



40-8502

August 18, 2003

License SUA-1341  
Docket No. 40-8502

U.S. Nuclear Regulatory Commission  
ATTN: Ms. Susan Frant, Chief  
Fuel Cycle Licensing Branch  
Mail Stop T-8A33  
Two White Flint North  
11545 Rockville Pike  
Rockville, MD 20852-2738

**RE: Submittal of Annual Surety Update**

Dear Ms. Frant:

Pursuant to Condition No. 9.5 of SUA-1341, please find enclosed COGEMA Mining, Inc.'s updated surety bond calculation for the 2003-2004 annual period.

Please note that the new proposed surety amount of \$11,652,503 is significantly lower than the current bond amount of \$13,652,478. The primary contributing reasons are a review and adjustment of individual unit cost rates (described in the attachment to the surety worksheets), and taking credit for the completion of groundwater sweep in all wellfields at both Irigaray and Christensen Ranch. Please also note that no inflation factor has been added because all unit rates were reviewed and adjusted where necessary to reflect 2003 dollars.

In NRC's review of COGEMA's 2002 surety dated September 27, 2002, it was noted that the NRC policy is to not reduce the surety amount for work completed unless that work has been inspected and approved by the NRC staff. NRC further stated that they had not reviewed the final groundwater restoration report and therefore could not give credit for a phase of groundwater restoration until the final report was submitted. I point to our tailings reclamation activities for Pathfinder Mines Corporation, whereby portions of the tailings have been completed, and applicable surety released by NRC, but the final tailings construction completion report will not be submitted until 2004 after tailings completion. We believe that ISL groundwater should be treated equally as tailings reclamation for the purpose of releasing portions of the surety.

Since receipt of NRC's September 27, 2002 letter, the State of Wyoming, Department of Environmental Quality (DEQ), approved the credit for groundwater sweep requested in COGEMA's August 18, 2002 surety submittal (letter dated April 3, 2003, copy attached). We believe that the DEQ's release of this portion of the surety should be sufficient justification for NRC to do the same.

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Ms. Susan Frant  
August 18, 2003  
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Accordingly, we request that NRC reconsider their policy regarding surety reduction for groundwater restoration work completed, and work approved for deletion from the surety by the Wyoming DEQ.

Your assistance with this matter is appreciated. Please contact me if I may answer any questions.

Sincerely,



Donna L. Wichers  
General Manager

Attachments:

2003-2004 Annual Reclamation/Restoration Bond Estimate  
Reclamation Bond Assumptions – 2003-2004 Bond Estimate  
April 3, 2003 letter from Glenn Mooney, DEQ-LQD

cc: NRC – Ms. Elaine Brummett, Project Manager  
NRC – Region IV  
W. Heili, T. Nicholson - COGEMA

**COGEMA Mining, Inc.  
2003-2004 Annual Surety Update  
NRC License SUA-1341  
Docket No. 4-8502**

**August 18, 2003**

COGEMA Mining, Inc.  
SUMMARY OF RECLAMATION/RESTORATION BOND ESTIMATE, 2003 - 2004  
WDEQ PERMIT NO. 478/USNRC LICENSE SUA-1341  
TABLE 1

<b>I</b>	<b>GROUNDWATER RESTORATION - Worksheet 1:</b>	<b>\$4,000,780</b>
<b>II</b>	<b>DECOMMISSIONING AND SURFACE RECLAMATION:</b>	
	A. Process Plant(s) Equipment Removal and Disposal Worksheet 2	\$205,103
	B. Plant Building(s) Demolition and Disposal Worksheet 3	\$720,777
	C. Process Pond Sludge and Liner Handling Worksheet 4	\$1,258,692
	D. Well Abandonment Worksheet 5	\$744,573
	E. Wellfield Equipment Removal and Disposal Worksheet 6	\$850,720
	F. Topsoil Replacement and Revegation Worksheet 7	\$753,148
	G. Miscellaneous Reclamation Activities Worksheet 8	\$129,778
	<b>Sub Total - Decommissioning and Surface Reclamation</b>	<b>\$4,662,790</b>
	<b>TOTAL RESTORATION AND RECLAMATION</b>	<b>\$8,663,571</b>
	<b>SUBTOTAL</b>	<b>\$8,663,571</b>
	<b>Miscellaneous Costs Associated with Third Party Contractors</b>	
	Project Design 2%	
	Contractor Profit & Mobilization 8%	
	Pre-construction Investigation 1%	
	Project Management 5%	
	On-site monitoring 0.5%	
	Site Security & Liability Assurance 1%	
	Longterm Administration 2%	
	Contingency 15%	
	<b>TOTAL CONTINGENCY 34.5%</b>	<b>\$2,988,932</b>
	<b>GRAND TOTAL RESTORATION AND RECLAMATION</b>	<b>\$11,652,503</b>

COGEMA Mining, Inc.  
 Restoration and Reclamation Costs  
 Wyoming Operations  
 WORKSHEET 1

GROUNDWATER RESTORATION

	Irigaray Mine Unit(s) #1 Thru #5	Irigaray Mine Unit(s) #6 Thru #9	Christensen Mine Unit #2	Christensen Mine Unit #3	Christensen Mine Unit #4	Christensen Mine Unit #5	Christensen Mine Unit #6	Christensen Mine Unit #7	Christensen Mine Unit #8
Wellfield Area (Ft²)	522720	784080	890000	798944	510088	1210968	2021243	1332936	1800000
Wellfield Area (Acres)	12.00	18.00	20.43	18.34	11.71	27.80	46.40	30.8	36.7
Affected Ore Zone Area (Ft²)	522720	784080	890000	798944	550193	1346004	2058344		
Avg Completed Thickness (Ft)	15.0	18.0	11.0	10.0	12.7	19.9	21.8		
Affected Volume:									
Factor For Vertical Flare	20%	20%	20%	20%	20%	20%	20%		
Factor For Horizontal Flare	20%	20%	20%	20%	20%	20%	20%		
Total Volume (Ft³)	11290752	20323353.6	14097600	11504783.6	10081929.6	38593685.7	64615534.85		
Porosity	26.0%	26.0%	26.0%	26.0%	26.0%	26.0%	26.0%		
Gallons Per Cubic Foot	7.48	7.48	7.48	7.48	7.48	7.48	7.48		
Gallons Per Pore Volume	21958254.49	39524858.1	27417012.5	22374522.6	19568440.7	75067000	125664292.2		
Number of Wells in Unit(s)									
Production Wells	150	274	153	185	105	217	202	155	
Injection Wells	310	390	173	277	128	277	244	170	
Monitor Wells	150	165	50	46	44	70	65	68	
Baseline Water Quality wells (prod or in)	19	27	24	19	15	25	47		
Average Well Spacing (Ft)	35	35	85	70	85	85	100	100	
Average Well Depth (Ft)	250	250	345	300	430	450	520	550	

I GROUNDWATER SWEEP

A. PLANT & OFFICE

Operating Assumptions:									
Flowrate (gpm)	200	200	200	200	200	200	200		
PV's Required	4	1	1	1	1	1	1		
Total Gallons For Treatment	87833017.96	39524858.1	27417012.5	22374522.6	19568440.7	75067000	125664292.2		
Total KGals for Treatment	87833	39525	27417	22375	19568	75057	125684		
Cost Assumptions:	127358								
Power									
Avg Connected Hp	51.30	51.30	40.00	40.00	40.00	40.00	40.00		
Kwh's/hp	1.00	1.00	0.83	0.83	0.83	0.83	0.83		
\$/Kwh	\$0.051	\$0.051	\$0.0365	\$0.0365	\$0.0365	\$0.0365	\$0.0365		
Gallons Per Minute	200	200	200	200	200	200	100		
Gallons Per Hour	12000	12000	12000	12000	12000	12000	6000		
Cost Per Hour	2.62	2.62	1.21	1.21	1.21	1.21	1.21		
Cost Per Gallon	0.00022	0.00022	0.00010	0.00010	0.00010	0.00010	0.00020		
Cost Per KGal (\$)	\$0.218	\$0.218	\$0.101	\$0.101	\$0.101	\$0.101	\$0.202		
Chemicals									
Antiscalant (\$/KGals)	\$0.0947	\$0.0947	\$0.0947	\$0.0947	\$0.0947	\$0.0947	\$0.0947		
Elution (\$/KGals)	\$0.099	\$0.099	\$0.099	\$0.099	\$0.099	\$0.099	\$0.099		
Repair & Maintenance (\$/KGals)	\$0.0379	\$0.0379	\$0.0379	\$0.0379	\$0.0379	\$0.0379	\$0.0379		
Analysis (\$/KGals)	\$0.043	\$0.137	\$0.175	\$0.170	\$0.153	\$0.067	\$0.075		
Total Cost Per KGal	\$0.493	\$0.586	\$0.508	\$0.502	\$0.486	\$0.399	\$0.508		
Total Treatment Cost	\$43,292	\$23,171	\$13,918	\$11,241	\$9,508	\$29,963	\$63,884		
Utilities									
Power (\$/Month)	\$65	\$65	\$65	\$65	\$65	\$65	\$65		
Telephone (\$/Month)	\$500	\$500	\$500	\$500	\$500	\$500	\$500		
Time For Treatment									
Minutes For Treatment	439165	197624	137085	111873	97842	375265	628321		
Hours For Treatment	7319	3294	2285	1865	1631	6255	10472		
Days For Treatment	305	137	95	78	68	261	436		
Average Days Per Month	30.4	30.4	30.4	30.4	30.4	30.4	30.4		
Months For Treatment	10.0	4.5	3.1	2.6	2.2	8.6	14.3		
Utilities Cost (\$)	\$5,665	\$2,549	\$1,768	\$1,443	\$1,262	\$4,841	\$8,105		
TOTAL PLANT & OFFICE COST	\$48,957	\$25,721	\$15,687	\$12,684	\$10,770	\$34,804	\$71,989	\$0	\$0

COGEMA Mining, Inc.  
Restoration and Reclamation Costs  
Wyoming Operations  
WORKSHEET 1

GROUNDWATER RESTORATION

	Irigaray Mine Unit(s) #1 Thru #5	Irigaray Mine Unit(s) #6 Thru #9	Christensen Mine Unit #2	Christensen Mine Unit #3	Christensen Mine Unit #4	Christensen Mine Unit #5	Christensen Mine Unit #6	Christensen Mine Unit #7	Christensen Mine Unit #8
<b>I GROUNDWATER SWEEP (Continued)</b>									
<b>B. WELLFIELD</b>									
Cost Assumptions:									
Power									
Avg Flow/Pump (gpm)	3.86	3.86	20	20	20	20	20		
Avg Hp/Pump	1.50	1.50	3.00	3.00	3.00	3.00	3.00		
Avg # of Pumps Required	51.8	51.8	10.0	10.0	10.0	10.0	10.0		
Avg Connected Hp	77.8	77.8	25	25	25	25	25		
Kwh's/Hp	1.000	1.000	0.830	0.830	0.830	0.830	0.830		
\$/Kwh	\$0.051	\$0.051	\$0.0365	\$0.0365	\$0.0365	\$0.0365	\$0.0365		
Gallons Per Minute	200	200	200	200	200	200	200		
Gallons Per Hour	12000	12000	12000	12000	12000	12000	12000		
Cost Per Hour (\$)	\$3.97	\$3.97	\$0.76	\$0.76	\$0.76	\$0.76	\$0.76		
Cost Per Gallon (\$)	\$0.0003	\$0.0003	\$0.0001	\$0.0001	\$0.0001	\$0.0001	\$0.0001		
Cost Per KGal (\$)	0.331	0.331	0.063	0.063	0.063	0.063	0.063		
Repair & Maintenance (\$/KGals)	\$0.289	\$0.289	\$0.289	\$0.289	\$0.289	\$0.289	\$0.289		
Total Cost Per KGal	\$0.620	\$0.620	\$0.353	\$0.353	\$0.353	\$0.353	\$0.353		
<b>TOTAL WELLFIELD COST</b>	<b>\$54,426</b>	<b>\$24,492</b>	<b>\$9,685</b>	<b>\$7,887</b>	<b>\$6,898</b>	<b>\$26,459</b>	<b>\$44,298</b>	<b>\$0</b>	<b>\$0</b>
<b>TOTAL GROUND WATER SWEEP COST</b>	<b>\$103,383</b>	<b>\$50,212</b>	<b>\$25,352</b>	<b>\$20,572</b>	<b>\$17,668</b>	<b>\$61,262</b>	<b>\$116,287</b>	<b>\$0</b>	<b>\$0</b>

**II REVERSE OSMOSIS**

<b>A. PLANT &amp; OFFICE</b>									
Operating Assumptions:									
Flowrate (gpm)	300	300	500	500	500	500	500		
PV's Required	3.0	5.0	5.0	5.0	5.0	5.0	5.0		
Total Gallons For Treatment	65874763.47	197624290	137085082	111872613	97842203.3	375285000	628321460.9		
Total KGals for Treatment	65875	197624	137085	111873	97842	375285	628321		
Feed to RO (gpm)	300	300	500	500	500	500	500		
Permeate Flow (gpm)	240	240	375	375	375	375	375		
Brine Flow (gpm)	60	60	125	125	125	125	125		
Average RO Recovery	80.0%	80.0%	75.0%	75.0%	75.0%	75.0%	75.0%		
Cost Assumptions:									
Power									
Avg Connected Hp	120.00	120.00	560.00	560.00	560.00	560.00	560.00		
Kwh's/Hp	1.000	1.000	0.830	0.830	0.830	0.830	0.830		
\$/Kwh	\$0.051	\$0.051	\$0.0365	\$0.0365	\$0.0365	\$0.0365	\$0.0365		
Gallons Per Minute	300	300	500	500	500	500	500		
Gallons Per Hour	18000	18000	30000	30000	30000	30000	30000		
Cost Per Hour (\$)	\$6.12	\$6.12	\$18.97	\$18.97	\$18.97	\$18.97	\$18.97		
Cost Per Gallon (\$)	\$0.00034	\$0.00034	\$0.00057	\$0.00057	\$0.00057	\$0.00057	\$0.00057		
Cost Per KGal (\$)	\$0.340	\$0.340	\$0.566	\$0.566	\$0.566	\$0.566	\$0.566		
Chemicals									
Caustic Soda (\$/KGals)	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018	\$0.018		
Antiscalant (\$/KGals)	\$0.0947	\$0.0947	\$0.0947	\$0.0947	\$0.0947	\$0.0947	\$0.0947		
Elution (\$/KGals)	\$0.099	\$0.099	\$0.099	\$0.099	\$0.099	\$0.099	\$0.099		
Repair & Maintenance (\$/KGals)	\$0.038	\$0.038	\$0.038	\$0.038	\$0.038	\$0.038	\$0.038		
Sampling & Analysis (\$/KGals)	\$0.094	\$0.048	\$0.101	\$0.132	\$0.102	\$0.043	\$0.036		
Total Cost Per KGal (\$)	\$0.684	\$0.637	\$0.916	\$0.947	\$0.917	\$0.858	\$0.851		
Total Pumping Cost (\$)	\$45,040	\$125,919	\$125,539	\$105,988	\$89,752	\$321,897	\$534,549		
Utilities									
Power (\$/Month)	\$65	\$65	\$65	\$65	\$65	\$65	\$65		
Propane (\$/Month)	\$500	\$500	\$500	\$500	\$500	\$500	\$500		
Time For Treatment									
Minutes For Treatment	219583	658748	274170	223745	195684	750570	1256643		
Hours For Treatment	3680	10979	4570	3729	3261	12510	20944		
Days For Treatment	152	457	190	155	136	521	873		
Average Days Per Month	30.4	30.4	30.4	30.4	30.4	30.4	30.4		
Months For Treatment	5.0	15.0	6.3	5.1	4.5	17.1	28.7		
Utilities Cost (\$)	\$2,825	\$8,475	\$3,560	\$2,882	\$2,543	\$9,662	\$16,216		
<b>TOTAL PLANT &amp; OFFICE COST</b>	<b>\$47,865</b>	<b>\$134,394</b>	<b>\$129,098</b>	<b>\$108,870</b>	<b>\$92,294</b>	<b>\$331,559</b>	<b>\$550,765</b>	<b>\$0</b>	<b>\$0</b>

COGEMA Mining, Inc.  
 Restoration and Reclamation Costs  
 Wyoming Operations  
 WORKSHEET 1

GROUNDWATER RESTORATION	Irigaray Mine Unit(s) #1 Thru #5	Irigaray Mine Unit(s) #6 Thru #9	Christensen Mine Unit #2	Christensen Mine Unit #3	Christensen Mine Unit #4	Christensen Mine Unit #5	Christensen Mine Unit #6	Christensen Mine Unit #7	Christensen Mine Unit #8
<b>II REVERSE OSMOSIS (Continued)</b>									
<b>B. WELLFIELD</b>									
Cost Assumptions:									
Power									
Avg Flow/Pump (gpm)	3.86	3.86	20.00	20.00	20.00	20.00	20.00		
Avg Hp/Pump	1.50	1.50	3.00	3.00	3.00	3.00	3.00		
Avg # of Pumps Required	77.7	77.7	25.0	25.0	25.0	25.0	25.0		
Avg Connected Hp	116.6	116.6	75.0	75.0	75.0	75.0	75.0		
Kwh's/Hp	1.000	1.000	0.830	0.830	0.830	0.830	0.830		
\$/Kwh	\$0.051	\$0.051	\$0.0365	\$0.0365	\$0.0365	\$0.0365	\$0.0365		
Gallons Per Minute	300	300	500	500	500	500	500		
Gallons Per Hour	18000	18000	30000	30000	30000	30000	30000		
Cost Per Hour (\$)	\$5.95	\$5.95	\$2.27	\$2.27	\$2.27	\$2.27	\$2.27		
Cost Per Gallon (\$)	\$0.0003	\$0.0003	\$0.0001	\$0.0001	\$0.0001	\$0.0001	\$0.0001		
Cost Per KGal (\$)	\$0.330	\$0.330	\$0.076	\$0.076	\$0.076	\$0.076	\$0.076		
Repair & Maintenance (\$/KGals)	\$0.289	\$0.289	\$0.289	\$0.289	\$0.289	\$0.289	\$0.289		
Total Cost Per KGal	\$0.619	\$0.619	\$0.365	\$0.365	\$0.365	\$0.365	\$0.365		
<b>TOTAL WELLFIELD COST</b>	<b>\$40,797</b>	<b>\$122,391</b>	<b>\$50,000</b>	<b>\$40,804</b>	<b>\$35,687</b>	<b>\$136,881</b>	<b>\$229,172</b>	<b>\$0</b>	<b>\$0</b>
Add for 1 PV of Hydrogen Sulfide gas reductant \$0.683 per Kgal	\$18,950	\$34,110	\$23,661	\$19,309	\$16,888	\$64,774	\$108,448		
<b>TOTAL REVERSE OSMOSIS COST</b>	<b>\$107,612</b>	<b>\$290,895</b>	<b>\$202,759</b>	<b>\$168,983</b>	<b>\$144,869</b>	<b>\$533,214</b>	<b>\$888,385</b>	<b>\$0</b>	<b>\$0</b>

