27,683,965.73

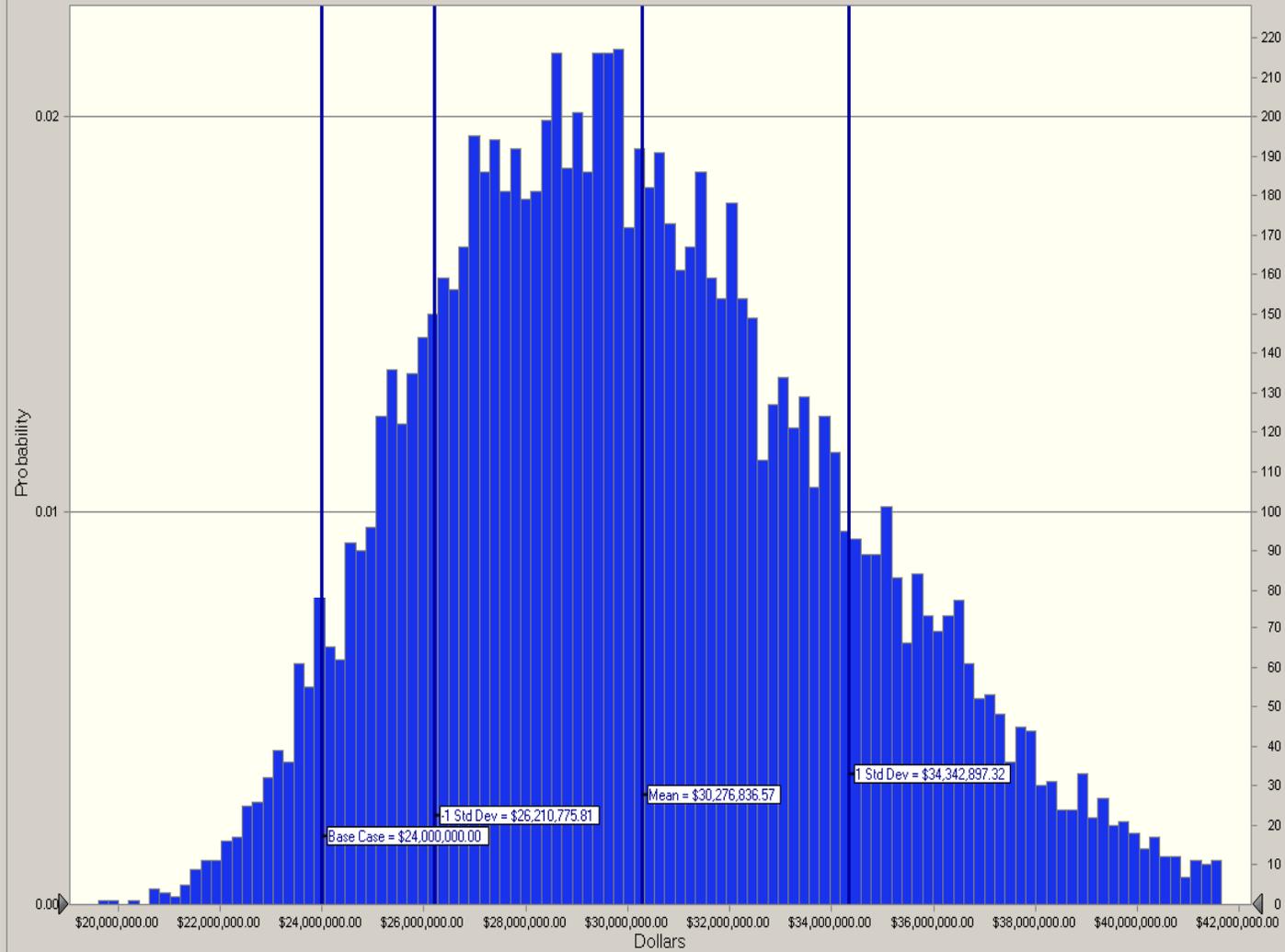
10,000 Trials

Contribution to Variance View

Sensitivity: Field Cost - Copco No. 2 - Full Removal - With Escalation



Construction Cost - Copco No. 2 - Full Removal - With Escalation



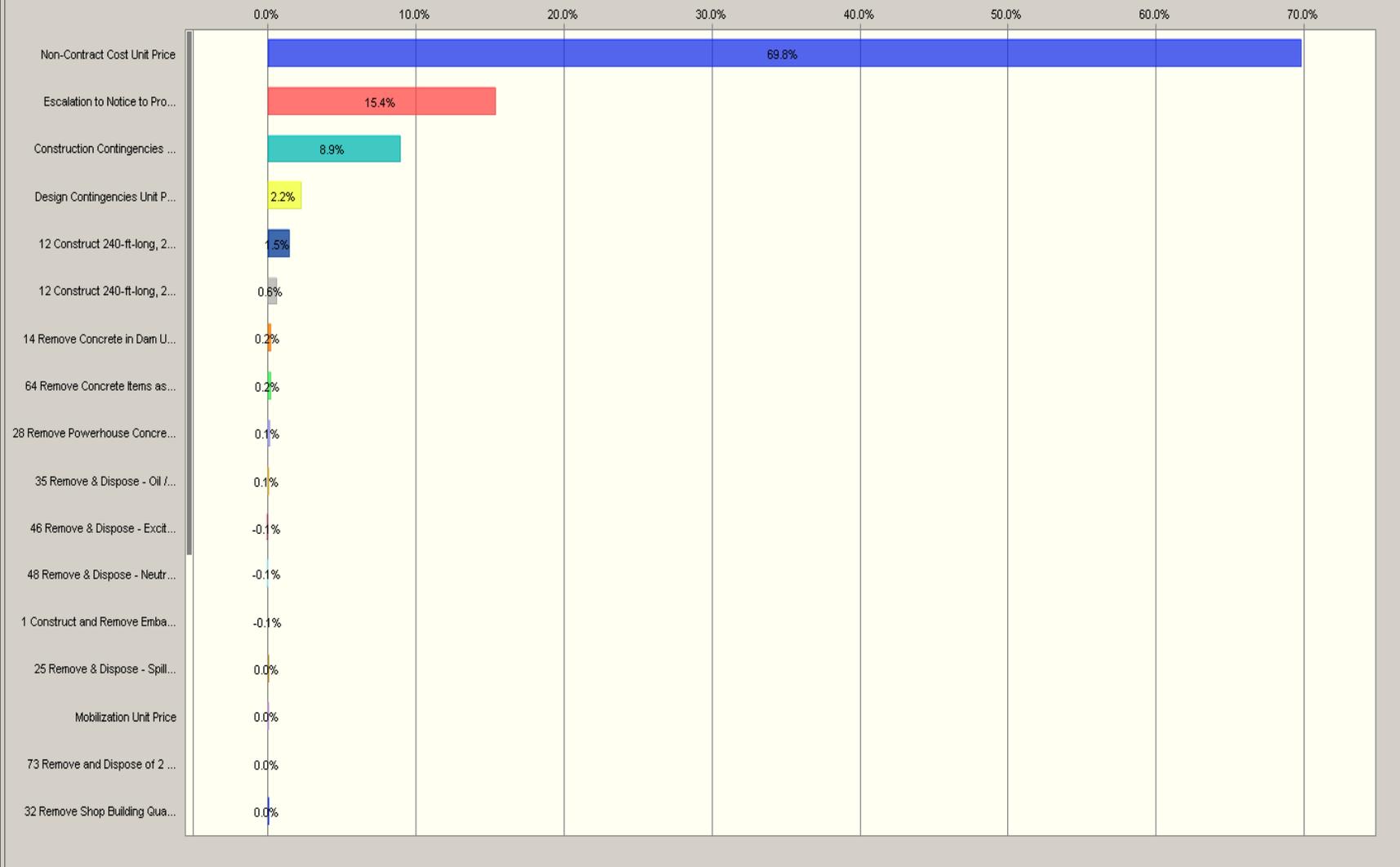
Statistic	Forecast values
Trials	10,000
Mean	\$30,276,836.57
Median	\$29,852,759.55
Mode	...
Standard Deviation	\$4,066,060.76
Variance	\$16,532,850,088,294.
Skewness	0.4595
Kurtosis	2.95
Coeff. of Variability	0.1343
Minimum	\$19,600,022.02
Maximum	\$46,617,455.61
Mean Std. Error	\$40,660.61

Percentile	Forecast values
0%	\$19,600,022.02
10%	\$25,314,965.30
20%	\$26,732,187.90
30%	\$27,814,772.61
40%	\$28,975,989.65
50%	\$29,851,421.66
60%	\$30,950,921.89
70%	\$32,156,784.61
80%	\$33,724,473.97
90%	\$35,886,502.51
100%	\$46,617,455.61

10,000 Trials

Contribution to Variance View

Sensitivity: Construction Cost - Copco No. 2 - Full Removal - With Escalation



ESTIMATE WORKSHEET

FEATURE:			PROJECT:										
REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 2 Dam & Powerplant Removal Escalation NOT Included SUMMARY ESTIMATE			Klamath River, Northern California/Southern Oregon										
			WOID: AF652 REGION: MP FILE: C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 2\Copco 2 - Full Removal Crystal Ball - without Escalation - 2011-04.xls\Yreka Water Supply-without Esc	ESTIMATE LEVEL: Feasibility PRICE LEVEL: Jul-2010									

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	Construct and Remove Embankment Cofferdam-Right Side of Dam	8130	3100	3100	3100	CY	\$70.00	\$85.00	\$130.00	\$217,000.00	\$263,500.00	\$403,000.00
	2	Furnish, Install and Remove Riprap	8130	465	465	465	CY	\$120.00	\$150.00	\$200.00	\$55,800.00	\$69,750.00	\$93,000.00
	3	Provide Dewatering behind Cofferdams	8130	1	1	1	LS	\$40,000.00	\$45,000.00	\$300,000.00	\$40,000.00	\$45,000.00	\$300,000.00
	4	Remove Water from behind Cofferdams	8130	241000	241000	241000	GAL	\$0.01	\$0.01	\$0.01	\$2,410.00	\$2,410.00	\$2,410.00
	5	Construct and Remove Embankment Cofferdam-Left Side of Dam	8130	1100	1100	1100	CY	\$70.00	\$85.00	\$130.00	\$77,000.00	\$93,500.00	\$143,000.00
	6	Furnish, Install and Remove Riprap	8130	250	250	250	CY	\$120.00	\$150.00	\$200.00	\$30,000.00	\$37,500.00	\$50,000.00
	7	Provide Dewatering behind Left Side Cofferdam	8130	1	1	1	LS	\$40,000.00	\$45,000.00	\$300,000.00	\$40,000.00	\$45,000.00	\$300,000.00
	8	Remove Water from behind Cofferdam	8130	36000	36000	36000	GAL	\$0.04	\$0.05	\$0.08	\$1,440.00	\$1,800.00	\$2,880.00
	9	Remove Water from behind Tailrace Cofferdam	8130	400000	400000	400000	GAL	\$0.01	\$0.01	\$0.01	\$4,000.00	\$4,000.00	\$4,000.00
	10	Provide Dewatering behind Tailrace Cofferdam	8130	1	1	1	LS	\$30,000.00	\$35,000.00	\$250,000.00	\$30,000.00	\$35,000.00	\$250,000.00
	11	Construct Embankment Cofferdam across Tailrace	8130	1,700	1,700	1,700	CY	\$70.00	\$85.00	\$130.00	\$119,000.00	\$144,500.00	\$221,000.00
	12	Construct 240-ft-long, 2-span concrete Bridge	8130	0	0	7,440	SF	\$200.00	\$300.00	\$600.00	\$0.00	\$0.00	\$4,464,000.00
	13	Remove and dispose of existing bridge	8130	0	0	1	LS	\$300,000.00	\$400,000.00	\$800,000.00	\$0.00	\$0.00	\$800,000.00
	14	Remove Concrete in Dam	8130	4,400	4,400	4,400	CY	\$270.00	\$315.00	\$500.00	\$1,188,000.00	\$1,386,000.00	\$2,200,000.00
	15	Remove concrete equipment slab from top of embankment wing dam on right abutment	8130	5	5	5	CY	\$170.00	\$215.00	\$380.00	\$850.00	\$1,075.00	\$1,900.00
	16	Remove Concrete Wingwall	8130	220	220	220	CY	\$170.00	\$215.00	\$380.00	\$37,400.00	\$47,300.00	\$83,600.00
	17	Right Abutment Removal - Random Fill	8313	1,200	1,200	1,200	CY	\$13.00	\$15.00	\$18.00	\$15,600.00	\$18,000.00	\$21,600.00
	18	Right Abutment Removal - Remove Hand Placed Riprap	8313	7,800	7,800	7,800	SF	\$0.85	\$1.00	\$1.30	\$6,630.00	\$7,800.00	\$10,140.00
	19	Right Abutment Removal - Gunite Curtain Wall	8313	210	210	210	CY	\$170.00	\$215.00	\$380.00	\$35,700.00	\$45,150.00	\$79,800.00
	20	Remove & Dispose - Hand Rails and Light Poles	8420	5,000	5,000	5,000	LBS	\$0.60	\$0.85	\$1.00	\$3,000.00	\$4,250.00	\$5,000.00
	21	Remove & Dispose - Radial Gates and Hoists	8420	66,000	66,000	66,000	LBS	\$0.60	\$0.85	\$1.00	\$39,600.00	\$56,100.00	\$66,000.00
	22	Remove & Dispose - 5-Raidal Gate stoplogs & slots (steel)	8420	95,800	95,800	95,800	LBS	\$0.60	\$0.85	\$1.00	\$57,480.00	\$81,430.00	\$95,800.00
	23	Remove & Dispose - Spillway intake 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
	24	Remove & Dispose - Spillway radial gate motors & control panel	8430	1	1	1	EA	\$900.00	\$1,000.00	\$1,500.00	\$900.00	\$1,000.00	\$1,500.00
	25	Remove & Dispose - Spillway trashrake motor, festoon cable & control panel	8430	1	1	1	EA	\$400.00	\$500.00	\$600.00	\$400.00	\$500.00	\$600.00
	26	Remove & Dispose - Distribution equipment , panelboards	8430	1	1	1	EA	\$4,000.00	\$4,500.00	\$5,000.00	\$4,000.00	\$4,500.00	\$5,000.00
	27	Remove Copper Shingles from Roof of Powerhouse	8130	7,000	7,000	7,000	SF	\$2.00	\$2.50	\$3.00	\$14,000.00	\$17,500.00	\$21,000.00
	28	Remove Powerhouse Concrete down to spring-line of turbine	8130	1,050	1,050	1,050	CY	\$270.00	\$350.00	\$1,000.00	\$283,500.00	\$367,500.00	\$1,050,000.00
	29	Remove Structural Steel items associated with Powerhouse	8130	220,000	220,000	220,000	LBS	\$0.60	\$0.85	\$1.00	\$132,000.00	\$187,000.00	\$220,000.00
	30	Remove Control House Concrete	8130	30	30	30	CY	\$170.00	\$215.00	\$380.00	\$5,100.00	\$6,450.00	\$11,400.00
	31	Remove Control House Structural Steel items	8130	3,500	3,500	3,500	LBS	\$0.60	\$0.85	\$1.00	\$2,100.00	\$2,975.00	\$3,500.00
	32	Remove Shop Building	8130	3,600	3,600	3,600	SF	\$55.00	\$60.00	\$65.00	\$198,000.00	\$216,000.00	\$234,000.00
	33	Remove & Dispose - 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
	34	Remove & Dispose - Cooling water and bearing oil systems	8420	13,300	13,300	13,300	LBS	\$0.60	\$0.85	\$1.00	\$7,980.00	\$11,305.00	\$13,300.00
	35	Remove & Dispose - Oil / Water seperator tank and piping	8420	2,700	2,700	2,700	LBS	\$0.60	\$0.85	\$1.00	\$1,620.00	\$2,295.00	\$2,700.00
	36	Remove & Dispose - 12 - Cast Iron Columns	8420	54,000	54,000	54,000	LBS	\$0.60	\$0.85	\$1.00	\$32,400.00	\$45,900.00	\$54,000.00
	37	Remove & Dispose - 2 - Francis Turbines	8420	660,000	660,000	660,000	LBS	\$0.60	\$0.85	\$1.00	\$396,000.00	\$561,000.00	\$660,000.00
	38	Remove & Dispose - 2-40 Ton indoor crane	8420	140,000	140,000	140,000	LBS	\$0.60	\$0.85	\$1.00	\$84,000.00	\$119,000.00	\$140,000.00
	39	Remove & Dispose - Compressed Air systems	8420	1,000	1,000	1,000	LBS	\$0.60	\$0.85	\$1.00	\$600.00	\$850.00	\$1,000.00
	40	Remove & Dispose - 2 - CO2 systems	8420	2,100	2,100	2,100	LBS	\$0.60	\$0.85	\$1.00	\$1,260.00	\$1,785.00	\$2,100.00
	41	Remove & Dispose - Plant Water and Fire Protection	8420	3,100	3,100	3,100	LBS	\$0.60	\$0.85	\$1.00	\$1,860.00	\$2,635.00	\$3,100.00
	42	Remove & Dispose - Transformer Oil Fire protection	8420	6,500	6,500	6,500	LBS	\$0.60	\$0.85	\$1.00	\$3,900.00	\$5,525.00	\$6,500.00
	43	Remove & Dispose - Unwatering Piping	8420	32,000	32,000	32,000	LBS	\$0.60	\$0.85	\$1.00	\$19,200.00	\$27,200.00	\$32,000.00
	44	Remove & Dispose - Drainage Piping	8420	10,000	10,000	10,000	LBS	\$0.60	\$0.85	\$1.00	\$6,000.00	\$8,500.00	\$10,000.00
	45	Remove & Dispose - AC Generator, Indoor Vertical	8430	2	2	2	EA	\$120,000.00	\$125,000.00	\$130,000.00	\$240,000.00	\$250,000.00	\$260,000.00
	46	Remove & Dispose - Excitation equipment for 15 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
	47	Remove & Dispose - Surge protection equip. for 15 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

FEATURE:			PROJECT:									
REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 2 Dam & Powerplant Removal Escalation NOT Included SUMMARY ESTIMATE			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 2\Copco 2 - Full Removal Crystal Ball - without Escalation - 2011-04.xls\Yreka Water Supply-without 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 - Neutral grounding equip. for 15 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
	49	Remove & Dispose - Generator Switchgear, 7.2kV-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
	50	Remove & Dispose - 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
	51	Remove & Dispose - 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
	52	Remove & Dispose - 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
	53	Remove & Dispose - 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
	54	Remove & Dispose - 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
	55	Remove & Dispose - 7 40-Ton Travelling Crane motors-hoist (2-30Hp*),	8430	1	1	1	EA	\$2,000.00	\$2,500.00	\$3,000.00	\$2,000.00	\$2,500.00	\$3,000.00
	56	Remove & Dispose - 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
	57	Remove & Dispose - 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
	58	Remove & Dispose - Step-up Transformers, outdoor, oil-filled, 1-phase, 10/20 MVA 6600/72000 volt	8430	0	0	0	EA				\$0.00	\$0.00	\$0.00
	59	Remove & Dispose - Step-up Transformers, outdoor, oil-filled, 1-phase, 10/20 MVA, 73800/230000 volt	8430	0	0	0	EA				\$0.00	\$0.00	\$0.00
	60	Remove & Dispose - Transmission Line No. 15	8430	0.14	0.14	0.14	MILE	\$25,000.00	\$30,000.00	\$40,000.00	\$3,500.00	\$4,200.00	\$5,600.00
	61	Remove Intake Structure Concrete	8130	1,500	1,500	1,500	CY	\$170.00	\$215.00	\$380.00	\$255,000.00	\$322,500.00	\$570,000.00
	62	Remove Concrete Items associated with 16-foot I.D. Wood Stave Pipe	8130	1,300	1,300	1,300	CY	\$170.00	\$215.00	\$380.00	\$221,000.00	\$279,500.00	\$494,000.00
	63	Place Concrete Plugs for Tunnels	8130	100	100	100	CY	\$1,100.00	\$1,200.00	\$1,300.00	\$110,000.00	\$120,000.00	\$130,000.00
	64	Remove Concrete Items associated with Penstocks D/S from Tunnel No. 2	8130	3,500	3,500	3,500	CY	\$170.00	\$215.00	\$380.00	\$595,000.00	\$752,500.00	\$1,330,000.00
	65	Remove and Dispose of Caterpillar Gate (steel)	8420	50,000	50,000	50,000	LBS	\$0.60	\$0.85	\$1.00	\$30,000.00	\$42,500.00	\$50,000.00
	66	Remove and Dispose of Trash rack and trash rake (steel)	8420	86,000	86,000	86,000	LBS	\$0.60	\$0.75	\$0.85	\$51,600.00	\$64,500.00	\$73,100.00
	67	Remove and Dispose of Stop Logs and slots for intake (steel)	8420	220,000	220,000	220,000	LBS	\$0.60	\$0.85	\$1.00	\$132,000.00	\$187,000.00	\$220,000.00
	68	Remove and Dispose of Wood Staves Soaked in Creosote	8420	1,100,000	1,100,000	1,100,000	LBS	\$0.65	\$0.70	\$0.85	\$715,000.00	\$770,000.00	\$935,000.00
	69	Remove and Dispose of Cradles (steel)	8420	290,000	290,000	290,000	LBS	\$0.60	\$0.85	\$1.00	\$174,000.00	\$246,500.00	\$290,000.00
	70	Remove and Dispose of Bands (steel)	8420	463,000	463,000	463,000	LBS	\$0.60	\$0.85	\$1.00	\$277,800.00	\$393,550.00	\$463,000.00
	71	Remove and Dispose of Penstock after bifurcation to butterfly valves	8420	860,000	860,000	860,000	LBS	\$0.60	\$0.85	\$1.00	\$516,000.00	\$731,000.00	\$860,000.00
	72	Remove and Dispose of Bifurcated vent pipes and support structure	8420	19,500	19,500	19,500	LBS	\$0.60	\$0.85	\$1.00	\$11,700.00	\$16,575.00	\$19,500.00
	73	Remove and Dispose of 2 - 138" Butterfly valves	8420	148,000	148,000	148,000	LBS	\$0.60	\$0.85	\$1.00	\$88,800.00	\$125,800.00	\$148,000.00
		Subtotal 1									\$6,739,830.00	\$8,436,910.00	\$18,102,530.00
		Mobilization (MPL ~ 5%; MP ~ 5%; MPH ~ 5%)		1	1	1	ls	\$340,000.00	\$420,000.00	\$910,000.00	\$340,000.00	\$420,000.00	\$910,000.00
		Subtotal 1 w/ mobilization											
		Escalation to Notice to Proceed (NTP) NOT INCLUDED											
		Design Contingencies (MPL ~ 8%; MP ~ 10%; MPH ~ 15%)		1	1	1	ls	\$520,170.00	\$843,090.00	\$2,550,182.00	\$520,170.00	\$843,090.00	\$2,550,182.00
		APS = Allowance for Procurement Strategies (if applicable) (MPL ~ 0%; MP ~ 0%; MPH ~ 2%)		1	1	1	ls	\$0.00	\$0.00	\$437,288.00	\$0.00	\$0.00	\$437,288.00
		CONTRACT COST									\$7,600,000.00	\$9,700,000.00	\$22,000,000.00
		Construction Contingencies (MPL ~ 18%; MP ~ 20%; MPH ~ 25%)		1	1	1	ls	\$1,400,000.00	\$1,800,000.00	\$6,000,000.00	\$1,400,000.00	\$1,800,000.00	\$6,000,000.00
		FIELD COST									\$9,000,000.00	\$11,500,000.00	\$28,000,000.00
		Non-Contract Cost (MPL ~ 52%; MP ~ 55%; MPH ~ 61%)		1	1	1	ls	\$4,500,000.00	\$6,500,000.00	\$17,000,000.00	\$4,500,000.00	\$6,500,000.00	\$17,000,000.00
		CONSTRUCTION COST									\$13,500,000.00	\$18,000,000.00	\$45,000,000.00

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	05/25/11	PEER REVIEW	

Crystal Ball Report - Full

Simulation started on 6/8/2011 at 13:21:25
 Simulation stopped on 6/8/2011 at 13:22:17

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) 52.38
 Trials/second (average) 191
 Random numbers per sec 29,018

Crystal Ball data:

Assumptions 152
 Correlations 0
 Correlated groups 0
 Decision variables 0
 Forecasts 3

TECHNICAL SERVICE CENTER
 ESTIMATING, SPECIFICATIONS
 AND VALUE PROGRAM GROUP
 UNIT PRICES BY Craig A. Grush
 DATE 6/9/2011

DATE	PEER REVIEWER(S)	CODE
6/9/11	<u>Dan M...</u> Signature	3170
	<u>DAN M...</u> Printed Name	
	Signature	
	Printed Name	
Author Initials		PEER REVIEW NOT REQUIRED

Forecasts

Worksheet: [Copco 2 - Full Removal Crystal Ball - without Escalation - 2011-04.xls]Copco 2 - F

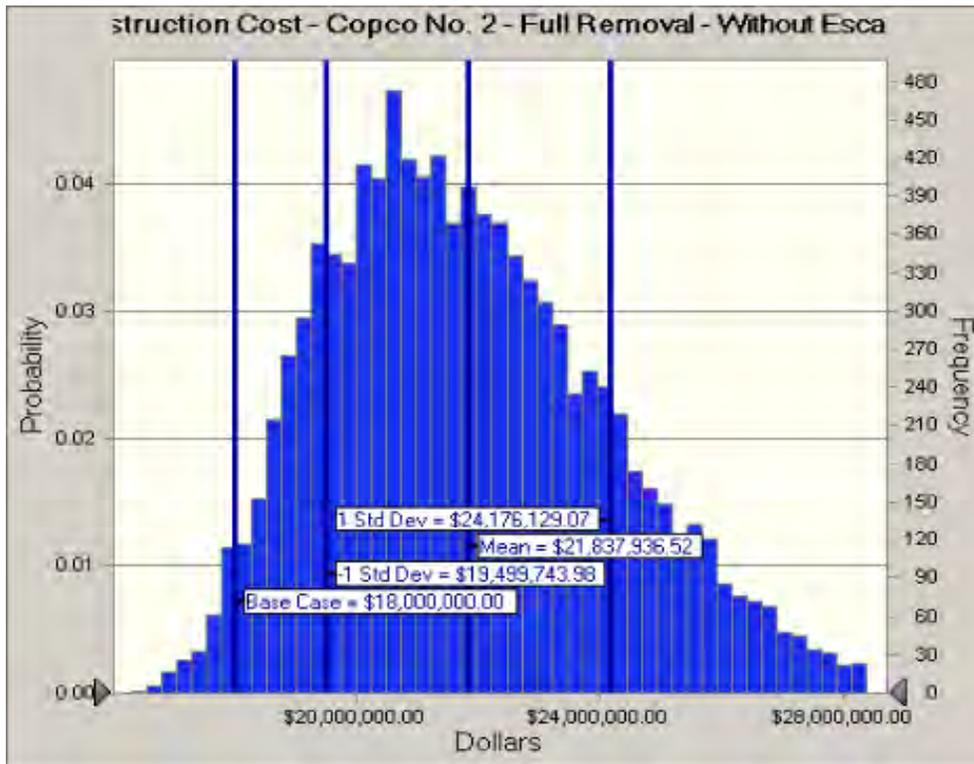
Forecast: Construction Cost - Copco No. 2 - Full Removal - Without Escalation Cell: U101

Summary:

Entire range is from \$16,308,457.92 to \$32,153,640.04

Base case is \$18,000,000.00

After 10,000 trials, the std. error of the mean is \$23,381.93



Forecast: Construction Cost - Copco No. 2 - Full Removal - Without Escalation (cont'd): U101

Statistics:	Forecast values
Trials	10,000
Mean	\$21,837,936.52
Median	\$21,568,711.44
Mode	---
Standard Deviation	\$2,338,192.55
Variance	\$5,467,144,381,194.27
Skewness	0.5223
Kurtosis	2.96
Coeff. of Variability	0.1071
Minimum	\$16,308,457.92
Maximum	\$32,153,640.04
Range Width	\$15,845,182.12
Mean Std. Error	\$23,381.93

Percentiles:	Forecast values
0%	\$16,308,457.92
10%	\$19,011,303.63
20%	\$19,762,391.46
30%	\$20,401,830.74
40%	\$20,964,195.62
50%	\$21,568,282.78
60%	\$22,215,110.79
70%	\$22,931,156.05
80%	\$23,812,109.48
90%	\$25,047,756.27
100%	\$32,153,640.04

Forecast: Contract Cost - Copco No. 2 - Full Removal - Without Escalation

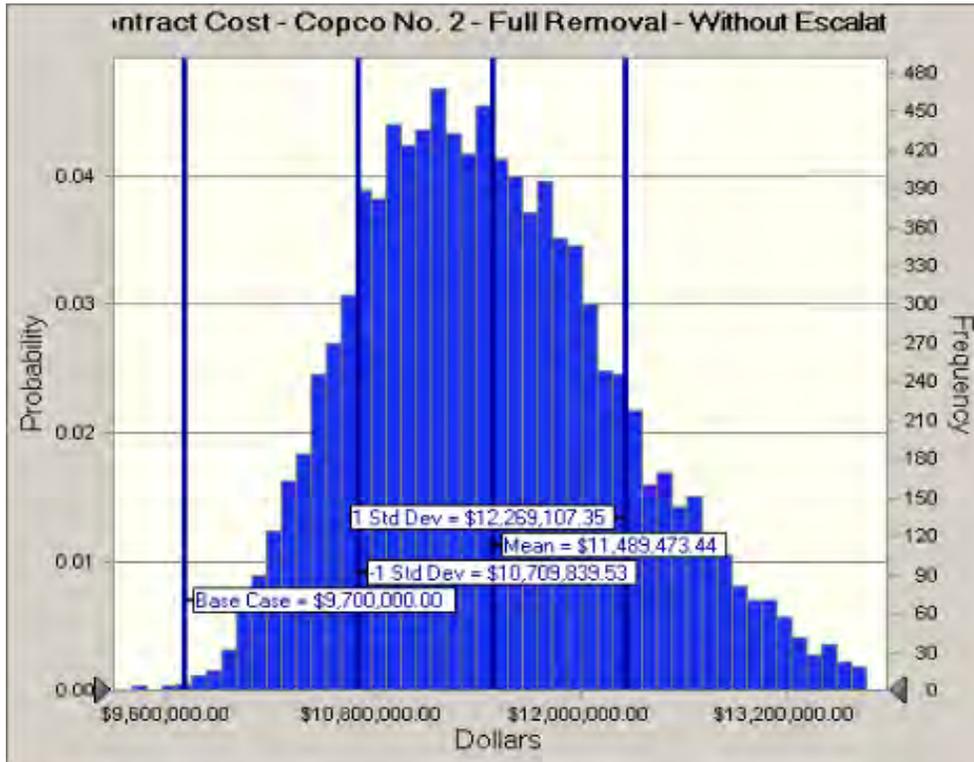
Cell: U97

Summary:

Entire range is from \$9,388,249.13 to \$15,104,036.31

Base case is \$9,700,000.00

After 10,000 trials, the std. error of the mean is \$7,796.34



Forecast: Contract Cost - Copco No. 2 - Full Removal - Without Escalation (cont'd) Cell: U97

Statistics:	Forecast values
Trials	10,000
Mean	\$11,489,473.44
Median	\$11,415,717.87
Mode	---
Standard Deviation	\$779,633.91
Variance	\$607,829,032,526.93
Skewness	0.5364
Kurtosis	3.24
Coeff. of Variability	0.0679
Minimum	\$9,388,249.13
Maximum	\$15,104,036.31
Range Width	\$5,715,787.18
Mean Std. Error	\$7,796.34

Percentiles:	Forecast values
0%	\$9,388,249.13
10%	\$10,547,778.38
20%	\$10,808,207.07
30%	\$11,020,015.35
40%	\$11,215,031.76
50%	\$11,415,640.11
60%	\$11,620,989.20
70%	\$11,848,990.03
80%	\$12,115,544.29
90%	\$12,545,228.40
100%	\$15,104,036.31

Forecast: Field Cost - Copco No. 2 - Full Removal - Without Escalation

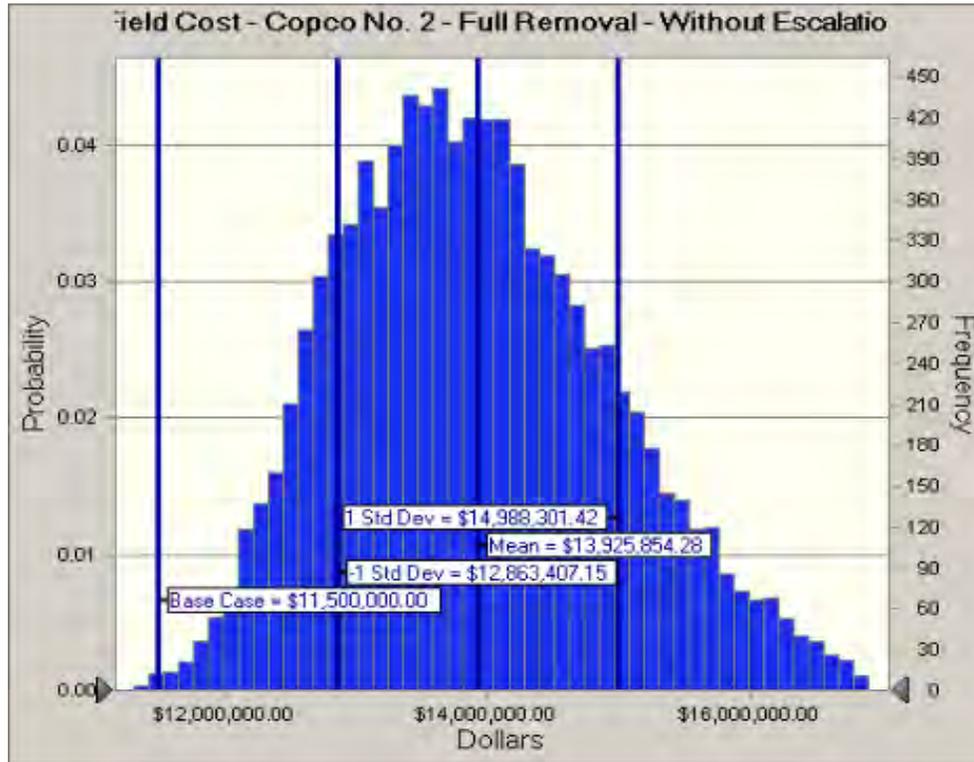
Cell: U99

Summary:

Entire range is from \$11,305,738.18 to \$18,770,225.18

Base case is \$11,500,000.00

After 10,000 trials, the std. error of the mean is \$10,624.47



Forecast: Field Cost - Copco No. 2 - Full Removal - Without Escalation (cont'd)

Cell: U99

Statistics:	Forecast values
Trials	10,000
Mean	\$13,925,854.28
Median	\$13,832,696.99
Mode	---
Standard Deviation	\$1,062,447.13
Variance	\$1,128,793,911,464.14
Skewness	0.4738
Kurtosis	3.08
Coeff. of Variability	0.0763
Minimum	\$11,305,738.18
Maximum	\$18,770,225.18
Range Width	\$7,464,487.00
Mean Std. Error	\$10,624.47

Percentiles:	Forecast values
0%	\$11,305,738.18
10%	\$12,635,044.76
20%	\$12,989,679.22
30%	\$13,301,795.55
40%	\$13,562,257.51
50%	\$13,832,617.41
60%	\$14,108,076.91
70%	\$14,419,016.90
80%	\$14,815,758.97
90%	\$15,356,140.17
100%	\$18,770,225.18

End of Forecasts

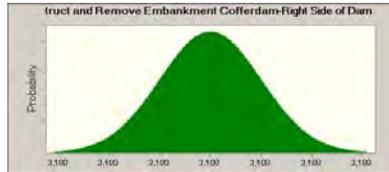
Assumptions

Worksheet: [Copco 2 - Full Removal Crystal Ball - without Escalation - 2011-04.xls]Copco 2 - F

Assumption: 1 Construct and Remove Embankment Cofferdam-Right Side of Dam Quantity **Cell: L14**

Normal distribution with parameters:

Mean 3,100 (=L14)
 Std. Dev. 0 (=0.000001)



Assumption: 1 Construct and Remove Embankment Cofferdam-Right Side of Dam Unit Price **Cell: R14**

BetaPERT distribution with parameters:

Minimum \$70.00 (=Q14)
 Likeliest \$85.00 (=R14)
 Maximum \$130.00 (=S14)

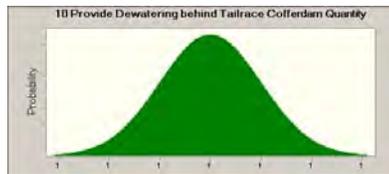


Assumption: 10 Provide Dewatering behind Tailrace Cofferdam Quantity

Cell: L23

Normal distribution with parameters:

Mean 1 (=L23)
 Std. Dev. 0 (=0.000001)

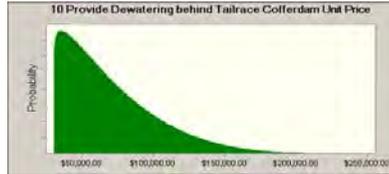


Assumption: 10 Provide Dewatering behind Tailrace Cofferdam Unit Price

Cell: R23

BetaPERT distribution with parameters:

Minimum	\$30,000.00	(=Q23)
Likeliest	\$35,000.00	(=R23)
Maximum	\$250,000.00	(=S23)

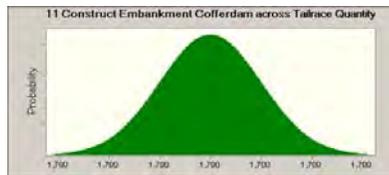


Assumption: 11 Construct Embankment Cofferdam across Tailrace Quantity

Cell: L24

Normal distribution with parameters:

Mean	1,700	(=L24)
Std. Dev.	0	(=0.000001)



Assumption: 11 Construct Embankment Cofferdam across Tailrace Unit Price

Cell: R24

BetaPERT distribution with parameters:

Minimum	\$70.00	(=Q24)
Likeliest	\$85.00	(=R24)
Maximum	\$130.00	(=S24)

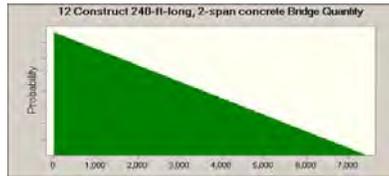


Assumption: 12 Construct 240-ft-long, 2-span concrete Bridge Quantity

Cell: L25

Triangular distribution with parameters:

Minimum	0	(=K25)
Likeliest	0	(=L25)
Maximum	7,440	(=M25)

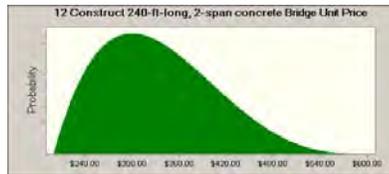


Assumption: 12 Construct 240-ft-long, 2-span concrete Bridge Unit Price

Cell: R25

BetaPERT distribution with parameters:

Minimum	\$200.00	(=Q25)
Likeliest	\$300.00	(=R25)
Maximum	\$600.00	(=S25)



Assumption: 13 Remove and dispose of existing bridge Quantity

Cell: L26

Triangular distribution with parameters:

Minimum	0	(=K26)
Likeliest	0	(=L26)
Maximum	1	(=M26)

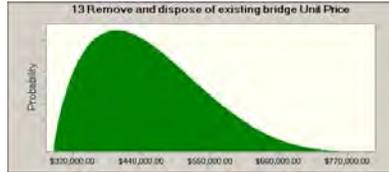


Assumption: 13 Remove and dispose of existing bridge Unit Price

Cell: R26

BetaPERT distribution with parameters:

Minimum	\$300,000.00	(=Q26)
Likeliest	\$400,000.00	(=R26)
Maximum	\$800,000.00	(=S26)

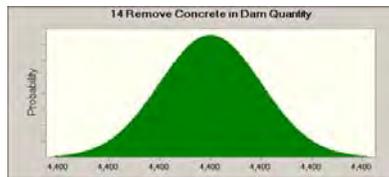


Assumption: 14 Remove Concrete in Dam Quantity

Cell: L27

Normal distribution with parameters:

Mean	4,400	(=L27)
Std. Dev.	0	(=0.000001)



Assumption: 14 Remove Concrete in Dam Unit Price

Cell: R27

BetaPERT distribution with parameters:

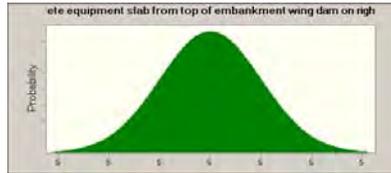
Minimum	\$270.00	(=Q27)
Likeliest	\$315.00	(=R27)
Maximum	\$500.00	(=S27)



Assumption: 15 Remove concrete equipment slab from top of embankment wing dam **Cell: L28**

Normal distribution with parameters:

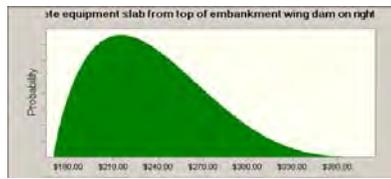
Mean 5 (=L28)
 Std. Dev. 0 (=0.000001)



Assumption: 15 Remove concrete equipment slab from top of embankment wing dam **Cell: R28**

BetaPERT distribution with parameters:

Minimum \$170.00 (=Q28)
 Likeliest \$215.00 (=R28)
 Maximum \$380.00 (=S28)



Assumption: 16 Remove Concrete Wingwall Quantity

Cell: L29

Normal distribution with parameters:

Mean 220 (=L29)
 Std. Dev. 0 (=0.000001)

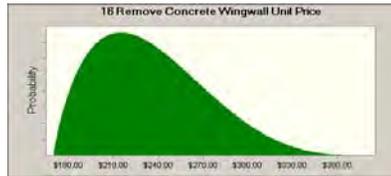


Assumption: 16 Remove Concrete Wingwall Unit Price

Cell: R29

BetaPERT distribution with parameters:

Minimum	\$170.00	(=Q29)
Likeliest	\$215.00	(=R29)
Maximum	\$380.00	(=S29)

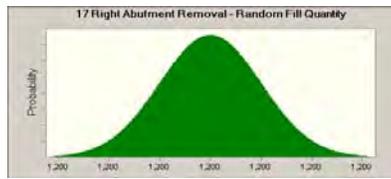


Assumption: 17 Right Abutment Removal - Random Fill Quantity

Cell: L30

Normal distribution with parameters:

Mean	1,200	(=L30)
Std. Dev.	0	(=0.000001)



Assumption: 17 Right Abutment Removal - Random Fill Unit Price

Cell: R30

BetaPERT distribution with parameters:

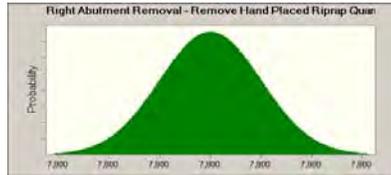
Minimum	\$13.00	(=Q30)
Likeliest	\$15.00	(=R30)
Maximum	\$18.00	(=S30)



Assumption: 18 Right Abutment Removal - Remove Hand Placed Riprap Quantity Cell: L31

Normal distribution with parameters:

Mean	7,800	(=L31)
Std. Dev.	0	(=0.000001)



Assumption: 18 Right Abutment Removal - Remove Hand Placed Riprap Unit Price Cell: R31

BetaPERT distribution with parameters:

Minimum	\$0.85	(=Q31)
Likeliest	\$1.00	(=R31)
Maximum	\$1.30	(=S31)

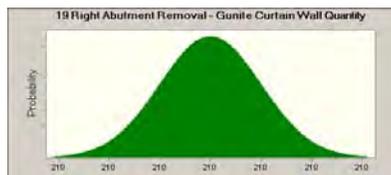


Assumption: 19 Right Abutment Removal - Gunite Curtain Wall Quantity Cell: L32

Cell: L32

Normal distribution with parameters:

Mean	210	(=L32)
Std. Dev.	0	(=0.000001)



Assumption: 19 Right Abutment Removal - Gunite Curtain Wall Unit Price

Cell: R32

BetaPERT distribution with parameters:

Minimum	\$170.00	(=Q32)
Likeliest	\$215.00	(=R32)
Maximum	\$380.00	(=S32)

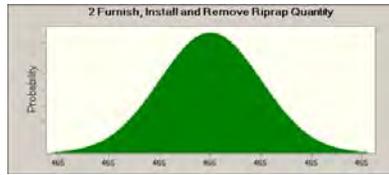


Assumption: 2 Furnish, Install and Remove Riprap Quantity

Cell: L15

Normal distribution with parameters:

Mean	465	(=L15)
Std. Dev.	0	(=0.000001)

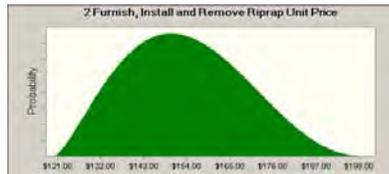


Assumption: 2 Furnish, Install and Remove Riprap Unit Price

Cell: R15

BetaPERT distribution with parameters:

Minimum	\$120.00	(=Q15)
Likeliest	\$150.00	(=R15)
Maximum	\$200.00	(=S15)

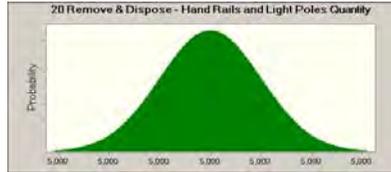


Assumption: 20 Remove & Dispose - Hand Rails and Light Poles Quantity

Cell: L33

Normal distribution with parameters:

Mean	5,000	(=L33)
Std. Dev.	0	(=0.000001)

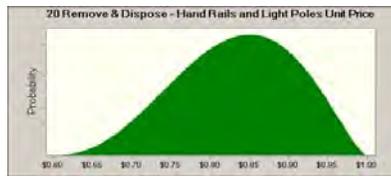


Assumption: 20 Remove & Dispose - Hand Rails and Light Poles Unit Price

Cell: R33

BetaPERT distribution with parameters:

Minimum	\$0.60	(=Q33)
Likeliest	\$0.85	(=R33)
Maximum	\$1.00	(=S33)

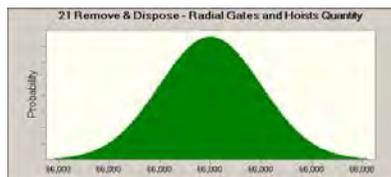


Assumption: 21 Remove & Dispose - Radial Gates and Hoists Quantity

Cell: L34

Normal distribution with parameters:

Mean	66,000	(=L34)
Std. Dev.	0	(=0.000001)

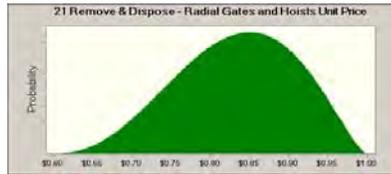


Assumption: 21 Remove & Dispose - Radial Gates and Hoists Unit Price

Cell: R34

BetaPERT distribution with parameters:

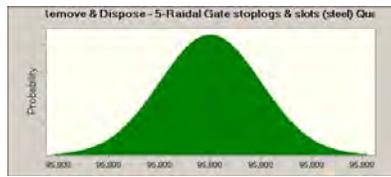
Minimum	\$0.60	(=Q34)
Likeliest	\$0.85	(=R34)
Maximum	\$1.00	(=S34)



Assumption: 22 Remove & Dispose - 5-Raidal Gate stoplogs & slots (steel) Quantity Cell: L35

Normal distribution with parameters:

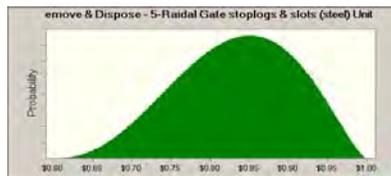
Mean	95,800	(=L35)
Std. Dev.	0	(=0.000001)



Assumption: 22 Remove & Dispose - 5-Raidal Gate stoplogs & slots (steel) Unit Price Cell: R35

BetaPERT distribution with parameters:

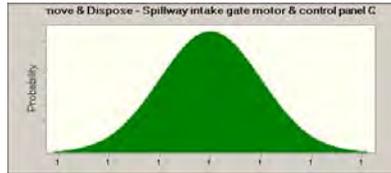
Minimum	\$0.60	(=Q35)
Likeliest	\$0.85	(=R35)
Maximum	\$1.00	(=S35)



Assumption: 23 Remove & Dispose - Spillway intake gate motor & control panel Quantity L36

Normal distribution with parameters:

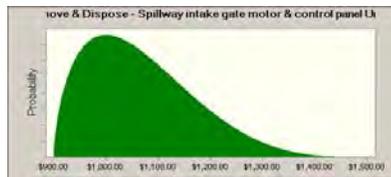
Mean	1	(=L36)
Std. Dev.	0	(=0.000001)



Assumption: 23 Remove & Dispose - Spillway intake gate motor & control panel Unit Price R36

BetaPERT distribution with parameters:

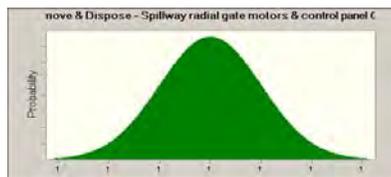
Minimum	\$900.00	(=Q36)
Likeliest	\$1,000.00	(=R36)
Maximum	\$1,500.00	(=S36)



Assumption: 24 Remove & Dispose - Spillway radial gate motors & control panel Quantity L37

Normal distribution with parameters:

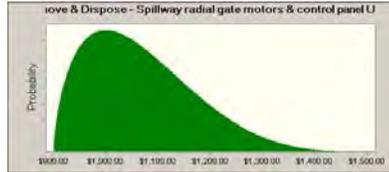
Mean	1	(=L37)
Std. Dev.	0	(=0.000001)



Assumption: 24 Remove & Dispose - Spillway radial gate motors & control panel Unit C1137

BetaPERT distribution with parameters:

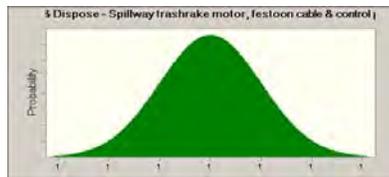
Minimum	\$900.00	(=Q37)
Likeliest	\$1,000.00	(=R37)
Maximum	\$1,500.00	(=S37)



Assumption: 25 Remove & Dispose - Spillway trashrake motor, festoon cable & control panel L38

Normal distribution with parameters:

Mean	1	(=L38)
Std. Dev.	0	(=0.000001)



Assumption: 25 Remove & Dispose - Spillway trashrake motor, festoon cable & control panel R38

BetaPERT distribution with parameters:

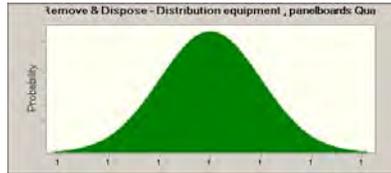
Minimum	\$400.00	(=Q38)
Likeliest	\$500.00	(=R38)
Maximum	\$600.00	(=S38)



Assumption: 26 Remove & Dispose - Distribution equipment , panelboards Quantity Cell: L39

Normal distribution with parameters:

Mean 1 (=L39)
 Std. Dev. 0 (=0.000001)



Assumption: 26 Remove & Dispose - Distribution equipment , panelboards Unit Price Cell: R39

BetaPERT distribution with parameters:

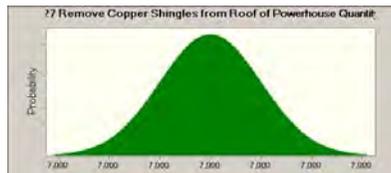
Minimum \$4,000.00 (=Q39)
 Likeliest \$4,500.00 (=R39)
 Maximum \$5,000.00 (=S39)



Assumption: 27 Remove Copper Shingles from Roof of Powerhouse Quantity Cell: L40

Normal distribution with parameters:

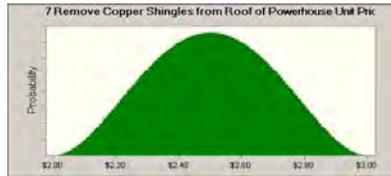
Mean 7,000 (=L40)
 Std. Dev. 0 (=0.000001)



Assumption: 27 Remove Copper Shingles from Roof of Powerhouse Unit Price Cell: R40

BetaPERT distribution with parameters:

Minimum	\$2.00	(=Q40)
Likeliest	\$2.50	(=R40)
Maximum	\$3.00	(=S40)



Assumption: 28 Remove Powerhouse Concrete down to spring-line of turbine Quantity Cell: L41

Normal distribution with parameters:

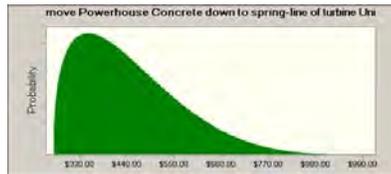
Mean	1,050	(=L41)
Std. Dev.	0	(=0.000001)



Assumption: 28 Remove Powerhouse Concrete down to spring-line of turbine Unit Price Cell: R41

BetaPERT distribution with parameters:

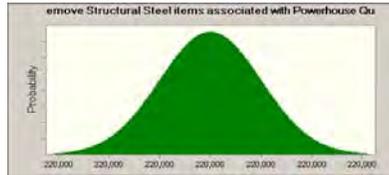
Minimum	\$270.00	(=Q41)
Likeliest	\$350.00	(=R41)
Maximum	\$1,000.00	(=S41)



Assumption: 29 Remove Structural Steel items associated with Powerhouse Quantity Cell: L42

Normal distribution with parameters:

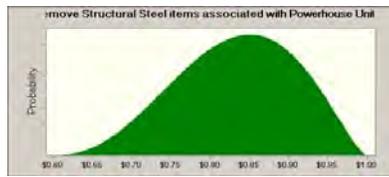
Mean	220,000	(=L42)
Std. Dev.	0	(=0.000001)



Assumption: 29 Remove Structural Steel items associated with Powerhouse Unit Price Cell: R42

BetaPERT distribution with parameters:

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

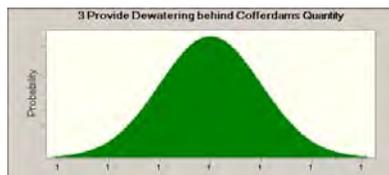


Assumption: 3 Provide Dewatering behind Cofferdams Quantity

Cell: L16

Normal distribution with parameters:

Mean	1	(=L16)
Std. Dev.	0	(=0.000001)

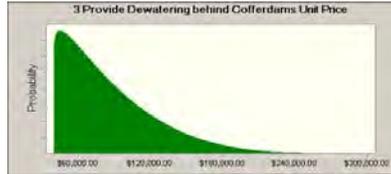


Assumption: 3 Provide Dewatering behind Cofferdams Unit Price

Cell: R16

BetaPERT distribution with parameters:

Minimum	\$40,000.00	(=Q16)
Likeliest	\$45,000.00	(=R16)
Maximum	\$300,000.00	(=S16)



Assumption: 30 Remove Control House Concrete Quantity

Cell: L43

Normal distribution with parameters:

Mean	30	(=L43)
Std. Dev.	0	(=0.000001)



Assumption: 30 Remove Control House Concrete Unit Price

Cell: R43

BetaPERT distribution with parameters:

Minimum	\$170.00	(=Q43)
Likeliest	\$215.00	(=R43)
Maximum	\$380.00	(=S43)



Assumption: 31 Remove Control House Structural Steel items Quantity

Cell: L44

Normal distribution with parameters:

Mean	3,500	(=L44)
Std. Dev.	0	(=0.000001)



Assumption: 31 Remove Control House Structural Steel items Unit Price

Cell: R44

BetaPERT distribution with parameters:

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



Assumption: 32 Remove Shop Building Quantity

Cell: L45

Normal distribution with parameters:

Mean	3,600	(=L45)
Std. Dev.	0	(=0.000001)



Assumption: 32 Remove Shop Building Unit Price

Cell: R45

BetaPERT distribution with parameters:

Minimum	\$55.00	(=Q45)
Likeliest	\$60.00	(=R45)
Maximum	\$65.00	(=S45)

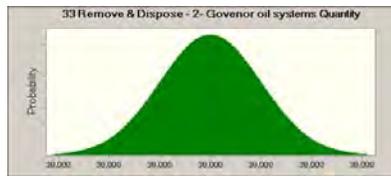


Assumption: 33 Remove & Dispose - 2- Govenor oil systems Quantity

Cell: L46

Normal distribution with parameters:

Mean	38,000	(=L46)
Std. Dev.	0	(=0.000001)

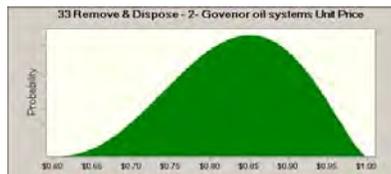


Assumption: 33 Remove & Dispose - 2- Govenor oil systems Unit Price

Cell: R46

BetaPERT distribution with parameters:

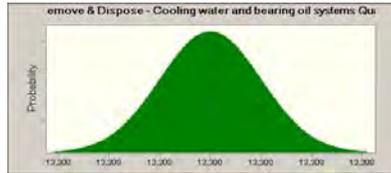
Minimum	\$0.60	(=Q46)
Likeliest	\$0.85	(=R46)
Maximum	\$1.00	(=S46)



Assumption: 34 Remove & Dispose - Cooling water and bearing oil systems Quantity Cell: L47

Normal distribution with parameters:

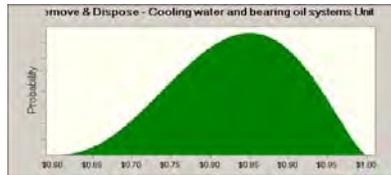
Mean	13,300	(=L47)
Std. Dev.	0	(=0.000001)



Assumption: 34 Remove & Dispose - Cooling water and bearing oil systems Unit Price Cell: R47

BetaPERT distribution with parameters:

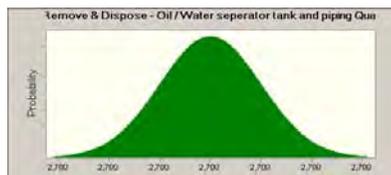
Minimum	\$0.60	(=Q47)
Likeliest	\$0.85	(=R47)
Maximum	\$1.00	(=S47)



Assumption: 35 Remove & Dispose - Oil / Water separator tank and piping Quantity Cell: L48

Normal distribution with parameters:

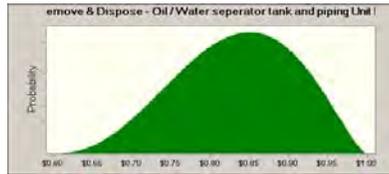
Mean	2,700	(=L48)
Std. Dev.	0	(=0.000001)



Assumption: 35 Remove & Dispose - Oil / Water separator tank and 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 - 12 - Cast Iron Columns Quantity

Cell: L49

Normal distribution with parameters:

Mean	54,000	(=L49)
Std. Dev.	0	(=0.000001)



Assumption: 36 Remove & Dispose - 12 - Cast Iron Columns Unit Price

Cell: R49

BetaPERT distribution with parameters:

Minimum	\$0.60	(=Q49)
Likeliest	\$0.85	(=R49)
Maximum	\$1.00	(=S49)

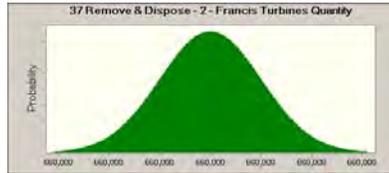


Assumption: 37 Remove & Dispose - 2 - Francis Turbines Quantity

Cell: L50

Normal distribution with parameters:

Mean	660,000	(=L50)
Std. Dev.	0	(=0.000001)

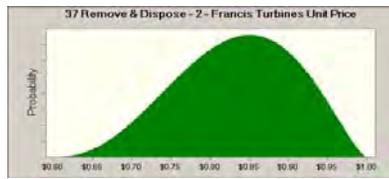


Assumption: 37 Remove & Dispose - 2 - Francis Turbines Unit Price

Cell: R50

BetaPERT distribution with parameters:

Minimum	\$0.60	(=Q50)
Likeliest	\$0.85	(=R50)
Maximum	\$1.00	(=S50)



Assumption: 38 Remove & Dispose - 2-40 Ton indoor crane Quantity

Cell: L51

Normal distribution with parameters:

Mean	140,000	(=L51)
Std. Dev.	0	(=0.000001)



Assumption: 38 Remove & Dispose - 2-40 Ton indoor crane Unit Price

Cell: R51

BetaPERT distribution with parameters:

Minimum	\$0.60	(=Q51)
Likeliest	\$0.85	(=R51)
Maximum	\$1.00	(=S51)

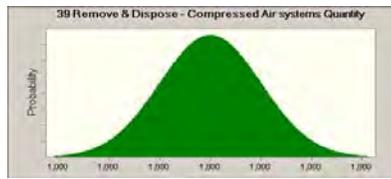


Assumption: 39 Remove & Dispose - Compressed Air systems Quantity

Cell: L52

Normal distribution with parameters:

Mean	1,000	(=L52)
Std. Dev.	0	(=0.000001)

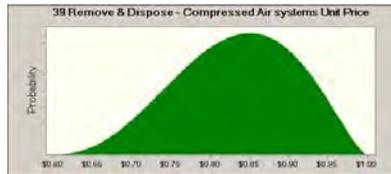


Assumption: 39 Remove & Dispose - Compressed Air systems Unit Price

Cell: R52

BetaPERT distribution with parameters:

Minimum	\$0.60	(=Q52)
Likeliest	\$0.85	(=R52)
Maximum	\$1.00	(=S52)



Assumption: 4 Remove Water from behind Cofferdams Quantity

Cell: L17

Normal distribution with parameters:

Mean 241,000 (=L17)
 Std. Dev. 0 (=0.000001)

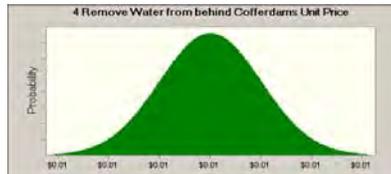


Assumption: 4 Remove Water from behind Cofferdams Unit Price

Cell: R17

Normal distribution with parameters:

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

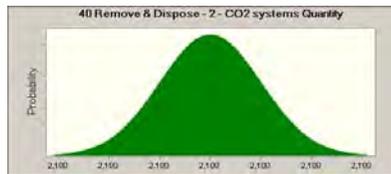


Assumption: 40 Remove & Dispose - 2 - CO2 systems Quantity

Cell: L53

Normal distribution with parameters:

Mean 2,100 (=L53)
 Std. Dev. 0 (=0.000001)

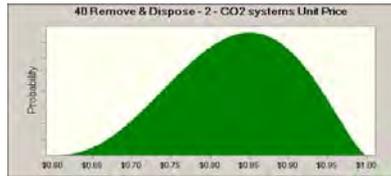


Assumption: 40 Remove & Dispose - 2 - CO2 systems Unit Price

Cell: R53

BetaPERT distribution with parameters:

Minimum	\$0.60	(=Q53)
Likeliest	\$0.85	(=R53)
Maximum	\$1.00	(=S53)

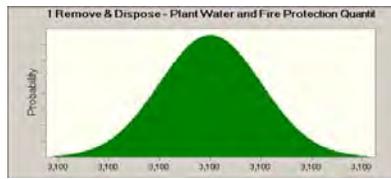


Assumption: 41 Remove & Dispose - Plant Water and Fire Protection Quantity

Cell: L54

Normal distribution with parameters:

Mean	3,100	(=L54)
Std. Dev.	0	(=0.000001)

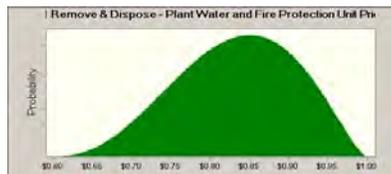


Assumption: 41 Remove & Dispose - Plant Water and Fire Protection Unit Price

Cell: R54

BetaPERT distribution with parameters:

Minimum	\$0.60	(=Q54)
Likeliest	\$0.85	(=R54)
Maximum	\$1.00	(=S54)

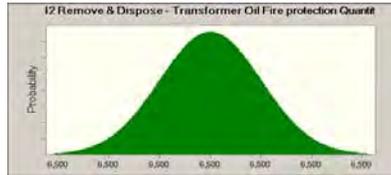


Assumption: 42 Remove & Dispose - Transformer Oil Fire protection Quantity

Cell: L55

Normal distribution with parameters:

Mean	6,500	(=L55)
Std. Dev.	0	(=0.000001)

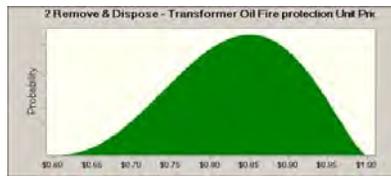


Assumption: 42 Remove & Dispose - Transformer Oil Fire protection Unit Price

Cell: R55

BetaPERT distribution with parameters:

Minimum	\$0.60	(=Q55)
Likeliest	\$0.85	(=R55)
Maximum	\$1.00	(=S55)



Assumption: 43 Remove & Dispose - Unwatering Piping Quantity

Cell: L56

Normal distribution with parameters:

Mean	32,000	(=L56)
Std. Dev.	0	(=0.000001)



Assumption: 43 Remove & Dispose - Unwatering Piping Unit Price

Cell: R56

BetaPERT distribution with parameters:

Minimum	\$0.60	(=Q56)
Likeliest	\$0.85	(=R56)
Maximum	\$1.00	(=S56)

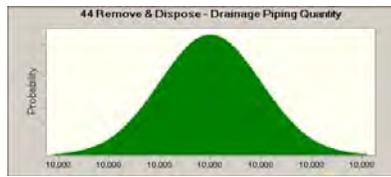


Assumption: 44 Remove & Dispose - Drainage Piping Quantity

Cell: L57

Normal distribution with parameters:

Mean	10,000	(=L57)
Std. Dev.	0	(=0.000001)



Assumption: 44 Remove & Dispose - Drainage Piping Unit Price

Cell: R57

BetaPERT distribution with parameters:

Minimum	\$0.60	(=Q57)
Likeliest	\$0.85	(=R57)
Maximum	\$1.00	(=S57)

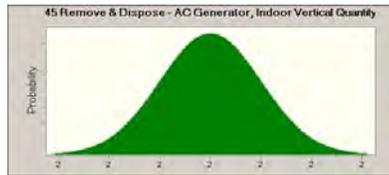


Assumption: 45 Remove & Dispose - AC Generator, Indoor Vertical Quantity

Cell: L58

Normal distribution with parameters:

Mean	2	(=L58)
Std. Dev.	0	(=0.000001)



Assumption: 45 Remove & Dispose - AC Generator, Indoor Vertical Unit Price

Cell: R58

BetaPERT distribution with parameters:

Minimum	\$120,000.00	(=Q58)
Likeliest	\$125,000.00	(=R58)
Maximum	\$130,000.00	(=S58)

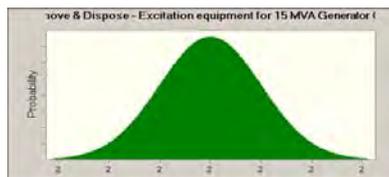


Assumption: 46 Remove & Dispose - Excitation equipment for 15 MVA Generator Quantity

Cell: L59

Normal distribution with parameters:

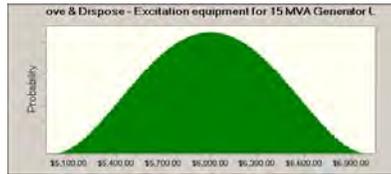
Mean	2	(=L59)
Std. Dev.	0	(=0.000001)



Assumption: 46 Remove & Dispose - Excitation equipment for 15 MVA Generator Unit R59

BetaPERT distribution with parameters:

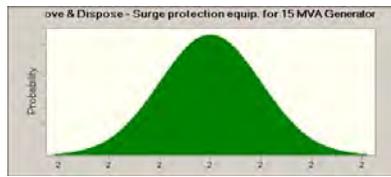
Minimum	\$5,000.00	(=Q59)
Likeliest	\$6,000.00	(=R59)
Maximum	\$7,000.00	(=S59)



Assumption: 47 Remove & Dispose - Surge protection equip. for 15 MVA Generator Unit L60

Normal distribution with parameters:

Mean	2	(=L60)
Std. Dev.	0	(=0.000001)



Assumption: 47 Remove & Dispose - Surge protection equip. for 15 MVA Generator Unit R60

BetaPERT distribution with parameters:

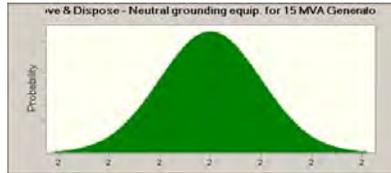
Minimum	\$1,500.00	(=Q60)
Likeliest	\$2,000.00	(=R60)
Maximum	\$3,000.00	(=S60)



Assumption: 48 Remove & Dispose - Neutral grounding equip. for 15 MVA Generator Unit L61

Normal distribution with parameters:

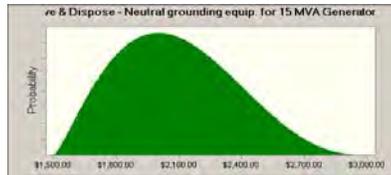
Mean	2	(=L61)
Std. Dev.	0	(=0.000001)



Assumption: 48 Remove & Dispose - Neutral grounding equip. for 15 MVA Generator Unit R61

BetaPERT distribution with parameters:

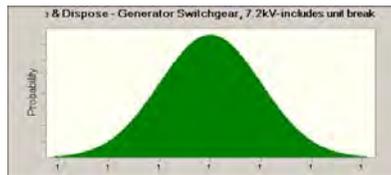
Minimum	\$1,500.00	(=Q61)
Likeliest	\$2,000.00	(=R61)
Maximum	\$3,000.00	(=S61)



Assumption: 49 Remove & Dispose - Generator Switchgear, 7.2kV-includes unit breaker L62

Normal distribution with parameters:

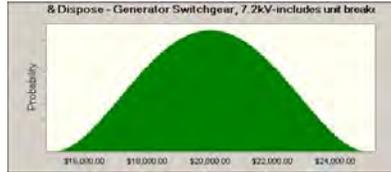
Mean	1	(=L62)
Std. Dev.	0	(=0.000001)



Assumption: 49 Remove & Dispose - Generator Switchgear, 7.2kV-includes unit break **Cell R62**

BetaPERT distribution with parameters:

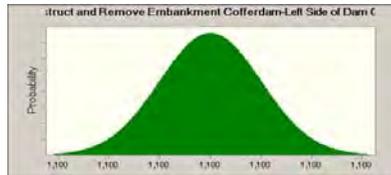
Minimum	\$15,000.00	(=Q62)
Likeliest	\$20,000.00	(=R62)
Maximum	\$25,000.00	(=S62)



Assumption: 5 Construct and Remove Embankment Cofferdam-Left Side of Dam **Cell L18**

Normal distribution with parameters:

Mean	1,100	(=L18)
Std. Dev.	0	(=0.000001)



Assumption: 5 Construct and Remove Embankment Cofferdam-Left Side of Dam **Cell R18**

BetaPERT distribution with parameters:

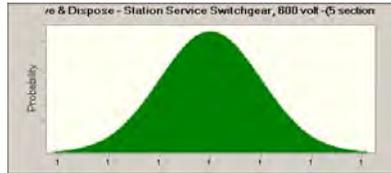
Minimum	\$70.00	(=Q18)
Likeliest	\$85.00	(=R18)
Maximum	\$130.00	(=S18)



Assumption: 50 Remove & Dispose - Station Service Switchgear, 600 volt -(5 sections) Cell: L63

Normal distribution with parameters:

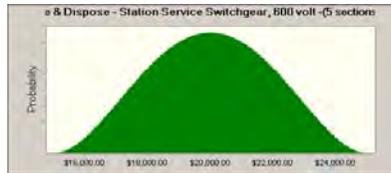
Mean	1	(=L63)
Std. Dev.	0	(=0.000001)



Assumption: 50 Remove & Dispose - Station Service Switchgear, 600 volt -(5 sections) Cell: L63

BetaPERT distribution with parameters:

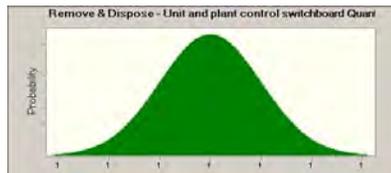
Minimum	\$15,000.00	(=Q63)
Likeliest	\$20,000.00	(=R63)
Maximum	\$25,000.00	(=S63)



Assumption: 51 Remove & Dispose - Unit and plant control switchboard Quantity Cell: L64

Normal distribution with parameters:

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



Assumption: 51 Remove & Dispose - Unit and plant control switchboard Unit Price Cell: R64

BetaPERT distribution with parameters:

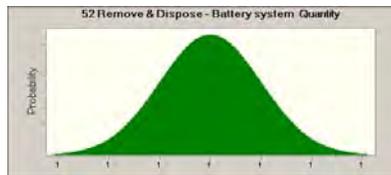
Minimum	\$14,000.00	(=Q64)
Likeliest	\$15,000.00	(=R64)
Maximum	\$17,000.00	(=S64)



Assumption: 52 Remove & Dispose - Battery system Quantity Cell: L65

Normal distribution with parameters:

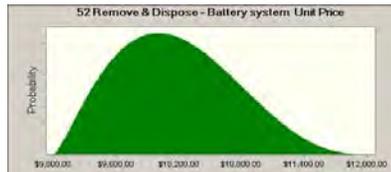
Mean	1	(=L65)
Std. Dev.	0	(=0.000001)



Assumption: 52 Remove & Dispose - Battery system Unit Price Cell: R65

BetaPERT distribution with parameters:

Minimum	\$9,000.00	(=Q65)
Likeliest	\$10,000.00	(=R65)
Maximum	\$12,000.00	(=S65)

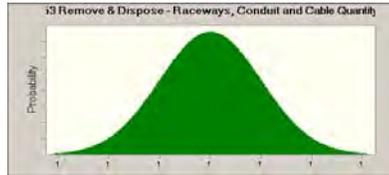


Assumption: 53 Remove & Dispose - Raceways, Conduit and Cable Quantity

Cell: L66

Normal distribution with parameters:

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



Assumption: 53 Remove & Dispose - Raceways, Conduit and Cable Unit Price

Cell: R66

BetaPERT distribution with parameters:

Minimum	\$14,000.00	(=Q66)
Likeliest	\$15,000.00	(=R66)
Maximum	\$17,000.00	(=S66)

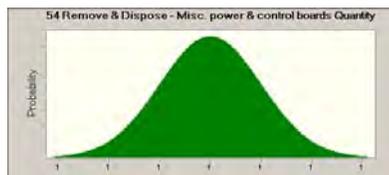


Assumption: 54 Remove & Dispose - Misc. power & control boards Quantity

Cell: L67

Normal distribution with parameters:

Mean	1	(=L67)
Std. Dev.	0	(=0.000001)



Assumption: 54 Remove & Dispose - Misc. power & control boards Unit Price

Cell: R67

BetaPERT distribution with parameters:

Minimum	\$4,000.00	(=Q67)
Likeliest	\$5,000.00	(=R67)
Maximum	\$7,000.00	(=S67)

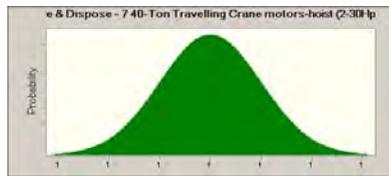


Assumption: 55 Remove & Dispose - 7 40-Ton Travelling Crane motors-hoist (2-30Hp) Unit Price

Cell: L68

Normal distribution with parameters:

Mean	1	(=L68)
Std. Dev.	0	(=0.000001)



Assumption: 55 Remove & Dispose - 7 40-Ton Travelling Crane motors-hoist (2-30Hp) Unit Price

Cell: R68

BetaPERT distribution with parameters:

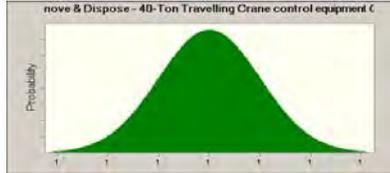
Minimum	\$2,000.00	(=Q68)
Likeliest	\$2,500.00	(=R68)
Maximum	\$3,000.00	(=S68)



Assumption: 56 Remove & Dispose - 40-Ton Travelling Crane control equipment Quantity L69

Normal distribution with parameters:

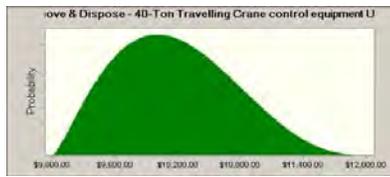
Mean	1	(=L69)
Std. Dev.	0	(=0.000001)



Assumption: 56 Remove & Dispose - 40-Ton Travelling Crane control equipment Unit Cost R69

BetaPERT distribution with parameters:

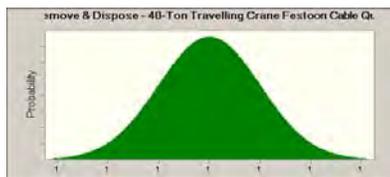
Minimum	\$9,000.00	(=Q69)
Likeliest	\$10,000.00	(=R69)
Maximum	\$12,000.00	(=S69)



Assumption: 57 Remove & Dispose - 40-Ton Travelling Crane Festoon Cable Quantity Cell: L70

Normal distribution with parameters:

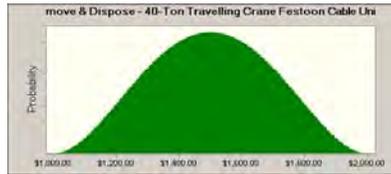
Mean	1	(=L70)
Std. Dev.	0	(=0.000001)



Assumption: 57 Remove & Dispose - 40-Ton Travelling Crane Festoon Cable Unit Price **Cell: R70**

BetaPERT distribution with parameters:

Minimum	\$1,000.00	(=Q70)
Likeliest	\$1,500.00	(=R70)
Maximum	\$2,000.00	(=S70)

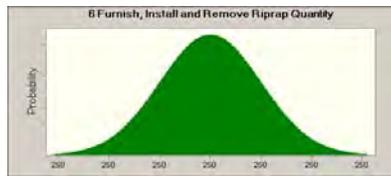


Assumption: 6 Furnish, Install and Remove Riprap Quantity

Cell: L19

Normal distribution with parameters:

Mean	250	(=L19)
Std. Dev.	0	(=0.000001)

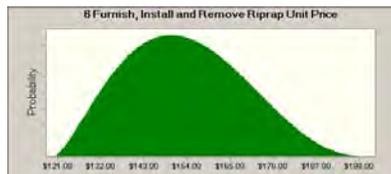


Assumption: 6 Furnish, Install and Remove Riprap Unit Price

Cell: R19

BetaPERT distribution with parameters:

Minimum	\$120.00	(=Q19)
Likeliest	\$150.00	(=R19)
Maximum	\$200.00	(=S19)

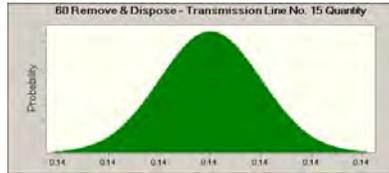


Assumption: 60 Remove & Dispose - Transmission Line No. 15 Quantity

Cell: L73

Normal distribution with parameters:

Mean	0.14	(=L73)
Std. Dev.	0.00	(=0.000001)

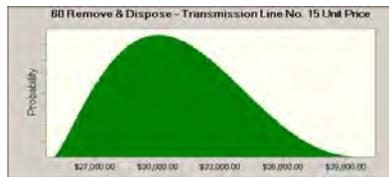


Assumption: 60 Remove & Dispose - Transmission Line No. 15 Unit Price

Cell: R73

BetaPERT distribution with parameters:

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

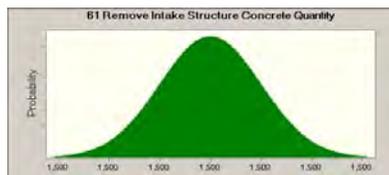


Assumption: 61 Remove Intake Structure Concrete Quantity

Cell: L74

Normal distribution with parameters:

Mean	1,500	(=L74)
Std. Dev.	0	(=0.000001)

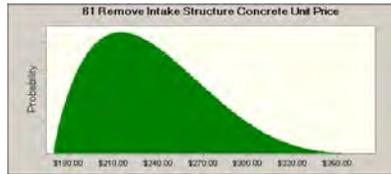


Assumption: 61 Remove Intake Structure Concrete Unit Price

Cell: R74

BetaPERT distribution with parameters:

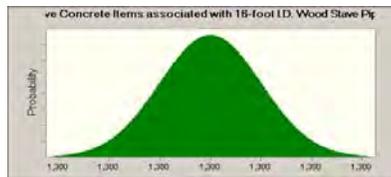
Minimum	\$170.00	(=Q74)
Likeliest	\$215.00	(=R74)
Maximum	\$380.00	(=S74)



Assumption: 62 Remove Concrete Items associated with 16-foot I.D. Wood Stave Pipe Unit

Normal distribution with parameters:

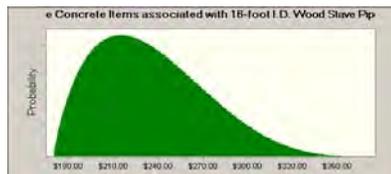
Mean	1,300	(=L75)
Std. Dev.	0	(=0.000001)



Assumption: 62 Remove Concrete Items associated with 16-foot I.D. Wood Stave Pipe Unit

BetaPERT distribution with parameters:

Minimum	\$170.00	(=Q75)
Likeliest	\$215.00	(=R75)
Maximum	\$380.00	(=S75)

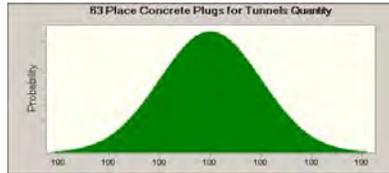


Assumption: 63 Place Concrete Plugs for Tunnels Quantity

Cell: L76

Normal distribution with parameters:

Mean	100	(=L76)
Std. Dev.	0	(=0.000001)



Assumption: 63 Place Concrete Plugs for Tunnels Unit Price

Cell: R76

BetaPERT distribution with parameters:

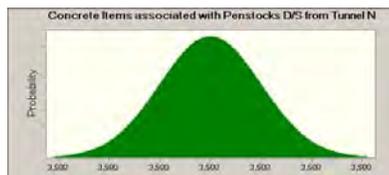
Minimum	\$1,100.00	(=Q76)
Likeliest	\$1,200.00	(=R76)
Maximum	\$1,300.00	(=S76)



Assumption: 64 Remove Concrete Items associated with Penstocks D/S from Tunnel No. 1

Normal distribution with parameters:

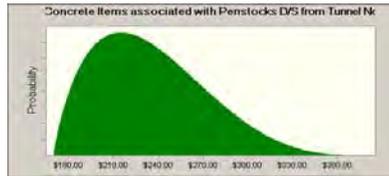
Mean	3,500	(=L77)
Std. Dev.	0	(=0.000001)



Assumption: 64 Remove Concrete Items associated with Penstocks D/S from Tunnel No. 277

BetaPERT distribution with parameters:

Minimum	\$170.00	(=Q77)
Likeliest	\$215.00	(=R77)
Maximum	\$380.00	(=S77)

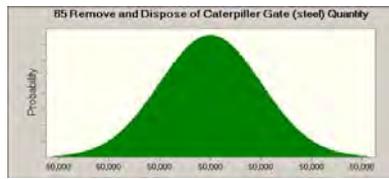


Assumption: 65 Remove and Dispose of Caterpillar Gate (steel) Quantity

Cell: L78

Normal distribution with parameters:

Mean	50,000	(=L78)
Std. Dev.	0	(=0.000001)

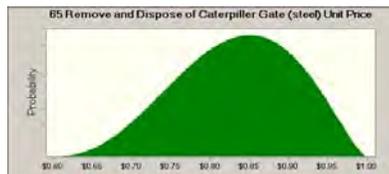


Assumption: 65 Remove and Dispose of Caterpillar Gate (steel) Unit Price

Cell: R78

BetaPERT distribution with parameters:

Minimum	\$0.60	(=Q78)
Likeliest	\$0.85	(=R78)
Maximum	\$1.00	(=S78)



Assumption: 66 Remove and Dispose of Trash rack and trash rake (steel) Quantity Cell: L79

Normal distribution with parameters:

Mean	86,000	(=L79)
Std. Dev.	0	(=0.000001)



Assumption: 66 Remove and Dispose of Trash rack and trash rake (steel) Unit Price Cell: R79

BetaPERT distribution with parameters:

Minimum	\$0.60	(=Q79)
Likeliest	\$0.75	(=R79)
Maximum	\$0.85	(=S79)



Assumption: 67 Remove and Dispose of Stop Logs and slots for intake (steel) Quantity Cell: L80

Normal distribution with parameters:

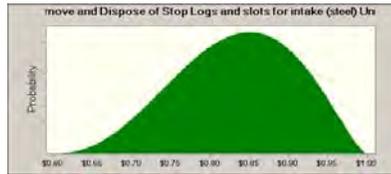
Mean	220,000	(=L80)
Std. Dev.	0	(=0.000001)



Assumption: 67 Remove and Dispose of Stop Logs and slots for intake (steel) Unit Price: R80

BetaPERT distribution with parameters:

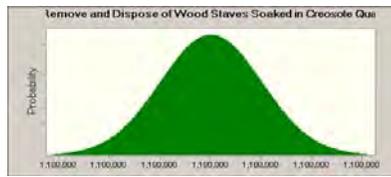
Minimum	\$0.60	(=Q80)
Likeliest	\$0.85	(=R80)
Maximum	\$1.00	(=S80)



Assumption: 68 Remove and Dispose of Wood Staves Soaked in Creosote Quantity Cell: L81

Normal distribution with parameters:

Mean	1,100,000	(=L81)
Std. Dev.	0	(=0.000001)



Assumption: 68 Remove and Dispose of Wood Staves Soaked in Creosote Unit Price: R81

BetaPERT distribution with parameters:

Minimum	\$0.65	(=Q81)
Likeliest	\$0.70	(=R81)
Maximum	\$0.85	(=S81)

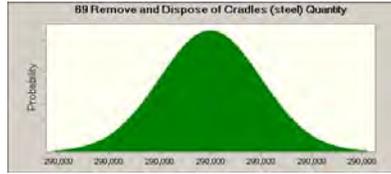


Assumption: 69 Remove and Dispose of Cradles (steel) Quantity

Cell: L82

Normal distribution with parameters:

Mean	290,000	(=L82)
Std. Dev.	0	(=0.000001)

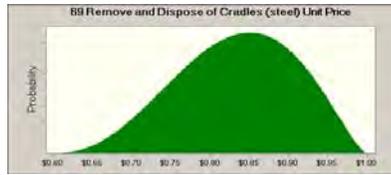


Assumption: 69 Remove and Dispose of Cradles (steel) Unit Price

Cell: R82

BetaPERT distribution with parameters:

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

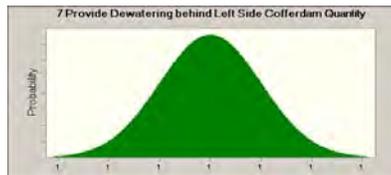


Assumption: 7 Provide Dewatering behind Left Side Cofferdam Quantity

Cell: L20

Normal distribution with parameters:

Mean	1	(=L20)
Std. Dev.	0	(=0.000001)

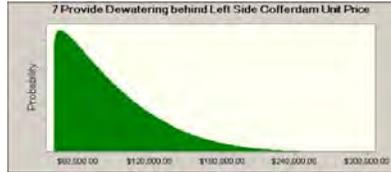


Assumption: 7 Provide Dewatering behind Left Side Cofferdam Unit Price

Cell: R20

BetaPERT distribution with parameters:

Minimum	\$40,000.00	(=Q20)
Likeliest	\$45,000.00	(=R20)
Maximum	\$300,000.00	(=S20)

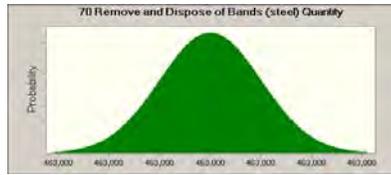


Assumption: 70 Remove and Dispose of Bands (steel) Quantity

Cell: L83

Normal distribution with parameters:

Mean	463,000	(=L83)
Std. Dev.	0	(=0.000001)

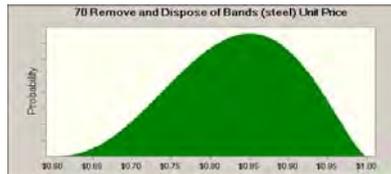


Assumption: 70 Remove and Dispose of Bands (steel) Unit Price

Cell: R83

BetaPERT distribution with parameters:

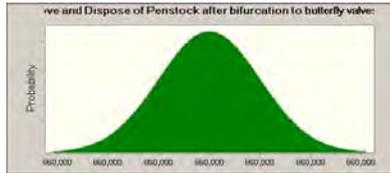
Minimum	\$0.60	(=Q83)
Likeliest	\$0.85	(=R83)
Maximum	\$1.00	(=S83)



Assumption: 71 Remove and Dispose of Penstock after bifurcation to butterfly valves **Cell L84**

Normal distribution with parameters:

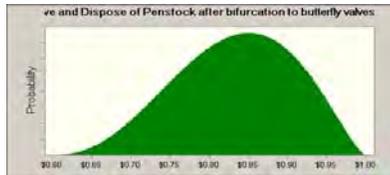
Mean 860,000 (=L84)
 Std. Dev. 0 (=0.000001)



Assumption: 71 Remove and Dispose of Penstock after bifurcation to butterfly valves **Cell R84**

BetaPERT distribution with parameters:

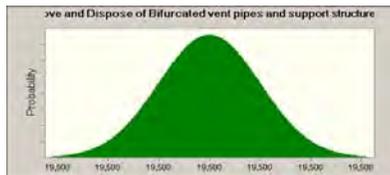
Minimum \$0.60 (=Q84)
 Likeliest \$0.85 (=R84)
 Maximum \$1.00 (=S84)



Assumption: 72 Remove and Dispose of Bifurcated vent pipes and support structure **Cell L85**

Normal distribution with parameters:

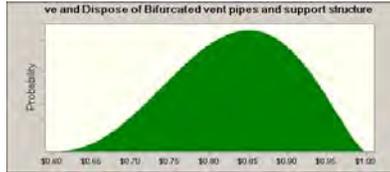
Mean 19,500 (=L85)
 Std. Dev. 0 (=0.000001)



Assumption: 72 Remove and Dispose of Bifurcated vent pipes and support structure **Cell: R85**

BetaPERT distribution with parameters:

Minimum	\$0.60	(=Q85)
Likeliest	\$0.85	(=R85)
Maximum	\$1.00	(=S85)

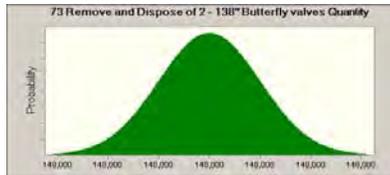


Assumption: 73 Remove and Dispose of 2 - 138" Butterfly valves Quantity

Cell: L86

Normal distribution with parameters:

Mean	148,000	(=L86)
Std. Dev.	0	(=0.000001)

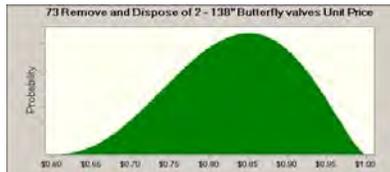


Assumption: 73 Remove and Dispose of 2 - 138" Butterfly valves Unit Price

Cell: R86

BetaPERT distribution with parameters:

Minimum	\$0.60	(=Q86)
Likeliest	\$0.85	(=R86)
Maximum	\$1.00	(=S86)

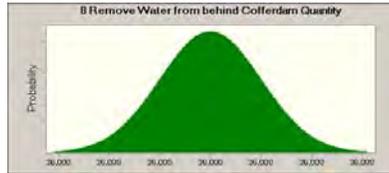


Assumption: 8 Remove Water from behind Cofferdam Quantity

Cell: L21

Normal distribution with parameters:

Mean	36,000	(=L21)
Std. Dev.	0	(=0.000001)



Assumption: 8 Remove Water from behind Cofferdam Unit Price

Cell: R21

BetaPERT distribution with parameters:

Minimum	\$0.04	(=Q21)
Likeliest	\$0.05	(=R21)
Maximum	\$0.08	(=S21)

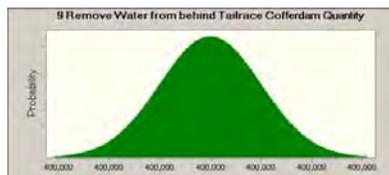


Assumption: 9 Remove Water from behind Tailrace Cofferdam Quantity

Cell: L22

Normal distribution with parameters:

Mean	400,000	(=L22)
Std. Dev.	0	(=0.000001)

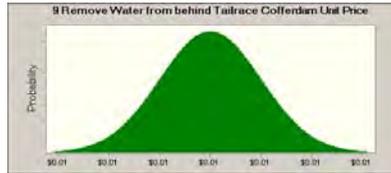


Assumption: 9 Remove Water from behind Tailrace Cofferdam Unit Price

Cell: R22

Normal distribution with parameters:

Mean	\$0.01	(=R22)
Std. Dev.	\$0.00	(=0.000001)

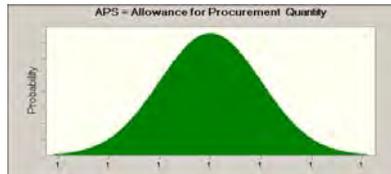


Assumption: APS = Allowance for Procurement Quantity

Cell: L95

Normal distribution with parameters:

Mean	1	(=L95)
Std. Dev.	0	(=0.000001)

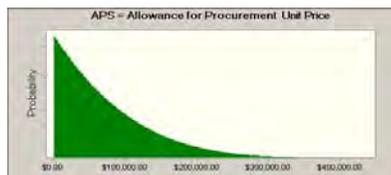


Assumption: APS = Allowance for Procurement Unit Price

Cell: R95

BetaPERT distribution with parameters:

Minimum	\$0.00	(=Q95)
Likeliest	\$0.00	(=R95)
Maximum	\$437,288.00	(=S95)

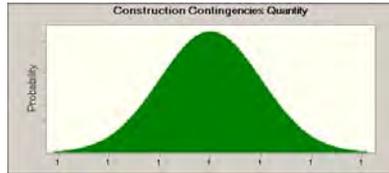


Assumption: Construction Contingencies Quantity

Cell: L98

Normal distribution with parameters:

Mean	1	(=L98)
Std. Dev.	0	(=0.000001)



Assumption: Construction Contingencies Unit Price

Cell: R98

BetaPERT distribution with parameters:

Minimum	\$1,400,000.00	(=Q98)
Likeliest	\$1,800,000.00	(=R98)
Maximum	\$6,000,000.00	(=S98)

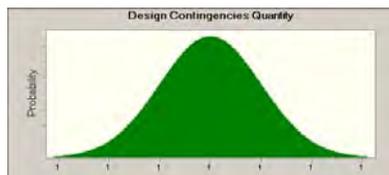


Assumption: Design Contingencies Quantity

Cell: L94

Normal distribution with parameters:

Mean	1	(=L94)
Std. Dev.	0	(=0.000001)



Assumption: Design Contingencies Unit Price

Cell: R94

BetaPERT distribution with parameters:

Minimum	\$520,170.00	(=Q94)
Likeliest	\$843,090.00	(=R94)
Maximum	\$2,550,182.00	(=S94)

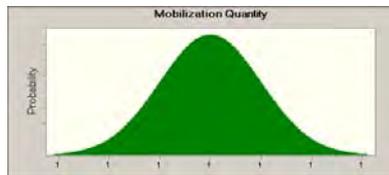


Assumption: Mobilization Quantity

Cell: L89

Normal distribution with parameters:

Mean	1	(=L89)
Std. Dev.	0	(=0.000001)



Assumption: Mobilization Unit Price

Cell: R89

BetaPERT distribution with parameters:

Minimum	\$340,000.00	(=Q89)
Likeliest	\$420,000.00	(=R89)
Maximum	\$910,000.00	(=S89)



Assumption: Non-Contract Cost Quantity

Cell: L100

Normal distribution with parameters:

Mean	1	(=L100)
Std. Dev.	0	(=0.000001)



Assumption: Non-Contract Cost Unit Price

Cell: R100

BetaPERT distribution with parameters:

Minimum	\$4,500,000.00	(=Q100)
Likeliest	\$6,500,000.00	(=R100)
Maximum	\$17,000,000.00	(=S100)



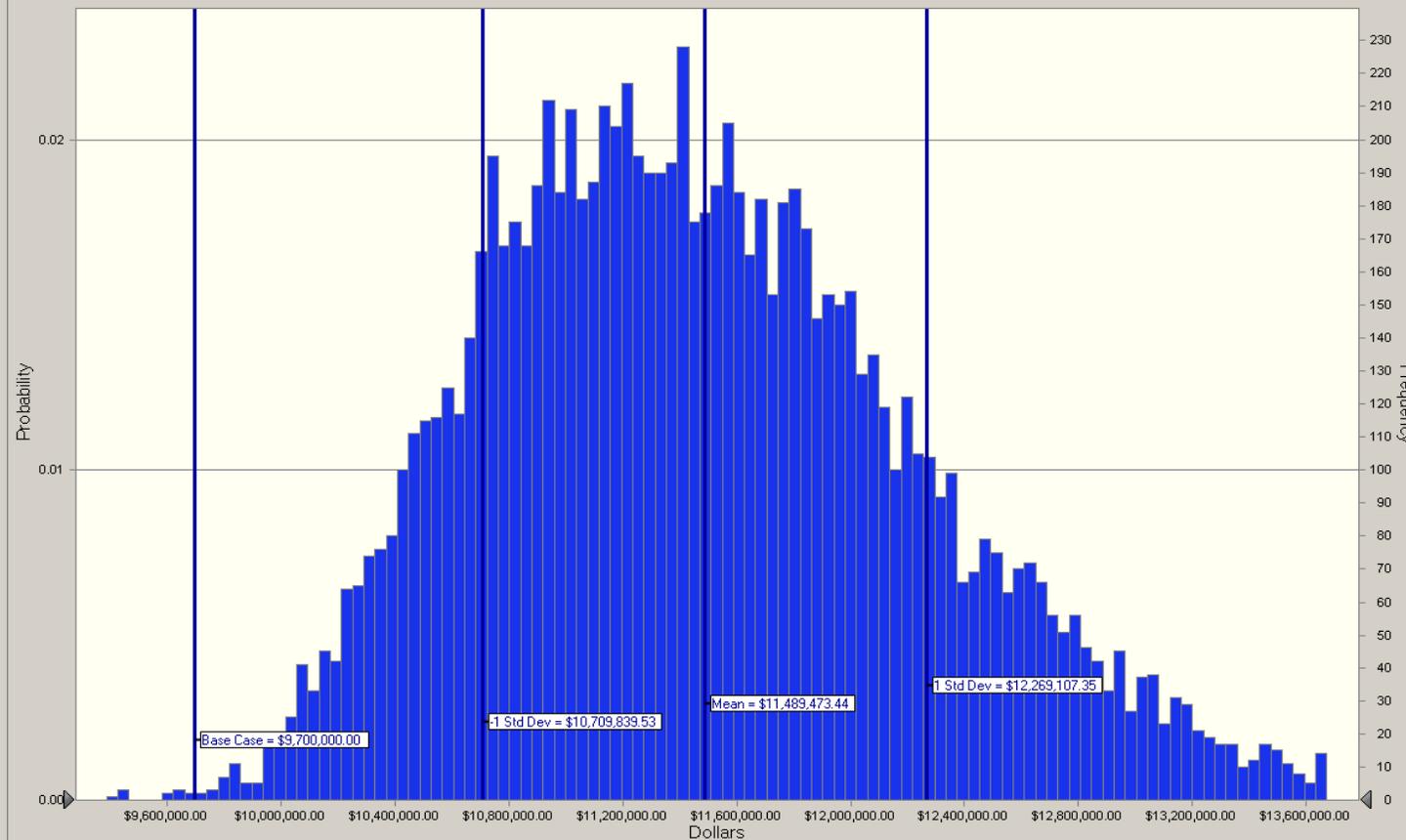
End of Assumptions

10,000 Trials

Split View

9,924 Displayed

Contract Cost - Copco No. 2 - Full Removal - Without Escalation



Statistic	Forecast values
Trials	10,000
Mean	\$11,489,473.44
Median	\$11,415,717.87
Mode	...
Standard Deviation	\$779,633.91
Variance	\$607,829,032,526.93
Skewness	0.5364
Kurtosis	3.24
Coeff. of Variability	0.0679
Minimum	\$9,388,249.13
Maximum	\$15,104,036.31
Mean Std. Error	\$7,796.34

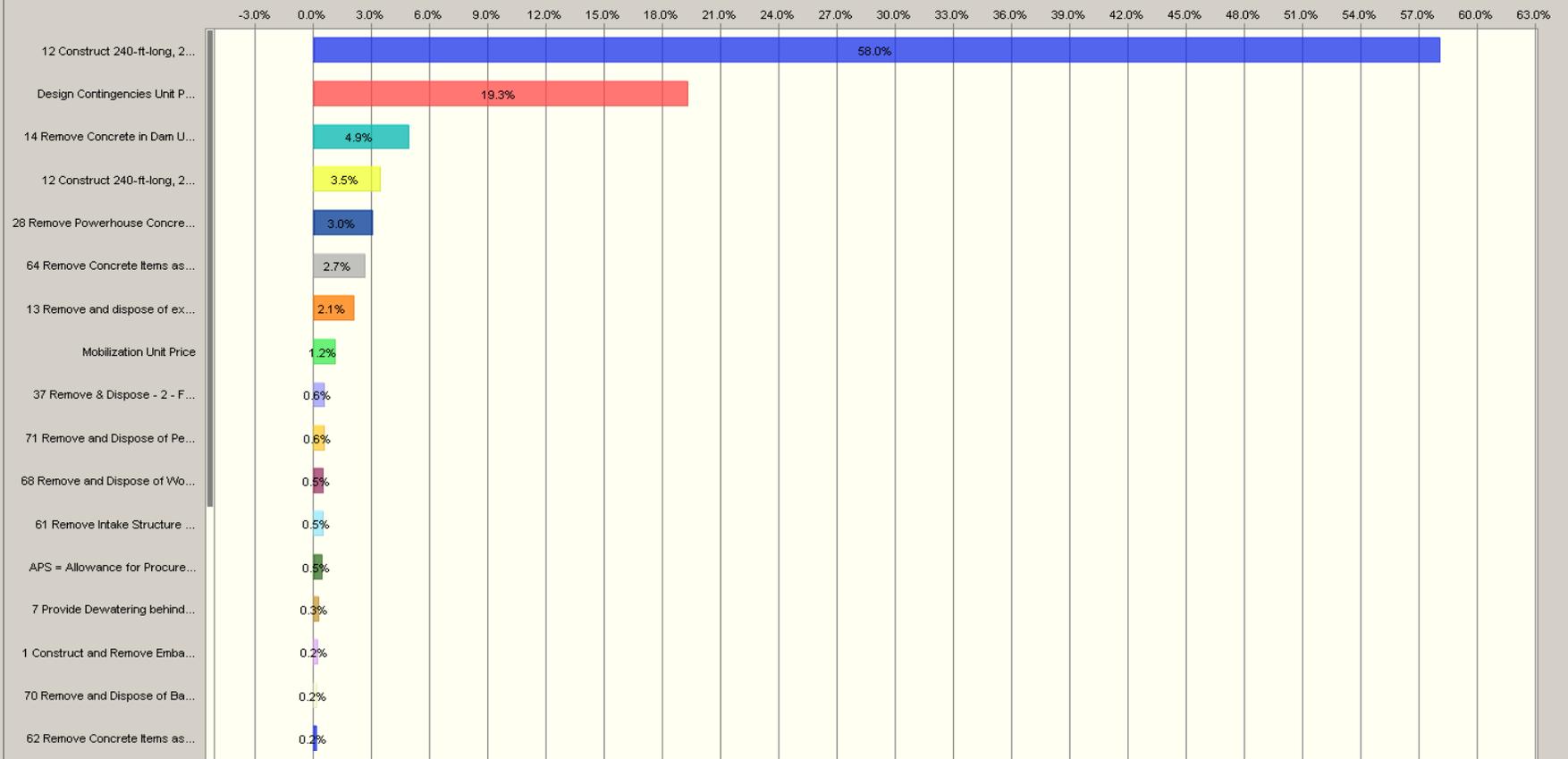
Percentile	Forecast values
0%	\$9,388,249.13
10%	\$10,547,778.38
20%	\$10,808,207.07
30%	\$11,020,015.35
40%	\$11,215,031.76
50%	\$11,415,640.11
60%	\$11,620,989.20
70%	\$11,848,990.03
80%	\$12,115,544.29
90%	\$12,545,228.40
100%	\$15,104,036.31

◀ -Infinity Certainty: 100.00 % ▶ Infinity

10,000 Trials

Contribution to Variance View

Sensitivity: Contract Cost - Copco No. 2 - Full Removal - Without Escalation

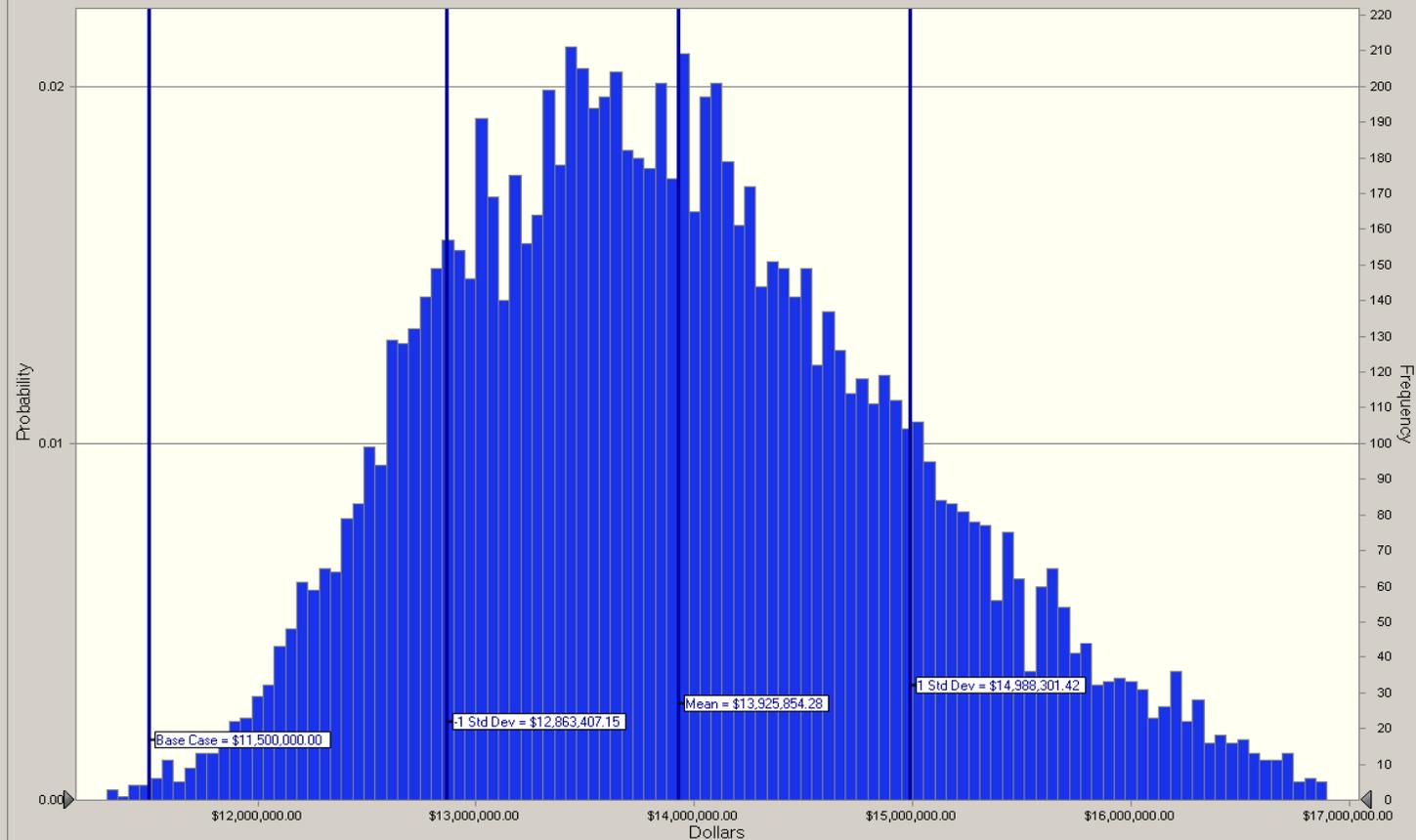


10,000 Trials

Split View

9,928 Displayed

Field Cost - Copco No. 2 - Full Removal - Without Escalation



Statistic	Forecast values
Trials	10,000
Mean	\$13,925,854.28
Median	\$13,832,696.99
Mode	...
Standard Deviation	\$1,062,447.13
Variance	\$1,128,793,911,464.1
Skewness	0.4738
Kurtosis	3.08
Coeff. of Variability	0.0763
Minimum	\$11,305,738.18
Maximum	\$18,770,225.18
Mean Std. Error	\$10,624.47

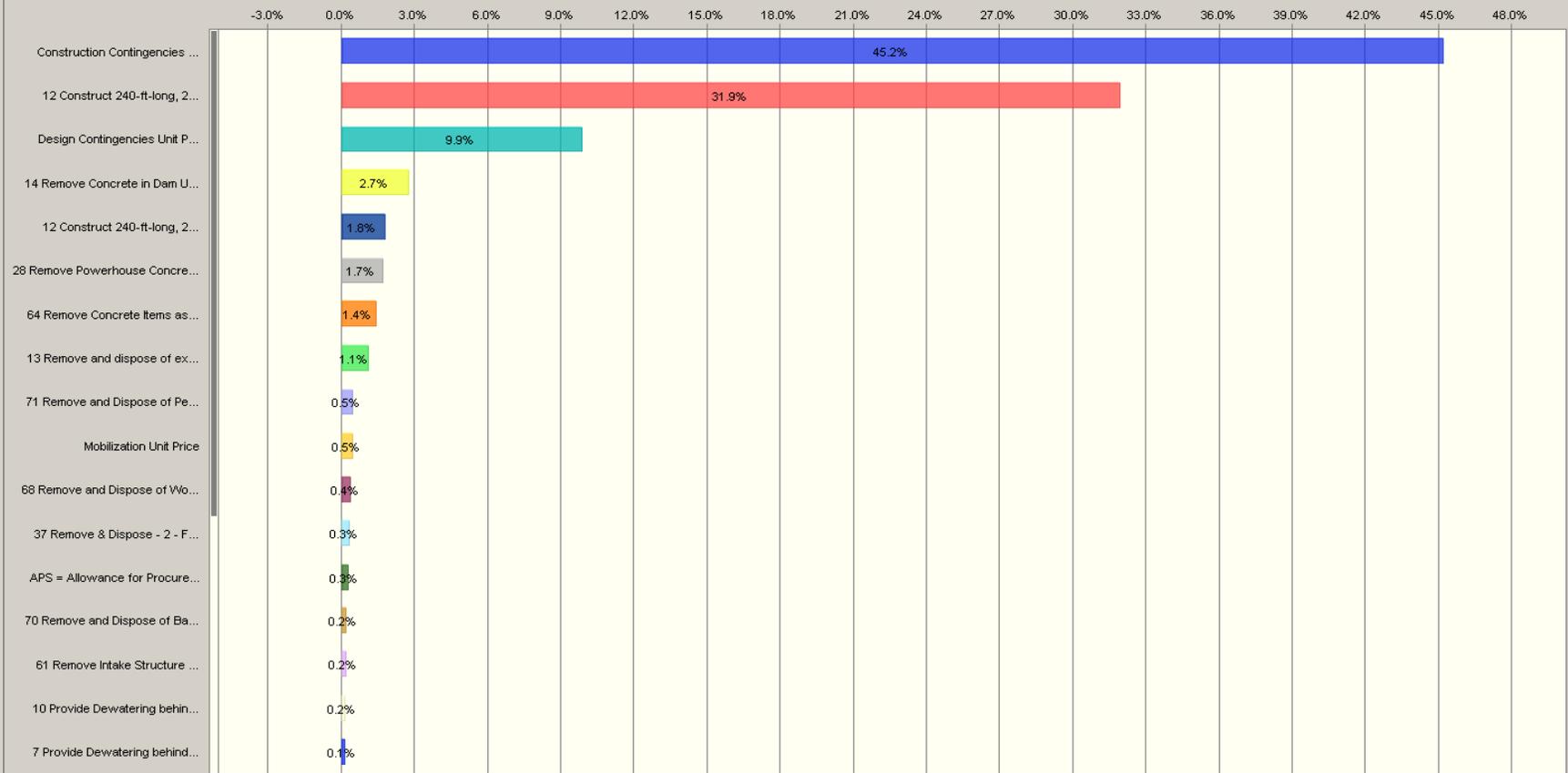
Percentile	Forecast values
0%	\$11,305,738.18
10%	\$12,635,044.76
20%	\$12,989,679.22
30%	\$13,301,795.55
40%	\$13,562,257.51
50%	\$13,832,617.41
60%	\$14,108,076.91
70%	\$14,419,016.90
80%	\$14,815,758.97
90%	\$15,356,140.17
100%	\$18,770,225.18

► -Infinity

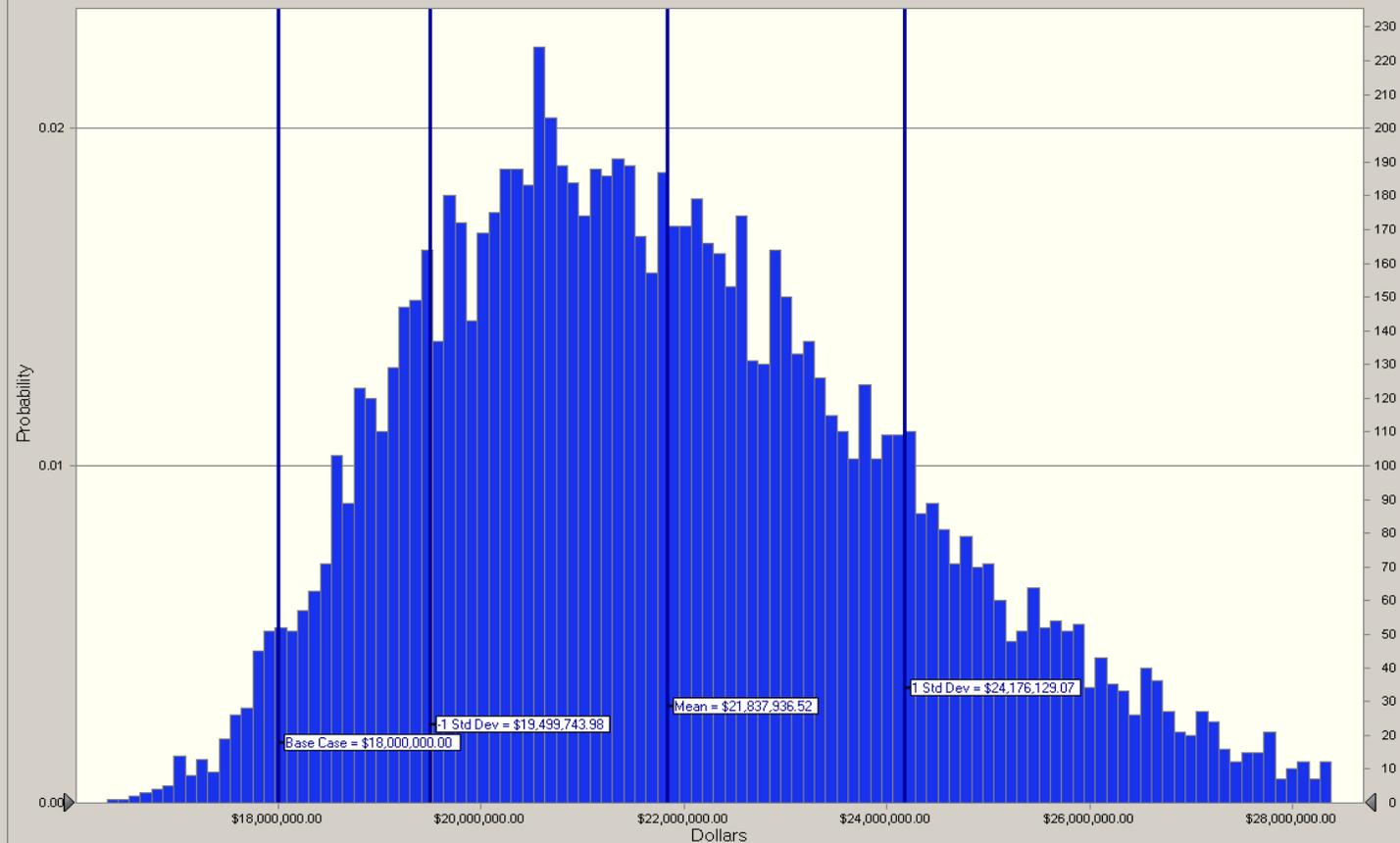
Certainty: 100.00 %

◀ Infinity

Sensitivity: Field Cost - Copco No. 2 - Full Removal - Without Escalation



Construction Cost - Copco No. 2 - Full Removal - Without Escalation



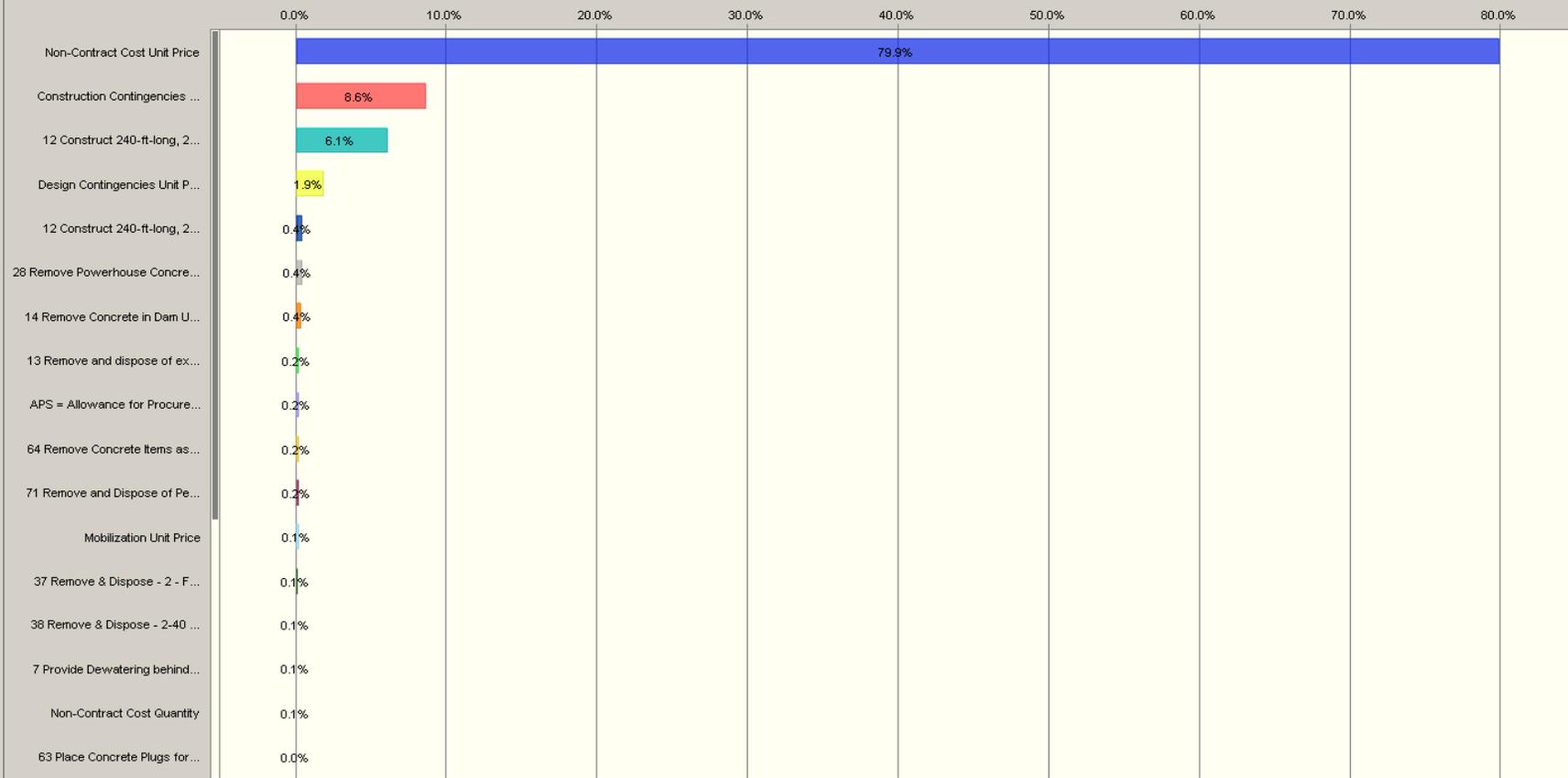
Statistic	Forecast values
Trials	10,000
Mean	\$21,837,936.52
Median	\$21,568,711.44
Mode	...
Standard Deviation	\$2,338,192.55
Variance	\$5,467,144,381,194.2
Skewness	0.5223
Kurtosis	2.96
Coeff. of Variability	0.1071
Minimum	\$16,308,457.92
Maximum	\$32,153,640.04
Mean Std. Error	\$23,381.93

Percentile	Forecast values
0%	\$16,308,457.92
10%	\$19,011,303.63
20%	\$19,762,391.46
30%	\$20,401,830.74
40%	\$20,964,195.62
50%	\$21,568,282.78
60%	\$22,215,110.79
70%	\$22,931,156.05
80%	\$23,812,109.48
90%	\$25,047,756.27
100%	\$32,153,640.04

10,000 Trials

Contribution to Variance View

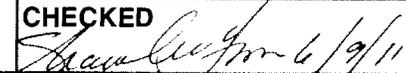
Sensitivity: Construction Cost - Copco No. 2 - Full Removal - Without Escalation



FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable Life Cycle - 50 Year Summary		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\02 - Copco 2\MP\Copco 2 Probable.xlsx\Life Cycle Summary	

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		Periodic Costs - Year 1					\$216,040.00
		Periodic Costs - Year 8					\$119,410.50
		Periodic Costs - Year 17					\$110,660.00
		Periodic Costs - Year 25					\$60,063.30
		Periodic Costs - Year 33					\$57,956.80
		Periodic Costs - Year 42					\$30,211.50
		Periodic Costs - Year 50					0.00
		Annual Costs - Maintenance					\$967,383.00
		(Assumes gov't service / construction contracts)					
		Subtotal 1					\$1,561,725.10
		Mobilization	5%	+/-			\$78,000.00
		Subtotal 1 with Mobilization					\$1,639,725.10
		Escalation to Notice to Proceed (NTP): from Unit Price Level (July, 2010) to NTP (July, 2020)					\$563,927.90
		at 3.0% per year for 120 months.					
		Subtotal 2 = Subtotal 1 with Mobilization + Escalation to NTP					\$2,203,653.00
		Design Contingencies	10%	+/-			\$196,347.00
		Subtotal 3 = Subtotal 2 + Design Contingencies					\$2,400,000.00
		Allowance for Procurement Strategies (APS)	0%	+/-			
		Type of solicitation assumed is: Competitive Request for Proposal					
		Subtotal 4 = Subtotal 3 + APS					\$2,400,000.00
		CONTRACT COST					\$2,400,000.00
		Construction Contingencies	20%	+/-			\$500,000.00
		FIELD COST					\$2,900,000.00
		Non-Contract Costs	30%	+/-			\$900,000.00
		(Environmental Cultural / Mitigation ~ 7%, Engineering Design ~ 5%, Maintenance Service Contract ~ 5%					
		Procurement ~ 2%, Inspections ~ 10% and Closeout ~ 1%)					
		CONSTRUCTION COST					\$3,800,000.00

Note: initial estimate completed 4/17/11, revised non-contract costs 5/12/11, design contingency 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 Atkins	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  6/13/11

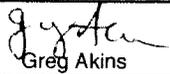
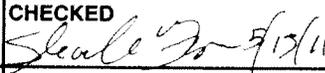
FEATURE:		PROJECT:	
Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable Life Cycle		Klamath River Oregon	
		WOID: AF652	ESTIMATE LEVEL: Feasibility
		REGION: MP	UNIT PRICE LEVEL: Jul-10
		FILE: U:\2011 Projects\Klamath\002 Completed Sheets\MP MPL MPH\02 - Copco 2\MP\Copco 2 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 link fence on all four sides of the powerhouse (assume a double 12ft wide gate for vehicle access) (assume replace two times)	86-68130	500	lf	\$60.00	\$30,000.00
	2	Repaint exposed portion of penstocks (assume repaint 5 times) <i>Estimate assume minor paint repair ~ 2% area</i>	86-68130	18,300	ft2	\$4.50	\$82,350.00
	3	Repaint sloping trashrack at penstock intake (quantity based on repainting all four sides of each 4" by 1/2" bar in trashrack, 48-ft-wide by 32-ft-high vertical opening, includes top plate) (assume repaint 5 times) <i>Estimate assume minor paint repair ~ 2% area</i>	86-68130	8,900	ft2	\$5.00	\$44,500.00
	4	Repaint gratings at penstock intake (quantity based on repainting all four sides of each 5/16" by 2 1/4" bar in grating, assume repaint five times) <i>Estimate assume minor paint repair ~ 2% area</i>	86-68130	1,300	ft2	\$7.50	\$9,750.00
	5	Repaint caterpillar gate (assume access available to both sides of gate, assume repaint five times)	86-68130	1,800	ft2	\$7.50	\$13,500.00
	6	Repaint caterpillar gate hoist structure (assume repaint five times) <i>Estimate assume minor paint repair ~ 2% area</i>	86-68130	1,400	ft2	\$7.50	\$10,500.00
	7	Repaint trashrake superstructure (assume repaint five times) <i>Estimate assume minor paint repair ~ 2% area</i>	86-68130	370	ft2	\$12.00	\$4,440.00
	8	Furnish, install, and maintain a 7-foot-high chain link fence on all four sides of penstock intake structure (assume single 3ft wide gate for access) (assume replace two times)	86-68130	350	lf	\$60.00	\$21,000.00
LIFE CYCLE SUBTOTAL							\$216,040.00

QUANTITIES		PRICES	
BY Rick Benik	CHECKED Stephen Latham	BY <i>Greg Akins</i> Greg Akins	CHECKED <i>5/13/11</i>
DATE PREPARED 03/21/11	PEER REVIEW / DATE Tom Hepler P.E. 3/24/11	DATE PREPARED <i>5/13/11</i>	PEER REVIEW / DATE <i>5/13/11</i>

FEATURE: Klamath River Dams Removal Partial Removal Option Removal Site Maintenance Most Probable 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\02 - Copco 2\MP\Copco 2 Probable.xlsx\Template Sheet 1	

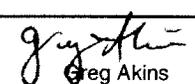
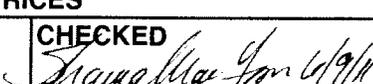
PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	1	Site Maintenance - Annual: Copco 2 Site only*		1	LS	\$46,000.00	\$46,000.00
		Labor needed per year - threes sites:	86-68130	120	mdy**		
		3-Man maintenance crew					
		6 Months active inspection/maintenance					
		2 Weeks full time (1 month each spring)					
		4 Full days, 2 times each month (5 months)					
		Site maintenance required at JC Boyle, Copco 1 & Copco 2					
		<i>Estimate prorated the time at each dam site based on percent of total partial removal construction costs</i>					
		Equipment needed per year	86-68130	40	dy***		
		1-Service truck					
		Includes compressor, welder, generator and general tools					
		<i>Estimate prorated the time at each dam site based on percent of total partial removal construction costs</i>					
		Materials needed per year (percentage of labor & equipment)	86-68130	15%			
		Road maintenance needed per year (percentage of labor & equipment)	86-68130	10%			
		*Total estimated cost for all 3 sites is approximately \$161,000 annually: prorated ±30% for Copco 2 site					
		** Man days per year for 50 years					
		***Days per year for 50 years					
SUBTOTAL THIS SHEET							\$46,000.00

QUANTITIES		PRICES	
BY Rick Benik	CHECKED Stephen Latham	BY  Greg Akins	CHECKED 
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

FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable High Life Cycle - 50 Year Summary	PROJECT: Klamath River Oregon	
	WOID: AF652	ESTIMATE LEVEL: Feasibility
	REGION: MP	UNIT PRICE LEVEL: 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					\$247,680.00
		Periodic Costs - Year 5					\$157,217.23
		Periodic Costs - Year 10					\$128,447.03
		Periodic Costs - Year 13					\$32,667.67
		Periodic Costs - Year 15					\$104,941.70
		Periodic Costs - Year 20					\$85,737.19
		Periodic Costs - Year 25					\$90,160.47
		Periodic Costs - Year 30					\$57,230.61
		Periodic Costs - Year 35					\$46,756.64
		Periodic Costs - Year 38					\$11,891.46
		Periodic Costs - Year 40					\$38,201.20
		Periodic Costs - Year 45					\$31,210.22
		Periodic Costs - Year 50					0.00
		Annual Costs - Maintenance					\$2,944,208.00
		(Assumes gov't service / construction contracts)					
		Subtotal 1					\$3,976,349.42
		Mobilization	5%	+/-			\$200,000.00
		Subtotal 1 with Mobilization					\$4,176,349.42
		Escalation to Notice to Proceed (NTP): from Unit Price Level (July, 2010) to NTP (July, 2020)					\$2,232,229.58
		at 4.375% per year for 120 months.					
		Subtotal 2 = Subtotal 1 with Mobilization + Escalation to NTP					\$6,408,579.00
		Design Contingencies	15%	+/-			\$944,024.00
		Subtotal 3 = Subtotal 2 + Design Contingencies					\$7,352,603.00
		Allowance for Procurement Strategies (APS)	2.0%	+/-			\$147,397.00
		Type of solicitation assumed is: Selective Request for Proposal					
		Subtotal 4 = Subtotal 3 + APS					\$7,500,000.00
		CONTRACT COST					\$7,500,000.00
		Construction Contingencies	25%	+/-			\$1,900,000.00
		FIELD COST					\$9,400,000.00
		Non-Contract Costs	35%	+/-			\$3,100,000.00
		(Environmental Cultural / Mitigation ~ 10%, Engineering Design ~ 7%, Maintenance Service Contract ~ 5% Procurement ~ 2%, Inspections ~ 10% and Closeout ~ 1%)					
		CONSTRUCTION COST					\$12,500,000.00

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  Tom Hepler
DATE PREPARED 03/24/11	PEER REVIEW / DATE Tom Hepler P.E. 3/25/11	DATE PREPARED 6/19/11	PEER REVIEW / DATE DCD 6/13/11

FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 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\MPL MPL MPH\02 - Copco 2\MPH\Copco 2 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 link fence on all four sides of the powerhouse (assume a double 12ft wide gate for vehicle access) (assume replace 3 times)	86-68130	500	lf	\$65.00	\$32,500.00
	2	Repaint exposed portion of penstocks (Assume repaint 9 times) <i>Estimate assume minor paint repair ~ 4% area</i>	86-68130	18,300	ft2	\$5.00	\$91,500.00
	3	Repaint sloping trashrack at penstock intake (quantity based on repainting all four sides of each 4" by 1/2" bar in trashrack, 48-ft-wide by 32-ft-high vertical opening, includes top plate) (Assume repaint 9 times) <i>Estimate assume minor paint repair ~ 4% area</i>	86-68130	8,900	ft2	\$6.00	\$53,400.00
	4	Repaint gratings at penstock intake (quantity based on repainting all four sides of each 5/16" by 2 1/4" bar in grating, assume repaint 9 times) <i>Estimate assume minor paint repair ~ 4% area</i>	86-68130	1,300	ft2	\$9.00	\$11,700.00
	5	Repaint caterpillar gate (assume access available to both sides of gate, assume repaint 9 times)	86-68130	1,800	ft2	\$9.00	\$16,200.00
	6	Repaint caterpillar gate hoist structure (assume repaint 9 times) <i>Estimate assume minor paint repair ~ 4% area</i>	86-68130	1,400	ft2	\$9.00	\$12,600.00
	7	Repaint trashrake superstructure (assume repaint 9 times) <i>Estimate assume minor paint repair ~ 4% area</i>	86-68130	370	ft2	\$19.00	\$7,030.00
	8	Furnish, install, and maintain a 7-foot-high chain link fence on all four sides of penstock intake structure (assume single 3ft wide gate for access) (assume replace 3 times)	86-68130	350	lf	\$65.00	\$22,750.00
LIFE CYCLE SUBTOTAL							\$247,680.00

QUANTITIES		PRICES	
BY Rick Benik	CHECKED Stephen Latham	BY <i>Greg Akins</i> Greg Akins	CHECKED <i>Scott</i> Jun 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 <i>DCD</i> 5/4/11

FEATURE: Klamath River Dams Removal Partial Removal Option Removal Site Maintenance Most Probable High 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	
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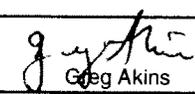
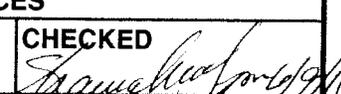
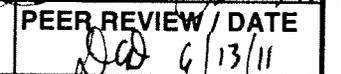
PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT	
	1	Site Maintenance - Annual: Copco 2 Site only*		1	LS	\$140,000.00	\$140,000.00	
		Labor needed per year	86-68130	150	mdy**			
		3-Man maintenance crew						
		6 Months active inspection/maintenance						
		2 Weeks full time (1 month each spring)						
		4 Full days, 2 times each month (5 months)						
		Site maintenance required at JC Boyle, Copco 1 & Copco 2						
		<i>Estimate prorated the amount of time at each dam site based on percent of total partial removal construction costs</i>						
		Equipment needed per year	86-68130	50	dy***			
		1-Service truck						
		Includes compressor, welder, generator and general tools						
		<i>Estimate prorated the time at each dam site based on percent of total partial removal construction costs</i>						
		Materials needed per year (percentage of labor & equipment)	86-68130	15%				
		Road maintenance needed per year (percentage of labor & equipment)	86-68130	10%				
		<i>*Total estimated cost for all 3 sites is approximately \$462,000 annually: prorated ±30% for the Copco 2 site only</i>						
		** Man days per year for 50 years						
		***Days per year for 50 years						
		SUBTOTAL THIS SHEET						\$140,000.00

QUANTITIES		PRICES	
BY Rick Benik	CHECKED Stephen Latham	BY  Greg Akins	CHECKED
DATE PREPARED 04/18/11	PEER REVIEW / DATE Tom Hepler P.E. 4/18/11	DATE PREPARED 5/4/11	PEER REVIEW / DATE  5/4/11

FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable Low Life Cycle - 50 Year Summary	PROJECT: 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\02 - Copco 2\MPL\Copco 2 MPL - Probable.xlsx\Life Cycle Summary
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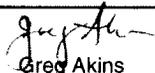
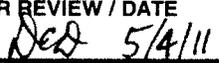
PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		Periodic Costs - Year 1					\$175,470.00
		Periodic Costs - Year 17					\$66,899.00
		Periodic Costs - Year 25					\$15,652.86
		Periodic Costs - Year 33					\$35,037.52
		Periodic Costs - Year 50					0.00
		(Assumes gov't service / construction contracts)					
		Annual Costs - Maintenance					\$630,902.00
		Subtotal 1					\$923,961.38
		Mobilization	5%	+/-			\$46,000.00
		Subtotal 1 with Mobilization					\$969,961.38
		Escalation to Notice to Proceed (NTP): from Unit Price Level (July, 2010) to NTP (July, 2020)					\$155,718.62
		at	1.5%	per year for	120	months.	
		Subtotal 2 = Subtotal 1 with Mobilization + Escalation to NTP					\$1,125,680.00
		Design Contingencies	8%	+/-			\$74,320.00
		Subtotal 3 = Subtotal 2 + Design Contingencies					\$1,200,000.00
		Allowance for Procurement Strategies (APS)	0%	+/-			
		Type of solicitation assumed is: Full and open sealed bid competition					
		Subtotal 4 = Subtotal 3 + APS					\$1,200,000.00
		CONTRACT COST					\$1,200,000.00
		Construction Contingencies	18%	+/-			\$250,000.00
		FIELD COST					\$1,450,000.00
		Non-Contract Costs	25%	+/-			\$350,000.00
		(Environmental Cultural / Mitigation ~ 5%, Engineering Design ~ 4%, Maintenance Service Contract ~ 4% Procurement ~ 1%, Inspections ~ 10% and Closeout ~ 1%)					
		CONSTRUCTION COST					\$1,800,000.00

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 
DATE PREPARED 03/24/11	PEER REVIEW / DATE Tom Hepler P.E. 3/25/11	DATE PREPARED 6/9/11	PEER REVIEW / DATE  6/13/11

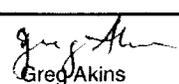
FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable Low Life Cycle - 50 Year Operation and Maintenance - Initial Capital Costs	PROJECT: Klamath River Oregon	
	WOID: AF652	ESTIMATE LEVEL: Feasibility
	REGION: MP	UNIT PRICE LEVEL: Jan-11
	FILE: U:\2011 Projects\Klamath\002 Completed Sheets\MPL MPL MPH\02 - Copco 2\MPL\Copco 2 MPL - 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 link fence on all four sides of the powerhouse (assume a double 12ft wide gate for vehicle access) (assume replace one time)	86-68130	500	lf	\$50.00	\$25,000.00
	2	Repaint exposed portion of penstocks (assume repaint 2 times) <i>Estimate assume minor paint repair ~ 2% area</i>	86-68130	18,300	ft2	\$3.50	\$64,050.00
	3	Repaint sloping trashrack at penstock intake (quantity based on repainting all four sides of each 4" by 1/2" bar in trashrack, 48-ft-wide by 32-ft-high vertical opening, includes top plate) (assume repaint 2 times) <i>Estimate assume minor paint repair ~ 2% area</i>	86-68130	8,900	ft2	\$4.00	\$35,600.00
	4	Repaint gratings at penstock intake (quantity based on repainting all four sides of each 5/16" by 2 1/4" bar in grating, assume repaint 2 times) <i>Estimate assume minor paint repair ~ 2% area</i>	86-68130	1,300	ft2	\$6.50	\$8,450.00
	5	Repaint caterpillar gate (assume access available to both sides of gate, assume repaint five times) <i>Estimate assume minor paint repair ~ 2% area</i>	86-68130	1,800	ft2	\$6.50	\$11,700.00
	6	Repaint caterpillar gate hoist structure (assume repaint 2 times) <i>Estimate assume minor paint repair ~ 2% area</i>	86-68130	1,400	ft2	\$6.50	\$9,100.00
	7	Repaint trashrake superstructure (assume repaint 2 times) <i>Estimate assume minor paint repair ~ 2% area</i>	86-68130	370	ft2	\$11.00	\$4,070.00
	8	Furnish, install, and maintain a 7-foot-high chain link fence on all four sides of penstock intake structure (assume single 3ft wide gate for access) (assume replace once times)	86-68130	350	lf	\$50.00	\$17,500.00
LIFE CYCLE SUBTOTAL							\$175,470.00

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 04/25/11 5/4/11	PEER REVIEW / DATE  5/4/11

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\02 - Copco 2\MPL\Copco 2 MPL - Probable.xlsx\O&M	

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT	
	1	Site Maintenance - Annual: Copco 2 Site only*		1	LS	\$30,000.00	\$30,000.00	
		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)						
		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	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 & equipment)	86-68130	15%				
		Road maintenance needed per year (percentage of labor & equipment)	86-68130	10%				
		*Total estimated cost for all 3 sites is approximately \$100,000 annually: prorated ±30% for the Copco 2 site only						
		** Man days per year for 50 years						
		***Days per year for 50 years						
		SUBTOTAL THIS SHEET						\$30,000.00

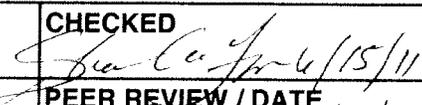
QUANTITIES		PRICES	
BY Rick Benik	CHECKED Stephen Latham	BY  Greg Akins	CHECKED  5/4/11
DATE PREPARED 04/18/11	PEER REVIEW / DATE Tom Hepler P.E. 4/18/11	DATE PREPARED 5/4/11	PEER REVIEW / DATE  5/4/11

FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable - Escalation NOT Incuded Life Cycle - 50 Year Summary	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\02 - Copco 2\No Escalation\Copco 2 Probable.xlsx\Life Cycle Summary		

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		Periodic Costs - Year 1					\$216,040.00
		Periodic Costs - Year 8					\$119,410.50
		Periodic Costs - Year 17					\$110,660.00
		Periodic Costs - Year 25					\$60,063.30
		Periodic Costs - Year 33					\$57,956.80
		Periodic Costs - Year 42					\$30,211.50
		Periodic Costs - Year 50					0.00
		Annual Costs - Maintenance					\$967,383.00
		(Assumes gov't service / construction contracts)					
		Subtotal 1					\$1,561,725.10
		Mobilization	5%	+/-			\$78,000.00
		Subtotal 1 with Mobilization					\$1,639,725.10
		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					
							\$1,639,725.10
		Design Contingencies	10%	+/-			\$160,274.90
		Subtotal 3 = Subtotal 2 + Design Contingencies					
							\$1,800,000.00
		Allowance for Procurement Strategies (APS)	0%	+/-			
		Type of solicitation assumed is: Competitive Request for Proposal					
		Subtotal 4 = Subtotal 3 + APS					
							\$1,800,000.00
		CONTRACT COST					
							\$1,800,000.00
		Construction Contingencies	20%	+/-			\$400,000.00
		FIELD COST					
							\$2,200,000.00
		Non-Contract Costs	30%	+/-			\$700,000.00
		(Environmental Cultural / Mitigation ~ 7%, Engineering Design ~ 5%, Maintenance Service Contract ~ 5% Procurement ~ 2%, Inspections ~ 10% and Closeout ~ 1%)					
		CONSTRUCTION COST					
							\$2,900,000.00

Note: initial estimate completed 4/17/11, revised non-contract costs 5/12/11, design contingency 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  Stephen Latham
DATE PREPARED 03/24/11	PEER REVIEW / DATE Tom Hepler P.E. 3/25/11	DATE PREPARED 6/15/11	PEER REVIEW / DATE  Greg Akins 6/15/11

FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable High- Escalation NOT Included Life Cycle - 50 Year Summary		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\02 - Copco 2\No Escalation\Copco 2 MPH - Probable.xlsx\Life Cycle Summary	

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		Periodic Costs - Year 1					\$247,680.00
		Periodic Costs - Year 5					\$157,217.23
		Periodic Costs - Year 10					\$128,447.03
		Periodic Costs - Year 13					\$32,667.67
		Periodic Costs - Year 15					\$104,941.70
		Periodic Costs - Year 20					\$85,737.19
		Periodic Costs - Year 25					\$90,160.47
		Periodic Costs - Year 30					\$57,230.61
		Periodic Costs - Year 35					\$46,756.64
		Periodic Costs - Year 38					\$11,891.46
		Periodic Costs - Year 40					\$38,201.20
		Periodic Costs - Year 45					\$31,210.22
		Periodic Costs - Year 50					0.00
		Annual Costs - Maintenance (Assumes gov't service / construction contracts)					\$2,944,208.00
		Subtotal 1					\$3,976,349.42
		Mobilization	5%	+/-			\$200,000.00
		Subtotal 1 with Mobilization					\$4,176,349.42
		Escalation to Notice to Proceed (NTP): from Unit Price Level (July, 2010) to NTP (July, 2020)					
		None Included:		per year for		months.	
		Subtotal 2 = Subtotal 1 with Mobilization + Escalation to NTP					\$4,176,349.42
		Design Contingencies	15%	+/-			\$627,594.58
		Subtotal 3 = Subtotal 2 + Design Contingencies					\$4,803,944.00
		Allowance for Procurement Strategies (APS)	2.0%	+/-			\$96,056.00
		Type of solicitation assumed is: Selective Request for Proposal					
		Subtotal 4 = Subtotal 3 + APS					\$4,900,000.00
		CONTRACT COST					\$4,900,000.00
		Construction Contingencies	25%	+/-			\$1,200,000.00
		FIELD COST					\$6,100,000.00
		Non-Contract Costs	35%	+/-			\$2,100,000.00
		(Environmental Cultural / Mitigation ~ 10%, Engineering Design ~ 7%, Maintenance Service Contract ~ 5% Procurement ~ 2%, Inspections ~ 10% and Closeout ~ 1%)					
		CONSTRUCTION COST					\$8,200,000.00

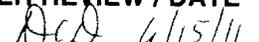
Ref.: For appropriate use and terminology, see Reclamation Manual, Directives and Standards FAC; 09-01, 09-02 and 09-03.

