

APPENDIX E

COST ESTIMATE

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MT TAYLOR MINE PLAN FOR MINE CLOSEOUT/ DP-61 CLOSURE

Rev.A 7/23/2012

Item #	Description	Material(s)	Units	\$/Unit	Quantity	Cost, \$	Cost Reference	Quantity Reference
1 Direct Reclamation Costs								
1.1 Shaft Closures								
1.1.1 Production/ Haulage (24 ft) Shaft Shaft Fittings and Equipment							Remove to plug level; Cut and drop in shaft	
		crane	day	\$ 1,205	10	\$ 12,050	RSM 01 54 19.50 0100	12-ton crane with crew
		demo crew	day	\$ 1,053	10	\$ 10,530	RSM Crew B-1A	
1.1.2 24 ft Shaft Headframe								
	24 ft Production Shaft Headframe - drop using explosives, dozers	Structural steel	leg	\$ 1,680	8	\$ 13,440	RSM 31 23 16.30; RSM 02 41 13.78 0700; WYDEQ, App. E	Assume each leg of headframe is equivalent to one radio tower 120 ft high
	Cut and remove to shaft, 20 ft max lengths	Cut Structural steel	hour	\$ 216	53	\$ 11,468	Piñon Ridge Mill Decommissioning and Reclamation Cost Estimate, Attachment G, item 8a2	http://www.structural-drafting-net-expert.com/steel-sections-i-beam-w-shape.html ; estimated 10 cuts per hour by CAT 365 with hydraulic shear
	Cut vent pipe, decking, stairs, railing, cable, sheet metal, etc. to size	Fabricated metal materials	CF	\$ 0.27	75000	\$ 6,810	RSM 02 41 19.21 1000	Assume 495 lbs/ ft ³ solid steel, 5 % of space is steel, so 25 lb./ ft ³ of space
	Load, haul, dump in shaft	Steel, scrap	hour	\$ 56	40	\$ 2,232	Piñon Ridge Mill Decommissioning and Reclamation Cost Estimate, Attachment G	Wheel skidder with grapple, same production as CAT 365
	Remove concrete from slab outside of collar, ore loading area	concrete	CY	\$ 89	661	\$ 59,040	RSM 02 41 16.17 1140	field measurement; concrete re-cycled for erosion protection per 1.4.4
1.1.3 24 ft Shaft Plug								
	Backfill Slurry batch plant		mo	\$ 4,600.00	3	\$ 13,800	RSM 01 54 33 50 0300	
	Set steel support	crane	day	\$ 1,205.00	5	\$ 6,025	RSM 01 54 19.50 0100	12-ton crane with crew
		crew	day	\$ 2,185.00	5	\$ 10,925	RSM B-2 crew	
	Cast Plug	concrete	CY	\$ 90.50	215	\$ 19,458	RSM 03 31 05.35 4350	1000 psi flowable; includes vent raise and tunnel to bulkhead
		placement	CY	\$ 13.07	215	\$ 2,810	RSM 03 31 05.70 3000	
		crane	day	\$ 1,205.00	5	\$ 6,025	RSM 01 54 19.50 0100	12-ton crane with crew
	Backfill (Shaft above plug, tunnel and vent raise)	mix	CY	\$ 77.50	2847	\$ 220,643	RSM 03 31 05.35 4100	Slurry of ore/cement/water.
		placement	CY	\$ 13.07	2847	\$ 37,210	RSM 03 31 05.70 3000	
1.1.4 Manway/ Ventilation (14 ft) Shaft Fittings and Equipment							Remove to plug level; Cut and drop in shaft	
		crane	day	\$ 1,205	5	\$ 6,025	RSM 01 54 19.50 0100	12-ton crane with crew
		crew	day	\$ 1,053	5	\$ 5,265	RSM Crew B-1A	