COGEMA Mining, Inc.  
 Restoration and Reclamation Costs  
 Wyoming Operations  
 WORKSHEET 1

GROUNDWATER RESTORATION

	Irigaray Mine Unit(s) #1 Thru #5	Irigaray Mine Unit(s) #6 Thru #9	Christensen Mine Unit #2	Christensen Mine Unit #3	Christensen Mine Unit #4	Christensen Mine Unit #5	Christensen Mine Unit #6	Christensen Mine Unit #7	Christensen Mine Unit #8
<b>III WASTE DISPOSAL WELL</b>									
Operating Assumptions:									
Annual Evaporation Capacity (Gals)			1,917,612	1,917,612	1,917,612	1,917,612	1,917,612		
Avg. Monthly Evap. Capacity (Gals)			159,801	159,801	159,801	159,801	159,801		
Total Disposal Requirement									
RO Brine Total Gallons			34,271,266	27,968,153	24,460,551	93,821,250	157,060,365		
RO Brine Total KGallons			34,271	27,968	24,461	93,821	157,060		
Brine Concentration Factor			60%	60%	60%	60%	60%		
Total Concentrated Brine (Gals)			20,562,759	16,780,892	14,678,330	56,292,750	94,248,219		
Months of RO Operation			6.3	5.1	4.5	17.1	28.7		
Average Monthly Reqmt (Gallons)			3,263,930	3,290,371	3,261,407	3,291,974	3,283,910		
Monthly Balance for DDW (Gals)			3,104,129	3,130,570	3,101,606	3,132,173	3,124,109		
Total WDW Disposal (Gallons)			19,556,013	15,965,807	13,957,226	53,560,153	89,661,930		
Total WDW Disposal (KGals)			19,556	15,966	13,957	53,560	89,662		
Cost Assumptions:									
Power									
Avg Connected Hp			100.00	100.00	100.00	100.00	100.00		
WDW Avg Connected Hp			180.00	180.00	180.00	180.00	180.00		
Kwh's/Hp			0.630	0.630	0.630	0.630	0.630		
\$/Kwh			\$0.0365	\$0.0365	\$0.0365	\$0.0365	\$0.0365		
Gallons Per Minute			150	150	150	150	150		
Gallons Per Hour			9000	9000	9000	9000	9000		
Cost Per Hour (\$)			\$8.48	\$8.48	\$8.48	\$8.48	\$8.48		
Cost Per Gallon (\$)			\$0.0009	\$0.0009	\$0.0009	\$0.0009	\$0.0009		
Cost Per KGal (\$)			\$0.943	\$0.943	\$0.943	\$0.943	\$0.943		
Chemicals (\$/Kgals)									
RO Antiscalant (\$/Kgals)			\$0.190	\$0.190	\$0.190	\$0.190	\$0.190		
WDW Antiscalant (\$/Kgals)			\$0.237	\$0.237	\$0.237	\$0.237	\$0.237		
Sulfuric Acid (\$/Kgals)			\$0.534	\$0.534	\$0.534	\$0.534	\$0.534		
Corrosion Inhibitor			\$0.000	\$0.000	\$0.000	\$0.000	\$0.000		
Algicide			\$0.111	\$0.111	\$0.111	\$0.111	\$0.111		
Repair & Maint (\$/Kgals)			\$0.077	\$0.077	\$0.077	\$0.077	\$0.077		
Total Cost Per KGal			\$2.092	\$2.092	\$2.092	\$2.092	\$2.092		
<b>TOTAL WASTE DISPOSAL WELL COST</b>			<b>\$40,902</b>	<b>\$33,393</b>	<b>\$29,182</b>	<b>\$112,022</b>	<b>\$187,529</b>	<b>\$0</b>	<b>\$0</b>

**IV STABILIZATION MONITORING**

Operating Assumptions:									
Time of Stabilization (mos)	9	9	9	9	9	9	9		
Frequency of Analysis (mos)	3	3	3	3	3	3	3		
Total Sets of Analysis	3	3	3	3	3	3	3		
Cost Assumptions:									
Generator Rental per sample set	\$280	\$280	\$280	\$280	\$280	\$280	\$280		
Analytical costs per set	\$3,800	\$5,400	\$4,800	\$3,800	\$3,000	\$5,000	\$9,400		
Total Sampling & Analysis Cost (\$)	\$12,240	\$17,040	\$15,240	\$12,240	\$9,840	\$15,840	\$29,040		
Utilities (Power + Telephone per month)	\$565	\$565	\$565	\$565	\$565	\$565	\$565		
Total Utilities Cost (\$)	\$5,085	\$5,085	\$5,085	\$5,085	\$5,085	\$5,085	\$5,085		
<b>TOTAL STABILIZATION COST</b>	<b>\$17,325</b>	<b>\$22,125</b>	<b>\$20,325</b>	<b>\$17,325</b>	<b>\$14,925</b>	<b>\$20,925</b>	<b>\$34,125</b>	<b>\$0</b>	<b>\$0</b>



COGEMA Mining, Inc.  
 Restoration and Reclamation Costs  
 Wyoming Operations  
 WORKSHEET 1

GROUNDWATER RESTORATION

	Irigaray Mine Unit(s) #1 Thru #5	Irigaray Mine Unit(s) #6 Thru #9	Christensen Mine Unit #2	Christensen Mine Unit #3	Christensen Mine Unit #4	Christensen Mine Unit #5	Christensen Mine Unit #6	Christensen Mine Unit #7	Christensen Mine Unit #8
<b>V LABOR (Irigaray and Christensen Combined)</b>									
Cost Assumptions	Cost/Hour	Hours/Year	Cost						
Crew:									
1 Supervisor	\$25.00	2080	\$52,000						
4 Operators	\$20.00	2080	\$168,400						
2 Maintenance	\$20.00	2080	\$83,200						
2 Vehicles	\$12.00	2080	\$49,920						
Cost per Year			\$351,520						
Time Required - Years (See Figure 1)	2.6								
<b>TOTAL RESTORATION LABOR COST</b>	<b>\$913,952</b>								

Irigaray Mine Unit(s) #1 Thru #9	Christensen Mine Unit #2 Thru #4	Total Christensen & Irigaray

**VI RESTORATION CAPITAL REQUIREMENTS**

I Deep Disposal Well(s)		\$0	\$0
II Plug and Abandon DDW (2)		\$200,000	\$200,000
III 500 GPM Reverse Osmosis Unit		\$0	\$0
<b>Total</b>	<b>\$0</b>	<b>\$200,000</b>	<b>\$200,000</b>

	Irigaray Mine Unit(s) #1 Thru #5	Irigaray Mine Unit(s) #6 Thru #9	Christensen Mine Unit #2	Christensen Mine Unit #3	Christensen Mine Unit #4	Christensen Mine Unit #5	Christensen Mine Unit #6	Christensen Mine Unit #7	Christensen Mine Unit #8	TOTAL
<b>SUMMARY:</b>										
I GROUNDWATER SWEEP	\$103,383	\$50,212	\$25,352	\$20,572	\$17,668	\$61,262	\$116,287	\$0		
II REVERSE OSMOSIS	\$107,612	\$290,895	\$202,759	\$188,983	\$144,869	\$533,214	\$888,385	\$0		
III WASTE DISPOSAL WELL	\$0	\$0	\$40,902	\$33,393	\$29,192	\$112,022	\$187,529	\$0		
IV STABILIZATION	\$17,325	\$22,125	\$20,325	\$17,325	\$14,925	\$20,925	\$34,125	\$0		
SUB TOTAL	\$228,319	\$363,232	\$289,338	\$240,273	\$206,654	\$727,423	\$1,228,327	\$0		\$3,281,565
V LABOR										\$913,952
VI CAPITAL										\$200,000
<b>TOTAL GROUNDWATER RESTORATION COST</b>										<b>\$4,395,517</b>
Credit for Completion of Groundwater Sweep	\$103,383	\$50,212	\$25,352	\$20,572	\$17,668	\$61,262	\$116,287	\$0		\$394,737
<b>GRAND TOTAL</b>										<b>\$4,000,780</b>

COGEMA Mining, Inc.  
 Restoration and Reclamation Costs  
 Wyoming Operations  
 WORKSHEET 2

PLANT EQUIPMENT REMOVAL AND DISPOSAL	Irigaray							Christensen				
	Maint Area & Laboratory	Main Process Building	Expansion Building	Resin + Sand Filter Media	Dry Pack Area	Restoration Building	Sub Total	Satellite Plant	Resin + Sand Filter Media	Restoration Extension	Wellfield Modules	Sub Total
Volume (Yds <sup>3</sup> )	40	200	180	110	40	40		91	197	42	55	
Quantity Per Truck Load (Yds <sup>3</sup> )	20	20	20	20	20	20		20	20	20	20	
Number of Truck Loads	2.0	10.0	9.0	5.5	2.0	2.0		4.55	9.9	2.1	2.8	
<b>I Decontamination Cost</b>												
Decontamination Cost (\$/Load)	\$435	\$435	\$435	\$435	\$435	\$435		\$435	\$435	\$435	\$435	
Percent Requiring Decontamination	20.0%	100.0%	100.0%	0.0%	100.0%	100.0%		100.0%	0.0%	100.0%	100.0%	
Total Cost	\$174	\$4,350	\$3,915	\$0	\$870	\$870	\$10,179	\$1,979	\$0	\$914	\$1,186	\$4,089
<b>II Dismantle and Loading Cost</b>												
Cost Per Truck Load (\$)	\$650	\$650	\$650	\$650	\$650	\$650		\$650	\$650	\$650	\$650	
Total Cost	\$1,300	\$6,500	\$5,850	\$3,575	\$1,300	\$1,300	\$19,825	\$2,958	\$6,403	\$1,365	\$1,788	\$12,513
<b>III Oversize Charges</b>												
Percent Requiring Permits	40.0%	40.0%	40.0%	0.0%	60.0%	40.0%		40.0%	0.0%	40.0%	0.0%	
Cost Per Truck Load (\$)	\$326	\$326	\$326	\$326	\$326	\$326		\$326	\$326	\$326	\$326	
Total Cost	\$261	\$1,304	\$1,174	\$0	\$391	\$261	\$3,390	\$593	\$0	\$274	\$0	\$667
<b>IV Transportation &amp; Disposal</b>												
<b>A. Landfill</b>												
Percent To Be Shipped	80.0%	80.0%	80.0%	0.0%	50.0%	80.0%		80.0%	0.0%	80.0%	80.0%	
Distance (Miles)	48	48	48	48	48	48		48	48	48	48	
Cost Per Mile (\$)	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58		\$2.58	\$2.58	\$2.58	\$2.58	
Transportation Cost	\$198	\$991	\$892	\$0	\$124	\$198		\$451	\$0	\$208	\$272	
Disposal Fee Per Cubic Yard	\$12.00	\$12.00	\$12.00	\$12.00	\$12.00	\$12.00		\$12.00	\$12.00	\$12.00	\$12.00	
Disposal Cost (\$)	\$384	\$1,820	\$1,728	\$0	\$240	\$384		\$874	\$0	\$403	\$528	
Total Cost	\$582	\$2,911	\$2,620	\$0	\$364	\$582		\$1,324	\$0	\$611	\$800	
<b>B. Licensed Site</b>												
Percent To Be Shipped	20.0%	20.0%	20.0%	100.0%	50.0%	20.0%		20.0%	100.0%	20.0%	20.0%	
Distance (Miles)	150	150	150	150	150	150		150	150	150	150	
Cost Per Mile (\$)	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58		\$2.58	\$2.58	\$2.58	\$2.58	
Transportation Cost	\$155	\$774	\$697	\$2,129	\$397	\$155		\$392	\$3,812	\$163	\$213	
Disposal Cost Per Cubic Foot (\$)	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00		\$11.00	\$11.00	\$11.00	\$11.00	
Quantity Per Truck Load (Yds <sup>3</sup> )	20.0	20.0	20.0	20.0	20.0	20.0		20.0	20.0	20.0	20.0	
Quantity Per Truck Load (Ft <sup>3</sup> )	540	540	540	540	540	540		540	540	540	540	
Disposal Cost	\$2,376	\$11,880	\$10,892	\$32,670	\$5,940	\$2,376		\$5,405	\$58,509	\$2,495	\$3,267	
Total Cost Licensed Site	\$2,531	\$12,654	\$11,389	\$34,799	\$6,327	\$2,531		\$5,758	\$62,321	\$2,657	\$3,480	
Total Cost Transportation & Disposal	\$3,113	\$15,565	\$14,008	\$34,799	\$6,691	\$3,113	\$77,268	\$7,082	\$62,321	\$3,269	\$4,260	\$76,952
<b>TOTAL COST</b>	\$4,848	\$27,719	\$24,947	\$38,374	\$9,252	\$5,544	\$110,683	\$12,612	\$68,723	\$5,821	\$7,264	\$94,420
<b>TOTAL COST - IRIGARAY AND CHRISTENSEN</b>												\$205,103

Irigaray						Christensen							
Maint Area & Laboratory	Warehouse & Offices	Main Process Building	Expansion Building	Dry Pack Area	Restoration Building	Sub Total	Satellite Plant	Wellfield Modules	Booster Pump Bldgs.	Restoration Extension	Office Building	Warehouse	Sub Total

**BUILDING DEMOLITION AND DISPOSAL**

Structural Character	1 Story Steel Frame	1 Story Steel Frame	1 Story Steel Frame	1 Story Steel Frame	3 Story Steel/Masonry	1 Story Steel Frame		2 Story Steel Frame	1 Story Pre Fab (22)	1 Story Pre Fab (4)	2 Story Steel Frame	1 Story Pre-Fab	1 Story Steel Frame	
Demolition Volume (Ft³)	179400	108720	430400	388400	126000	69840		192000	95040	48720	72000	64800	11000	
Cost of Demolition Per Ft³	\$0.1850	\$0.1850	\$0.1850	\$0.1850	\$0.1850	\$0.1850		\$0.1850	\$0.1850	\$0.1850	\$0.1850	\$0.1850	\$0.1850	
Demolition Cost (\$)	\$29,601	\$17,939	\$71,016	\$63,756	\$20,790	\$11,491	\$214,592	\$31,680	\$15,882	\$7,709	\$11,880	\$10,692	\$1,815	\$79,457
Factor For Gutting	15.0%	10.0%	30.0%	10.0%	20.0%	10.0%		20.0%	0.0%	0.0%	20.0%	10.0%	10.0%	
Cost For Gutting (\$)	\$4,440	\$1,794	\$21,305	\$6,376	\$4,158	\$1,149	\$39,221	\$6,336	\$0	\$0	\$2,376	\$1,069	\$182	\$9,963
Weight (pounds)	158761	98212	380885	341947	111504	61828		169912	68860	28032	63717	38802	9735	
Weight per Truckload	40000	40000	40000	40000	40000	40000		40000	40000	40000	40000	40000	40000	
Number of Truckloads	4.0	2.4	9.5	8.5	2.8	1.5		4.2	1.7	0.7	1.6	1.0	0.2	
Distance to Landfill	48	48	48	48	48	48		48	48	48	48	48	48	
Cost per Mile	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58		\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	
Transportation Cost	\$492	\$298	\$1,179	\$1,059	\$345	\$191	\$3,563	\$526	\$206	\$97	\$197	\$120	\$30	\$1,167
Disposal Cost per Truckload (25 CY)	\$300.00	\$300.00	\$300.00	\$300.00	\$300.00	\$300.00		\$300.00	\$300.00	\$300.00	\$300.00	\$300.00	\$300.00	
Disposal Cost	\$1,191	\$722	\$2,857	\$2,585	\$838	\$482	\$8,632	\$1,274	\$500	\$210	\$478	\$291	\$73	\$2,826
<b>TOTAL COST</b>	<b>\$35,723</b>	<b>\$20,752</b>	<b>\$96,357</b>	<b>\$73,755</b>	<b>\$26,129</b>	<b>\$13,293</b>	<b>\$268,009</b>	<b>\$39,816</b>	<b>\$18,388</b>	<b>\$8,006</b>	<b>\$14,931</b>	<b>\$12,172</b>	<b>\$2,100</b>	<b>\$93,413</b>
<b>TOTAL COST IRIGARAY AND CHRISTENSEN</b>														<b>\$359,423</b>