QUANTITIES		PRICES	
BY Rick Benik	CHECKED Stephen Latham	BY <i>Greg Akins</i> Greg Akins	CHECKED <i>Shea Cooper 4/15/11</i>
DATE PREPARED 03/24/11	PEER REVIEW / DATE Tom Hepler P.E. 3/25/11	DATE PREPARED	PEER REVIEW / DATE <i>ACD 6/15/11</i>

FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable Low- Escalation NOT Included Life Cycle - 50 Year Summary	PROJECT: Klamath River Oregon		
	WOID: AF652	ESTIMATE LEVEL Feasibility	
	REGION MP	UNIT PRICE LEVE Jul-10	
	FILE: U:\2011 Projects\Klamath\002 Completed Sheets\MPL MPL MPH\02 - Copco 2\No Escalation\Copco 2 MPL - Probable.xlsx\Life Cycle Summary		

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		Periodic Costs - Year 1					\$175,470.00
		Periodic Costs - Year 17					\$66,899.00
		Periodic Costs - Year 25					\$15,652.86
		Periodic Costs - Year 33					\$35,037.52
		Periodic Costs - Year 50					0.00
		(Assumes gov't service / construction contracts)					
		Annual Costs - Maintenance					\$630,902.00
		Subtotal 1					\$923,961.38
		Mobilization	5%	+/-			\$46,000.00
		Subtotal 1 with Mobilization					\$969,961.38
		Escalation to Notice to Proceed (NTP): from Unit Price Level (July, 2010) to NTP (July, 2020)					
		None included:		per year for		months.	
		Subtotal 2 = Subtotal 1 with Mobilization + Escalation to NTP					\$969,961.38
		Design Contingencies	8%	+/-			\$80,038.62
		Subtotal 3 = Subtotal 2 + Design Contingencies					\$1,050,000.00
		Allowance for Procurement Strategies (APS)	0%	+/-			
		Type of solicitation assumed is: Full and open sealed bid competition					
		Subtotal 4 = Subtotal 3 + APS					\$1,050,000.00
		CONTRACT COST					\$1,050,000.00
		Construction Contingencies	18%	+/-			\$200,000.00
		FIELD COST					\$1,250,000.00
		Non-Contract Costs	25%	+/-			\$400,000.00
		(Environmental Cultural / Mitigation ~ 5%, Engineering Design ~ 4%, Maintenance Service Contract ~ 4% Procurement ~ 1%, Inspections ~ 10% and Closeout ~ 1%)					
		CONSTRUCTION COST					\$1,650,000.00

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 
DATE PREPARED 03/24/11	PEER REVIEW / DATE Tom Hepler P.E. 3/25/11	DATE PREPARED	PEER REVIEW / DATE  6/15/11

FEATURE:			PROJECT:									
Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Escalation Included SUMMARY ESTIMATE			Klamath River, Northern California/Southern Oregon									
			WOID: AF852		ESTIMATE LEVEL: Feasibility							
			REGION: MP		PRICE LEVEL: Jul-2010							
			FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 2\Copco 2 - Partial Removal Crystal Ball - with Escalation - 2011-04.xls\Copco 2 - Partial - 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	Construct and Remove Embankment Cofferdam-Right Side of Dam	8130	3,100	3,100	3,100	CY	\$70.00	\$85.00	\$130.00	\$217,000.00	\$263,500.00	\$403,000.00
	2	Furnish, Install and Remove Riprap	8130	465	465	465	CY	\$120.00	\$150.00	\$200.00	\$55,800.00	\$69,750.00	\$93,000.00
	3	Provide Dewatering behind Cofferdams	8130	1	1	1	LS	\$40,000.00	\$45,000.00	\$300,000.00	\$40,000.00	\$45,000.00	\$300,000.00
	4	Remove Water from behind Cofferdams	8130	241,000	241,000	241,000	GAL	\$0.01	\$0.01	\$0.01	\$2,410.00	\$2,410.00	\$2,410.00
	5	Construct and Remove Embankment Cofferdam-Left Side of Dam	8130	1,100	1,100	1,100	CY	\$70.00	\$85.00	\$130.00	\$77,000.00	\$93,500.00	\$143,000.00
	6	Furnish, Install and Remove Riprap	8130	250	250	250	CY	\$120.00	\$150.00	\$200.00	\$30,000.00	\$37,500.00	\$50,000.00
	7	Provide Dewatering behind Left Side Cofferdam	8130	1	1	1	LS	\$40,000.00	\$45,000.00	\$300,000.00	\$40,000.00	\$45,000.00	\$300,000.00
	8	Remove Water from behind Cofferdam	8130	36,000	36,000	36,000	GAL	\$0.04	\$0.05	\$0.08	\$1,440.00	\$1,800.00	\$2,880.00
	9	Remove Water from behind Tailrace Cofferdam	8130	0	0	0	GAL				\$0.00	\$0.00	\$0.00
	10	Provide Dewatering behind Tailrace Cofferdam	8130	0	0	0	LS				\$0.00	\$0.00	\$0.00
	11	Construct Embankment Cofferdam across Tailrace	8130	0	0	0	CY				\$0.00	\$0.00	\$0.00
	12	Construct 240-ft-long, 2-span concrete Bridge	8130	0	0	0	SF				\$0.00	\$0.00	\$0.00
	13	Remove and dispose of existing bridge	8130	0	0	0	LS				\$0.00	\$0.00	\$0.00
	14	Remove Concrete in Dam	8130	4,200	4,200	4,200	CY	\$270.00	\$315.00	\$500.00	\$1,134,000.00	\$1,323,000.00	\$2,100,000.00
	15	Remove concrete equipment slab from top of embankment wing dam on right abutment	8130	5	5	5	CY	\$170.00	\$215.00	\$380.00	\$850.00	\$1,075.00	\$1,900.00
	16	Remove Concrete Wingwall	8130	220	220	220	CY	\$170.00	\$215.00	\$380.00	\$37,400.00	\$47,300.00	\$83,600.00
	17	Right Abutment Removal - Random Fill	8313	0	0	0	CY				\$0.00	\$0.00	\$0.00
	18	Right Abutment Removal - Remove Hand Placed Riprap	8313	0	0	0	SF				\$0.00	\$0.00	\$0.00
	19	Right Abutment Removal - Gunite Curtain Wall	8313	0	0	0	CY				\$0.00	\$0.00	\$0.00
	20	Remove & Dispose - Hand Rails and Light Poles	8420	5,000	5,000	5,000	LBS	\$0.60	\$0.85	\$1.00	\$3,000.00	\$4,250.00	\$5,000.00
	21	Remove & Dispose - Radial Gates and Hoists	8420	66,000	66,000	66,000	LBS	\$0.60	\$0.85	\$1.00	\$39,600.00	\$56,100.00	\$66,000.00
	22	Remove & Dispose - 5-Raidal Gate stoplogs & slots (steel)	8420	95,800	95,800	95,800	LBS	\$0.60	\$0.85	\$1.00	\$57,480.00	\$81,430.00	\$95,800.00
	23	Remove & Dispose - Spillway intake 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
	24	Remove & Dispose - Spillway radial gate motors & control panel	8430	1	1	1	EA	\$900.00	\$1,000.00	\$1,500.00	\$900.00	\$1,000.00	\$1,500.00
	25	Remove & Dispose - Spillway trashrake motor, festoon cable & control panel	8430	1	1	1	EA	\$400.00	\$500.00	\$600.00	\$400.00	\$500.00	\$600.00
	26	Remove & Dispose - Distribution equipment , panelboards	8430	1	1	1	EA	\$4,000.00	\$4,500.00	\$5,000.00	\$4,000.00	\$4,500.00	\$5,000.00
	27	Remove Copper Shingles from Roof of Powerhouse	8130	0	0	0	SF				\$0.00	\$0.00	\$0.00
	28	Remove Powerhouse Concrete down to spring-line of turbine	8130	0	0	0	CY				\$0.00	\$0.00	\$0.00
	29	Remove Structural Steel items associated with Powerhouse	8130	0	0	0	LBS				\$0.00	\$0.00	\$0.00
	30	Remove Control House Concrete	8130	30	30	30	CY	\$170.00	\$215.00	\$380.00	\$5,100.00	\$6,450.00	\$11,400.00
	31	Remove Control House Structural Steel items	8130	3,500	3,500	3,500	LBS	\$0.60	\$0.85	\$1.00	\$2,100.00	\$2,975.00	\$3,500.00
	32	Remove Shop Building	8130	0	0	0	SF				\$0.00	\$0.00	\$0.00
	33	Remove & Dispose - 2- Govenor oil systems	8420	0	0	0	LBS				\$0.00	\$0.00	\$0.00
	34	Remove & Dispose - Cooling water and bearing oil systems	8420	0	0	0	LBS				\$0.00	\$0.00	\$0.00
	35	Remove & Dispose - Oil / Water seperator tank and piping	8420	0	0	0	LBS				\$0.00	\$0.00	\$0.00
	36	Remove & Dispose - 12 - Cast Iron Columns	8420	0	0	0	LBS				\$0.00	\$0.00	\$0.00
	37	Remove & Dispose - 2 - Francis Turbines	8420	0	0	0	LBS				\$0.00	\$0.00	\$0.00
	38	Remove & Dispose - 2-40 Ton indoor crane	8420	0	0	0	LBS				\$0.00	\$0.00	\$0.00
	39	Remove & Dispose - Compressed Air systems	8420	0	0	0	LBS				\$0.00	\$0.00	\$0.00
	40	Remove & Dispose - 2 - CO2 systems	8420	0	0	0	LBS				\$0.00	\$0.00	\$0.00
	41	Remove & Dispose - Plant Water and Fire Protection	8420	0	0	0	LBS				\$0.00	\$0.00	\$0.00
	42	Remove & Dispose - Transformer Oil Fire protection	8420	0	0	0	LBS				\$0.00	\$0.00	\$0.00
	43	Remove & Dispose - Unwatering Piping	8420	0	0	0	LBS				\$0.00	\$0.00	\$0.00
	44	Remove & Dispose - Drainage Piping	8420	0	0	0	LBS				\$0.00	\$0.00	\$0.00
	44A	Remove Petroleum Products from Mechanical Equipment	8420	3,300	3,300	3,300	GAL	\$9.00	\$10.00	\$12.00	\$29,700.00	\$33,000.00	\$39,600.00
	44B	Remove Petroleum Products at or near the Power House	8420	2,000	2,000	2,000	GAL	\$9.00	\$10.00	\$12.00	\$18,000.00	\$20,000.00	\$24,000.00
	45	Remove & Dispose - AC Generator, Indoor Vertical	8430	0	0	0	EA				\$0.00	\$0.00	\$0.00
	46	Remove & Dispose - Excitation equipment for 15 MVA Generator	8430	0	0	0	EA				\$0.00	\$0.00	\$0.00
	47	Remove & Dispose - Surge protection equip. for 15 MVA Generator	8430	0	0	0	EA				\$0.00	\$0.00	\$0.00
	48	Remove & Dispose - Neutral grounding equip. for 15 MVA Generator	8430	0	0	0	EA				\$0.00	\$0.00	\$0.00
	49	Remove & Dispose - Generator Switchgear, 7.2kV-includes unit breakers	8430	0	0	0	EA				\$0.00	\$0.00	\$0.00
	50	Remove & Dispose - Station Service Switchgear, 600 volt -(5 sections)	8430	0	0	0	EA				\$0.00	\$0.00	\$0.00
	51	Remove & Dispose - Unit and plant control switchboard	8430	0	0	0	EA				\$0.00	\$0.00	\$0.00
	52	Remove & Dispose - 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
	53	Remove & Dispose - Raceways, Conduit and Cable	8430	0	0	0	EA				\$0.00	\$0.00	\$0.00

ESTIMATE WORKSHEET

FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Escalation Included SUMMARY ESTIMATE	PROJECT: <p style="text-align: center;">Klamath River, Northern California/Southern Oregon</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:30%;">WOID: AF652</td> <td style="width:70%;">ESTIMATE LEVEL: Feasibility</td> </tr> <tr> <td>REGION: MP</td> <td>PRICE LEVEL: Jul-2010</td> </tr> </table> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:30%;">FILE:</td> <td>C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 2\Copco 2 - Partial Removal Crystal Ball - with Escalation - 2011-04.xls\Copco 2 - Partial - with Esc</td> </tr> </table>	WOID: AF652	ESTIMATE LEVEL: Feasibility	REGION: MP	PRICE LEVEL: Jul-2010	FILE:	C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 2\Copco 2 - Partial Removal Crystal Ball - with Escalation - 2011-04.xls\Copco 2 - Partial - with Esc
WOID: AF652	ESTIMATE LEVEL: Feasibility						
REGION: MP	PRICE LEVEL: Jul-2010						
FILE:	C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 2\Copco 2 - Partial Removal Crystal Ball - with Escalation - 2011-04.xls\Copco 2 - Partial - 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
	54	Remove & Dispose - Misc. power & control boards	8430	0	0	0	EA				\$0.00	\$0.00	\$0.00
	55	Remove & Dispose - 7 40-Ton Travelling Crane motors-hoist (2-30Hp*),	8430	0	0	0	EA				\$0.00	\$0.00	\$0.00
	56	Remove & Dispose - 40-Ton Travelling Crane control equipment	8430	0	0	0	EA				\$0.00	\$0.00	\$0.00
	57	Remove & Dispose - 40-Ton Travelling Crane Festoon Cable	8430	0	0	0	EA				\$0.00	\$0.00	\$0.00
	58	Remove & Dispose - Step-up Transformers, outdoor, oil-filled, 1-phase, 10/20 MVA 6600/72000 volt	8430	0	0	0	EA				\$0.00	\$0.00	\$0.00
	59	Remove & Dispose - Step-up Transformers, outdoor, oil-filled, 1-phase, 10/20 MVA, 73800/230000 volt	8430	0	0	0	EA				\$0.00	\$0.00	\$0.00
	60	Remove & Dispose - Transmission Line No. 15	8430	0.14	0.14	0.14	MILE	\$25,000.00	\$30,000.00	\$40,000.00	\$3,500.00	\$4,200.00	\$5,600.00
	60A	Remove Oil from Oil-filled Step-up Transformers	8430	23,000	23,000	23,000	GAL	\$9.00	\$10.00	\$12.00	\$207,000.00	\$230,000.00	\$276,000.00
	61	Remove Intake Structure Concrete	8130	0	0	0	CY				\$0.00	\$0.00	\$0.00
	62	Remove Concrete Items associated with 16-foot I.D. Wood Stave Pipe	8130	0	0	0	CY				\$0.00	\$0.00	\$0.00
	63	Place Concrete Plugs for Tunnels	8130	64	64	64	CY	\$1,100.00	\$1,200.00	\$1,300.00	\$70,400.00	\$76,800.00	\$83,200.00
	64	Remove Concrete Items associated with Penstocks D/S from Tunnel No. 2	8130	0	0	0	CY				\$0.00	\$0.00	\$0.00
	65	Remove and Dispose of Caterpillar Gate (steel)	8420	0	0	0	LBS				\$0.00	\$0.00	\$0.00
	66	Remove and Dispose of Trash rack and trash rake (steel)	8420	0	0	0	LBS				\$0.00	\$0.00	\$0.00
	67	Remove and Dispose of Stop Logs and slots for intake (steel)	8420	0	0	0	LBS				\$0.00	\$0.00	\$0.00
	68	Remove and Dispose of Wood Staves Soaked in Creosote	8420	1,100,000	1,100,000	1,100,000	LBS	\$0.65	\$0.70	\$0.85	\$715,000.00	\$770,000.00	\$935,000.00
	69	Remove and Dispose of Cradles (steel)	8420	290,000	290,000	290,000	LBS	\$0.60	\$0.85	\$1.00	\$174,000.00	\$246,500.00	\$290,000.00
	70	Remove and Dispose of Bands (steel)	8420	463,000	463,000	463,000	LBS	\$0.60	\$0.85	\$1.00	\$277,800.00	\$393,550.00	\$463,000.00
	71	Remove and Dispose of Penstock after bifurcation to butterfly valves	8420	0	0	0	LBS				\$0.00	\$0.00	\$0.00
	72	Remove and Dispose of Bifurcated vent pipes and support structure	8420	0	0	0	LBS				\$0.00	\$0.00	\$0.00
	73	Remove and Dispose of 2 - 138" Butterfly valves	8420	0	0	0	LBS				\$0.00	\$0.00	\$0.00
		Subtotal 1									\$3,253,780.00	\$3,872,090.00	\$5,798,490.00
		Mobilization (MPL ~ 5%; MP ~ 5%; MPH ~ 5%)		1	1	1	ls	\$165,000.00	\$195,000.00	\$290,000.00	\$165,000.00	\$195,000.00	\$290,000.00
		Subtotal 1 w/ mobilization									\$3,418,780.00	\$4,067,090.00	\$6,088,490.00
		Escalation to Notice to Proceed (NTP) 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.		1	1	1	ls	\$548,854.00	\$1,398,739.00	\$3,254,254.00	\$548,854.00	\$1,398,739.00	\$3,254,254.00
		Design Contingencies (MPL ~ 8%; MP ~ 10%; MPH ~ 15%)		1	1	1	ls	\$332,366.00	\$534,171.00	\$1,442,373.00	\$332,366.00	\$534,171.00	\$1,442,373.00
		APS = Allowance for Procurement Strategies (if applicable) (MPL ~ 0%; MP ~ 0%; MPH ~ 2%)		1	1	1	ls	\$0.00	\$0.00	\$214,883.00	\$0.00	\$0.00	\$214,883.00
		CONTRACT COST									\$4,300,000.00	\$6,000,000.00	\$11,000,000.00
		Construction Contingencies (MPL ~ 18%; MP ~ 20%; MPH ~ 25%)		1	1	1	ls	\$800,000.00	\$1,200,000.00	\$2,500,000.00	\$800,000.00	\$1,200,000.00	\$2,500,000.00
		FIELD COST									\$5,100,000.00	\$7,200,000.00	\$13,500,000.00
		Non-Contract Cost (MPL ~ 62%; MP ~ 65%; MPH ~ 71%)		1	1	1	ls	\$3,200,000.00	\$4,800,000.00	\$9,500,000.00	\$3,200,000.00	\$4,800,000.00	\$9,500,000.00
		CONSTRUCTION COST									\$8,300,000.00	\$12,000,000.00	\$23,000,000.00

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	DA 06-09-11
DATE PREPARED	1/20/2011	PEER REVIEW:	See Group Worksheets	DATE PREPARED	06/09/11	PEER REVIEW	ACA 6-9-11

Crystal Ball Report - Full

Simulation started on 6/9/2011 at 9:02:30
 Simulation stopped on 6/9/2011 at 9:02:56

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) 25.88
 Trials/second (average) 386
 Random numbers per sec 27,053

Crystal Ball data:

Assumptions 70
 Correlations 0
 Correlated groups 0
 Decision variables 0
 Forecasts 3

TECHNICAL SERVICE CENTER
 ESTIMATING, SPECIFICATIONS
 AND VALUE PROGRAM GROUP
 UNIT PRICES BY Craig A. Grogan
 DATE 6/9/2011

DATE	PEER REVIEWER(S)	CODE
6/9/11	<u>Dan M...</u> Signature <u>DAN M...</u> Printed Name	8170
	Signature Printed Name	
Author Initials		PEER REVIEW NOT REQUIRED

Forecasts

Worksheet: [Copco 2 - Partial Removal Crystal Ball - with Escalation - 2011-04.xls]Copco 2 - P:

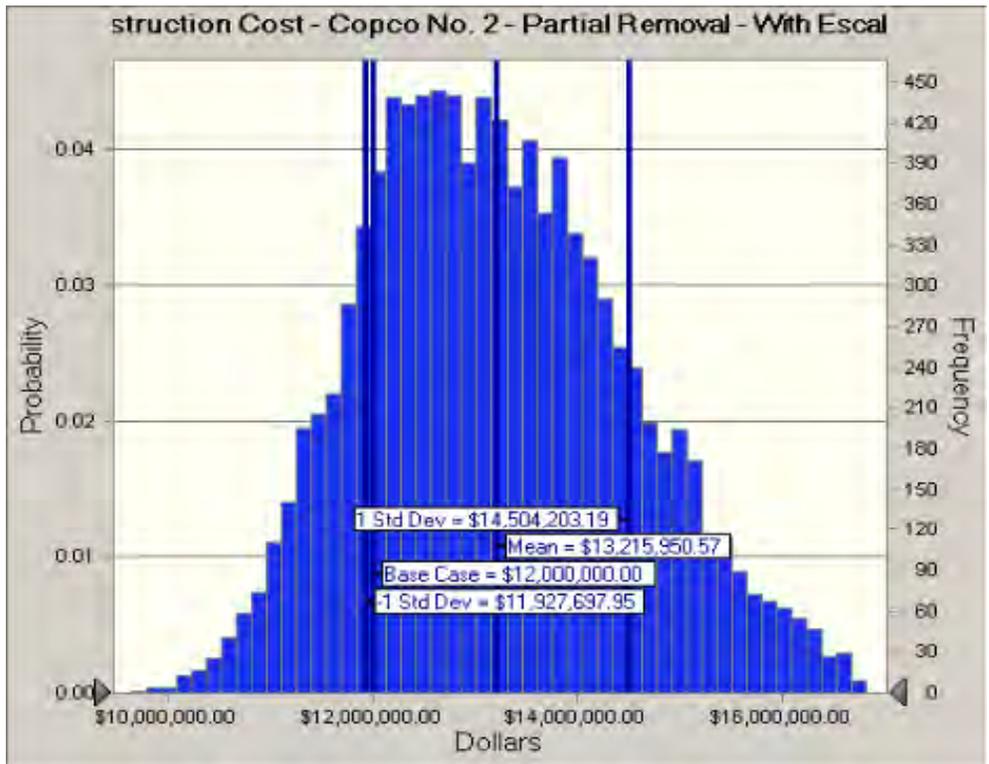
Forecast: Construction Cost - Copco No. 2 - Partial Removal - With Escalation Cell: U104

Summary:

Entire range is from \$9,652,055.69 to \$18,089,119.59

Base case is \$12,000,000.00

After 10,000 trials, the std. error of the mean is \$12,882.53



Forecast: Construction Cost - Copco No. 2 - Partial Removal - With Escalation (cont'd): U104

Statistics:	Forecast values
Trials	10,000
Mean	\$13,215,950.57
Median	\$13,112,875.88
Mode	---
Standard Deviation	\$1,288,252.62
Variance	\$1,659,594,814,394.06
Skewness	0.3438
Kurtosis	2.80
Coeff. of Variability	0.0975
Minimum	\$9,652,055.69
Maximum	\$18,089,119.59
Range Width	\$8,437,063.90
Mean Std. Error	\$12,882.53

Percentiles:	Forecast values
0%	\$9,652,055.69
10%	\$11,625,740.65
20%	\$12,092,799.23
30%	\$12,433,622.17
40%	\$12,768,305.15
50%	\$13,112,807.18
60%	\$13,475,653.62
70%	\$13,862,536.42
80%	\$14,319,750.10
90%	\$14,983,335.12
100%	\$18,089,119.59

Forecast: Contract Cost - Copco No. 2 - Partial Removal - With Escalation

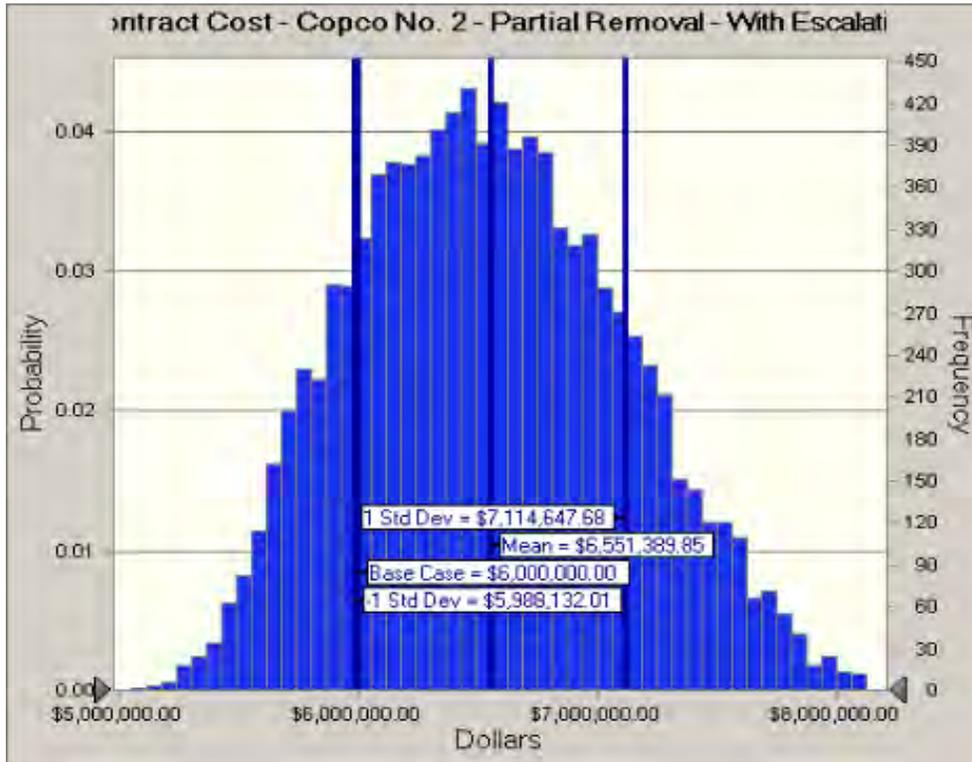
Cell: U100

Summary:

Entire range is from \$5,052,210.87 to \$8,717,284.66

Base case is \$6,000,000.00

After 10,000 trials, the std. error of the mean is \$5,632.58



Forecast: Contract Cost - Copco No. 2 - Partial Removal - With Escalation (cont'd) Cell: U100

Statistics:	Forecast values
Trials	10,000
Mean	\$6,551,389.85
Median	\$6,522,352.01
Mode	---
Standard Deviation	\$563,257.83
Variance	\$317,259,388,481.60
Skewness	0.2380
Kurtosis	2.63
Coeff. of Variability	0.0860
Minimum	\$5,052,210.87
Maximum	\$8,717,284.66
Range Width	\$3,665,073.79
Mean Std. Error	\$5,632.58

Percentiles:	Forecast values
0%	\$5,052,210.87
10%	\$5,822,760.46
20%	\$6,041,874.95
30%	\$6,211,815.01
40%	\$6,373,461.09
50%	\$6,522,330.95
60%	\$6,681,388.67
70%	\$6,847,228.50
80%	\$7,046,174.11
90%	\$7,300,733.61
100%	\$8,717,284.66

Forecast: Field Cost - Copco No. 2 - Partial Removal - With Escalation

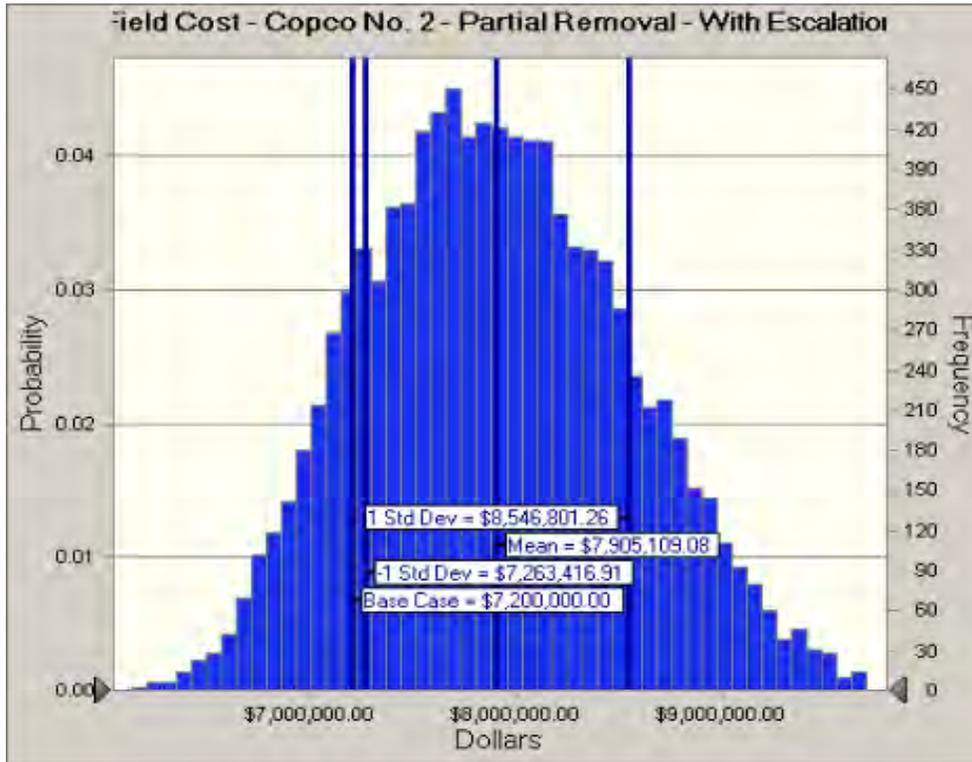
Cell: U102

Summary:

Entire range is from \$6,128,829.44 to \$10,264,761.92

Base case is \$7,200,000.00

After 10,000 trials, the std. error of the mean is \$6,416.92



Forecast: Field Cost - Copco No. 2 - Partial Removal - With Escalation (cont'd)

Cell: U102

Statistics:	Forecast values
Trials	10,000
Mean	\$7,905,109.08
Median	\$7,874,360.68
Mode	---
Standard Deviation	\$641,692.17
Variance	\$411,768,845,734.85
Skewness	0.2355
Kurtosis	2.75
Coeff. of Variability	0.0812
Minimum	\$6,128,829.44
Maximum	\$10,264,761.92
Range Width	\$4,135,932.47
Mean Std. Error	\$6,416.92

Percentiles:	Forecast values
0%	\$6,128,829.44
10%	\$7,095,883.70
20%	\$7,331,046.27
30%	\$7,537,449.50
40%	\$7,704,660.45
50%	\$7,874,246.12
60%	\$8,050,816.01
70%	\$8,237,002.20
80%	\$8,458,251.36
90%	\$8,763,811.61
100%	\$10,264,761.92

End of Forecasts

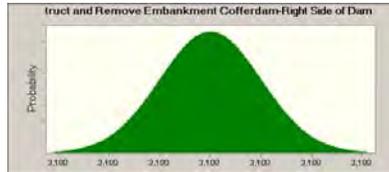
Assumptions

Worksheet: [Copco 2 - Partial Removal Crystal Ball - with Escalation - 2011-04.xls]Copco 2 - P

Assumption: 1 Construct and Remove Embankment Cofferdam-Right Side of Dam Quantity **Cell: L14**

Normal distribution with parameters:

Mean 3,100 (=L14)
 Std. Dev. 0 (=0.000001)



Assumption: 1 Construct and Remove Embankment Cofferdam-Right Side of Dam Unit Price **Cell: R14**

BetaPERT distribution with parameters:

Minimum \$70.00 (=Q14)
 Likeliest \$85.00 (=R14)
 Maximum \$130.00 (=S14)

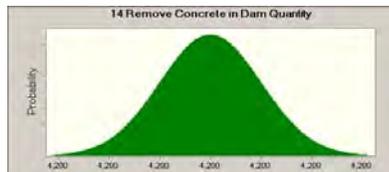


Assumption: 14 Remove Concrete in Dam Quantity

Cell: L27

Normal distribution with parameters:

Mean 4,200 (=L27)
 Std. Dev. 0 (=0.000001)



Assumption: 14 Remove Concrete in Dam Unit Price

Cell: R27

BetaPERT distribution with parameters:

Minimum	\$270.00	(=Q27)
Likeliest	\$315.00	(=R27)
Maximum	\$500.00	(=S27)

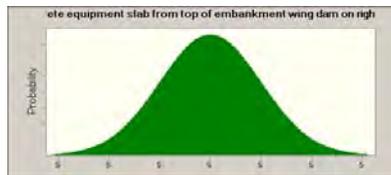


Assumption: 15 Remove concrete equipment slab from top of embankment wing dam on right

Cell: L28

Normal distribution with parameters:

Mean	5	(=L28)
Std. Dev.	0	(=0.000001)

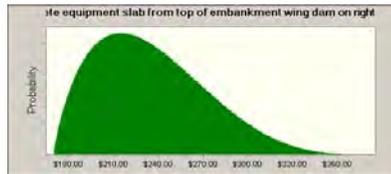


Assumption: 15 Remove concrete equipment slab from top of embankment wing dam on right

Cell: R28

BetaPERT distribution with parameters:

Minimum	\$170.00	(=Q28)
Likeliest	\$215.00	(=R28)
Maximum	\$380.00	(=S28)



Assumption: 16 Remove Concrete Wingwall Quantity

Cell: L29

Normal distribution with parameters:

Mean	220	(=L29)
Std. Dev.	0	(=0.000001)



Assumption: 16 Remove Concrete Wingwall Unit Price

Cell: R29

BetaPERT distribution with parameters:

Minimum	\$170.00	(=Q29)
Likeliest	\$215.00	(=R29)
Maximum	\$380.00	(=S29)

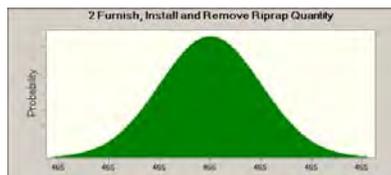


Assumption: 2 Furnish, Install and Remove Riprap Quantity

Cell: L15

Normal distribution with parameters:

Mean	465	(=L15)
Std. Dev.	0	(=0.000001)



Assumption: 2 Furnish, Install and Remove Riprap Unit Price

Cell: R15

BetaPERT distribution with parameters:

Minimum	\$120.00	(=Q15)
Likeliest	\$150.00	(=R15)
Maximum	\$200.00	(=S15)

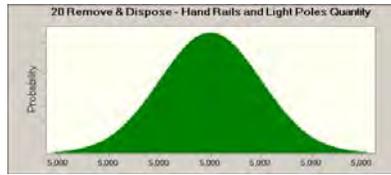


Assumption: 20 Remove & Dispose - Hand Rails and Light Poles Quantity

Cell: L33

Normal distribution with parameters:

Mean	5,000	(=L33)
Std. Dev.	0	(=0.000001)



Assumption: 20 Remove & Dispose - Hand Rails and Light Poles Unit Price

Cell: R33

BetaPERT distribution with parameters:

Minimum	\$0.60	(=Q33)
Likeliest	\$0.85	(=R33)
Maximum	\$1.00	(=S33)

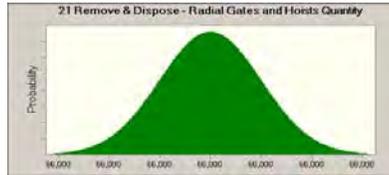


Assumption: 21 Remove & Dispose - Radial Gates and Hoists Quantity

Cell: L34

Normal distribution with parameters:

Mean 66,000 (=L34)
 Std. Dev. 0 (=0.000001)

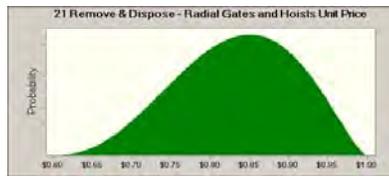


Assumption: 21 Remove & Dispose - Radial Gates and Hoists Unit Price

Cell: R34

BetaPERT distribution with parameters:

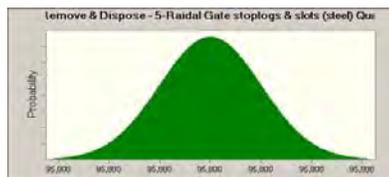
Minimum \$0.60 (=Q34)
 Likeliest \$0.85 (=R34)
 Maximum \$1.00 (=S34)



Assumption: 22 Remove & Dispose - 5-Raidal Gate stoplogs & slots (steel) Quantity Cell: L35

Normal distribution with parameters:

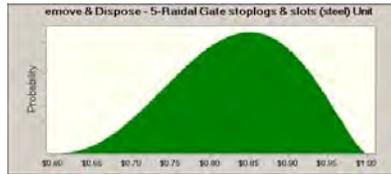
Mean 95,800 (=L35)
 Std. Dev. 0 (=0.000001)



Assumption: 22 Remove & Dispose - 5-Raidal Gate stoplogs & slots (steel) Unit PriceCell: R35

BetaPERT distribution with parameters:

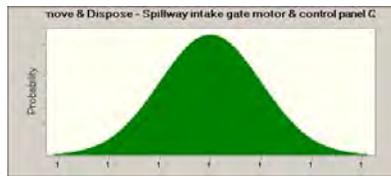
Minimum	\$0.60	(=Q35)
Likeliest	\$0.85	(=R35)
Maximum	\$1.00	(=S35)



Assumption: 23 Remove & Dispose - Spillway intake gate motor & control panel Quantity L36

Normal distribution with parameters:

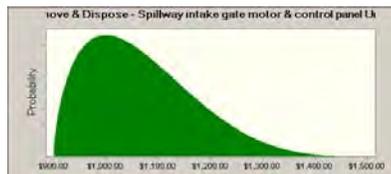
Mean	1	(=L36)
Std. Dev.	0	(=0.000001)



Assumption: 23 Remove & Dispose - Spillway intake gate motor & control panel Unit Price R36

BetaPERT distribution with parameters:

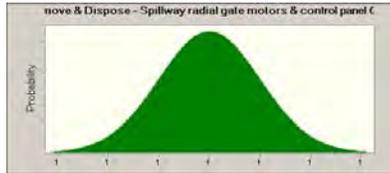
Minimum	\$900.00	(=Q36)
Likeliest	\$1,000.00	(=R36)
Maximum	\$1,500.00	(=S36)



Assumption: 24 Remove & Dispose - Spillway radial gate motors & control panel Quantity L37

Normal distribution with parameters:

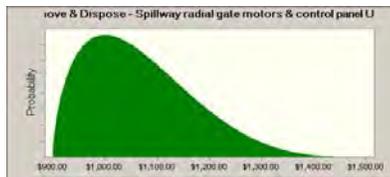
Mean	1	(=L37)
Std. Dev.	0	(=0.000001)



Assumption: 24 Remove & Dispose - Spillway radial gate motors & control panel Unit Price R37

BetaPERT distribution with parameters:

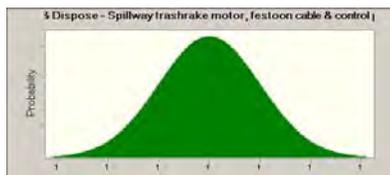
Minimum	\$900.00	(=Q37)
Likeliest	\$1,000.00	(=R37)
Maximum	\$1,500.00	(=S37)



Assumption: 25 Remove & Dispose - Spillway trashrake motor, festoon cable & control panel L38

Normal distribution with parameters:

Mean	1	(=L38)
Std. Dev.	0	(=0.000001)



Assumption: 25 Remove & Dispose - Spillway trashrake motor, festoon cable & control panel

BetaPERT distribution with parameters:

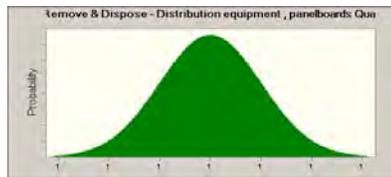
Minimum	\$400.00	(=Q38)
Likeliest	\$500.00	(=R38)
Maximum	\$600.00	(=S38)



Assumption: 26 Remove & Dispose - Distribution equipment , panelboards Quantity Cell: L39

Normal distribution with parameters:

Mean	1	(=L39)
Std. Dev.	0	(=0.000001)



Assumption: 26 Remove & Dispose - Distribution equipment , panelboards Unit Price Cell: R39

BetaPERT distribution with parameters:

Minimum	\$4,000.00	(=Q39)
Likeliest	\$4,500.00	(=R39)
Maximum	\$5,000.00	(=S39)

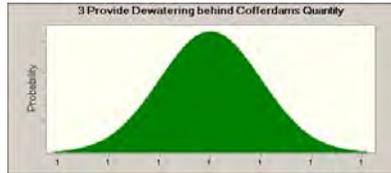


Assumption: 3 Provide Dewatering behind Cofferdams Quantity

Cell: L16

Normal distribution with parameters:

Mean 1 (=L16)
 Std. Dev. 0 (=0.000001)

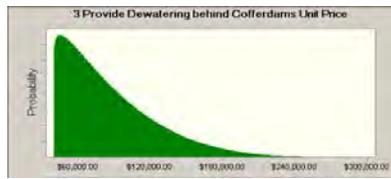


Assumption: 3 Provide Dewatering behind Cofferdams Unit Price

Cell: R16

BetaPERT distribution with parameters:

Minimum \$40,000.00 (=Q16)
 Likeliest \$45,000.00 (=R16)
 Maximum \$300,000.00 (=S16)

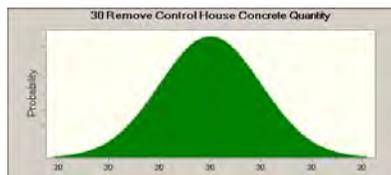


Assumption: 30 Remove Control House Concrete Quantity

Cell: L43

Normal distribution with parameters:

Mean 30 (=L43)
 Std. Dev. 0 (=0.000001)



Assumption: 30 Remove Control House Concrete Unit Price

Cell: R43

BetaPERT distribution with parameters:

Minimum	\$170.00	(=Q43)
Likeliest	\$215.00	(=R43)
Maximum	\$380.00	(=S43)

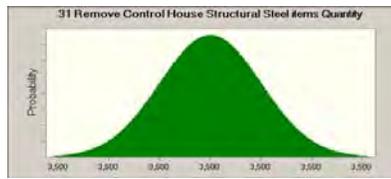


Assumption: 31 Remove Control House Structural Steel items Quantity

Cell: L44

Normal distribution with parameters:

Mean	3,500	(=L44)
Std. Dev.	0	(=0.000001)



Assumption: 31 Remove Control House Structural Steel items Unit Price

Cell: R44

BetaPERT distribution with parameters:

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

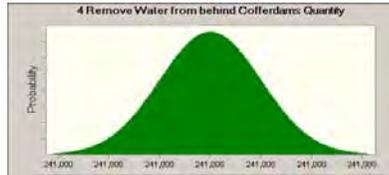


Assumption: 4 Remove Water from behind Cofferdams Quantity

Cell: L17

Normal distribution with parameters:

Mean 241,000 (=L17)
Std. Dev. 0 (=0.000001)

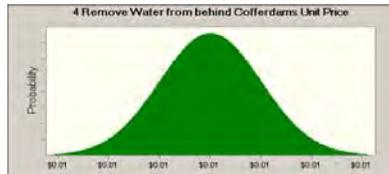


Assumption: 4 Remove Water from behind Cofferdams Unit Price

Cell: R17

Normal distribution with parameters:

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

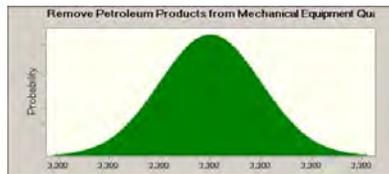


Assumption: 44A Remove Petroleum Products from Mechanical Equipment Quantity

Cell: L58

Normal distribution with parameters:

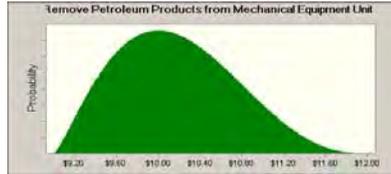
Mean 3,300 (=L58)
Std. Dev. 0 (=0.000001)



Assumption: 44A Remove Petroleum Products from Mechanical Equipment Unit Price Cell: R58

BetaPERT distribution with parameters:

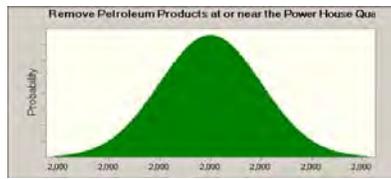
Minimum	\$9.00	(=Q58)
Likeliest	\$10.00	(=R58)
Maximum	\$12.00	(=S58)



Assumption: 44B Remove Petroleum Products at or near the Power House Quantity Cell: L59

Normal distribution with parameters:

Mean	2,000	(=L59)
Std. Dev.	0	(=0.000001)



Assumption: 44B Remove Petroleum Products at or near the Power House Unit Price Cell: R59

BetaPERT distribution with parameters:

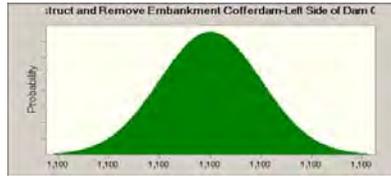
Minimum	\$9.00	(=Q59)
Likeliest	\$10.00	(=R59)
Maximum	\$12.00	(=S59)



Assumption: 5 Construct and Remove Embankment Cofferdam-Left Side of Dam Quantity Cell: L18

Normal distribution with parameters:

Mean	1,100	(=L18)
Std. Dev.	0	(=0.000001)



Assumption: 5 Construct and Remove Embankment Cofferdam-Left Side of Dam Unit Price Cell: R18

BetaPERT distribution with parameters:

Minimum	\$70.00	(=Q18)
Likeliest	\$85.00	(=R18)
Maximum	\$130.00	(=S18)

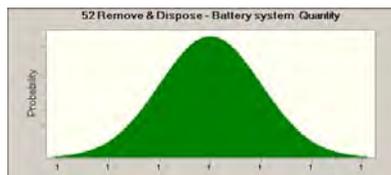


Assumption: 52 Remove & Dispose - Battery system Quantity

Cell: L67

Normal distribution with parameters:

Mean	1	(=L67)
Std. Dev.	0	(=0.000001)



Assumption: 52 Remove & Dispose - Battery system Unit Price

Cell: R67

BetaPERT distribution with parameters:

Minimum	\$9,000.00	(=Q67)
Likeliest	\$10,000.00	(=R67)
Maximum	\$12,000.00	(=S67)

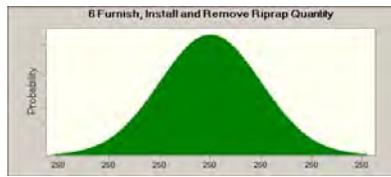


Assumption: 6 Furnish, Install and Remove Riprap Quantity

Cell: L19

Normal distribution with parameters:

Mean	250	(=L19)
Std. Dev.	0	(=0.000001)



Assumption: 6 Furnish, Install and Remove Riprap Unit Price

Cell: R19

BetaPERT distribution with parameters:

Minimum	\$120.00	(=Q19)
Likeliest	\$150.00	(=R19)
Maximum	\$200.00	(=S19)

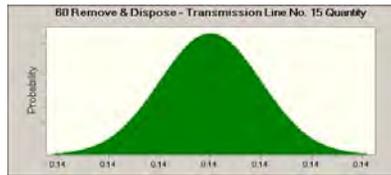


Assumption: 60 Remove & Dispose - Transmission Line No. 15 Quantity

Cell: L75

Normal distribution with parameters:

Mean	0.14	(=L75)
Std. Dev.	0.00	(=0.000001)



Assumption: 60 Remove & Dispose - 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)

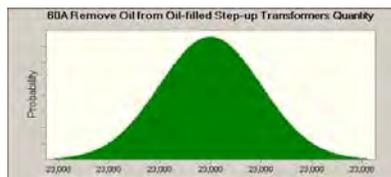


Assumption: 60A Remove Oil from Oil-filled Step-up Transformers Quantity

Cell: L76

Normal distribution with parameters:

Mean	23,000	(=L76)
Std. Dev.	0	(=0.000001)

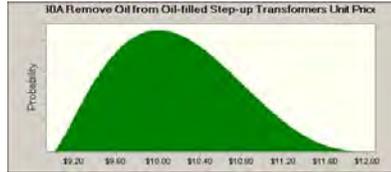


Assumption: 60A Remove Oil from Oil-filled Step-up Transformers Unit Price

Cell: R76

BetaPERT distribution with parameters:

Minimum	\$9.00	(=Q76)
Likeliest	\$10.00	(=R76)
Maximum	\$12.00	(=S76)

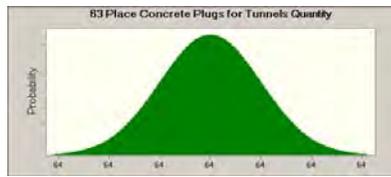


Assumption: 63 Place Concrete Plugs for Tunnels Quantity

Cell: L79

Normal distribution with parameters:

Mean	64	(=L79)
Std. Dev.	0	(=0.000001)

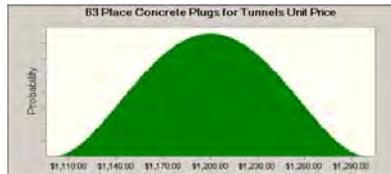


Assumption: 63 Place Concrete Plugs for Tunnels Unit Price

Cell: R79

BetaPERT distribution with parameters:

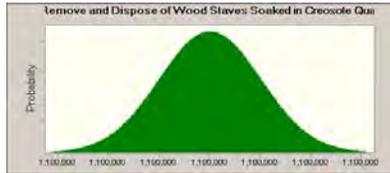
Minimum	\$1,100.00	(=Q79)
Likeliest	\$1,200.00	(=R79)
Maximum	\$1,300.00	(=S79)



Assumption: 68 Remove and Dispose of Wood Staves Soaked in Creosote Quantity Cell: L84

Normal distribution with parameters:

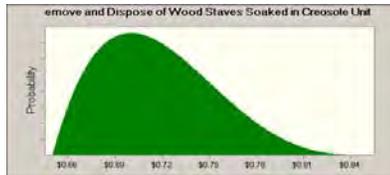
Mean 1,100,000 (=L84)
 Std. Dev. 0 (=0.000001)



Assumption: 68 Remove and Dispose of Wood Staves Soaked in Creosote Unit Price Cell: R84

BetaPERT distribution with parameters:

Minimum \$0.65 (=Q84)
 Likeliest \$0.70 (=R84)
 Maximum \$0.85 (=S84)

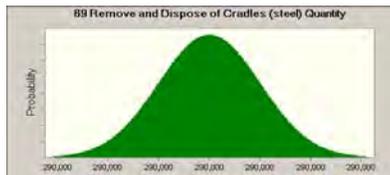


Assumption: 69 Remove and Dispose of Cradles (steel) Quantity

Cell: L85

Normal distribution with parameters:

Mean 290,000 (=L85)
 Std. Dev. 0 (=0.000001)

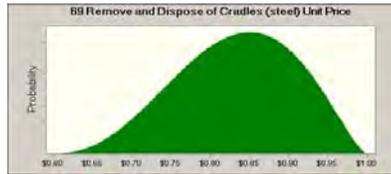


Assumption: 69 Remove and Dispose of Cradles (steel) Unit Price

Cell: R85

BetaPERT distribution with parameters:

Minimum	\$0.60	(=Q85)
Likeliest	\$0.85	(=R85)
Maximum	\$1.00	(=S85)



Assumption: 7 Provide Dewatering behind Left Side Cofferdam Quantity

Cell: L20

Normal distribution with parameters:

Mean	1	(=L20)
Std. Dev.	0	(=0.000001)

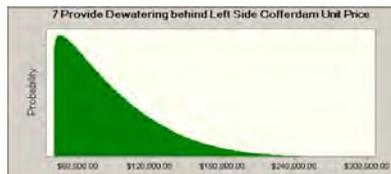


Assumption: 7 Provide Dewatering behind Left Side Cofferdam Unit Price

Cell: R20

BetaPERT distribution with parameters:

Minimum	\$40,000.00	(=Q20)
Likeliest	\$45,000.00	(=R20)
Maximum	\$300,000.00	(=S20)

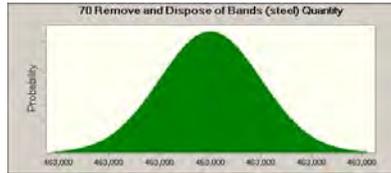


Assumption: 70 Remove and Dispose of Bands (steel) Quantity

Cell: L86

Normal distribution with parameters:

Mean	463,000	(=L86)
Std. Dev.	0	(=0.000001)

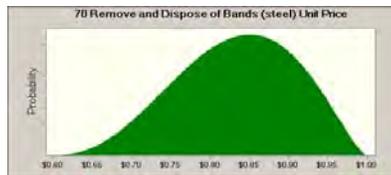


Assumption: 70 Remove and Dispose of Bands (steel) Unit Price

Cell: R86

BetaPERT distribution with parameters:

Minimum	\$0.60	(=Q86)
Likeliest	\$0.85	(=R86)
Maximum	\$1.00	(=S86)

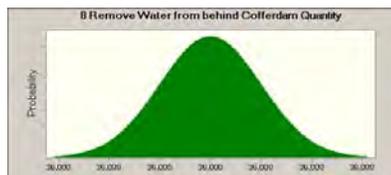


Assumption: 8 Remove Water from behind Cofferdam Quantity

Cell: L21

Normal distribution with parameters:

Mean	36,000	(=L21)
Std. Dev.	0	(=0.000001)



Assumption: 8 Remove Water from behind Cofferdam Unit Price

Cell: R21

BetaPERT distribution with parameters:

Minimum	\$0.04	(=Q21)
Likeliest	\$0.05	(=R21)
Maximum	\$0.08	(=S21)

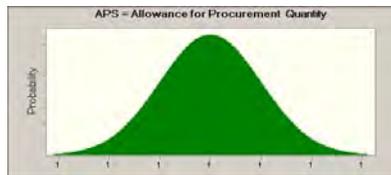


Assumption: APS = Allowance for Procurement Quantity

Cell: L98

Normal distribution with parameters:

Mean	1	(=L98)
Std. Dev.	0	(=0.000001)



Assumption: APS = Allowance for Procurement Unit Price

Cell: R98

BetaPERT distribution with parameters:

Minimum	\$0.00	(=Q98)
Likeliest	\$0.00	(=R98)
Maximum	\$214,883.00	(=S98)

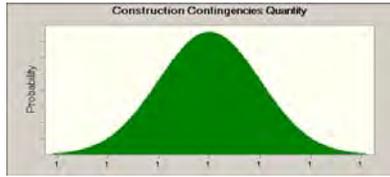


Assumption: Construction Contingencies Quantity

Cell: L101

Normal distribution with parameters:

Mean	1	(=L101)
Std. Dev.	0	(=0.000001)



Assumption: Construction Contingencies Unit Price

Cell: R101

BetaPERT distribution with parameters:

Minimum	\$800,000.00	(=Q101)
Likeliest	\$1,200,000.00	(=R101)
Maximum	\$2,500,000.00	(=S101)

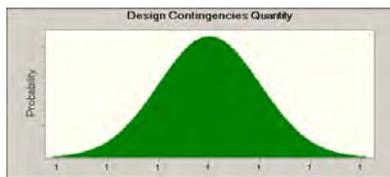


Assumption: Design Contingencies Quantity

Cell: L97

Normal distribution with parameters:

Mean	1	(=L97)
Std. Dev.	0	(=0.000001)



Assumption: Design Contingencies Unit Price

Cell: R97

BetaPERT distribution with parameters:

Minimum	\$332,366.00	(=Q97)
Likeliest	\$534,171.00	(=R97)
Maximum	\$1,442,373.00	(=S97)

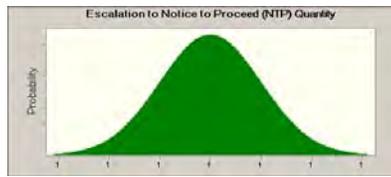


Assumption: Escalation to Notice to Proceed (NTP) Quantity

Cell: L94

Normal distribution with parameters:

Mean	1	(=L94)
Std. Dev.	0	(=0.000001)

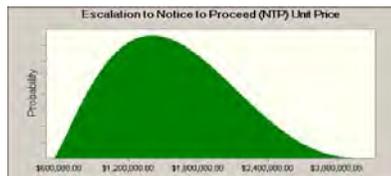


Assumption: Escalation to Notice to Proceed (NTP) Unit Price

Cell: R94

BetaPERT distribution with parameters:

Minimum	\$548,854.00	(=Q94)
Likeliest	\$1,398,739.00	(=R94)
Maximum	\$3,254,254.00	(=S94)

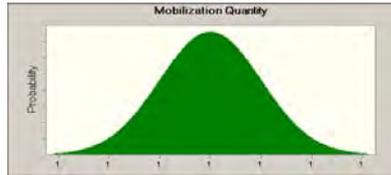


Assumption: Mobilization Quantity

Cell: L92

Normal distribution with parameters:

Mean	1	(=L92)
Std. Dev.	0	(=0.000001)

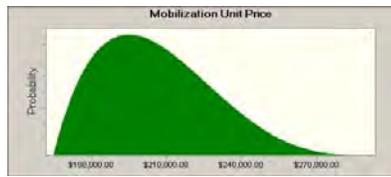


Assumption: Mobilization Unit Price

Cell: R92

BetaPERT distribution with parameters:

Minimum	\$165,000.00	(=Q92)
Likeliest	\$195,000.00	(=R92)
Maximum	\$290,000.00	(=S92)

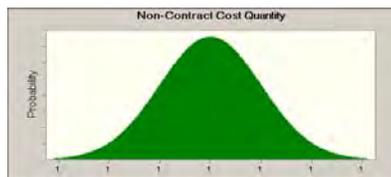


Assumption: Non-Contract Cost Quantity

Cell: L103

Normal distribution with parameters:

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



Assumption: Non-Contract Cost Unit Price

Cell: R103

BetaPERT distribution with parameters:

Minimum	\$3,200,000.00	(=Q103)
Likeliest	\$4,800,000.00	(=R103)
Maximum	\$9,500,000.00	(=S103)



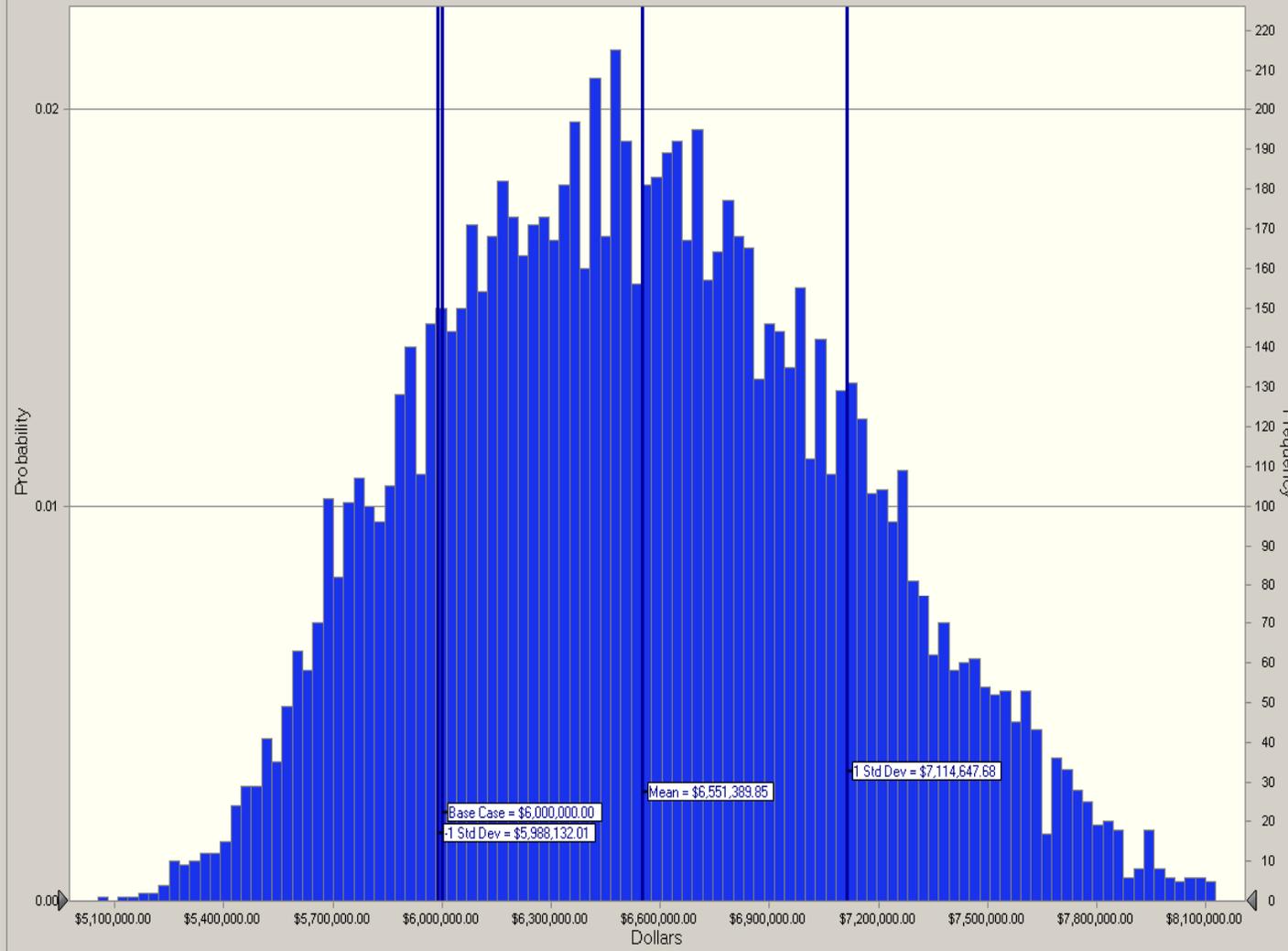
End of Assumptions

10,000 Trials

Split View

9,974 Displayed

Contract Cost - Copco No. 2 - Partial Removal - With Escalation



Statistic	Forecast values
Trials	10,000
Mean	\$6,551,389.85
Median	\$6,522,352.01
Mode	...
Standard Deviation	\$563,257.83
Variance	\$317,259,388,481.60
Skewness	0.2380
Kurtosis	2.63
Coeff. of Variability	0.0860
Minimum	\$5,052,210.87
Maximum	\$8,717,284.66
Mean Std. Error	\$5,632.58

Percentile	Forecast values
0%	\$5,052,210.87
10%	\$5,822,760.46
20%	\$6,041,874.95
30%	\$6,211,815.01
40%	\$6,373,461.09
50%	\$6,522,330.95
60%	\$6,681,388.67
70%	\$6,847,228.50
80%	\$7,046,174.11
90%	\$7,300,733.61
100%	\$8,717,284.66

◀ -Infinity

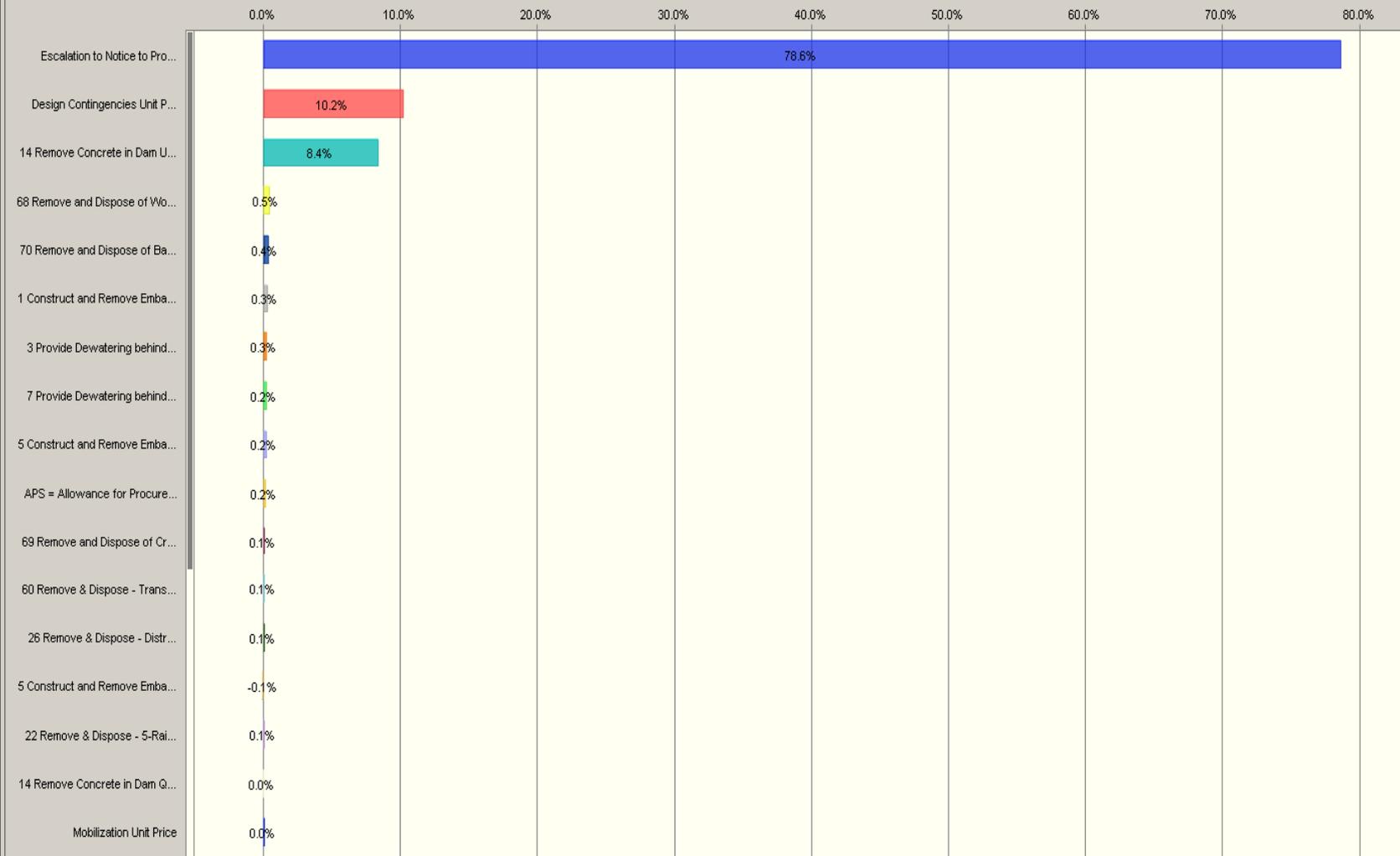
Certainty: 100.00 %

▶ Infinity

10,000 Trials

Contribution to Variance View

Sensitivity: Contract Cost - Copco No. 2 - Partial Removal - With Escalation

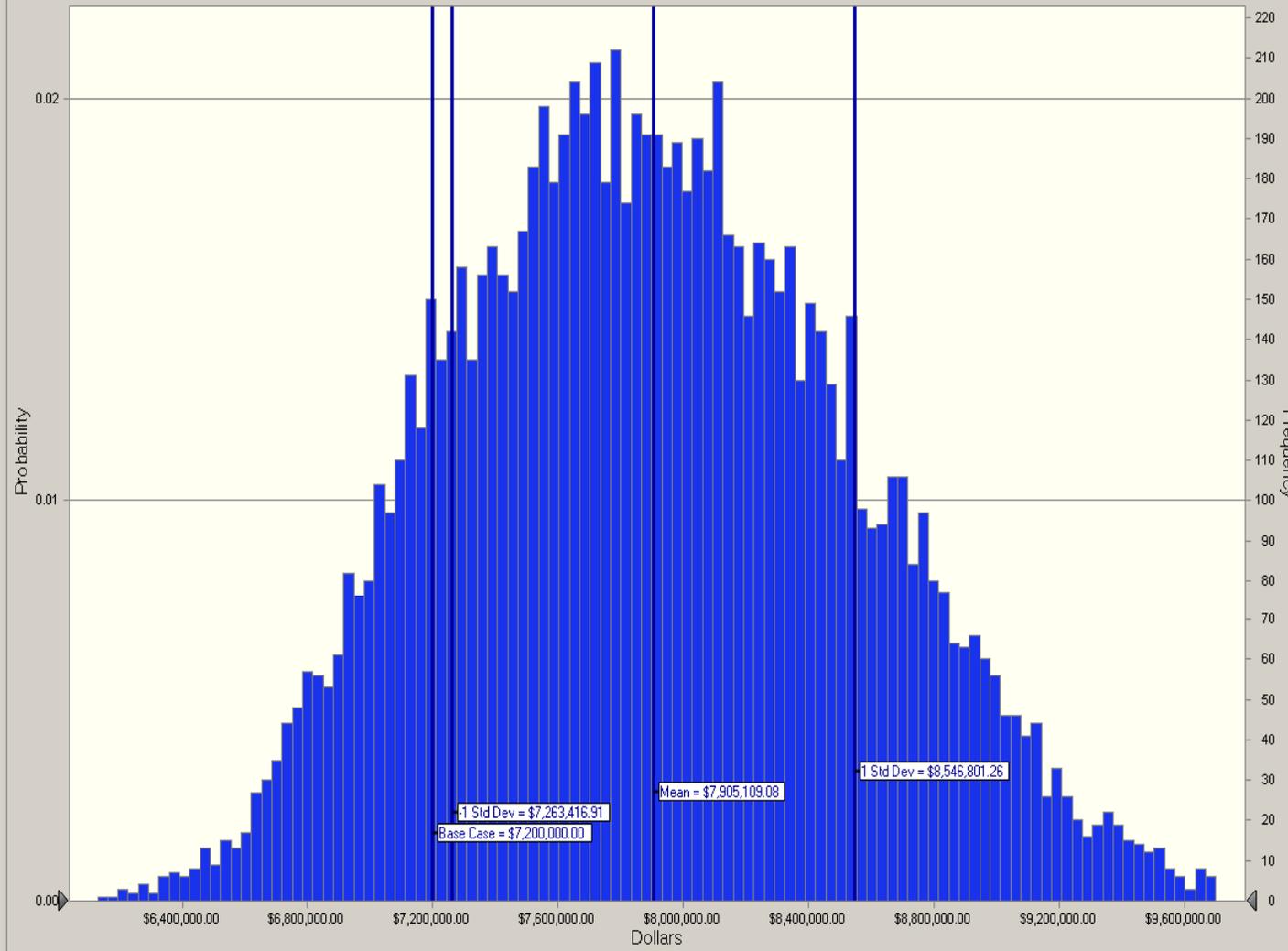


10,000 Trials

Split View

9,965 Displayed

Field Cost - Copco No. 2 - Partial Removal - With Escalation



Statistic	Forecast values
Trials	10,000
Mean	\$7,905,109.08
Median	\$7,874,360.68
Mode	...
Standard Deviation	\$641,692.17
Variance	\$411,768,845,734.85
Skewness	0.2355
Kurtosis	2.75
Coeff. of Variability	0.0812
Minimum	\$6,128,829.44
Maximum	\$10,264,761.92
Mean Std. Error	\$6,416.92

Percentile	Forecast values
0%	\$6,128,829.44
10%	\$7,095,883.70
20%	\$7,331,046.27
30%	\$7,537,449.50
40%	\$7,704,660.45
50%	\$7,874,246.12
60%	\$8,050,816.01
70%	\$8,237,002.20
80%	\$8,458,251.36
90%	\$8,763,811.61
100%	\$10,264,761.92

◀ -Infinity

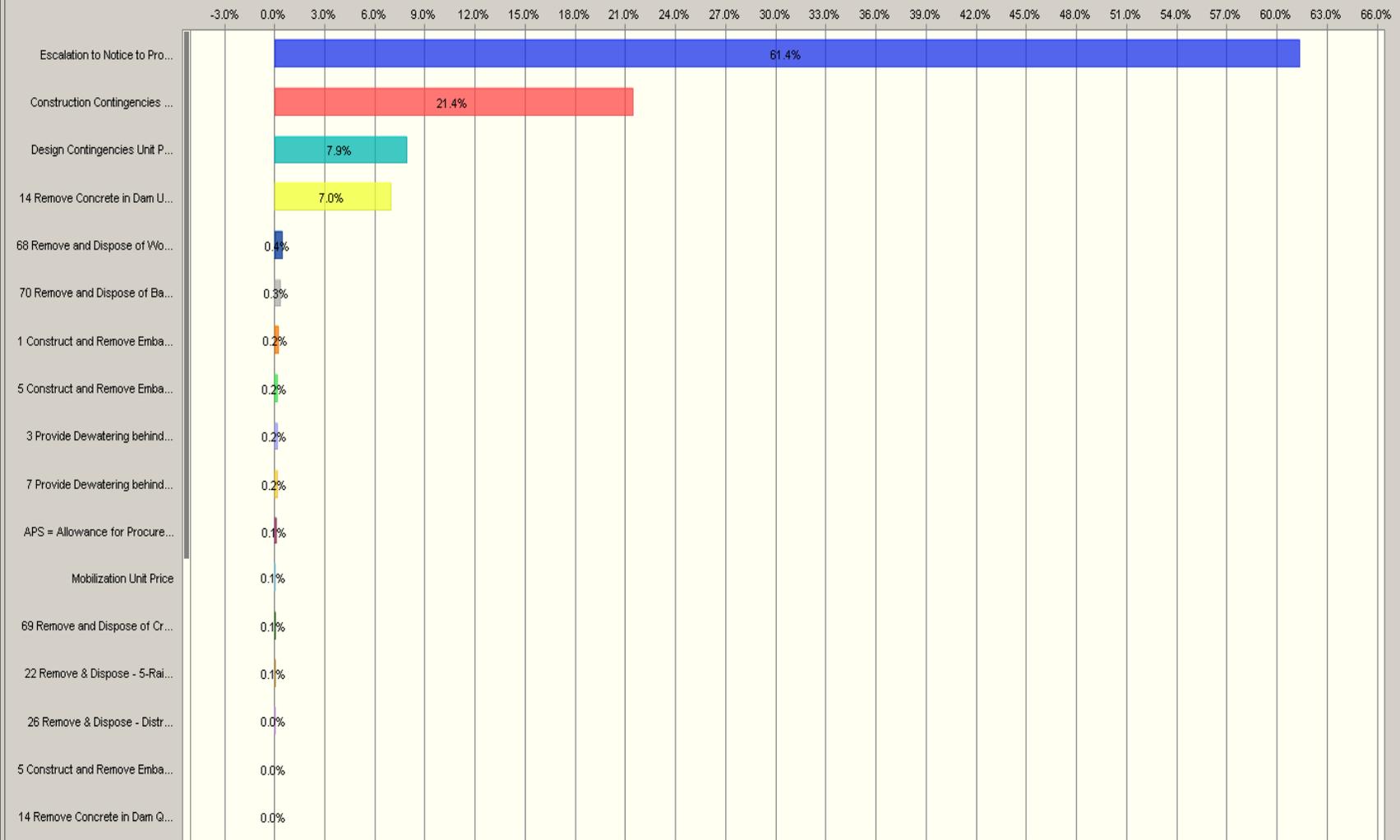
Certainty: 100.00 %

▶ Infinity

10,000 Trials

Contribution to Variance View

Sensitivity: Field Cost - Copco No. 2 - Partial Removal - With Escalation

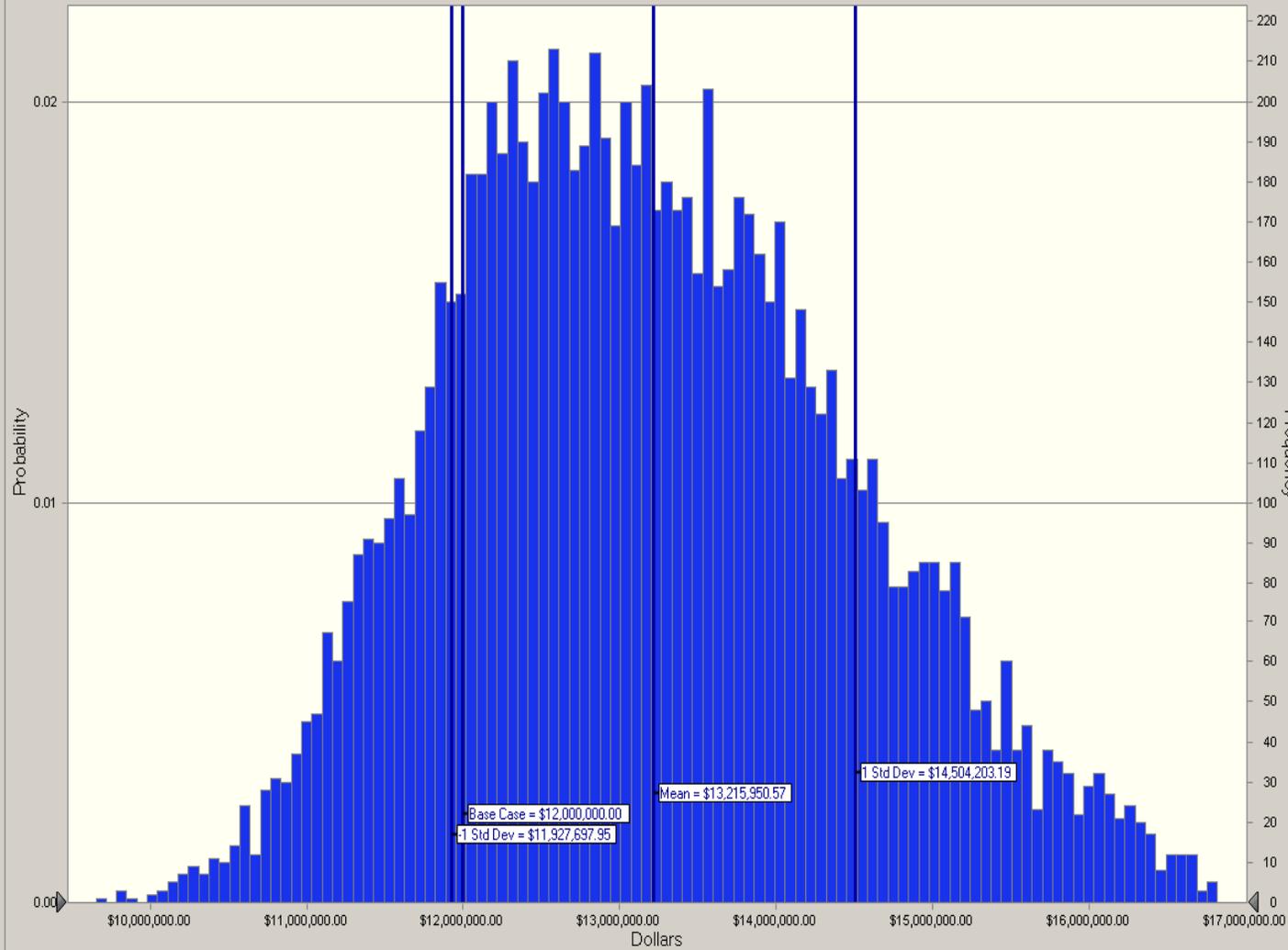


10,000 Trials

Split View

9,966 Displayed

Construction Cost - Copco No. 2 - Partial Removal - With Escalation



Statistic	Forecast values
Trials	10,000
Mean	\$13,215,950.57
Median	\$13,112,875.88
Mode	...
Standard Deviation	\$1,288,252.62
Variance	\$1,659,594,814,394.0
Skewness	0.3438
Kurtosis	2.80
Coeff. of Variability	0.0975
Minimum	\$9,652,055.69
Maximum	\$18,089,119.59
Mean Std. Error	\$12,882.53

Percentile	Forecast values
0%	\$9,652,055.69
10%	\$11,625,740.65
20%	\$12,092,799.23
30%	\$12,433,622.17
40%	\$12,768,305.15
50%	\$13,112,807.18
60%	\$13,475,653.62
70%	\$13,862,536.42
80%	\$14,319,750.10
90%	\$14,983,335.12
100%	\$18,089,119.59