Item #	Description	Material(s)	Units	\$/Unit	Quantity	Cost, \$	Cost Reference	Quantity Reference
1.1.5 14 ft Shaft Headframe								
	14 ft Vent/ Manway Shaft Headframe - drop using explosives, dozers	Structural steel	leg	\$ 1,494.00	6	\$ 8,964	RSM 31 23 16.30; RSM 02 41 13.78 0900; WYDEQ, App. E	Assume each leg of headframe is equivalent to one radio tower 60 ft high
	Cut and remove to shaft, 10 ft max lengths	Structural steel	hour	\$ 216.37	29	\$ 6,275	Piñon Ridge Mill Decommissioning and Reclamation Cost Estimate, Attachment G, item 8a2	http://www.structural-drafting-net-expert.com/steel-sections-i-beam-w-shape.html ; estimated 10 cuts per hour by CAT 365 with hydraulic shear
	Cut vent pipe, decking, stairs, railing, cable, sheet metal, etc. to size	Fabricated metal materials	CF	\$ 0.27	24300	\$ 6,561	RSM 02 41 19.21 1000	Assume 495 lbs/ ft ³ solid steel, 5 % of space is steel, so 25 lb. /ft ³ of space
	Load, haul, dump in shaft	Steel, scrap	hour	\$ 55.81	24	\$ 1,339	Piñon Ridge Mill Decommissioning and Reclamation Cost Estimate, Attachment G, item 8a1	Wheel skidder with grapple, same production as CAT 365
	Remove concrete slab outside of collar	concrete	CY	\$ 89.33	62	\$ 5,539	RSM 02 41 16.17 1140	field measurement; concrete re-cycled for erosion protection per 1.4.4
1.1.6 14 ft Shaft Plug and Backfill								
	Set steel support	crane	day	\$ 1,205.00	4	\$ 4,820	RSM 01 54 19.50 0100	12-ton crane with crew
		crew	day	\$ 2,185.00	4	\$ 8,740	RSM B-2 crew	
	Cast Plug	concrete	CY	\$ 90.50	153	\$ 13,847	RSM 03 31 05.35 4350	1000 psi flowable
		placement	CY	\$ 13.07	153	\$ 2,000	RSM 03 31 05.70 3000	
		crane	day	\$ 1,205.00	3	\$ 3,615	RSM 01 54 19.50 0100	12-ton crane with crew
	Backfill (Shaft above plug, vent raise and tunnel)	mix	CY	\$ 77.50	764	\$ 59,210	RSM 03 31 05.35 4100	Slurry of ore/cement/water. Includes vent raise and tunnels to bulkhead
		placement	CY	\$ 13.07	764	\$ 9,985	RSM 03 31 05.70 3000	
1.2 Well and Conduit Plugging								
1.2.1 Mine Conduit								
	Concrete Plug - two conduits, 18 ft.	concrete	CY	\$ 90.50	0.96	\$ 87	RSM 03 31 05.35 4350	
	Cut Casing at 2.0 ft	demo crew	day	\$ 1,053	1	\$ 1,053	RSM Crew B-1A	
1.2.2 Well Abandonment								
	Deep wells (16)	4 ;1 cement bentonite grout mix	CF	\$ 12.61	16632	\$ 209,735	RSM 31 43 13.13 0320	7 inch to 9 5/8 inch diameter casing grouted in all wells; plugging per 19.27.4 NMAC
	Abatement monitoring wells (5)	cement bentonite grout	ft	\$ 4.00	180	\$ 720	WYDEQ, App. L	2 to 6 inch diameter casing