**CONCRETE DECONTAMINATION, DEMOLITION & DISPOSAL**

Area (Ft²)	8020	7100	17600	18400	5600	3600		9600	0	1440	3600	0	1000	
Average Thickness (Ft)	0.5	0.5	0.5	0.5	1	0.5		0.5	0.0	0.5	0.5	0.0	0.5	
Volume (Ft³)	4010	3550	8800	9200	5600	1800		4800	0	720	1800	0	500	
Percent Requiring Decontamination	0.0%	0.0%	100.0%	100.0%	100.0%	100.0%		100.0%	0.0%	100.0%	100.0%	0.0%	0.0%	
Percent Decontaminated	0.0%	0.0%	75.0%	75.0%	40.0%	75.0%		75.0%	0.0%	100.0%	100.0%	0.0%	0.0%	
Decontamination (\$/Ft²)	\$0.134	\$0.134	\$0.134	\$0.134	\$0.134	\$0.134		\$0.134	\$0.134	\$0.134	\$0.134	\$0.134	\$0.134	
Decontamination Cost	\$0	\$0	\$1,789	\$1,849	\$300	\$362	\$4,280	\$665	\$0	\$193	\$482	\$0	\$0	\$1,640
Demolition (\$/Ft²)	\$3.05	\$3.05	\$3.05	\$3.05	\$3.05	\$3.05		\$3.05	\$3.05	\$3.05	\$3.05	\$3.05	\$3.05	
Demolition Cost	\$24,461	\$21,655	\$53,680	\$56,120	\$17,080	\$10,980	\$183,976	\$29,280	\$0	\$4,392	\$10,980	\$0	\$3,050	\$47,702
Transportation & Disposal														
A. Onsite Disposal														
Percent to be Disposed Onsite	100%	100%	90%	90%	40%	90%		90%	0%	100%	100%	0%	100%	
Transportation Cost	\$0	\$0	\$0	\$0	\$0	\$0		\$0	\$0	\$0	\$0	\$0	\$0	
Disposal Cost per Cubic Foot	\$0.230	\$0.230	\$0.230	\$0.230	\$0.230	\$0.230		\$0.230	\$0.230	\$0.230	\$0.230	\$0.230	\$0.230	
Disposal Cost (\$)	\$922	\$817	\$1,822	\$1,904	\$515	\$373	\$6,353	\$994	\$0	\$168	\$414	\$0	\$115	\$1,688
B. Licensed Site														
Percent to be Shipped	0%	0%	10%	10%	60%	10%		10%	100%	0%	0%	100%	0%	
Distance (Miles)	150	150	150	150	150	150		150	150	150	150	150	150	
Cost per Mile (\$)	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58		\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	
Transportation Cost	\$0	\$0	\$631	\$659	\$2,408	\$129	\$3,827	\$344	\$0	\$0	\$0	\$0	\$0	\$344
Disposal Cost per Cubic Foot	\$3.70	\$3.70	\$3.70	\$3.70	\$3.70	\$3.70		\$3.70	\$3.70	\$3.70	\$3.70	\$3.70	\$3.70	
Quantity Per Truck Load (Yds³)	20	20	20	20	20	20		20	20	20	20	20	20	
Quantity Per Truck Load (Ft³)	540	540	540	540	540	540		540	540	540	540	540	540	
Disposal Cost (\$)	\$0	\$0	\$3,256	\$3,404	\$12,432	\$688	\$19,758	\$1,778	\$0	\$0	\$0	\$0	\$0	\$1,778
<b>TOTAL COST</b>	<b>\$25,383</b>	<b>\$22,472</b>	<b>\$81,157</b>	<b>\$63,937</b>	<b>\$32,735</b>	<b>\$12,509</b>	<b>\$218,194</b>	<b>\$33,358</b>	<b>\$0</b>	<b>\$4,751</b>	<b>\$11,878</b>	<b>\$0</b>	<b>\$3,165</b>	<b>\$53,150</b>
<b>TOTAL COST IRIGARAY AND CHRISTENSEN</b>														<b>\$271,344</b>

COGEMA Mining, Inc.  
 Restoration and Reclamation Costs  
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 WORKSHEET 3

Maint Area & Laboratory	Warehouse & Offices	Main Process Building	Irigaray				Sub Total	Christensen						Sub Total
			Expansion Building	Dry Pack Area	Restoration Building	Satellite Plant		Wellfield Modules	Booster Pump Bldgs.	Restoration Extension	Office Building	Warehouse		

**SOIL REMOVAL & DISPOSAL**

Assume removal of 3" of Contaminated Soil under Primary Areas, Disposal at a Licensed facility.

Removal with Loader (\$75/hr)	\$75	\$0	\$0	\$1,222	\$1,278	\$389	\$250	\$3,139	\$667	\$0	\$0	\$0	\$0	\$0	\$0	\$667
Quantity to be Shipped (Ft³)	0	0	4400	4600	1400	900	2400	0	0	0	0	0	0	0	0	0
Distance (Miles)	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150
Cost Per Mile (\$)	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58
Transportation Cost (\$)	\$0	\$0	\$3,153	\$3,297	\$1,003	\$645	\$8,098	\$1,720	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,720
Disposal fee Per Cubic Foot(\$)	\$3.70	\$3.70	\$3.70	\$3.70	\$3.70	\$3.70	\$3.70	\$3.70	\$3.70	\$3.70	\$3.70	\$3.70	\$3.70	\$3.70	\$3.70	\$3.70
Quantity per Truckload (Ft³)	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540
Disposal Cost (\$)	\$0	\$0	\$16,280	\$17,020	\$5,180	\$3,330	\$41,810	\$8,880	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$8,880
<b>Removal, NPDES Pts.</b>																
Quantity to be Shipped (Ft³)			559					5,030								
Distance (Miles)	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150
Cost Per Mile (\$)	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58
Transportation Cost (\$)	\$0	\$0	\$401	\$0	\$0	\$0	\$401	\$3,805	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$3,805
Disposal fee Per Cubic Foot(\$)	\$3.70	\$3.70	\$3.70	\$3.70	\$3.70	\$3.70	\$3.70	\$3.70	\$3.70	\$3.70	\$3.70	\$3.70	\$3.70	\$3.70	\$3.70	\$3.70
Quantity per Truckload (Ft³)	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540
Disposal Cost (\$)	\$0	\$0	\$2,068	\$0	\$0	\$0	\$2,068	\$18,811	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$18,811
<b>Total Cost</b>	\$0	\$0	\$23,124	\$21,594	\$6,572	\$4,225	\$55,516	\$33,483	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$33,483
<b>TOTAL COST</b>	\$0	\$0	\$23,124	\$21,594	\$6,572	\$4,225	\$55,516	\$33,483	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$33,483
<b>TOTAL COST IRIGARAY AND CHRISTENSEN</b>																\$88,999

**RADIATION SURVEY**

Area required (acres)	0.18	0.16	0.40	0.42	0.13	0.08		0.22	0.00	0.03	0.08	0.00	0.02			
Survey Cost (\$/acre)	\$580.00	\$580.00	\$580.00	\$580.00	\$580.00	\$580.00		\$580.00	\$580.00	\$580.00	\$580.00	\$580.00	\$580.00			
<b>TOTAL SURVEY COST (\$)</b>	\$107	\$95	\$234	\$245	\$75	\$48	\$804	\$128	\$0	\$19	\$48	\$0	\$13			\$208

<b>TOTAL COST</b>	\$61,214	\$43,319	\$180,872	\$159,531	\$65,512	\$30,075	\$540,522	\$106,786	\$16,388	\$12,775	\$26,858	\$12,172	\$5,278			\$180,255
<b>TOTAL COST IRIGARAY AND CHRISTENSEN</b>																\$720,777

COGEMA Mining, Inc.  
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 WORKSHEET 4

POND RECLAMATION COST	Irigaray								517				Christensen				
	Pond A	Pond B	Pond C	Pond D	Pond E	Pond RA	Pond RB	Pond 1	Pond 2A	Pond 2B	Pond 3	Brine Pond 1	Brine Pond 2	Brine Pond 3	Brine Pond 4	Permeate Pond	
<b>POND SLUDGE:</b>																	
Average Sludge Depth (Ft)	0.188	0.156	0.123	0.135	0.227	0.188	0.156					0.168	0.222	0.143	0.068	0.000	
Average Area of Sludge (Ft²)	50,845	50,604	62,291	62,291	29,583	50,845	50,604					20,909	20,909	20,909	20,909	-	
Volume of Sludge (Ft³)	9,583	7,907	7,683	8,435	6,729	9,583	7,907					3,466	4,651	2,983	1,414	-	
Volume of Sludge (Yds³)	355	293	285	312	249	355	293	0	0	0	0	128	172	110	52	0	
Volume of Sludge Per Truck Load (Yds³)	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	
# of Truck Loads of Sludge	17.8	14.7	14.3	15.6	12.5	17.8	14.7	0.0	0.0	0.0	0.0	6.4	8.6	5.5	2.6	0.0	
Sludge Handling Cost Per Load (\$)	\$240.00	\$240.00	\$240.00	\$240.00	\$240.00	\$240.00	\$240.00	\$240.00	\$240.00	\$240.00	\$240.00	\$240.00	\$240.00	\$240.00	\$240.00	\$240.00	
Total Sludge Handling Cost (\$)	\$4,272	\$3,528	\$3,432	\$3,744	\$3,000	\$4,272	\$3,528	\$0	\$0	\$0	\$0	\$1,536	\$2,064	\$1,320	\$624	\$0	
<b>Transportation &amp; Disposal</b>																	
Percent To Be Shipped	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
Distance (Miles)	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	
Cost Per Mile (\$)	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	
Transportation Cost (\$)	\$6,889	\$5,689	\$5,534	\$6,037	\$4,838	\$6,889	\$5,689	\$0	\$0	\$0	\$0	\$2,477	\$3,328	\$2,129	\$1,006	\$0	
Disposal Cost Per Cubic Foot (\$)	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00	
Quantity Per Truck Load (Yds³)	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	
Quantity Per Truck Load (Ft³)	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	
Disposal Cost (\$)	\$105,732	\$87,318	\$84,942	\$92,664	\$74,250	\$105,732	\$87,318	\$0	\$0	\$0	\$0	\$38,016	\$51,084	\$32,670	\$15,444	\$0	
Total Transportation & Disposal (\$)	\$112,621	\$93,007	\$90,476	\$98,701	\$79,088	\$112,621	\$93,007	\$0	\$0	\$0	\$0	\$40,493	\$54,412	\$34,799	\$16,450	\$0	
<b>TOTAL SLUDGE COST (\$)</b>	<b>\$116,893</b>	<b>\$96,535</b>	<b>\$93,908</b>	<b>\$102,445</b>	<b>\$82,086</b>	<b>\$116,893</b>	<b>\$96,535</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$42,028</b>	<b>\$56,476</b>	<b>\$36,119</b>	<b>\$17,074</b>	<b>\$0</b>	
<b>POND LINER:</b>																	
Total Pond Area (Acres)	1.75	1.72	1.75	1.72	0.78	2.17	2.17					1.10	1.10	1.10	1.10	0.00	
Total Pond Area (Ft²)	76230	74923.2	76230	74923.2	33976.8	94525.2	94525.2	0	0	0	0	47916	47916	47916	47916	0	
Factor For Sloping Sides	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	0.0%	
Total Liner Area (Ft²)	91476	89908	91476	89908	40772	113430	113430	0	0	0	0	57499	57499	57499	57499	0	
Liner Thickness (Millimeters)	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	0	
Liner Thickness (Inches)	0.1181	0.1181	0.1181	0.1181	0.1181	0.1181	0.1181	0.1181	0.1181	0.1181	0.1181	0.1181	0.1181	0.1181	0.1181	0	
Liner Thickness (Ft)	0.0098	0.0098	0.0098	0.0098	0.0098	0.0098	0.0098	0.0098	0.0098	0.0098	0.0098	0.0098	0.0098	0.0098	0.0098	0	
"Swell" Factor	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	0.0%	
Liner Volume (Ft³)	1121	1101	1121	1101	499	1390	1390	0	0	0	0	704	704	704	704	0	
Truck Loads of Liner	2.1	2.0	2.1	2.0	0.9	2.6	2.6	0.0	0.0	0.0	0.0	1.3	1.3	1.3	1.3	0.0	
<b>Liner Handling Cost (\$)</b>																	
Labor Crew Cost per Hour (\$)	\$90	\$90	\$90	\$90	\$90	\$90	\$90	\$90	\$90	\$90	\$90	\$90	\$90	\$90	\$90	\$0	
Hours per Load	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0	
Liner Handling Cost Per Load (\$)	\$180.00	\$180.00	\$180.00	\$180.00	\$180.00	\$180.00	\$180.00	\$180.00	\$180.00	\$180.00	\$180.00	\$180.00	\$180.00	\$180.00	\$180.00	\$0.00	
Total Liner Handling Cost (\$)	\$378	\$360	\$378	\$360	\$162	\$468	\$468	\$0	\$0	\$0	\$0	\$234	\$234	\$234	\$234	\$0	
<b>Transportation &amp; Disposal</b>																	
Percent To Be Shipped	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
Distance (Miles)	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	
Cost Per Mile (\$)	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	
Transportation Cost (\$)	\$813	\$774	\$813	\$774	\$348	\$1,006	\$1,006	\$0	\$0	\$0	\$0	\$503	\$503	\$503	\$503	\$0	
Disposal Cost Per Cubic Foot (\$)	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00	
Quantity Per Truck Load (Ft³)	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	
Disposal Cost (\$)	\$12,474	\$11,880	\$12,474	\$11,880	\$5,346	\$15,444	\$15,444	\$0	\$0	\$0	\$0	\$7,722	\$7,722	\$7,722	\$7,722	\$0	
Total Transportation & Disposal (\$)	\$13,287	\$12,654	\$13,287	\$12,654	\$5,694	\$16,450	\$16,450	\$0	\$0	\$0	\$0	\$8,225	\$8,225	\$8,225	\$8,225	\$0	
<b>TOTAL LINER COST (\$)</b>	<b>\$13,665</b>	<b>\$13,014</b>	<b>\$13,665</b>	<b>\$13,014</b>	<b>\$5,856</b>	<b>\$16,918</b>	<b>\$16,918</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$8,459</b>	<b>\$8,459</b>	<b>\$8,459</b>	<b>\$8,459</b>	<b>\$0</b>	
<b>POND BACKFILL:</b>																	
Backfill required (Yds³)	8740	8580	8740	8580	2517	14817	16319	2345	1837	1537	163	9048	9048	9048	9048	18070	
Backfill Cost (\$/Yd³)	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	
<b>TOTAL BACKFILL COST (\$)</b>	<b>\$8,740</b>	<b>\$8,580</b>	<b>\$8,740</b>	<b>\$8,580</b>	<b>\$2,517</b>	<b>\$14,817</b>	<b>\$16,319</b>	<b>\$2,345</b>	<b>\$1,837</b>	<b>\$1,537</b>	<b>\$163</b>	<b>\$9,048</b>	<b>\$9,048</b>	<b>\$9,048</b>	<b>\$9,048</b>	<b>\$18,070</b>	

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POND RECLAMATION COST	Irigaray							S17				Christensen				
	Pond A	Pond B	Pond C	Pond D	Pond E	Pond RA	Pond RB	Pond 1	Pond 2A	Pond 2B	Pond 3	Brine Pond 1	Brine Pond 2	Brine Pond 3	Brine Pond 4	Permeate Pond
<b>RADIATION SURVEY</b>																
Areal required (acres)	1.75	1.72	1.75	1.72	0.78	2.17	2.17	0.00	0.00	0.00	0.00	1.10	1.10	1.10	1.10	0
Survey Cost (\$/acre)	\$580.00	\$580.00	\$580.00	\$580.00	\$580.00	\$580.00	\$580.00	\$580.00	\$580.00	\$580.00	\$580.00	\$580.00	\$580.00	\$580.00	\$580.00	\$1.00
<b>TOTAL SURVEY COST (\$)</b>	<b>\$1,015</b>	<b>\$998</b>	<b>\$1,015</b>	<b>\$998</b>	<b>\$452</b>	<b>\$1,259</b>	<b>\$1,259</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$638</b>	<b>\$638</b>	<b>\$638</b>	<b>\$638</b>	<b>\$0</b>
<b>LEAK DETECTION SYSTEM REMOVAL</b>																
Volume of Gravel and Piping (Ft <sup>3</sup> ) (Assume 3")			14337	13851				0								
Quantity per Truckload (Ft <sup>3</sup> )			540	540				540								
Quantity to be Shipped (Loads)			28.8	25.7				0.0								
Distance (Miles)			150	150				150								
Cost per Mile (\$)			\$2.58	\$2.58				\$2.58								
Transportation Cost (\$)			\$10,275	\$9,927				\$0								
Handling Cost per load			\$8,372	\$6,158				\$0								
Disposal Fee per Cubic Foot (\$)			\$3.70	\$3.70				\$3.70								
Disposal Cost (\$)			\$53,047	\$51,249				\$0								
<b>TOTAL LEAK DETECTION SYSTEM REMOVAL</b>	<b>\$0</b>	<b>\$0</b>	<b>\$69,694</b>	<b>\$67,331</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$137,025</b>
<b>TOTAL POND RECLAMATION COST</b>	<b>\$140,313</b>	<b>\$119,127</b>	<b>\$187,021</b>	<b>\$192,368</b>	<b>\$90,913</b>	<b>\$149,687</b>	<b>\$131,031</b>	<b>\$2,345</b>	<b>\$1,837</b>	<b>\$1,537</b>	<b>\$163</b>	<b>\$60,174</b>	<b>\$74,621</b>	<b>\$54,264</b>	<b>\$35,219</b>	<b>\$18,070</b>

SUMMARY - IRIGARAY:

TOTAL SLUDGE COST (\$)	\$705,297
TOTAL LINER COST (\$)	\$93,050
TOTAL BACKFILL COST (\$)	\$73,975
TOTAL RADIATION SURVEY COST (\$)	\$6,996
LEAK DETECTION SYSTEM REMOVAL	\$137,025
<b>TOTAL POND RECLAMATION COST</b>	<b>\$1,016,343</b>