◀ -Infinity

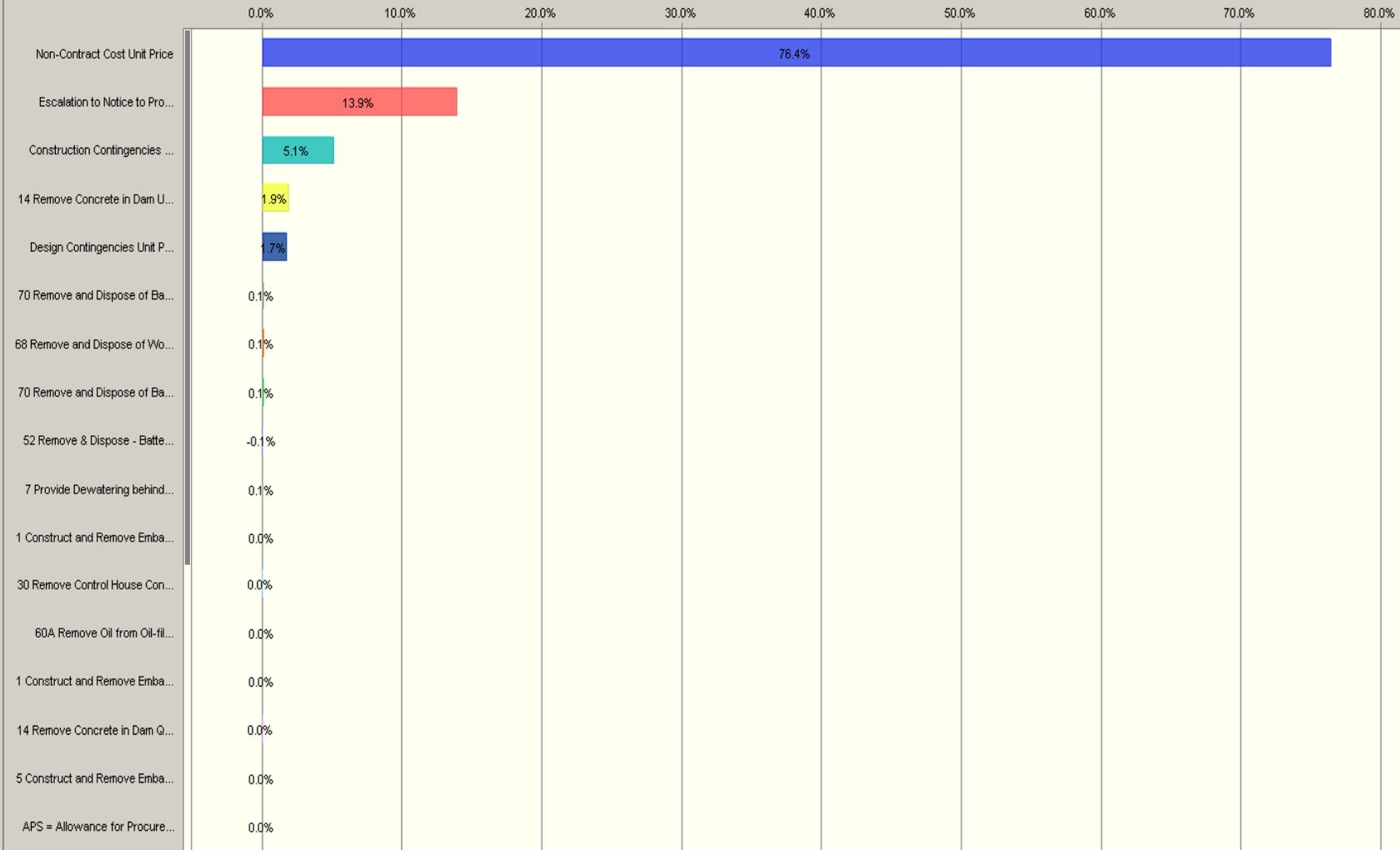
Certainty: 100.00 %

▶ Infinity

10,000 Trials

Contribution to Variance View

Sensitivity: Construction Cost - Copco No. 2 - Partial Removal - With Escalation



ESTIMATE WORKSHEET

FEATURE:			PROJECT:									
Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Escalation NOT Included SUMMARY ESTIMATE			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 2\Copco 2 - Partial Removal Crystal Ball - without Escalation - 2011-04.xls\Copco 2 - Partial - without 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	Construct and Remove Embankment Cofferdam-Right Side of Dam	8130	3,100	3,100	3,100	CY	\$70.00	\$85.00	\$130.00	\$217,000.00	\$263,500.00	\$403,000.00
	2	Furnish, Install and Remove Riprap	8130	465	465	465	CY	\$120.00	\$150.00	\$200.00	\$55,800.00	\$69,750.00	\$93,000.00
	3	Provide Dewatering behind Cofferdams	8130	1	1	1	LS	\$40,000.00	\$45,000.00	\$300,000.00	\$40,000.00	\$45,000.00	\$300,000.00
	4	Remove Water from behind Cofferdams	8130	241,000	241,000	241,000	GAL	\$0.01	\$0.01	\$0.01	\$2,410.00	\$2,410.00	\$2,410.00
	5	Construct and Remove Embankment Cofferdam-Left Side of Dam	8130	1,100	1,100	1,100	CY	\$70.00	\$85.00	\$130.00	\$77,000.00	\$93,500.00	\$143,000.00
	6	Furnish, Install and Remove Riprap	8130	250	250	250	CY	\$120.00	\$150.00	\$200.00	\$30,000.00	\$37,500.00	\$50,000.00
	7	Provide Dewatering behind Left Side Cofferdam	8130	1	1	1	LS	\$40,000.00	\$45,000.00	\$300,000.00	\$40,000.00	\$45,000.00	\$300,000.00
	8	Remove Water from behind Cofferdam	8130	36,000	36,000	36,000	GAL	\$0.04	\$0.05	\$0.08	\$1,440.00	\$1,800.00	\$2,880.00
	9	Remove Water from behind Tailrace Cofferdam	8130	0	0	0	GAL				\$0.00	\$0.00	\$0.00
	10	Provide Dewatering behind Tailrace Cofferdam	8130	0	0	0	LS				\$0.00	\$0.00	\$0.00
	11	Construct Embankment Cofferdam across Tailrace	8130	0	0	0	CY				\$0.00	\$0.00	\$0.00
	12	Construct 240-ft-long, 2-span concrete Bridge	8130	0	0	0	SF				\$0.00	\$0.00	\$0.00
	13	Remove and dispose of existing bridge	8130	0	0	0	LS				\$0.00	\$0.00	\$0.00
	14	Remove Concrete in Dam	8130	4,200	4,200	4,200	CY	\$270.00	\$315.00	\$500.00	\$1,134,000.00	\$1,323,000.00	\$2,100,000.00
	15	Remove concrete equipment slab from top of embankment wing dam on right abutment	8130	5	5	5	CY	\$170.00	\$215.00	\$380.00	\$850.00	\$1,075.00	\$1,900.00
	16	Remove Concrete Wingwall	8130	220	220	220	CY	\$170.00	\$215.00	\$380.00	\$37,400.00	\$47,300.00	\$83,600.00
	17	Right Abutment Removal - Random Fill	8313	0	0	0	CY				\$0.00	\$0.00	\$0.00
	18	Right Abutment Removal - Remove Hand Placed Riprap	8313	0	0	0	SF				\$0.00	\$0.00	\$0.00
	19	Right Abutment Removal - Gunite Curtain Wall	8313	0	0	0	CY				\$0.00	\$0.00	\$0.00
	20	Remove & Dispose - Hand Rails and Light Poles	8420	5,000	5,000	5,000	LBS	\$0.60	\$0.85	\$1.00	\$3,000.00	\$4,250.00	\$5,000.00
	21	Remove & Dispose - Radial Gates and Hoists	8420	66,000	66,000	66,000	LBS	\$0.60	\$0.85	\$1.00	\$39,600.00	\$56,100.00	\$66,000.00
	22	Remove & Dispose - 5-Raidal Gate stoplogs & slots (steel)	8420	95,800	95,800	95,800	LBS	\$0.60	\$0.85	\$1.00	\$57,480.00	\$81,430.00	\$95,800.00
	23	Remove & Dispose - Spillway intake 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
	24	Remove & Dispose - Spillway radial gate motors & control panel	8430	1	1	1	EA	\$900.00	\$1,000.00	\$1,500.00	\$900.00	\$1,000.00	\$1,500.00
	25	Remove & Dispose - Spillway trashrake motor, festoon cable & control panel	8430	1	1	1	EA	\$400.00	\$500.00	\$600.00	\$400.00	\$500.00	\$600.00
	26	Remove & Dispose - Distribution equipment , panelboards	8430	1	1	1	EA	\$4,000.00	\$4,500.00	\$5,000.00	\$4,000.00	\$4,500.00	\$5,000.00
	27	Remove Copper Shingles from Roof of Powerhouse	8130	0	0	0	SF				\$0.00	\$0.00	\$0.00
	28	Remove Powerhouse Concrete down to spring-line of turbine	8130	0	0	0	CY				\$0.00	\$0.00	\$0.00
	29	Remove Structural Steel items associated with Powerhouse	8130	0	0	0	LBS				\$0.00	\$0.00	\$0.00
	30	Remove Control House Concrete	8130	30	30	30	CY	\$170.00	\$215.00	\$380.00	\$5,100.00	\$6,450.00	\$11,400.00
	31	Remove Control House Structural Steel items	8130	3,500	3,500	3,500	LBS	\$0.60	\$0.85	\$1.00	\$2,100.00	\$2,975.00	\$3,500.00
	32	Remove Shop Building	8130	0	0	0	SF				\$0.00	\$0.00	\$0.00
	33	Remove & Dispose - 2- Govenor oil systems	8420	0	0	0	LBS				\$0.00	\$0.00	\$0.00
	34	Remove & Dispose - Cooling water and bearing oil systems	8420	0	0	0	LBS				\$0.00	\$0.00	\$0.00
	35	Remove & Dispose - Oil / Water seperator tank and piping	8420	0	0	0	LBS				\$0.00	\$0.00	\$0.00
	36	Remove & Dispose - 12 - Cast Iron Columns	8420	0	0	0	LBS				\$0.00	\$0.00	\$0.00
	37	Remove & Dispose - 2 - Francis Turbines	8420	0	0	0	LBS				\$0.00	\$0.00	\$0.00
	38	Remove & Dispose - 2-40 Ton indoor crane	8420	0	0	0	LBS				\$0.00	\$0.00	\$0.00
	39	Remove & Dispose - Compressed Air systems	8420	0	0	0	LBS				\$0.00	\$0.00	\$0.00
	40	Remove & Dispose - 2 - CO2 systems	8420	0	0	0	LBS				\$0.00	\$0.00	\$0.00
	41	Remove & Dispose - Plant Water and Fire Protection	8420	0	0	0	LBS				\$0.00	\$0.00	\$0.00
	42	Remove & Dispose - Transformer Oil Fire protection	8420	0	0	0	LBS				\$0.00	\$0.00	\$0.00
	43	Remove & Dispose - Unwatering Piping	8420	0	0	0	LBS				\$0.00	\$0.00	\$0.00
	44	Remove & Dispose - Drainage Piping	8420	0	0	0	LBS				\$0.00	\$0.00	\$0.00
	44A	Remove Petroleum Products from Mechanical Equipment	8420	3,300	3,300	3,300	GAL	\$9.00	\$10.00	\$12.00	\$29,700.00	\$33,000.00	\$39,600.00
	44B	Remove Petroleum Products at or near the Power House	8420	2,000	2,000	2,000	GAL	\$9.00	\$10.00	\$12.00	\$18,000.00	\$20,000.00	\$24,000.00
	45	Remove & Dispose - AC Generator, Indoor Vertical	8430	0	0	0	EA				\$0.00	\$0.00	\$0.00
	46	Remove & Dispose - Excitation equipment for 15 MVA Generator	8430	0	0	0	EA				\$0.00	\$0.00	\$0.00
	47	Remove & Dispose - Surge protection equip. for 15 MVA Generator	8430	0	0	0	EA				\$0.00	\$0.00	\$0.00
	48	Remove & Dispose - Neutral grounding equip. for 15 MVA Generator	8430	0	0	0	EA				\$0.00	\$0.00	\$0.00
	49	Remove & Dispose - Generator Switchgear, 7.2kV-includes unit breakers	8430	0	0	0	EA				\$0.00	\$0.00	\$0.00
	50	Remove & Dispose - Station Service Switchgear, 600 volt -(5 sections)	8430	0	0	0	EA				\$0.00	\$0.00	\$0.00
	51	Remove & Dispose - Unit and plant control switchboard	8430	0	0	0	EA				\$0.00	\$0.00	\$0.00
	52	Remove & Dispose - 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
	53	Remove & Dispose - Raceways, Conduit and Cable	8430	0	0	0	EA				\$0.00	\$0.00	\$0.00

FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 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 2\Copco 2 - Partial Removal Crystal Ball - without Escalation - 2011-04.xls\Copco 2 - Partial - without Esc
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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
	54	Remove & Dispose - Misc. power & control boards	8430	0	0	0	EA				\$0.00	\$0.00	\$0.00
	55	Remove & Dispose - 7 40-Ton Travelling Crane motors-hoist (2-30Hp*),	8430	0	0	0	EA				\$0.00	\$0.00	\$0.00
	56	Remove & Dispose - 40-Ton Travelling Crane control equipment	8430	0	0	0	EA				\$0.00	\$0.00	\$0.00
	57	Remove & Dispose - 40-Ton Travelling Crane Festoon Cable	8430	0	0	0	EA				\$0.00	\$0.00	\$0.00
	58	Remove & Dispose - Step-up Transformers, outdoor, oil-filled, 1-phase, 10/20 MVA 6600/72000 volt	8430	0	0	0	EA				\$0.00	\$0.00	\$0.00
	59	Remove & Dispose - Step-up Transformers, outdoor, oil-filled, 1-phase, 10/20 MVA, 73800/230000 volt	8430	0	0	0	EA				\$0.00	\$0.00	\$0.00
	60	Remove & Dispose - Transmission Line No. 15	8430	0.14	0.14	0.14	MILE	\$25,000.00	\$30,000.00	\$40,000.00	\$3,500.00	\$4,200.00	\$5,600.00
	60A	Remove Oil from Oil-filled Step-up Transformers	8430	23,000	23,000	23,000	GAL	\$9.00	\$10.00	\$12.00	\$207,000.00	\$230,000.00	\$276,000.00
	61	Remove Intake Structure Concrete	8130	0	0	0	CY				\$0.00	\$0.00	\$0.00
	62	Remove Concrete Items associated with 16-foot I.D. Wood Stave Pipe	8130	0	0	0	CY				\$0.00	\$0.00	\$0.00
	63	Place Concrete Plugs for Tunnels	8130	64	64	64	CY	\$1,100.00	\$1,200.00	\$1,300.00	\$70,400.00	\$76,800.00	\$83,200.00
	64	Remove Concrete Items associated with Penstocks D/S from Tunnel No. 2	8130	0	0	0	CY				\$0.00	\$0.00	\$0.00
	65	Remove and Dispose of Caterpillar Gate (steel)	8420	0	0	0	LBS				\$0.00	\$0.00	\$0.00
	66	Remove and Dispose of Trash rack and trash rake (steel)	8420	0	0	0	LBS				\$0.00	\$0.00	\$0.00
	67	Remove and Dispose of Stop Logs and slots for intake (steel)	8420	0	0	0	LBS				\$0.00	\$0.00	\$0.00
	68	Remove and Dispose of Wood Staves Soaked in Creosote	8420	1,100,000	1,100,000	1,100,000	LBS	\$0.65	\$0.70	\$0.85	\$715,000.00	\$770,000.00	\$935,000.00
	69	Remove and Dispose of Cradles (steel)	8420	290,000	290,000	290,000	LBS	\$0.60	\$0.85	\$1.00	\$174,000.00	\$246,500.00	\$290,000.00
	70	Remove and Dispose of Bands (steel)	8420	463,000	463,000	463,000	LBS	\$0.60	\$0.85	\$1.00	\$277,800.00	\$393,550.00	\$463,000.00
	71	Remove and Dispose of Penstock after bifurcation to butterfly valves	8420	0	0	0	LBS				\$0.00	\$0.00	\$0.00
	72	Remove and Dispose of Bifurcated vent pipes and support structure	8420	0	0	0	LBS				\$0.00	\$0.00	\$0.00
	73	Remove and Dispose of 2 - 138" Butterfly valves	8420	0	0	0	LBS				\$0.00	\$0.00	\$0.00
		Subtotal 1									\$3,253,780.00	\$3,872,090.00	\$5,798,490.00
		Mobilization (MPL ~ 5%; MP ~ 5%; MPH ~ 5%)		1	1	1	ls	\$165,000.00	\$195,000.00	\$290,000.00	\$165,000.00	\$195,000.00	\$290,000.00
		Subtotal 1 w/ mobilization											
		Escalation to Notice to Proceed (NTP)											
		NOT INCLUDED											
		Design Contingencies (MPL ~ 8%; MP ~ 10%; MPH ~ 15%)		1	1	1	ls	\$281,220.00	\$432,910.00	\$871,475.00	\$281,220.00	\$432,910.00	\$871,475.00
		APS = Allowance for Procurement Strategies (if applicable) (MPL ~ 0%; MP ~ 0%; MPH ~ 2%)		1	1	1	ls	\$0.00	\$0.00	\$140,035.00	\$0.00	\$0.00	\$140,035.00
		CONTRACT COST									\$3,700,000.00	\$4,500,000.00	\$7,100,000.00
		Construction Contingencies (MPL ~ 18%; MP ~ 20%; MPH ~ 25%)		1	1	1	ls	\$700,000.00	\$900,000.00	\$1,800,000.00	\$700,000.00	\$900,000.00	\$1,800,000.00
		FIELD COST									\$4,400,000.00	\$5,400,000.00	\$8,900,000.00
		Non-Contract Cost (MPL ~ 62%; MP ~ 65%; MPH ~ 71%)		1	1	1	ls	\$2,700,000.00	\$3,500,000.00	\$6,100,000.00	\$2,700,000.00	\$3,500,000.00	\$6,100,000.00
		CONSTRUCTION COST									\$7,100,000.00	\$8,900,000.00	\$15,000,000.00

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:	06-09-11	06-09-11	06-09-11	06-09-11
DATE PREPARED: 1/20/2011	PEER REVIEW: See Group Worksheets	DATE PREPARED:	PEER REVIEW:	06/09/11	06/09/11	06/09/11	06/09/11

Crystal Ball Report - Full

Simulation started on 6/9/2011 at 9:24:19
 Simulation stopped on 6/9/2011 at 9:24:44

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) 25.00
 Trials/second (average) 400
 Random numbers per sec 27,199

Crystal Ball data:

Assumptions 68
 Correlations 0
 Correlated groups 0
 Decision variables 0
 Forecasts 3

TECHNICAL SERVICE CENTER
 ESTIMATING, SPECIFICATIONS
 AND VALUE PROGRAM GROUP

UNIT PRICES BY *Craig A. Grushy*
gca. JH
 DATE 6/9/2011

DATE	PEER REVIEWER(S)	CODE
6/9/11	<i>Dan M...</i> Signature DAN M...	8170
	Signature	
	Printed Name	
Author Initials		PEER REVIEW NOT REQUIRED

Forecasts

Worksheet: [Copco 2 - Partial Removal Crystal Ball - without Escalation - 2011-04.xls]Copco 2

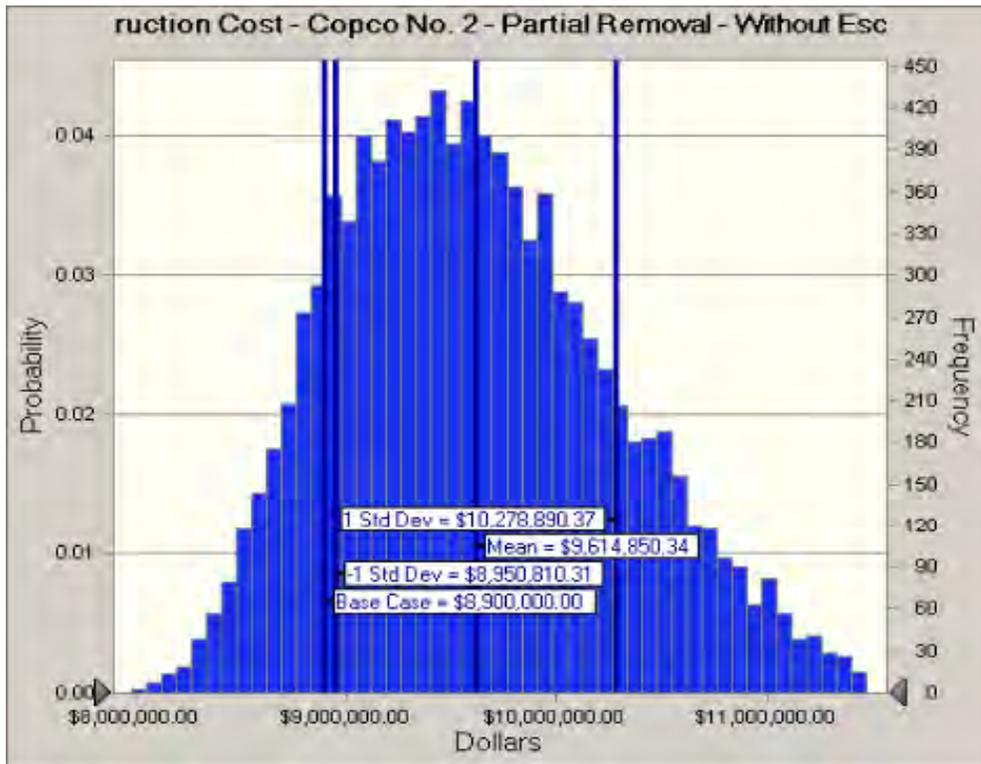
Forecast: Construction Cost - Copco No. 2 - Partial Removal - Without Escalation Cell: U104

Summary:

Entire range is from \$7,980,796.19 to \$11,993,777.07

Base case is \$8,900,000.00

After 10,000 trials, the std. error of the mean is \$6,640.40



Forecast: Construction Cost - Copco No. 2 - Partial Removal - Without Escalation (Cell: D104)

Statistics:	Forecast values
Trials	10,000
Mean	\$9,614,850.34
Median	\$9,556,010.43
Mode	---
Standard Deviation	\$664,040.03
Variance	\$440,949,163,629.47
Skewness	0.4161
Kurtosis	2.79
Coeff. of Variability	0.0691
Minimum	\$7,980,796.19
Maximum	\$11,993,777.07
Range Width	\$4,012,980.88
Mean Std. Error	\$6,640.40

Percentiles:	Forecast values
0%	\$7,980,796.19
10%	\$8,803,248.13
20%	\$9,021,878.23
30%	\$9,208,043.56
40%	\$9,383,622.66
50%	\$9,555,844.51
60%	\$9,731,661.52
70%	\$9,933,398.88
80%	\$10,177,595.16
90%	\$10,537,407.07
100%	\$11,993,777.07

Forecast: Contract Cost - Copco No. 2 - Partial Removal - Without Escalation

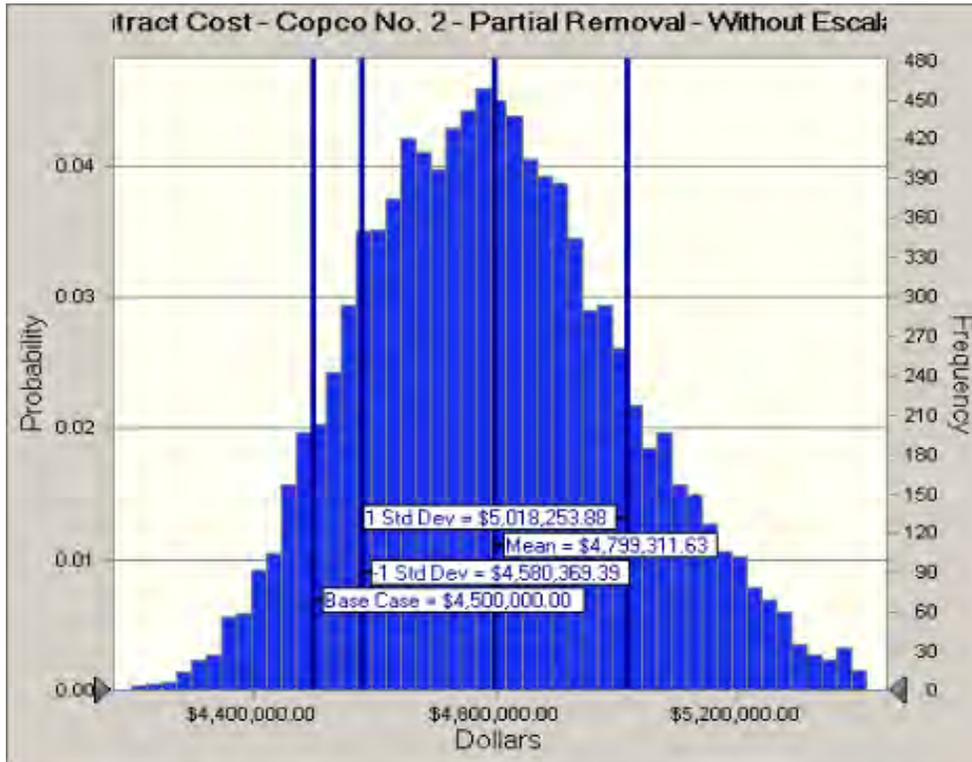
Cell: U100

Summary:

Entire range is from \$4,199,690.84 to \$5,722,921.31

Base case is \$4,500,000.00

After 10,000 trials, the std. error of the mean is \$2,189.42



Forecast: Contract Cost - Copco No. 2 - Partial Removal - Without Escalation (cont'd) Cell: U100

Statistics:	Forecast values
Trials	10,000
Mean	\$4,799,311.63
Median	\$4,787,537.70
Mode	---
Standard Deviation	\$218,942.25
Variance	\$47,935,707,878.79
Skewness	0.3307
Kurtosis	2.95
Coeff. of Variability	0.0456
Minimum	\$4,199,690.84
Maximum	\$5,722,921.31
Range Width	\$1,523,230.47
Mean Std. Error	\$2,189.42

Percentiles:	Forecast values
0%	\$4,199,690.84
10%	\$4,525,814.01
20%	\$4,608,306.34
30%	\$4,670,871.98
40%	\$4,731,719.05
50%	\$4,787,526.10
60%	\$4,842,949.00
70%	\$4,905,504.86
80%	\$4,981,367.78
90%	\$5,094,107.06
100%	\$5,722,921.31

Forecast: Field Cost - Copco No. 2 - Partial Removal - Without Escalation

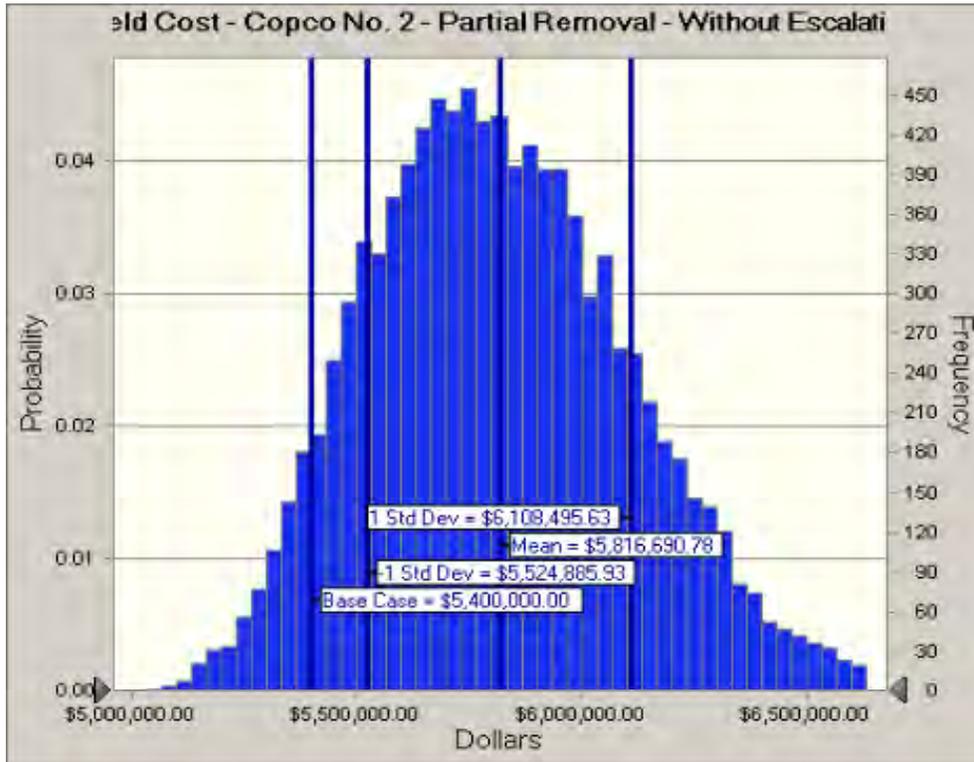
Cell: U102

Summary:

Entire range is from \$4,956,865.56 to \$6,935,927.15

Base case is \$5,400,000.00

After 10,000 trials, the std. error of the mean is \$2,918.05



Forecast: Field Cost - Copco No. 2 - Partial Removal - Without Escalation (cont'd) Cell: U102

Statistics:	Forecast values
Trials	10,000
Mean	\$5,816,690.78
Median	\$5,798,004.35
Mode	---
Standard Deviation	\$291,804.85
Variance	\$85,150,070,579.33
Skewness	0.3385
Kurtosis	2.92
Coeff. of Variability	0.0502
Minimum	\$4,956,865.56
Maximum	\$6,935,927.15
Range Width	\$1,979,061.59
Mean Std. Error	\$2,918.05

Percentiles:	Forecast values
0%	\$4,956,865.56
10%	\$5,453,266.33
20%	\$5,560,464.60
30%	\$5,647,873.59
40%	\$5,722,922.01
50%	\$5,797,919.62
60%	\$5,877,297.24
70%	\$5,961,652.14
80%	\$6,060,774.28
90%	\$6,206,058.50
100%	\$6,935,927.15

End of Forecasts

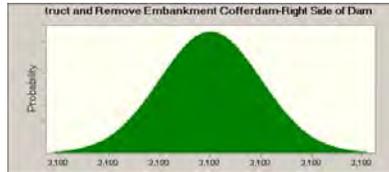
Assumptions

Worksheet: [Copco 2 - Partial Removal Crystal Ball - without Escalation - 2011-04.xls]Copco 2

Assumption: 1 Construct and Remove Embankment Cofferdam-Right Side of Dam Quantity **Cell: L14**

Normal distribution with parameters:

Mean	3,100	(=L14)
Std. Dev.	0	(=0.000001)



Assumption: 1 Construct and Remove Embankment Cofferdam-Right Side of Dam Unit Price **Cell: R14**

BetaPERT distribution with parameters:

Minimum	\$70.00	(=Q14)
Likeliest	\$85.00	(=R14)
Maximum	\$130.00	(=S14)

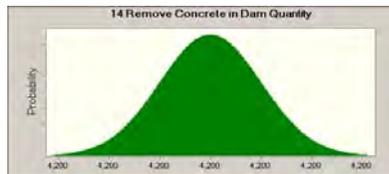


Assumption: 14 Remove Concrete in Dam Quantity

Cell: L27

Normal distribution with parameters:

Mean	4,200	(=L27)
Std. Dev.	0	(=0.000001)



Assumption: 14 Remove Concrete in Dam Unit Price

Cell: R27

BetaPERT distribution with parameters:

Minimum	\$270.00	(=Q27)
Likeliest	\$315.00	(=R27)
Maximum	\$500.00	(=S27)

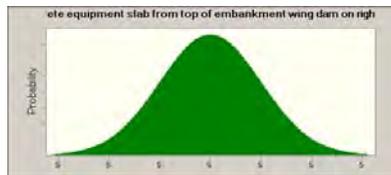


Assumption: 15 Remove concrete equipment slab from top of embankment wing dam on right

Cell: L28

Normal distribution with parameters:

Mean	5	(=L28)
Std. Dev.	0	(=0.000001)

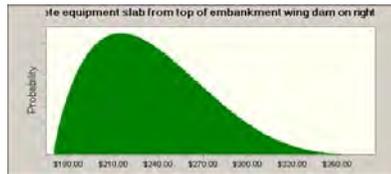


Assumption: 15 Remove concrete equipment slab from top of embankment wing dam on right

Cell: R28

BetaPERT distribution with parameters:

Minimum	\$170.00	(=Q28)
Likeliest	\$215.00	(=R28)
Maximum	\$380.00	(=S28)



Assumption: 16 Remove Concrete Wingwall Quantity

Cell: L29

Normal distribution with parameters:

Mean	220	(=L29)
Std. Dev.	0	(=0.000001)



Assumption: 16 Remove Concrete Wingwall Unit Price

Cell: R29

BetaPERT distribution with parameters:

Minimum	\$170.00	(=Q29)
Likeliest	\$215.00	(=R29)
Maximum	\$380.00	(=S29)

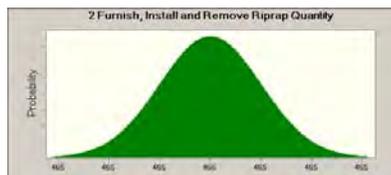


Assumption: 2 Furnish, Install and Remove Riprap Quantity

Cell: L15

Normal distribution with parameters:

Mean	465	(=L15)
Std. Dev.	0	(=0.000001)



Assumption: 2 Furnish, Install and Remove Riprap Unit Price

Cell: R15

BetaPERT distribution with parameters:

Minimum	\$120.00	(=Q15)
Likeliest	\$150.00	(=R15)
Maximum	\$200.00	(=S15)

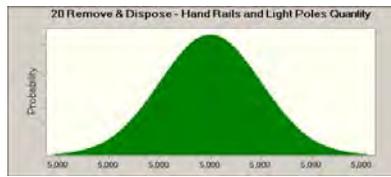


Assumption: 20 Remove & Dispose - Hand Rails and Light Poles Quantity

Cell: L33

Normal distribution with parameters:

Mean	5,000	(=L33)
Std. Dev.	0	(=0.000001)

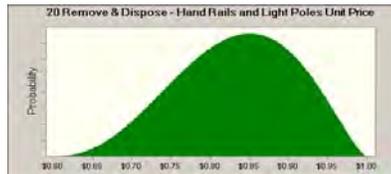


Assumption: 20 Remove & Dispose - Hand Rails and Light Poles Unit Price

Cell: R33

BetaPERT distribution with parameters:

Minimum	\$0.60	(=Q33)
Likeliest	\$0.85	(=R33)
Maximum	\$1.00	(=S33)



Assumption: 21 Remove & Dispose - Radial Gates and Hoists Quantity

Cell: L34

Normal distribution with parameters:

Mean 66,000 (=L34)
 Std. Dev. 0 (=0.000001)

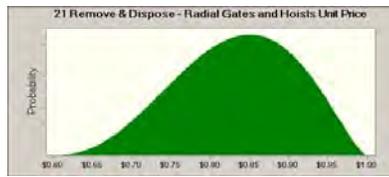


Assumption: 21 Remove & Dispose - Radial Gates and Hoists Unit Price

Cell: R34

BetaPERT distribution with parameters:

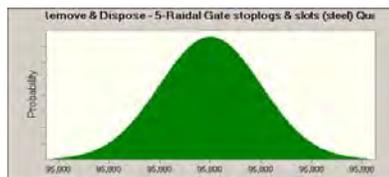
Minimum \$0.60 (=Q34)
 Likeliest \$0.85 (=R34)
 Maximum \$1.00 (=S34)



Assumption: 22 Remove & Dispose - 5-Raidal Gate stoplogs & slots (steel) Quantity Cell: L35

Normal distribution with parameters:

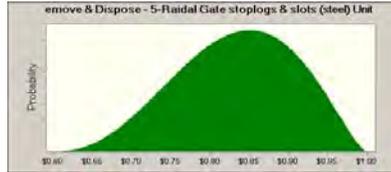
Mean 95,800 (=L35)
 Std. Dev. 0 (=0.000001)



Assumption: 22 Remove & Dispose - 5-Raidal Gate stoplogs & slots (steel) Unit PriceCell: R35

BetaPERT distribution with parameters:

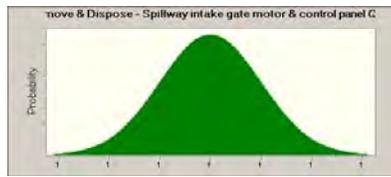
Minimum	\$0.60	(=Q35)
Likeliest	\$0.85	(=R35)
Maximum	\$1.00	(=S35)



Assumption: 23 Remove & Dispose - Spillway intake gate motor & control panel Quantity L36

Normal distribution with parameters:

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



Assumption: 23 Remove & Dispose - Spillway intake gate motor & control panel Unit Price R36

BetaPERT distribution with parameters:

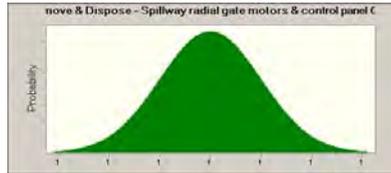
Minimum	\$900.00	(=Q36)
Likeliest	\$1,000.00	(=R36)
Maximum	\$1,500.00	(=S36)



Assumption: 24 Remove & Dispose - Spillway radial gate motors & control panel Quantity L37

Normal distribution with parameters:

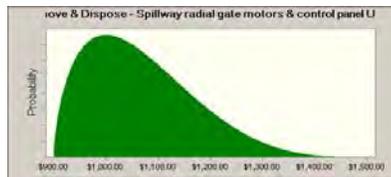
Mean	1	(=L37)
Std. Dev.	0	(=0.000001)



Assumption: 24 Remove & Dispose - Spillway radial gate motors & control panel Unit Price R37

BetaPERT distribution with parameters:

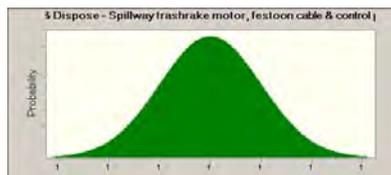
Minimum	\$900.00	(=Q37)
Likeliest	\$1,000.00	(=R37)
Maximum	\$1,500.00	(=S37)



Assumption: 25 Remove & Dispose - Spillway trashrake motor, festoon cable & control panel L38

Normal distribution with parameters:

Mean	1	(=L38)
Std. Dev.	0	(=0.000001)



Assumption: 25 Remove & Dispose - Spillway trashrake motor, festoon cable & control panel

BetaPERT distribution with parameters:

Minimum	\$400.00	(=Q38)
Likeliest	\$500.00	(=R38)
Maximum	\$600.00	(=S38)



Assumption: 26 Remove & Dispose - Distribution equipment , panelboards Quantity Cell: L39

Normal distribution with parameters:

Mean	1	(=L39)
Std. Dev.	0	(=0.000001)



Assumption: 26 Remove & Dispose - Distribution equipment , panelboards Unit Price Cell: R39

BetaPERT distribution with parameters:

Minimum	\$4,000.00	(=Q39)
Likeliest	\$4,500.00	(=R39)
Maximum	\$5,000.00	(=S39)

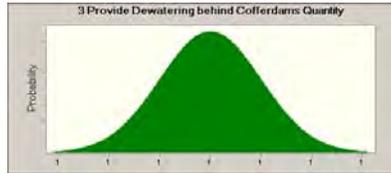


Assumption: 3 Provide Dewatering behind Cofferdams Quantity

Cell: L16

Normal distribution with parameters:

Mean	1	(=L16)
Std. Dev.	0	(=0.000001)

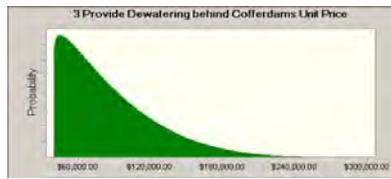


Assumption: 3 Provide Dewatering behind Cofferdams Unit Price

Cell: R16

BetaPERT distribution with parameters:

Minimum	\$40,000.00	(=Q16)
Likeliest	\$45,000.00	(=R16)
Maximum	\$300,000.00	(=S16)



Assumption: 30 Remove Control House Concrete Quantity

Cell: L43

Normal distribution with parameters:

Mean	30	(=L43)
Std. Dev.	0	(=0.000001)



Assumption: 30 Remove Control House Concrete Unit Price

Cell: R43

BetaPERT distribution with parameters:

Minimum	\$170.00	(=Q43)
Likeliest	\$215.00	(=R43)
Maximum	\$380.00	(=S43)



Assumption: 31 Remove Control House Structural Steel items Quantity

Cell: L44

Normal distribution with parameters:

Mean	3,500	(=L44)
Std. Dev.	0	(=0.000001)



Assumption: 31 Remove Control House Structural Steel items Unit Price

Cell: R44

BetaPERT distribution with parameters:

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



Assumption: 4 Remove Water from behind Cofferdams Quantity

Cell: L17

Normal distribution with parameters:

Mean 241,000 (=L17)
Std. Dev. 0 (=0.000001)

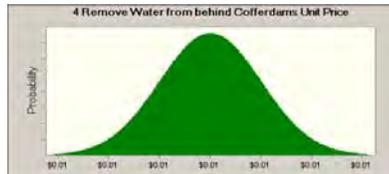


Assumption: 4 Remove Water from behind Cofferdams Unit Price

Cell: R17

Normal distribution with parameters:

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

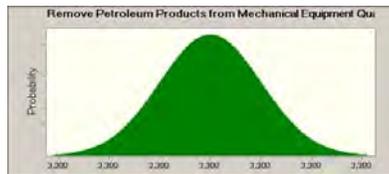


Assumption: 44A Remove Petroleum Products from Mechanical Equipment Quantity

Cell: L58

Normal distribution with parameters:

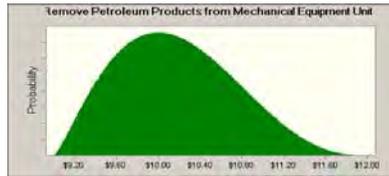
Mean 3,300 (=L58)
Std. Dev. 0 (=0.000001)



Assumption: 44A Remove Petroleum Products from Mechanical Equipment Unit Price Cell: R58

BetaPERT distribution with parameters:

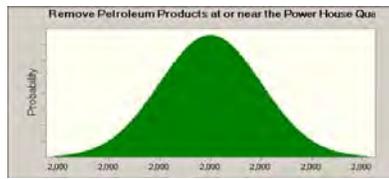
Minimum	\$9.00	(=Q58)
Likeliest	\$10.00	(=R58)
Maximum	\$12.00	(=S58)



Assumption: 44B Remove Petroleum Products at or near the Power House Quantity Cell: L59

Normal distribution with parameters:

Mean	2,000	(=L59)
Std. Dev.	0	(=0.000001)



Assumption: 44B Remove Petroleum Products at or near the Power House Unit Price Cell: R59

BetaPERT distribution with parameters:

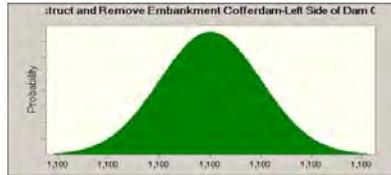
Minimum	\$9.00	(=Q59)
Likeliest	\$10.00	(=R59)
Maximum	\$12.00	(=S59)



Assumption: 5 Construct and Remove Embankment Cofferdam-Left Side of Dam Quantity **Cell: L18**

Normal distribution with parameters:

Mean 1,100 (=L18)
 Std. Dev. 0 (=0.000001)



Assumption: 5 Construct and Remove Embankment Cofferdam-Left Side of Dam Unit Price **Cell: R18**

BetaPERT distribution with parameters:

Minimum \$70.00 (=Q18)
 Likeliest \$85.00 (=R18)
 Maximum \$130.00 (=S18)

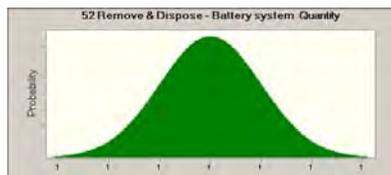


Assumption: 52 Remove & Dispose - Battery system Quantity

Cell: L67

Normal distribution with parameters:

Mean 1 (=L67)
 Std. Dev. 0 (=0.000001)



Assumption: 52 Remove & Dispose - Battery system Unit Price

Cell: R67

BetaPERT distribution with parameters:

Minimum	\$9,000.00	(=Q67)
Likeliest	\$10,000.00	(=R67)
Maximum	\$12,000.00	(=S67)

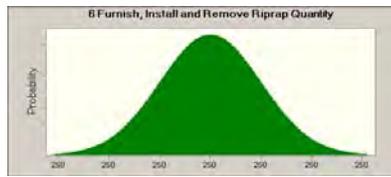


Assumption: 6 Furnish, Install and Remove Riprap Quantity

Cell: L19

Normal distribution with parameters:

Mean	250	(=L19)
Std. Dev.	0	(=0.000001)



Assumption: 6 Furnish, Install and Remove Riprap Unit Price

Cell: R19

BetaPERT distribution with parameters:

Minimum	\$120.00	(=Q19)
Likeliest	\$150.00	(=R19)
Maximum	\$200.00	(=S19)

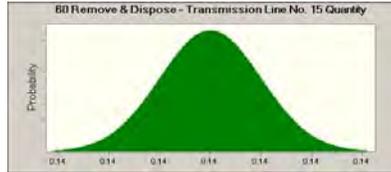


Assumption: 60 Remove & Dispose - Transmission Line No. 15 Quantity

Cell: L75

Normal distribution with parameters:

Mean	0.14	(=L75)
Std. Dev.	0.00	(=0.000001)



Assumption: 60 Remove & Dispose - 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)

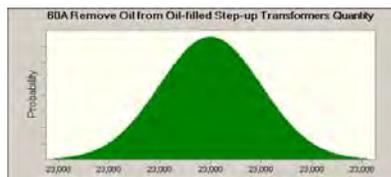


Assumption: 60A Remove Oil from Oil-filled Step-up Transformers Quantity

Cell: L76

Normal distribution with parameters:

Mean	23,000	(=L76)
Std. Dev.	0	(=0.000001)



Assumption: 60A Remove Oil from Oil-filled Step-up Transformers Unit Price

Cell: R76

BetaPERT distribution with parameters:

Minimum	\$9.00	(=Q76)
Likeliest	\$10.00	(=R76)
Maximum	\$12.00	(=S76)

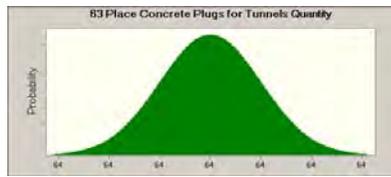


Assumption: 63 Place Concrete Plugs for Tunnels Quantity

Cell: L79

Normal distribution with parameters:

Mean	64	(=L79)
Std. Dev.	0	(=0.000001)

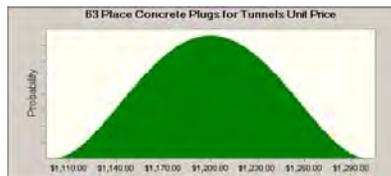


Assumption: 63 Place Concrete Plugs for Tunnels Unit Price

Cell: R79

BetaPERT distribution with parameters:

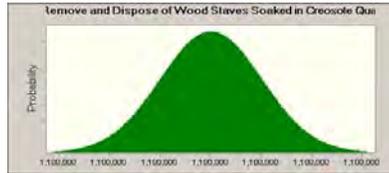
Minimum	\$1,100.00	(=Q79)
Likeliest	\$1,200.00	(=R79)
Maximum	\$1,300.00	(=S79)



Assumption: 68 Remove and Dispose of Wood Staves Soaked in Creosote Quantity Cell: L84

Normal distribution with parameters:

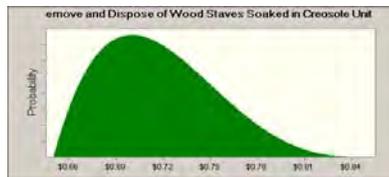
Mean	1,100,000	(=L84)
Std. Dev.	0	(=0.000001)



Assumption: 68 Remove and Dispose of Wood Staves Soaked in Creosote Unit Price Cell: R84

BetaPERT distribution with parameters:

Minimum	\$0.65	(=Q84)
Likeliest	\$0.70	(=R84)
Maximum	\$0.85	(=S84)

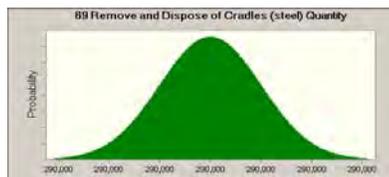


Assumption: 69 Remove and Dispose of Cradles (steel) Quantity

Cell: L85

Normal distribution with parameters:

Mean	290,000	(=L85)
Std. Dev.	0	(=0.000001)

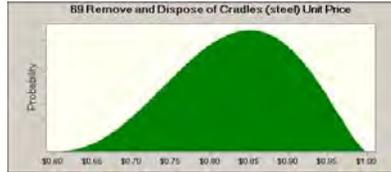


Assumption: 69 Remove and Dispose of Cradles (steel) Unit Price

Cell: R85

BetaPERT distribution with parameters:

Minimum	\$0.60	(=Q85)
Likeliest	\$0.85	(=R85)
Maximum	\$1.00	(=S85)



Assumption: 7 Provide Dewatering behind Left Side Cofferdam Quantity

Cell: L20

Normal distribution with parameters:

Mean	1	(=L20)
Std. Dev.	0	(=0.000001)

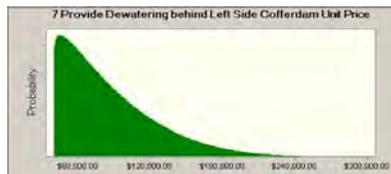


Assumption: 7 Provide Dewatering behind Left Side Cofferdam Unit Price

Cell: R20

BetaPERT distribution with parameters:

Minimum	\$40,000.00	(=Q20)
Likeliest	\$45,000.00	(=R20)
Maximum	\$300,000.00	(=S20)

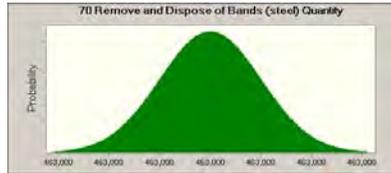


Assumption: 70 Remove and Dispose of Bands (steel) Quantity

Cell: L86

Normal distribution with parameters:

Mean	463,000	(=L86)
Std. Dev.	0	(=0.000001)

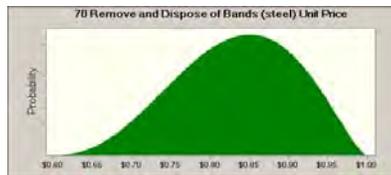


Assumption: 70 Remove and Dispose of Bands (steel) Unit Price

Cell: R86

BetaPERT distribution with parameters:

Minimum	\$0.60	(=Q86)
Likeliest	\$0.85	(=R86)
Maximum	\$1.00	(=S86)

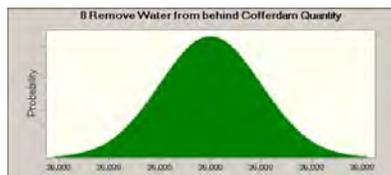


Assumption: 8 Remove Water from behind Cofferdam Quantity

Cell: L21

Normal distribution with parameters:

Mean	36,000	(=L21)
Std. Dev.	0	(=0.000001)



Assumption: 8 Remove Water from behind Cofferdam Unit Price

Cell: R21

BetaPERT distribution with parameters:

Minimum	\$0.04	(=Q21)
Likeliest	\$0.05	(=R21)
Maximum	\$0.08	(=S21)

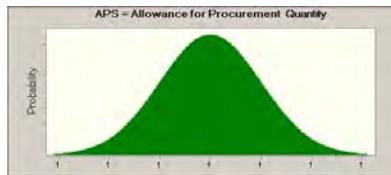


Assumption: APS = Allowance for Procurement Quantity

Cell: L98

Normal distribution with parameters:

Mean	1	(=L98)
Std. Dev.	0	(=0.000001)



Assumption: APS = Allowance for Procurement Unit Price

Cell: R98

BetaPERT distribution with parameters:

Minimum	\$0.00	(=Q98)
Likeliest	\$0.00	(=R98)
Maximum	\$140,035.00	(=S98)

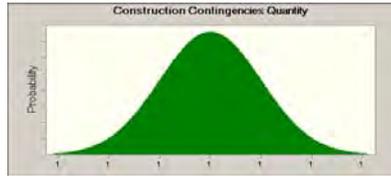


Assumption: Construction Contingencies Quantity

Cell: L101

Normal distribution with parameters:

Mean	1	(=L101)
Std. Dev.	0	(=0.000001)



Assumption: Construction Contingencies Unit Price

Cell: R101

BetaPERT distribution with parameters:

Minimum	\$700,000.00	(=Q101)
Likeliest	\$900,000.00	(=R101)
Maximum	\$1,800,000.00	(=S101)

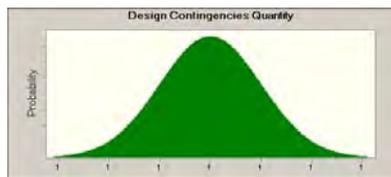


Assumption: Design Contingencies Quantity

Cell: L97

Normal distribution with parameters:

Mean	1	(=L97)
Std. Dev.	0	(=0.000001)



Assumption: Design Contingencies Unit Price

Cell: R97

BetaPERT distribution with parameters:

Minimum	\$281,220.00	(=Q97)
Likeliest	\$432,910.00	(=R97)
Maximum	\$871,475.00	(=S97)

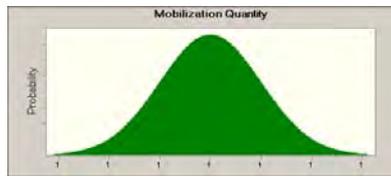


Assumption: Mobilization Quantity

Cell: L92

Normal distribution with parameters:

Mean	1	(=L92)
Std. Dev.	0	(=0.000001)



Assumption: Mobilization Unit Price

Cell: R92

BetaPERT distribution with parameters:

Minimum	\$165,000.00	(=Q92)
Likeliest	\$195,000.00	(=R92)
Maximum	\$290,000.00	(=S92)



Assumption: Non-Contract Cost Quantity

Cell: L103

Normal distribution with parameters:

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



Assumption: Non-Contract Cost Unit Price

Cell: R103

BetaPERT distribution with parameters:

Minimum	\$2,700,000.00	(=Q103)
Likeliest	\$3,500,000.00	(=R103)
Maximum	\$6,100,000.00	(=S103)



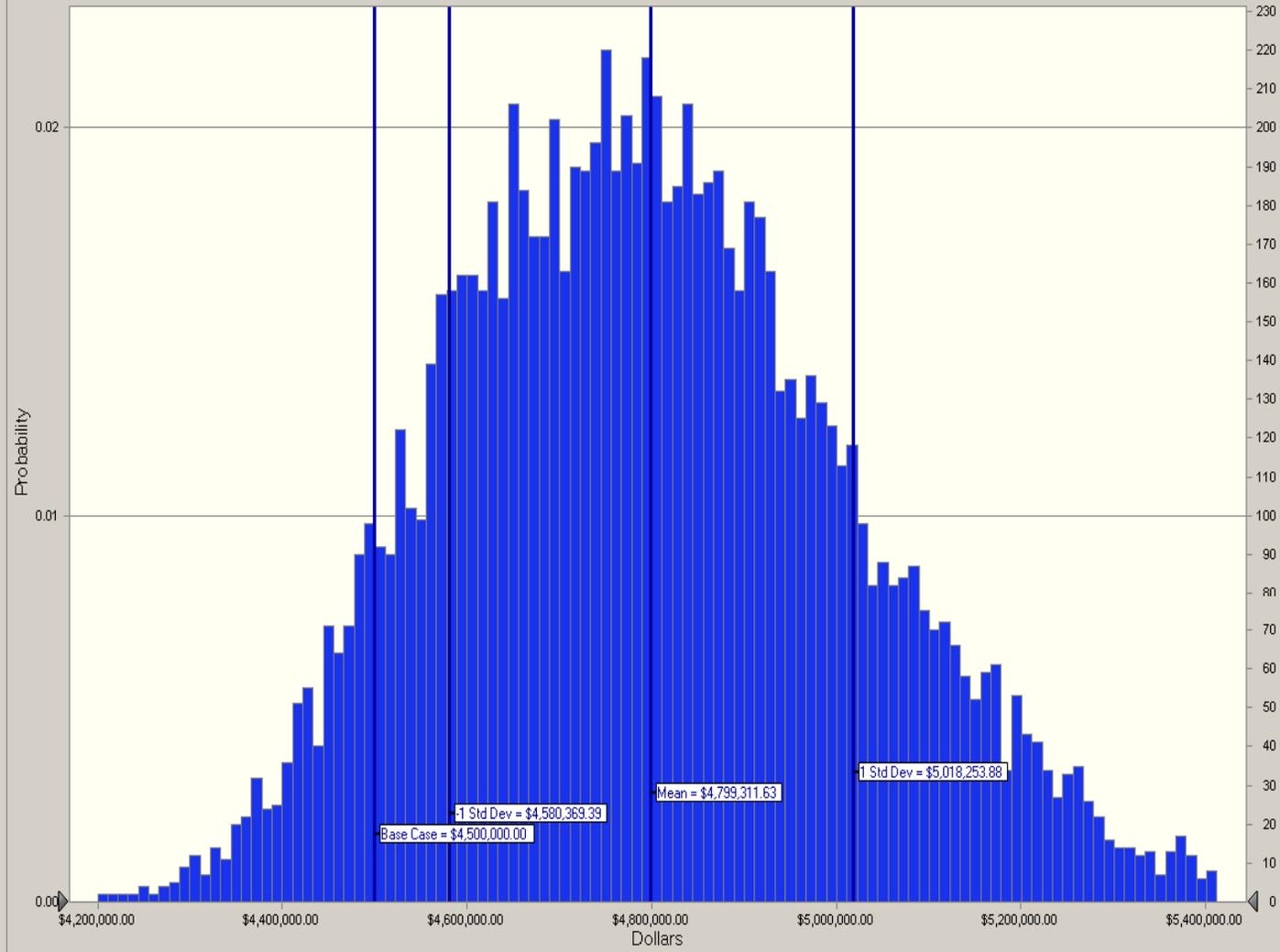
End of Assumptions

10,000 Trials

Split View

9,959 Displayed

Contract Cost - Copco No. 2 - Partial Removal - Without Escalation



Statistic	Forecast values
Trials	10,000
Mean	\$4,799,311.63
Median	\$4,787,537.70
Mode	...
Standard Deviation	\$218,942.25
Variance	\$47,935,707,878.79
Skewness	0.3307
Kurtosis	2.95
Coeff. of Variability	0.0456
Minimum	\$4,199,690.84
Maximum	\$5,722,921.31
Mean Std. Error	\$2,189.42

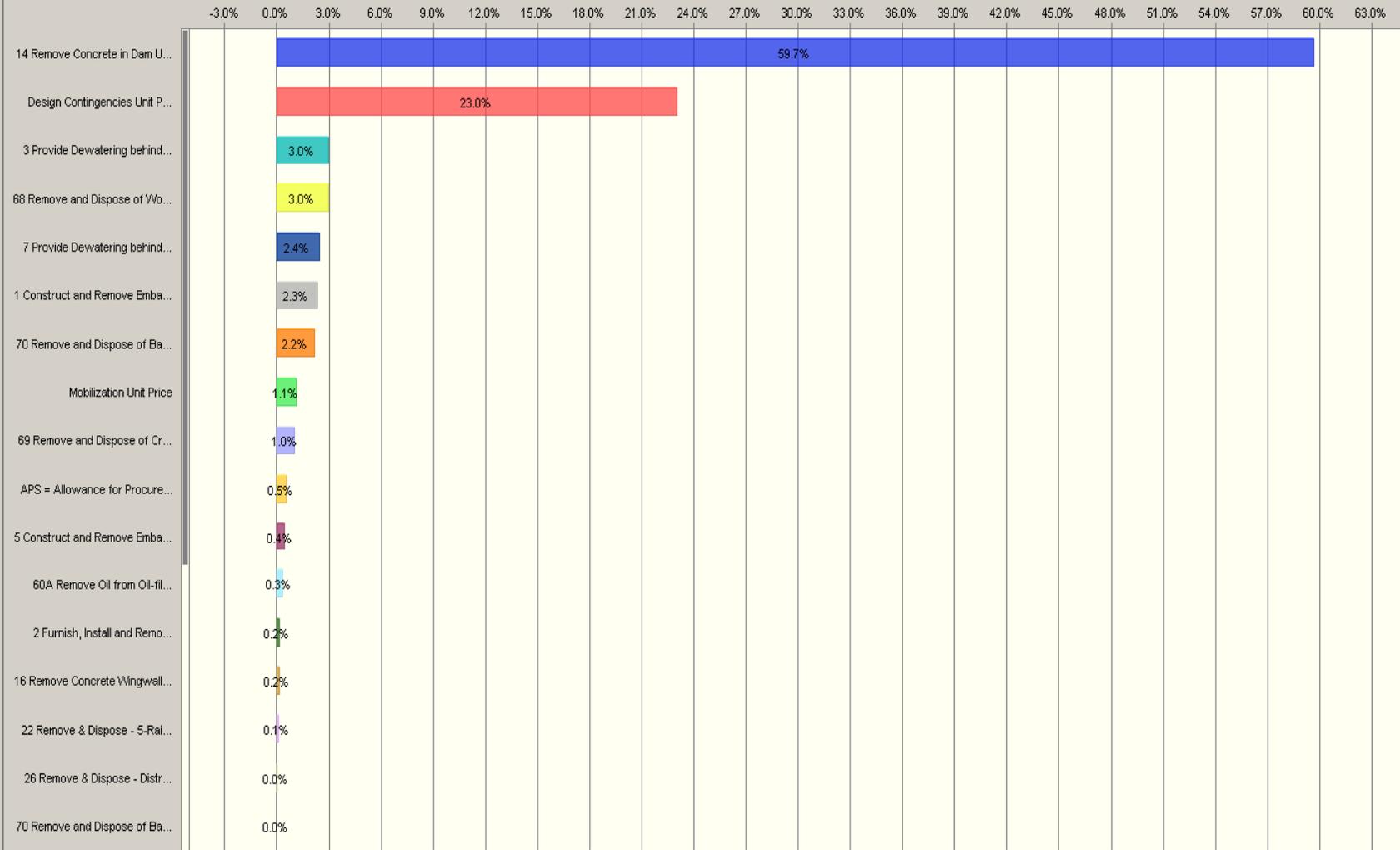
Percentile	Forecast values
0%	\$4,199,690.84
10%	\$4,525,814.01
20%	\$4,608,306.34
30%	\$4,670,871.98
40%	\$4,731,719.05
50%	\$4,787,526.10
60%	\$4,842,949.00
70%	\$4,905,504.86
80%	\$4,981,367.78
90%	\$5,094,107.06
100%	\$5,722,921.31

Certainty: %

10,000 Trials

Contribution to Variance View

Sensitivity: Contract Cost - Copco No. 2 - Partial Removal - Without Escalation

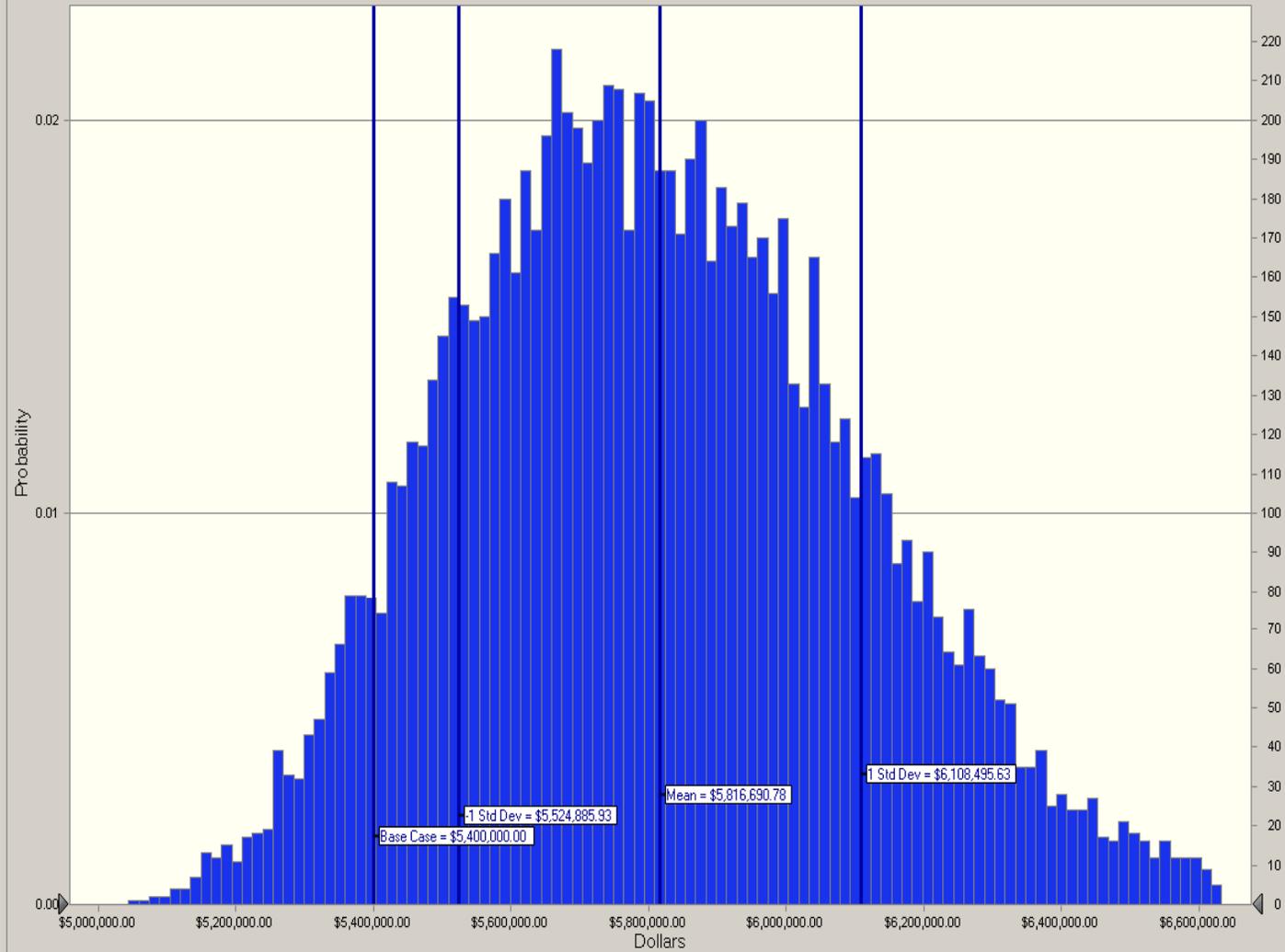


10,000 Trials

Split View

9,948 Displayed

Field Cost - Copco No. 2 - Partial Removal - Without Escalation



Statistic	Forecast values
Trials	10,000
Mean	\$5,816,690.78
Median	\$5,798,004.35
Mode	...
Standard Deviation	\$291,804.85
Variance	\$85,150,070,579.33
Skewness	0.3385
Kurtosis	2.92
Coeff. of Variability	0.0502
Minimum	\$4,956,865.56
Maximum	\$6,935,927.15
Mean Std. Error	\$2,918.05

Percentile	Forecast values
0%	\$4,956,865.56
10%	\$5,453,266.33
20%	\$5,560,464.60
30%	\$5,647,873.59
40%	\$5,722,922.01
50%	\$5,797,919.62
60%	\$5,877,297.24
70%	\$5,961,652.14
80%	\$6,060,774.28
90%	\$6,206,058.50
100%	\$6,935,927.15

◀ -Infinity

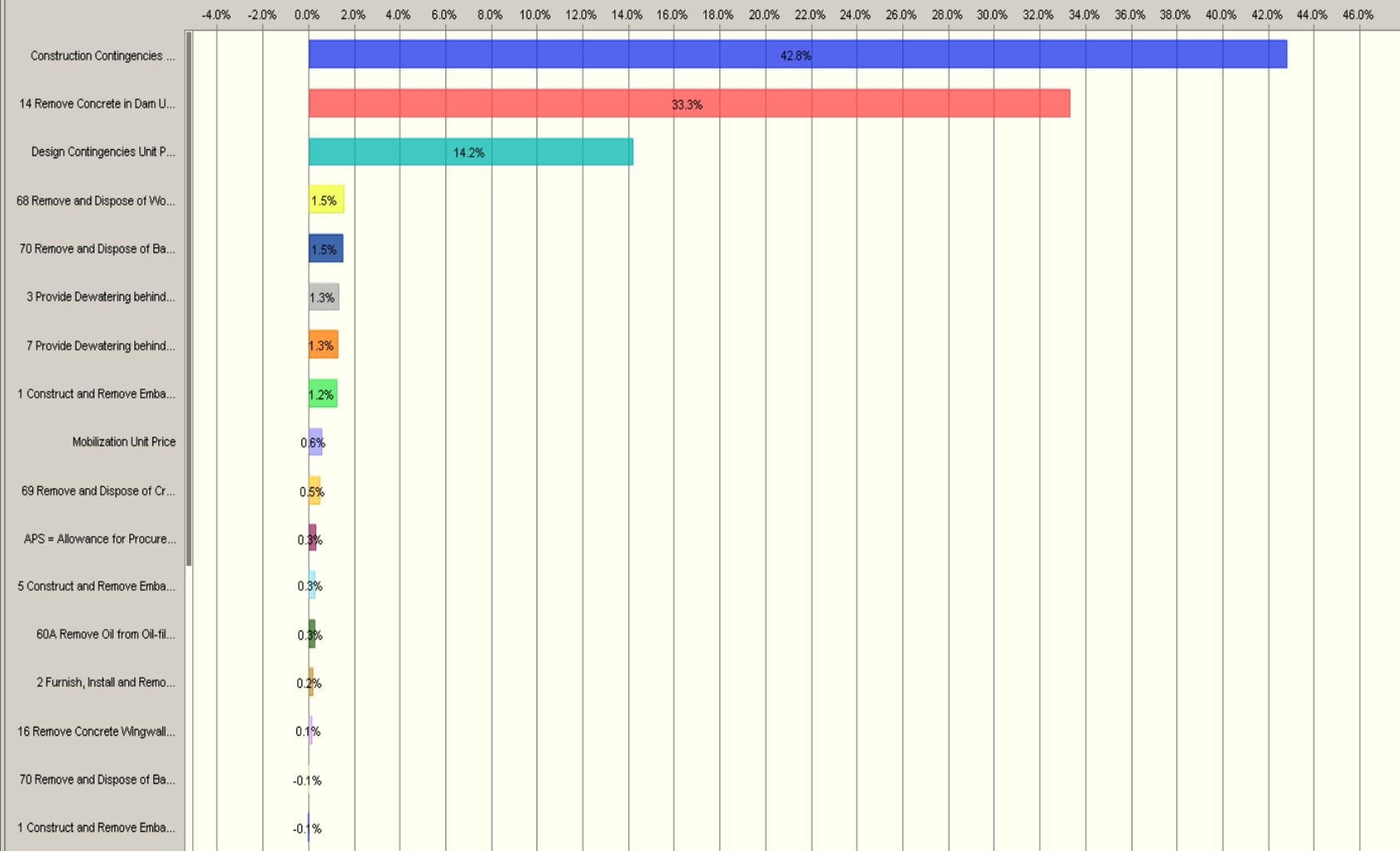
Certainty: 100.00 %

▶ Infinity

10,000 Trials

Contribution to Variance View

Sensitivity: Field Cost - Copco No. 2 - Partial Removal - Without Escalation

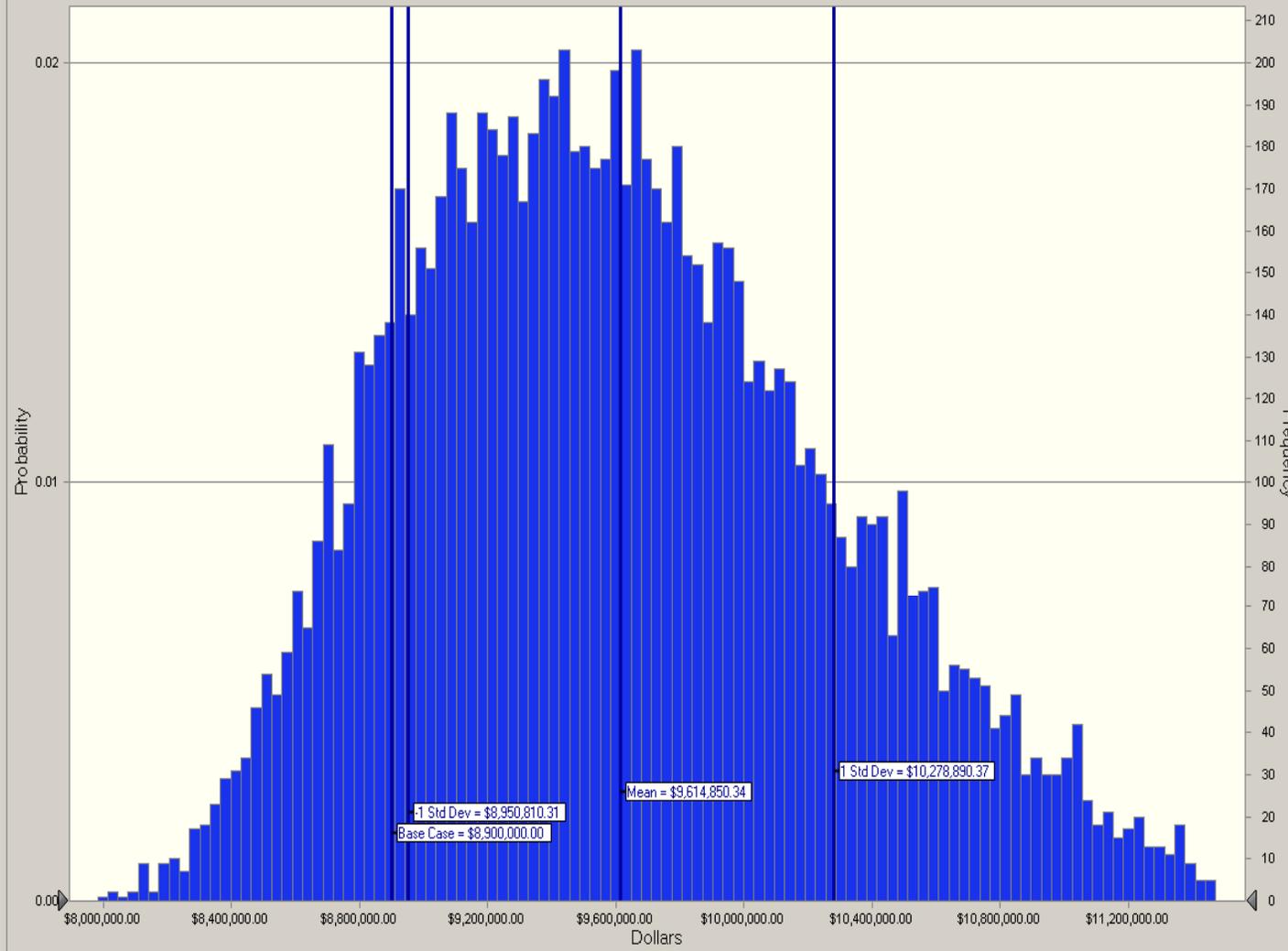


10,000 Trials

Split View

9,960 Displayed

Construction Cost - Copco No. 2 - Partial Removal - Without Escalation



Statistic	Forecast values
Trials	10,000
Mean	\$9,614,850.34
Median	\$9,556,010.43
Mode	...
Standard Deviation	\$664,040.03
Variance	\$440,949,163,629.47
Skewness	0.4161
Kurtosis	2.79
Coeff. of Variability	0.0691
Minimum	\$7,980,796.19
Maximum	\$11,993,777.07
Mean Std. Error	\$6,640.40

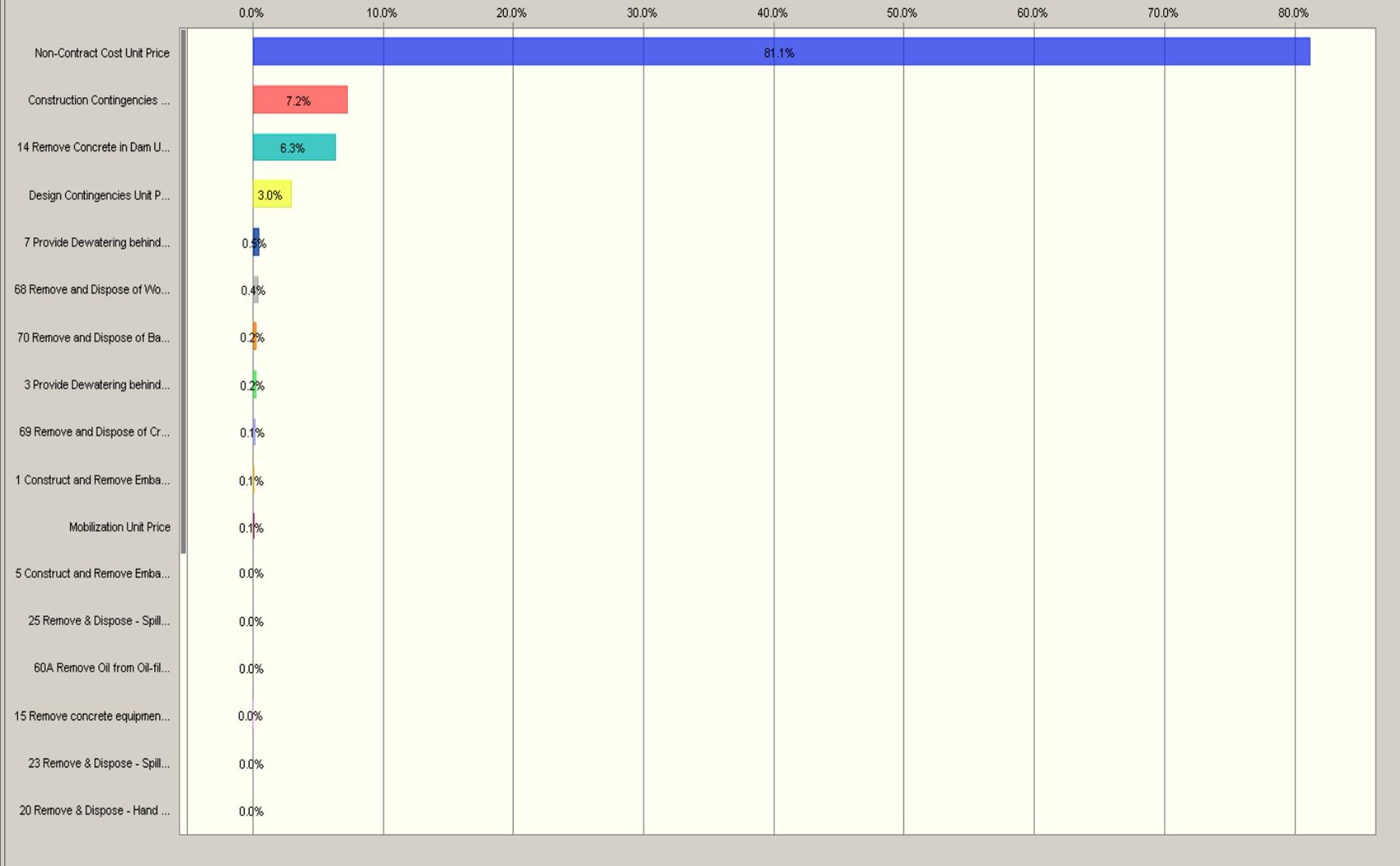
Percentile	Forecast values
0%	\$7,980,796.19
10%	\$8,803,248.13
20%	\$9,021,878.23
30%	\$9,208,043.56
40%	\$9,383,622.66
50%	\$9,555,844.51
60%	\$9,731,661.52
70%	\$9,933,398.88
80%	\$10,177,595.16
90%	\$10,537,407.07
100%	\$11,993,777.07