Item #	Description	Material(s)	Units	\$/Unit	Quantity	Cost, \$	Cost Reference	Quantity Reference
1.3	Surface Facilities Demolition							
1.3.1	Glycol Heat Exchanger	Steel Frame (2)	CF	\$ 0.135	24000	\$ 3,240	RSM 02 41 16.13 0500, 5000	
		equipment, various	CF	\$ 4.93	1500	\$ 7,395	RSM 02 41 19.21 1000	assume 1 ft ³ volume per ft ² gutted area
		concrete slab	SF	\$ 4.80	1500	\$ 7,200	RSM 02 41 16.17 0420, 5000	assume 0.5 ft thickness
1.3.2	Chlorine Building	concrete block	CF	\$ 0.135	6120	\$ 826	RSM 02 41 16.13 0080	
		equipment, various	CF	\$ 4.93	360	\$ 1,775	RSM 02 41 19.21 1000	assume 1 ft ³ volume per ft ² gutted area
		concrete slab	SF	\$ 4.80	360	\$ 1,728	RSM 02 41 16.17 0420, 5000	assume 0.5 ft thickness
1.3.3	Flocculant Treatment Building	Steel Frame (2)	CF	\$ 0.135	8280	\$ 1,118	RSM 02 41 16.13 0500, 5000	
		equipment, various	CF	\$ 4.93	690	\$ 3,402	RSM 02 41 19.21 1000	assume 1 ft ³ volume per ft ² gutted area
		concrete slab	SF	\$ 4.80	690	\$ 3,312	RSM 02 41 16.17 0420, 5000	assume 0.5 ft thickness
1.3.4	Barium Chloride Treatment Building	Steel Frame (2)	CF	\$ 0.135	16000	\$ 2,160	RSM 02 41 16.13 0500, 5000	
		equipment, various	CF	\$ 4.93	1000	\$ 4,930	RSM 02 41 19.21 1000	assume 1 ft ³ volume per ft ² gutted area
		concrete slab	SF	\$ 4.80	1000	\$ 4,800	RSM 02 41 16.17 0420, 5000	assume 0.5 ft thickness
1.3.5	Ion Exchange Building	Steel Frame (2)	CF	\$ 0.135	324800	\$ 43,848	RSM 02 41 16.13 0500, 5000	
		equipment	CF	\$ 4.93	none			
		concrete slab	SF	\$ 4.80	10150	\$ 48,720	RSM 02 41 16.17 0420, 5000	assume 0.5 ft thickness
1.3.6	Mine Water Treatment Pond Hydraulic Structures	concrete	CY	\$ 67.70	80	\$ 5,416	RSM 03 05 05.10 0050	Disposed in pond basins
1.3.7	Mine Car Rails	90 lb steel rail	lineal ft	\$ 8.56	8787	\$ 75,217	WYDEQ, App. K	Dwg C-159, -160, F-119; field survey "Rail Footage"; assume 4 lineal ft = 1 ft ³ volume
	Concrete base for rail	low strength concrete	SF	\$ 4.80	8569	\$ 41,132	RSM 02 41 16.17 0420, 5000	assume 0.5 ft thickness
1.3.8	Shaft Exhaust Fans and Vents	light structural steel, sheet metal	CF	\$ 0.135	18750	\$ 2,531	RSM 02 41 16.13 0500, 5000	
1.3.9	Cooling Towers	Steel frame and plate	CF	\$ 0.135	46875	\$ 6,328	RSM 02 41 16.13 0500, 5001	
		equipment, various	CF	\$ 4.93	5625	\$ 27,731	RSM 02 41 19.21 1000	assume 3 ft ³ volume per ft ² gutted area
		concrete slab	SF	\$ 4.80	1875	\$ 9,000	RSM 02 41 16.17 0420, 5000	assume 0.5 ft thickness
1.3.10	York Chiller Building	RETAINED				\$ -		
	Chilling/ Refrigeration Equipment	mechanical equipment	CY	\$ 730.00	10	\$ 7,300	RSM 23 05 05.10 3600	
1.3.11	Mine Water Discharge Pipes	12in. Sch 40 PVC	LF	3.14	3000	\$ 9,420	RSM 02 41 13.38 1800	Remove only the portions of pipes extending beyond the tunnel. 0.1 ft ³ / ft volume
1.3.12	Treated Water Discharge Pipeline	steel	LF	\$ 23.17	23000	\$ 532,910	RSM 22 05 05.10 2155; http://www.engineeringtoolbox.com/ansi-steel-pipes-d_305.html ; RSM 22 05 05.10 2220	Assume scrap at \$180/ton, 2.56 tons per 30 ft length = \$352,280. Pipeline will be cut in 30 ft lengths and staged on site for sale and removal by purchaser.
1.3.13	Debris hauling and dumping/ stacking for salvage		CY	\$ 2.72	16815	\$ 45,736	RSM 31 23 23.20 5000	Assume 10% of building and equipment dimensions are solid space. 2000 ft average cycle distance