SUMMARY - CHRISTENSEN:

TOTAL SLUDGE COST (\$)	\$151,698
TOTAL LINER COST (\$)	\$33,836
TOTAL BACKFILL COST (\$)	\$54,262
TOTAL RADIATION SURVEY COST (\$)	\$2,552
LEAK DETECTION SYSTEM REMOVAL	\$0
<b>TOTAL POND RECLAMATION COST</b>	<b>\$242,348</b>
<b>TOTAL PROJECT COST - CR and IR (\$)</b>	<b>\$1,258,692</b>

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WELL PLUGGING AND ABANDONMENT

	Irigaray				Christensen			
	Mine Units #1 Thru #9	517 USMT Test Sites	Monitor/ Trend	Sub Total	Mine Units #2 Thru #7	Monitor/ Trend	Misc. Regional	Sub Total
Number of Wells	1064	11	314	1389	2082	327	137	2526
Average Depth	250	250	250		410	410	410	
Average Diameter	4.5	4.5	4.5		4.5	4.5	4.5	
<b>Materials</b>								
Bentonite Chips Required (F <sup>3</sup> /Well)	11.4	11.4	11.4		11.4	11.4	11.4	
Bags of Chips Required/Well	15.0	15.0	15.0		15.0	15.0	15.0	
Cost Per Bag (\$)	\$4.50	\$4.50	\$4.50		\$4.50	\$4.50	\$4.50	
Cost/Well Bentonite Chips (\$)	\$67.50	\$67.50	\$67.50		\$67.50	\$67.50	\$67.50	
Gravel Fill Required (F <sup>3</sup> /Well)	15.7	15.7	15.7		33.6	33.6	33.6	
Gravel Fill Required (Yd <sup>3</sup> /Well)	0.58	0.58	0.58		1.24	1.24	1.24	
Cost of Gravel/Yd <sup>3</sup> (\$)	\$20.00	\$20.00	\$20.00		\$20.00	\$20.00	\$20.00	
Cost/Well Gravel Fill (\$)	\$11.63	\$11.63	\$11.63		\$24.89	\$24.89	\$24.89	
Cement Cones/Markers Req'd/Well	1.0	1.0	1.0		1.0	1.0	1.0	
Cost of Cement Cones/Markers (\$)	\$4.00	\$4.00	\$4.00		\$4.00	\$4.00	\$4.00	
Total Materials Cost per Well	\$83.13	\$83.13	\$83.13		\$96.39	\$96.39	\$96.39	
<b>Labor</b>								
Hours Required per Well	1.0	1.0	1.0		1.0	1.0	1.0	
Labor Cost per Hour	\$60.00	\$60.00	\$60.00		\$60.00	\$60.00	\$60.00	
Total Labor Cost per Well (\$)	\$60.00	\$60.00	\$60.00		\$60.00	\$60.00	\$60.00	
<b>Equipment Rental</b>								
Hours Required per Well	1.0	1.0	1.0		1.0	1.0	1.0	
Backhoe w/Operator Cost/Hr (\$)	\$38.50	\$38.50	\$38.50		\$38.50	\$38.50	\$38.50	
Total Equipment Cost per Well (\$)	\$38.50	\$38.50	\$38.50		\$38.50	\$38.50	\$38.50	
Total Cost per Well (\$)	\$181.63	\$181.63	\$181.63		\$194.89	\$194.89	\$194.89	
<b>TOTAL WELL ABANDONMENT COST (\$)</b>	<b>\$193,254</b>	<b>\$1,998</b>	<b>\$57,032</b>	<b>\$252,284</b>	<b>\$401,861</b>	<b>\$63,729</b>	<b>\$28,700</b>	<b>\$492,289</b>
<b>GRAND TOTAL IRIGARAY AND CHRISTENSEN</b>								<b>\$744,573</b>

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WELLFIELD EQUIPMENT REMOVAL & DISPOSAL

	Irigaray Mine Unit(s) #1 Thru #9	Christensen Mine Units #2 Thru #4	Christensen Mine Unit #5	Christensen Mine Unit #6	Christensen Mine Unit #7	Christensen Mine Unit #8	Total Christensen & Irigaray
<b>I Wellfield Piping</b>							
<b>A. Removal</b>							
Length/Well (Ft)	100	300	300	300			
Total Number of Wells	1064	1021	494	448			
Total Quantity (Ft)	106400	306300	148200	133800			
Cost of Removal (\$/Ft)	\$0.202	\$0.202	\$0.202	\$0.202			
Cost of Removal (\$)	\$21,493	\$61,873	\$29,936	\$27,028			\$140,329
Average OD (Inches)	3.0	3.0	3.0	3.0			
Chipped Volume Reduction (Ft <sup>3</sup> /Ft)	0.016	0.016	0.016	0.016			
Chipped Volume (Ft <sup>3</sup> )	1,702	4,901	2,371	2,141			
Quantity Per Truck Load (Ft <sup>3</sup> )	540	540	540	540			
Total Number of Truck Loads	3.2	9.1	4.4	4.0			
<b>B. Survey &amp; Decontamination</b>							
Percent Requiring Decontamination	0%	0%	0%	0%			
Loads for Decontamination	0.0	0.0	0.0	0.0			
Cost for Decontamination (\$/Load)	\$435.00	\$435.00	\$435.00	\$435.00			
Cost for Decontamination (\$)	\$0	\$0	\$0	\$0			\$0
<b>C. Transport &amp; Disposal</b>							
<b>1.) Landfill</b>							
<b>a. Transportation</b>							
Percent To Be Shipped	0.0%	0.0%	0.0%	0.0%			
Loads To Be Shipped	0.0	0.0	0.0	0.0			
Distance (Miles)	48	48	48	48			
Transportation Cost (\$/mile)	\$2.58	\$2.58	\$2.58	\$2.58			
Transportation Cost (\$)	\$0	\$0	\$0	\$0			\$0
<b>b. Disposal</b>							
Disposal Fee Per Yd <sup>3</sup>	\$12.00	\$12.00	\$12.00	\$12.00			
Yds <sup>3</sup> Per Load	20	20	20	20			
Disposal Cost (\$)	\$0	\$0	\$0	\$0			
Total Cost - Landfill	\$0	\$0	\$0	\$0			\$0
<b>2.) Licensed Site</b>							
<b>a. Transportation</b>							
Percent To Be Shipped	100.0%	100.0%	100.0%	100.0%			
Loads To Be Shipped	3.2	9.1	4.4	4.0			
Distance (Miles)	150	150	150	150			
Cost Per Mile (\$/mile)	\$2.58	\$2.58	\$2.58	\$2.58			
Transportation Cost (\$)	\$1,238	\$3,522	\$1,703	\$1,548			\$8,011
<b>b. Disposal</b>							
Disposal Cost Per Ft <sup>3</sup>	\$11.00	\$11.00	\$11.00	\$11.00			
Disposal Fee Per Yd <sup>3</sup>	\$297.00	\$297.00	\$297.00	\$297.00			
Quantity Per Truck Load (Yds <sup>3</sup> )	20	20	20	20			
Disposal Cost (\$)	\$19,008	\$54,054	\$28,136	\$23,760			\$122,958
Total Cost - Licensed Site	\$20,246	\$57,576	\$27,839	\$25,308			\$130,969
Total Cost - Transport & Disposal	\$20,246	\$57,576	\$27,839	\$25,308			\$130,969
Total Cost - WF Piping Removal & Disposal	\$41,739	\$119,448	\$57,775	\$52,336	\$0	\$0	\$271,298



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	Irigaray Mine Unit(s) #1 Thru #9	Christensen Mine Units #2 Thru #4	Christensen Mine Unit #5	Christensen Mine Unit #6	Christensen Mine Unit #7	Christensen Mine Unit #8	Total Christensen & Irigaray
<b>WELLFIELD EQUIPMENT REMOVAL &amp; DISPOSAL</b>							
<b>II. Production Well Pumps</b>							
<b>A. Pump and Tubing Removal</b>							
Number of Production Wells	424	443	217	202			
Cost of Removal (\$/well)	\$22.50	\$22.50	\$22.50	\$22.50			
Cost of Removal (\$)	\$9,540	\$9,968	\$4,883	\$4,545			\$28,935
Number of Pumps Per Truck Load	180	180	180	180			
Number of Truck Loads (Pumps)	2.4	2.5	1.2	1.1			
<b>B. Survey &amp; Decontamination (Pumps)</b>							
Percent Requiring Decontamination	50.0%	50.0%	50.0%	50.0%			
Loads for Decontamination	1.2	1.3	0.6	0.6			
Cost for Decontamination (\$/Load)	\$435.00	\$435.00	\$435.00	\$435.00			
Cost for Decontamination (\$)	\$522	\$566	\$261	\$261			\$1,610
<b>C. Tubing Volume Reduction &amp; Loading</b>							
Length per Well (Ft)	100	300	300	450			
Total Quantity (Ft)	42,400	132,900	65,100	90,900			
Cost of Removal (\$/Ft)	\$0.025	\$0.025	\$0.025	\$0.025			
Cost of Removal (\$)	\$1,060	\$3,323	\$1,628	\$2,273			\$8,283
Average OD (Inches)	3.0	3.0	3.0	3.0			
Chipped Volume Reduction (Ft <sup>3</sup> /Ft)	0.016	0.016	0.016	0.016			
Chipped Volume (Ft <sup>3</sup> )	678	2,126	1,042	1,454			
Quantity per Truckload (Ft <sup>3</sup> )	540	540	540	540			
Number of Truck Loads	1.3	3.9	1.9	2.7			
<b>D. Transport &amp; Disposal</b>							
<b>1.) Landfill</b>							
<b>a. Transportation</b>							
Percent To Be Shipped (Pumps)	50.0%	50.0%	50.0%	50.0%			
Loads To Be Shipped	1.2	1.3	0.6	0.6			
Distance (Miles)	48	48	48	48			
Cost Per Mile (\$/mile)	\$2.58	\$2.58	\$2.58	\$2.58			
Transportation Cost (\$)	\$149	\$161	\$74	\$74			\$458
<b>b. Disposal</b>							
Disposal Fee Per Yd <sup>3</sup>	\$12.00	\$12.00	\$12.00	\$12.00			
Yds <sup>3</sup> Per Load	20	20	20	20			
Disposal Cost (\$)	\$288	\$312	\$144	\$144			\$888
Total Cost - Landfill	\$437	\$473	\$218	\$218			\$1,346
<b>2.) Licensed Site</b>							
<b>a. Transportation</b>							
Percent To Be Shipped (Pumps)	50.0%	50.0%	50.0%	50.0%			
Percent To Be Shipped (Tubing)	100.0%	100.0%	100.0%	100.0%			
Loads To Be Shipped	2.5	5.2	2.5	3.2			
Distance (Miles)	150	150	150	150			
Cost Per Mile (\$/mile)	\$2.58	\$2.58	\$2.58	\$2.58			
Transportation Cost (\$)	\$951	\$2,008	\$979	\$1,255			\$5,192
<b>b. Disposal</b>							
Disposal Cost Per Ft <sup>3</sup>	\$11.00	\$11.00	\$11.00	\$11.00			
Disposal Fee Per Yd <sup>3</sup>	\$297.00	\$297.00	\$297.00	\$297.00			
Quantity Per Truck Load (Yds <sup>3</sup> )	20	20	20	20			
Disposal Cost (\$)	\$14,590	\$30,815	\$15,022	\$19,285			\$79,693
Total Cost - Licensed Site	\$15,541	\$32,823	\$16,000	\$20,521			\$84,895
Total Cost - Transport & Disposal	\$15,978	\$33,296	\$16,219	\$20,739			\$86,231
Total Cost - Pump Removal & Disposal	\$27,100	\$47,152	\$22,990	\$27,817	\$0	\$0	\$125,058

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	Irigaray Mine Unit(s) #1 Thru #9	Christensen Mine Units #2 Thru #4	Christensen Mine Unit #5	Christensen Mine Unit #6	Christensen Mine Unit #7	Christensen Mine Unit #8	Total Christensen & Irigaray
<b>WELLFIELD EQUIPMENT REMOVAL &amp; DISPOSAL</b>							
<b>III Surface Trunkline Piping</b>							
<b>A. Removal</b>							
Total Quantity (Ft)	44700	0	0	0	0	0	
Cost of Removal (\$/Ft)	\$0.146	\$0.146	\$0.146	\$0.146	\$0.146	\$0.146	
Cost of Removal (\$)	\$6,526	\$0	\$0	\$0	\$0	\$0	\$6,526
Average OD (Inches)	8.750	8.750	0.000	0.000	0.000	0.000	
Chipped Volume Reduction (Ft <sup>3</sup> /Ft)	0.088	0.088	0.088	0.088	0.088	0.088	
Chipped Volume (Ft <sup>3</sup> )	3934	0	0	0	0	0	
Quantity Per Truck Load (Ft <sup>3</sup> )	540	540	540	540	0	0	
Total Number of Truck Loads	7.3	0.0	0.0	0.0	0.0	0.0	
<b>B. Survey &amp; Decontamination</b>							
Percent Requiring Decontamination	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Loads for Decontamination	0.0	0.0	0.0	0.0	0.0	0.0	
Cost for Decontamination (\$/Load)	\$435.00	\$435.00	\$435.00	\$435.00	\$0.00	\$0.00	
Cost for Decontamination (\$)	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>C. Transport &amp; Disposal</b>							
<b>1.) Landfill</b>							
<b>a. Transportation</b>							
Percent To Be Shipped	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Loads To Be Shipped	0.0	0.0	0.0	0.0	0.0	0.0	
Distance (Miles)	48	48	48	48	0	0	
Cost Per Mile (\$/mile)	\$2.58	\$2.58	\$2.58	\$2.58	\$0.00	\$0.00	
Transportation Cost (\$)	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>b. Disposal</b>							
Disposal Fee Per Yd <sup>3</sup>	\$12.00	\$12.00	\$12.00	\$12.00	\$0.00	\$0.00	
Yds <sup>3</sup> Per Load	20	20	20	20	0	0	
Disposal Cost (\$)	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total Cost - Landfill	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>2.) Licensed Site</b>							
<b>a. Transportation</b>							
Percent To Be Shipped	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
Loads To Be Shipped	7.3	0.0	0.0	0.0	0.0	0.0	
Distance (Miles)	150	150	150	150	0	0	
Cost Per Mile (\$/mile)	\$2.58	\$2.58	\$2.58	\$2.58	\$0.00	\$0.00	
Transportation Cost (\$)	\$2,819	\$0	\$0	\$0	\$0	\$0	\$2,819
<b>b. Disposal</b>							
Disposal Cost Per Ft <sup>3</sup>	\$11.00	\$11.00	\$11.00	\$11.00	\$0.00	\$0.00	
Disposal Fee Per Yd <sup>3</sup>	\$297.00	\$297.00	\$297.00	\$297.00	\$0.00	\$0.00	
Quantity Per Truck Load (Yds <sup>3</sup> )	20	20	20	20	0	0	
Disposal Cost (\$)	\$43,270	\$0	\$0	\$0	\$0	\$0	\$43,270
Total Cost - Licensed Site	\$46,089	\$0	\$0	\$0	\$0	\$0	\$46,089
Total Cost - Transport & Disposal	\$46,089	\$0	\$0	\$0	\$0	\$0	\$46,089
<b>Total Cost - Surface Trunkline Removal &amp; Disposal</b>	<b>\$52,615</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$52,615</b>

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WELLFIELD EQUIPMENT REMOVAL & DISPOSAL	Irigaray Mine Unit(s) #1 Thru #8	Christensen Mine Units #2 Thru #4	Christensen Mine Unit #5	Christensen Mine Unit #6	Christensen Mine Unit #7	Christensen Mine Unit #8	Total Christensen & Irigaray
<b>IV Buried Trunkline</b>							
<b>A. Removal</b>							
Total Quantity (Ft)	7300	11585	24500	47000	0	0	
Cost of Removal (\$/Ft)	\$3.12	\$3.12	\$3.12	\$3.12	\$3.12	\$3.12	
Cost of Removal (\$)	\$22,776	\$36,083	\$76,440	\$146,840	\$0	\$0	\$281,939
Average OD (Inches)	8.750	8.750	8.750	12.000	12.000	12.000	
Chipped Volume Reduction (Ft <sup>3</sup> /Ft)	0.088	0.088	0.088	0.130	0.130	0.130	
Chipped Volume (Ft <sup>3</sup> )	642	1018	2156	6110	0	0	
Quantity Per Truck Load (Ft <sup>3</sup> )	540	540	540	540	0	0	
Number of Truck Loads	1.2	1.9	4.0	11.3	0.0	0.0	
<b>B. Survey &amp; Decontamination</b>							
Percent Requiring Decontamination	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Loads for Decontamination	0.0	0.0	0.0	0.0	0.0	0.0	
Cost for Decontamination. (\$/Load)	\$435.00	\$435.00	\$435.00	\$435.00	\$0.00	\$0.00	
Cost for Decontamination. (\$)	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>C. Transport &amp; Disposal</b>							
1.) Landfill							
a. Transportation							
Percent To Be Shipped	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Loads To Be Shipped	0.0	0.0	0.0	0.0	0.0	0.0	
Distance (Miles)	48	48	48	48	0	0	
Cost Per Mile (\$/mile)	\$2.58	\$2.58	\$2.58	\$2.58	\$0.00	\$0.00	
Transportation Cost (\$)	\$0	\$0	\$0	\$0	\$0	\$0	\$0
b. Disposal							
Disposal Fee Per Yd <sup>3</sup>	\$12.00	\$12.00	\$12.00	\$12.00	\$0.00	\$0.00	
Yds <sup>3</sup> Per Load	20	20	20	20	0	0	
Disposal Cost (\$)	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total Cost - Landfill	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2.) Licensed Site							
a. Transportation							
Percent To Be Shipped	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
Loads To Be Shipped	1.2	1.9	4.0	11.3	0.0	0.0	
Distance (Miles)	150	150	150	150	0	0	
Cost Per Mile (\$/mile)	\$2.58	\$2.58	\$2.58	\$2.58	\$0.00	\$0.00	
Transportation Cost (\$)	\$464	\$735	\$1,548	\$4,373	\$0	\$0	\$7,121
b. Disposal							
Disposal Cost Per Ft <sup>3</sup>	\$11.00	\$11.00	\$11.00	\$11.00	\$0.00	\$0.00	
Disposal Fee Per Yd <sup>3</sup>	\$297.00	\$297.00	\$297.00	\$297.00	\$0.00	\$0.00	
Quantity Per Truck Load (Yds <sup>3</sup> )	20	20	20	20	0	0	
Disposal Cost (\$)	\$7,128	\$11,286	\$23,760	\$67,122	\$0	\$0	\$109,296
Total Cost - Licensed Site	\$7,592	\$12,021	\$25,308	\$71,495	\$0	\$0	\$116,417
Total Cost - Transport & Disposal	\$7,592	\$12,021	\$25,308	\$71,495	\$0	\$0	\$116,417
<b>Total Cost - Buried Trunkline Removal &amp; Disposal</b>	<b>\$30,368</b>	<b>\$48,104</b>	<b>\$101,748</b>	<b>\$218,135</b>	<b>\$0</b>	<b>\$0</b>	<b>\$398,356</b>