Certainty: %

10,000 Trials

Contribution to Variance View

Sensitivity: Construction Cost - Copco No. 2 - Partial Removal - Without Escalation



FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 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\2\02with Escalation\02 Copco 2 Crystal Ball Spreadsheet with esc.xlsx\Construction Cost Sensitivity
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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	\$175,470.00	\$216,040.00	\$247,680.00	\$175,470.00	\$216,040.00	\$247,680.00
	PI 2	Periodic Costs - Year 5	86-68130	0	0	1	LS	\$157,217.23	\$157,217.23	\$157,217.23	\$0.00	\$0.00	\$157,217.23
	PI 3	Periodic Costs - Year 8	86-68130	0	1	0	LS	\$119,410.50	\$119,410.50	\$119,410.50	\$0.00	\$119,410.50	\$0.00
	PI 4	Periodic Costs - Year 10	86-68130	0	0	1	LS	\$128,447.03	\$128,447.03	\$128,447.03	\$0.00	\$0.00	\$128,447.03
	PI 5	Periodic Costs - Year 13	86-68130	0	0	1	LS	\$32,667.67	\$32,667.67	\$32,667.67	\$0.00	\$0.00	\$32,667.67
	PI 6	Periodic Costs - Year 15	86-68130	0	0	1	LS	\$104,941.70	\$104,941.70	\$104,941.70	\$0.00	\$0.00	\$104,941.70
	PI 7	Periodic Costs - Year 17	86-68130	1	1	0	LS	\$66,899.00	\$110,660.00	\$110,660.00	\$66,899.00	\$110,660.00	\$0.00
	PI 8	Periodic Costs - Year 20	86-68130	0	0	1	LS	\$85,737.19	\$85,737.19	\$85,737.19	\$0.00	\$0.00	\$85,737.19
	PI 9	Periodic Costs - Year 25	86-68130	1	1	1	LS	\$15,652.86	\$60,063.30	\$90,160.47	\$15,652.86	\$60,063.30	\$90,160.47
	PI 10	Periodic Costs - Year 30	86-68130	0	0	1	LS	\$57,230.61	\$57,230.61	\$57,230.61	\$0.00	\$0.00	\$57,230.61
	PI 11	Periodic Costs - Year 33	86-68130	1	1	0	LS	\$35,037.52	\$57,956.80	\$57,956.80	\$35,037.52	\$57,956.80	\$0.00
	PI 12	Periodic Costs - Year 35	86-68130	0	0	1	LS	\$46,756.64	\$46,756.64	\$46,756.64	\$0.00	\$0.00	\$46,756.64
	PI 13	Periodic Costs - Year 38	86-68130	0	0	1	LS	\$11,891.46	\$11,891.46	\$11,891.46	\$0.00	\$0.00	\$11,891.46
	PI 14	Periodic Costs - Year 40	86-68130	0	0	1	LS	\$38,201.20	\$38,201.20	\$38,201.20	\$0.00	\$0.00	\$38,201.20
	PI 15	Periodic Costs - Year 42	86-68130	0	1	0	LS	\$30,211.50	\$30,211.50	\$30,211.50	\$0.00	\$30,211.50	\$0.00
	PI 16	Periodic Costs - Year 45	86-68130	0	0	1	LS	\$31,210.22	\$31,210.22	\$31,210.22	\$0.00	\$0.00	\$31,210.22
	PI 17	Annual Costs - Maintenance	86-68130	1	1	1	LS	\$630,902.00	\$967,383.00	\$2,944,208.00	\$630,902.00	\$967,383.00	\$2,944,208.00
		Subtotal 1									\$923,961.38	\$1,561,725.10	\$3,976,349.42
		Mobilization		1	1	1	LS	\$46,000.00	\$78,000.00	\$200,000.00	\$46,000.00	\$78,000.00	\$200,000.00
		Subtotal 1 w/ mobilization									\$969,961.38	\$1,639,725.10	\$4,176,349.42
		Escalation to Notice to Proceed (NTP)		1	1	1	LS	\$155,718.62	\$563,927.90	\$2,232,229.58	\$155,718.62	\$563,927.90	\$2,232,229.58
		Design Contingencies		1	1	1	LS	\$74,320.00	\$196,347.00	\$944,024.00	\$74,320.00	\$196,347.00	\$944,024.00
		APS = Allowance for		0	0	1	LS	\$0.00	\$0.00	\$147,397.00	\$0.00	\$0.00	\$147,397.00
		Procurement Strategies (if applicable)											
		CONTRACT COST									\$1,200,000.00	\$2,400,000.00	\$7,500,000.00
		Construction Contingencies		1	1	1	LS	\$250,000.00	\$500,000.00	\$1,900,000.00	\$250,000.00	\$500,000.00	\$1,900,000.00
		FIELD COST									\$1,450,000.00	\$2,900,000.00	\$9,400,000.00
		Non-Contract Costs		1	1	1	LS	\$350,000.00	\$900,000.00	\$3,100,000.00	\$350,000.00	\$900,000.00	\$3,100,000.00
		CONSTRUCTION COST									\$1,800,000.00	\$3,800,000.00	\$12,500,000.00

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:	<i>[Signature]</i>
DATE PREPARED	3/24/2011	PEER REVIEW:	Tom Hepler P.E.	DATE PREPARED	06/15/11	PEER REVIEW	<i>[Signature]</i> 6-15-11

REPORT with escalation

Crystal Ball Report - Full

Simulation started on 6/15/2011 at 16:15:43
 Simulation stopped on 6/15/2011 at 16:18:31

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) 22.25
 Trials/second (average) 450
 Random numbers per sec 20,678

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 g. j. stur
 DATE 6/15/11

DATE	PEER REVIEWER(S)	CODE
6/15/2011	<i>Craig A. Grush</i> Signature	86-60170
	Craig A. Grush Printed Name	
	Signature	
	Printed Name	
Author Initials		PEER REVIEW NOT REQUIRED

Forecasts

Worksheet: [02 Copco 2 Crystal Ball Spreadsheet with esc.xlsx]SUMMARY 480 FP

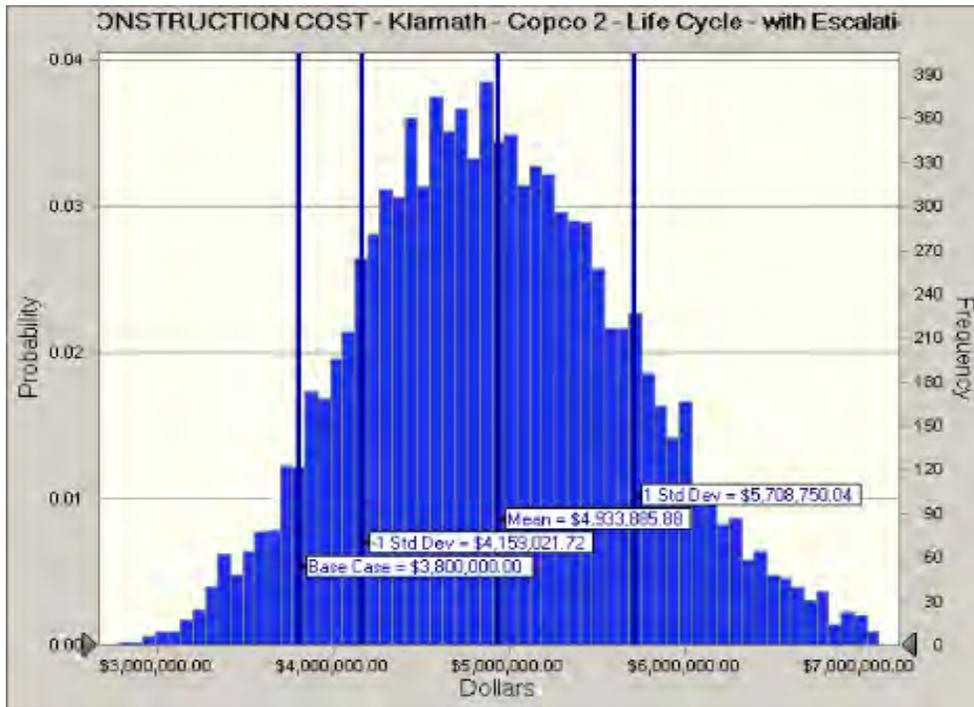
Forecast: CONSTRUCTION COST - Klamath - Copco 2 - Life Cycle - with Escalation Cell: U40

Summary:

Entire range is from \$2,774,649.71 to \$8,170,535.07

Base case is \$3,800,000.00

After 10,000 trials, the std. error of the mean is \$7,748.64



REPORT with escalation

Forecast: CONSTRUCTION COST - Klamath - Copco 2 - Life Cycle - with Escalation (cont'd): U40

Statistics:	Forecast values
Trials	10,000
Mean	\$4,933,885.88
Median	\$4,889,356.45
Mode	---
Standard Deviation	\$774,864.16
Variance	#####
Skewness	0.3015
Kurtosis	3.00
Coeff. of Variability	0.1570
Minimum	\$2,774,649.71
Maximum	\$8,170,535.07
Range Width	\$5,395,885.37
Mean Std. Error	\$7,748.64

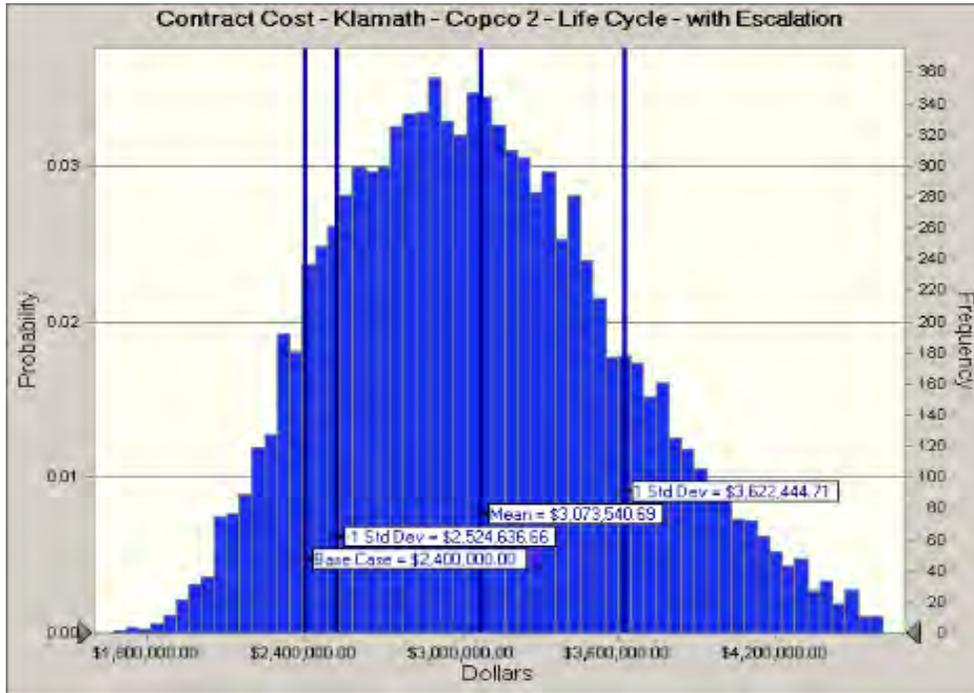
Percentiles:	Forecast values
0%	\$2,774,649.71
10%	\$3,966,749.04
20%	\$4,268,861.03
30%	\$4,487,116.91
40%	\$4,690,953.31
50%	\$4,889,353.15
60%	\$5,096,917.55
70%	\$5,323,143.79
80%	\$5,580,707.77
90%	\$5,956,238.21
100%	\$8,170,535.07

Forecast: Contract Cost - Klamath - Copco 2 - Life Cycle - with Escalation

Cell: U36

Summary:

Entire range is from \$1,668,900.21 to \$5,535,470.17
 Base case is \$2,400,000.00
 After 10,000 trials, the std. error of the mean is \$5,489.04



Statistics:	Forecast values
Trials	10,000
Mean	\$3,073,540.69
Median	\$3,035,049.76
Mode	---
Standard Deviation	\$548,904.03
Variance	#####
Skewness	0.4311
Kurtosis	2.99
Coeff. of Variability	0.1786
Minimum	\$1,668,900.21
Maximum	\$5,535,470.17
Range Width	\$3,866,569.97
Mean Std. Error	\$5,489.04

REPORT with escalation

Forecast: Contract Cost - Klamath - Copco 2 - Life Cycle - with Escalation (cont'd)

Cell: U36

Percentiles:	Forecast values
0%	\$1,668,900.21
10%	\$2,396,449.92
20%	\$2,584,643.44
30%	\$2,743,571.52
40%	\$2,889,053.40
50%	\$3,034,972.94
60%	\$3,177,363.36
70%	\$3,337,648.58
80%	\$3,525,269.62
90%	\$3,814,132.75
100%	\$5,535,470.17

Forecast: FIELD COST - Klamath - Copco 2 - Life Cycle - with Escalation

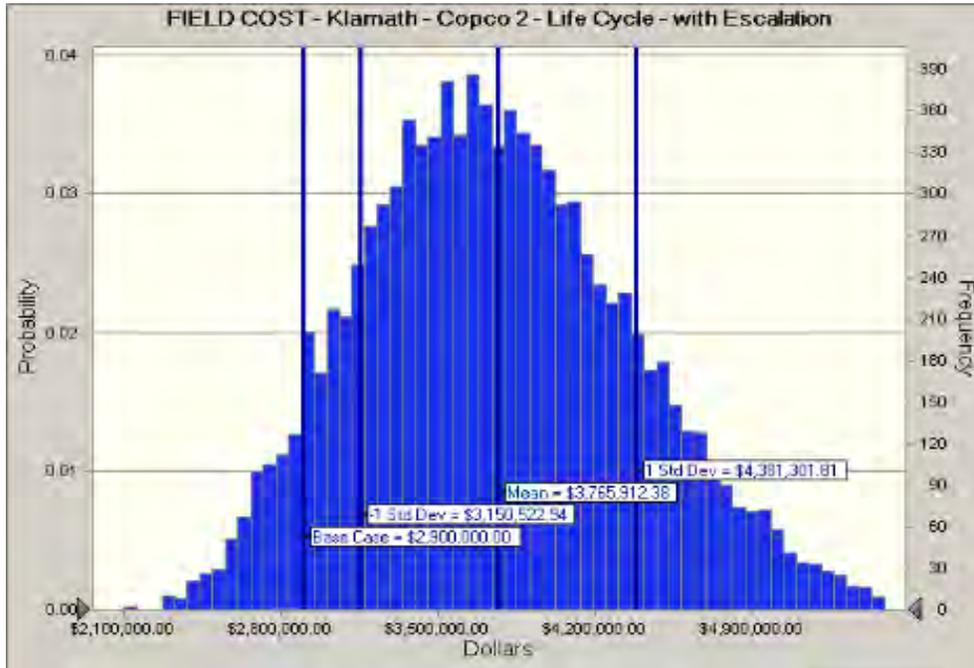
Cell: U38

Summary:

Entire range is from \$2,014,748.21 to \$6,181,831.55

Base case is \$2,900,000.00

After 10,000 trials, the std. error of the mean is \$6,153.89



Statistics:	Forecast values
Trials	10,000
Mean	\$3,765,912.38
Median	\$3,723,345.41
Mode	---
Standard Deviation	\$615,389.43
Variance	#####
Skewness	0.3667
Kurtosis	3.01
Coeff. of Variability	0.1634
Minimum	\$2,014,748.21
Maximum	\$6,181,831.55
Range Width	\$4,167,083.35
Mean Std. Error	\$6,153.89

REPORT with escalation

Forecast: FIELD COST - Klamath - Copco 2 - Life Cycle - with Escalation (cont'd)

Cell: U38

Percentiles:	Forecast values
0%	\$2,014,748.21
10%	\$2,993,033.64
20%	\$3,232,381.09
30%	\$3,410,135.57
40%	\$3,569,160.75
50%	\$3,723,282.89
60%	\$3,886,876.81
70%	\$4,062,486.10
80%	\$4,284,021.22
90%	\$4,583,431.60
100%	\$6,181,831.55

End of Forecasts

Assumptions

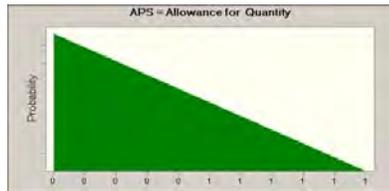
Worksheet: [02 Copco 2 Crystal Ball Spreadsheet with esc.xlsx]SUMMARY 480 FP

Assumption: APS = Allowance for Quantity

Cell: L34

Triangular distribution with parameters:

Minimum	0	(=K34)
Likeliest	0	(=L34)
Maximum	1	(=M34)

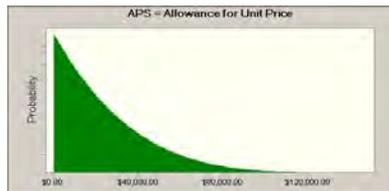


Assumption: APS = Allowance for Unit Price

Cell: R34

BetaPERT distribution with parameters:

Minimum	\$0.00	(=Q34)
Likeliest	\$0.00	(=R34)
Maximum	\$147,397.00	(=S34)

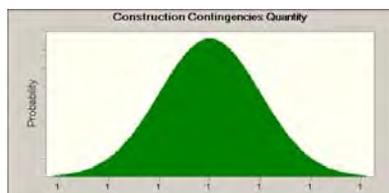


Assumption: Construction Contingencies Quantity

Cell: L37

Normal distribution with parameters:

Mean	1	(=L37)
Std. Dev.	0	

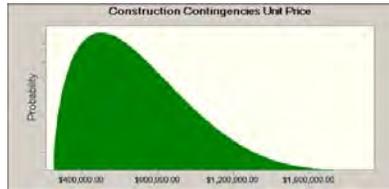


Assumption: Construction Contingencies Unit Price

Cell: R37

BetaPERT distribution with parameters:

Minimum	\$250,000.00	(=Q37)
Likeliest	\$500,000.00	(=R37)
Maximum	\$1,900,000.00	(=S37)

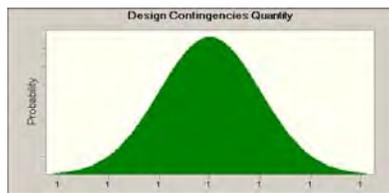


Assumption: Design Contingencies Quantity

Cell: L33

Normal distribution with parameters:

Mean	1	(=L33)
Std. Dev.	0	



Assumption: Design Contingencies Unit Price

Cell: R33

BetaPERT distribution with parameters:

Minimum	\$74,320.00	(=Q33)
Likeliest	\$196,347.00	(=R33)
Maximum	\$944,024.00	(=S33)



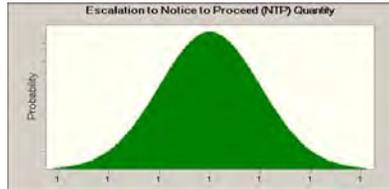
REPORT with escalation

Assumption: Escalation to Notice to Proceed (NTP) Quantity

Cell: L32

Normal distribution with parameters:

Mean 1 (=L32)
Std. Dev. 0

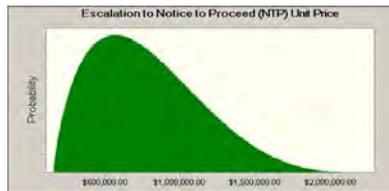


Assumption: Escalation to Notice to Proceed (NTP) Unit Price

Cell: R32

BetaPERT distribution with parameters:

Minimum \$155,718.62 (=Q32)
Likeliest \$563,927.90 (=R32)
Maximum \$2,232,229.58 (=S32)

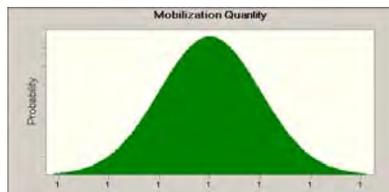


Assumption: Mobilization Quantity

Cell: L30

Normal distribution with parameters:

Mean 1 (=L30)
Std. Dev. 0



REPORT with escalation

Assumption: Mobilization Unit Price

Cell: R30

BetaPERT distribution with parameters:

Minimum	\$46,000.00	(=Q30)
Likeliest	\$78,000.00	(=R30)
Maximum	\$200,000.00	(=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	\$350,000.00	(=Q39)
Likeliest	\$900,000.00	(=R39)
Maximum	\$3,100,000.00	(=S39)



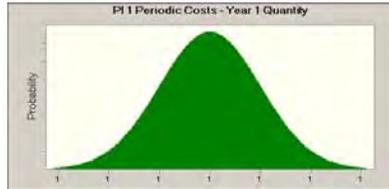
REPORT with escalation

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 \$175,470.00 (=Q12)
Likeliest \$216,040.00 (=R12)
Maximum \$247,680.00 (=S12)

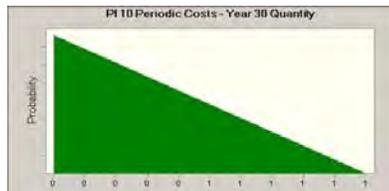


Assumption: PI 10 Periodic Costs - Year 30 Quantity

Cell: L21

Triangular distribution with parameters:

Minimum 0 (=K21)
Likeliest 0 (=L21)
Maximum 1 (=M21)



REPORT with escalation

Assumption: PI 10 Periodic Costs - Year 30 Unit Price

Cell: R21

Normal distribution with parameters:

Mean \$57,230.61 (=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)

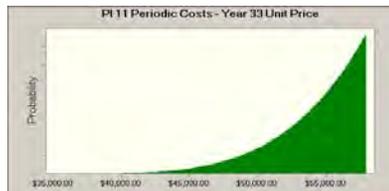


Assumption: PI 11 Periodic Costs - Year 33 Unit Price

Cell: R22

BetaPERT distribution with parameters:

Minimum \$35,037.52 (=Q22)
Likeliest \$57,956.80 (=R22)
Maximum \$57,956.80 (=S22)



Assumption: PI 12 Periodic Costs - Year 35 Quantity

Cell: L23

Triangular distribution with parameters:

Minimum	0	(=K23)
Likeliest	0	(=L23)
Maximum	1	(=M23)

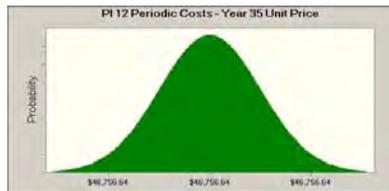


Assumption: PI 12 Periodic Costs - Year 35 Unit Price

Cell: R23

Normal distribution with parameters:

Mean	\$46,756.64	(=R23)
Std. Dev.	\$0.00	

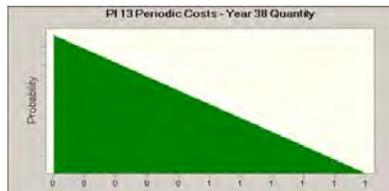


Assumption: PI 13 Periodic Costs - Year 38 Quantity

Cell: L24

Triangular distribution with parameters:

Minimum	0	(=K24)
Likeliest	0	(=L24)
Maximum	1	(=M24)



REPORT with escalation

Assumption: PI 13 Periodic Costs - Year 38 Unit Price

Cell: R24

Normal distribution with parameters:

Mean \$11,891.46 (=R24)
Std. Dev. \$0.00

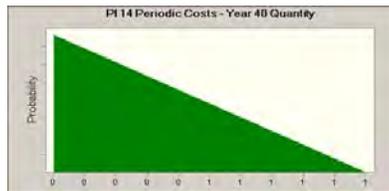


Assumption: PI 14 Periodic Costs - Year 40 Quantity

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 \$38,201.20 (=R25)
Std. Dev. \$0.00

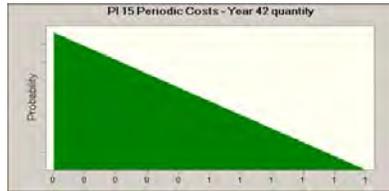


Assumption: PI 15 Periodic Costs - Year 42 quantity

Cell: L26

Triangular distribution with parameters:

Minimum	0	(=K26)
Likeliest	0	(=M26)
Maximum	1	(=L26)

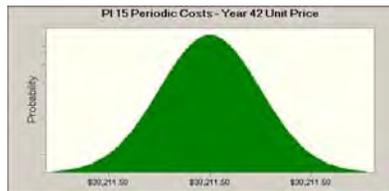


Assumption: PI 15 Periodic Costs - Year 42 Unit Price

Cell: R26

Normal distribution with parameters:

Mean	\$30,211.50	(=R26)
Std. Dev.	\$0.00	

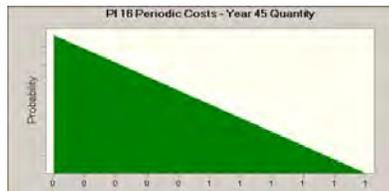


Assumption: PI 16 Periodic Costs - Year 45 Quantity

Cell: L27

Triangular distribution with parameters:

Minimum	0	(=K27)
Likeliest	0	(=L27)
Maximum	1	(=M27)



REPORT with escalation

Assumption: PI 16 Periodic Costs - Year 45 Unit Price

Cell: R27

Normal distribution with parameters:

Mean \$31,210.22 (=R27)
Std. Dev. \$0.00



Assumption: PI 17 Annual Costs - Maintenance Quantity

Cell: L28

Normal distribution with parameters:

Mean 1 (=L28)
Std. Dev. 0

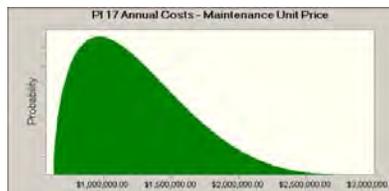


Assumption: PI 17 Annual Costs - Maintenance Unit Price

Cell: R28

BetaPERT distribution with parameters:

Minimum \$630,902.00 (=Q28)
Likeliest \$967,383.00 (=R28)
Maximum \$2,944,208.00 (=S28)



Assumption: PI 2 Periodic Costs - Year 5 Quantity

Cell: L13

Triangular distribution with parameters:

Minimum	0	(=K13)
Likeliest	0	(=L13)
Maximum	1	(=M13)

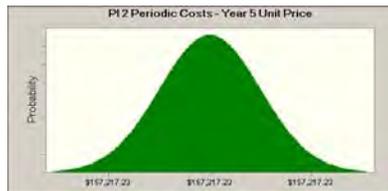


Assumption: PI 2 Periodic Costs - Year 5 Unit Price

Cell: R13

Normal distribution with parameters:

Mean	\$157,217.23	(=R13)
Std. Dev.	\$0.00	

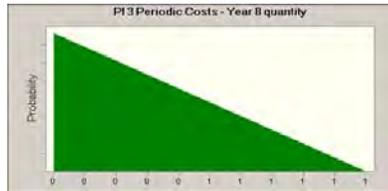


Assumption: PI 3 Periodic Costs - Year 8 quantity

Cell: L14

Triangular distribution with parameters:

Minimum	0	(=K14)
Likeliest	0	(=M14)
Maximum	1	(=L14)



REPORT with escalation

Assumption: PI 3 Periodic Costs - Year 8 Unit Price

Cell: R14

Normal distribution with parameters:

Mean \$119,410.50 (=R14)
Std. Dev. \$0.00

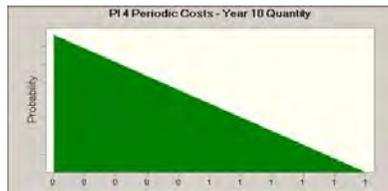


Assumption: PI 4 Periodic Costs - Year 10 Quantity

Cell: L15

Triangular distribution with parameters:

Minimum 0 (=K15)
Likeliest 0 (=L15)
Maximum 1 (=M15)

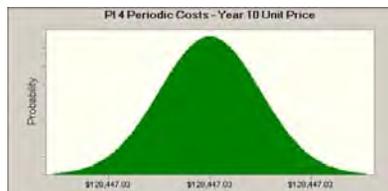


Assumption: PI 4 Periodic Costs - Year 10 Unit Price

Cell: R15

Normal distribution with parameters:

Mean \$128,447.03 (=R15)
Std. Dev. \$0.00

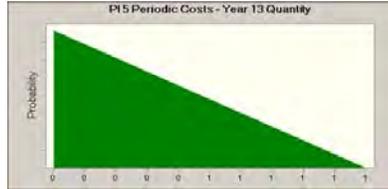


Assumption: PI 5 Periodic Costs - Year 13 Quantity

Cell: L16

Triangular distribution with parameters:

Minimum	0	(=K16)
Likeliest	0	(=L16)
Maximum	1	(=M16)

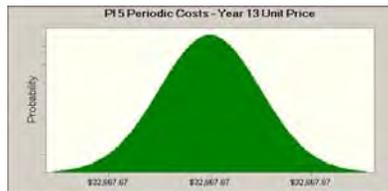


Assumption: PI 5 Periodic Costs - Year 13 Unit Price

Cell: R16

Normal distribution with parameters:

Mean	\$32,667.67	(=R16)
Std. Dev.	\$0.00	

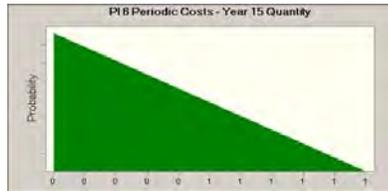


Assumption: PI 6 Periodic Costs - Year 15 Quantity

Cell: L17

Triangular distribution with parameters:

Minimum	0	(=K17)
Likeliest	0	(=L17)
Maximum	1	(=M17)



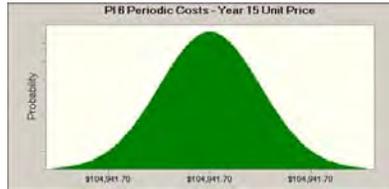
REPORT with escalation

Assumption: PI 6 Periodic Costs - Year 15 Unit Price

Cell: R17

Normal distribution with parameters:

Mean \$104,941.70 (=R17)
Std. Dev. \$0.00

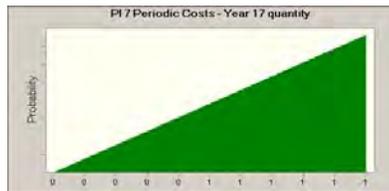


Assumption: PI 7 Periodic Costs - Year 17 quantity

Cell: L18

Triangular distribution with parameters:

Minimum 0 (=M18)
Likeliest 1 (=K18)
Maximum 1 (=L18)

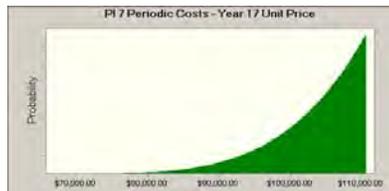


Assumption: PI 7 Periodic Costs - Year 17 Unit Price

Cell: R18

BetaPERT distribution with parameters:

Minimum \$66,899.00 (=Q18)
Likeliest \$110,660.00 (=R18)
Maximum \$110,660.00 (=S18)



Assumption: PI 8 Periodic Costs - Year 20 Quantity

Cell: L19

Triangular distribution with parameters:

Minimum	0	(=K19)
Likeliest	0	(=L19)
Maximum	1	(=M19)

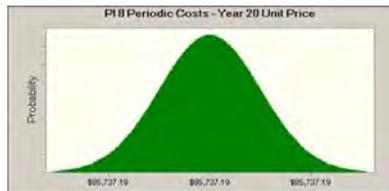


Assumption: PI 8 Periodic Costs - Year 20 Unit Price

Cell: R19

Normal distribution with parameters:

Mean	\$85,737.19	(=R19)
Std. Dev.	\$0.00	

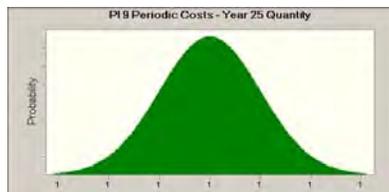


Assumption: PI 9 Periodic Costs - Year 25 Quantity

Cell: L20

Normal distribution with parameters:

Mean	1	(=L20)
Std. Dev.	0	



REPORT with escalation

Assumption: PI 9 Periodic Costs - Year 25 Unit Price

Cell: R20

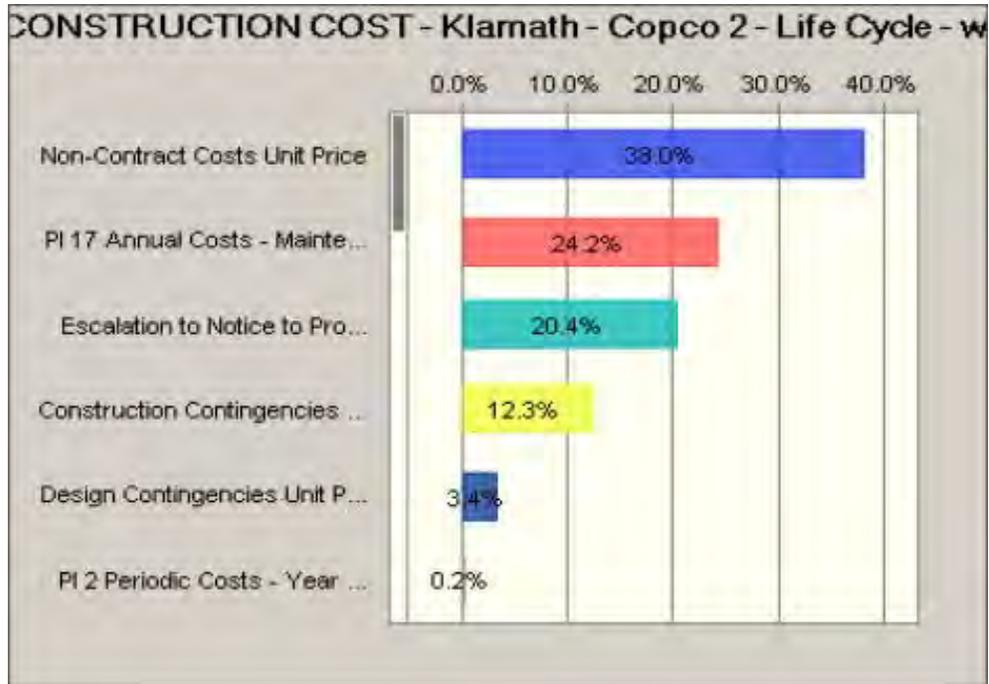
BetaPERT distribution with parameters:

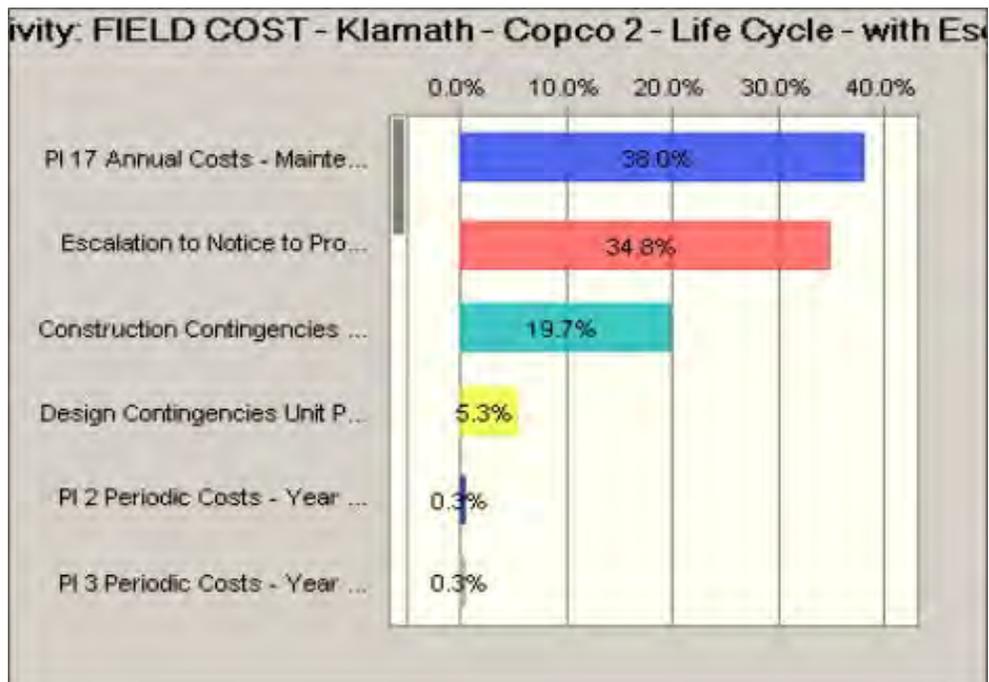
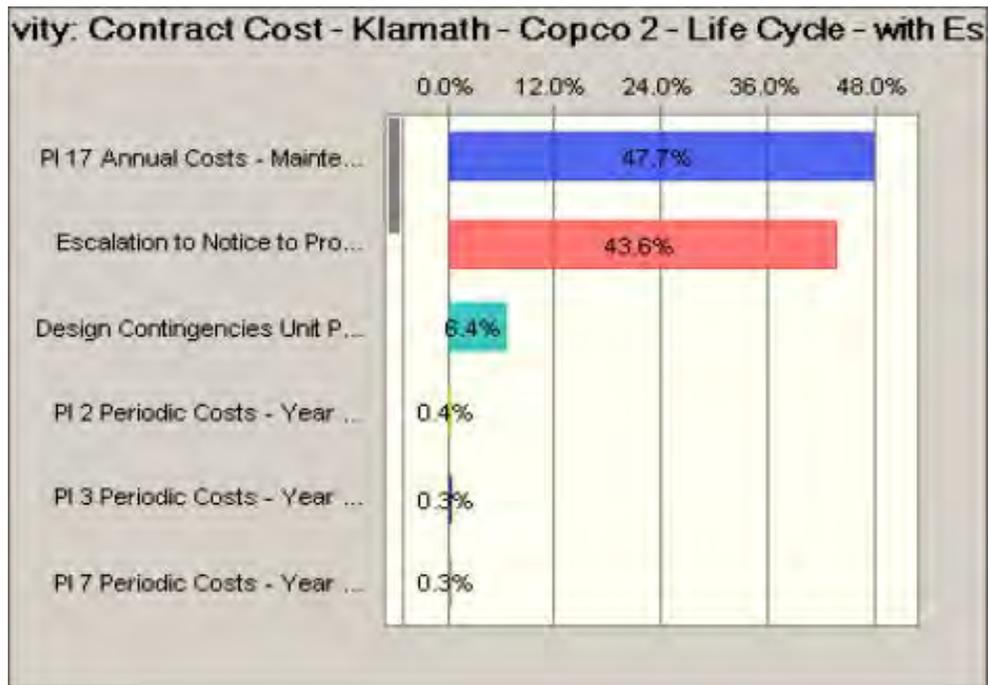
Minimum	\$15,652.86	(=Q20)
Likeliest	\$60,063.30	(=R20)
Maximum	\$90,160.47	(=S20)

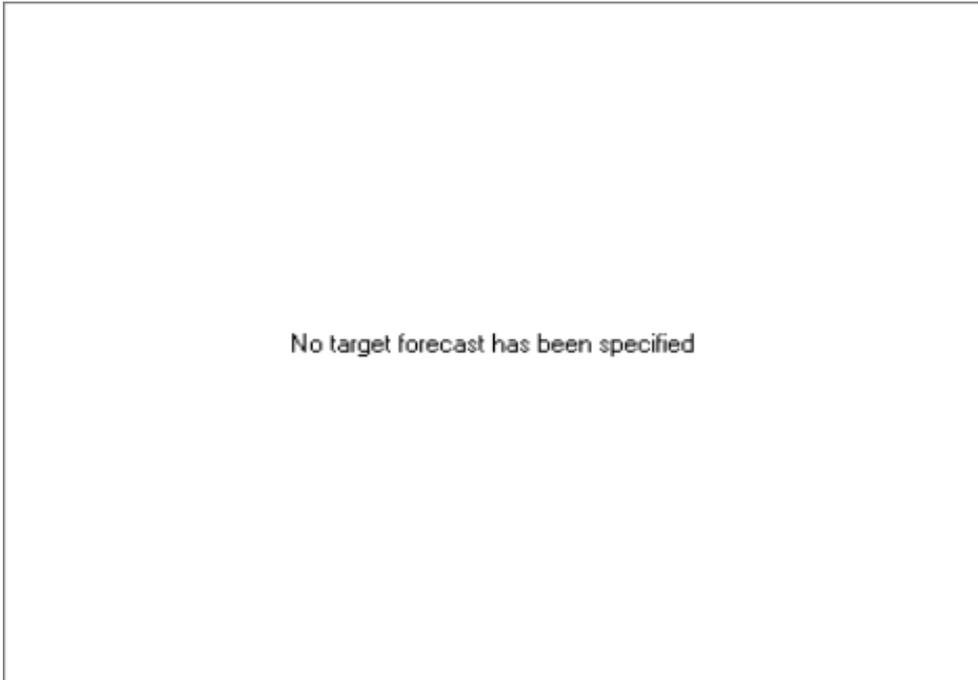
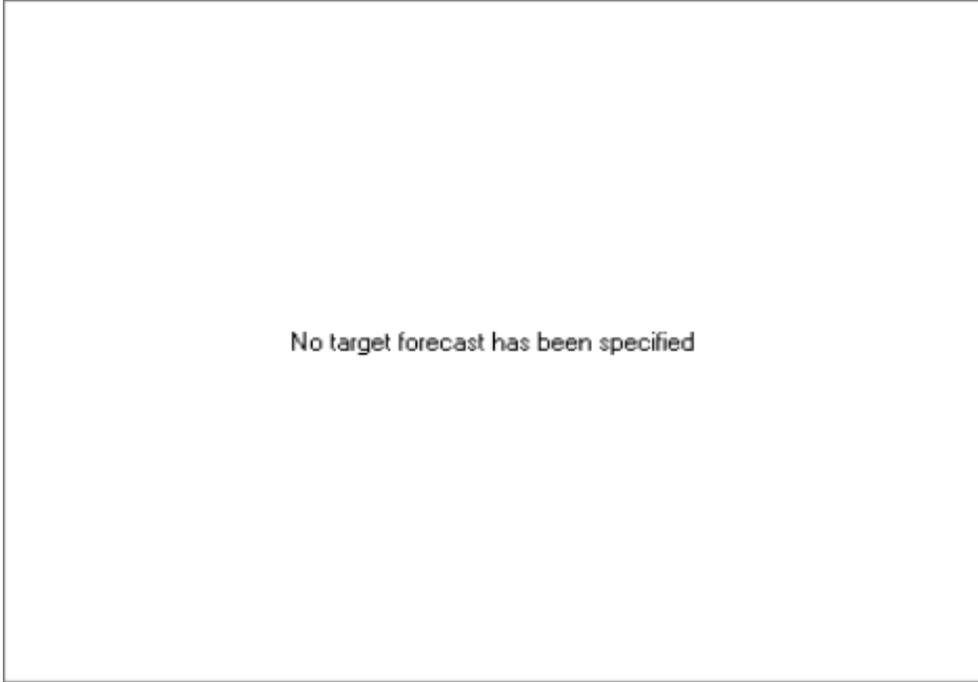


End of Assumptions

Sensitivity Charts







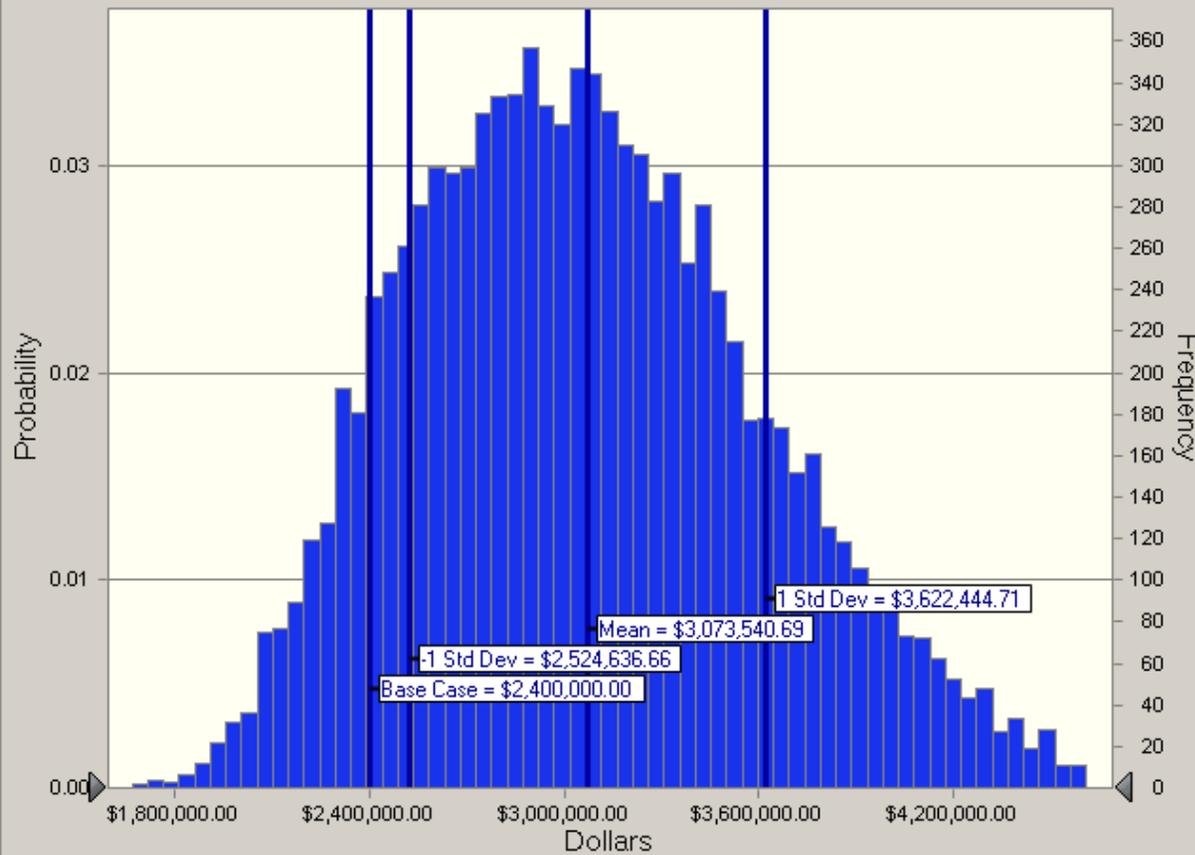
End of Sensitivity Charts

10,000 Trials

Split View

9,946 Displayed

Contract Cost - Klamath - Copco 2 - Life Cycle - with Escalation



Statistic	Forecast values
Trials	10,000
Mean	\$3,073,540.69
Median	\$3,035,049.76
Mode	...
Standard Deviation	\$548,904.03
Variance	\$301,295,629,054.92
Skewness	0.4311
Kurtosis	2.99
Coeff. of Variability	0.1786
Minimum	\$1,668,900.21
Maximum	\$5,535,470.17
Mean Std. Error	\$5,489.04

Percentile	Forecast values
0%	\$1,668,900.21
10%	\$2,396,449.92
20%	\$2,584,643.44
30%	\$2,743,571.52
40%	\$2,889,053.40
50%	\$3,034,972.94
60%	\$3,177,363.36
70%	\$3,337,648.58
80%	\$3,525,269.62
90%	\$3,814,132.75
100%	\$5,535,470.17

► -Infinity

Certainty: 100.00 %

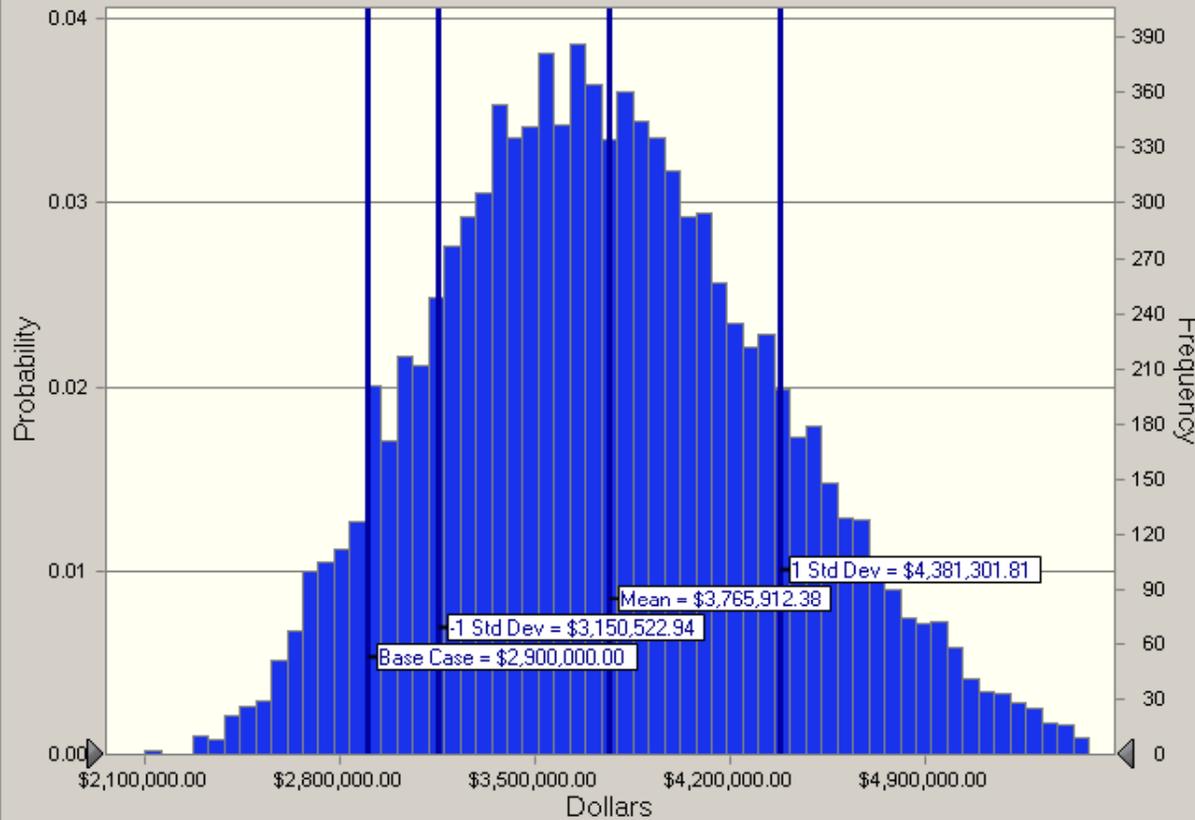
◄ Infinity

10,000 Trials

Split View

9,935 Displayed

FIELD COST - Klamath - Copco 2 - Life Cycle - with Escalation



Statistic	Forecast values
Trials	10,000
Mean	\$3,765,912.38
Median	\$3,723,345.41
Mode	...
Standard Deviation	\$615,389.43
Variance	\$378,704,155,244.30
Skewness	0.3667
Kurtosis	3.01
Coeff. of Variability	0.1634
Minimum	\$2,014,748.21
Maximum	\$6,181,831.55
Mean Std. Error	\$6,153.89

Percentile	Forecast values
0%	\$2,014,748.21
10%	\$2,993,033.64
20%	\$3,232,381.09
30%	\$3,410,135.57
40%	\$3,569,160.75
50%	\$3,723,282.89
60%	\$3,886,876.81
70%	\$4,062,486.10
80%	\$4,284,021.22
90%	\$4,583,431.60
100%	\$6,181,831.55

-Infinity

Certainty: 100.00 %

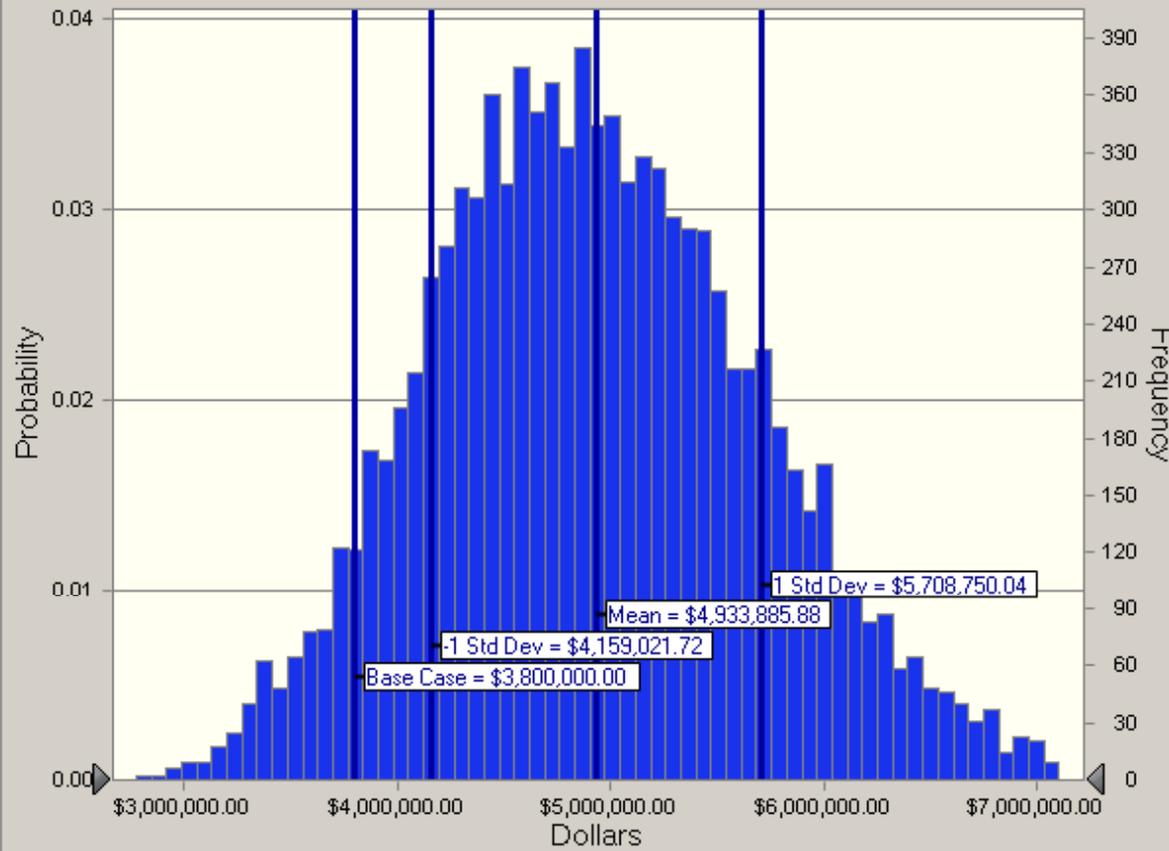
Infinity

10,000 Trials

Split View

9,949 Displayed

ONSTRUCTION COST - Klamath - Copco 2 - Life Cycle - with Escalati



Statistic	Forecast values
Trials	10,000
Mean	\$4,933,885.88
Median	\$4,889,356.45
Mode	...
Standard Deviation	\$774,864.16
Variance	\$600,414,465,741.43
Skewness	0.3015
Kurtosis	3.00
Coeff. of Variability	0.1570
Minimum	\$2,774,649.71
Maximum	\$8,170,535.07
Mean Std. Error	\$7,748.64

Percentile	Forecast values
0%	\$2,774,649.71
10%	\$3,966,749.04
20%	\$4,268,861.03
30%	\$4,487,116.91
40%	\$4,690,953.31
50%	\$4,889,353.15
60%	\$5,096,917.55
70%	\$5,323,143.79
80%	\$5,580,707.77
90%	\$5,956,238.21
100%	\$8,170,535.07

► -Infinity

Certainty: %

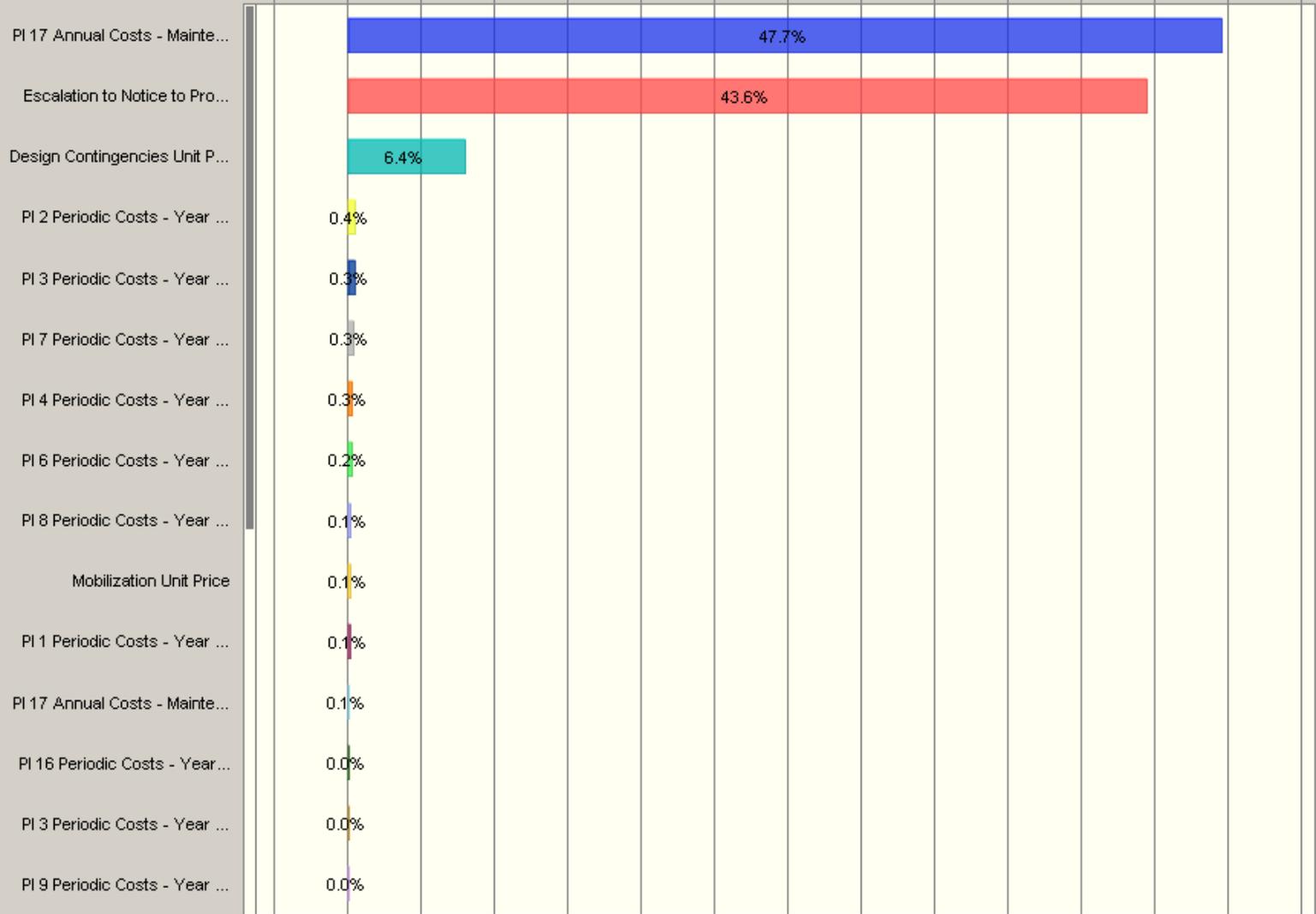
◄ Infinity

10,000 Trials

Contribution to Variance View

Sensitivity: Contract Cost - Klamath - Copco 2 - Life Cycle - with Escalation

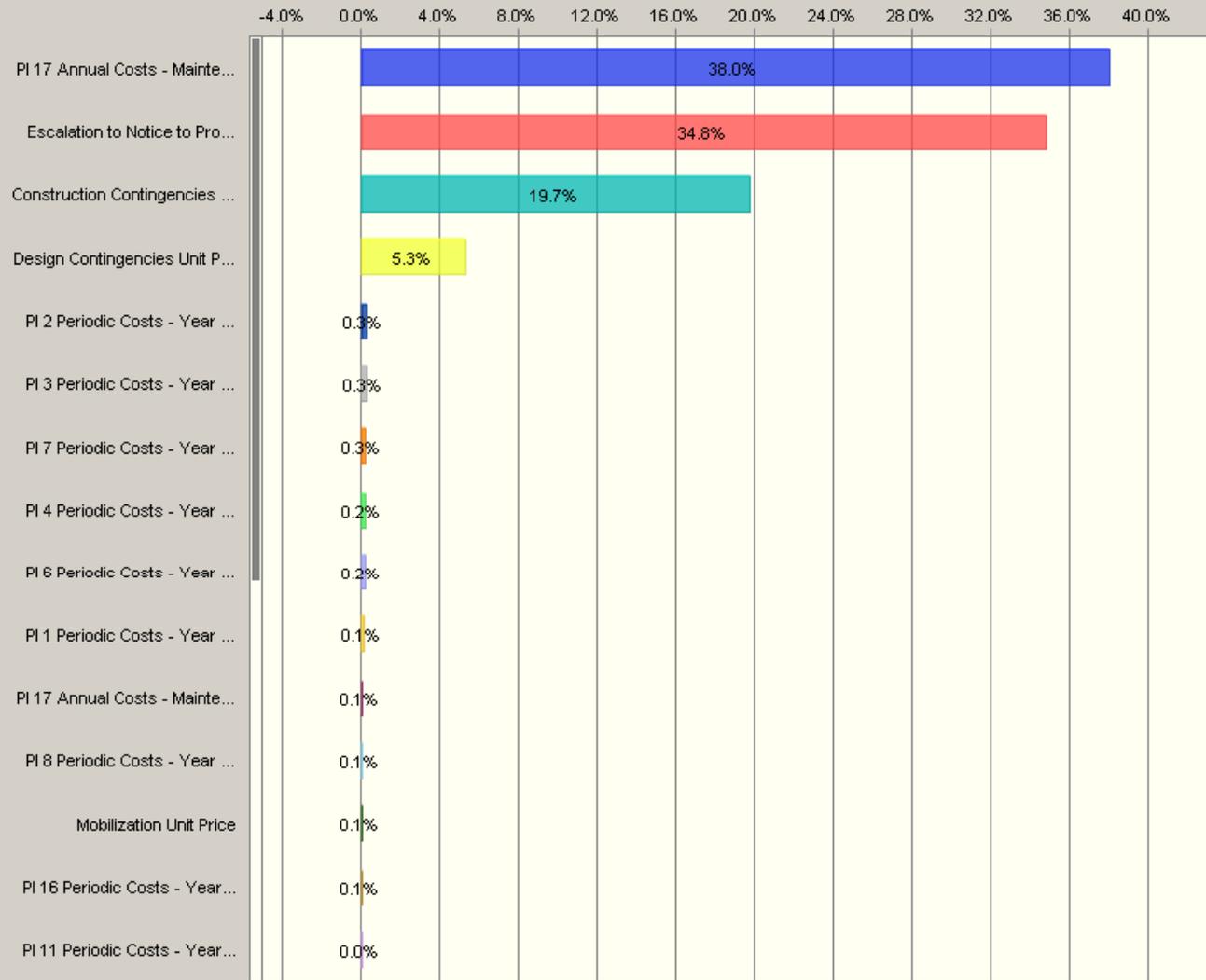
-4.0% 0.0% 4.0% 8.0% 12.0% 16.0% 20.0% 24.0% 28.0% 32.0% 36.0% 40.0% 44.0% 48.0% 52.0%



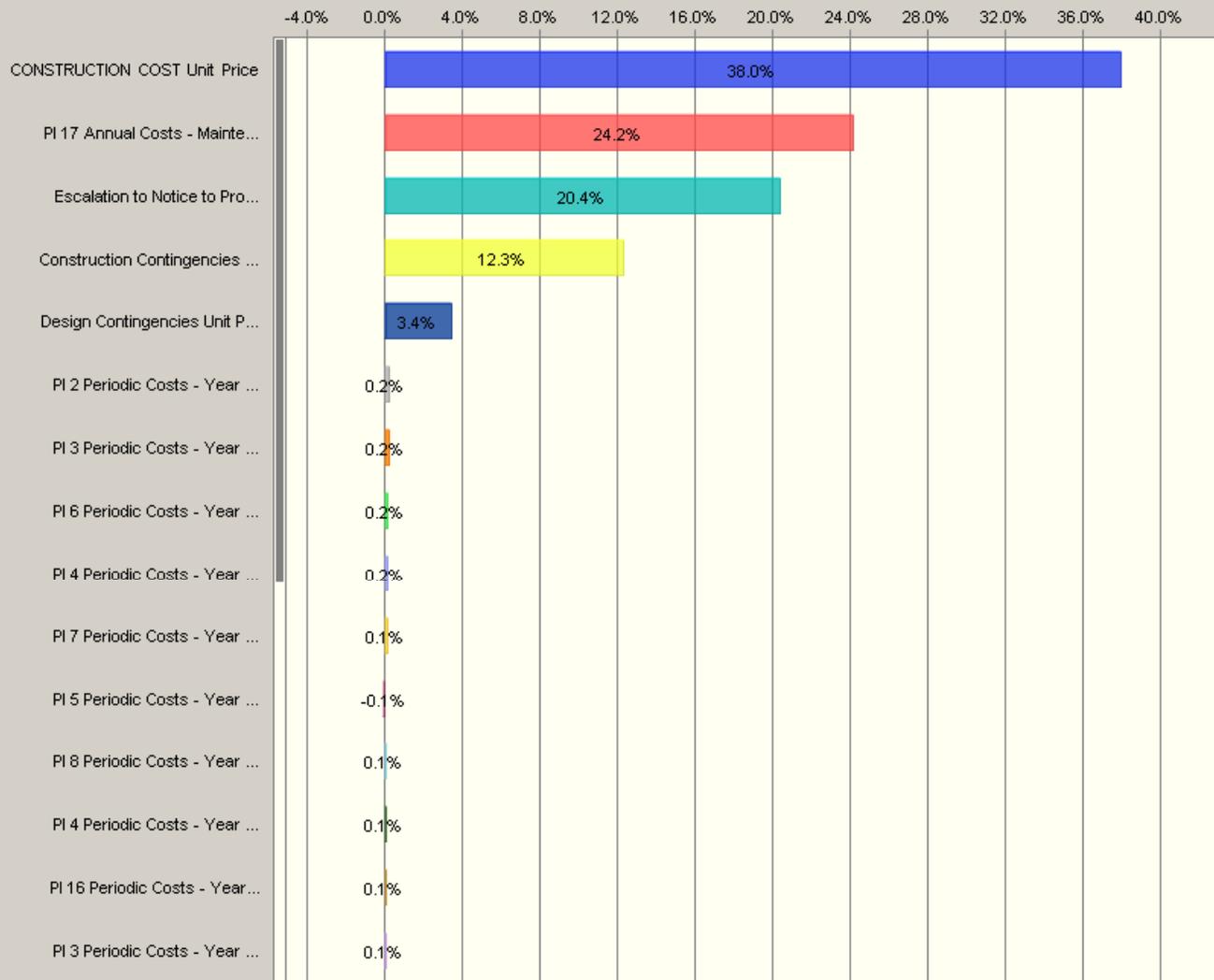
10,000 Trials

Contribution to Variance View

Sensitivity: FIELD COST - Klamath - Copco 2 - Life Cycle - with Escalation



Sensitivity: CONSTRUCTION COST - Klamath - Copco 2 - Life Cycle - with Escalation



FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 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\2\02\without Escalation\02 Copco 2 Crystal Ball Spreadsheet wo esc A.xlsx\Contract Cost Graph
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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	\$175,470.00	\$216,040.00	\$247,680.00	\$175,470.00	\$216,040.00	\$247,680.00
	PI 2	Periodic Costs - Year 5	86-68130	0	0	1	LS	\$157,217.23	\$157,217.23	\$157,217.23	\$0.00	\$0.00	\$157,217.23
	PI 3	Periodic Costs - Year 8	86-68130	0	1	0	LS	\$119,410.50	\$119,410.50	\$119,410.50	\$0.00	\$119,410.50	\$0.00
	PI 4	Periodic Costs - Year 10	86-68130	0	0	1	LS	\$128,447.03	\$128,447.03	\$128,447.03	\$0.00	\$0.00	\$128,447.03
	PI 5	Periodic Costs - Year 13	86-68130	0	0	1	LS	\$32,667.67	\$32,667.67	\$32,667.67	\$0.00	\$0.00	\$32,667.67
	PI 6	Periodic Costs - Year 15	86-68130	0	0	1	LS	\$104,941.70	\$104,941.70	\$104,941.70	\$0.00	\$0.00	\$104,941.70
	PI 7	Periodic Costs - Year 17	86-68130	1	1	0	LS	\$66,899.00	\$110,660.00	\$110,660.00	\$66,899.00	\$110,660.00	\$0.00
	PI 8	Periodic Costs - Year 20	86-68130	0	0	1	LS	\$85,737.19	\$85,737.19	\$85,737.19	\$0.00	\$0.00	\$85,737.19
	PI 9	Periodic Costs - Year 25	86-68130	1	1	1	LS	\$15,652.86	\$60,063.30	\$90,160.47	\$15,652.86	\$60,063.30	\$90,160.47
	PI 10	Periodic Costs - Year 30	86-68130	0	0	1	LS	\$57,230.61	\$57,230.61	\$57,230.61	\$0.00	\$0.00	\$57,230.61
	PI 11	Periodic Costs - Year 33	86-68130	1	1	0	LS	\$35,037.52	\$57,956.80	\$57,956.80	\$35,037.52	\$57,956.80	\$0.00
	PI 12	Periodic Costs - Year 35	86-68130	0	0	1	LS	\$46,756.64	\$46,756.64	\$46,756.64	\$0.00	\$0.00	\$46,756.64
	PI 13	Periodic Costs - Year 38	86-68130	0	0	1	LS	\$11,891.46	\$11,891.46	\$11,891.46	\$0.00	\$0.00	\$11,891.46
	PI 14	Periodic Costs - Year 40	86-68130	0	0	1	LS	\$38,201.20	\$38,201.20	\$38,201.20	\$0.00	\$0.00	\$38,201.20
	PI 15	Periodic Costs - Year 42	86-68130	0	1	0	LS	\$30,211.50	\$30,211.50	\$30,211.50	\$0.00	\$30,211.50	\$0.00
	PI 16	Periodic Costs - Year 45	86-68130	0	0	1	LS	\$31,210.22	\$31,210.22	\$31,210.22	\$0.00	\$0.00	\$31,210.22
	PI 17	Annual Costs - Maintenance	86-68130	1	1	1	LS	\$630,902.00	\$967,383.00	\$2,944,208.00	\$630,902.00	\$967,383.00	\$2,944,208.00
		Subtotal 1									\$923,961.38	\$1,561,725.10	\$3,976,349.42
		Mobilization		1	1	1	LS	\$46,000.00	\$78,000.00	\$200,000.00	\$46,000.00	\$78,000.00	\$200,000.00
		Subtotal 1 w/ mobilization									\$969,961.38	\$1,639,725.10	\$4,176,349.42
		Escalation to Notice to Proceed (NTP)									\$0.00	\$0.00	\$0.00
		Design Contingencies		1	1	1	LS	\$80,038.62	\$160,274.90	\$627,594.58	\$80,038.62	\$160,274.90	\$627,594.58
		APS = Allowance for		0	0	1	LS	\$0.00	\$0.00	\$96,056.00	\$0.00	\$0.00	\$96,056.00
		Procurement Strategies (if applicable)											
		CONTRACT COST									\$1,050,000.00	\$1,800,000.00	\$4,900,000.00
		Construction Contingencies		1	1	1	LS	\$200,000.00	\$400,000.00	\$1,200,000.00	\$200,000.00	\$400,000.00	\$1,200,000.00
		FIELD COST									\$1,250,000.00	\$2,200,000.00	\$6,100,000.00
		Non-Contract Costs		1	1	1	LS	\$400,000.00	\$700,000.00	\$2,100,000.00	\$400,000.00	\$700,000.00	\$2,100,000.00
		CONSTRUCTION COST									\$1,650,000.00	\$2,900,000.00	\$8,200,000.00

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:	[Signature] 4/15/11
DATE PREPARED	3/24/2011	PEER REVIEW:	Tom Hepler P.E.	DATE PREPARED	06/15/11	PEER REVIEW	[Signature] 6/15/11

Crystal Ball Report - Full

Simulation started on 6/15/2011 at 16:24:14
 Simulation stopped on 6/15/2011 at 16:24:35

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) 21.67
 Trials/second (average) 461
 Random numbers per sec 20,302

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 Jay Alami
 DATE 6/15/11

DATE	PEER REVIEWER(S)	CODE
6/15/2011	<i>[Signature]</i> Signature Craig A. Grush Printed Name	86-68170
	<i>[Signature]</i> Signature	
	Printed Name	
Author Initials		PEER REVIEW NOT REQUIRED

Forecasts

Worksheet: [02 Copco 2 Crystal Ball Spreadsheet wo esc A.xlsx]SUMMARY 480 FP

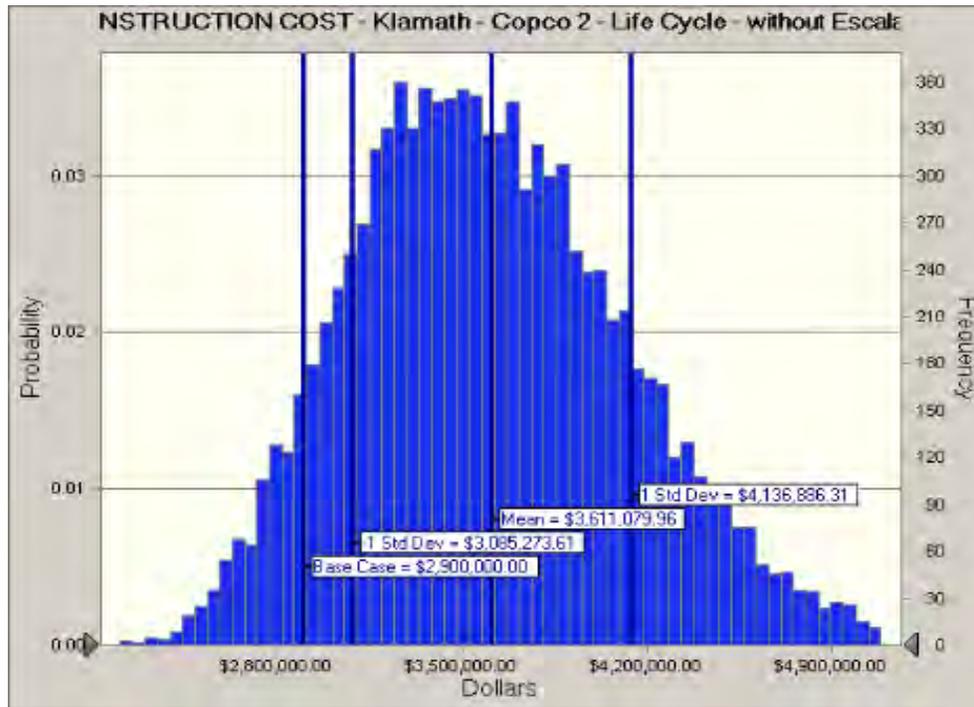
Forecast: CONSTRUCTION COST - Klamath - Copco 2 - Life Cycle - without Escalation Cell: U40

Summary:

Entire range is from \$2,205,241.95 to \$5,716,958.55

Base case is \$2,900,000.00

After 10,000 trials, the std. error of the mean is \$5,258.06



Forecast: CONSTRUCTION COST - Klamath - Copco 2 - Life Cycle - without Escalation (Cold)J40

Statistics:	Forecast values
Trials	10,000
Mean	\$3,611,079.96
Median	\$3,569,256.31
Mode	---
Standard Deviation	\$525,806.35
Variance	#####
Skewness	0.3998
Kurtosis	3.01
Coeff. of Variability	0.1456
Minimum	\$2,205,241.95
Maximum	\$5,716,958.55
Range Width	\$3,511,716.60
Mean Std. Error	\$5,258.06

Percentiles:	Forecast values
0%	\$2,205,241.95
10%	\$2,963,751.91
20%	\$3,157,627.99
30%	\$3,298,319.80
40%	\$3,436,143.39
50%	\$3,569,255.89
60%	\$3,709,792.63
70%	\$3,862,983.93
80%	\$4,050,526.53
90%	\$4,314,062.84
100%	\$5,716,958.55

Forecast: Contract Cost - Klamath - Copco 2 - Life Cycle - without Escalation

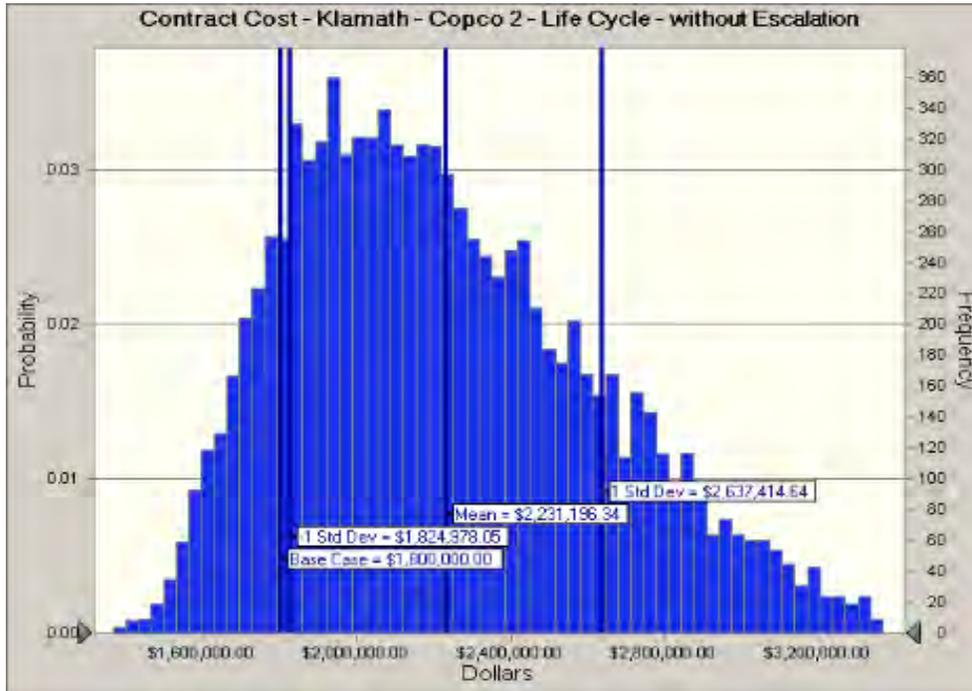
Cell: U36

Summary:

Entire range is from \$1,366,069.96 to \$3,919,752.29

Base case is \$1,800,000.00

After 10,000 trials, the std. error of the mean is \$4,062.18



Statistics:	Forecast values
Trials	10,000
Mean	\$2,231,196.34
Median	\$2,173,452.43
Mode	---
Standard Deviation	\$406,218.29
Variance	#####
Skewness	0.6096
Kurtosis	2.97
Coeff. of Variability	0.1821
Minimum	\$1,366,069.96
Maximum	\$3,919,752.29
Range Width	\$2,553,682.33
Mean Std. Error	\$4,062.18

Forecast: Contract Cost - Klamath - Copco 2 - Life Cycle - without Escalation (cont'd)

Cell: U36

Percentiles:	Forecast values
0%	\$1,366,069.96
10%	\$1,750,148.89
20%	\$1,869,706.83
30%	\$1,968,923.22
40%	\$2,071,251.73
50%	\$2,173,436.20
60%	\$2,283,548.70
70%	\$2,418,792.21
80%	\$2,578,414.98
90%	\$2,799,628.43
100%	\$3,919,752.29

Forecast: FIELD COST - Klamath - Copco 2 - Life Cycle - without Escalation

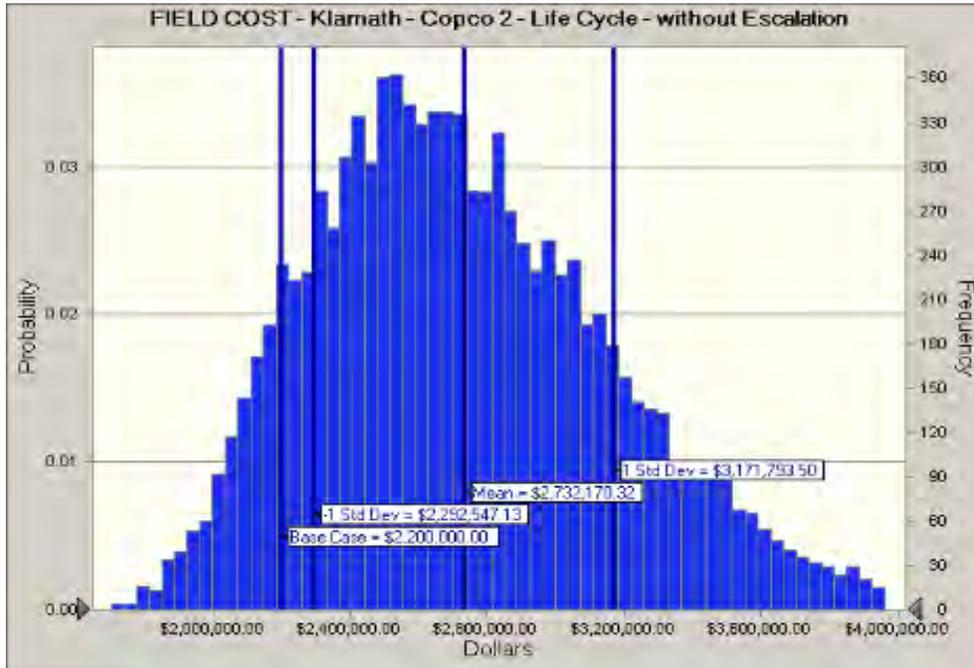
Cell: U38

Summary:

Entire range is from \$1,703,277.50 to \$4,626,300.78

Base case is \$2,200,000.00

After 10,000 trials, the std. error of the mean is \$4,396.23



Statistics:	Forecast values
Trials	10,000
Mean	\$2,732,170.32
Median	\$2,684,162.71
Mode	---
Standard Deviation	\$439,623.19
Variance	#####
Skewness	0.5064
Kurtosis	3.01
Coeff. of Variability	0.1609
Minimum	\$1,703,277.50
Maximum	\$4,626,300.78
Range Width	\$2,923,023.27
Mean Std. Error	\$4,396.23

Forecast: FIELD COST - Klamath - Copco 2 - Life Cycle - without Escalation (cont'd)

Cell: U38

Percentiles:	Forecast values
0%	\$1,703,277.50
10%	\$2,194,909.95
20%	\$2,347,034.79
30%	\$2,467,788.10
40%	\$2,574,995.38
50%	\$2,683,951.13
60%	\$2,804,431.98
70%	\$2,939,202.61
80%	\$3,101,111.09
90%	\$3,334,349.40
100%	\$4,626,300.78

End of Forecasts

Assumptions

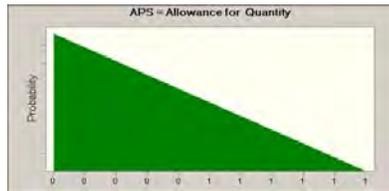
Worksheet: [02 Copco 2 Crystal Ball Spreadsheet wo esc A.xlsx]SUMMARY 480 FP

Assumption: APS = Allowance for Quantity

Cell: L34

Triangular distribution with parameters:

Minimum	0	(=K34)
Likeliest	0	(=L34)
Maximum	1	(=M34)

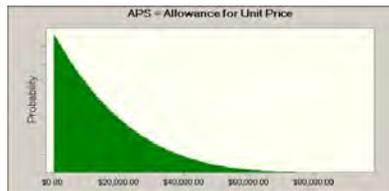


Assumption: APS = Allowance for Unit Price

Cell: R34

BetaPERT distribution with parameters:

Minimum	\$0.00	(=Q34)
Likeliest	\$0.00	(=R34)
Maximum	\$96,056.00	(=S34)

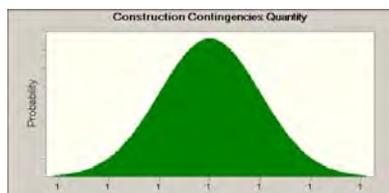


Assumption: Construction Contingencies Quantity

Cell: L37

Normal distribution with parameters:

Mean	1	(=L37)
Std. Dev.	0	



Assumption: Construction Contingencies Unit Price

Cell: R37

BetaPERT distribution with parameters:

Minimum	\$200,000.00	(=Q37)
Likeliest	\$400,000.00	(=R37)
Maximum	\$1,200,000.00	(=S37)

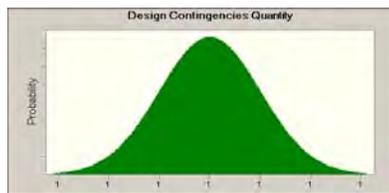


Assumption: Design Contingencies Quantity

Cell: L33

Normal distribution with parameters:

Mean	1	(=L33)
Std. Dev.	0	

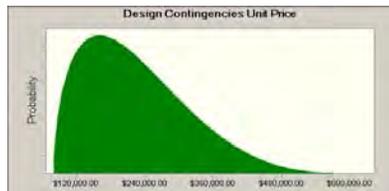


Assumption: Design Contingencies Unit Price

Cell: R33

BetaPERT distribution with parameters:

Minimum	\$80,038.62	(=Q33)
Likeliest	\$160,274.90	(=R33)
Maximum	\$627,594.58	(=S33)

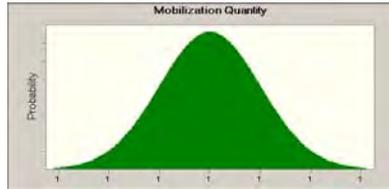


Assumption: Mobilization Quantity

Cell: L30

Normal distribution with parameters:

Mean	1	(=L30)
Std. Dev.	0	



Assumption: Mobilization Unit Price

Cell: R30

BetaPERT distribution with parameters:

Minimum	\$46,000.00	(=Q30)
Likeliest	\$78,000.00	(=R30)
Maximum	\$200,000.00	(=S30)

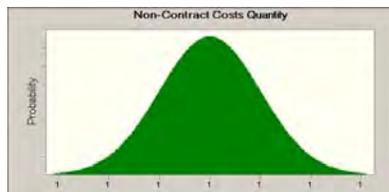


Assumption: Non-Contract Costs Quantity

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	\$400,000.00	(=Q39)
Likeliest	\$700,000.00	(=R39)
Maximum	\$2,100,000.00	(=S39)

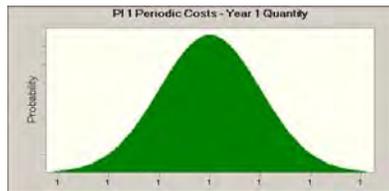


Assumption: PI 1 Periodic Costs - Year 1 Quantity

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	\$175,470.00	(=Q12)
Likeliest	\$216,040.00	(=R12)
Maximum	\$247,680.00	(=S12)



Assumption: PI 10 Periodic Costs - Year 30 Quantity

Cell: L21

Triangular distribution with parameters:

Minimum	0	(=K21)
Likeliest	0	(=L21)
Maximum	1	(=M21)

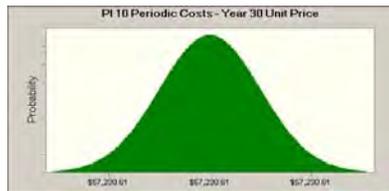


Assumption: PI 10 Periodic Costs - Year 30 Unit Price

Cell: R21

Normal distribution with parameters:

Mean	\$57,230.61	(=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	\$35,037.52	(=Q22)
Likeliest	\$57,956.80	(=R22)
Maximum	\$57,956.80	(=S22)



Assumption: PI 12 Periodic Costs - Year 35 Quantity

Cell: L23

Triangular distribution with parameters:

Minimum	0	(=K23)
Likeliest	0	(=L23)
Maximum	1	(=M23)

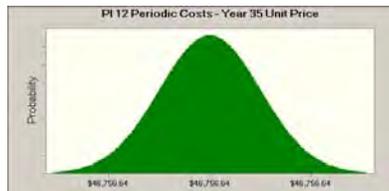


Assumption: PI 12 Periodic Costs - Year 35 Unit Price

Cell: R23

Normal distribution with parameters:

Mean	\$46,756.64	(=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)

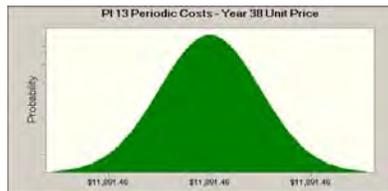


Assumption: PI 13 Periodic Costs - Year 38 Unit Price

Cell: R24

Normal distribution with parameters:

Mean	\$11,891.46	(=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)

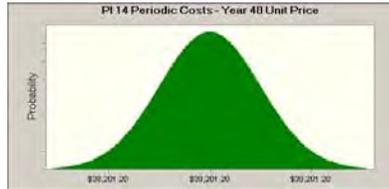


Assumption: PI 14 Periodic Costs - Year 40 Unit Price

Cell: R25

Normal distribution with parameters:

Mean \$38,201.20 (=R25)
 Std. Dev. \$0.00

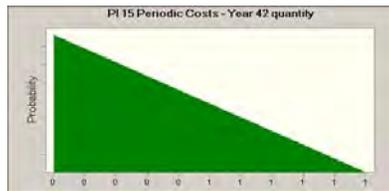


Assumption: PI 15 Periodic Costs - Year 42 quantity

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 \$30,211.50 (=R26)
 Std. Dev. \$0.00

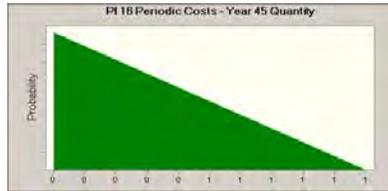


Assumption: PI 16 Periodic Costs - Year 45 Quantity

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	\$31,210.22	(=R27)
Std. Dev.	\$0.00	



Assumption: PI 17 Annual Costs - Maintenance Quantity

Cell: L28

Normal distribution with parameters:

Mean	1	(=L28)
Std. Dev.	0	

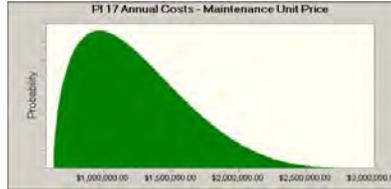


Assumption: PI 17 Annual Costs - Maintenance Unit Price

Cell: R28

BetaPERT distribution with parameters:

Minimum	\$630,902.00	(=Q28)
Likeliest	\$967,383.00	(=R28)
Maximum	\$2,944,208.00	(=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	\$157,217.23	(=R13)
Std. Dev.	\$0.00	

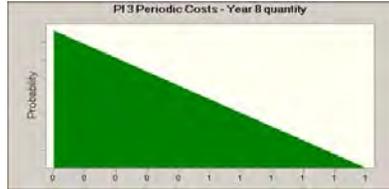


Assumption: PI 3 Periodic Costs - Year 8 quantity

Cell: L14

Triangular distribution with parameters:

Minimum	0	(=K14)
Likeliest	0	(=M14)
Maximum	1	(=L14)

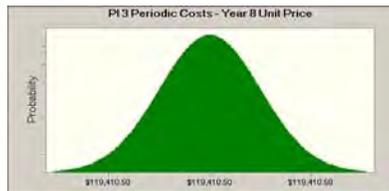


Assumption: PI 3 Periodic Costs - Year 8 Unit Price

Cell: R14

Normal distribution with parameters:

Mean	\$119,410.50	(=R14)
Std. Dev.	\$0.00	

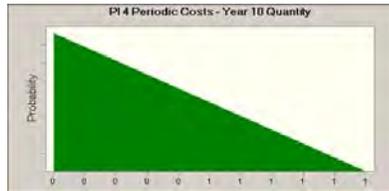


Assumption: PI 4 Periodic Costs - Year 10 Quantity

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 \$128,447.03 (=R15)
 Std. Dev. \$0.00



Assumption: PI 5 Periodic Costs - Year 13 Quantity

Cell: L16

Triangular distribution with parameters:

Minimum 0 (=K16)
 Likeliest 0 (=L16)
 Maximum 1 (=M16)

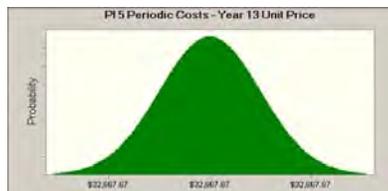


Assumption: PI 5 Periodic Costs - Year 13 Unit Price

Cell: R16

Normal distribution with parameters:

Mean \$32,667.67 (=R16)
 Std. Dev. \$0.00

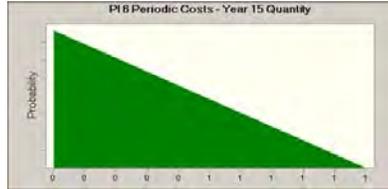


Assumption: PI 6 Periodic Costs - Year 15 Quantity

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	\$104,941.70	(=R17)
Std. Dev.	\$0.00	

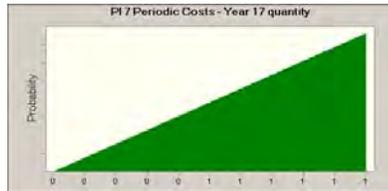


Assumption: PI 7 Periodic Costs - Year 17 quantity

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	\$66,899.00	(=Q18)
Likeliest	\$110,660.00	(=R18)
Maximum	\$110,660.00	(=S18)

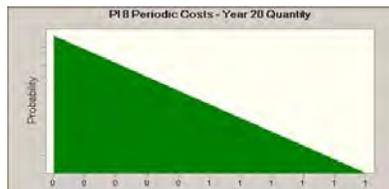


Assumption: PI 8 Periodic Costs - Year 20 Quantity

Cell: L19

Triangular distribution with parameters:

Minimum	0	(=K19)
Likeliest	0	(=L19)
Maximum	1	(=M19)

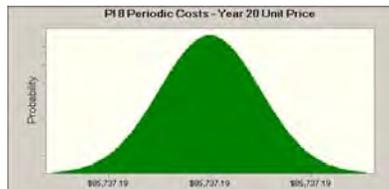


Assumption: PI 8 Periodic Costs - Year 20 Unit Price

Cell: R19

Normal distribution with parameters:

Mean	\$85,737.19	(=R19)
Std. Dev.	\$0.00	

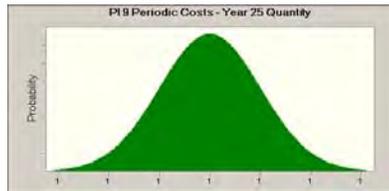


Assumption: PI 9 Periodic Costs - Year 25 Quantity

Cell: L20

Normal distribution with parameters:

Mean	1	(=L20)
Std. Dev.	0	



Assumption: PI 9 Periodic Costs - Year 25 Unit Price

Cell: R20

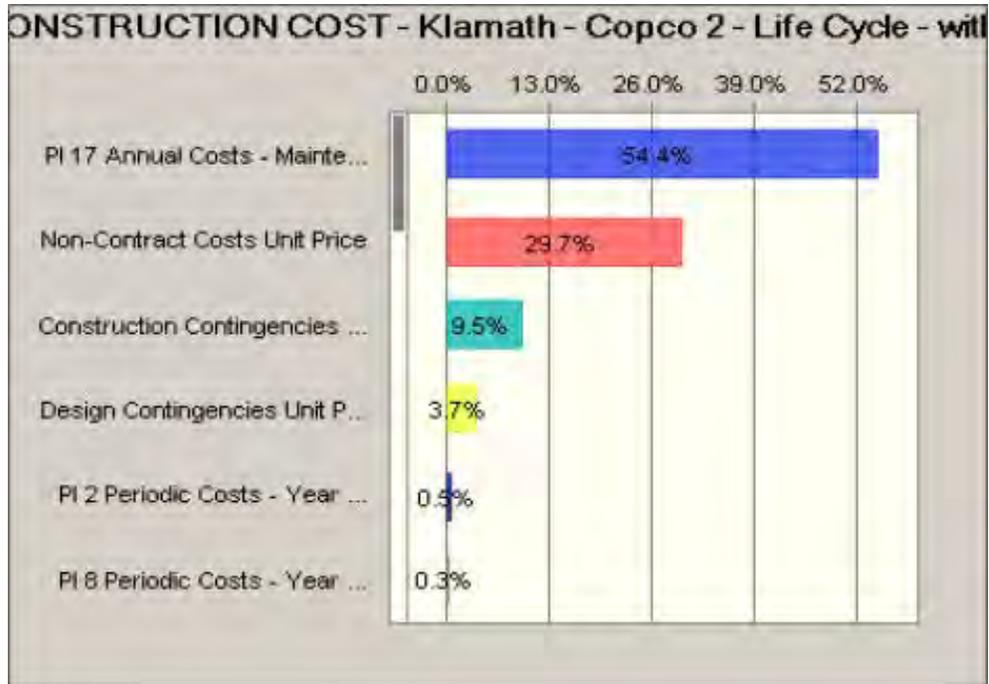
BetaPERT distribution with parameters:

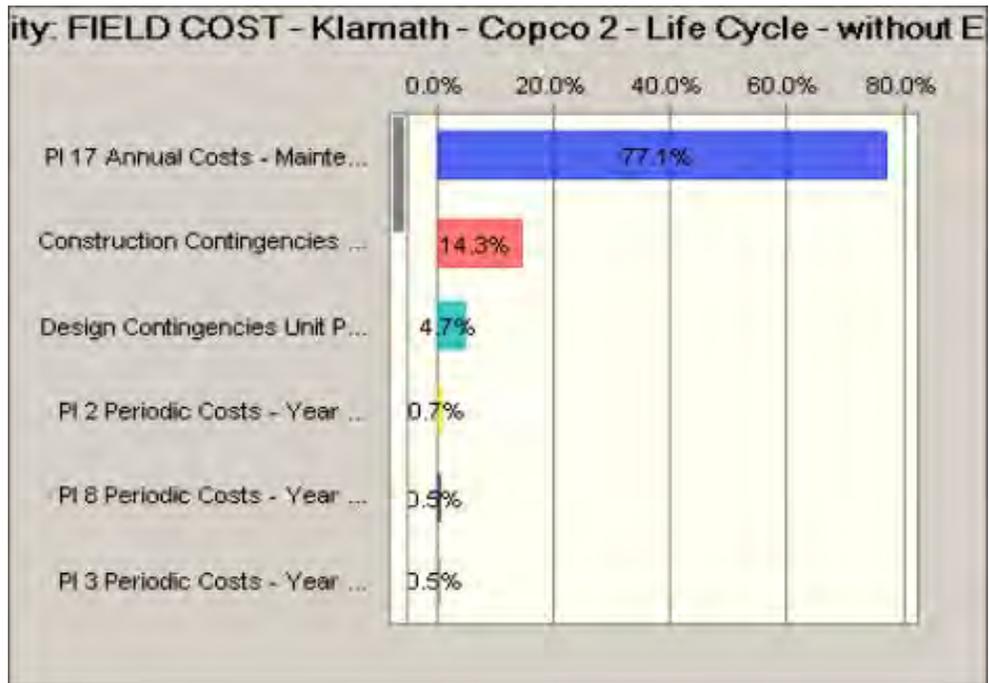
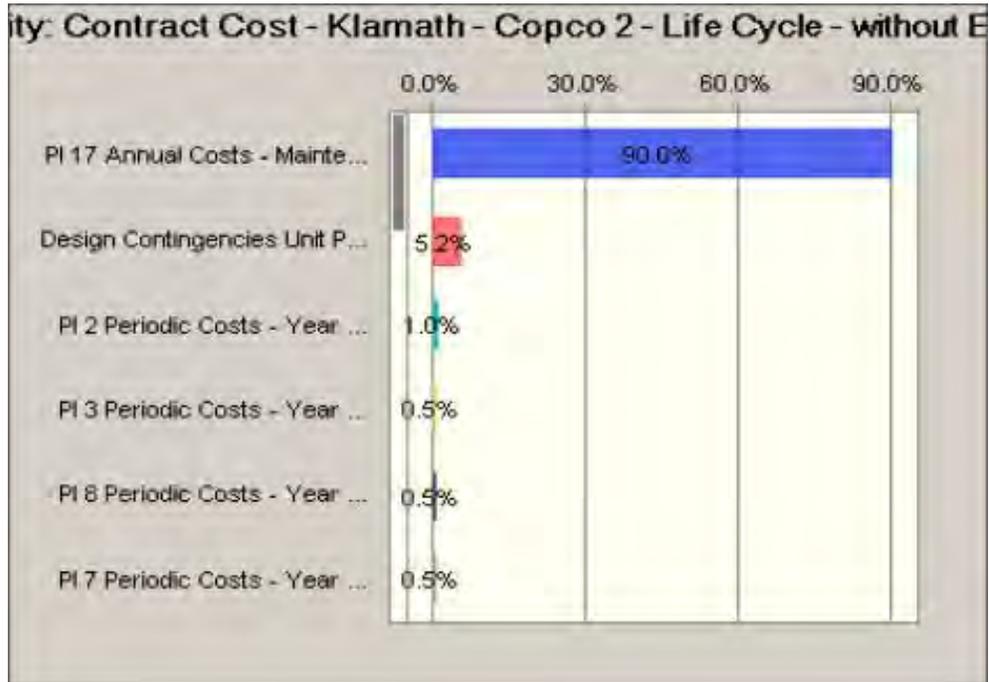
Minimum	\$15,652.86	(=Q20)
Likeliest	\$60,063.30	(=R20)
Maximum	\$90,160.47	(=S20)

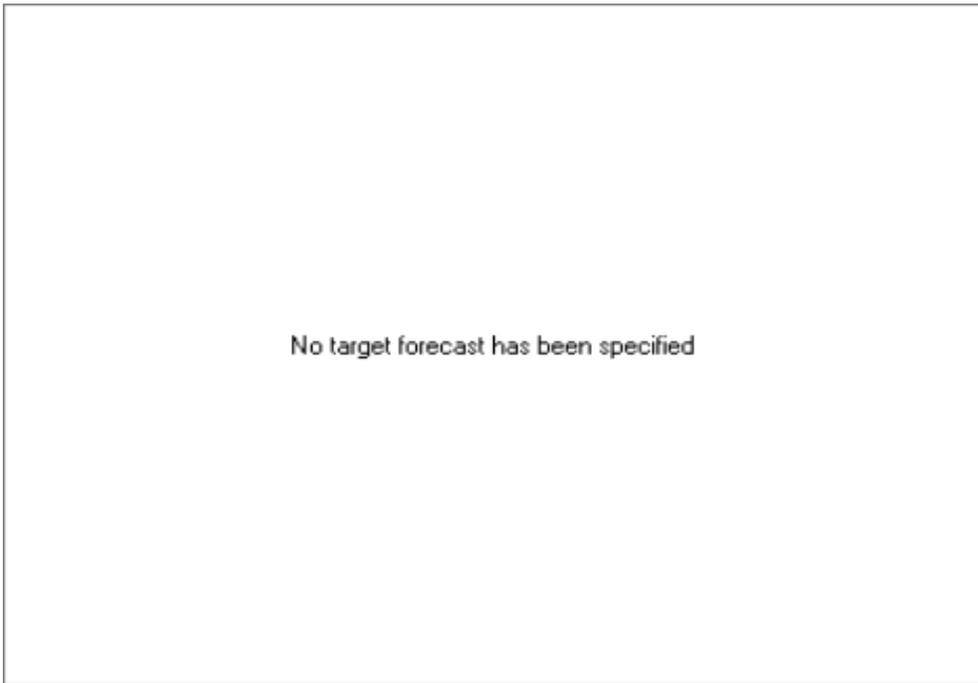
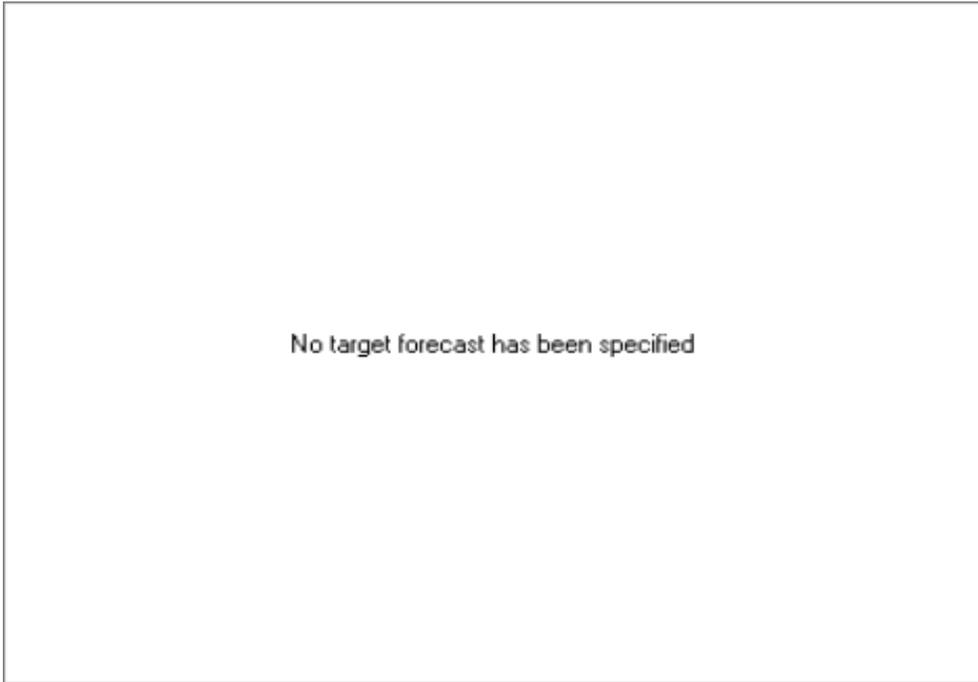


End of Assumptions

Sensitivity Charts







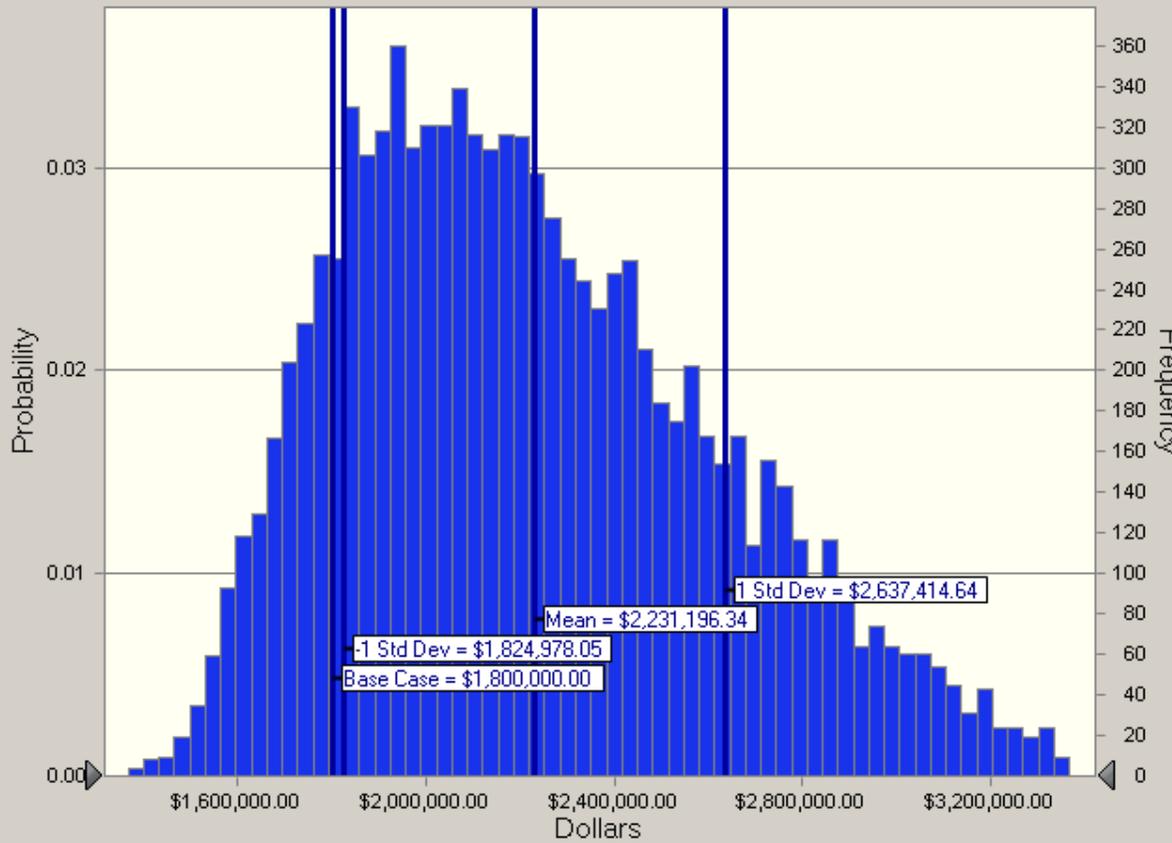
End of Sensitivity Charts

10,000 Trials

Split View

9,932 Displayed

Contract Cost - Klamath - Copco 2 - Life Cycle - without Escalation



Statistic	Forecast values
Trials	10,000
Mean	\$2,231,196.34
Median	\$2,173,452.43
Mode	...
Standard Deviation	\$406,218.29
Variance	\$165,013,301,192.68
Skewness	0.6096
Kurtosis	2.97
Coeff. of Variability	0.1821
Minimum	\$1,366,069.96
Maximum	\$3,919,752.29
Mean Std. Error	\$4,062.18

Percentile	Forecast values
0%	\$1,366,069.96
10%	\$1,750,148.89
20%	\$1,869,706.83
30%	\$1,968,923.22
40%	\$2,071,251.73
50%	\$2,173,436.20
60%	\$2,283,548.70
70%	\$2,418,792.21
80%	\$2,578,414.98
90%	\$2,799,628.43
100%	\$3,919,752.29

► -Infinity

Certainty: 100.00 %

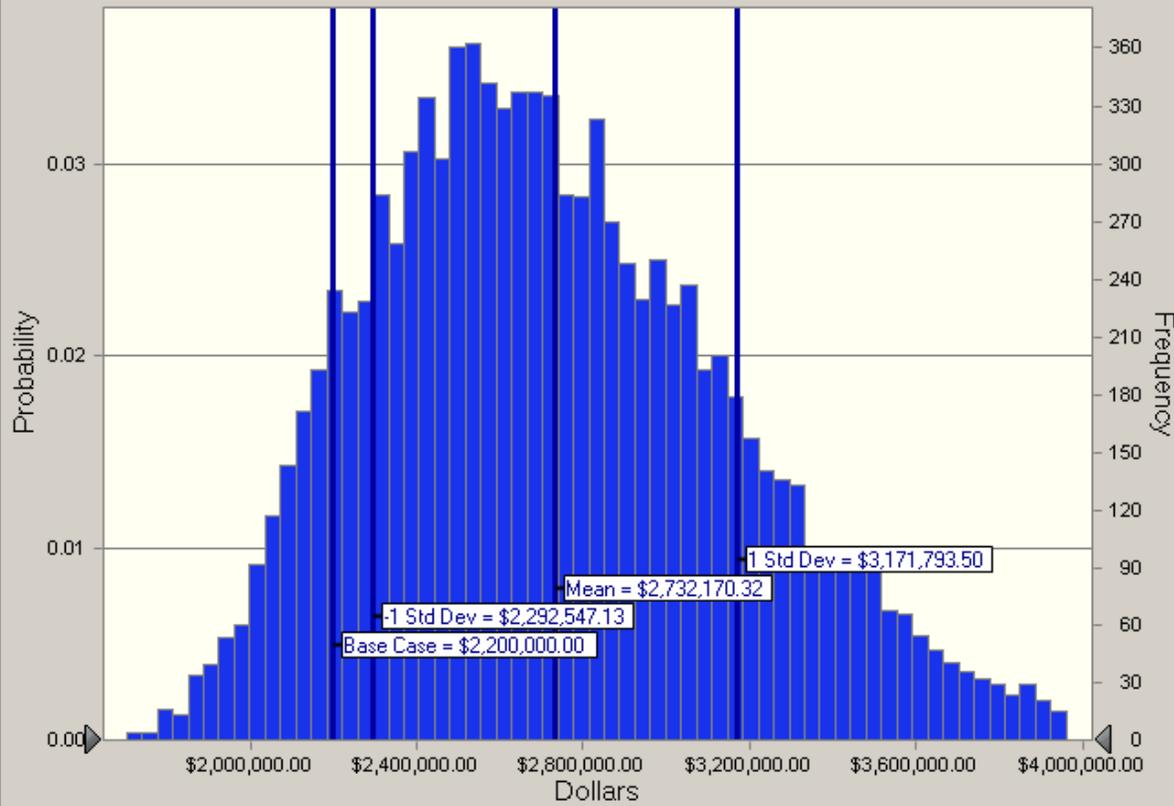
◄ Infinity

10,000 Trials

Split View

9,941 Displayed

FIELD COST - Klamath - Copco 2 - Life Cycle - without Escalation



Statistic	Forecast values
Trials	10,000
Mean	\$2,732,170.32
Median	\$2,684,162.71
Mode	---
Standard Deviation	\$439,623.19
Variance	\$193,268,545,177.87
Skewness	0.5064
Kurtosis	3.01
Coeff. of Variability	0.1609
Minimum	\$1,703,277.50
Maximum	\$4,626,300.78
Mean Std. Error	\$4,396.23

Percentile	Forecast values
0%	\$1,703,277.50
10%	\$2,194,909.95
20%	\$2,347,034.79
30%	\$2,467,788.10
40%	\$2,574,995.38
50%	\$2,683,951.13
60%	\$2,804,431.98
70%	\$2,939,202.61
80%	\$3,101,111.09
90%	\$3,334,349.40
100%	\$4,626,300.78

► -Infinity

Certainty: 100.00 %

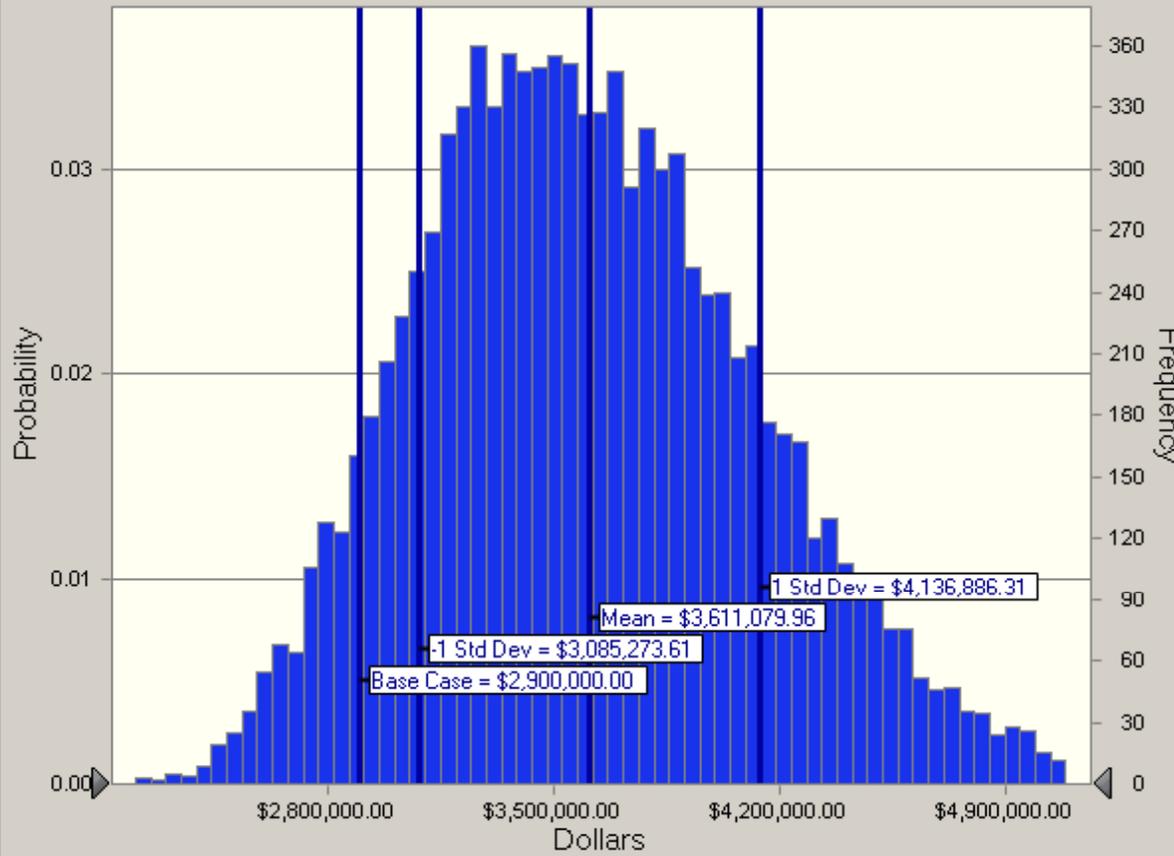
◄ Infinity

10,000 Trials

Split View

9,934 Displayed

NSTRUCTION COST - Klamath - Copco 2 - Life Cycle - without Escal



Statistic	Forecast values
Trials	10,000
Mean	\$3,611,079.96
Median	\$3,569,256.31
Mode	---
Standard Deviation	\$525,806.35
Variance	\$276,472,319,132.13
Skewness	0.3998
Kurtosis	3.01
Coeff. of Variability	0.1456
Minimum	\$2,205,241.95
Maximum	\$5,716,958.55
Mean Std. Error	\$5,258.06

Percentile	Forecast values
0%	\$2,205,241.95
10%	\$2,963,751.91
20%	\$3,157,627.99
30%	\$3,298,319.80
40%	\$3,436,143.39
50%	\$3,569,255.89
60%	\$3,709,792.63
70%	\$3,862,983.93
80%	\$4,050,526.53
90%	\$4,314,062.84
100%	\$5,716,958.55

► -Infinity

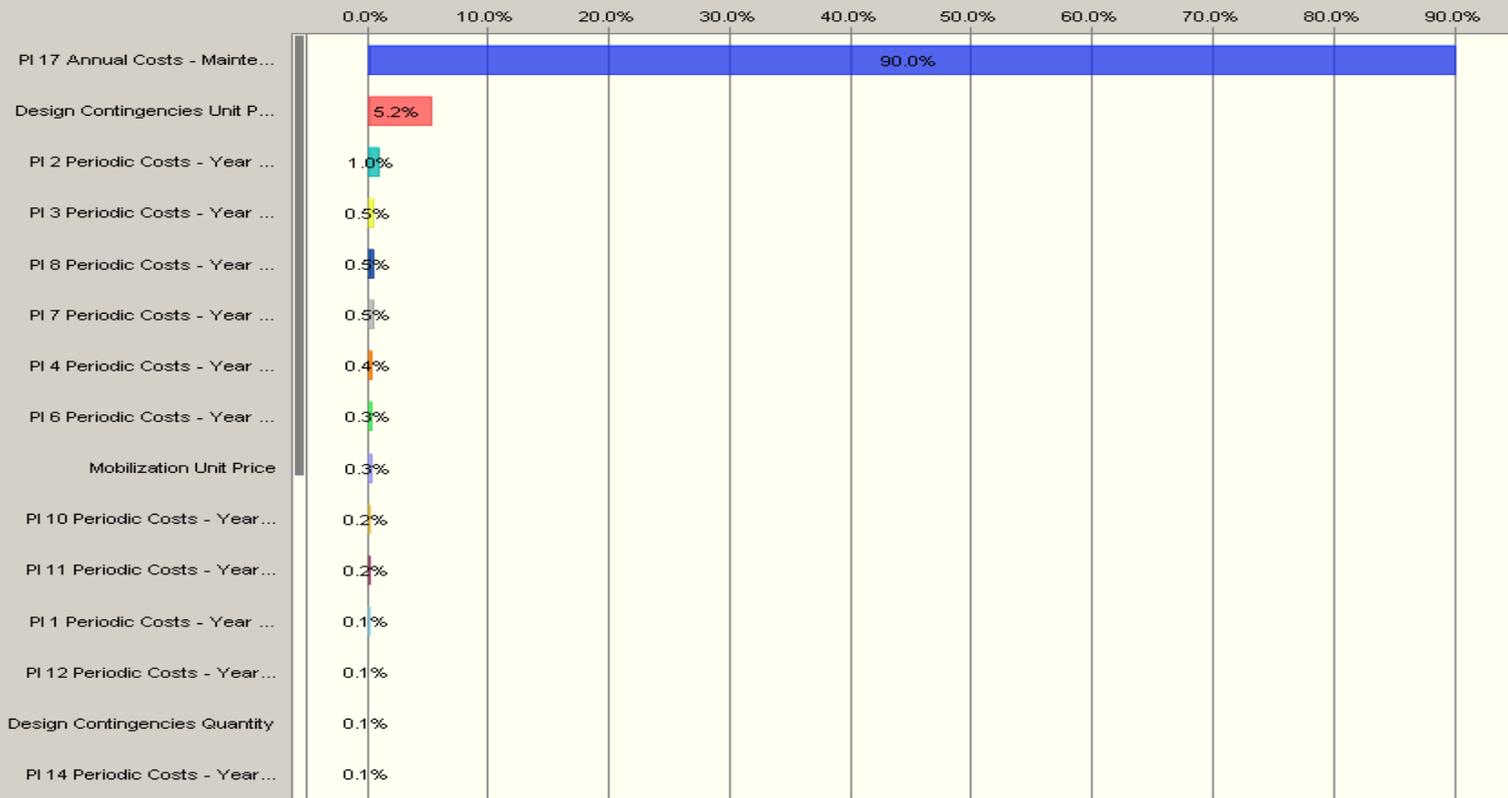
Certainty: 100.00 %

◄ Infinity

10,000 Trials

Contribution to Variance View

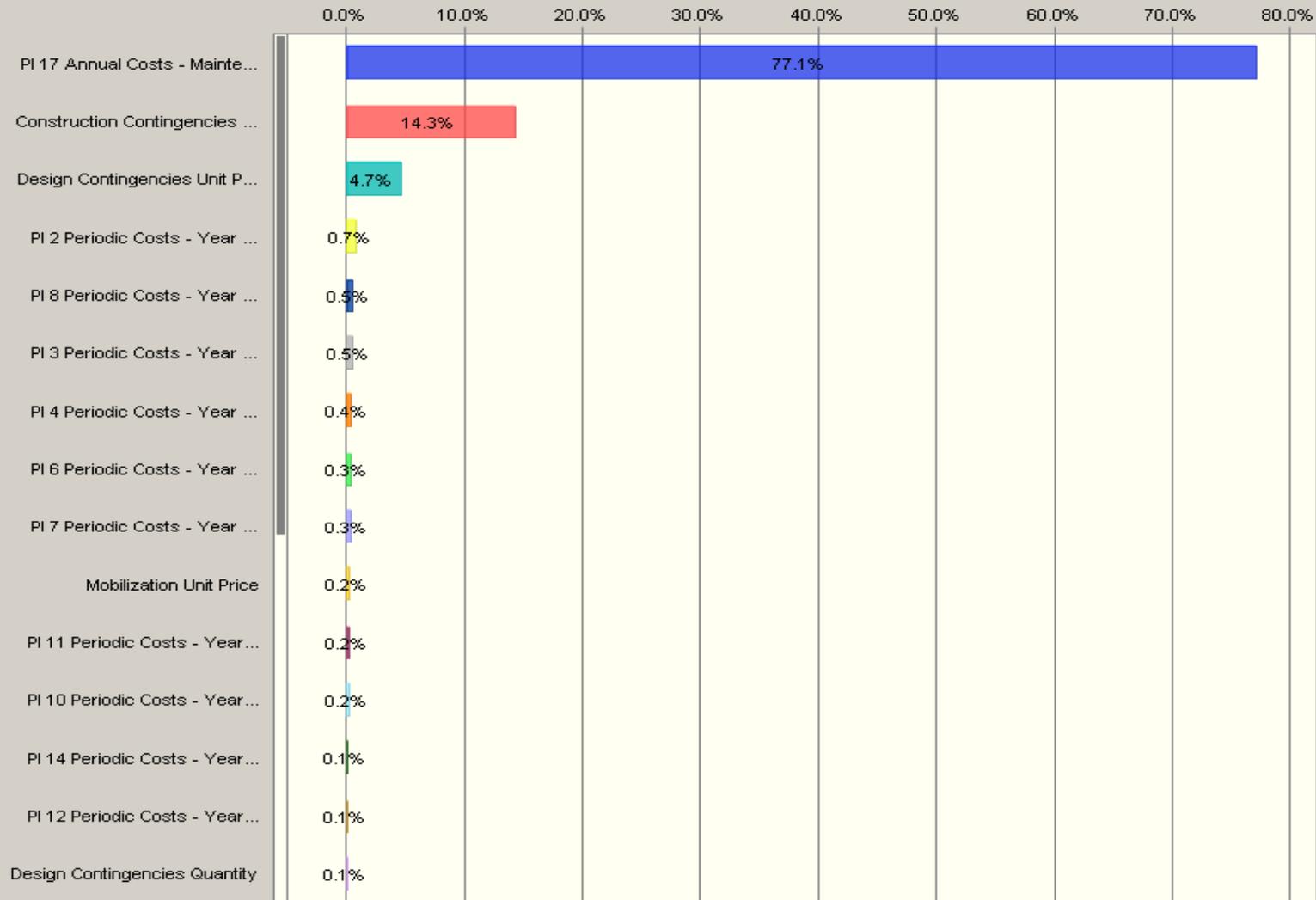
Sensitivity: Contract Cost - Klamath - Copco 2 - Life Cycle - without Escalation



10,000 Trials

Contribution to Variance View

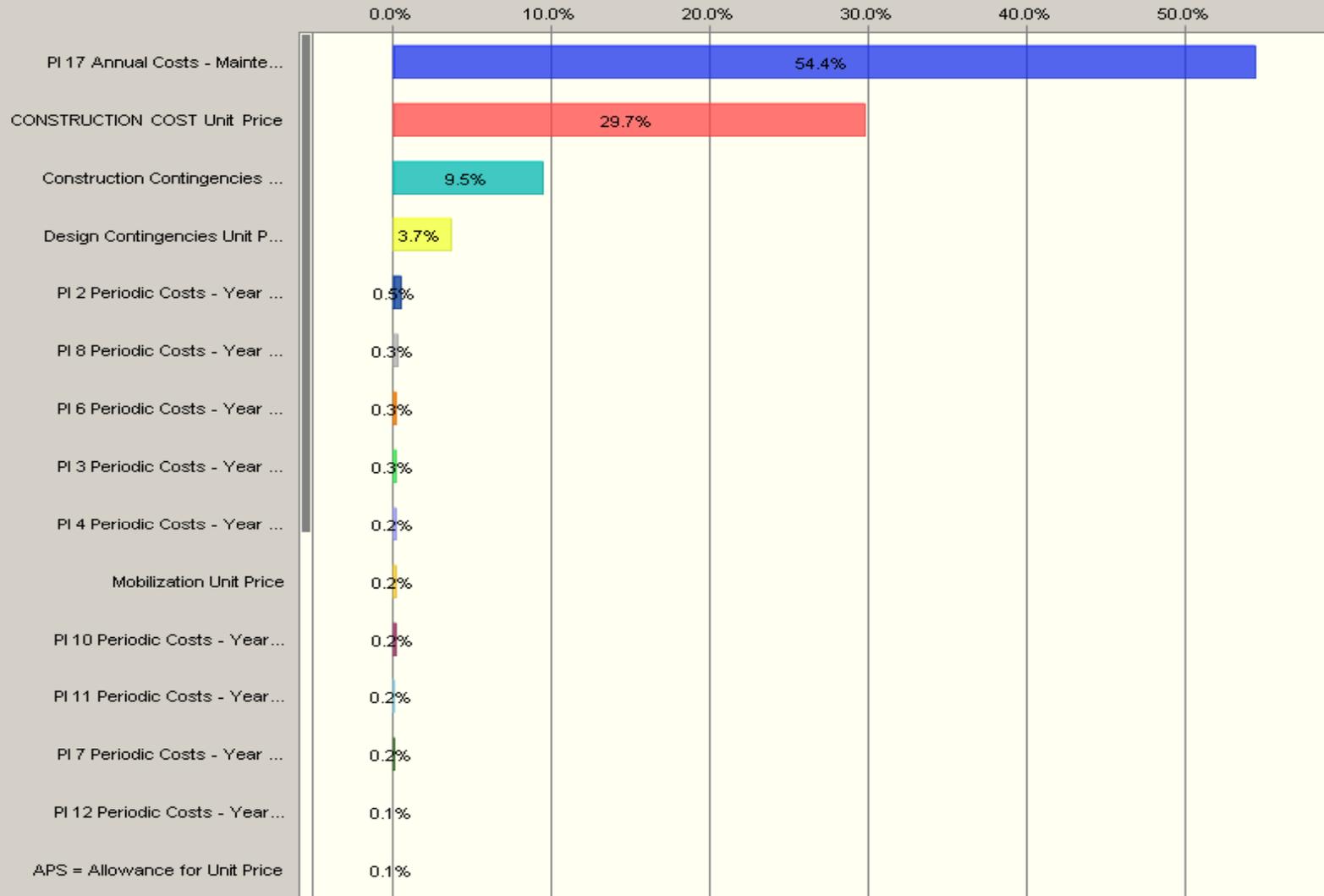
Sensitivity: FIELD COST - Klamath - Copco 2 - Life Cycle - without Escalation



10,000 Trials

Contribution to Variance View

Sensitivity: CONSTRUCTION COST - Klamath - Copco 2 - Life Cycle - without Escalation



FEATURE:		PROJECT:	
REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 2 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 2\Klamath Dams Removal - COPCO 2 - 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	Construct and Remove Embankment Cofferdam to Remove Right Side of Dam. Upstream cofferdam 2,300 cy Downstream cofferdam 800 cy Assumes 10 ft wide crest with 2:1 side slopes. Embankment material taken from borrow/waste area on left abutment of Iron Gate Dam, approximately 10 mile haul distance.	86-68130	3,100	cy	\$130.00	\$403,000.00
	2	Furnish, Install and Remove Riprap Upstream cofferdam 280 cy Downstream cofferdam 185 cy	86-68130	465	cy	\$200.00	\$93,000.00
	3	Provide Dewatering behind Cofferdams Assume two 3 inch portable trash pump operating for approximately 4 months.	86-68130	1	ls		\$300,000.00
	4	Remove Water from behind Cofferdams Upstream cofferdam 230,000 gals Downstream cofferdam 11,000 gals Assume 3 inch portable trash pump	86-68130	241,000	gals	\$0.01	\$2,410.00
	5	Construct and Remove Embankment Cofferdam to Remove Left Side of Dam. Also allows for removal of trashracks, caterpillar gate, and concrete intake structure, and to construct tunnel plug in the dry. Assumes 10 ft wide crest with 2:1 side slopes, approximately 300 ft long and 5 ft high. Embankment material taken from right side cofferdam.	86-68130	1,100	cy	\$130.00	\$143,000.00
	6	Furnish, Install and Remove Riprap Reuse riprap from right side cofferdam.	86-68130	250	cy	\$200.00	\$50,000.00
SUBTOTAL THIS SHEET							\$991,410.00

QUANTITIES		PRICES	
BY Rick Benik	CHECKED Sheena Barnes	BY Craig A. Brush, P.E.	CHECKED 05-18-11
DATE PREPARED 10/19/10	PEER REVIEW / DATE Tom Hepler P.E. 10/20/10	DATE PREPARED 05/17/11	PEER REVIEW / DATE 6/3/11

FEATURE:		PROJECT:	
REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 2 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 2\Klamath Dams Removal - COPCO 2 - Full Removal Option - REV#1 - MPH Feas Est - 4-2011.xlsx\Summary	

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
	7	Provide Dewatering behind Left Side Cofferdam Assume 3 inch portable trash pump operating for approximately 4 months.	86-68130	1	ls		\$300,000.00
	8	Remove Water from behind Cofferdam Assume 3 inch portable trash pump	86-68130	36,000	gals	\$0.08	\$2,880.00
	9	Remove Water from behind Tailrace Cofferdam Unwatering of tailrace for removal of the powerhouse in the dry. Assume 3 inch portable trash pump	86-68130	400,000	gals	\$0.01	\$4,000.00
	10	Provide Dewatering behind Tailrace Cofferdam for removal of Powerhouse in the dry. Assume 3 inch portable trash pump operating for approximately 3 months.	86-68130	1	ls		\$250,000.00
	11	Construct Embankment Cofferdam across Tailrace to remove Powerhouse in dry. Assumes 10 ft wide crest with 2:1 side slopes, approximately 110 ft long and 12 ft high. Embankment material taken from Iron Gate Dam Removal, approximately 10 mile haul distance.	86-68130	1,700	yd3	\$130.00	\$221,000.00
SUBTOTAL THIS SHEET							\$777,880.00

QUANTITIES		PRICES	
BY Rick Benik	CHECKED Sheena Barnes	BY Craig A. Grysh, P.E.	CHECKED AW 05-18-11
DATE PREPARED 10/19/10	PEER REVIEW / DATE Tom Hepler P.E. 10/20/10	DATE PREPARED 05/17/11	PEER REVIEW / DATE DCR 6/3/11

FEATURE: REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable High Powerplant Access Road Bridge	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 2\Klamath Dams Removal - COPCO 2 - Full Removal Option - REV#1 - MPH Feas Est - 4-2011.xlsx\Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
	12	Construct 240-ft-long, 2-span concrete Bridge. 31-ft deck width (two 12-ft lanes, two 2-ft shoulders, additional width for jersey barriers along each side). To be constructed near existing bridge, which is to be kept in service until new bridge is ready for service. Design loading is HS-20 truck. Cost is based on unit cost per ft2 of deck for similar concrete bridge at Upper San Joaquin priced out in 2009.	86-68130	7,440	ft2	\$600.00	\$4,464,000.00
	13	Remove and dispose of existing bridge. Bridge is approximately 231 feet long. Consists of 4 steel girder spans: One @ 40', one @ 75', one @ 56', one @ 60'. Timber deck (15'-16' wide) with wood running planks. Rails and wheel guards along both sides are timber. Two piers are concrete, third pier appears to be timber posts. Assume wood is pressure-treated. Assume girders contain paint with heavy metals.	86-68130	1	ls		\$800,000.00
DIVERSION AND CARE SUBTOTAL							\$7,033,290.00

QUANTITIES		PRICES	
BY Stephen Latham	CHECKED Rick Benik	BY <i>[Signature]</i> Craig A. Grish, P.E.	CHECKED <i>[Signature]</i> 05-18-11
DATE PREPARED 11/08/10	PEER REVIEW / DATE Tom Hepler, P.E. 11/08/10	DATE PREPARED 05/17/11	PEER REVIEW / DATE <i>[Signature]</i> 6/3/11

FEATURE: REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable High 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 2\Klamath Dams Removal - COPCO 2 - 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:					
	14	Remove Concrete in Dam. Reinforced concrete in ogee overflow section and in D/S apron and sidewalls, gate piers, hoist deck, & north wingwall (on right side, upstream of dam).	86-68130	4,400	yd3	\$500.00	\$2,200,000.00
	15	Remove concrete equipment slab from top of embankment wing dam on right abutment.	86-68130	5	yd3	\$380.00	\$1,900.00
	16	Remove Concrete Wingwall. Located on left side of spill tunnel outfall channel. Assume wall is unreinforced concrete.	86-68130	220	yd3	\$380.00	\$83,600.00
SUBTOTAL THIS SHEET							\$2,285,500.00

QUANTITIES		PRICES	
BY Stephen Latham	CHECKED Jonathan East	BY  Craig A. Grush, P.E.	CHECKED  05-18-11
DATE PREPARED 10/19/10	PEER REVIEW / DATE Rick Benik P.E. 10/19/10	DATE PREPARED 05/17/11	PEER REVIEW / DATE  6/3/11

FEATURE: REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable High 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 2\Klamath Dams Removal - COPCO 2 - Full Removal Option - REV#1 - 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 remove the earth fill embankment and concrete cutoff wall of Copco 2 Dam to original ground surface.					
		Right Abutment Removal					
	17	Random Fill	86-68313	1,200	yd3	\$18.00	\$21,600.00
	18	Remove Hand Placed Riprap average size 12-inches, 8 inches thick	86-68313	7,800	ft2	\$1.30	\$10,140.00
	19	Gunite Curtain Wall similar to a concrete cutoff wall remove to 5' below excavated grade.	86-68313	210	yd3	\$380.00	\$79,800.00
		SUBTOTAL THIS SHEET					\$111,540.00

QUANTITIES		PRICES	
BY Randy Kuzniakowski	CHECKED Tuti Tierney	BY Craig A. Grush, P.E.	CHECKED [Signature] 05-18-11
DATE PREPARED 11/01/10	PEER REVIEW / DATE Daniel W. Osmun 11/1/10	DATE PREPARED 05/17/11	PEER REVIEW / DATE [Signature] 6/3/11

FEATURE: REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable High 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 2\Klamath Dams Removal - COPCO 2 - 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 Dam:					
	20	Hand Rails and Light Poles (Assume contains paint with heavy metals)	86-68420	5,000	lb	\$1.00	\$5,000.00
	21	Radial Gates and Hoists 5 radial gates, 2 hoists (2,900 lbs. each) (Assume contains paint with heavy metals & petroleum products)	86-68420	66,000	lb	\$1.00	\$66,000.00
	22	5 - Radial Gate stoplogs & slots (steel) (stoplog slots embedded in concrete ~1,500 lb each) (Assume contains paint with heavy metals)	86-68420	95,800	lb	\$1.00	\$95,800.00
SUBTOTAL THIS SHEET							\$166,800.00

QUANTITIES		PRICES	
BY K. Converse	CHECKED T Turnage	BY <i>[Signature]</i> Craig A. Grush, P.E.	CHECKED <i>[Signature]</i> 05-18-11
DATE PREPARED 10/28/10	PEER REVIEW / DATE Dan Drake 11/1/10	DATE PREPARED 05/17/11	PEER REVIEW / DATE <i>[Signature]</i> 6/3/11

FEATURE: REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable High 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 2\Klamath Dams Removal - COPCO 2 - 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:					
	23	Spillway intake gate motor & control panel Total weight approximately: 500 lbs.	86-68430	1	EA	\$1,500.00	\$1,500.00
	24	Spillway radial gate motors & control panel Total weight approximately: 500 lbs.	86-68430	1	EA	\$1,500.00	\$1,500.00
	25	Spillway trashrake motor, festoon cable & control Total weight approximately: 100 lbs.	86-68430	1	EA	\$600.00	\$600.00
	26	Distribution equipment , panelboards Total weight approximately: 500 lbs.	86-68430	1	EA	\$5,000.00	\$5,000.00
		DAM SUBTOTAL					\$2,572,440.00

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY <i>[Signature]</i> Craig A. Grush, P.E.	CHECKED <i>[Signature]</i> 05-18-11
DATE PREPARED 10/19/10	PEER REVIEW / DATE L. Rossi 11/1/10	DATE PREPARED 05/17/11	PEER REVIEW / DATE <i>[Signature]</i> 6/3/11

FEATURE: REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 2 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\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 2\Klamath Dams Removal - COPCO 2 - 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:					
	27	Remove Copper Shingles from Roof of Powerhouse for Recycling.	86-68130	7,000	ft2	\$3.00	\$21,000.00
	28	Remove Powerhouse Concrete down to springline of the turbines, Elev. 2338 (USGS datum). Local datum is converted to USGS datum by adding 2211 feet. (Elev. 127.0 + 2211 = Elev. 2338.) All concrete is reinforced. Includes all exterior & interior walls, columns, & beams, and concrete in foundations for transformers (outside powerhouse).	86-68130	1,050	yd3	\$1,000.00	\$1,050,000.00
	29	Remove Structural Steel Items associated with Powerhouse. Includes columns, beams, crane girders, bracing, misc. shapes, roof trusses, purlins, etc. Assume contains paint with heavy metals.	86-68130	220,000	lb	\$1.00	\$220,000.00
	30	Remove Control House Concrete. Control house is located between the powerhouse and the switchyards. All concrete is reinforced.	86-68130	30	yd3	\$380.00	\$11,400.00
	31	Remove Control House Structural Steel Items. This is actually total metal weight for steel gutter frames (2174 lbs) with aluminum tread plate (1344 lbs). Assume contains paint with heavy metals.	86-68130	3,500	lb	\$1.00	\$3,500.00
	32	Remove Shop Building Located just SW of the switchyards. See dwg PB-45621. Assume single story steel bldg on concrete slab. Estimate 40 ft x 90 ft.	86-68130	3,600	ft2	\$65.00	\$234,000.00
SUBTOTAL THIS SHEET							\$1,539,900.00

QUANTITIES		PRICES	
BY Stephen Latham	CHECKED Jonathan East	BY Craig A. Brush, P.E.	CHECKED 05-18-11
DATE PREPARED 11/01/10	PEER REVIEW / DATE Rick Benik P.E. 11/1/10	DATE PREPARED 05/17/11	PEER REVIEW / DATE 6/3/11

FEATURE: REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable High Powerhouse, Switchyard, and Transmission Line	PROJECT: 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:					
	33	2 - Governor oil systems governor, sump tanks, accumulator tank, piping (Assume contains paint with heavy metals & petroleum products)	86-68420	38,000	lb	\$1.00	\$38,000.00
	34	Cooling water and bearing oil systems (Assume contains paint with heavy metals & petroleum products)	86-68420	13,300	lb	\$1.00	\$13,300.00
	35	Oil / Water seperator tank and piping (Assume contains paint with heavy metals & petroleum products)	86-68420	2,700	lb	\$1.00	\$2,700.00
	36	12 - Cast Iron Columns (encased in concrete) (Assume contains paint with heavy metals)	86-68420	54,000	lb	\$1.00	\$54,000.00
	37	2 - Francis Turbines (includes runner, scroll case, draft tube and shaft) (Assume contains paint with heavy metals, petroleum products, and/or asbestos)	86-68420	660,000	lb	\$1.00	\$660,000.00
	38	2-40 Ton indoor crane Includes crane and rail, not steel rail base (Assume contains paint with heavy metals & petroleum products)	86-68420	140,000	lb	\$1.00	\$140,000.00
	39	Compressed Air systems (Assume contains paint with heavy metals & petroleum products)	86-68420	1,000	lb	\$1.00	\$1,000.00
	40	2 - CO2 systems (Assume contains paint with heavy metals & petroleum products)	86-68420	2,100	lb	\$1.00	\$2,100.00
	41	Plant Water and Fire Protection (Assume contains paint with heavy metals)	86-68420	3,100	lb	\$1.00	\$3,100.00
	42	Transformer Oil Fire protection (Assume contains paint with heavy metals & petroleum products)	86-68420	6,500	lb	\$1.00	\$6,500.00
	43	Unwatering Piping (Assume contains paint with heavy metals)	86-68420	32,000	lb	\$1.00	\$32,000.00
	44	Drainage Piping (Assume contains paint with heavy metals)	86-68420	10,000	lb	\$1.00	\$10,000.00
		SUBTOTAL THIS SHEET					\$962,700.00

QUANTITIES		PRICES	
BY K. Converse	CHECKED T Turnage	BY <i>[Signature]</i> Craig A. Gush, P.E.	CHECKED <i>[Signature]</i> 05-18-11
DATE PREPARED 10/28/10	PEER REVIEW / DATE Dan Drake 11/1/10	DATE PREPARED 05/17/11	PEER REVIEW / DATE <i>[Signature]</i> 6/3/11

FEATURE: REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable High Powerhouse, Switchyard, and Transmission Line	PROJECT: Klamath River Northern California/Southern Oregon				
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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:					
	45	AC Generator, Indoor Vertical Unit 1 & 2 ea: 15 MVA (13.5 MW); 0.9PF, 6,600V, 171.5 RPM, 3 Ph, including rotating exciter Total weight each approximately: 230,000 lbs. Stator: 113,000 lbs., Rotor: 117,000 lbs. Exciter Assembly: 3,260 lbs. Heaviest lift: 117,000 lbs.	86-68430	2	EA	\$130,000.00	\$260,000.00
	46	Excitation equipment for 15 MVA Generator (2 sections) Total weight approximately: 1,000 lbs.	86-68430	2	EA	\$7,000.00	\$14,000.00
	47	Surge protection equip. for 15 MVA Generator Total weight approximately: 800 lbs.	86-68430	2	EA	\$3,000.00	\$6,000.00
	48	Neutral grounding equip. for 15 MVA Generator includes transformer Total weight approximately: 500 lbs.	86-68430	2	EA	\$3,000.00	\$6,000.00
SUBTOTAL THIS SHEET							\$286,000.00

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY <i>[Signature]</i> Craig A. Gosh, P.E.	CHECKED <i>[Signature]</i> 05-18-11
DATE PREPARED 10/19/10	PEER REVIEW / DATE L. Rossi 11/1/10	DATE PREPARED 05/17/11	PEER REVIEW / DATE <i>[Signature]</i> 6/3/11

FEATURE: REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable High Powerhouse, Switchyard, and Transmission Line	PROJECT: Klamath River Northern California/Southern Oregon
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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	Generator Switchgear, 7.2kV-includes unit breaker (2 Sections @ 2,400 lbs each section) 3 ft x 7.5 ft x 95 inches high Total weight approximately: 4,800 lbs.	86-68430	1	EA	\$25,000.00	\$25,000.00
	50	Station Service Switchgear, 600 volt -(5 sections) (400 lbs each section), 3 ft x 3ft x 90 inches high Total weight approximately: 2,000 lbs.	86-68430	1	EA	\$25,000.00	\$25,000.00
	51	Unit and plant control switchboard 5 cubicles (400 lbs each), 2ft x 2ft x 90 in. high Total weight approximately: 2,000 lbs.	86-68430	1	EA	\$17,000.00	\$17,000.00
	52	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
	53	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	\$17,000.00	\$17,000.00
	54	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	\$7,000.00	\$7,000.00
SUBTOTAL THIS SHEET							\$103,000.00

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY <i>[Signature]</i> Craig A. Brush, P.E.	CHECKED <i>[Signature]</i> 05-18-11
DATE PREPARED 10/19/10	PEER REVIEW / DATE L. Rossi 11/1/10	DATE PREPARED 05/17/11	PEER REVIEW / DATE <i>[Signature]</i> 6/3/11

FEATURE: REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable High Powerhouse, Switchyard, and Transmission Line	PROJECT: Klamath River Northern California/Southern Oregon				
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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:					
	55	7 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	\$3,000.00	\$3,000.00
	56	40-Ton Travelling Crane control equipment (5 cubicles), Total weight approximately: 500 lbs.	86-68430	1	EA	\$12,000.00	\$12,000.00
	57	40-Ton Travelling Crane Festoon Cable (approx. 200 lin. Ft. cable) Total weight approximately: 800 lbs.	86-68430	1	EA	\$2,000.00	\$2,000.00
		Remove and dispose of the following equipment outside the Powerplant:					
	58	Step-up Transformers, outdoor, oil-filled, 1-phase, 10/20 MVA, 6,600/72,000 volt Total weight approximately each: 40,300 lbs.	86-68430	6	EA		Deleted
	59	Step-up Transformers, outdoor, oil-filled, 1-phase, 10/20 MVA, 73,800/230,000 volt Total weight approximately each: 58,200 lbs.	86-68430	3	EA		Deleted
		Remove and dispose of the following equipment from switchyard:	86-68430				
	60	Transmission Line No. 15 From Copco No. 2 switchyard to Copco No. 2 plant 556 AAC, 69-kV	86-68430	0.14	mile	\$40,000.00	\$5,600.00
POWERHOUSE, SWITCHYARD, & TRANS LINE SUBTOTAL							\$2,914,200.00

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY Craig A. Grish, P.E.	CHECKED 05-18-11
DATE PREPARED 10/29/10	PEER REVIEW / DATE L. Rossi 11/1/10	DATE PREPARED 05/17/11	PEER REVIEW / DATE 6/3/11

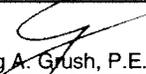
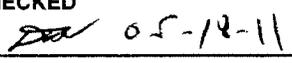
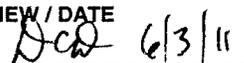
FEATURE:		PROJECT:	
REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable High Penstock		Klamath River Northern California/Southern Oregon	
		WOID: AF652	ESTIMATE LEVEL: Feasibility
		REGION: MP	UNIT PRICE LEVEL: July-2010
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
		Concrete and Structural Steel Items:					
	61	Remove Intake Structure Concrete. <i>All reinforced concrete. Includes structure plus entrance transition (to tunnel No. 1) D/S to construction joint at Sta. 0+20.00.</i>	86-68130	1,500	yd3	\$380.00	\$570,000.00
	62	Remove Concrete Items associated with 16-foot I.D. Wood Stave Pipe. <i>Assume reinforced concrete conduit sections will be removed between Tunnel No. 1 exit portal at Sta. 24+40 and the D/S end of concrete at Sta. 24+55, and between the U/S end of concrete at Sta. 37+70 and tunnel No. 2 entrance portal at Sta. 37+85. Assume the concrete conduit sections will be sawcut at the tunnel portals. Quantity also includes reinforced concrete in cradle footings for pipeline (148 footings spaced on 8- to 10-foot centers).</i>	86-68130	1,300	yd3	\$380.00	\$494,000.00
	63	Place Concrete Plugs for Tunnels. <i>There will be 9 plugs total (4 for tunnel No. 1 and 5 for tunnel No. 2). Plugs will be 2 feet thick, reinforced concrete, 3000 psi min. Location of plugs and info about openings is as follows: Tunnel No. 1, Sta. 0+20; Upper portal is a 16-ft dia., concrete-lined, horseshoe shape. Tunnel No. 1, Sta. 24+40; Lower portal is a 16-ft dia., concrete-lined, circular shape. Tunnel No. 1, Sta. 9+77.25; Top of air vent shaft is a 4-ft x 6-ft, concrete-box-lined (assumed) shaft. Tunnel No. 1, Sta. 9+96.96; Adit entrance (300 ft from tunnel) is a 7-ft x 7-ft, timber-lined opening. Tunnel No. 2, Sta. 37+85; Upper portal is a 16-ft dia., concrete-lined, horseshoe shape. Tunnel No. 2, Sta. 48+80; Lower portal is a double-barrel conduit; Each barrel is a 13.5-ft dia., steel-lined, circular shape. Tunnel No. 2, Sta. 47+75; Top of surge chamber air vent shaft is a 4-ft x 6-ft (assumed), concrete-box-lined (assumed) shaft. Tunnel No. 2; D/S end of Spill Tunnel, Sta. 3+30, is an approx. 15-ft to 16-ft dia., gunite-lined, horseshoe shape.</i>	86-68130	100	yd3	\$1,300.00	\$130,000.00
SUBTOTAL THIS SHEET							\$1,194,000.00

QUANTITIES		PRICES	
BY Stephen Latham	CHECKED Jonathan East	BY Craig A. Grysh, P.E.	CHECKED [Signature] 05-18-11
DATE PREPARED 10/19/10	PEER REVIEW / DATE Rick Benik P.E. 10/19/10	DATE PREPARED 05/17/11	PEER REVIEW / DATE [Signature] 6/3/11

FEATURE:		PROJECT:	
REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable High Penstock		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					
		Remove and dispose of the following equipment at the Intake:					
	65	Caterpillar Gate : Gate, frame and hoist (steel) (Assume contains paint with heavy metals & petroleum products)	86-68420	50,000	lb	\$1.00	\$50,000.00
	66	Trash rack and trash rake (steel) (Assume contains asbestos)	86-68420	86,000	lb	\$0.85	\$73,100.00
	67	Stop Logs and slots for intake (steel) stop log slots embedded in concrete (~10,000 lb) (Assume contains paint with heavy metals)	86-68420	220,000	lb	\$1.00	\$220,000.00
	68	Middle section of Penstock Wood staves soaked in creosote	86-68420	1,100,000	lb	\$0.85	\$935,000.00
	69	<i>Cradles (steel)</i> (Assume contains paint with heavy metals)	86-68420	290,000	lb	\$1.00	\$290,000.00
	70	<i>Bands (steel)</i> (Assume contains paint with heavy metals)	86-68420	463,000	lb	\$1.00	\$463,000.00
	71	Penstock after bifurcation to butterfly valves includes pipe, expansion joint and support rings (steel, partially encased in concrete supports) (Assume contains paint with heavy metals, and/or asbestos)	86-68420	860,000	lb	\$1.00	\$860,000.00
	72	Bifurcated vent pipes and support structure (Assume contains paint with heavy metals, and/or asbestos)	86-68420	19,500	lb	\$1.00	\$19,500.00
	73	2 - 138" Butterfly valves (Assume contains paint with heavy metals, petroleum products, and/or asbestos)	86-68420	148,000	lb	\$1.00	\$148,000.00
		PENSTOCK SUBTOTAL					\$5,582,600.00

QUANTITIES		PRICES	
BY K. Converse	CHECKED T Turnage	BY 	CHECKED  05-18-11
DATE PREPARED 10/28/10	PEER REVIEW / DATE Dan Drake 11/1/10	DATE PREPARED 05/17/11	PEER REVIEW / DATE  6/3/11

FEATURE: REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable High SUMMARY	PROJECT: Klamath River Northern California/Southern Oregon <hr/> WOID: AF652 ESTIMATE LEVEL: Feasibility <hr/> REGION: MP UNIT PRICE LEVEL: July-2010 <hr/> FILE: C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 2\Klamath Dams Removal - COPCO 2 - Full Removal Option - REV#1 - MPH Feas Est - 4-2011.xls\Summary
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT	
		Diversion and Care					\$7,033,290.00	
		Dam Removal					\$2,572,440.00	
		Powerhouse/Switchyard/Transmission Line Removal					\$2,914,200.00	
		Penstock Removal					\$5,582,600.00	
		Reservoir Vegetative Restoration					\$0.00	
		Road Improvements					\$0.00	
		Recreational Facilities to be Removed					\$0.00	
		Subtotal					\$18,102,530.00	
		Mobilization	5%	+/-			\$910,000.00	
		Subtotal 1 with Mobilization					\$19,012,530.00	
		Escalation to Notice to Proceed (NTP), from July 2010 to July 2020 (assumes 4.375%/yr compounding over 10 years)						\$10,162,062.00
		Subtotal 2 = Subtotal 1 with Mobilization + Escalation to NTP						\$29,174,592.00
		Design Contingencies	15%	+/-			\$4,154,392.00	
		Allowance for Procurement Strategies (APS)	2%	+/-			\$671,016.00	
		Type of solicitation assumed is: Competitive RFP						
		CONTRACT COST					\$34,000,000.00	
		Construction Contingencies	25%	+/-			\$9,000,000.00	
		FIELD COST					\$43,000,000.00	
		Non-Contract Costs:	61%	+/-			\$26,000,000.00	
		(Environmental & Cultural Resources Mitigation ~ 35%, Design Data Collection ~ 2%, Engineering Design ~ 6%, Permitting ~ 4%, Procurement ~ 2%, Construction Management ~ 11%, and Closeout ~ 1%)						
		CONSTRUCTION COST					\$69,000,000.00	
		Ref.: For appropriate use and terminology, see Reclamation Manual, Directives and Standards FAC; 09-01, 09-02 and 09-03.						