Item #	Description	Material(s)	Units	\$/Unit	Quantity	Cost, \$	Cost Reference	Quantity Reference
1.4 Earthwork		15 % swell of BCY to LCY assumed						
1.4.1 Ore Stockpile Removal								
	Excavate and load		BCY	\$ 0.56	63000	\$ 35,280	RSM 31 23 16.43 2450	AutoCad; CAT 980 loader with 5CY bucket, 1200 CY/day
	Haul and dump at shafts for backfill below plugs		LCY	\$ 1.88	68297	\$ 128,399	RSM 31 23 23.20 4013	15 % swell from BCY; 16.75 CY/ft of depth capacity in 24 ft shaft, 5 CY/ft of depth capacity in 14 ft. shaft
	Haul and dump at shafts for backfill above plugs		LCY	\$ 1.88	4153	\$ 7,807	RSM 31 23 23.20 4014	Loader, truck haul 1300 ft to slurry batch plant
1.4.2 Water Treatment (MWTU) Ponds Backfill and Cover								
	Pond berm excavation and placement as backfill		BCY	\$ 2.42	118,550	\$ 286,891	RSM 31 23 16.46 6035; Caterpillar Performance Handbook	CAT D11, max. 200 ft push
1.4.3 Excavation and Disposal of Contaminated Soil		Soil above 23 mR/hr, 6.8 pCi/g Ra						Disposal in pond basins and waste pile
	Borrow Area		BCY	\$ 2.70	6700	\$ 18,090	RSM 31 23 16.50 2420: Caterpillar Performance Handbook	20 CY scraper, 1500 ft haul; 2000 CY/day
	Mine Water Treatment Pond Area, including Area A	Total pond area less pond basins	BCY	\$ 2.70	37,420	\$ 101,034	RSM 31 23 16.50 2420: Caterpillar Performance Handbook	21 CY scraper, 1500 ft haul; 2000 CY/day
	County Road ROW		BCY	\$ 2.70	4660	\$ 12,582	RSM 31 23 16.50 2420: Caterpillar Performance Handbook	21 CY scraper, 1500 ft haul
	Ore Stockpile Area		BCY	\$ 2.70	4500	\$ 12,150	RSM 31 23 16.50 2420: Caterpillar Performance Handbook	21 CY scraper, 1500 ft haul
Storm Water Ponds								
	Excavate and load		BCY	\$ 0.88	6990	\$ 6,151	RSM 31 23 16.42 1601	Pond at waste pile and near ore storage pad; CAT 980 loader 3 cy bucket
	Haul and dump on waste pile and pond #8		LCY	\$ 1.68	8039	\$ 13,505	RSM 31 23 23.20 4014	15 % swell from BCY; 20 cy truck 0.5 mi cycle
	Service and Support Area		BCY	\$ 2.70	32000	\$ 86,400	RSM 31 23 16.50 2420: Caterpillar Performance Handbook	21 CY scraper, 1500 ft haul

Item #	Description	Material(s)	Units	\$/Unit	Quantity	Cost, \$	Cost Reference	Quantity Reference
1.4.4 Waste Pile Stabilization								
	Excavate and dump shallow waste rock on pile	mine waste rock	BCY	\$ 0.88	16000	\$ 14,080	RSM 31 23 16.42 1601	Drawing MT12-CL-08, 2012 site base, 1963 topo
	Regrading to reclamation design slopes	mine waste rock	BCY	\$ 2.42	27,000	\$ 65,340	RSM 31 23 16.46 6035; Caterpillar Performance Handbook	CAT D11, max. 200 ft push
	Cover	shaft muck	BCY	\$ 2.42	35,000	\$ 84,700	RSM 31 23 16.46 6036; Caterpillar Performance Handbook	CAT D11, max. 200 ft push; 2.0 ft across waste pile
	Erosion control mat		SY	\$ 0.46	25625	\$ 11,787	RSM 31 25 14.16 0300	
	Riprap and Water Bars							
	Concrete debris loading and hauling		CY	\$ 8.22	1617	\$ 13,293	RSM G1030 150 7000	Concrete broken by hydraulic pulverizer during facility demolition; CAT 980 with 5 cy bucket, D250E truck
	Boulder and cobble selective excavation, loading, hauling		CY	\$ 8.22	825	\$ 6,785	RSM G1030 150 7000	Basalt cobbles and boulders from mesa slope; CAT 980 with 5 cy bucket, D250E truck
	Crushing		hours	\$ 90.00	17	\$ 1,486	http://www.fao.org/docrep/T0579E/t0579e06.htm ; http://www.grimmsfuel.com/prices.htm ; RSM 03 05 05.10 0050	crushing plant for rock only ; ave 50 CY/hr
	Screening		day	\$ 532.20	20	\$ 10,644	RSM 01 54 33 3710	150-200 CY/day
	Placing channel riprap		SY	\$ 28.50	889	\$ 25,333	RSM 31 37 13.10 0200	1500 CY machine placed, 2 ft thick
	Placing on waste pile slope		CY	\$ 25.87	1850	\$ 47,860	RSM 31 37 13.10 0300	Dumped on slope for rock mulch or spreading in finish grading
1.4.5 Finish grading								
								pond/ ore pad/ borrow area +surface facilities + waste pile
	Mine Water Treatment Pond Area		acres	\$ 73.79	43.5	\$ 3,210	WYDEQ, App. G	AutoCad measured
	County Road ROW		acres	\$ 73.79	5.8	\$ 428	WYDEQ, App. G	AutoCad measured
	Ore Storage and Borrow Soil Area		acres	\$ 73.79	19.0	\$ 1,402	WYDEQ, App. G	AutoCad measured
	Waste pile area	waste pile and adjacent area to east	acres	\$ 73.79	21.7	\$ 1,601	WYDEQ, App. G	AutoCad measured
	Pipeline corridor		acres	\$ 74.79	15.0	\$ 1,122	WYDEQ, App. G	Estimated
	Bench wall slope reduction		BCY	\$ 1.38	1852	\$ 2,556	RSM 31 23 16.42 0300	Drag slope to flatten from vertical to 1H:1V, all rock. CAT 320 excavator
	Service and Support Area		acres	\$ 73.79	38.6	\$ 2,848	WYDEQ, App. G	Estimated. Includes 7 acres north o Marquez Canyon arroyo