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	Irigaray Mine Unit(s) #1 Thru #9	Christensen Mine Units #2 Thru #4	Christensen Mine Unit #5	Christensen Mine Unit #6	Christensen Mine Unit #7	Christensen Mine Unit #8	Total Christensen & Irigaray
<b>WELLFIELD EQUIPMENT REMOVAL &amp; DISPOSAL</b>							
<b>V Manholes</b>							
<b>A. Removal</b>							
Total Quantity	5	8	5	11	0	0	
Cost of Removal (\$ Each)	\$117.00	\$117.00	\$117.00	\$117.00	\$117.00	\$117.00	
Cost of Removal (\$)	\$585	\$936	\$585	\$1,287	\$0	\$0	\$3,393
Quantity Per Truck Load	10	10	10	10	10	10	
Number of Truck Loads	0.5	0.8	0.5	1.1	0.0	0.0	
<b>B. Survey &amp; Decontamination</b>							
Percent Requiring Decontamination	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Loads for Decontamination	0.0	0.0	0.0	0.0	0.0	0.0	
Cost for Decontamination (\$/Load)	\$435.00	\$435.00	\$435.00	\$435.00	\$0.00	\$0.00	
Cost for Decontamination (\$)	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>C. Transport &amp; Disposal</b>							
<b>1.) Landfill</b>							
<b>a. Transportation</b>							
Percent To Be Shipped	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Loads To Be Shipped	0.0	0.0	0.0	0.0	0.0	0.0	
Distance (Miles)	48	48	48	48	0	0	
Cost Per Mile (\$/mile)	\$2.58	\$2.58	\$2.58	\$2.58	\$0.00	\$0.00	
Transportation Cost (\$)	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>b. Disposal</b>							
Disposal Fee Per Yd <sup>3</sup> (\$)	\$12.00	\$12.00	\$12.00	\$12.00	\$0.00	\$0.00	
Yds <sup>3</sup> Per Load	20	20	20	20	0	0	
Disposal Cost (\$)	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total Cost - Landfill	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>2.) Licensed Site</b>							
<b>a. Transportation</b>							
Percent To Be Shipped	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Loads To Be Shipped	0.0	0.0	0.0	0.0	0.0	0.0	
Distance (Miles)	150	150	150	150	0	0	
Cost Per Mile (\$/mile)	\$2.58	\$2.58	\$2.58	\$2.58	\$0.00	\$0.00	
Transportation Cost (\$)	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>b. Disposal</b>							
Disposal Cost Per Ft <sup>3</sup>	\$11.00	\$11.00	\$11.00	\$11.00	\$0.00	\$0.00	
Disposal Fee Per Yd <sup>3</sup>	\$297.00	\$297.00	\$297.00	\$297.00	\$0.00	\$0.00	
Quantity Per Truck Load (Yds <sup>3</sup> )	20	20	20	20	0	0	
Disposal Cost (\$)	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total Cost - Licensed Site	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total Cost - Transport & Disposal	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>Total Cost Manhole Removal &amp; Disposal</b>	<b>\$585</b>	<b>\$936</b>	<b>\$585</b>	<b>\$1,287</b>	<b>\$0</b>	<b>\$0</b>	<b>\$3,393</b>
<b>TOTAL COST - WELLFIELD EQUIP REMOVAL &amp; DISP</b>	<b>\$152,407</b>	<b>\$215,640</b>	<b>\$183,098</b>	<b>\$299,575</b>	<b>\$0</b>	<b>\$0</b>	<b>\$850,720</b>

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TOPSOIL REPLACEMENT & REVEGETATION

	Irigaray Mine Unit(s) #1 Thru #9	Christensen Mine Units #2 Thru #4	Christensen Mine Unit #5	Christensen Mine Unit #6	Christensen Mine Unit #7	Christensen Mine Unit #8	Total Christensen & Irigaray
<b>I Process Plant and Office Building</b>							
<b>A. Topsoil Handling &amp; Grading</b>							
Affected Area (Acres)	5.0	2.5	0.0	0.0	0.0	0.0	
Average Affected Thickness (Ins)	12.0	12.0	0.0	0.0	0.0	0.0	
Topsoil Volume (Yds <sup>3</sup> )	8067	4033	0	0	0	0	
Unit Cost - Haul/Place (\$/Yd <sup>3</sup> )	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	
Topsoil Handling Cost (\$)	\$8,067	\$4,033	\$0	\$0	\$0	\$0	
Unit Cost - Grading (\$/Ac)	\$38.45	\$38.45	\$38.45	\$38.45	\$38.45	\$38.45	
Grading Cost (\$)	\$192	\$96	\$0	\$0	\$0	\$0	
Sub Total - Topsoil	\$8,259	\$4,129	\$0	\$0	\$0	\$0	\$12,388
<b>B. Radiation Survey &amp; Soil Analysis</b>							
Unit Cost (\$/Ac)	\$580.00	\$580.00	\$580.00	\$580.00	\$580.00	\$580.00	
Sub Total - Survey & Analysis	\$2,900	\$1,450	\$0	\$0	\$0	\$0	\$4,350
<b>C. Revegetation</b>							
Fertilizer (\$/Ac)	\$46.49	\$46.49	\$46.49	\$46.49	\$46.49	\$46.49	
Seeding Prep & Seeding (\$/Ac)	\$168.68	\$168.68	\$168.68	\$168.68	\$168.68	\$168.68	
Mulching & Crimping (\$/Ac)	\$276.54	\$276.54	\$276.54	\$276.54	\$276.54	\$276.54	
Sub Total Cost/Acre	\$491.71	\$491.71	\$491.71	\$491.71	\$491.71	\$491.71	
Sub Total - Revegetation	\$2,459	\$1,229	\$0	\$0	\$0	\$0	\$3,688
Sub Total - Process Plant and Office Bldg.	\$13,617	\$6,809	\$0	\$0	\$0	\$0	\$20,426
<b>II Ponds</b>							
<b>A. Topsoil Handling &amp; Grading</b>							
Affected Area (Acres)	20.0	12.0	0.0	0.0	0.0	0.0	
Average Affected Thickness (Ins)	12	12	0	0	0	0	
Topsoil Volume (Yds <sup>3</sup> )	32267	19360	0	0	0	0	
Unit Cost - Haul/Place (\$/Yd <sup>3</sup> )	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	
Topsoil Handling Cost (\$)	\$32,267	\$19,360	\$0	\$0	\$0	\$0	
Unit Cost - Grading (\$/Ac)	\$38.45	\$38.45	\$38.45	\$38.45	\$38.45	\$38.45	
Grading Cost (\$)	\$769	\$461	\$0	\$0	\$0	\$0	
Sub Total - Topsoil	\$33,036	\$19,821	\$0	\$0	\$0	\$0	\$52,857
<b>B. Radiation Survey &amp; Soil Analysis</b>							
Unit Cost (\$/Ac)	\$580.00	\$580.00	\$580.00	\$580.00	\$580.00	\$580.00	
Sub Total - Survey & Analysis	\$11,600	\$6,960	\$0	\$0	\$0	\$0	\$18,560
<b>C. Revegetation</b>							
Fertilizer (\$/Ac)	\$46.49	\$46.49	\$46.49	\$46.49	\$46.49	\$46.49	
Seeding Prep & Seeding (\$/Ac)	\$168.68	\$168.68	\$168.68	\$168.68	\$168.68	\$168.68	
Mulching & Crimping (\$/Ac)	\$276.54	\$276.54	\$276.54	\$276.54	\$276.54	\$276.54	
Sub Total Cost/Acre	\$491.71	\$491.71	\$491.71	\$491.71	\$491.71	\$491.71	
Sub Total - Revegetation	\$9,834	\$5,901	\$0	\$0	\$0	\$0	\$15,735
Sub Total - Ponds	\$54,470	\$32,682	\$0	\$0	\$0	\$0	\$71,362

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	Irigaray Mine Unit(s) #1 Thru #9	Christensen Mine Units #2 Thru #4	Christensen Mine Unit #5	Christensen Mine Unit #6	Christensen Mine Unit #7	Christensen Mine Unit #8	Total Christensen & Irigaray
<b>TOPSOIL REPLACEMENT &amp; REVEGETATION</b>							
<b>III Wellfields</b>							
<b>A. Topsoil Handling &amp; Grading</b>							
Affected Area (Acres)	40.0	55.0	30.0	50.0	35.0	40.0	
Average Affected Thickness (ins)	3.5	0.0	0.0	0.0	0.0	0.0	
Topsoil Volume (Yds <sup>3</sup> )	18822	0	0	0	0	0	
Unit Cost - Haul/Place (\$/Yd <sup>3</sup> )	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	
Topsoil Handling Cost (\$)	\$18,822	\$0	\$0	\$0	\$0	\$0	
Unit Cost - Grading (\$/Ac)	\$38.45	\$38.45	\$38.45	\$38.45	\$38.45	\$38.45	
Grading Cost (\$)	\$1,538	\$2,115	\$1,154	\$1,923	\$1,346	\$0	
Sub Total - Topsoil	\$20,360	\$2,115	\$1,154	\$1,923	\$1,346	\$0	\$26,897
<b>B. Radiation Survey &amp; Soil Analysis</b>							
Unit Cost (\$/Ac)	\$580.00	\$580.00	\$580.00	\$580.00	\$0.00	\$0.00	
Sub Total - Survey & Analysis	\$23,200	\$31,900	\$17,400	\$29,000	\$0	\$0	\$101,500
<b>C. Spill Cleanup</b>							
Affected Area (Acres)	0.054	0.038	0	0	0	0	
Affected Area (ft <sup>2</sup> )	2,352	1,568	0	0	0	0	
Average Affected Thickness (ft)	0.25	0.25	0	0	0	0	
Affected Volume (ft <sup>3</sup> )	588	392	0	0	0	0	
Quantity per Truckload (ft <sup>3</sup> )	540	540	540	540	540	540	
Quantity to be Shipped (Loads)	1.1	0.7	0.0	0.0	0.0	0.0	
Distance (Miles)	150	150	150	150	150	150	
Cost per Mile (\$)	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	
Transportation Cost (\$)	\$421	\$281	\$0	\$0	\$0	\$0	
Handling Cost (\$240/load)	\$261	\$174	\$0	\$0	\$0	\$0	
Disposal Fee per Cubic Foot (\$)	\$3.70	\$3.70	\$3.70	\$3.70	\$3.70	\$3.70	
Disposal Cost (\$)	\$2,178	\$1,450	\$0	\$0	\$0	\$0	
Sub Total - Spill Cleanup	\$2,597	\$1,731	\$0	\$0	\$0	\$0	\$4,328
<b>D. Revegetation</b>							
Fertilizer (\$/Ac)	\$48.49	\$48.49	\$48.49	\$48.49	\$48.49	\$48.49	
Seeding Prep & Seeding (\$/Ac)	\$168.68	\$168.68	\$168.68	\$168.68	\$168.68	\$168.68	
Mulching & Crimping (\$/Ac)	\$276.54	\$276.54	\$276.54	\$276.54	\$276.54	\$276.54	
Sub Total Cost/Acre	\$491.71	\$491.71	\$491.71	\$491.71	\$491.71	\$491.71	
Sub Total - Revegetation	\$19,688	\$27,044	\$14,751	\$24,586	\$17,210	\$19,688	\$122,928
Sub Total - Wellfields (\$)	\$65,628	\$62,790	\$33,305	\$55,508	\$18,556	\$19,688	\$255,653
<b>IV Roads</b>							
<b>A. Topsoil Handling &amp; Grading</b>							
Affected Area (Acres)	25.0	20.0	15.0	21.0	0.0	0.0	
Average Affected Thickness (ins)	12	12	12	12	12	12	
Topsoil Volume (Yds <sup>3</sup> )	40333	32267	24200	33880	0	0	
Unit Cost - Haul/Place (\$/Yd <sup>3</sup> )	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	
Topsoil Handling Cost (\$)	\$40,333	\$32,267	\$24,200	\$33,880	\$0	\$0	
Unit Cost - Grading (\$/Ac)	\$38.45	\$38.45	\$38.45	\$38.45	\$38.45	\$38.45	
Grading Cost (\$)	\$981	\$769	\$577	\$807	\$0	\$0	
Sub Total - Topsoil	\$41,295	\$33,036	\$24,777	\$34,687	\$0	\$0	\$133,794
<b>B. Radiation Survey &amp; Soil Analysis</b>							
Unit Cost (\$/Ac)	\$580.00	\$580.00	\$580.00	\$580.00	\$0.00	\$0.00	
Sub Total - Survey & Analysis	\$14,500	\$11,600	\$8,700	\$12,180	\$0	\$0	\$46,980
<b>C. Revegetation</b>							
Fertilizer (\$/Ac)	\$48.49	\$48.49	\$48.49	\$48.49			
Seeding Prep & Seeding (\$/Ac)	\$168.68	\$168.68	\$168.68	\$168.68			
Mulching & Crimping (\$/Ac)	\$276.54	\$276.54	\$276.54	\$276.54			
Sub Total Cost/Acre	\$491.71	\$491.71	\$491.71	\$491.71			
Sub Total - Revegetation	\$12,293	\$9,834	\$7,376	\$10,326	\$0	\$0	\$39,829
Sub Total - Roads (\$)	\$68,087	\$54,470	\$40,852	\$57,193	\$0	\$0	\$220,603

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TOPSOIL REPLACEMENT & REVEGETATION	Irigaray Mine Unit(s) #1 Thru #9	Christensen Mine Units #2 Thru #4	Christensen Mine Unit #5	Christensen Mine Unit #6	Christensen Mine Unit #7	Christensen Mine Unit #8	Total Christensen & Irigaray
<b>V Other</b>							
<b>A. Topsoil Handling &amp; Grading</b>							
Affected Area (Acres)	41.0	19.0	5.0	5.0	0.0	0.0	
Average Affected Thickness (Ins)	0.0	0.0	0	0	0	0	
Topsoil Volume (Yds <sup>3</sup> )	0	0	0	0	0	0	
Unit Cost - Haul/Place (\$/Yd <sup>3</sup> )	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	
Topsoil Handling Cost (\$)	\$0	\$0	\$0	\$0	\$0	\$0	
Unit Cost - Grading (\$/Ac)	\$38.45	\$38.45	\$38.45	\$38.45	\$38.45	\$0.00	
Grading Cost (\$)	\$1,576	\$731	\$192	\$192	\$0	\$0	
Sub Total - Topsoil	\$1,576	\$731	\$192	\$192	\$0	\$0	\$2,692
<b>B. Radiation Survey &amp; Soil Analysis</b>							
Unit Cost (\$/Ac)	\$580.00	\$580.00	\$580.00	\$580.00	\$0.00	\$0.00	
Sub Total - Survey & Analysis	\$23,780	\$11,020	\$2,900	\$2,900	\$0	\$0	\$40,600
<b>C. Revegetation</b>							
Fertilizer (\$/Ac)	\$46.49	\$46.49	\$46.49	\$46.49	\$0.00	\$0.00	
Seeding Prep & Seeding (\$/Ac)	\$168.68	\$168.68	\$168.68	\$168.68	\$0.00	\$0.00	
Mulching & Crimping (\$/Ac)	\$276.54	\$276.54	\$276.54	\$276.54	\$0.00	\$0.00	
Sub Total Cost/Acre	\$491.71	\$491.71	\$491.71	\$491.71	\$0.00	\$0.00	
Sub Total - Revegetation	\$20,160	\$9,342	\$2,459	\$2,459	\$0	\$0	\$34,420
Sub Total - Other	\$45,517	\$21,093	\$5,551	\$5,551	\$0	\$0	\$77,711
<b>VI Remedial Action</b>							
<b>A. Topsoil Handling &amp; Grading</b>							
Affected Area (Acres)	65.5	54.3	25.0	38.0	17.5	20.0	
Average Affected Thickness (Ins)	0.0	0.0	0.0	0.0	0.0	0.0	
Topsoil Volume (Yds <sup>3</sup> )	0	0	0	0	0	0	
Unit Cost - Haul/Place (\$/Yd <sup>3</sup> )	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
Topsoil Handling Cost (\$)	\$0	\$0	\$0	\$0	\$0	\$0	
Unit Cost - Grading (\$/Ac)	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
Grading Cost (\$)	\$0	\$0	\$0	\$0	\$0	\$0	
Sub Total - Topsoil	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>B. Radiation Survey &amp; Soil Analysis</b>							
Unit Cost (\$/Ac)	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
Sub Total - Survey & Analysis	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>C. Revegetation</b>							
Fertilizer (\$/Ac)	\$46.49	\$46.49	\$46.49	\$46.49	\$46.49	\$46.49	
Seeding Prep & Seeding (\$/Ac)	\$168.68	\$168.68	\$168.68	\$168.68	\$0.00	\$0.00	
Mulching & Crimping (\$/Ac)	\$276.54	\$276.54	\$276.54	\$276.54	\$0.00	\$0.00	
Sub Total Cost/Acre	\$491.71	\$491.71	\$491.71	\$491.71	\$46.49	\$46.49	
Sub Total - Revegetation	\$32,207	\$26,675	\$12,293	\$18,685	\$814	\$930	\$91,603
Sub Total - Remedial Action	\$32,207	\$26,675	\$12,293	\$18,685	\$814	\$930	\$91,603
<b>TOTAL COST - TOPSOIL &amp; REVEGETATION</b>	<b>\$279,724</b>	<b>\$204,519</b>	<b>\$92,001</b>	<b>\$136,937</b>	<b>\$19,369</b>	<b>\$20,598</b>	<b>\$753,148</b>