QUANTITIES		PRICES	
BY	CHECKED	BY	CHECKED
Refer to Previous Sheets	Refer to Previous Sheets	Craig A. Grush, P.E.	<i>[Signature]</i> 05-18-11
DATE PREPARED	PEER REVIEW / DATE	DATE PREPARED	PEER REVIEW / DATE
	Refer to Previous Sheets	05/18/11	<i>[Signature]</i> 6/3/11

FEATURE: REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable Low Diversion and Care	PROJECT: 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					
	1	Construct and Remove Embankment Cofferdam to Remove Right Side of Dam. Upstream cofferdam 2,300 cy Downstream cofferdam 800 cy Assumes 10 ft wide crest with 2:1 side slopes. Embankment material taken from borrow/waste area on left abutment of Iron Gate Dam, approximately 10 mile haul distance.	86-68130	3,100	cy	\$70.00	\$217,000.00
	2	Furnish, Install and Remove Riprap Upstream cofferdam 280 cy Downstream cofferdam 185 cy	86-68130	465	cy	\$120.00	\$55,800.00
	3	Provide Dewatering behind Cofferdams Assume two 3 inch portable trash pump operating for approximately 4 months.	86-68130	1	ls		\$40,000.00
	4	Remove Water from behind Cofferdams Upstream cofferdam 230,000 gals Downstream cofferdam 11,000 gals Assume 3 inch portable trash pump	86-68130	241,000	gals	\$0.01	\$2,410.00
	5	Construct and Remove Embankment Cofferdam to Remove Left Side of Dam. Also allows for removal of trashracks, caterpillar gate, and concrete intake structure, and to construct tunnel plug in the dry. Assumes 10 ft wide crest with 2:1 side slopes, approximately 300 ft long and 5 ft high. Embankment material taken from right side cofferdam.	86-68130	1,100	cy	\$70.00	\$77,000.00
	6	Furnish, Install and Remove Riprap Reuse riprap from right side cofferdam.	86-68130	250	cy	\$120.00	\$30,000.00
SUBTOTAL THIS SHEET							\$422,210.00

QUANTITIES		PRICES	
BY Rick Benik	CHECKED Sheena Barnes	BY Craig A. Grush, P.E.	CHECKED DW 05-18-11
DATE PREPARED 10/19/10	PEER REVIEW / DATE Tom Hepler P.E. 10/20/10	DATE PREPARED 05/17/11	PEER REVIEW / DATE JCAR 6/3/11

FEATURE: REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable Low Diversion and Care	PROJECT: Klamath River Northern California/Southern Oregon		
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
	7	Provide Dewatering behind Left Side Cofferdam Assume 3 inch portable trash pump operating for approximately 4 months.	86-68130	1	ls		\$40,000.00
	8	Remove Water from behind Cofferdam Assume 3 inch portable trash pump	86-68130	36,000	gals	\$0.04	\$1,440.00
	9	Remove Water from behind Tailrace Cofferdam Unwatering of tailrace for removal of the powerhouse in the dry. Assume 3 inch portable trash pump	86-68130	400,000	gals	\$0.01	\$4,000.00
	10	Provide Dewatering behind Tailrace Cofferdam for removal of Powerhouse in the dry. Assume 3 inch portable trash pump operating for approximately 3 months.	86-68130	1	ls		\$30,000.00
	11	Construct Embankment Cofferdam across Tailrace to remove Powerhouse in dry. Assumes 10 ft wide crest with 2:1 side slopes, approximately 110 ft long and 12 ft high. Embankment material taken from Iron Gate Dam Removal, approximately 10 mile haul distance.	86-68130	1,700	yd3	\$70.00	\$119,000.00
SUBTOTAL THIS SHEET							\$194,440.00

QUANTITIES		PRICES	
BY Rick Benik	CHECKED Sheena Barnes	BY Craig A. Grush, P.E.	CHECKED [Signature] 05-18-11
DATE PREPARED 10/19/10	PEER REVIEW / DATE Tom Hepler P.E. 10/20/10	DATE PREPARED 05/17/11	PEER REVIEW / DATE [Signature] 6/3/11

FEATURE: REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable Low Powerplant Access Road Bridge	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 2\Klamath Dams Removal - COPCO 2 - Full Removal Option - REV#1 - MPL Feas Est - 4-2011.xlsx\Diversion & Care

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
	12	Construct 240-ft-long, 2-span concrete Bridge. 31-ft deck width (two 12-ft lanes, two 2-ft shoulders, additional width for jersey barriers along each side). To be constructed near existing bridge, which is to be kept in service until new bridge is ready for service. Design loading is HS-20 truck. Cost is based on unit cost per ft2 of deck for similar concrete bridge at Upper San Joaquin priced out in 2009.	86-68130	0	ft2	\$200.00	
	13	Remove and dispose of existing bridge. Bridge is approximately 231 feet long. Consists of 4 steel girder spans: One @ 40', one @ 75', one @ 56', one @ 60'. Timber deck (15'-16' wide) with wood running planks. Rails and wheel guards along both sides are timber. Two piers are concrete, third pier appears to be timber posts. Assume wood is pressure-treated. Assume girders contain paint with heavy metals.	86-68130	0	ls	\$300,000.00	
DIVERSION AND CARE SUBTOTAL							\$616,650.00

QUANTITIES		PRICES	
BY Stephen Latham	CHECKED Rick Benik	BY Craig A. Grush, P.E.	CHECKED <i>[Signature]</i> 05-25-11
DATE PREPARED 11/08/10	PEER REVIEW / DATE Tom Hepler, P.E. 11/08/10	DATE PREPARED 05/25/11	PEER REVIEW / DATE <i>[Signature]</i> 6/3/11

FEATURE: REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 2 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 2\Klamath Dams Removal - COPCO 2 - Full Removal Option - REV#1 - MPL Feas Est - 4-2011.xlsx\Penstock

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
		Concrete and Structural Steel Items:					
	14	Remove Concrete in Dam. Reinforced concrete in ogee overflow section and in D/S apron and sidewalls, gate piers, hoist deck, & north wingwall (on right side, upstream of dam).	86-68130	4,400	yd3	\$270.00	\$1,188,000.00
	15	Remove concrete equipment slab from top of embankment wing dam on right abutment.	86-68130	5	yd3	\$170.00	\$850.00
	16	Remove Concrete Wingwall. Located on left side of spill tunnel outfall channel. Assume wall is unreinforced concrete.	86-68130	220	yd3	\$170.00	\$37,400.00
SUBTOTAL THIS SHEET							\$1,226,250.00

QUANTITIES		PRICES	
BY Stephen Latham	CHECKED Jonathan East	BY <i>[Signature]</i> Craig A. Grush, P.E.	CHECKED <i>[Signature]</i> 05-18-11
DATE PREPARED 10/19/10	PEER REVIEW / DATE Rick Benik P.E. 10/19/10	DATE PREPARED 05/17/11	PEER REVIEW / DATE <i>[Signature]</i> 6/3/11

FEATURE: REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 2 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
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		GEOTECHNICAL					
		These quantities represent the work required to remove the earth fill embankment and concrete cutoff wall of Copco 2 Dam to original ground surface.					
		Right Abutment Removal					
	17	Random Fill	86-68313	1,200	yd3	\$13.00	\$15,600.00
	18	Remove Hand Placed Riprap average size 12-inches, 8 inches thick	86-68313	7,800	ft2	\$0.85	\$6,630.00
	19	Gunite Curtain Wall similar to a concrete cutoff wall remove to 5' below excavated grade.	86-68313	210	yd3	\$170.00	\$35,700.00
		SUBTOTAL THIS SHEET					\$57,930.00

QUANTITIES		PRICES	
BY Randy Kuzniakowski	CHECKED Tuti Tierney	BY  Craig A. Grush, P.E.	CHECKED  05-18-11
DATE PREPARED 11/01/10	PEER REVIEW / DATE Daniel W. Osmun 11/1/10	DATE PREPARED 05/17/11	PEER REVIEW / DATE DCA 6/3/11

FEATURE: REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 2 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 2\Klamath Dams Removal - COPCO 2 - Full Removal Option - REV#1 - MPL Feas Est - 4-2011.xlsx\Penstock

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		MECHANICAL					
		Remove and dispose of the following equipment at Dam:					
	20	Hand Rails and Light Poles	86-68420	5,000	lb	\$0.60	\$3,000.00
	21	Radial Gates and Hoists 5 radial gates, 2 hoists (2,900 lbs. each)	86-68420	66,000	lb	\$0.60	\$39,600.00
	22	5 - Radial Gate stoplogs & slots (steel) (stoplog slots embedded in concrete ~1,500 lb each)	86-68420	95,800	lb	\$0.60	\$57,480.00
		SUBTOTAL THIS SHEET					\$100,080.00

QUANTITIES		PRICES	
BY K. Converse	CHECKED T Turnage	BY <i>[Signature]</i> Craig A. Grush, P.E.	CHECKED <i>[Signature]</i> 05-18-11
DATE PREPARED 10/28/10	PEER REVIEW / DATE Dan Drake 11/1/10	DATE PREPARED 05/17/11	PEER REVIEW / DATE <i>[Signature]</i> 6/5/11

FEATURE: REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 2 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
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		ELECTRICAL					
		Remove and dispose of the following equipment at Spillway:					
	23	Spillway intake gate motor & control panel Total weight approximately: 500 lbs.	86-68430	1	EA	\$900.00	\$900.00
	24	Spillway radial gate motors & control panel Total weight approximately: 500 lbs.	86-68430	1	EA	\$900.00	\$900.00
	25	Spillway trashrake motor, festoon cable & control Total weight approximately: 100 lbs.	86-68430	1	EA	\$400.00	\$400.00
	26	Distribution equipment , panelboards Total weight approximately: 500 lbs.	86-68430	1	EA	\$4,000.00	\$4,000.00
		DAM SUBTOTAL					\$1,390,460.00

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY <i>[Signature]</i> Craig A. Grish, P.E.	CHECKED <i>[Signature]</i> 05-18-11
DATE PREPARED 10/19/10	PEER REVIEW / DATE L. Rossi 11/1/10	DATE PREPARED 05/17/11	PEER REVIEW / DATE <i>[Signature]</i> 6/3/11

FEATURE: REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 2 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 2\Klamath Dams Removal - COPCO 2 - Full Removal Option - REV#1 - MPL Feas Est - 4-2011.xlsx\Penstock		

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
		Concrete and Structural Steel Items:					
	27	Remove Copper Shingles from Roof of Powerhouse for Recycling.	86-68130	7,000	ft2	\$2.00	\$14,000.00
	28	Remove Powerhouse Concrete down to spring-line of the turbines, Elev. 2338 (USGS datum). Local datum is converted to USGS datum by adding 2211 feet. (Elev. 127.0 + 2211 = Elev. 2338.) All concrete is reinforced. Includes all exterior & interior walls, columns, & beams, and concrete in foundations for transformers (outside powerhouse).	86-68130	1,050	yd3	\$270.00	\$283,500.00
	29	Remove Structural Steel Items associated with Powerhouse. Includes columns, beams, crane girders, bracing, misc. shapes, roof trusses, purlins, etc.	86-68130	220,000	lb	\$0.60	\$132,000.00
	30	Remove Control House Concrete. Control house is located between the powerhouse and the switchyards. All concrete is reinforced.	86-68130	30	yd3	\$170.00	\$5,100.00
	31	Remove Control House Structural Steel Items. This is actually total metal weight for steel gutter frames (2174 lbs) with aluminum tread plate (1344 lbs).	86-68130	3,500	lb	\$0.60	\$2,100.00
	32	Remove Shop Building Located just SW of the switchyards. See dwg PB-45621. Assume single story steel bldg on concrete slab. Estimate 40 ft x 90 ft.	86-68130	3,600	ft2	\$55.00	\$198,000.00
		SUBTOTAL THIS SHEET					\$634,700.00

QUANTITIES		PRICES	
BY Stephen Latham	CHECKED Jonathan East	BY Craig A. Orish, P.E.	CHECKED [Signature] 05-18-11
DATE PREPARED 11/01/10	PEER REVIEW / DATE Rick Benik P.E. 11/1/10	DATE PREPARED 05/17/11	PEER REVIEW / DATE [Signature] 6/3/11

FEATURE: REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 2 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					
		Remove and dispose of the following equipment at the Power House:					
	33	2 - Governor oil systems governor, sump tanks, accumulator tank, piping	86-68420	38,000	lb	\$0.60	\$22,800.00
	34	Cooling water and bearing oil systems	86-68420	13,300	lb	\$0.60	\$7,980.00
	35	Oil / Water seperator tank and piping	86-68420	2,700	lb	\$0.60	\$1,620.00
	36	12 - Cast Iron Columns (encased in concrete)	86-68420	54,000	lb	\$0.60	\$32,400.00
	37	2 - Francis Turbines (includes runner, scroll case, draft tube and shaft)	86-68420	660,000	lb	\$0.60	\$396,000.00
	38	2-40 Ton indoor crane Includes crane and rail, not steel rail base)	86-68420	140,000	lb	\$0.60	\$84,000.00
	39	Compressed Air systems	86-68420	1,000	lb	\$0.60	\$600.00
	40	2 - CO2 systems	86-68420	2,100	lb	\$0.60	\$1,260.00
	41	Plant Water and Fire Protection	86-68420	3,100	lb	\$0.60	\$1,860.00
	42	Transformer Oil Fire protection	86-68420	6,500	lb	\$0.60	\$3,900.00
	43	Unwatering Piping	86-68420	32,000	lb	\$0.60	\$19,200.00
	44	Drainage Piping	86-68420	10,000	lb	\$0.60	\$6,000.00
		SUBTOTAL THIS SHEET					\$577,620.00

QUANTITIES		PRICES	
BY K. Converse	CHECKED T Turnage	BY <i>[Signature]</i> Craig A. Gush, P.E.	CHECKED <i>[Signature]</i> 05-18-11
DATE PREPARED 10/28/10	PEER REVIEW / DATE Dan Drake 11/1/10	DATE PREPARED 05/17/11	PEER REVIEW / DATE <i>[Signature]</i> 6/3/11

FEATURE: REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 2 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:					
	45	AC Generator, Indoor Vertical Unit 1 & 2 ea: 15 MVA (13.5 MW); 0.9PF, 6,600V, 171.5 RPM, 3 Ph, including rotating exciter Total weight each approximately: 230,000 lbs. Stator: 113,000 lbs., Rotor: 117,000 lbs. Exciter Assembly: 3,260 lbs. Heaviest lift: 117,000 lbs.	86-68430	2	EA	\$120,000.00	\$240,000.00
	46	Excitation equipment for 15 MVA Generator (2 sections) Total weight approximately: 1,000 lbs.	86-68430	2	EA	\$5,000.00	\$10,000.00
	47	Surge protection equip. for 15 MVA Generator Total weight approximately: 800 lbs.	86-68430	2	EA	\$1,500.00	\$3,000.00
	48	Neutral grounding equip. for 15 MVA Generator includes transformer Total weight approximately: 500 lbs.	86-68430	2	EA	\$1,500.00	\$3,000.00
		SUBTOTAL THIS SHEET					\$256,000.00

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY <i>[Signature]</i> Craig A. Gush, P.E.	CHECKED <i>[Signature]</i> 05-18-11
DATE PREPARED 10/19/10	PEER REVIEW / DATE L. Rossi 11/1/10	DATE PREPARED 05/17/11	PEER REVIEW / DATE <i>[Signature]</i> 6/3/11

FEATURE: REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable Low Powerhouse, Switchyard, and Transmission Line	PROJECT: Klamath River Northern California/Southern Oregon <hr/> 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 2\Klamath Dams Removal - COPCO 2 - Full Removal Option - REV#1 - MPL Feas Est - 4-2011.xlsx\Penstock
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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	Generator Switchgear, 7.2kV-includes unit breaker (2 Sections @ 2,400 lbs each section) 3 ft x 7.5 ft x 95 inches high Total weight approximately: 4,800 lbs.	86-68430	1	EA	\$15,000.00	\$15,000.00
	50	Station Service Switchgear, 600 volt -(5 sections) (400 lbs each section), 3 ft x 3ft x 90 inches high Total weight approximately: 2,000 lbs.	86-68430	1	EA	\$15,000.00	\$15,000.00
	51	Unit and plant control switchboard 5 cubicles (400 lbs each), 2ft x 2ft x 90 in. high Total weight approximately: 2,000 lbs.	86-68430	1	EA	\$14,000.00	\$14,000.00
	52	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
	53	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
	54	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
SUBTOTAL THIS SHEET							\$71,000.00

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY <i>[Signature]</i> Craig A. Grish, P.E.	CHECKED <i>[Signature]</i> 05-18-11
DATE PREPARED 10/19/10	PEER REVIEW / DATE L. Rossi 11/1/10	DATE PREPARED 05/17/11	PEER REVIEW / DATE <i>[Signature]</i> 6/3/11

FEATURE: REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 2 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 2\Klamath Dams Removal - COPCO 2 - Full Removal Option - REV#1 - MPL Feas Est - 4-2011.xlsx\Penstock

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		ELECTRICAL					
		Remove and dispose of the following equipment in the Powerplant:					
	55	7 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
	56	40-Ton Travelling Crane control equipment (5 cubicles), Total weight approximately: 500 lbs.	86-68430	1	EA	\$9,000.00	\$9,000.00
	57	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
		Remove and dispose of the following equipment outside the Powerplant:					
	58	Step-up Transformers, outdoor, oil-filled, 1-phase 10/20 MVA, 6,600/72,000 volt Total weight approximately each: 40,300 lbs.	86-68430	6	EA		Deleted
	59	Step-up Transformers, outdoor, oil-filled, 1-phase 10/20 MVA, 73,800/230,000 volt Total weight approximately each: 58,200 lbs.	86-68430	3	EA		Deleted
		Remove and dispose of the following equipment from switchyard:	86-68430				
	60	Transmission Line No. 15 From Copco No. 2 switchyard to Copco No. 2 plant 556 AAC, 69-kV	86-68430	0.14	mile	\$25,000.00	\$3,500.00
POWERHOUSE, SWITCHYARD, & TRANS LINE SUBTOTAL							\$1,554,820.00

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY <i>[Signature]</i> Craig A. Grush, P.E.	CHECKED <i>[Signature]</i> 05-18-11
DATE PREPARED 10/29/10	PEER REVIEW / DATE L. Rossi 11/1/10	DATE PREPARED 05/17/11	PEER REVIEW / DATE <i>[Signature]</i> 6/3/11

FEATURE: REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 2 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 2\Klamath Dams Removal - COPCO 2 - Full Removal Option - REV#1 - MPL Feas Est - 4-2011.xlsx\Penstock	

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
		Concrete and Structural Steel Items:					
	61	Remove Intake Structure Concrete. <i>All reinforced concrete. Includes structure plus entrance transition (to tunnel No. 1) D/S to construction joint at Sta. 0+20.00.</i>	86-68130	1,500	yd3	\$170.00	\$255,000.00
	62	Remove Concrete Items associated with 16-foot I.D. Wood Stave Pipe. <i>Assume reinforced concrete conduit sections will be removed between Tunnel No. 1 exit portal at Sta. 24+40 and the D/S end of concrete at Sta. 24+55, and between the U/S end of concrete at Sta. 37+70 and tunnel No. 2 entrance portal at Sta. 37+85. Assume the concrete conduit sections will be sawcut at the tunnel portals. Quantity also includes reinforced concrete in cradle footings for pipeline (148 footings spaced on 8- to 10-foot centers).</i>	86-68130	1,300	yd3	\$170.00	\$221,000.00
	63	Place Concrete Plugs for Tunnels. <i>There will be 9 plugs total (4 for tunnel No. 1 and 5 for tunnel No. 2). Plugs will be 2 feet thick, reinforced concrete, 3000 psi min. Location of plugs and info about openings is as follows: Tunnel No. 1, Sta. 0+20; Upper portal is a 16-ft dia., concrete-lined, horseshoe shape. Tunnel No. 1, Sta. 24+40; Lower portal is a 16-ft dia., concrete-lined, circular shape. Tunnel No. 1, Sta. 9+77.25; Top of air vent shaft is a 4-ft x 6-ft, concrete-box-lined (assumed) shaft. Tunnel No. 1, Sta. 9+96.96; Adit entrance (300 ft from tunnel) is a 7-ft x 7-ft, timber-lined opening. Tunnel No. 2, Sta. 37+85; Upper portal is a 16-ft dia., concrete-lined, horseshoe shape. Tunnel No. 2, Sta. 48+80; Lower portal is a double-barrel conduit; Each barrel is a 13.5-ft dia., steel-lined, circular shape. Tunnel No. 2, Sta. 47+75; Top of surge chamber air vent shaft is a 4-ft x 6-ft (assumed), concrete-box-lined (assumed) shaft. Tunnel No. 2; D/S end of Spill Tunnel, Sta. 3+30, is an approx. 15-ft to 16-ft dia., gunite-lined, horseshoe shape.</i>	86-68130	100	yd3	\$1,100.00	\$110,000.00
		SUBTOTAL THIS SHEET					\$586,000.00

QUANTITIES		PRICES	
BY Stephen Latham	CHECKED Jonathan East	BY Craig A. Grush, P.E.	CHECKED [Signature] 6-5-11
DATE PREPARED 10/19/10	PEER REVIEW / DATE Rick Benik P.E. 10/19/10	DATE PREPARED 05/17/11	PEER REVIEW / DATE [Signature] 6/3/11

FEATURE:		PROJECT:	
REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 2 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
		MECHANICAL					
		Remove and dispose of the following equipment at the Intake:					
	65	Caterpillar Gate : Gate, frame and hoist (steel)	86-68420	50,000	lb	\$0.60	\$30,000.00
	66	Trash rack and trash rake (steel)	86-68420	86,000	lb	\$0.60	\$51,600.00
	67	Stop Logs and slots for intake (steel) stop log slots embedded in concrete (~10,000 lb)	86-68420	220,000	lb	\$0.60	\$132,000.00
	68	Middle section of Penstock Wood staves soaked in creosote	86-68420	1,100,000	lb	\$0.65	\$715,000.00
	69	Cradles (steel)	86-68420	290,000	lb	\$0.60	\$174,000.00
	70	Bands (steel)	86-68420	463,000	lb	\$0.60	\$277,800.00
	71	Penstock after bifurcation to butterfly valves includes pipe, expansion joint and support rings (steel, partially encased in concrete supports)	86-68420	860,000	lb	\$0.60	\$516,000.00
	72	Bifurcated vent pipes and support structure	86-68420	19,500	lb	\$0.60	\$11,700.00
	73	2 - 138" Butterfly valves	86-68420	148,000	lb	\$0.60	\$88,800.00
		PENSTOCK SUBTOTAL					\$3,177,900.00

QUANTITIES		PRICES	
BY K. Converse	CHECKED T Turnage	BY <i>[Signature]</i> Craig A. Grush, P.E.	CHECKED <i>[Signature]</i> 05-14-11
DATE PREPARED 10/28/10	PEER REVIEW / DATE Dan Drake 11/1/10	DATE PREPARED 05/17/11	PEER REVIEW / DATE <i>[Signature]</i> 6/3/11

FEATURE: REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 2 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 2\Klamath Dams Removal - COPCO 2 - Full Removal Option - REV#1 - MPL Feas Est - 4-2011.xlsx\Penstock		

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		Diversion and Care					\$616,650.00
		Dam Removal					\$1,390,460.00
		Powerhouse/Switchyard/Transmission Line Removal					\$1,554,820.00
		Penstock Removal					\$3,177,900.00
		Reservoir Vegetative Restoration					\$0.00
		Road Improvements					\$0.00
		Recreational Facilities to be Removed					\$0.00
		Subtotal					\$6,739,830.00
		Mobilization	5%	+/-			\$340,000.00
		Subtotal 1 with Mobilization					\$7,079,830.00
		Escalation to Notice to Proceed (NTP), from July 2010 to July 2020 (assumes 1.5%/yr compounding over 10 years)					\$1,136,602.00
		Subtotal 2 = Subtotal 1 with Mobilization + Escalation to NTP					\$8,216,432.00
		Design Contingencies	8%	+/-			\$683,568.00
		Allowance for Procurement Strategies (APS)	0%	+/-			
		Type of solicitation assumed is: Competitive RFP					
		CONTRACT COST					\$8,900,000.00
		Construction Contingencies	18%	+/-			\$1,600,000.00
		FIELD COST					\$10,500,000.00
		Non-Contract Costs: (Environmental & Cultural Resources Mitigation ~ 35%, Design Data Collection ~ 1%, Engineering Design ~ 3%, Permitting ~ 2%, Procurement ~ 1%, Construction Management ~ 9%, and Closeout ~ 1%)	52%	+/-			\$5,500,000.00
		CONSTRUCTION COST					\$16,000,000.00
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 [Signature] 05-18-11
DATE PREPARED	PEER REVIEW / DATE Refer to Previous Sheets	DATE PREPARED 05/17/11	PEER REVIEW / DATE [Signature] 6/3/11

FEATURE:				PROJECT:			
REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 2 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 2\Klamath Dams Removal - COPCO 2 - Full Removal Option - REV#1 - MP Feas Est - 4-2011.xlsx\Penstock			

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
	1	Construct and Remove Embankment Cofferdam to Remove Right Side of Dam. Upstream cofferdam 2,300 cy Downstream cofferdam 800 cy Assumes 10 ft wide crest with 2:1 side slopes. Embankment material taken from borrow/waste area on left abutment of Iron Gate Dam, approximately 10 mile haul distance.	86-68130	3,100	cy	\$85.00	\$263,500.00
	2	Furnish, Install and Remove Riprap Upstream cofferdam 280 cy Downstream cofferdam 185 cy	86-68130	465	cy	\$150.00	\$69,750.00
	3	Provide Dewatering behind Cofferdams Assume two 3 inch portable trash pump operating for approximately 4 months.	86-68130	1	ls		\$45,000.00
	4	Remove Water from behind Cofferdams Upstream cofferdam 230,000 gals Downstream cofferdam 11,000 gals Assume 3 inch portable trash pump	86-68130	241,000	gals	\$0.01	\$2,410.00
	5	Construct and Remove Embankment Cofferdam to Remove Left Side of Dam. Also allows for removal of trashracks, caterpillar gate, and concrete intake structure, and to construct tunnel plug in the dry. Assumes 10 ft wide crest with 2:1 side slopes, approximately 300 ft long and 5 ft high. Embankment material taken from right side cofferdam.	86-68130	1,100	cy	\$85.00	\$93,500.00
	6	Furnish, Install and Remove Riprap Reuse riprap from right side cofferdam.	86-68130	250	cy	\$150.00	\$37,500.00
SUBTOTAL THIS SHEET							\$511,660.00

QUANTITIES		PRICES	
BY Rick Benik	CHECKED Sheena Barnes	BY <i>[Signature]</i> Craig A. Brush, P.E.	CHECKED <i>[Signature]</i> 04-14-11
DATE PREPARED 10/19/10	PEER REVIEW / DATE Tom Hepler P.E. 10/20/10	DATE PREPARED 04/14/11	PEER REVIEW / DATE <i>[Signature]</i> 4/14/11

FEATURE: REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable Diversion and Care	PROJECT: Klamath River Northern California/Southern Oregon <hr/> WOID: AF484 ESTIMATE LEVEL: Feasibility <hr/> REGION: MP UNIT PRICE LEVEL: July-2010 <hr/> FILE: C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 2\Klamath Dams Removal - COPCO 2 - Full Removal Option - REV#1 - MP Feas Est - 4-2011.xlsx\Penstock
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
	7	Provide Dewatering behind Left Side Cofferdam Assume 3 inch portable trash pump operating for approximately 4 months.	86-68130	1	ls		\$45,000.00
	8	Remove Water from behind Cofferdam Assume 3 inch portable trash pump	86-68130	36,000	gals	\$0.05	\$1,800.00
	9	Remove Water from behind Tailrace Cofferdam Unwatering of tailrace for removal of the powerhouse in the dry. Assume 3 inch portable trash pump	86-68130	400,000	gals	\$0.01	\$4,000.00
	10	Provide Dewatering behind Tailrace Cofferdam for removal of Powerhouse in the dry. Assume 3 inch portable trash pump operating for approximately 3 months.	86-68130	1	ls		\$35,000.00
	11	Construct Embankment Cofferdam across Tailrace to remove Powerhouse in dry. Assumes 10 ft wide crest with 2:1 side slopes, approximately 110 ft long and 12 ft high. Embankment material taken from Iron Gate Dam Removal, approximately 10 mile haul distance.	86-68130	1,700	yd3	\$85.00	\$144,500.00
SUBTOTAL THIS SHEET							\$230,300.00

QUANTITIES		PRICES	
BY Rick Benik	CHECKED Sheena Barnes	BY Craig A. Grush, P.E.	CHECKED 09-14-11
DATE PREPARED 10/19/10	PEER REVIEW / DATE Tom Hepler P.E. 10/20/10	DATE PREPARED 04/14/11	PEER REVIEW / DATE 4/14/11

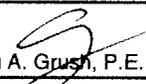
FEATURE: REVISION #2 Klamath River Dams Removal Full Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable Powerplant Access Road Bridge	PROJECT: Klamath River Northern California/Southern Oregon <hr/> WOID: AF484 ESTIMATE LEVEL: Appraisal <hr/> REGION: MP UNIT PRICE LEVEL: July-2010 <hr/> FILE: C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 2\Klamath Dams Removal - COPCO 2 - Full Removal Option - REV#2 - MP Feas Est - 4-2011.xls\Diversion & Care
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
	12	Construct 240-ft-long, 2-span concrete Bridge. 31-ft deck width (two 12-ft lanes, two 2-ft shoulders, additional width for jersey barriers along each side). To be constructed near existing bridge, which is to be kept in service until new bridge is ready for service. Design loading is HS-20 truck. Cost is based on unit cost per ft2 of deck for similar concrete bridge at Upper San Joaquin priced out in 2009.	86-68130	0	ft2	\$300.00	
	13	Remove and dispose of existing bridge. Bridge is approximately 231 feet long. Consists of 4 steel girder spans: One @ 40', one @ 75', one @ 56', one @ 60'. Timber deck (15'-16' wide) with wood running planks. Rails and wheel guards along both sides are timber. Two piers are concrete, third pier appears to be timber posts. Assume wood is pressure-treated. Assume girders contain paint with heavy metals.	86-68130	0	ls	\$400,000.00	
DIVERSION AND CARE SUBTOTAL							\$741,960.00

QUANTITIES		PRICES	
BY Stephen Latham	CHECKED Rick Benik	BY Craig A. Gush, P.E.	CHECKED 05-25-11
DATE PREPARED 11/08/10	PEER REVIEW / DATE Tom Hepler, P.E. 11/08/10	DATE PREPARED 05/25/11	PEER REVIEW / DATE 5/25/11

FEATURE: REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable Dam	PROJECT: Klamath River Northern California/Southern Oregon <hr/> WOID: AF484 ESTIMATE LEVEL: Feasibility <hr/> REGION: MP UNIT PRICE LEVEL: July-2010 <hr/> FILE: C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 2\Klamath Dams Removal - COPCO 2 - Full Removal Option - REV#1 - MP Feas Est - 4-2011.xlsx\Penstock
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
		Concrete and Structural Steel Items:					
	14	Remove Concrete in Dam. Reinforced concrete in ogee overflow section and in D/S apron and sidewalls, gate piers, hoist deck, & north wingwall (on right side, upstream of dam).	86-68130	4,400	yd3	\$315.00	\$1,386,000.00
	15	Remove concrete equipment slab from top of embankment wing dam on right abutment.	86-68130	5	yd3	\$215.00	\$1,075.00
	16	Remove Concrete Wingwall. Located on left side of spill tunnel outfall channel. Assume wall is unreinforced concrete.	86-68130	220	yd3	\$215.00	\$47,300.00
		SUBTOTAL THIS SHEET					\$1,434,375.00

QUANTITIES		PRICES	
BY Stephen Latham	CHECKED Jonathan East	BY  Craig A. Grush, P.E.	CHECKED  09-14-11
DATE PREPARED 10/19/10	PEER REVIEW / DATE Rick Benik P.E. 10/19/10	DATE PREPARED 04/14/11	PEER REVIEW / DATE  4/14/11

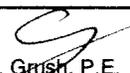
FEATURE: REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable Dam	PROJECT: Klamath River Northern California/Southern Oregon <hr/> WOID: AF484 ESTIMATE LEVEL: Feasibility <hr/> REGION: MP UNIT PRICE LEVEL: July-2010 <hr/> FILE: C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 2\Klamath Dams Removal - COPCO 2 - Full Removal Option - REV#1 - MP Feas Est - 4-2011.xlsx\Penstock
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		GEOTECHNICAL					
		These quantities represent the work required to remove the earth fill embankment and concrete cutoff wall of Copco 2 Dam to original ground surface.					
		Right Abutment Removal					
	17	Random Fill	86-68313	1,200	yd3	\$15.00	\$18,000.00
	18	Remove Hand Placed Riprap average size 12-inches, 8 inches thick	86-68313	7,800	ft2	\$1.00	\$7,800.00
	19	Gunite Curtain Wall similar to a concrete cutoff wall remove to 5' below excavated grade.	86-68313	210	yd3	\$215.00	\$45,150.00
		SUBTOTAL THIS SHEET					\$70,950.00

QUANTITIES		PRICES	
BY Randy Kuzniakowski	CHECKED Tuti Tierney	BY Craig A. Grush, P.E.	CHECKED 09-14-11
DATE PREPARED 11/01/10	PEER REVIEW / DATE Daniel W. Osmun 11/1/10	DATE PREPARED 04/14/11	PEER REVIEW / DATE 4/14/11

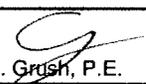
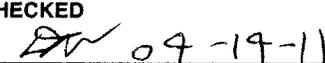
FEATURE: REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable Dam	PROJECT: Klamath River Northern California/Southern Oregon <hr/> WOID: AF484 ESTIMATE LEVEL: Feasibility REGION: MP UNIT PRICE LEVEL: July-2010 FILE: C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 2\Klamath Dams Removal - COPCO 2 - Full Removal Option - REV#1 - MP Feas Est - 4-2011.xls\Penstock
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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:					
	20	Hand Rails and Light Poles (Assume contains paint with heavy metals)	86-68420	5,000	lb	\$0.85	\$4,250.00
	21	Radial Gates and Hoists 5 radial gates, 2 hoists (2,900 lbs. each) (Assume contains paint with heavy metals & petroleum products)	86-68420	66,000	lb	\$0.85	\$56,100.00
	22	5 - Radial Gate stoplogs & slots (steel) (stoplog slots embedded in concrete ~1,500 lb each) (Assume contains paint with heavy metals)	86-68420	95,800	lb	\$0.85	\$81,430.00
SUBTOTAL THIS SHEET							\$141,780.00

QUANTITIES		PRICES	
BY K. Converse	CHECKED T Turnage	BY  Craig A. Grush, P.E.	CHECKED  04-14-11
DATE PREPARED 10/28/10	PEER REVIEW / DATE Dan Drake 11/1/10	DATE PREPARED 04/14/11	PEER REVIEW / DATE  4/14/11

FEATURE: REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable Dam	PROJECT: Klamath River Northern California/Southern Oregon <hr/> WOID: AF484 ESTIMATE LEVEL: Feasibility <hr/> REGION: MP UNIT PRICE LEVEL: July-2010 <hr/> FILE: C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 2\Klamath Dams Removal - COPCO 2 - Full Removal Option - REV#1 - MP Feas Est - 4-2011.xls\Penstock
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		ELECTRICAL					
		Remove and dispose of the following equipment at Spillway:					
	23	Spillway intake gate motor & control panel Total weight approximately: 500 lbs.	86-68430	1	EA	\$1,000.00	\$1,000.00
	24	Spillway radial gate motors & control panel Total weight approximately: 500 lbs.	86-68430	1	EA	\$1,000.00	\$1,000.00
	25	Spillway trashrake motor, festoon cable & control Total weight approximately: 100 lbs.	86-68430	1	EA	\$500.00	\$500.00
	26	Distribution equipment , panelboards Total weight approximately: 500 lbs.	86-68430	1	EA	\$4,500.00	\$4,500.00
		DAM SUBTOTAL					\$1,654,105.00

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY  Craig A. Grush, P.E.	CHECKED  DW 09-19-11
DATE PREPARED 10/19/10	PEER REVIEW / DATE L. Rossi 11/1/10	DATE PREPARED 04/14/11	PEER REVIEW / DATE  RCB 4/14/11

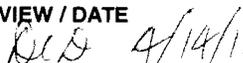
FEATURE: REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable Powerhouse, Switchyard, and Transmission Line	PROJECT: Klamath River Northern California/Southern Oregon <hr/> WOID: AF484 ESTIMATE LEVEL: Feasibility REGION: MP UNIT PRICE LEVEL: July-2010 FILE: C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 2\Klamath Dams Removal - COPCO 2 - Full Removal Option - REV#1 - MP Feas Est - 4-2011.xlsx\Penstock
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
		Concrete and Structural Steel Items:					
	27	Remove Copper Shingles from Roof of Powerhouse for Recycling.	86-68130	7,000	ft2	\$2.50	\$17,500.00
	28	Remove Powerhouse Concrete down to springline of the turbines, Elev. 2338 (USGS datum). Local datum is converted to USGS datum by adding 2211 feet. (Elev. 127.0 + 2211 = Elev. 2338.) All concrete is reinforced. Includes all exterior & interior walls, columns, & beams, and concrete in foundations for transformers (outside powerhouse).	86-68130	1,050	yd3	\$350.00	\$367,500.00
	29	Remove Structural Steel Items associated with Powerhouse. Includes columns, beams, crane girders, bracing, misc. shapes, roof trusses, purlins, etc. Assume contains paint with heavy metals.	86-68130	220,000	lb	\$0.85	\$187,000.00
	30	Remove Control House Concrete. Control house is located between the powerhouse and the switchyards. All concrete is reinforced.	86-68130	30	yd3	\$215.00	\$6,450.00
	31	Remove Control House Structural Steel Items. This is actually total metal weight for steel gutter frames (2174 lbs) with aluminum tread plate (1344 lbs). Assume contains paint with heavy metals.	86-68130	3,500	lb	\$0.85	\$2,975.00
	32	Remove Shop Building. Located just SW of the switchyards. See dwg PB-45621. Assume single story steel bldg on concrete slab. Estimate 40 ft x 90 ft.	86-68130	3,600	ft2	\$60.00	\$216,000.00
		SUBTOTAL THIS SHEET					\$797,425.00

QUANTITIES		PRICES	
BY Stephen Latham	CHECKED Jonathan East	BY Craig A. Grush, P.E.	CHECKED DW 04-14-11
DATE PREPARED 11/01/10	PEER REVIEW / DATE Rick Benik P.E. 11/1/10	DATE PREPARED 04/14/11	PEER REVIEW / DATE AKL 4/14/11

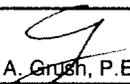
FEATURE: REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable Powerhouse, Switchyard, and Transmission Line	PROJECT: Klamath River Northern California/Southern Oregon <hr/> WOID: AF484 ESTIMATE LEVEL: Feasibility <hr/> REGION: MP UNIT PRICE LEVEL: July-2010 <hr/> FILE: C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 2\Klamath Dams Removal - COPCO 2 - Full Removal Option - REV#1 - MP Feas Est - 4-2011.xlsx\Penstock
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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:					
	33	2 - Governor oil systems governor, sump tanks, accumulator tank, piping (Assume contains paint with heavy metals & petroleum products)	86-68420	38,000	lb	\$0.85	\$32,300.00
	34	Cooling water and bearing oil systems (Assume contains paint with heavy metals & petroleum products)	86-68420	13,300	lb	\$0.85	\$11,305.00
	35	Oil / Water seperator tank and piping (Assume contains paint with heavy metals & petroleum products)	86-68420	2,700	lb	\$0.85	\$2,295.00
	36	12 - Cast Iron Columns (encased in concrete) (Assume contains paint with heavy metals)	86-68420	54,000	lb	\$0.85	\$45,900.00
	37	2 - Francis Turbines (includes runner, scroll case, draft tube and shaft) (Assume contains paint with heavy metals & petroleum products)	86-68420	660,000	lb	\$0.85	\$561,000.00
	38	2-40 Ton indoor crane Includes crane and rail, not steel rail base (Assume contains paint with heavy metals & petroleum products)	86-68420	140,000	lb	\$0.85	\$119,000.00
	39	Compressed Air systems (Assume contains paint with heavy metals & petroleum products)	86-68420	1,000	lb	\$0.85	\$850.00
	40	2 - CO2 systems (Assume contains paint with heavy metals & petroleum products)	86-68420	2,100	lb	\$0.85	\$1,785.00
	41	Plant Water and Fire Protection (Assume contains paint with heavy metals)	86-68420	3,100	lb	\$0.85	\$2,635.00
	42	Transformer Oil Fire protection (Assume contains paint with heavy metals & petroleum products)	86-68420	6,500	lb	\$0.85	\$5,525.00
	43	Unwatering Piping (Assume contains paint with heavy metals)	86-68420	32,000	lb	\$0.85	\$27,200.00
	44	Drainage Piping (Assume contains paint with heavy metals)	86-68420	10,000	lb	\$0.85	\$8,500.00
		SUBTOTAL THIS SHEET					\$818,295.00

QUANTITIES		PRICES	
BY K. Converse	CHECKED T Turnage	BY  Craig A. Grush, P.E.	CHECKED  09-14-11
DATE PREPARED 10/28/10	PEER REVIEW / DATE Dan Drake 11/1/10	DATE PREPARED 04/14/11	PEER REVIEW / DATE  4/14/11

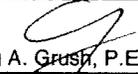
FEATURE: REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable Powerhouse, Switchyard, and Transmission Line	PROJECT: Klamath River Northern California/Southern Oregon <hr/> WOID: AF484 ESTIMATE LEVEL: Feasibility REGION: MP UNIT PRICE LEVEL: July-2010 FILE: C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 2\Klamath Dams Removal - COPCO 2 - Full Removal Option - REV#1 - MP Feas Est - 4-2011.xlsx\Penstock
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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:					
	45	AC Generator, Indoor Vertical Unit 1 & 2 ea: 15 MVA (13.5 MW); 0.9PF, 6,600V, 171.5 RPM, 3 Ph, including rotating exciter Total weight each approximately: 230,000 lbs. Stator: 113,000 lbs., Rotor: 117,000 lbs. Exciter Assembly: 3,260 lbs. Heaviest lift: 117,000 lbs.	86-68430	2	EA	\$125,000.00	\$250,000.00
	46	Excitation equipment for 15 MVA Generator (2 sections)Total weight approximately: 1,000 lbs.	86-68430	2	EA	\$6,000.00	\$12,000.00
	47	Surge protection equip. for 15 MVA Generator Total weight approximately: 800 lbs.	86-68430	2	EA	\$2,000.00	\$4,000.00
	48	Neutral grounding equip. for 15 MVA Generator includes transformer Total weight approximately: 500 lbs.	86-68430	2	EA	\$2,000.00	\$4,000.00
		SUBTOTAL THIS SHEET					\$270,000.00

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY  Craig A. Grush, P.E.	CHECKED  04-14-11
DATE PREPARED 10/19/10	PEER REVIEW / DATE L. Rossi 11/1/10	DATE PREPARED 04/14/11	PEER REVIEW / DATE  4/14/11

FEATURE: REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable Powerhouse, Switchyard, and Transmission Line	PROJECT: Klamath River Northern California/Southern Oregon <hr/> 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 2\Klamath Dams Removal - COPCO 2 - Full Removal Option - REV#1 - MP Feas Est - 4-2011.xlsx\Penstock
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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	Generator Switchgear, 7.2kV-includes unit breaker (2 Sections @ 2,400 lbs each section) 3 ft x 7.5 ft x 95 inches high Total weight approximately: 4,800 lbs.	86-68430	1	EA	\$20,000.00	\$20,000.00
	50	Station Service Switchgear, 600 volt -(5 sections) (400 lbs each section), 3 ft x 3ft x 90 inches high Total weight approximately: 2,000 lbs.	86-68430	1	EA	\$20,000.00	\$20,000.00
	51	Unit and plant control switchboard 5 cubicles (400 lbs each), 2ft x 2ft x 90 in. high Total weight approximately: 2,000 lbs.	86-68430	1	EA	\$15,000.00	\$15,000.00
	52	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
	53	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	\$15,000.00	\$15,000.00
	54	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	\$5,000.00	\$5,000.00
		SUBTOTAL THIS SHEET					\$85,000.00

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY  Craig A. Grush, P.E.	CHECKED  04-14-11
DATE PREPARED 10/19/10	PEER REVIEW / DATE L. Rossi 11/1/10	DATE PREPARED 04/14/11	PEER REVIEW / DATE  4/14/11

FEATURE: REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable Powerhouse, Switchyard, and Transmission Line	PROJECT: Klamath River Northern California/Southern Oregon <hr/> 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 2\Klamath Dams Removal - COPCO 2 - Full Removal Option - REV#1 - MP Feas Est - 4-2011.xlsx\Penstock
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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:					
	55	7 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	\$2,500.00	\$2,500.00
	56	40-Ton Travelling Crane control equipment (5 cubicles), Total weight approximately: 500 lbs.	86-68430	1	EA	\$10,000.00	\$10,000.00
	57	40-Ton Travelling Crane Festoon Cable (approx. 200 lin. Ft. cable) Total weight approximately: 800 lbs.	86-68430	1	EA	\$1,500.00	\$1,500.00
		Remove and dispose of the following equipment outside the Powerplant:					
	58	Step-up Transformers, outdoor, oil-filled, 1-phase 10/20 MVA, 6,600/72,000 volt Total weight approximately each: 40,300 lbs.	86-68430	6	EA		Deleted
	59	Step-up Transformers, outdoor, oil-filled, 1-phase 10/20 MVA, 73,800/230,000 volt Total weight approximately each: 58,200 lbs.	86-68430	3	EA		Deleted
		Remove and dispose of the following equipment from switchyard:	86-68430				
	60	Transmission Line No. 15 From Copco No. 2 switchyard to Copco No. 2 plant 556 AAC, 69-kV	86-68430	0.14	mile	\$30,000.00	\$4,200.00
POWERHOUSE, SWITCHYARD, & TRANS LINE SUBTOTAL							\$1,988,920.00

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY <i>[Signature]</i> Craig A. Grush, P.E.	CHECKED <i>[Signature]</i> 04-14-11
DATE PREPARED 10/29/10	PEER REVIEW / DATE L. Rossi 11/1/10	DATE PREPARED 04/14/11	PEER REVIEW / DATE <i>[Signature]</i> 4/14/11

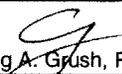
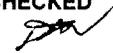
FEATURE:				PROJECT:			
REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable Penstock				Klamath River Northern California/Southern Oregon			
		WOID: AF484		ESTIMATE LEVEL: Feasibility			
		REGION: MP		UNIT PRICE LEVEL: July-2010			
FILE:				C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 2\Klamath Dams Removal - COPCO 2 - Full Removal Option - REV#1 - MP Feas Est - 4-2011.xlsx\Penstock			

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
		Concrete and Structural Steel Items:					
	61	Remove Intake Structure Concrete. <i>All reinforced concrete. Includes structure plus entrance transition (to tunnel No. 1) D/S to construction joint at Sta. 0+20.00.</i>	86-68130	1,500	yd3	\$215.00	\$322,500.00
	62	Remove Concrete Items associated with 16-foot I.D. Wood Stave Pipe. <i>Assume reinforced concrete conduit sections will be removed between Tunnel No. 1 exit portal at Sta. 24+40 and the D/S end of concrete at Sta. 24+55, and between the U/S end of concrete at Sta. 37+70 and tunnel No. 2 entrance portal at Sta. 37+85. Assume the concrete conduit sections will be sawcut at the tunnel portals. Quantity also includes reinforced concrete in cradle footings for pipeline (148 footings spaced on 8- to 10-foot centers).</i>	86-68130	1,300	yd3	\$215.00	\$279,500.00
	63	Place Concrete Plugs for Tunnels. <i>There will be 9 plugs total (4 for tunnel No. 1 and 5 for tunnel No. 2). Plugs will be 2 feet thick, reinforced concrete, 3000 psi min. Location of plugs and info about openings is as follows: Tunnel No. 1, Sta. 0+20; Upper portal is a 16-ft dia., concrete-lined, horseshoe shape. Tunnel No. 1, Sta. 24+40; Lower portal is a 16-ft dia., concrete-lined, circular shape. Tunnel No. 1, Sta. 9+77.25; Top of air vent shaft is a 4-ft x 6-ft, concrete-box-lined (assumed) shaft. Tunnel No. 1, Sta. 9+96.96; Adit entrance (300 ft from tunnel) is a 7-ft x 7-ft, timber-lined opening. Tunnel No. 2, Sta. 37+85; Upper portal is a 16-ft dia., concrete-lined, horseshoe shape. Tunnel No. 2, Sta. 48+80; Lower portal is a double-barrel conduit; Each barrel is a 13.5-ft dia., steel-lined, circular shape. Tunnel No. 2, Sta. 47+75; Top of surge chamber air vent shaft is a 4-ft x 6-ft (assumed), concrete-box-lined (assumed) shaft. Tunnel No. 2, D/S end of Spill Tunnel, Sta. 3+30, is an approx. 15-ft to 16-ft dia., gunite-lined, horseshoe shape.</i>	86-68130	100	yd3	\$1,200.00	\$120,000.00
SUBTOTAL THIS SHEET							\$722,000.00

QUANTITIES		PRICES	
BY Stephen Latham	CHECKED Jonathan East	BY <i>[Signature]</i> Craig A. Grish, P.E.	CHECKED <i>[Signature]</i> 07-19-11
DATE PREPARED 10/19/10	PEER REVIEW / DATE Rick Benik P.E. 10/19/10	DATE PREPARED 04/14/11	PEER REVIEW / DATE <i>[Signature]</i> 4/14/11

FEATURE: REVISION #1 Klamath River Dams Removal Full Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable Penstock	PROJECT: Klamath River Northern California/Southern Oregon <hr/> WOID: AF484 ESTIMATE LEVEL: Feasibility REGION: MP UNIT PRICE LEVEL: July-2010 <hr/> FILE: C:\Estimating\Klamath\Klamath River Dams\Removal\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 2\Klamath Dams Removal - COPCO 2 - Full Removal Option - REV#1 - MP Feas Est - 4-2011.xlsx\Penstock
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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:					
	65	Caterpillar Gate : Gate, frame and hoist (steel) (Assume contains paint with heavy metals & petroleum products)	86-68420	50,000	lb	\$0.85	\$42,500.00
	66	Trash rack and trash rake (steel)	86-68420	86,000	lb	\$0.75	\$64,500.00
	67	Stop Logs and slots for intake (steel) stop log slots embedded in concrete (~10,000 lb) (Assume contains paint with heavy metals)	86-68420	220,000	lb	\$0.85	\$187,000.00
	68	Middle section of Penstock Wood staves soaked in creosote	86-68420	1,100,000	lb	\$0.70	\$770,000.00
	69	<i>Cradles (steel)</i> (Assume contains paint with heavy metals)	86-68420	290,000	lb	\$0.85	\$246,500.00
	70	<i>Bands (steel)</i> (Assume contains paint with heavy metals)	86-68420	463,000	lb	\$0.85	\$393,550.00
	71	Penstock after bifurcation to butterfly valves includes pipe, expansion joint and support rings (steel, partially encased in concrete supports) (Assume contains paint with heavy metals)	86-68420	860,000	lb	\$0.85	\$731,000.00
	72	Bifurcated vent pipes and support structure (Assume contains paint with heavy metals)	86-68420	19,500	lb	\$0.85	\$16,575.00
	73	2 - 138" Butterfly valves (Assume contains paint with heavy metals & petroleum products)	86-68420	148,000	lb	\$0.85	\$125,800.00
		PENSTOCK SUBTOTAL					\$4,051,925.00

QUANTITIES		PRICES	
BY K. Converse	CHECKED T Turnage	BY 	CHECKED  09-14-11
DATE PREPARED 10/28/10	PEER REVIEW / DATE Dan Drake 11/1/10	DATE PREPARED 04/14/11	PEER REVIEW / DATE  4/14/11

FEATURE:
REVISION #1
Klamath River Dams Removal
Full Removal Option
Copco No. 2 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\Feasibility Estimates\MPL, MP, MPH - Revision #1 - 2011-03\Copco 2\Klamath Dams Removal - COPCO 2 - Full Removal Option - REV#1 - MP Feas Est - 4-2011.xlsx\Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		Diversion and Care					\$741,960.00
		Dam Removal					\$1,654,105.00
		Powerhouse/Switchyard/Transmission Line Removal					\$1,988,920.00
		Penstock Removal					\$4,051,925.00
		Reservoir Vegetative Restoration					\$0.00
		Road Improvements					\$0.00
		Recreational Facilities to be Removed					\$0.00
		Subtotal					\$8,436,910.00
		Mobilization	5%	+/-			\$420,000.00
		Subtotal 1 with Mobilization					\$8,856,910.00
		Escalation to Notice to Proceed (NTP), from July 2010 to July 2020 (assumes 3%/yr compounding over 10 years)					\$3,046,036.00
		Subtotal 2 = Subtotal 1 with Mobilization + Escalation to NTP					\$11,902,946.00
		Design Contingencies	10%	+/-			\$1,197,054.00
		Allowance for Procurement Strategies (APS)	0%	+/-			
		Type of solicitation assumed is: Competitive RFP					
		CONTRACT COST					\$13,100,000.00
		Construction Contingencies	20%	+/-			\$2,400,000.00
		FIELD COST					\$15,500,000.00
		Non-Contract Costs: (Environmental & Cultural Resources Mitigation ~ 35%, Design Data Collection ~ 1%, Engineering Design ~ 4%, Permitting ~ 3%, Procurement ~ 1%, Construction Management ~ 10%, and Closeout ~ 1%)	55%	+/-			\$8,500,000.00
		CONSTRUCTION COST					\$24,000,000.00
		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 09-18-11
DATE PREPARED	PEER REVIEW / DATE Refer to Previous Sheets	DATE PREPARED 04/18/11	PEER REVIEW / DATE DOD 4/20/11

FEATURE:		PROJECT:	
Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable Diversion and Care		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 2\Klamath Dams Removal - COPCO 2 - Partial Removal Option - MP Feas Est - 4-2011.xlsx\Summary	

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
	1	Construct and Remove Embankment Cofferdam to Remove Right Side of Dam. Upstream cofferdam 2,300 cy Downstream cofferdam 800 cy Assumes 10 ft wide crest with 2:1 side slopes. Embankment material taken from borrow/waste area on left abutment of Iron Gate Dam, approximately 10 mile haul distance.	86-68130	3,100	cy	\$85.00	\$263,500.00
	2	Furnish, Install and Remove Riprap Upstream cofferdam 280 cy Downstream cofferdam 185 cy	86-68130	465	cy	\$150.00	\$69,750.00
	3	Provide Dewatering behind Cofferdams Assume two 3 inch portable trash pump operating for approximately 4 months.	86-68130	1	ls		\$45,000.00
	4	Remove Water from behind Cofferdams Upstream cofferdam 230,000 gals Downstream cofferdam 11,000 gals Assume 3 inch portable trash pump	86-68130	241,000	gals	\$0.01	\$2,410.00
	5	Construct and Remove Embankment Cofferdam to Remove Left Side of Dam. Also allows for removal of trashracks, caterpillar gate, and concrete intake structure, and to construct tunnel plug in the dry. Assumes 10 ft wide crest with 2:1 side slopes, approximately 300 ft long and 5 ft high. Embankment material taken from right side cofferdam.	86-68130	1,100	cy	\$85.00	\$93,500.00
	6	Furnish, Install and Remove Riprap Reuse riprap from right side cofferdam.	86-68130	250	cy	\$150.00	\$37,500.00
SUBTOTAL THIS SHEET							\$511,660.00

QUANTITIES		PRICES	
BY Rick Benik	CHECKED Sheena Barnes	BY Craig A. Grush, P.E.	CHECKED <i>[Signature]</i> 4/22/11
DATE PREPARED 11/19/10	PEER REVIEW / DATE Tom Hepler P.E. 12/10/10	DATE PREPARED 04/22/11	PEER REVIEW / DATE <i>[Signature]</i> 4/22/11

FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable Diversion and Care	PROJECT: Klamath River Northern California/Southern Oregon <hr/> WOID: AF121 ESTIMATE LEVEL: Feasibility <hr/> REGION: MP UNIT PRICE LEVEL: July-2010 <hr/> FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 2\Klamath Dams Removal - COPCO 2 - Partial Removal Option - MP Feas Est - 4-2011.xlsx\Ssummary
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
	7	Provide Dewatering behind Left Side Cofferdam Assume 3 inch portable trash pump operating for approximately 4 months.	86-68130	1	ls		\$45,000.00
	8	Remove Water from behind Cofferdam Assume 3 inch portable trash pump	86-68130	36,000	gals	\$0.05	\$1,800.00
	9	Remove Water from behind Tailrace Cofferdam Unwatering of tailrace for removal of the powerhouse in the dry. Assume 3 inch portable trash pump	86-68130	400,000	gals		DELETED
	10	Provide Dewatering behind Tailrace Cofferdam for removal of Powerhouse in the dry. Assume 3 inch portable trash pump operating for approximately 3 months.	86-68130	4	ls		DELETED
	11	Construct Embankment Cofferdam across Tailrace to remove Powerhouse in dry. Assumes 10 ft wide crest with 2:1 side slopes, approximately 110 ft long and 12 ft high. Embankment material taken from Iron Gate Dam Removal, approximately 10 mile haul distance.	86-68130	1,700	yd3		DELETED
		SUBTOTAL THIS SHEET					\$46,800.00

QUANTITIES		PRICES	
BY Rick Benik	CHECKED Sheena Barnes	BY Craig A. Grush, P.E.	CHECKED <i>[Signature]</i> 4/22/11
DATE PREPARED 11/19/10	PEER REVIEW / DATE Tom Hepler P.E. 12/10/10	DATE PREPARED 04/22/11	PEER REVIEW / DATE <i>[Signature]</i> 4/22/11

FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable Powerplant Access Road Bridge	PROJECT: Klamath River Northern California/Southern Oregon <hr/> WOID: AF121 ESTIMATE LEVEL: Appraisal <hr/> REGION: MP UNIT PRICE LEVEL: July-2010 <hr/> FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 2\Klamath Dams Removal - COPCO 2 - Partial Removal Option - MP Feas Est - 4-2011.xlsx\SSummary
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
	12	Construct 240-ft long, 2-span concrete Bridge. 31-ft deck width (two 12-ft lanes, two 2-ft shoulders, additional width for jersey barriers along each side). To be constructed near existing bridge, which is to be kept in service until new bridge is ready for service. Design loading is HS-20 truck. Cost is based on unit cost per ft ² of deck for similar concrete bridge at Upper San Joaquin priced out in 2000.	86-68130	7,440	ft ²		DELETED
	13	Remove and dispose of existing bridge. Bridge is approximately 231 feet long. Consists of 4 steel girder spans: One @ 40', one @ 75', one @ 56', one @ 60'. Timber deck (15'-16' wide) with wood running planks. Rails and wheel guards along both sides are timber. Two piers are concrete, third pier appears to be timber posts. Assume wood is pressure-treated. Assume girders contain paint with heavy metals.	86-68130	1	ls		DELETED
DIVERSION AND CARE SUBTOTAL							\$558,460.00

QUANTITIES		PRICES	
BY Stephen Latham	CHECKED Rick Benik	BY Craig A. Grush, P.E.	CHECKED Tom Hepler 4/22/11
DATE PREPARED 11/08/10	PEER REVIEW / DATE Tom Hepler, P.E. 11/08/10	DATE PREPARED 04/22/11	PEER REVIEW / DATE Craig A. Grush 4/22/11

FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable Dam	PROJECT: Klamath River Northern California/Southern Oregon <hr/> WOID: AF121 ESTIMATE LEVEL: Feasibility <hr/> REGION: MP UNIT PRICE LEVEL: July-2010 <hr/> FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 2\Klamath Dams Removal - COPCO 2 - Partial Removal Option - MP Feas Est - 4-2011.xlsx Summary
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
		Concrete and Structural Steel Items:					
	14	Remove Concrete in Dam. Reinforced concrete in ogee overflow section and in D/S apron, left sidewall, right sidewall , gate piers, hoist deck, & north wingwall (on right side, upstream of dam).	86-68130	4,200	yd3	\$315.00	\$1,323,000.00
	15	Remove concrete equipment slab from top of embankment wing dam on right abutment.	86-68130	5	yd3	\$215.00	\$1,075.00
	16	Remove Concrete Wingwall. Located on left side of spill tunnel outfall channel. Assume wall is unreinforced concrete.	86-68130	220	yd3	\$215.00	\$47,300.00
		SUBTOTAL THIS SHEET					\$1,371,375.00

QUANTITIES		PRICES	
BY Stephen Latham	CHECKED Jonathan East	BY Craig A. Grish, P.E.	CHECKED 4/22/11
DATE PREPARED 11/19/10	PEER REVIEW / DATE Rick Benik P.E. 12/11/10	DATE PREPARED 04/22/11	PEER REVIEW / DATE 4/22/11

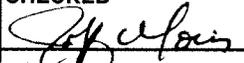
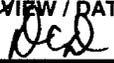
FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable Dam	PROJECT: Klamath River Northern California/Southern Oregon <hr/> WOID: AF121 ESTIMATE LEVEL: Feasibility <hr/> REGION: MP UNIT PRICE LEVEL: July-2010 <hr/> FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 2\Klamath Dams Removal - COPCO 2 - Partial Removal Option - MP Feas Est - 4-2011.xlsx\SSummary
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		GEOTECHNICAL					
		These quantities represent the work required to remove the earth fill embankment and concrete cutoff wall of Copco 2 Dam to original ground surface.					
		Right Abutment Removal					
	17	Random Fill	86-68313	1,200	yd3		DELETED
	18	Remove Hand Placed Riprap average size 12 inches, 8 inches thick	86-68313	7,800	ft2		DELETED
	19	Gunite Curtain Wall similar to a concrete cutoff wall remove to 5' below excavated grade.	86-68313	210	yd3		DELETED
		SUBTOTAL THIS SHEET					

QUANTITIES		PRICES	
BY Randy Kuzniakowski	CHECKED Tuti Tierney	BY Craig A. Grush, P.E.	CHECKED 4/22/11
DATE PREPARED 11/19/10	PEER REVIEW / DATE Daniel W. Osmun 12/20/10	DATE PREPARED 04/22/11	PEER REVIEW / DATE 4/22/11

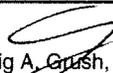
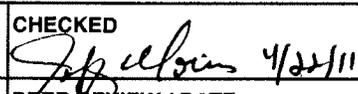
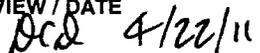
FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable Dam	PROJECT: Klamath River Northern California/Southern Oregon
	WOID: AF121 ESTIMATE LEVEL: Feasibility
	REGION: MP UNIT PRICE LEVEL: July-2010
	FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 2\Klamath Dams Removal - COPCO 2 - 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:					
	20	Hand Rails and Light Poles (Assume contains paint with heavy metals)	86-68420	5,000	lb	\$0.85	\$4,250.00
	21	Radial Gates and Hoists 5 radial gates, 2 hoists (2,900 lbs. each) (Assume contains paint with heavy metals & petroleum products)	86-68420	66,000	lb	\$0.85	\$56,100.00
	22	5 - Radial Gate stoplogs & slots (steel) (stoplog slots embedded in concrete ~1,500 lb each) (Assume contains paint with heavy metals)	86-68420	95,800	lb	\$0.85	\$81,430.00
SUBTOTAL THIS SHEET							\$141,780.00

QUANTITIES		PRICES	
BY K. Converse	CHECKED T Turnage	BY  Craig A. Grush, P.E.	CHECKED  4/22/11
DATE PREPARED 11/19/10	PEER REVIEW / DATE Dan Drake 12/16/10	DATE PREPARED 04/22/11	PEER REVIEW / DATE  4/22/11

FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 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 2\Klamath Dams Removal - COPCO 2 - Partial Removal Option - MP Feas Est - 4-2011.xlsx\Ssummary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		ELECTRICAL					
		Remove and dispose of the following equipment at Spillway:					
	23	Spillway intake gate motor & control panel Total weight approximately: 500 lbs.	86-68430	1	EA	\$1,000.00	\$1,000.00
	24	Spillway radial gate motors & control panel Total weight approximately: 500 lbs.	86-68430	1	EA	\$1,000.00	\$1,000.00
	25	Spillway trashrake motor, festoon cable & control Total weight approximately: 100 lbs.	86-68430	1	EA	\$500.00	\$500.00
	26	Distribution equipment , panelboards Total weight approximately: 500 lbs.	86-68430	1	EA	\$4,500.00	\$4,500.00
		DAM SUBTOTAL					\$1,520,155.00

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY  Craig A. Grush, P.E.	CHECKED  4/22/11
DATE PREPARED 11/19/10	PEER REVIEW / DATE L. Rossi 12/15/10	DATE PREPARED 04/22/11	PEER REVIEW / DATE  4/22/11

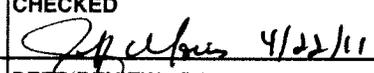
FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable Powerhouse, Switchyard, and Transmission Line	PROJECT: Klamath River Northern California/Southern Oregon <hr/> WOID: AF121 ESTIMATE LEVEL: Feasibility <hr/> REGION: MP UNIT PRICE LEVEL: July-2010 <hr/> FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 2\Klamath Dams Removal - COPCO 2 - Partial Removal Option - MP Feas Est - 4-2011.xlsx Summary
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
		Concrete and Structural Steel Items:					
	27	Remove Copper Shingles from Roof of Power-house for Recycling.	86-68130	7,000	ft2		DELETED
	28	Remove Powerhouse Concrete down to spring-line of the turbines, Elev. 2338 (USGS datum). Local datum is converted to USGS datum by adding 2211 feet. (Elev. 127.0 + 2211 = Elev. 2338.) All concrete is reinforced. Includes all exterior & interior walls, columns, & beams, and concrete in foundations for transformers (outside powerhouse).	86-68130	1,050	yd3		DELETED
	29	Remove Structural Steel Items associated with Powerhouse. Includes columns, beams, crane girders, bracing, misc. shapes, roof trusses, purlins, etc. Assume contains paint with heavy metals.	86-68130	220,000	lb		DELETED
	30	Remove Control House Concrete. Control house is located between the powerhouse and the switchyards. All concrete is reinforced.	86-68130	30	yd3	\$215.00	\$6,450.00
	31	Remove Control House Structural Steel Items. This is actually total metal weight for steel gutter frames (2174 lbs) with aluminum tread plate (1344 lbs). Assume contains paint with heavy metals.	86-68130	3,500	lb	\$0.85	\$2,975.00
	32	Remove Shop Building Located just SW of the switchyards. See dwg PB-45621. Assume single story steel bldg on concrete slab. Estimate 40 ft x 90 ft.	86-68130	3,600	ft2		DELETED
SUBTOTAL THIS SHEET							\$9,425.00

QUANTITIES		PRICES	
BY Stephen Latham	CHECKED Jonathan East	BY Craig A. Grush, P.E.	CHECKED <i>[Signature]</i> 4/22/11
DATE PREPARED 11/19/10	PEER REVIEW / DATE Rick Benik P.E. 12/1/10	DATE PREPARED 04/22/11	PEER REVIEW / DATE <i>[Signature]</i> 4/22/11

FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable Powerhouse, Switchyard, and Transmission Line	PROJECT: Klamath River Northern California/Southern Oregon <hr/> WOID: AF121 ESTIMATE LEVEL: Feasibility <hr/> REGION: MP UNIT PRICE LEVEL: July-2010 <hr/> FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 2\Klamath Dams Removal - COPCO 2 - Partial Removal Option - MP Feas Est - 4-2011.xlsx\Summary
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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:					
	33	2 - Governor oil systems governor, sump tanks, accumulator tank, piping (Assume contains paint with heavy metals & petroleum products)	86-68420	38,000	lb		DELETED
	34	Cooling water and bearing oil systems (Assume contains paint with heavy metals & petroleum products)	86-68420	13,300	lb		DELETED
	35	Oil / Water separator tank and piping (Assume contains paint with heavy metals & petroleum products)	86-68420	2,700	lb		DELETED
	36	12 - Cast Iron Columns (encased in concrete) (Assume contains paint with heavy metals)	86-68420	54,000	lb		DELETED
	37	2 - Francis Turbines (includes runner, scroll case, draft tube and shaft) (Assume contains paint with heavy metals & petroleum products)	86-68420	660,000	lb		DELETED
	38	2-40 Ton indoor crane Includes crane and rail, not steel rail base) (Assume contains paint with heavy metals & petroleum products)	86-68420	140,000	lb		DELETED
	39	Compressed Air systems (Assume contains paint with heavy metals & petroleum products)	86-68420	1,000	lb		DELETED
	40	2 - CO2 systems (Assume contains paint with heavy metals & petroleum products)	86-68420	2,100	lb		DELETED
	41	Plant Water and Fire Protection (Assume contains paint with heavy metals)	86-68420	3,100	lb		DELETED
	42	Transformer Oil Fire protection (Assume contains paint with heavy metals & petroleum products)	86-68420	6,500	lb		DELETED
	43	Unwatering Piping (Assume contains paint with heavy metals)	86-68420	32,000	lb		DELETED
	44	Drainage Piping (Assume contains paint with heavy metals)	86-68420	10,000	lb		DELETED
		SUBTOTAL THIS SHEET					

QUANTITIES		PRICES	
BY K. Converse	CHECKED T Turnage	BY 	CHECKED 
DATE PREPARED 12/08/10	PEER REVIEW / DATE Dan Drake 12/16/10	DATE PREPARED 04/22/11	PEER REVIEW / DATE  4/22/11

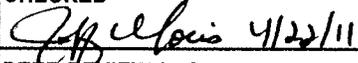
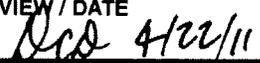
FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable Powerhouse, Switchyard, and Transmission Line	PROJECT: Klamath River Northern California/Southern Oregon <hr/> WOID: AF121 ESTIMATE LEVEL: Feasibility <hr/> REGION: MP UNIT PRICE LEVEL: July-2010 <hr/> FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 2\Klamath Dams Removal - COPCO 2 - Partial Removal Option - MP Feas Est - 4-2011.xlsx Summary
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		MECHANICAL					
		Remove and dispose of the following petroleum products at or near the Power House:					
	44A	Remove Petroleum Products from Mechanical Equipment.	86-68420	3,300	gal	\$10.00	\$33,000.00
		Includes quantities for the following equipment: From Item 35, Units 1 & 2, bearing oil systems. DTE heavy oil, 470 gal. per unit, 940 gal. total. From Item 31, Units 1 & 2, governor oil sumps and accumulator tanks. Hydraulic oil, 1,200 gal. per unit, 2,400 gal. total. The remaining items contain petroleum products in amounts too small to be considered for this level of estimate.					
	44B	Remove Petroleum Products at or near the Power House.	86-68420	2,000	gal	\$10.00	\$20,000.00
		Includes quantities for the following: Oil supply storage area drums. New oil, approx. 7 drums @ 55 gal. Oil storage area drums. New and used oil, approx. 2 drums @ 55 gal. Convault fuel tanks. Diesel fuel tank @ 500 gal., Gasoline tank @ 1,000 gal. Tanks to remain on-site.					
		SUBTOTAL THIS SHEET					\$53,000.00