Item #	Description	Material(s)	Units	\$/Unit	Quantity	Cost, \$	Cost Reference	Quantity Reference
1.5	Revegetation							
1.5.1	Seeding		acres	\$ 1,247.99	148	\$ 184,703	RSM 32 91 19.14 5300	finish-graded area
1.5.2	Mulching		acres	\$ 1,676.62	148	\$ 248,140	RSM 32 91 13.16 0350	finish-graded area
1.5.3	Fencing		LF	\$ 1.46	10000	\$ 14,600	WYDEQ, App. H	Chain link fence around final pond and waste pile areas
Total Direct							\$ 3,133,626	
2	Indirect Reclamation Costs (3)	% of Direct Cost (3)						
2.1	Mobilization and Demobilization	2%				\$ 62,673		
2.2	Contingencies	10%				\$ 313,363		
2.3	Redesign Costs	6%				\$ 188,018		
2.4	Profit and Overhead	10%				\$ 313,363		
2.5	Contract Management Fee	7%				\$ 219,354		
2.6	MMD Procurement Cost (2%-10%)	6%				\$ 188,018		
Total Indirect						\$ 1,284,787		
NOTES:								
(1)	RSM = RS Means Heavy Construction Cost Data 2012							
(2)	Cost includes loading and hauling 1 mi. RT							
(3)	per No Aqua cost estimate example from MMD							
Total Direct + Indirect							\$ 4,418,413	
Location Cost Index - Cost adjustment to RS Means 2012 costs based on location versus national averages,						1.005	RSM 2012 City Cost Indexes for Albuquerque, Gallup 024, 31-34	
Total Direct + Indirect, Present Cost P, Location-adjusted						\$ 4,440,505		

Escalation (Inflation)

Rate, i, per CPI-U, 2012	3.0%		
Future cost, $F=P*(1+i)^n$	n, years from 2012		F, Future Cost
in 2012	0		\$ 4,440,505
in 2013	1		\$ 4,573,720
in 2014	2		\$ 4,710,932
in 2015	3		\$ 4,852,260

The inflation rate is based on the year-to-year Consumer Price Index U. S. City Average for 2011 (<ftp://ftp.bls.gov/pub/special.requests/cpi/cpiai.txt>).

The average rate for the preceding five years (2006-2010) was 2.18, so 3.0% represents a conservative estimate based on recent history as the basis for projection over the current standby permit period.

Net Present Value

Discount rate , D	3.75%		
NPV, $= F*1/(1+D)^n$	n, years from 2012		NPV
in 2012	0		\$ 4,440,505
in 2013	1		\$ 4,408,405
in 2014	2		\$ 4,376,537
in 2015	3		\$ 4,344,899