COGEMA Mining, Inc.  
 Restoration and Reclamation Costs  
 Wyoming Operations  
 WORKSHEET 8

	Irigaray Mine Unit(s) #1 Thru #9	Christensen Mine Units #2 Thru #4	Christensen Mine Unit #5	Christensen Mine Unit #6	Christensen Mine Unit #7	Christensen Mine Unit #8	Total Christensen & Irigaray
<b>MISCELLANEOUS RECLAMATION</b>							
<b>I Fence Removal &amp; Disposal</b>							
Quantity (Feet)	15240	35260	20000	9000	0	0	
Cost of Removal/Disposal (\$/Ft)	\$0.68	\$0.68	\$0.68	\$0.68	\$0.68	\$0.68	
Cost of Removal/Disposal (\$)	\$10,363	\$23,977	\$13,600	\$6,120	\$0	\$0	\$54,060
<b>II Powerline Removal &amp; Disposal</b>							
Quantity (Feet)	9450	10565	18000	18000	0	0	
Cost of Removal/Disposal (\$/Ft)	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
Cost of Removal/Disposal (\$)	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>III Powerpole Removal &amp; Disposal</b>							
Quantity	25	30	60	60	0	0	
Cost of Removal/Disposal (\$/Each)	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
Cost of Removal/Disposal (\$)	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>IV Transformer Removal &amp; Disposal</b>							
Quantity	3	1	0	18	0	0	
Cost of Removal/Disposal (\$/Each)	\$2,500	\$2,500	\$2,500	\$800	\$800	\$800	
Cost of Removal/Disposal (\$)	\$7,500	\$2,500	\$0	\$10,800	\$0	\$0	\$20,800
<b>V Booster Pump Assembly Removal &amp; Disposal</b>							
Quantity	0	6	5	5	0	0	
Cost of Removal/Disposal (\$/Each)	\$300	\$300	\$300	\$300	\$300	\$300	
Cost of Removal/Disposal (\$)	\$0	\$1,800	\$1,500	\$1,500	\$0	\$0	\$4,800
<b>VI Culvert Removal &amp; Disposal</b>							
Quantity (Feet)	150	1200	1000	1000	0	0	
Cost of Removal/Disposal (\$/Ft)	\$3.48	\$3.48	\$3.48	\$3.48	\$3.48	\$3.48	
Cost of Removal/Disposal (\$)	\$522	\$4,176	\$3,480	\$3,480	\$0	\$0	\$11,658
<b>VII Guardrail Removal</b>							
Quantity (Feet)	200	3000	0	0	0	0	
Cost of Removal/Disposal (\$/Ft)	\$6.30	\$6.30	\$6.30	\$6.30	\$6.30	\$6.30	
Cost of Removal/Disposal (\$)	\$1,260	\$18,900	\$0	\$0	\$0	\$0	\$20,160
<b>VIII Low Water Stream Crossing</b>							
Quantity	0	1	1	0	0	0	
Cost of Removal/Disposal (\$/Each)	\$8,500	\$8,500	\$8,500	\$8,500	\$8,500	\$8,500	
Cost of Removal/Disposal (\$)	\$0	\$8,500	\$8,500	\$0	\$0	\$0	\$17,000
<b>IX Utilities Cost</b>							
Quantity (Mos)	4	8	4	4	0	0	
Cost Per Month (\$/Month)	\$65	\$65	\$65	\$65	\$65	\$65	
Total Cost (\$)	\$260	\$520	\$260	\$260	\$0	\$0	\$1,300
<b>TOTAL MISCELLANEOUS COST</b>	<b>\$19,905</b>	<b>\$60,373</b>	<b>\$27,340</b>	<b>\$22,160</b>	<b>\$0</b>	<b>\$0</b>	<b>\$129,778</b>





**Reclamation Bond Assumptions  
Irigaray and Christensen Ranch ISL Projects  
Permit to Mine No. 478  
2003 Annual Report, August 2003**

**Table 1 – Summary of Reclamation/Restoration Bond Estimate**

Table 1 is a summary of costs from individual bond worksheets. Added to the grand total of estimated spending are “miscellaneous” costs associated with the hiring of a third part contractor to actually perform the work. The specific miscellaneous costs are a requirement of the Wyoming Department of Environmental Quality (WDEQ), as outlined in the WDEQ Land Quality Division’s Guideline No. 12, “Standardized Reclamation Performance Bond Format and Cost Calculation Methods”, page 11. The U.S. Nuclear Regulatory Commission (NRC) also mandates that a standard contingency, in this case 15%, be added to the overall estimate for contingency for unknowns. An explanation of the various miscellaneous costs and contingency for Table 1 are as follows.

**Project Design**

This is the cost for an independent firm to design the final reclamation project. This includes all design and engineering work through production of construction documents. Some surveying and redesign of the operator’s reclamation plan to fit the current situation may be required. WDEQ reference sources place this category at 2 to 6.5% of the total bond cost. WDEQ typically uses 3%. COGEMA has been approved to use 2% for this category based on the details of our reclamation plan.

**Contractor Profit & Mobilization**

This percentage covers contractor costs typically not found in the basic unit rates. This percentage specifically covers contractor profit, overhead costs, mobilization costs to the site and demobilization costs after job completion. According to WDEQ, assorted references place this cost from 8% to 15% of the total bond cost. WDEQ typically uses 10%. COGEMA has been approved by the WDEQ to use 8% for this category.

**Pre-construction Investigation**

This item addresses all fieldwork necessary to document and mitigate dangerous and/or quickly deteriorating conditions. Any assessment under this item will be based on the WDEQ’s knowledge of specific site conditions and length of time between bond forfeiture (reason for a third party contractor) and initiation of the final reclamation project. WDEQ uses 1%, and has reference sources placing this cost between 1% and 2%. COGEMA has been asked by WDEQ to incorporate the 1% into our bond estimate.

**Project Management**

This category includes the costs for an independent firm to manage the final reclamation project. It includes complete oversight of all demolition, construction and reclamation activities. Examples would include supervision of groundwater restoration, wellfield piping and structures removal, plant buildings and equipment demolition, soil sampling, byproduct waste shipments, etc. References place this cost at 3% to 4%. WDEQ typically uses 3%. However, WDEQ has required a 4% project management cost for COGEMA due to the more technical aspects of groundwater restoration. Furthermore, at the suggestion of NRC, COGEMA has included a Radiation Safety Officer as part of the project management team, bringing the percentage for this estimate up to 5%.

### **On-site Monitoring**

This category covers the costs for any miscellaneous monitoring felt necessary by the WDEQ after the final reclamation is completed. Costs of this item typically vary, depending upon the volume of monitoring already included in the bond or the type of reclamation activity required. The WDEQ typically uses 0.5%, and this is what COGEMA is bonded for.

### **Site Security & Liability Assurance**

This category covers the cost for the WDEQ, or third party contractor, to provide any necessary site security measures during the reclamation program, and to purchase liability insurance to cover the timeframe of the reclamation program and full bonding period. WDEQ references place this cost at about 1% of the total bond amount. The WDEQ typically uses 1%, and this is what COGEMA is bonded for.

### **Longterm Administration**

This category applies to the period between completion of the reclamation project and final bond release which is a minimum 5 year period for uranium mines. During this time the WDEQ will incur administrative costs prior to the final bond release. WDEQ typically uses 1% to 2% for this category depending upon the scale or complexity of the reclamation and post-reclamation monitoring. WDEQ has required COGEMA to use 2%.

### **Contingency**

Contingency is included in the bond estimate to cover unknown conditions that could occur during the reclamation project. The WDEQ references place this cost at 2% to 5% of the total bond cost. Under normal circumstances WDEQ uses 4%. NRC requires a contingency of 15% regardless of the detail of the bond estimate, so COGEMA has incorporated the 15%.

**WDEQ Reference Sources:** The reference sources used by WDEQ to establish the ranges of percentages used in the miscellaneous items are:

- Means Heavy Construction Cost Data (current edition), R.S. Means Company, Inc., Kingston MA
- Means Site Work Cost Data (current edition), R.S. Means Company, Inc.
- Building Construction Cost Data (current edition), R.S. Means Company, Inc.
- Handbook for Calculation of Reclamation Bond Costs, 1987, Department of Interior, Office of Surface Mining Reclamation and Enforcement, Washington, D.C.
- Wyoming DEQ Abandoned Mine Land Program contracting and reclamation practices and cumulative experience.

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## **Worksheet 1 – Groundwater Restoration**

Worksheet 1 provides the cost estimate to complete the groundwater restoration work at both the Irigaray and Christensen sites. Most of the input data and calculations are self-explanatory. Explanations for the various unit rates or factors used in the calculations are described below:

### **Technical Assumptions:**

All of the input data provided in the technical assumptions are actual site specific information. These data are used throughout the bond estimate as needed.

### **Restoration Operating Assumptions:**

Flowrates, pore volumes required, RO efficiencies and disposal well information are taken from the restoration plan. The remainder of the operating assumptions are calculated using the conversion factors listed and the technical assumptions. A new line has been added this year to account for the number of baseline wells in each mine unit.

**Restoration Cost Assumptions:**

Power costs are based on actual (average) installed horsepower and actual costs for electricity at each of the sites. A factor of 1.0 has been requested by WDEQ for use as the Kwh/Hp ratio to account for motor efficiencies. This factor is used for the Irigaray operations, because we do not have current data on pumping costs. COGEMA's actual ratio of Kwh/Hp is 0.83 Kwh/Hp for Christensen Ranch, where restoration operations continue. This includes all operating submersible pumps, reverse osmosis feed pumps, the plant injection pumps, the two disposal well pumps, and miscellaneous electricity used in the restoration plant (lights, etc.). The factor of 0.83 Kwh/Hp is based on actual data from Christensen operations in years 2002 and 2003 (see Attachment 1), 0.83 has been incorporated into the bond estimate. Using this number, a unit rate for power (\$/Kgal) is calculated.

Chemical costs are based on actual spending (year 2003) at the Christensen site. These costs have been applied to Irigaray, where appropriate. Repair and maintenance is also a unit rate based on actual spending for this category. These costs are outlined below:

Groundwater Sweep and Reverse Osmosis Phases – Other Operating Assumptions:

- BaCl (barium chloride) – would not be used in the future; instead would use radium resin currently on site.
- Anti-scalent (is used at Christensen only for surface discharge during GWS):
 

Purchase of 250 gallon tote	= \$2,958	
	= \$11.832/gallon	
Addition target rate of 8 ppm		
8 gallons	X \$11.832	= \$0.0947/Kgal
1,000 Kgal H2O	gallon	
- Elution cost is based on actual spending of \$2,850 per average elution (includes labor and chemicals). \$2,850 divided by 28,800 Kgal/elution = \$0.099/Kgal.
- Sulfuric Acid, Hydrochloric acid and sodium sulfide are no longer used in the restoration process. Updated membranes for the RO units no longer need low pH feedwater, thus eliminating the need for acid addition prior to reverse osmosis. Hydrogen sulfide gas is now used instead of sodium sulfide.
- A unit rate of \$0.863/Kgal is used for hydrogen sulfide gas. This is based on actual spending at Christensen Mine Units 2 and 4 over the past 10 months. The cost includes purchase of the chemical (\$0.41/lb), an addition rate of 100 ppm, a flow rate of 100 gpm, one pore volume of use, plus a \$75/day trailer rental fee. This cost has been added as a separate line item below the Reverse Osmosis wellfield section, as only 1 PV of hydrogen sulfide per mine unit is assumed.
- The unit rate of \$0.0181/Kgal for caustic soda (reverse osmosis phase) is based on actual spending from August 2002 through July 2003.

- Restoration Plant repair and maintenance (GWS and RO) is based on actual spending from August 2002 through July 2003. These costs include purchase of piping, fittings, pump maintenance, filters and miscellaneous supplies.

Supplies	= \$0.0358 per Kgal
Outside Services	= <u>\$0.0021 per Kgal</u>
	= \$0.0379 per Kgal
  
- Restoration wellfield repair and maintenance (GWS and RO) is based on actual spending from August 2002 through July 2003. Costs include purchase of submersible pumps, piping, fittings, filters and miscellaneous supplies.

Supplies	= \$0.1185 per Kgal
Outside Services	= <u>\$0.1709 per Kgal</u>
	= \$0.2894 per Kgal
  
- Sampling and Analysis for Groundwater Sweep is based on taking a round of samples from each baseline well after the final GWS pore volume and analyzing the samples for a full suite Guideline 8 (26 parameters). This amount is then converted to a cost per Kgal for the pore volume:

Irigaray Units 6-9: <u>(27 baselines X \$200 = \$5,400)</u>	= \$0.137/Kgal
1 PV GWS = 39,525 Kgal	

  

Christensen Unit 2: <u>(24 baselines X \$200 = \$4,800)</u>	= \$0.175/Kgal
1 PV GWS = 27,414 Kgal	
  
- Sampling and Analysis for the Reverse Osmosis phase is based on one round of Guideline 8 analyses for each baseline well at the end of RO; plus a recovery composite analyzed for Guideline 8 in each mine unit (or area for Irigaray) for each PV; and miscellaneous samples during the process. For Christensen miscellaneous, assume 10 wells in each wellfield module of each mine unit are analyzed for 4 parameters, each PV. The cost of analysis is \$10 each parameter, or \$40. Christensen Unit 2 has 4 modules, Unit 3: 5 modules, Unit 4: 3 modules, Unit 5: 5 modules; and Unit 6: 6 modules. For Irigaray, assume 15 wells per Units 1-5, and 15 wells for Units 6-9, each PV, for the 4 parameters. These costs are divided by the total Kgals in 5 PV of RO treatment:

Irigaray Units 6-9: 27 baselines X \$200 =	\$5,400
Rec. Comp.: 5 PV X 1 wellfield area (Units 6-9) X \$200 =	\$1,000
Misc.: 5 PV X 15 wells X (4 analytes, \$10 each) =	\$3,000
Total = \$9,400/(197,624 Kgal/5 PV) =	\$0.048/Kgal

  

Christensen Unit 2: 24 baselines X \$200 =	\$4,800
Rec. Comp.: 5 PV X 1 mine unit X \$200 =	\$1,000
Misc.: 5 PV X (10 wells/module*4 modules)*(4 analytes*\$10 each) =	\$8,000
Total = \$13,800/(137,085 Kgal/5 PV) =	\$0.101/Kgal
  
- Utility costs listed are for electricity, heating and telephone for the offices during the restoration operations. The cost per month has been revised since last year. It was previously assumed that the main offices would continue operating if the work were contracted. In reality, to save costs during contracting, one of the on-site trailers would be used to office project management personnel during this time period. Powder River Energy Corp. has provided an average cost of \$65/month for a typical full electric house trailer (heating and lights), thus eliminating the need for propane. Current telephone costs at Irigaray and Christensen combined are approximately

\$500/month. Thus the new monthly unit rate of \$565 is more appropriate than the \$1000/month estimate in the previous bond estimate.

**Waste Disposal Well Cost Assumptions:**

Operating assumptions for the waste disposal well are based on the restoration plan and historical experience (such as the brine concentration factor). Cost assumptions follow the same rationale as for restoration costs (unit rates are based on actual site spending for the power, chemicals, repair and maintenance).