QUANTITIES		PRICES	
BY K. Converse	CHECKED T Turnage	BY <i>Craig A. Grush P.E.</i>	CHECKED <i>Jeff Lewis</i> 4/22/11
DATE PREPARED 12/08/10	PEER REVIEW / DATE Dan Drake 12/16/10	DATE PREPARED 4/22/11	PEER REVIEW / DATE <i>DED</i> 4/22/11

FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable Powerhouse, Switchyard, and Transmission Line	PROJECT: Klamath River Northern California/Southern Oregon <hr/> WOID: AF121 ESTIMATE LEVEL: Feasibility <hr/> REGION: MP UNIT PRICE LEVEL: July-2010 <hr/> FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 2\Klamath Dams Removal - COPCO 2 - Partial Removal Option - MP Feas Est - 4-2011.xlsx)Summary
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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:					
	45	AC Generator, Indoor-Vertical Unit 1 & 2 ea: 15 MVA (13.5 MW); 0.9PF, 6,600V, 171.5 RPM, 3 Ph, including rotating exciter Total weight each approximately: 230,000 lbs. Stator: 113,000 lbs., Rotor: 117,000 lbs. Exciter Assembly: 3,260 lbs. Heaviest lift: 117,000 lbs.	86-68430	2	EA		DELETED
	46	Excitation equipment for 15 MVA Generator (2 sections) Total weight approximately: 1,000 lbs.	86-68430	2	EA		DELETED
	47	Surge protection equip. for 15 MVA Generator Total weight approximately: 800 lbs.	86-68430	2	EA		DELETED
	48	Neutral grounding equip. for 15 MVA Generator includes transformer Total weight approximately: 600 lbs.	86-68430	2	EA		DELETED
		SUBTOTAL THIS SHEET					

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY  Craig A. Grish, P.E.	CHECKED  4/22/11
DATE PREPARED 12/08/10	PEER REVIEW / DATE L. Rossi 12/16/10	DATE PREPARED 04/22/11	PEER REVIEW / DATE  4/22/11

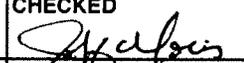
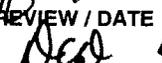
FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable Powerhouse, Switchyard, and Transmission Line	PROJECT: Klamath River Northern California/Southern Oregon <hr/> WOID: AF121 ESTIMATE LEVEL: Feasibility <hr/> REGION: MP UNIT PRICE LEVEL: July-2010 <hr/> FILE: C:\Estimating\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 2\Klamath Dams Removal - COPCO 2 - Partial Removal Option - MP Feas Est - 4-2011.xlsx\Summary
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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	Generator Switchgear, 7.2kV- includes unit breaker (2 Sections @ 2,400 lbs each section) 3 ft x 7.5 ft x 95 inches high- Total weight approximately: 4,800 lbs.-	86-68430	1	EA		DELETED
	50	Station Service Switchgear, 600 volt (5 sections) (400 lbs each section), 3 ft x 3ft x 90 inches high- Total weight approximately: 2,000 lbs.-	86-68430	1	EA		DELETED
	51	Unit and plant control switchboard 5 cubicles (400 lbs each), 2ft x 2ft x 90 in. high- Total weight approximately: 2,000 lbs.-	86-68430	1	EA		DELETED
	52	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
	53	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
	54	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
SUBTOTAL THIS SHEET							\$10,000.00

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY Craig A. Grysh, P.E.	CHECKED <i>[Signature]</i> 4/22/11
DATE PREPARED 12/08/10	PEER REVIEW / DATE L. Rossi 12/15/10	DATE PREPARED 04/22/11	PEER REVIEW / DATE <i>[Signature]</i> 4/22/11

FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable Powerhouse, Switchyard, and Transmission Line	PROJECT: Klamath River Northern California/Southern Oregon <hr/> WOID: AF121 ESTIMATE LEVEL: Feasibility <hr/> REGION: MP UNIT PRICE LEVEL: July-2010 <hr/> FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 2\Klamath Dams Removal - COPCO 2 - Partial Removal Option - MP Feas Est - 4-2011.xlsx\Summary
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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:					
	55	7 40-Ton Travelling Crane motors-hoist (2-30Hp*) hoist trolley (7.5Hp*), gantry (4-15Hp*) (Hp* Approx.) Total weight approximately: 600 lbs.	86-68430	4	EA		DELETED
	56	40-Ton Travelling Crane control equipment (5 cubic feet), Total weight approximately: 500 lbs.	86-68430	4	EA		DELETED
	57	40-Ton Travelling Crane Festoon Cable (approx. 200 lin. Ft. cable) Total weight approximately: 800 lbs.	86-68430	4	EA		DELETED
		Remove and dispose of the following equipment outside the Powerplant:					
	58	Step-up Transformers, outdoor, oil-filled, 1-phase 10/20 MVA, 6,600/72,000 volt Total weight approximately each: 40,300 lbs.	86-68430	6	EA		DELETED
	59	Step-up Transformers, outdoor, oil-filled, 1-phase 10/20 MVA, 73,800/230,000 volt Total weight approximately each: 58,200 lbs.	86-68430	3	EA		DELETED
		Remove and dispose of the following equipment from switchyard:	86-68430				
	60	Transmission Line No. 15 From Copco No. 2 switchyard to Copco No. 2 plant 556 AAC, 69-kV	86-68430	0.14	mile	\$30,000.00	\$4,200.00
		SUBTOTAL THIS SHEET					\$4,200.00

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY  Craig A. Grush, P.E.	CHECKED  4/22/11
DATE PREPARED 12/08/10	PEER REVIEW / DATE L. Rossi 12/15/10	DATE PREPARED 04/22/11	PEER REVIEW / DATE  4/22/11

FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable Powerhouse, Switchyard, and Transmission Line	PROJECT: Klamath River Northern California/Southern Oregon <hr/> WOID: AF121 ESTIMATE LEVEL: Feasibility <hr/> REGION: MP UNIT PRICE LEVEL: July-2010 <hr/> FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 2\Klamath Dams Removal - COPCO 2 - Partial Removal Option - MP Feas Est - 4-2011.xlsx\Ssummary
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		ELECTRICAL					
		Remove and dispose of the following equipment from switchyard:	86-68430				
	58A	Remove Oil from Oil-filled Step-up Transformers. From Item 56, six transformers @ 1,700 gallons each. From Item 57, two transformers @ 6,220 gallons each. (Note that three single-phase transformers were replaced with two 3-phase transformers.)	86-68430	23,000	gal	\$10.00	\$230,000.00
POWERHOUSE, SWITCHYARD, & TRANS LINE SUBTOTAL							\$306,625.00

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY <i>Craig A. Grush, P.E.</i>	CHECKED <i>[Signature]</i> 4/22/11
DATE PREPARED 12/08/10	PEER REVIEW / DATE L. Rossi 12/15/10	DATE PREPARED 4/22/2011	PEER REVIEW / DATE <i>[Signature]</i> 4/22/11

FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 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 2\Klamath Dams Removal - COPCO 2 - Partial Removal Option - MP Feas Est - 4-2011.xls\Summary	

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
		Concrete and Structural Steel Items:					
	61	Remove Intake Structure Concrete. <i>All reinforced concrete. Includes structure plus entrance transition (to tunnel No. 1) D/S to construction joint at Sta. 0+20.00.</i>	86-68130	1,500	yd3		DELETED
	62	Remove Concrete Items associated with 16-foot I.D. Wood Stave Pipe. <i>Assume reinforced concrete conduit sections will be removed between Tunnel No. 1 exit portal at Sta. 24+40 and the D/S end of concrete at Sta. 24+55, and between the U/S end of concrete at Sta. 37+70 and tunnel No. 2 entrance portal at Sta. 37+85. Assume the concrete conduit sections will be sawcut at the tunnel portals. Quantity also includes reinforced concrete in cradle footings for pipeline (148 footings spaced on 8- to 10-foot centers).</i>	86-68130	1,300	yd3		DELETED
	63	Place Concrete Plugs for Tunnels. <i>There will be 6 plugs total (4 for tunnel No. 1 and 5 for tunnel No. 2). Plugs will be 2 feet thick, reinforced concrete, 3000 psi min. Location of plugs and info about openings is as follows: Tunnel No. 1, Sta. 0+20; Upper portal is a 16-ft dia., concrete-lined, horseshoe shape. Close gate. Tunnel No. 1, Sta. 24+40; Lower portal is a 16-ft dia., concrete-lined, circular shape. Tunnel No. 1, Sta. 9+77.25; Top of air vent shaft is a 4-ft x 6-ft, concrete-box-lined (assumed) shaft. Tunnel No. 1, Sta. 9+96.96; Adit entrance (300 ft from tunnel) is a 7-ft x 7-ft, timber-lined opening. Tunnel No. 2, Sta. 37+85; Upper portal is a 16-ft dia., concrete-lined, horseshoe shape. Tunnel No. 2, Sta. 48+80; Lower portal is a double-barrel conduit; Each barrel is a 13.5-ft dia., steel-lined, circular shape. Keep penstocks. Tunnel No. 2, Sta. 47+75; Top of surge chamber air vent shaft is a 4-ft x 6-ft (assumed), concrete-box-lined (assumed) shaft. Tunnel No. 2; D/S end of Spill Tunnel, Sta. 3+30, is an approx. 15-ft to 16-ft dia., gunite-lined, horseshoe shape.</i>	86-68130	64	yd3	\$1,200.00	\$76,800.00
SUBTOTAL THIS SHEET							\$76,800.00

QUANTITIES		PRICES	
BY Stephen Latham	CHECKED Jonathan East	BY Craig A. Grush, P.E.	CHECKED [Signature] 4/22/11
DATE PREPARED 11/24/10	PEER REVIEW / DATE Rick Benik P.E. 12/11/10	DATE PREPARED 04/22/11	PEER REVIEW / DATE [Signature] 4/22/11

FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable Penstock	PROJECT: Klamath River Northern California/Southern Oregon <hr/> WOID: AF121 ESTIMATE LEVEL: Feasibility <hr/> REGION: MP UNIT PRICE LEVEL: July-2010 <hr/> FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 2\Klamath Dams Removal - COPCO 2 - Partial Removal Option - MP Feas Est - 4-2011.xlsx\Ssummary
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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:					
	66	Caterpillar Gate: Gate, frame and hoist (steel) (Assume contains paint with heavy metals & petroleum products)	86-68420	50,000	lb		DELETED
	66	Trash rack and trash rake (steel)	86-68420	86,000	lb		DELETED
	67	Stop Logs and slots for intake (steel) stop log slots embedded in concrete (~ 10,000 lb) (Assume contains paint with heavy metals)	86-68420	220,000	lb		DELETED
	68	Middle section of Penstock Wood staves soaked in creosote	86-68420	1,100,000	lb	\$0.70	\$770,000.00
	69	Cradles (steel) (Assume contains paint with heavy metals)	86-68420	290,000	lb	\$0.85	\$246,500.00
	70	Bands (steel) (Assume contains paint with heavy metals)	86-68420	463,000	lb	\$0.85	\$393,550.00
	71	Penstock after bifurcation to butterfly valves includes pipe, expansion joint and support rings (steel, partially encased in concrete supports) (Assume contains paint with heavy metals)	86-68420	860,000	lb		DELETED
	72	Bifurcated vent pipes and support structure (Assume contains paint with heavy metals)	86-68420	10,500	lb		DELETED
	73	2 - 138" Butterfly valves (Assume contains paint with heavy metals & petroleum products)	86-68420	148,000	lb		DELETED
		PENSTOCK SUBTOTAL					\$1,486,850.00

QUANTITIES		PRICES	
BY K. Converse	CHECKED T Turnage	BY 	CHECKED 
DATE PREPARED 11/24/10	PEER REVIEW / DATE Dan Drake 12/16/10	DATE PREPARED 04/22/11	PEER REVIEW / DATE DCD 4/22/11

FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable SUMMARY	PROJECT: Klamath River Northern California/Southern Oregon <hr/> WOID: AF121 ESTIMATE LEVEL: Feasibility <hr/> REGION: MP UNIT PRICE LEVEL: July-2010 <hr/> FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 2\Klamath Dams Removal - COPCO 2 - Partial Removal Option - MP Feas Est - 4-2011.xlsx\Summary
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		Diversion and Care					\$558,460.00
		Dam Removal					\$1,520,155.00
		Powerhouse/Switchyard/Transmission Line Removal					\$306,625.00
		Penstock Removal					\$1,486,850.00
		Reservoir Vegetative Restoration					\$0.00
		Road Improvements					\$0.00
		Recreational Facilities to be Removed					\$0.00
		Subtotal					\$3,872,090.00
		Mobilization	5%	+/-			\$195,000.00
		Subtotal 1 with Mobilization					\$4,067,090.00
		Escalation to Notice to Proceed (NTP), from July 2010 to July 2020 (assumes 3%/yr compounding over 10 years)					\$1,398,739.00
		Subtotal 2 = Subtotal 1 with Mobilization + Escalation to NTP					\$5,465,829.00
		Design Contingencies	10%	+/-			\$534,171.00
		Allowance for Procurement Strategies (APS)	0%	+/-			
		Type of solicitation assumed is: Competitive RFP					
		CONTRACT COST					\$6,000,000.00
		Construction Contingencies	20%	+/-			\$1,200,000.00
		FIELD COST					\$7,200,000.00
		Non-Contract Costs: (Environmental & Cultural Resources Mitigation ~ 45%, Design Data Collection ~ 1%, Engineering Design ~ 4%, Permitting ~ 3%, Procurement ~ 1%, Construction Management ~ 10%, and Closeout ~ 1%)	65%	+/-			\$4,800,000.00
		CONSTRUCTION COST					\$12,000,000.00
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 [Signature] 4/22/11
DATE PREPARED	PEER REVIEW / DATE Refer to Previous Sheets	DATE PREPARED 04/22/11	PEER REVIEW / DATE [Signature] 4/22/11

FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable High Diversion and Care	PROJECT: Klamath River Northern California/Southern Oregon <hr/> WOID: AF652 ESTIMATE LEVEL: Feasibility <hr/> REGION: MP UNIT PRICE LEVEL: July-2010 <hr/> FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 2\Klamath Dams Removal - COPCO 2 - Partial Removal Option - MPH Feas Est - 4-2011.xlsx\SSummary
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
	1	Construct and Remove Embankment Cofferdam to Remove Right Side of Dam. Upstream cofferdam 2,300 cy Downstream cofferdam 800 cy Assumes 10 ft wide crest with 2:1 side slopes. Embankment material taken from borrow/waste area on left abutment of Iron Gate Dam, approximately 10 mile haul distance.	86-68130	3,100	cy	\$130.00	\$403,000.00
	2	Furnish, Install and Remove Riprap Upstream cofferdam 280 cy Downstream cofferdam 185 cy	86-68130	465	cy	\$200.00	\$93,000.00
	3	Provide Dewatering behind Cofferdams Assume two 3 inch portable trash pump operating for approximately 4 months.	86-68130	1	ls		\$300,000.00
	4	Remove Water from behind Cofferdams Upstream cofferdam 230,000 gals Downstream cofferdam 11,000 gals Assume 3 inch portable trash pump	86-68130	241,000	gals	\$0.01	\$2,410.00
	5	Construct and Remove Embankment Cofferdam to Remove Left Side of Dam. Also allows for removal of trashracks, caterpillar gate, and concrete intake structure, and to construct tunnel plug in the dry. Assumes 10 ft wide crest with 2:1 side slopes, approximately 300 ft long and 5 ft high. Embankment material taken from right side cofferdam.	86-68130	1,100	cy	\$130.00	\$143,000.00
	6	Furnish, Install and Remove Riprap Reuse riprap from right side cofferdam.	86-68130	250	cy	\$200.00	\$50,000.00
SUBTOTAL THIS SHEET							\$991,410.00

QUANTITIES		PRICES	
BY Rick Benik	CHECKED Sheena Barnes	BY <i>[Signature]</i> Craig A. Grish, P.E.	CHECKED <i>[Signature]</i> 05-18-11
DATE PREPARED 11/19/10	PEER REVIEW / DATE Tom Hepler P.E. 12/10/10	DATE PREPARED 05/18/11	PEER REVIEW / DATE <i>[Signature]</i> 6/3/11

FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable High Diversion and Care	PROJECT: Klamath River Northern California/Southern Oregon <hr/> WOID: AF652 ESTIMATE LEVEL: Feasibility <hr/> REGION: MP UNIT PRICE LEVEL: July-2010 <hr/> FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 2\Klamath Dams Removal - COPCO 2 - Partial Removal Option - MPH Feas Est - 4-2011.xlsx\Ssummary
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
	7	Provide Dewatering behind Left Side Cofferdam Assume 3 inch portable trash pump operating for approximately 4 months.	86-68130	1	ls		\$300,000.00
	8	Remove Water from behind Cofferdam Assume 3 inch portable trash pump	86-68130	36,000	gals	\$0.08	\$2,880.00
	9	Remove Water from behind Tailrace Cofferdam Unwatering of tailrace for removal of the powerhouse in the dry. Assume 3 inch portable trash pump	86-68130	400,000	gals		DELETED
	10	Provide Dewatering behind Tailrace Cofferdam for removal of Powerhouse in the dry. Assume 3 inch portable trash pump operating for approximately 3 months.	86-68130	4	ls		DELETED
	11	Construct Embankment Cofferdam across Tailrace to remove Powerhouse in dry. Assumes 10 ft wide crest with 2:1 side slopes, approximately 110 ft long and 12 ft high. Embankment material taken from Iron Gate Dam Removal, approximately 10 mile haul distance.	86-68130	1,700	yd3		DELETED
		SUBTOTAL THIS SHEET					\$302,880.00

QUANTITIES		PRICES	
BY Rick Benik	CHECKED Sheena Barnes	BY Craig A. Grish, P.E.	CHECKED 05-18-11
DATE PREPARED 11/19/10	PEER REVIEW / DATE Tom Hepler P.E. 12/10/10	DATE PREPARED 05/18/11	PEER REVIEW / DATE 6/3/11

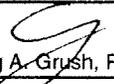
FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable High Powerplant Access Road Bridge	PROJECT: Klamath River Northern California/Southern Oregon
	WOID: AF652 ESTIMATE LEVEL: Appraisal
	REGION: MP UNIT PRICE LEVEL: July-2010
	FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 2\Klamath Dams Removal - COPCO 2 - Partial Removal Option - MPH Feas Est - 4-2011.xlsx\Division & Care

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
	12	Construct 240-ft-long, 2-span concrete Bridge. 31-ft deck width (two 12-ft lanes, two 2-ft shoulders, additional width for jersey barriers along each side). To be constructed near existing bridge, which is to be kept in service until new bridge is ready for service. Design loading is HS-20 truck. Cost is based on unit cost per ft2 of deck for similar concrete bridge at Upper San Joaquin priced out in 2009.	86-68130	7,440	ft2		DELETED
	13	Remove and dispose of existing bridge. Bridge is approximately 231 feet long. Consists of 4 steel girder spans: One @ 40', one @ 75', one @ 56', one @ 60'. Timber deck (15'-16' wide) with wood running planks. Rails and wheel guards along both sides are timber. Two piers are concrete, third pier appears to be timber posts. Assume wood is pressure-treated. Assume girders contain paint with heavy metals.	86-68130	1	ls		DELETED
DIVERSION AND CARE SUBTOTAL							\$1,294,290.00

QUANTITIES		PRICES	
BY Stephen Latham	CHECKED Rick Benik	BY <i>[Signature]</i> Craig A. Grush, P.E.	CHECKED <i>[Signature]</i> 06-09-11
DATE PREPARED 11/08/10	PEER REVIEW / DATE Tom Hepler, P.E. 11/08/10	DATE PREPARED 06/09/11	PEER REVIEW / DATE <i>[Signature]</i> 6-9-11

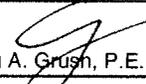
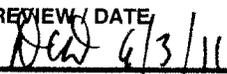
FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable High Dam	PROJECT: Klamath River Northern California/Southern Oregon
	WOID: AF652 ESTIMATE LEVEL: Feasibility
	REGION: MP UNIT PRICE LEVEL: July-2010
	FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 2\Klamath Dams Removal - COPCO 2 - 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:					
	14	Remove Concrete in Dam. Reinforced concrete in ogee overflow section and in D/S apron, left sidewall, right sidewall, gate piers, hoist deck, & north wingwall (on right side, upstream of dam).	86-68130	4,200	yd3	\$500.00	\$2,100,000.00
	15	Remove concrete equipment slab from top of embankment wing dam on right abutment.	86-68130	5	yd3	\$380.00	\$1,900.00
	16	Remove Concrete Wingwall. Located on left side of spill tunnel outfall channel. Assume wall is unreinforced concrete.	86-68130	220	yd3	\$380.00	\$83,600.00
		SUBTOTAL THIS SHEET					\$2,185,500.00

QUANTITIES		PRICES	
BY Stephen Latham	CHECKED Jonathan East	BY  Craig A. Grush, P.E.	CHECKED  05-18-11
DATE PREPARED 11/19/10	PEER REVIEW / DATE Rick Benik P.E. 12/11/10	DATE PREPARED 05/18/11	PEER REVIEW / DATE  6/3/11

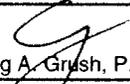
FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable High Dam	PROJECT: Klamath River Northern California/Southern Oregon <hr/> WOID: AF652 ESTIMATE LEVEL: Feasibility <hr/> REGION: MP UNIT PRICE LEVEL: July-2010 <hr/> FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 2\Klamath Dams Removal - COPCO 2 - Partial Removal Option - MPH Feas Est - 4-2011.xlsx\Summary
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		GEOTECHNICAL					
		These quantities represent the work required to remove the earth fill embankment and concrete cutoff wall of Copco 2 Dam to original ground surface.					
		Right Abutment Removal					
	17	Random Fill	86-68313	1,200	yd3		DELETED
	18	Remove Hand Placed Riprap average size 12-inches, 8-inches thick	86-68313	7,800	ft2		DELETED
	19	Gunito Curtain Wall similar to a concrete cutoff wall remove to 5' below excavated grade.	86-68313	210	yd3		DELETED
		SUBTOTAL THIS SHEET					

QUANTITIES		PRICES	
BY Randy Kuzniakowski	CHECKED Tuti Tierney	BY  Craig A. Grush, P.E.	CHECKED  05-18-11
DATE PREPARED 11/19/10	PEER REVIEW / DATE Daniel W. Osmun 12/20/10	DATE PREPARED 05/18/11	PEER REVIEW / DATE  6/3/11

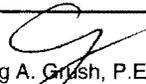
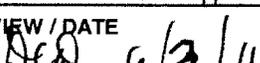
FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable High Dam	PROJECT: Klamath River Northern California/Southern Oregon <hr/> WOID: AF652 ESTIMATE LEVEL: Feasibility <hr/> REGION: MP UNIT PRICE LEVEL: July-2010 <hr/> FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 2\Klamath Dams Removal - COPCO 2 - Partial Removal Option - MPH Feas Est - 4-2011.xlsx\Ssummary
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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:					
	20	Hand Rails and Light Poles (Assume contains paint with heavy metals)	86-68420	5,000	lb	\$1.00	\$5,000.00
	21	Radial Gates and Hoists 5 radial gates, 2 hoists (2,900 lbs. each) (Assume contains paint with heavy metals & petroleum products)	86-68420	66,000	lb	\$1.00	\$66,000.00
	22	5 - Radial Gate stoplogs & slots (steel) (stoplog slots embedded in concrete ~1,500 lb each) (Assume contains paint with heavy metals)	86-68420	95,800	lb	\$1.00	\$95,800.00
SUBTOTAL THIS SHEET							\$166,800.00

QUANTITIES		PRICES	
BY K. Converse	CHECKED T Turnage	BY  Craig A. Grush, P.E.	CHECKED  05-18-11
DATE PREPARED 11/19/10	PEER REVIEW / DATE Dan Drake 12/16/10	DATE PREPARED 05/18/11	PEER REVIEW / DATE  6/3/11

FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable High Dam	PROJECT: Klamath River Northern California/Southern Oregon <hr/> WOID: AF652 ESTIMATE LEVEL: Feasibility <hr/> REGION: MP UNIT PRICE LEVEL: July-2010 <hr/> FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 2\Klamath Dams Removal - COPCO 2 - Partial Removal Option - MPH Feas Est - 4- 2011.xlsx\Summary
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		ELECTRICAL					
		Remove and dispose of the following equipment at Spillway:					
	23	Spillway intake gate motor & control panel Total weight approximately: 500 lbs.	86-68430	1	EA	\$1,500.00	\$1,500.00
	24	Spillway radial gate motors & control panel Total weight approximately: 500 lbs.	86-68430	1	EA	\$1,500.00	\$1,500.00
	25	Spillway trashrake motor, festoon cable & control Total weight approximately: 100 lbs.	86-68430	1	EA	\$600.00	\$600.00
	26	Distribution equipment , panelboards Total weight approximately: 500 lbs.	86-68430	1	EA	\$5,000.00	\$5,000.00
		DAM SUBTOTAL					\$2,360,900.00

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY  Craig A. Grush, P.E.	CHECKED  05-18-11
DATE PREPARED 11/19/10	PEER REVIEW / DATE L. Rossi 12/15/10	DATE PREPARED 05/18/11	PEER REVIEW / DATE  6/3/11

FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable High Powerhouse, Switchyard, and Transmission Line	PROJECT: Klamath River Northern California/Southern Oregon <hr/> WOID: AF652 ESTIMATE LEVEL: Feasibility <hr/> REGION: MP UNIT PRICE LEVEL: July-2010 <hr/> FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 2\Klamath Dams Removal - COPCO 2 - Partial Removal Option - MPH Feas Est - 4-2011.xlsx)Summary
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
		Concrete and Structural Steel Items:					
	27	Remove Copper Shingles from Roof of Power-house for Recycling.	86-68130	7,000	ft2		DELETED
	28	Remove Powerhouse Concrete down to spring-line of the turbines, Elev. 2338 (USGS datum). Local datum is converted to USGS datum by adding 2211 feet. (Elev. 127.0 + 2211 = Elev. 2338.) All concrete is reinforced. Includes all exterior & interior walls, columns, & beams, and concrete in foundations for transformers (outside powerhouse).	86-68130	1,050	yd3		DELETED
	29	Remove Structural Steel Items associated with Powerhouse. Includes columns, beams, crane girders, bracing, misc. shapes, roof trusses, purlins, etc. Assume contains paint with heavy metals.	86-68130	220,000	lb		DELETED
	30	Remove Control House Concrete. Control house is located between the powerhouse and the switchyards. All concrete is reinforced.	86-68130	30	yd3	\$380.00	\$11,400.00
	31	Remove Control House Structural Steel Items. This is actually total metal weight for steel gutter frames (2174 lbs) with aluminum tread plate (1344 lbs). Assume contains paint with heavy metals.	86-68130	3,500	lb	\$1.00	\$3,500.00
	32	Remove Shop Building Located just SW of the switchyards. See dwg PB-46621. Assume single story steel bldg on concrete slab. Estimate 40 ft x 90 ft.	86-68130	3,600	ft2		DELETED
SUBTOTAL THIS SHEET							\$14,900.00

QUANTITIES		PRICES	
BY Stephen Latham	CHECKED Jonathan East	BY Craig A. Brush, P.E.	CHECKED 05-18-11
DATE PREPARED 11/19/10	PEER REVIEW / DATE Rick Benik P.E. 12/1/10	DATE PREPARED 05/18/11	PEER REVIEW / DATE 6/3/11

FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable High Powerhouse, Switchyard, and Transmission Line	PROJECT: Klamath River Northern California/Southern Oregon <hr/> WOID: AF652 ESTIMATE LEVEL: Feasibility <hr/> REGION: MP UNIT PRICE LEVEL: July-2010 <hr/> FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 2\Klamath Dams Removal - COPCO 2 - Partial Removal Option - MPH Feas Est - 4-2011.xlsx\Summary
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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:					
	33	2- Governor oil systems governor, sump tanks, accumulator tank, piping (Assume contains paint with heavy metals & petroleum products)	86-68420	38,000	lb		DELETED
	34	Cooling water and bearing oil systems (Assume contains paint with heavy metals & petroleum products)	86-68420	13,300	lb		DELETED
	35	Oil / Water seperator tank and piping (Assume contains paint with heavy metals & petroleum products)	86-68420	2,700	lb		DELETED
	36	12- Cast Iron Columns (encased in concrete) (Assume contains paint with heavy metals)	86-68420	54,000	lb		DELETED
	37	2- Francis Turbines (includes runner, scroll case, draft tube and shaft) (Assume contains paint with heavy metals, petroleum products, and/or asbestos)	86-68420	660,000	lb		DELETED
	38	2-40 Ton indoor crane Includes crane and rail, not steel rail base) (Assume contains paint with heavy metals & petroleum products)	86-68420	140,000	lb		DELETED
	39	Compressed Air systems (Assume contains paint with heavy metals & petroleum products)	86-68420	1,000	lb		DELETED
	40	2- CO2 systems (Assume contains paint with heavy metals & petroleum products)	86-68420	2,100	lb		DELETED
	41	Plant Water and Fire Protection (Assume contains paint with heavy metals)	86-68420	3,100	lb		DELETED
	42	Transformer Oil Fire protection (Assume contains paint with heavy metals & petroleum products)	86-68420	6,500	lb		DELETED
	43	Unwatering Piping (Assume contains paint with heavy metals)	86-68420	32,000	lb		DELETED
	44	Drainage Piping (Assume contains paint with heavy metals)	86-68420	10,000	lb		DELETED
		SUBTOTAL THIS SHEET					

QUANTITIES		PRICES	
BY K. Converse	CHECKED T Turnage	BY <i>[Signature]</i> Craig A. Grush, P.E.	CHECKED <i>[Signature]</i> 05-18-11
DATE PREPARED 12/08/10	PEER REVIEW / DATE Dan Drake 12/16/10	DATE PREPARED 05/18/11	PEER REVIEW / DATE <i>[Signature]</i> 6/3/11

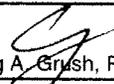
FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable High Powerhouse, Switchyard, and Transmission Line	PROJECT: Klamath River Northern California/Southern Oregon <hr/> WOID: AF652 ESTIMATE LEVEL: Feasibility <hr/> REGION: MP UNIT PRICE LEVEL: July-2010 <hr/> FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 2\Klamath Dams Removal - COPCO 2 - Partial Removal Option - MPH Feas Est - 4-2011.xlsx\Summary
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		MECHANICAL					
		Remove and dispose of the following petroleum products at or near the Power House:					
	44A	Remove Petroleum Products from Mechanical Equipment.	86-68420	3,300	gal	\$12.00	\$39,600.00
		Includes quantities for the following equipment: From Item 35, Units 1 & 2, bearing oil systems. DTE heavy oil, 470 gal. per unit, 940 gal. total.					
		From Item 31, Units 1 & 2, governor oil sumps and accumulator tanks. Hydraulic oil, 1,200 gal. per unit, 2,400 gal. total.					
		The remaining items contain petroleum products in amounts too small to be considered for this level of estimate.					
	44B	Remove Petroleum Products at or near the Power House.	86-68420	2,000	gal	\$12.00	\$24,000.00
		Includes quantities for the following: Oil supply storage area drums. New oil, approx. 7 drums @ 55 gal.					
		Oil storage area drums. New and used oil, approx. 2 drums @ 55 gal.					
		Convault fuel tanks. Diesel fuel tank @ 500 gal., Gasoline tank @ 1,000 gal.					
		Tanks to remain on-site.					
		SUBTOTAL THIS SHEET					\$63,600.00

QUANTITIES		PRICES	
BY K. Converse	CHECKED T Turnage	BY <i>Craig A. Grush, P.E.</i>	CHECKED <i>DCW 05-18-11</i>
DATE PREPARED 12/08/10	PEER REVIEW / DATE Dan Drake 12/16/10	DATE PREPARED <i>DCW</i>	PEER REVIEW / DATE <i>DCW 6/3/11</i>

FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable High Powerhouse, Switchyard, and Transmission Line	PROJECT: Klamath River Northern California/Southern Oregon <hr/> WOID: AF652 ESTIMATE LEVEL: Feasibility <hr/> REGION: MP UNIT PRICE LEVEL: July-2010 <hr/> FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 2\Klamath Dams Removal - COPCO 2 - Partial Removal Option - MPH Feas Est - 4-2011.xlsx)Summary
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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:					
	45	AC Generator, Indoor-Vertical Unit 1 & 2 ea: 15-MVA (13.5 MW); 0.9PF, 6,600V, 171.5 RPM, 3 Ph, including rotating exciter Total weight each approximately: 230,000 lbs. Stator: 113,000 lbs., Rotor: 117,000 lbs. Exciter Assembly: 3,260 lbs. Heaviest lift: 117,000 lbs.	86-68430	2	EA		DELETED
	46	Excitation equipment for 15-MVA Generator (2 sections) Total weight approximately: 1,000 lbs.	86-68430	2	EA		DELETED
	47	Surge protection equip. for 15-MVA Generator Total weight approximately: 800 lbs.	86-68430	2	EA		DELETED
	48	Neutral grounding equip. for 15-MVA Generator includes transformer Total weight approximately: 500 lbs.	86-68430	2	EA		DELETED
		SUBTOTAL THIS SHEET					

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY  Craig A. Brush, P.E.	CHECKED  05-18-11
DATE PREPARED 12/08/10	PEER REVIEW / DATE L. Rossi 12/16/10	DATE PREPARED 05/18/11	PEER REVIEW / DATE  6/3/11

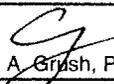
FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable High Powerhouse, Switchyard, and Transmission Line	PROJECT: Klamath River Northern California/Southern Oregon <hr/> WOID: AF652 ESTIMATE LEVEL: Feasibility <hr/> REGION: MP UNIT PRICE LEVEL: July-2010 <hr/> FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 2\Klamath Dams Removal - COPCO 2 - Partial Removal Option - MPH Feas Est - 4-2011.xlsx\Summary
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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	Generator Switchgear, 7.2kV- includes unit breaker (2 Sections @ 2,400 lbs each section) 3 ft x 7.5 ft x 96 inches high- Total weight approximately: 4,800 lbs.-	86-68430	1	EA		DELETED
	50	Station Service Switchgear, 600 volt (5 sections) (400 lbs each section), 3 ft x 3ft x 90 inches high- Total weight approximately: 2,000 lbs.-	86-68430	1	EA		DELETED
	51	Unit and plant control switchboard 5 cubicles (400 lbs each), 2ft x 2ft x 90 in. high- Total weight approximately: 2,000 lbs.-	86-68430	1	EA		DELETED
	52	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
	53	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
	54	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
SUBTOTAL THIS SHEET							\$12,000.00

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY <i>CAG</i> Craig A. Grush, P.E.	CHECKED <i>DCW</i> 05-18-11
DATE PREPARED 12/08/10	PEER REVIEW / DATE L. Rossi 12/15/10	DATE PREPARED 05/18/11	PEER REVIEW / DATE <i>DCW</i> 6/3/11

FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable High Powerhouse, Switchyard, and Transmission Line	PROJECT: Klamath River Northern California/Southern Oregon
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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:					
	55	7 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
	56	40-Ton Travelling Crane control equipment (6 cubicles), Total weight approximately: 600 lbs.	86-68430	1	EA		DELETED
	57	40-Ton Travelling Crane Festoon Cable (approx. 200 lin. Ft. cable) Total weight approximately: 800 lbs.	86-68430	1	EA		DELETED
		Remove and dispose of the following equipment outside the Powerplant:					
	58	Step-up Transformers, outdoor, oil-filled, 1-phase 10/20 MVA, 6,600/72,000 volt Total weight approximately each: 40,300 lbs.	86-68430	6	EA		DELETED
	59	Step-up Transformers, outdoor, oil-filled, 1-phase 10/20 MVA, 73,800/230,000 volt Total weight approximately each: 58,200 lbs.	86-68430	3	EA		DELETED
		Remove and dispose of the following equipment from switchyard:	86-68430				
	60	Transmission Line No. 15 From Copco No. 2 switchyard to Copco No. 2 plant 556 AAC, 69-kV	86-68430	0.14	mile	\$40,000.00	\$5,600.00
		SUBTOTAL THIS SHEET					\$5,600.00

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY  Craig A. Brush, P.E.	CHECKED  05-18-11
DATE PREPARED 12/08/10	PEER REVIEW / DATE L. Rossi 12/15/10	DATE PREPARED 05/18/11	PEER REVIEW / DATE  6/3/11

FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable High Powerhouse, Switchyard, and Transmission Line	PROJECT: Klamath River Northern California/Southern Oregon <hr/> WOID: AF652 ESTIMATE LEVEL: Feasibility <hr/> REGION: MP UNIT PRICE LEVEL: July-2010 <hr/> FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 2\Klamath Dams Removal - COPCO 2 - Partial Removal Option - MPH Feas Est - 4-2011.xlsx\Summary
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		ELECTRICAL					
		Remove and dispose of the following equipment from switchyard:	86-68430				
	58A	Remove Oil from Oil-filled Step-up Transformers. From Item 56, six transformers @ 1,700 gallons each. From Item 57, two transformers @ 6,220 gallons each. (Note that three single-phase transformers were replaced with two 3-phase transformers.)	86-68430	23,000	gal	\$12.00	\$276,000.00
POWERHOUSE, SWITCHYARD, & TRANS LINE SUBTOTAL							\$372,100.00

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY <i>Craig A. Grush, P.E.</i>	CHECKED <i>DN 05-18-11</i>
DATE PREPARED 12/08/10	PEER REVIEW / DATE L. Rossi 12/15/10	DATE PREPARED	PEER REVIEW / DATE <i>DCD 6/3/11</i>

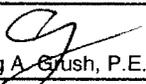
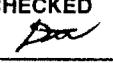
FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable High Penstock	PROJECT: Klamath River Northern California/Southern Oregon <hr/> WOID: AF652 ESTIMATE LEVEL: Feasibility <hr/> REGION: MP UNIT PRICE LEVEL: July-2010 <hr/> FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 2\Klamath Dams Removal - COPCO 2 - Partial Removal Option - MPH Feas Est - 4-2011.xlsx\SSummary
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
		Concrete and Structural Steel Items:					
	61	Remove Intake Structure Concrete. <i>All reinforced concrete. Includes structure plus entrance transition (to tunnel No. 1) D/S to construction joint at Sta. 0+20.00.</i>	86-68130	1,500	yd3		DELETED
	62	Remove Concrete Items associated with 16-foot I.D. Wood Stave Pipe. <i>Assume reinforced concrete conduit sections will be removed between Tunnel No. 1 exit portal at Sta. 24+40 and the D/S end of concrete at Sta. 24+56, and between the U/S end of concrete at Sta. 37+70 and tunnel No. 2 entrance portal at Sta. 37+85. Assume the concrete conduit sections will be sawcut at the tunnel portals. Quantity also includes reinforced concrete in cradle footings for pipeline (148 footings spaced on 8- to 10-foot centers).</i>	86-68130	1,300	yd3		DELETED
	63	Place Concrete Plugs for Tunnels. <i>There will be 6 plugs total (4 for tunnel No. 1 and 5 for tunnel No. 2). Plugs will be 2 feet thick, reinforced concrete, 3000 psi min. Location of plugs and info about openings is as follows: Tunnel No. 1, Sta. 0+20; Upper portal is a 16-ft dia., concrete-lined, horseshoe shape. Close gate. Tunnel No. 1, Sta. 24+40; Lower portal is a 16-ft dia., concrete-lined, circular shape. Tunnel No. 1, Sta. 9+77.25; Top of air vent shaft is a 4-ft x 6-ft, concrete-box-lined (assumed) shaft. Tunnel No. 1, Sta. 9+96.96; Adit entrance (300 ft from tunnel) is a 7-ft x 7-ft, timber-lined opening. Tunnel No. 2, Sta. 37+85; Upper portal is a 16-ft dia., concrete-lined, horseshoe shape. Tunnel No. 2, Sta. 48+80; Lower portal is a double barrel conduit; Each barrel is a 13.5-ft dia., steel-lined, circular shape. Keep penstocks. Tunnel No. 2, Sta. 47+75; Top of surge chamber air vent shaft is a 4-ft x 6-ft (assumed), concrete-box-lined (assumed) shaft. Tunnel No. 2; D/S end of Spill Tunnel, Sta. 3+30, is an approx. 15-ft to 16-ft dia., gunite-lined, horseshoe shape.</i>	86-68130	64	yd3	\$1,300.00	\$83,200.00
		SUBTOTAL THIS SHEET					\$83,200.00

QUANTITIES		PRICES	
BY Stephen Latham	CHECKED Jonathan East	BY <i>[Signature]</i> Craig A. Grush, P.E.	CHECKED <i>[Signature]</i> 05-18-11
DATE PREPARED 11/24/10	PEER REVIEW / DATE Rick Benik P.E. 12/11/10	DATE PREPARED 05/18/11	PEER REVIEW / DATE <i>[Signature]</i> 6/3/11

FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable High Penstock	PROJECT: Klamath River Northern California/Southern Oregon <hr/> WOID: AF652 ESTIMATE LEVEL: Feasibility <hr/> REGION: MP UNIT PRICE LEVEL: July-2010 <hr/> FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 2\Klamath Dams Removal - COPCO 2 - Partial Removal Option - MPH Feas Est - 4-2011.xlsx)Summary
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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:					
	65	Caterpillar Gate: Gate, frame and hoist (steel) (Assume contains paint with heavy metals & petroleum products)	86-68420	50,000	lb		DELETED
	66	Trash rack and trash rake (steel)	86-68420	86,000	lb		DELETED
	67	Stop Logs and slots for intake (steel) stop log slots embedded in concrete (~ 10,000 lb) (Assume contains paint with heavy metals)	86-68420	220,000	lb		DELETED
	68	Middle section of Penstock Wood staves soaked in creosote	86-68420	1,100,000	lb	\$0.85	\$935,000.00
	69	Cradles (steel) (Assume contains paint with heavy metals)	86-68420	290,000	lb	\$1.00	\$290,000.00
	70	Bands (steel) (Assume contains paint with heavy metals)	86-68420	463,000	lb	\$1.00	\$463,000.00
	71	Penstock after bifurcation to butterfly valves includes pipe, expansion joint and support rings (steel, partially encased in concrete supports) (Assume contains paint with heavy metals and/or asbestos)	86-68420	860,000	lb		DELETED
	72	Bifurcated vent pipes and support structure (Assume contains paint with heavy metals and/or asbestos)	86-68420	10,500	lb		DELETED
	73	2 - 138" Butterfly valves (Assume contains paint with heavy metals, petroleum products, and/or asbestos)	86-68420	148,000	lb		DELETED
		PENSTOCK SUBTOTAL					\$1,771,200.00

QUANTITIES		PRICES	
BY K. Converse	CHECKED T Turnage	BY 	CHECKED  05-18-11
DATE PREPARED 11/24/10	PEER REVIEW / DATE Dan Drake 12/16/10	DATE PREPARED 05/18/11	PEER REVIEW / DATE  6/3/11

FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 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
	FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 2\Klamath Dams Removal - COPCO 2 - Partial Removal Option - MPH Feas Est - 4-2011.xlsx\Summary	

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		Diversion and Care					\$1,294,290.00
		Dam Removal					\$2,360,900.00
		Powerhouse/Switchyard/Transmission Line Removal					\$372,100.00
		Penstock Removal					\$1,771,200.00
		Reservoir Vegetative Restoration					\$0.00
		Road Improvements					\$0.00
		Recreational Facilities to be Removed					\$0.00
		Subtotal					\$5,798,490.00
		Mobilization	5%	+/-			\$290,000.00
		Subtotal 1 with Mobilization					\$6,088,490.00
		Escalation to Notice to Proceed (NTP), from July 2010 to July 2020 (assumes 4.375%/yr compounding over 10 years)					\$3,254,255.00
		Subtotal 2 = Subtotal 1 with Mobilization + Escalation to NTP					\$9,342,745.00
		Design Contingencies	15%	+/-			\$1,442,372.00
		Allowance for Procurement Strategies (APS)	2%	+/-			\$214,883.00
		Type of solicitation assumed is: Competitive RFP					
		CONTRACT COST					\$11,000,000.00
		Construction Contingencies	25%	+/-			\$2,500,000.00
		FIELD COST					\$13,500,000.00
		Non-Contract Costs: (Environmental & Cultural Resources Mitigation ~ 45%, Design Data Collection ~ 2%, Engineering Design ~ 6%, Permitting ~ 4%, Procurement ~ 2%, Construction Management ~ 11%, and Closeout ~ 1%)	71%	+/-			\$9,500,000.00
		CONSTRUCTION COST					\$23,000,000.00

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 06-09-11
DATE PREPARED	PEER REVIEW / DATE Refer to Previous Sheets	DATE PREPARED 06/09/11	PEER REVIEW / DATE DCB 6-9-11

FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 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	
	FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 2\Klamath Dams Removal - COPCO 2 - Partial Removal Option - MPL Feas Est - 4-2011.xlsx\Summary		

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
	1	Construct and Remove Embankment Cofferdam to Remove Right Side of Dam. Upstream cofferdam 2,300 cy Downstream cofferdam 800 cy Assumes 10 ft wide crest with 2:1 side slopes. Embankment material taken from borrow/waste area on left abutment of Iron Gate Dam, approximately 10 mile haul distance.	86-68130	3,100	cy	\$70.00	\$217,000.00
	2	Furnish, Install and Remove Riprap Upstream cofferdam 280 cy Downstream cofferdam 185 cy	86-68130	465	cy	\$120.00	\$55,800.00
	3	Provide Dewatering behind Cofferdams Assume two 3 inch portable trash pump operating for approximately 4 months.	86-68130	1	ls		\$40,000.00
	4	Remove Water from behind Cofferdams Upstream cofferdam 230,000 gals Downstream cofferdam 11,000 gals Assume 3 inch portable trash pump	86-68130	241,000	gals	\$0.01	\$2,410.00
	5	Construct and Remove Embankment Cofferdam to Remove Left Side of Dam. Also allows for removal of trashracks, caterpillar gate, and concrete intake structure, and to construct tunnel plug in the dry. Assumes 10 ft wide crest with 2:1 side slopes, approximately 300 ft long and 5 ft high. Embankment material taken from right side cofferdam.	86-68130	1,100	cy	\$70.00	\$77,000.00
	6	Furnish, Install and Remove Riprap Reuse riprap from right side cofferdam.	86-68130	250	cy	\$120.00	\$30,000.00
SUBTOTAL THIS SHEET							\$422,210.00

QUANTITIES		PRICES	
BY Rick Benik	CHECKED Sheena Barnes	BY Craig A. Grush, P.E.	CHECKED [Signature] 05-78-11
DATE PREPARED 11/19/10	PEER REVIEW / DATE Tom Hepler P.E. 12/10/10	DATE PREPARED 05/18/11	PEER REVIEW / DATE [Signature] 6/3/11

FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 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
	FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 2\Klamath Dams Removal - COPCO 2 - Partial Removal Option - MPL Feas Est - 4-2011.xlsx\Summary

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
	7	Provide Dewatering behind Left Side Cofferdam Assume 3 inch portable trash pump operating for approximately 4 months.	86-68130	1	ls		\$40,000.00
	8	Remove Water from behind Cofferdam Assume 3 inch portable trash pump	86-68130	36,000	gals	\$0.04	\$1,440.00
	9	Remove Water from behind Tailrace Cofferdam Unwatering of tailrace for removal of the powerhouse in the dry. Assume 3 inch portable trash pump	86-68130	400,000	gals		DELETED
	10	Provide Dewatering behind Tailrace Cofferdam for removal of Powerhouse in the dry. Assume 3 inch portable trash pump operating for approximately 3 months.	86-68130	1	ls		DELETED
	11	Construct Embankment Cofferdam across Tailrace to remove Powerhouse in dry. Assumes 10 ft wide crest with 2:1 side slopes, approximately 110 ft long and 12 ft high. Embankment material taken from Iron Gate Dam Removal, approximately 10 mile haul distance.	86-68130	1,700	yd3		DELETED
SUBTOTAL THIS SHEET							\$41,440.00

QUANTITIES		PRICES	
BY Rick Benik	CHECKED Sheena Barnes	BY  Craig A. Grush, P.E.	CHECKED  05-18-11
DATE PREPARED 11/19/10	PEER REVIEW / DATE Tom Hepler P.E. 12/10/10	DATE PREPARED 05/18/11	PEER REVIEW / DATE  6/3/11

FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable Low Powerplant Access Road Bridge	PROJECT: Klamath River Northern California/Southern Oregon <hr/> WOID: AF652 ESTIMATE LEVEL: Appraisal <hr/> REGION: MP UNIT PRICE LEVEL: July-2010 <hr/> FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 2\Klamath Dams Removal - COPCO 2 - Partial Removal Option - MPL Feas Est - 4-2011.xlsx\Diversion & Care
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
	12	Construct 240 ft long, 2 span concrete Bridge. 31 ft deck width (two 12 ft lanes, two 2 ft shoulders, additional width for jersey barriers along each side). To be constructed near existing bridge, which is to be kept in service until new bridge is ready for service. Design loading is HS-20 truck. Cost is based on unit cost per ft2 of deck for similar concrete bridge at Upper San Joaquin priced out in 2009.	86-68130	0	ft2		DELETED
	13	Remove and dispose of existing bridge. Bridge is approximately 231 feet long. Consists of 4 steel girder spans: One @ 40', one @ 75', one @ 56', one @ 60'. Timber deck (15'-16' wide) with wood running planks. Rails and wheel guards along both sides are timber. Two piers are concrete, third pier appears to be timber posts. Assume wood is pressure treated. Assume girders contain paint with heavy metals.	86-68130	0	ls		DELETED
DIVERSION AND CARE SUBTOTAL							\$463,650.00

QUANTITIES		PRICES	
BY Stephen Latham	CHECKED Rick Benik	BY Craig A. Grush, P.E.	CHECKED [Signature] 66-09-11
DATE PREPARED 11/08/10	PEER REVIEW / DATE Tom Hepler, P.E. 11/08/10	DATE PREPARED 06/09/11	PEER REVIEW / DATE [Signature] 6-9-11

FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable Low Dam	PROJECT: Klamath River Northern California/Southern Oregon <hr/> WOID: AF652 ESTIMATE LEVEL: Feasibility <hr/> REGION: MP UNIT PRICE LEVEL: July-2010 <hr/> FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 2\Klamath Dams Removal - COPCO 2 - Partial Removal Option - MPL Feas Est - 4-2011.xlsx\Dam
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
		Concrete and Structural Steel Items:					
	14	Remove Concrete in Dam. Reinforced concrete in ogee overflow section and in D/S apron, left sidewall, right sidewall , gate piers, hoist deck, & north wingwall (on right side, upstream of dam).	86-68130	4,200	yd3	\$270.00	\$1,134,000.00
	15	Remove concrete equipment slab from top of embankment wing dam on right abutment.	86-68130	5	yd3	\$170.00	\$850.00
	16	Remove Concrete Wingwall. Located on left side of spill tunnel outfall channel. Assume wall is unreinforced concrete.	86-68130	220	yd3	\$170.00	\$37,400.00
SUBTOTAL THIS SHEET							\$1,172,250.00

QUANTITIES		PRICES	
BY Stephen Latham	CHECKED Jonathan East	BY Craig A. Grush, P.E.	CHECKED <i>[Signature]</i> 05-18-11
DATE PREPARED 11/19/10	PEER REVIEW / DATE Rick Benik P.E. 12/11/10	DATE PREPARED 05/18/11	PEER REVIEW / DATE <i>[Signature]</i> 6/3/11

FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable Low Dam	PROJECT: Klamath River Northern California/Southern Oregon <hr/> WOID: AF652 ESTIMATE LEVEL: Feasibility <hr/> REGION: MP UNIT PRICE LEVEL: July-2010 <hr/> FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 2\Klamath Dams Removal - COPCO 2 - Partial Removal Option - MPL Feas Est - 4-2011.xlsx\Dam
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		GEOTECHNICAL					
		These quantities represent the work required to remove the earth fill embankment and concrete cutoff wall of Copco 2 Dam to original ground surface.					
		Right Abutment Removal					
	17	Random Fill	86-68313	1,200	yd3		DELETED
	18	Remove Hand Placed Riprap average size 12 inches, 8 inches thick	86-68313	7,800	#2		DELETED
	19	Gunite Curtain Wall similar to a concrete cutoff wall remove to 5' below excavated grade.	86-68313	240	yd3		DELETED
		SUBTOTAL THIS SHEET					

QUANTITIES		PRICES	
BY Randy Kuzniakowski	CHECKED Tuti Tierney	BY Craig A. Grush, P.E.	CHECKED 05-18-11
DATE PREPARED 11/19/10	PEER REVIEW / DATE Daniel W. Osmun 12/20/10	DATE PREPARED 05/18/11	PEER REVIEW / DATE 6/3/11

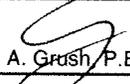
FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable Low Dam	PROJECT: Klamath River Northern California/Southern Oregon <hr/> WOID: AF652 ESTIMATE LEVEL: Feasibility <hr/> REGION: MP UNIT PRICE LEVEL: July-2010 <hr/> FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 2\Klamath Dams Removal - COPCO 2 - Partial Removal Option - MPL Feas Est - 4-2011.xlsx\Dam
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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:					
	20	Hand Rails and Light Poles	86-68420	5,000	lb	\$0.60	\$3,000.00
	21	Radial Gates and Hoists 5 radial gates, 2 hoists (2,900 lbs. each)	86-68420	66,000	lb	\$0.60	\$39,600.00
	22	5 - Radial Gate stoplogs & slots (steel) (stoplog slots embedded in concrete ~1,500 lb each)	86-68420	95,800	lb	\$0.60	\$57,480.00
SUBTOTAL THIS SHEET							\$100,080.00

QUANTITIES		PRICES	
BY K. Converse	CHECKED T Turnage	BY 	CHECKED  05-18-11
DATE PREPARED 11/19/10	PEER REVIEW / DATE Dan Drake 12/16/10	DATE PREPARED 05/18/11	PEER REVIEW / DATE  6/3/11

FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable Low Dam	PROJECT: Klamath River Northern California/Southern Oregon <hr/> WOID: AF652 ESTIMATE LEVEL: Feasibility <hr/> REGION: MP UNIT PRICE LEVEL: July-2010 <hr/> FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 2\Klamath Dams Removal - COPCO 2 - Partial Removal Option - MPL Feas Est - 4-2011.xlsx\Dam
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		ELECTRICAL					
		Remove and dispose of the following equipment at Spillway:					
	23	Spillway intake gate motor & control panel Total weight approximately: 500 lbs.	86-68430	1	EA	\$900.00	\$900.00
	24	Spillway radial gate motors & control panel Total weight approximately: 500 lbs.	86-68430	1	EA	\$900.00	\$900.00
	25	Spillway trashrake motor, festoon cable & control Total weight approximately: 100 lbs.	86-68430	1	EA	\$400.00	\$400.00
	26	Distribution equipment , panelboards Total weight approximately: 500 lbs.	86-68430	1	EA	\$4,000.00	\$4,000.00
		DAM SUBTOTAL					\$1,278,530.00

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY  Craig A. Grush, P.E.	CHECKED  05-18-11
DATE PREPARED 11/19/10	PEER REVIEW / DATE L. Rossi 12/15/10	DATE PREPARED 05/18/11	PEER REVIEW / DATE  6/3/11

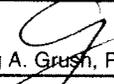
FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable Low Powerhouse, Switchyard, and Transmission Line	PROJECT: Klamath River Northern California/Southern Oregon <hr/> WOID: AF652 ESTIMATE LEVEL: Feasibility <hr/> REGION: MP UNIT PRICE LEVEL: July-2010 <hr/> FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 2\Klamath Dams Removal - COPCO 2 - Partial Removal Option - MPL Feas Est - 4-2011.xlsx\PwrHs, Switchyrd, Trans Line
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
		Concrete and Structural Steel Items:					
	27	Remove Copper Shingles from Roof of Powerhouse for Recycling.	86-68130	7,000	#2		DELETED
	28	Remove Powerhouse Concrete down to spring-line of the turbines, Elev. 2338 (USGS datum). Local datum is converted to USGS datum by adding 2211 feet. (Elev. 127.0 + 2211 = Elev. 2338.) All concrete is reinforced. Includes all exterior & interior walls, columns, & beams, and concrete in foundations for transformers (outside powerhouse).	86-68130	1,050	yd3		DELETED
	29	Remove Structural Steel Items associated with Powerhouse. Includes columns, beams, crane girders, bracing, misc. shapes, roof trusses, purlins, etc. Assume contains paint with heavy metals.	86-68130	220,000	lb		DELETED
	30	Remove Control House Concrete. Control house is located between the powerhouse and the switchyards. All concrete is reinforced.	86-68130	30	yd3	\$170.00	\$5,100.00
	31	Remove Control House Structural Steel Items. This is actually total metal weight for steel gutter frames (2174 lbs) with aluminum tread plate (1344 lbs). Assume contains paint with heavy metals.	86-68130	3,500	lb	\$0.60	\$2,100.00
	32	Remove Shop Building. Located just SW of the switchyards. See dwg PB-45621. Assume single story steel bldg on concrete slab. Estimate 40 ft x 90 ft.	86-68130	3,600	ft2		DELETED
		SUBTOTAL THIS SHEET					\$7,200.00

QUANTITIES		PRICES	
BY Stephen Latham	CHECKED Jonathan East	BY  Craig A. Grush, P.E.	CHECKED  05-18-11
DATE PREPARED 11/19/10	PEER REVIEW / DATE Rick Benik P.E. 12/1/10	DATE PREPARED 05/18/11	PEER REVIEW / DATE  6/3/11

FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable Low Powerhouse, Switchyard, and Transmission Line	PROJECT: Klamath River Northern California/Southern Oregon <hr/> WOID: AF652 ESTIMATE LEVEL: Feasibility <hr/> REGION: MP UNIT PRICE LEVEL: July-2010 <hr/> FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 2\Klamath Dams Removal - COPCO 2 - Partial Removal Option - MPL Feas Est - 4-2011.xlsx\PwrHs, Switchyrd, Trans Line
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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:					
	33	2 - Governor oil systems governor, sump tanks, accumulator tank, piping	86-68420	38,000	lb		DELETED
	34	Cooling water and bearing oil systems	86-68420	13,300	lb		DELETED
	35	Oil / Water seperator tank and piping	86-68420	2,700	lb		DELETED
	36	12 - Cast Iron Columns (encased in concrete)	86-68420	54,000	lb		DELETED
	37	2 - Francis Turbines (includes runner, scroll case, draft tube and shaft)	86-68420	660,000	lb		DELETED
	38	2-40 Ton indoor crane Includes crane and rail, not steel rail base)	86-68420	140,000	lb		DELETED
	39	Compressed Air systems	86-68420	1,000	lb		DELETED
	40	2 - CO2 systems	86-68420	2,100	lb		DELETED
	41	Plant Water and Fire Protection	86-68420	3,100	lb		DELETED
	42	Transformer Oil Fire protection	86-68420	6,500	lb		DELETED
	43	Unwatering Piping	86-68420	32,000	lb		DELETED
	44	Drainage Piping	86-68420	10,000	lb		DELETED
		SUBTOTAL THIS SHEET					

QUANTITIES		PRICES	
BY K. Converse	CHECKED T Turnage	BY  Craig A. Grush, P.E.	CHECKED  05-18-11
DATE PREPARED 12/08/10	PEER REVIEW / DATE Dan Drake 12/16/10	DATE PREPARED 05/18/11	PEER REVIEW / DATE  6/3/11

FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable Low Powerhouse, Switchyard, and Transmission Line	PROJECT: Klamath River Northern California/Southern Oregon <hr/> WOID: AF652 ESTIMATE LEVEL: Feasibility <hr/> REGION: MP UNIT PRICE LEVEL: July-2010 <hr/> FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 2\Klamath Dams Removal - COPCO 2 - Partial Removal Option - MPL Feas Est - 4-2011.xls\PwrHs, Switchyrd, Trans Line
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		MECHANICAL					
		Remove and dispose of the following petroleum products at or near the Power House:					
	44A	Remove Petroleum Products from Mechanical Equipment.	86-68420	3,300	gal	\$9.00	\$29,700.00
		Includes quantities for the following equipment: From Item 35, Units 1 & 2, bearing oil systems. DTE heavy oil, 470 gal. per unit, 940 gal. total. From Item 31, Units 1 & 2, governor oil sumps and accumulator tanks. Hydraulic oil, 1,200 gal. per unit, 2,400 gal. total. The remaining items contain petroleum products in amounts too small to be considered for this level of estimate.					
	44B	Remove Petroleum Products at or near the Power House.	86-68420	2,000	gal	\$9.00	\$18,000.00
		Includes quantities for the following: Oil supply storage area drums. New oil, approx. 7 drums @ 55 gal. Oil storage area drums. New and used oil, approx. 2 drums @ 55 gal. Convault fuel tanks. Diesel fuel tank @ 500 gal., Gasoline tank @ 1,000 gal. Tanks to remain on-site.					
SUBTOTAL THIS SHEET							\$47,700.00

QUANTITIES		PRICES	
BY K. Converse	CHECKED T Turnage	BY <i>Craig A. Gresh P.E.</i>	CHECKED <i>05-18-11</i>
DATE PREPARED 12/08/10	PEER REVIEW / DATE Dan Drake 12/16/10	DATE PREPARED 5/18/2011	PEER REVIEW / DATE <i>ACD 6/3/11</i>

FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable Low Powerhouse, Switchyard, and Transmission Line	PROJECT: Klamath River Northern California/Southern Oregon <hr/> WOID: AF652 ESTIMATE LEVEL: Feasibility <hr/> REGION: MP UNIT PRICE LEVEL: July-2010 <hr/> FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 2\Klamath Dams Removal - COPCO 2 - Partial Removal Option - MPL Feas Est - 4-2011.xlsx\PwrHs, Swtchyrd, Trans Line
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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:					
	45	AC Generator, Indoor Vertical Unit 1 & 2 ea: 15 MVA (13.5 MW); 0.9PF, 6,600V, 171.5 RPM, 3 Ph, including rotating exciter Total weight each approximately: 230,000 lbs. Stator: 113,000 lbs., Rotor: 117,000 lbs. Exciter Assembly: 3,260 lbs. Heaviest lift: 117,000 lbs.	86-68430	2	EA		DELETED
	46	Excitation equipment for 15 MVA Generator (2 sections) Total weight approximately: 1,000 lbs.	86-68430	2	EA		DELETED
	47	Surge protection equip. for 15 MVA Generator Total weight approximately: 800 lbs.	86-68430	2	EA		DELETED
	48	Neutral grounding equip. for 15 MVA Generator includes transformer Total weight approximately: 500 lbs.	86-68430	2	EA		DELETED
		SUBTOTAL THIS SHEET					

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY  Craig A. Grass, P.E.	CHECKED  05-18-11
DATE PREPARED 12/08/10	PEER REVIEW / DATE L. Rossi 12/16/10	DATE PREPARED 05/18/11	PEER REVIEW / DATE  6/3/11

FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable Low Powerhouse, Switchyard, and Transmission Line	PROJECT: Klamath River Northern California/Southern Oregon <hr/> WOID: AF652 ESTIMATE LEVEL: Feasibility <hr/> REGION: MP UNIT PRICE LEVEL: July-2010 <hr/> FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 2\Klamath Dams Removal - COPCO 2 - Partial Removal Option - MPL Feas Est - 4-2011.xls\PrWrHs, Switchyrd, Trans Line
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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	Generator Switchgear, 7.2kV includes unit breaker (2 Sections @ 2,400 lbs each section) 3 ft x 7.5 ft x 96 inches high- Total weight approximately: 4,800 lbs.-	86-68430	1	EA		DELETED
	50	Station Service Switchgear, 600 volt (5 sections) (400 lbs each section), 3 ft x 3ft x 90 inches high- Total weight approximately: 2,000 lbs.-	86-68430	1	EA		DELETED
	51	Unit and plant control switchboard 5 cubicles (400 lbs each), 2ft x 2ft x 90 in. high- Total weight approximately: 2,000 lbs.-	86-68430	1	EA		DELETED
	52	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
	53	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
	54	Misc. power & control boards 10 boards (60 lbs each) 3ft x 2 ft x 0 in Total weight approximately: 600 lbs.-	86-68430	1	EA		DELETED
		SUBTOTAL THIS SHEET					\$9,000.00

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY	CHECKED 05-18-11
DATE PREPARED 12/08/10	PEER REVIEW / DATE L. Rossi 12/15/10	DATE PREPARED 05/18/11	PEER REVIEW / DATE 6/3/11

FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable Low Powerhouse, Switchyard, and Transmission Line	PROJECT: Klamath River Northern California/Southern Oregon <hr/> WOID: AF652 ESTIMATE LEVEL: Feasibility <hr/> REGION: MP UNIT PRICE LEVEL: July-2010 <hr/> FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 2\Klamath Dams Removal - COPCO 2 - Partial Removal Option - MPL Feas Est - 4-2011.xlsx\PrwrHs, Switchyrd, Trans Line
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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:					
	55	7 40-Ton Travelling Crane motors-hoist (2-30Hp*) hoist trolley (7.5Hp*), gantry (4-15Hp*) (Hp* Approx.) Total weight approximately: 600 lbs.	86-68430	4	EA		DELETED
	56	40-Ton Travelling Crane control equipment (5 cubicles), Total weight approximately: 500 lbs.	86-68430	4	EA		DELETED
	57	40-Ton Travelling Crane Festoon Cable (approx. 200 lin. Ft. cable) Total weight approximately: 800 lbs.	86-68430	4	EA		DELETED
		Remove and dispose of the following equipment outside the Powerplant:					
	58	Step-up Transformers, outdoor, oil-filled, 1-phase 10/20 MVA, 6,600/72,000 volt Total weight approximately each: 40,300 lbs.	86-68430	6	EA		DELETED
	59	Step-up Transformers, outdoor, oil-filled, 1-phase 10/20 MVA, 73,800/230,000 volt Total weight approximately each: 58,200 lbs.	86-68430	3	EA		DELETED
		Remove and dispose of the following equipment from switchyard:	86-68430				
	60	Transmission Line No. 15 From Copco No. 2 switchyard to Copco No. 2 plant 556 AAC, 69-kV	86-68430	0.14	mile	\$25,000.00	\$3,500.00
SUBTOTAL THIS SHEET							\$3,500.00

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY  Craig A. Grish, P.E.	CHECKED  5-18-11
DATE PREPARED 12/08/10	PEER REVIEW / DATE L. Rossi 12/15/10	DATE PREPARED 05/18/11	PEER REVIEW / DATE  6/3/11

FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable Low Powerhouse, Switchyard, and Transmission Line	PROJECT: Klamath River Northern California/Southern Oregon				
	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:33%;">WOID: AF652</td> <td style="width:33%;">ESTIMATE LEVEL: Feasibility</td> </tr> <tr> <td>REGION: MP</td> <td>UNIT PRICE LEVEL: July-2010</td> </tr> </table>	WOID: AF652	ESTIMATE LEVEL: Feasibility	REGION: MP	UNIT PRICE LEVEL: July-2010
WOID: AF652	ESTIMATE LEVEL: Feasibility				
REGION: MP	UNIT PRICE LEVEL: July-2010				
FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 2\Klamath Dams Removal - COPCO 2 - Partial Removal Option - MPL Feas Est - 4-2011.xlsx\PwrHs, Swtchyrd, Trans Line					

PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		ELECTRICAL					
		Remove and dispose of the following equipment from switchyard:	86-68430				
	58A	Remove Oil from Oil-filled Step-up Transformers. From Item 56, six transformers @ 1,700 gallons each. From Item 57, two transformers @ 6,220 gallons each. (Note that three single-phase transformers were replaced with two 3-phase transformers.)	86-68430	23,000	gal	\$9.00	\$207,000.00
POWERHOUSE, SWITCHYARD, & TRANS LINE SUBTOTAL							\$274,400.00

QUANTITIES		PRICES	
BY D. Berk	CHECKED T. Griess	BY <i>Craig A. Grush, P.E.</i>	CHECKED <i>AS 05-18-11</i>
DATE PREPARED 12/08/10	PEER REVIEW / DATE L. Rossi 12/15/10	DATE PREPARED 5/18/2011	PEER REVIEW / DATE <i>Don 6/3/11</i>

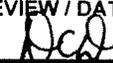
FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable Low Penstock	PROJECT: Klamath River Northern California/Southern Oregon <hr/> WOID: AF652 ESTIMATE LEVEL: Feasibility <hr/> REGION: MP UNIT PRICE LEVEL: July-2010 <hr/> FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 2\Klamath Dams Removal - COPCO 2 - Partial Removal Option - MPL Feas Est - 4-2011.xlsx\Penstock
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CIVIL					
		Concrete and Structural Steel Items:					
	61	Remove Intake Structure Concrete. <i>All reinforced concrete. Includes structure plus entrance transition (to tunnel No. 1) D/S to construction joint at Sta. 0+20.00.</i>	86-68130	1,500	yd3		DELETED
	62	Remove Concrete Items associated with 16-foot I.D. Wood Stave Pipe. <i>Assume reinforced concrete conduit sections will be removed between Tunnel No. 1 exit portal at Sta. 24+40 and the D/S end of concrete at Sta. 24+65, and between the U/S end of concrete at Sta. 37+70 and tunnel No. 2 entrance portal at Sta. 37+85. Assume the concrete conduit sections will be sawcut at the tunnel portals. Quantity also includes reinforced concrete in cradle footings for pipeline (148 footings spaced on 8- to 10-foot centers).</i>	86-68130	1,300	yd3		DELETED
	63	Place Concrete Plugs for Tunnels. <i>There will be 6 plugs total (4 for tunnel No. 1 and 5 for tunnel No. 2). Plugs will be 2 feet thick, reinforced concrete, 3000 psi min. Location of plugs and info about openings is as follows: Tunnel No. 1, Sta. 0+20; Upper portal is a 16-ft dia., concrete-lined, horseshoe shape. Close gate. Tunnel No. 1, Sta. 24+40; Lower portal is a 16-ft dia., concrete-lined, circular shape. Tunnel No. 1, Sta. 9+77.25; Top of air vent shaft is a 4-ft x 6-ft, concrete-box-lined (assumed) shaft. Tunnel No. 1, Sta. 9+96.96; Adit entrance (300 ft from tunnel) is a 7-ft x 7-ft, timber-lined opening. Tunnel No. 2, Sta. 37+85; Upper portal is a 16-ft dia., concrete-lined, horseshoe shape. Tunnel No. 2, Sta. 48+80; Lower portal is a double-barrel conduit. Each barrel is a 13.5-ft dia., steel-lined, circular shape. Keep penstocks. Tunnel No. 2, Sta. 47+75; Top of surge chamber air vent shaft is a 4-ft x 6-ft (assumed), concrete-box-lined (assumed) shaft. Tunnel No. 2; D/S end of Spill Tunnel, Sta. 3+30, is an approx. 15-ft to 16-ft dia., gunite-lined, horseshoe shape.</i>	86-68130	64	yd3	\$1,100.00	\$70,400.00
SUBTOTAL THIS SHEET							\$70,400.00

QUANTITIES		PRICES	
BY Stephen Latham	CHECKED Jonathan East	BY <i>[Signature]</i> Craig A. Grish, P.E.	CHECKED <i>[Signature]</i> 05-18-11
DATE PREPARED 11/24/10	PEER REVIEW / DATE Rick Benik P.E. 12/11/10	DATE PREPARED 05/18/11	PEER REVIEW / DATE <i>[Signature]</i> 6/3/11

FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable Low Penstock	PROJECT: Klamath River Northern California/Southern Oregon <hr/> WOID: AF652 ESTIMATE LEVEL: Feasibility <hr/> REGION: MP UNIT PRICE LEVEL: July-2010 <hr/> FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 2\Klamath Dams Removal - COPCO 2 - Partial Removal Option - MPL Feas Est - 4-2011.xlsx\Summary
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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:					
	66	Caterpillar Gate: Gate, frame and hoist (steel)	86-68420	50,000	lb		DELETED
	66	Trash rack and trash rake (steel)	86-68420	86,000	lb		DELETED
	67	Stop Logs and slots for intake (steel) stop-log slots embedded in concrete (~10,000 lb)	86-68420	220,000	lb		DELETED
		Middle section of Penstock					
	68	Wood staves soaked in creosote	86-68420	1,100,000	lb	\$0.65	\$715,000.00
	69	Cradles (steel) (Assume contains paint with heavy metals)	86-68420	290,000	lb	\$0.60	\$174,000.00
	70	Bands (steel) (Assume contains paint with heavy metals)	86-68420	463,000	lb	\$0.60	\$277,800.00
	71	Penstock after bifurcation to butterfly valves includes pipe, expansion joint and support rings (steel, partially encased in concrete supports)	86-68420	860,000	lb		DELETED
	72	Bifurcated vent pipes and support structure	86-68420	10,600	lb		DELETED
	73	2 - 138" Butterfly valves	86-68420	148,000	lb		DELETED
		PENSTOCK SUBTOTAL					\$1,237,200.00

QUANTITIES		PRICES	
BY K. Converse	CHECKED T Turnage	BY  Craig A. Orush, P.E.	CHECKED  05-18-11
DATE PREPARED 11/24/10	PEER REVIEW / DATE Dan Drake 12/16/10	DATE PREPARED 05/18/11	PEER REVIEW / DATE  6/3/11

FEATURE: Klamath River Dams Removal Partial Removal Option Copco No. 2 Dam & Powerplant Removal Most Probable Low SUMMARY	PROJECT: Klamath River Northern California/Southern Oregon <hr/> WOID: AF652 ESTIMATE LEVEL: Feasibility <hr/> REGION: MP UNIT PRICE LEVEL: July-2010 <hr/> FILE: C:\Estimating\Klamath\Klamath River Dams\Removal - Partial\Feasibility Estimates\Copco 2\Klamath Dams Removal - COPCO 2 - Partial Removal Option - MPH Feas Est - 4-2011.xlsx\Summary
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		Diversion and Care					\$463,650.00
		Dam Removal					\$1,278,530.00
		Powerhouse/Switchyard/Transmission Line Removal					\$274,400.00
		Penstock Removal					\$1,237,200.00
		Reservoir Vegetative Restoration					\$0.00
		Road Improvements					\$0.00
		Recreational Facilities to be Removed					\$0.00
		Subtotal					\$3,253,780.00
		Mobilization	5%	+/-			\$165,000.00
		Subtotal 1 with Mobilization					\$3,418,780.00
		Escalation to Notice to Proceed (NTP), from July 2010 to July 2020 (assumes 1.5%/yr compounding over 10 years)					\$548,854.00
		Subtotal 2 = Subtotal 1 with Mobilization + Escalation to NTP					\$3,967,634.00
		Design Contingencies	8%	+/-			\$332,366.00
		Allowance for Procurement Strategies (APS)	0%	+/-			
		Type of solicitation assumed is: Competitive RFP					
		CONTRACT COST					\$4,300,000.00
		Construction Contingencies	18%	+/-			\$800,000.00
		FIELD COST					\$5,100,000.00
		Non-Contract Costs:	62%	+/-			\$3,200,000.00
		(Environmental & Cultural Resources Mitigation ~ 45%, Design Data Collection ~ 1%, Engineering Design ~ 3%, Permitting ~ 2%, Procurement ~ 1%, Construction Management ~ 9%, and Closeout ~ 1%)					
		CONSTRUCTION COST					\$8,300,000.00
		Ref.: For appropriate use and terminology, see Reclamation Manual, Directives and Standards FAC; 09-01, 09-02 and 09-03.					

QUANTITIES		PRICES	
BY	CHECKED	BY	CHECKED
Refer to Previous Sheets	Refer to Previous Sheets	Craig A. Gruff, P.E.	<i>[Signature]</i> 05-19-11
DATE PREPARED	PEER REVIEW / DATE	DATE PREPARED	PEER REVIEW / DATE
	Refer to Previous Sheets	05/19/11	<i>[Signature]</i> 6/3/11