- Electrical power costs are based on the average Kwh/Hp factor of 0.83, which is the actual ratio for Christensen (includes all site pumps).
- RO Antiscalent cost (RO processed feed water for disposal well):
  - Purchase of 250 gallon tote (delivered) = \$4,758
  - (Chemico Int'l RO 9) = \$19.032/gallon
  - Addition target rate of 10 ppm
  - $\frac{10 \text{ gallons}}{1,000 \text{ Kgal H}_2\text{O}} \times \$19.032 = \$0.1903/\text{Kgal}$
- Disposal Well Antiscalent cost:
  - 440 gallons delivered = \$5,220.60
  - (Champion Tech Gypton t-67) = \$11.865/gallon
  - Addition target rate of 20 ppm
  - $\frac{20 \text{ gallons}}{1,000 \text{ Kgal H}_2\text{O}} \times \$11.865 = \$0.2373/\text{Kgal}$
- Sulfuric Acid (used prior to RO to avoid precipitation). Actual spending in 2003 was \$22,243, divided by 41,662 Kgal = \$0.5339/Kgal.
- Corrosion inhibitor: no longer required.
- Algaecide: 2003 purchases = \$4,634; 2003 Kgal = 41,662; = \$0.111/Kgal
- Repair and maintenance is based on actual spending from August 2002 through July 2003 for bag filters, pump parts, oil and lube, fittings. The unit rate for this is equal to \$0.0116/Kgal as RO feed. Converted to Kgal of disposal well injection is:
  - $\frac{\$0.0116}{\text{Kgal RO feed}} \times \frac{1000 \text{ Kgal RO feed}}{150 \text{ Kgal disposal well feed}} = \$0.0773/\text{Kgal}$

**Stabilization Monitoring:**

Three sample sets will be taken during the 9-month stabilization-monitoring period. The first set is taken three months after the beginning of stabilization monitoring. The next set is taken after six months and the last after 9 months. The sampling cost per set is based on rental of a 30 Kw, 480 volt, 3-phase portable generator for a one week period at a rate of \$280/week (Industrial Engine Service, Casper WY, quote of August 2003). As each well is pumped for an hour period, and the generator can service 4 wells at a time, then it is possible to sample a maximum of 32 wells per day during 8 hours (assuming a 10-hour workday). A one-week rental is more than sufficient to sample all baseline wells in a mine unit, so this number is very conservative. The analytical cost is a calculation based on sampling all baseline wells in each wellfield with an analysis cost of \$200/well for a DEQ Guideline 8 analysis for uranium mines (increased from last year's \$150/sample). For this calculation, a new line has been added to the technical assumptions to show the number of baseline wells per area. Labor is included at the end of Worksheet 1. Utilities (electricity, telephone) are included for maintaining the office open during stabilization monitoring. These costs were previously described under the groundwater sweep explanations, above.

**Labor:**

Labor costs for 2.6 years of restoration operations are included (unchanged from last year). In reality, the completion of restoration at Christensen is only one year forward.

The operations crew consists of 1 supervisor, 4 operators, and 2 maintenance personnel. Operating costs for 2 vehicles are also included in this category. Unit rates for each worker category are shown in the table. A higher labor rate is used for groundwater restoration than is used in the remainder of the surface reclamation portion of the bond. This is because more skilled labor is required for operating the restoration equipment. Management labor is included in the Miscellaneous category under Project Management in Table 1.

#### Restoration Capital Requirements:

The only capital requirement listed is the plugging and abandonment of the two wastewater disposal wells. This has been listed as capital as the plugging and abandonment were included in the original capital construction estimate for the well, and this is the amount remaining. The plugging cost estimate of \$100,000 per well is based on a consultant's estimate in 1999 of approximately \$75,000 per well (placing cement plugs in accordance with Wyoming Oil & Gas Commission abandonment guidance).

### Worksheet 2 – Plant Equipment Removal and Disposal

This worksheet calculates the costs to decontaminate, dismantle and remove, transport and dispose of plant process equipment. Explanations for the various unit rates or factors used in the calculations are described below:

#### Decontamination Cost

The decontamination unit rate was first developed in 1994, and was \$462/load. In 2001, this estimate was inflated to 2001\$ by applying a factor of 19.1%. This increased the base unit rate to \$550/load. However, checking local rental rates for equipment, the current price for labor and hydrochloric acid, the 1994 assumptions are very close to today's cost. Accordingly, the decontamination unit rate has been revised downwards to \$435/load.

#### Assumptions:

- 2 cubic feet = 6 square feet (surface)
- 2 laborers can powerwash or sandblast 10 square feet per minute, or 1.7 cubic feet per minute = 102 cubic feet/hour
- 1 load = 540 cubic feet

#### Labor:

- 2 laborers @ \$15/hour = \$30/hour
- 540 cubic feet/load divided by 102 cubic feet/hour = 5.29 hours/load
- 5.29 hours/load x \$30/hour = \$158.7, say \$160

#### Equipment Rental:

- 2 3500 psi pressure washers @ \$6/hour x 2 = \$12/hour\* (\$60/day, 10 hr/day)
- 1 185 cfm air compressor @ \$12.5/hour\* (\$125/day, 10 hr/day)  
with sandblast pot, hood,  
wand, hose = \$24.5/hour

\*rates based on 08-15-03 quote from Contractor's Equipment, Casper, WY

- 5.29 hours x \$24.5/hour = \$129.61, say \$130

#### Materials:

- Sand: 75 cubic feet @ \$1/foot\*\* = \$75
  - 10% HCl, 440 gallons @ \$0.155/gal\*\*\* = \$68
- \$143, say \$145

\*\*\$1/foot from 08-15-03 quote of \$19/ton for fine sand (100 lbs/ft3) from JTL, Casper

\*\*\* 10% HCl = 506 lbs/yd<sup>3</sup>, 202 gallons/yd<sup>3</sup>, \$124/ton = \$0.155/gal  
TOTAL = \$160 + \$130 + \$145 = \$435/load

#### Dismantling and Loading Cost

The base detail of this cost was also generated in 1994 (\$600/load) and inflated to 2001\$ (\$715/load). Using current quotes, the cost is now estimated at \$650/load.

Dismantling and loading cost of \$600/load (1994 \$):

Labor Crew:	1 foreman	@ \$20/hour
	4 laborers	@ \$15/hour = \$60/hour
	1 truck	@ \$10/hour
	1 welder	@ \$35/hour
		<u>\$125/hour</u>

Estimate: 4 hours @ \$125/hour = \$500

Equipment Rental: 1 front-end loader with operator @ \$75/hour (CAT 988C, June 2003 quote from Rapid Construction)

Productivity: 1 load = 20 yd<sup>3</sup>, 10 yd<sup>3</sup>/hr

Estimate: 2 hours @ \$75/hour = \$150

TOTAL = \$650/load

#### Oversize Charges

The cost of \$326/per truckload for oversize charges was provided to COGEMA by our former trucking firm, Key Trucking (Kaycee, Wyoming). This was their estimate of what they would be paying for permits for any loads that were larger than 15' wide, 15' high and 75' long. No other details are available. Standard charges from the Wyoming Department of Transportation, Port of Entry, are \$15 plus \$0.03/foot/mile for the oversized item. We believe that the \$326/load is very conservative based on the standard charges quoted.

#### Transportation & Disposal

- Cost per mile of \$2.58 for transportation of decommissioned materials is standard throughout the bond estimate. This is the actual price charged by Key Trucking for hauling materials short distances (less than 200 miles). The mileages listed in the bond are 48 miles from the project sites to the Edgerton, Wyoming industrial landfill, and 150 miles to Shirley Basin, Wyoming (tailings facility for byproduct disposal). The \$2.58 charge is based on a loaded mile (one-way).
- Landfill costs of \$12.00/cubic yard are the actual rates charged by the Edgerton, Wyoming industrial landfill (July 2003 rate sheet).
- COGEMA Mining has a byproduct material disposal agreement with Pathfinder Mines Corporation's Shirley Basin tailings facility. The disposal fee per cubic foot for piping, process equipment, demolition waste is \$11/cubic foot.

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### Worksheet 3 – Plant Building(s) Demolition and Disposal

This spreadsheet provides the costs for demolition and disposal of all buildings at Irigaray and Christensen, including concrete decontamination, demolition and disposal. Also included in the spreadsheet are costs for the removal and disposal of contaminated soils under the process buildings, and at the NPDES surface discharge points (one each site). Individual cost items are:

#### Structural Character

- Western Water Consultants, Sheridan, Wyoming, provided factors for gutting, and estimated material weights for the Irigaray process buildings volumes. Volumes,



etc., for the Christensen buildings were estimated by COGEMA's in-house staff, using the Western Water Consultants work at Irigaray.

- The building demolition cost of \$0.165/cubic foot is taken directly from Appendix K of LQD's Guideline No. 12.
- The building demolition disposal cost of \$300/truckload (25 CY trailer) is from the July, 2003 rate sheet from the Edgerton, Wyoming industrial landfill.

#### **Concrete Decontamination, Demolition & Disposal**

- The decontamination costs of \$0.134/square foot is based on the decontamination estimate of \$435/load discussed above for Worksheet 2. One load = 540 cubic feet; assuming 1 cubic foot = 6 square feet (surface), then \$435/load divided by 3240 square feet per load = \$0.134 per square foot.
- The concrete demolition rate of \$3.05/square foot is taken directly from Appendix K of LQD's Guideline No. 12.
- The on-site disposal cost has been calculated as \$0.23/ft<sup>3</sup>, or \$6.25/yd<sup>3</sup>. This is based on the following:
  - 1 988C loader with operator @ \$75/hour (Rapid Construction quote, 2003)
  - 1 dump truck with operator @ \$50/hour

\$125/hour

Productivity: 2 loads/hr (10 yd<sup>3</sup> load) = 20 yd<sup>3</sup>, or 540 ft<sup>3</sup>  
TOTAL = \$125/540 = \$0.23/ft<sup>3</sup>
- The disposal fee of \$3.70/cubic foot is based on the byproduct waste disposal agreement with Pathfinder Mines Corporation's Shirley Basin site. This rate is based on the agreement fee of \$100/cubic yard for soils and concrete rubble. (\$100/27 cubic feet per cubic yard = \$3.70 per cubic foot).

#### **Soil Removal & Disposal**

The estimate of contaminated soils is simply a contingency for unknowns. All unit rates associated with this contingency have previously been justified, except that the unit rate for a front end loader (with operator) has been increased from \$50/hr to \$75/hr (Rapid Construction quote for a 988C loader, 2003).

#### **Radiation Survey**

The cost for radiation surveys is detailed below:

Soil sampling and analysis cost:

- \$75/soil sample for digestion, U and Ra-226 analysis (Energy Lab, Casper quote)
- \$25/soil sample for labor
- Total = \$100/sample, and an average of 4 samples per acre = \$400/acre

Gamma characterization and verification survey

- \$100/acre for GPS survey
- \$50/acre for grid establishment
- \$30/acre for verification after excavation
- Total = \$180/acre (quotes from ERG, New Mexico)

Grand Total = \$580/acre

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### **Worksheet 4 – Pond Reclamation Costs**

Worksheet 4 provides all costs for the decommissioning of evaporation ponds located at the Irigaray and Christensen site. Unit rates used for this work that have not been identified in detail for other worksheets are provided following:

### Pond Sludge

Last year's sludge handling costs per load were \$238/load. This was based on a 1994 cost estimate of \$200/load then inflated to 2001\$ (19.1%). Using current rates, the sludge handling costs per load are given as \$240/load.:

- Front-end loader with operator @ \$75/hr (10 c.y./hr) for 2 hrs. = \$150
  - Labor crew (1 hour) =
    - 1 foreman @ \$20/hr
    - 4 laborers @ \$15/hr
    - 1 truck @ \$10/hr
- = \$90/hr = \$90

TOTAL = \$240/load

### Pond Liner

- Labor crew costs per hour for handling the pond liner are taken from the above estimate of \$90/hour. Labor costs are relatively unchanged over the past few years
- The \$11/ft<sup>3</sup> for disposal is the current contract price for this type of material at Pathfinder's Shirley Basin tailings impoundment.

### Pond Backfill

- The unit rate for backfilling of \$1.00 per cubic yard is conservative. A third party contractor at Pathfinder's Shirley Basin facility is currently charging \$0.70 per cubic yard for backfilling/excavation work and \$0.54 per cubic yard for regrading (Rapid Construction, 2003).

### Radiation Survey – See Worksheet 3

### Leak Detection System Removal

- This section assumes that contamination is found in the leak detection system wherever a leak has been detected in a pond during its operating life. This is why volumes are included for only Ponds C and D at Irigaray. The amounts from Pond 1 at the 517 site have been removed as this area has already been decontaminated and is ready for clean backfill. Handling costs for removal of these systems are included as \$240/load, or the same as the pond liner handling costs.

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## Worksheet 5 – Well Abandonment

The method used for well abandonment in this bond calculation involves the placement of bentonite chips in the bottom 75 feet and upper 30 feet of each well, with the intermediate volume filled with gravel. A cement cone is placed two feet below the surface, then the surface casing is removed and the hole is backfilled with soil using a backhoe. The abandonment unit rate for 2003 has increased very slightly over last year's rate due to price changes, described as follows:

- Cost of bentonite chips - \$4.50/bag is a quote from Casper Well Products, Casper, Wyoming (August 2003).
- Cost of gravel/cubic yard – two quotes were obtained in August 2003 for sand & gravel to fill the wells for final abandonment. The first was from JTL Group (Casper, WY) for screened, washed pea gravel. The quote was \$16.00/ton, with a 1.5 tons/yd conversion, or \$24.00 per yard. The second quote was from '71 Construction (Casper, WY) for a sand-pea gravel mix, suitable for well abandonment.

This cost came in at \$16 per ton with a 1.25 tons/yard conversion, or \$20 per yard. This cost has been used to replace last year's cost of \$17.53 per cubic yard.

- Cost of cement cones/markers - \$4.00 each from Casper Well Products, Wyoming.
- An example of a typical well abandonment calculation for Irigaray is as follows:

Assume: well volume = 27.6 ft<sup>3</sup>; well depth = 250 ft; casing diameter = 4.5 inches  
Materials per well:

Bentonite chips from 250' to 175' (Christensen = 410' to 335')	
Sand/gravel from 175' to 30' (Christensen = 335' to 30')	
Bentonite chips from 30' to 2'	
Cement cone and backfill from 2' to surface	
Materials/well: 15 bags bentonite chips @ \$4.50/bag	= \$67.50
(65 lbs/ft <sup>3</sup> , 11.4 ft <sup>3</sup> /well, 50 lb. bags)	
0.58 c.y. gravel @ \$20/c.y.	= \$11.60
[Well T.D. - (105'-2') x 0.11( $\frac{\pi r^2}{144 \text{ in}^2/\text{ft}^2}$ )/27]	
Cement cone and marker @ \$4.00 each	= \$ 4.00

Labor: 1 hr./well

1 - Foreman @ \$20.00/hour	
2 - Laborers @ \$15.00/hour	
1 - Vehicle @ \$10.00/hour	
\$60.00/hour	
\$60.00/hour x 1 hour/well	= \$60.00

Equipment Rental: 1 backhoe @ \$38.50/hour x 1 hour/well	= \$38.50
(Operator included - rate is actual 2003 rental rate)	
<b>TOTAL cost per well</b>	<b>= \$181.60</b>

## Worksheet 6 - Wellfield Equipment Removal & Disposal

This spreadsheet covers the removal & disposal of all wellfield piping, submersible pumps and tubing, trunklines running from the wellfields to the plant, and manholes along the trunklines. Unit rates not addressed previously are detailed below.

### Wellfield Piping Removal

The 1994 cost of \$0.162/ft to remove buried lines running from the module buildings to each individual well was used for last year's unit rate, then inflated by 19.1% to 2001\$ for the unit rate of \$0.193/ft. This year costs have been updated, such as an increase in the backhoe and chainsaw rental charges, providing a new unit rate of \$0.202/ft of removal. An example of the calculation is provided as follows:

Open Trenches:

- 300'/well, 446 wells = 133,800 linear feet of pipe
- trenches: 300'/well x 2' deep x 2' wide = 1,200 ft<sup>3</sup> = 44 c.y./well
- 44 c.y./well x 446 wells (Christensen Unit 6) = 19,624 c.y.
- 19,624 c.y. @ 50 c.y./hour = 392 hours
- Equipment rental: 2 backhoes @ \$38.5/hour x 196 hours each = \$15,092  
(operators included) (\$0.113/ft)

Remove Pipe, Chip and Load: (assume approximately 20,000 feet /day chipped)

- Labor: 1 - Foreman @ \$20.00/hr.

4 – Laborers @ \$15.00/hr.		
1 – Vehicle @ \$10.00/hr.		
	\$90.00/hr. x 6 days	= \$ 4,320
▪ Equipment Rental: 2 chainsaws @ \$5.00/hr x 3 days		= \$ 30
(chainsaw rental = \$50/day, assume 10 hr day)		= (\$0.0325/ft)

**Backfill Trenches:**

▪ 19,624 c.y. @ 100 c.y./hr. = 196 hrs.		
▪ Equipment rental: 2 backhoes @ \$38.50/hr. x 98 hrs each		= \$ 7,546
(operators included)		(\$0.056/ft)
	<b>TOTAL=</b>	<b>\$0.202/linear foot</b>

Non-contaminated landfill charges of \$12/yd<sup>3</sup> throughout Worksheet 6 is from the July 2003 rate sheet from the Edgerton landfill (quote for demolition trash).

**Pump Removal**

Submersible pumps are set in each production well for mining and restoration. Last year's pump removal cost of \$21.44 is the 1994 cost of \$18.00 per well adjusted to 2001\$ (19.1% increase). This year, we have updated the pulling unit cost and now have a unit rate of \$22.50 per pump or well. Using Christensen Mine Unit 6 as an example, the details are as follows:

Pull pumps and tubing – 4 wells/hour, 202 production wells

▪ Labor:	1 – Foreman @ \$20.00/hour		
	2 – Laborers @ \$15.00/hour		
	\$50.00/hour	x 50.5 hours	= \$ 2,525
▪ Equipment Rental:	1 pulling unit @ \$40.00/hr.	x 50.5 hours	= \$ 2,020
			\$ 4,545
	<b>TOTAL = \$4,545 / 202 wells = \$22.50/ pump or well</b>		

**Survey & Decontamination – see Worksheet 2**

**Tubing Volume Reduction and Loading**

Using Christensen Mine Unit 6 as an example, the details of this cost are as follows:

Tubing: 300'/well average x 202 wells = 60,600 linear feet

▪ Chip and load: average O.D. (inches) = 3; chipped volume reduction (ft <sup>3</sup> /ft) = 0.016; chipped volume = 970 ft <sup>3</sup> ; assume approximately 20,000 feet per day chipped.		
▪ Labor:	1 – Foreman @ \$20.00/hour	
	2 Laborers @ \$15.00/hour	
	\$50.00/hour x 3 days (30 hours)	= \$1,500
▪ Equipment: shredder is owned by COGEMA		
	<b>TOTAL = \$1,500 / 60,600 linear feet = \$0.025/linear foot</b>	

**Surface Piping Removal**

Surface piping exists at the Irigaray site. The cost for removing the Irigaray is the same as the wellfield piping removal cost of \$0.202 above, but \$0.056/ft must be removed for the cost of backfilling. The \$0.113/ft. cost for opening trenches was kept, because portions of the surface lines are partially covered with soil, and buried in some locations. So, the removal, chipping and loading costs for surface lines (only located at Irigaray) is \$0.146/ft. Last year's estimate was \$0.143/ft based on an inflated 1994 cost estimate.

**Buried Trunkline Removal**

Last year's unit rate of \$2.80 was developed from the 1994 cost for removal of buried trunklines, inflated to 2001\$ (19.1%). Using the buried 12" lines at Irigaray for an example, the updated unit cost for removal of buried trunklines is now estimated as \$3.12/ft. Cost changes for backhoe rental and 10 hour days are incorporated.

**Open Trenches:**

- 7,300 linear feet of pipeline
- 2' deep x 4' wide = 29.6 c.y. soil per 100 feet of trench
- 29.6 c.y. x 7,300' / 100 = 2,163 c.y. soil to be removed
- Equipment Rental: 1 Tractor @ \$110.00/hour x 14.4 hours = \$ 1,586  
(operator included, 150 c.y./hr rate) (\$0.22/ft)

**Remove Pipe, Chip and Load: Assume 500' per day**

- Labor: 1 – Foreman @ \$20.00/hr
- 4 – Laborers @ \$15.00/hr
- 1 – Vehicle @ \$10.00/hr
- \$90.00/hr x 14.6 days (146 hrs) = \$13,140 (\$1.80/ft)
  
- Equipment Rental: 1 Chainsaw @ \$5.00/hr
- 1 Backhoe @ \$38.50/hr
- \$43.50/hr x 14.6 days = \$ 6,351 (\$0.87/ft)

**Backfill Trenches:**

- Assume 50 c.y./hr x 2,163 hours = 43.3 hours
  - Equipment rental: 1 backhoe @ \$38.50/hr x 43.3 hours = \$ 1,667 (\$0.23/ft)
- TOTAL = \$22,744 / 7,300 linear feet = \$3.12/linear foot**

**Manhole Removal**

Manholes are present along each of the buried trunklines to permit access to valves. Removal is essentially the crushing of the 12' by 8' culvert in place and backfilling. Removal cost of \$110 per manhole is based on the following:

- Labor: 1 – Foreman @ \$20.00/hr
- 2 – Laborers @ \$15.00/hr
- 1 – Vehicle @ \$10.00/hr
- \$60.00/hr x 1.3 hour/manhole = \$ 78.00
- Equipment Rental: 1 Backhoe @ \$38.50/hr x 1 hour/manhole = \$ 38.50
- \$116.50
- say = \$117.00

In the previous bond estimate, it is assumed that the manhole culverts are contaminated. In reality, these culverts are not contaminated and will be demolished as stated, in place. Another potential is to pull and sell them.

**Worksheet 7**

Worksheet 7 provides to costs to replace topsoil in areas where topsoil was stripped and stockpiled, to conduct radiation surveys & soil analysis prior to topsoil placement, then the revegetation of the topsoil or ground surface without topsoil. Unit rates used in the calculations that have not been previously detailed are described below.

### **Unit Cost – Grading**

- A cost of \$1/yd<sup>3</sup> is used to haul and place topsoil. This is conservative considering that Rapid Construction is hauling and placing topsoil at Pathfinder's Shirley Basin mine in July 2003 for a unit rate of \$0.80/yd<sup>3</sup>.
- \$38.45/acre – WDEQ Guideline 12 places the cost for final grading using a Caterpillar 16H Motor Grader at \$38.45 per acre (\$102.28/hr, 2.66 acres/hr).

### **Wellfield - Spills**

- Wellfield spill areal estimates are based on documentation of on-site spills. The handling cost of \$240/load is taken from Worksheet 4 for handling of pond sludge.

### **Revegetation**

- \$491.71/acre – This cost has been used in past bond estimates and was taken from previous issues of the WDEQ Guideline 12. In the most recent edition of Guideline 12, operators are allowed to calculate their own revegetation costs, because the \$491.71/acre is very high. The last revegetation done at Christensen in year 2000 cost \$195/acre (seed plus drill costs). Mulching and crimping were not necessary, and will only be necessary on steep slopes. We have continued to use the \$491.71/acre as it is considered conservative.

### **Remedial Action**

- An assumption is made that 50% of all surface areas that have been revegetated will require remedial action. The costs assume that these areas will be revegetated again at the same cost of \$491.71/acre.

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## **Worksheet 8**

Worksheet 8 provides all the remaining miscellaneous items that could be involved in the final reclamation. Unit rates are described below:

### **Fence Removal & Disposal**

The unit rate of \$0.68/ft is taken from Appendix H, WDEQ – LQD Guideline 12.

### **Powerline Removal & Disposal, Powerpole Removal & Disposal**

Distribution lines and power poles are owned by Powder River Energy Corp. (PREC) and will be removed upon request at no charge. Transmission lines and power poles which go from the main metering points to various electrical substations will also be removed by PREC at no cost for their salvage value.

### **Transformer Removal & Disposal**

The costs for removal and disposal of transformers are based on the 1994 issue of WDEQ-LQD's Guideline No. 12. The costs for the larger transformers at Irigaray and Christensen Units 2 through 5 were \$2,040 each, inflated to 2001\$ = \$2,428. The smaller transformers used in Christensen Unit 6 are \$500 each inflated to 2001\$ = \$595 each. To account for any additional inflation since 2001, the large transformers have been increased to \$2,500 and small transformers to \$600.

**Booster Pump Assembly Removal & Disposal**

Removal of the booster pump assemblies along the trunklines at Christensen is based on labor, and will be non-contaminated. An internal estimate of \$200/assembly was used in 1994\$, then inflated to 2001\$ = \$298. Current listed cost is \$300.

**Culvert Removal & Disposal**

The cost of \$3.48/foot of culvert is taken from the most recent edition of WDEQ-LQD Guideline 12, Appendix J.

**Guardrail Removal**

The 2001 cost for guardrail removal of \$6.19/foot was based on the 1994 edition of WDEQ-LQD Guideline 12 where the cost per foot for guardrail removal was \$5.20/foot. The value of \$6.30/foot has been incorporated as a 2003 cost.

**Low Water Stream Crossing**

In 1994, this cost was estimated as the same as the construction cost (\$7,000). Inflated to 2001\$, the cost was \$8,330. A cost of \$8,500 has been incorporated as the 2003 cost.

**Utilities Cost**

In 1994, the utility cost per month for heating or providing electricity during the reclamation operations was estimated at \$2,000/month for Irigaray and \$1,000/month for Christensen. These costs were simply inflated to 2001\$, or \$2,380/month for Irigaray and \$1,190/month for Christensen. This cost has been revised to show the cost of utilities for use of one of the on-site office trailers instead of operating the power system for the offices. An average cost of \$65/month for a full electric house trailer was obtained from PREC and is used for this estimate.

**ATTACHMENT 1  
POWER BILL HISTORY  
Christensen Ranch Mine**

Month	Billed Days	Billed Hours	Billed KWH	Active HP	KWH/HP*	\$/KWH
Jan-02	30	720	820,800	1,225	0.93	0.0380
Feb-02	33	792	974,400	1,346	0.91	0.0358
Mar-02	29	696	868,800	1,347	0.93	0.0374
Apr-02	27	648	793,200	1,385	0.88	0.0391
May-02	30	720	798,000	1,387	0.80	0.0381
Jun-02	29	696	760,800	1,377	0.79	0.0371
Jul-02	33	792	838,800	1,375	0.77	0.0350
Aug-02	30	720	746,400	1,340	0.77	0.0363
Sep-02	32	768	724,800	1,345	0.70	0.0365
Oct-02	35	840	840,000	1,345	0.74	0.0341
Nov-02	25	600	740,400	1,345	0.92	0.0374
Dec-02	38	912	900,000	1,345	0.73	0.0355
Jan-03	31	744	950,400	1,353	0.94	0.0343
Feb-03	28	672	792,000	1,353	0.87	0.0369
Mar-03	27	648	775,200	1,353	0.88	0.0377
Apr-03	29	696	708,000	1,288	0.79	0.0388
May-03	28	672	760,800	1,288	0.88	0.0366
Jun-03	29	696	723,600	1,299	0.80	0.0375
Jul-03	35	840	937,200	1,299	0.86	0.0329
Aug-03	33	792	805,200	1,301	0.78	0.0344
<b>TOTAL</b>	<b>611</b>	<b>14664</b>	<b>16,258,800</b>	<b>1,317</b>	<b>0.842</b>	<b>0.0364</b>

\* Note:  $KWH/HP = \text{Billed KWH} / \text{Billed Hours} / \text{Active HP}$





The State  
of Wyoming



cc: WWH  
TGN



**Department of Environmental Quality**  
1043 Coffeen Avenue, Suite D - Sheridan, Wyoming 82801

Dave Freudenthal, Governor

AIR QUALITY  
(307) 672-6457  
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LAND QUALITY  
(307) 672-6488  
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WATER QUALITY  
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Fax (307) 674-6050

April 3, 2003

Mrs. Donna Wichers  
COGEMA Mining, Inc.  
P. O. Box 730  
Mills, WY 82644

**RE: Irigaray-Christensen Operations, Permit No. 478, Review of 2002 Annual Report**

Dear Mrs. Wichers:

I have reviewed the 2002 Annual Report on the Irigaray and Christensen Ranch Operations as well as the reclamation bond calculations submitted with the Annual Report.

In the attached memo, I find the reclamation bond could be reduced to a total of \$13,539,000. A recommendation for reduction of the bond to this amount will be made to the Director.

Please feel free to call me if you have any questions.

Sincerely,

*Glenn Mooney*  
Glenn Mooney  
Senior Geologist

\gm

Attachments

cc: Cheyenne File w/attach.  
NRC-MD w/attach.

478an02rv.3gm

4/3/03  
PLS

## MEMORANDUM

**TO:** File, COGEMA Mining Co's. Irigaray-Christensen Ranch In Situ Uranium Operations, Permit No. 478

**FROM:** Glenn Mooney *GM*

**DATE:** April 3, 2003

**SUBJECT:** Review of 2002 Annual Report and 2003 Semiannual Report

### Introduction

A review was conducted of the Annual Report, covering the period July 1, 2001, to June 30, 2002, and received August 16, 2002. The Semiannual Monitoring Report covers the period July 1, 2002, through December 31, 2002, and was received by the District III Office on February 28, 2003.

Restoration work at COGEMA's operations consist of the following phases:

1. Groundwater sweep

The procedure removes the affected groundwater within the well field and replaces it with native groundwater from outside the mining zone. The affected water pumped from the well field is treated with reverse osmosis (RO) where the cleaned portion (permeate) is surface-discharged and the reject portion is disposed in evaporation ponds or deep well injection.

2. Reverse osmosis with permeate injection

Water from the well field is processed by a RO unit with the cleaned permeate reinjected into the well field and the reject portion disposed in evaporation ponds or deep well injection.

The use of chemical reductants is authorized by the restoration plan during this phase, but to date, their use has not been required.

3. Groundwater recirculation

Water from the well field is pumped from the recovery wells and reinjected into the mining zone aquifer through the injection wells. No treatment of the water is normally done. The effect is to insure the complete mixing of cleaned and partially cleaned groundwater. Up to one pore volume is involved in this procedure.

*4/3/03  
Bbe*

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**4. Stabilization monitoring**

This is a nine-month-long period where the baseline wells are sampled for a full suite of chemical and radiological parameters at the beginning, at three-month intervals during and again at the end of the period for a total of four samples. This procedure is intended to demonstrate that the restoration effort has been complete and that the aquifer and ore zone have reached equilibrium.

**Chronology**

The following production and restoration milestones and other occurrences happened during the past report year.

August 15, 2001	Irigaray Unit 2 Monitor Well M2 goes into excursion again
August 21, 2001	Christensen Ranch Unit 5 Monitor Well 5MW66 goes into excursion
September 2001	Oxygen scavenging unit installed at Christensen Ranch
October 2001	RO filtration and permeate injection phase completed in Irigaray Unit 6 NPDES discharge ended at Irigaray RO permeate injection begun in final module of Christensen Unit 3
October 11, 2001	Excursion ends in Irigaray Unit 2 Monitor Well M2
November 2001	Well field recirculation completed in Irigaray Unit Wellfield 6 Groundwater restoration completed at Irigaray
November 30, 2001	Excursion ends in Irigaray Unit 5 Monitor Well RS27
December 2001	Irigaray staff reassigned to Christensen
January 15, 2002	Excursion ends in Christensen Unit 5 Monitor Well 5MW66
March 2002	RO phase completed in Christensen Unit 2; 10.8 pore volume displacements processed

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April 2002	RO permeate phase begins in Christensen Unit 4
May 2002	Groundwater stabilization monitoring completed in Irigaray Unit 7
June 6, 2002	Restoration confirmation samples from Irigaray Unit 7 split with DEQ/LQD
August 2002	Groundwater stabilization monitoring completed in Irigaray Unit 6  RO permeate injection suspended in Christensen Unit 3; 15.5 pore volume displacements processed
August 13, 2002	Restoration confirmation samples from Irigaray Unit 6 split with DEQ/LQD
November 2002	RO permeate injection suspended in Christensen Unit 4
November 22, 2002	Monitor Well 5MW54 in Christensen Ranch Unit 5 goes into excursion
December 2002	Recirculation of groundwater with added H <sub>2</sub> S begins in Christensen Unit 4
December 17, 2002	Monitor Well 5MW8 in Christensen Ranch Unit 5 goes into excursion

**Excursions**

A number of monitor wells at both the Irigaray and Christensen Ranch operations are or have been on excursion status.

Excursion status in a monitor well at both Irigaray and Christensen Ranch is determined when two or more of the three excursion parameters, conductivity, chloride and total alkalinity, are found during biweekly sampling to be at or above a predetermined level known as the Upper Control Limit or UCL.

COGEMA files a monthly report listing those wells that have been in excursion status during the previous month.

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**Irigaray**

The following monitor wells at Irigaray have remained on excursion status the entire report period: SSM3, SSM18, SSM40, SSM41, SSM42 SSM43 and DM10. In addition, M-2 went on excursion status from August 15, 2001 to October 11, 2001.

With one exception, the wells on long-term excursion at Irigaray are completed into a shallow sand located above the ore zone aquifer. Most have been on excursion status for a number of years.

The following Irigaray wells on long-term excursion status are as follows:

<b>SSM3</b>	This Mine Unit 2 well has been on excursion since August 30, 1999.
<b>SSM18</b>	This Mine Unit 8 well has been on excursion since September 13, 1996.
<b>SSM40</b>	This Mine Unit 8 well has been on excursion since August 16, 1996.
<b>SSM41</b>	This Mine Unit 4 well has been on excursion since Nov. 19, 1998.
<b>SSM42</b>	This Mine Unit 3 well has been on excursion since October 20, 1990.
<b>SSM43</b>	This Mine Unit 1 well has been on excursion since October 11, 1989.
<b>DM10</b>	This is a deep monitor zone well, having been completed in the nearest aquifer below the ore zone. This Mine Unit 6 well has been on excursion since February 2, 1994.

**Christensen Ranch**

Monitor well 5MW54 in Christensen Mine Unit 5 has been on excursion status since November 22, 2002. Monitor well 5MW8, also in Christensen Mine Unit 5, has been on excursion status since December 17, 2002.

**Monitoring Data**

The report documents contain a large amount of monitoring data. Information from the monitoring of 327 monitor and trend wells is presented for a one-year period, January through December 2003. Data from the other six months is presented in the Semiannual Report submitted in late February. Samples are taken monthly from monitor wells not in excursion status. For those wells in excursion status, samples are taken weekly. For monitor wells located in or adjacent to restored well fields, samples are only taken quarterly. Samples taken are analyzed for the excursion parameters: chloride, specific conductance and total alkalinity, along with pH. The potentiometric elevations of the water in the wells are also measured just prior to sampling. Uranium levels are measured for those wells in excursion status.

**COGEMA Mining, Inc., Irigaray-Christensen Ranch Operations**

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The results of testing regional surface water and water wells for radiometric parameters are presented on Table 2 of both reports. This information is required by the Nuclear Regulatory Commission (NRC).

**Mechanical Integrity Testing**

Results of mechanical integrity testing (MIT) for the period are presented in Appendix 4 of the Annual Report. Sixteen (16) wells, in Christensen Units 2 and 5, were tested with six (6) failed casings found.

**Surface Disturbances**

There was no additional land disturbed during the report period.

Some reclamation work has been carried out in the 5I7 site area where the evaporation ponds have been removed and the wells abandoned.

Attached as Figure 1 to the Reclamation Bond calculations, a schedule of restoration and reclamation tasks shows that Facilities Reclamation of the Irigaray Plant, Ponds and Road is to begin as early as January 2003. Plugging and abandonment of the Irigaray well field wells is shown on this figure to begin as early as June 2003.

No application for bond release of costs associated with restoration of the Irigaray well fields has been received as of early March 2003.

**Bond**

A detailed bond estimate was included with the Annual Report. Some aspects of the bond estimate are:

1. The estimate does not include any costs for groundwater restoration of Christensen Ranch Units 7 and 8 as injection never occurred in either of these well fields. The estimate does show that a total of 391 wells were drilled in Unit 7 and the cost for abandonment of these wells was included. Costs for revegetation of disturbances in both these units were also included.
2. Unlike previous estimates, this one assumes credit for most well field restoration work already carried out, such as Irigaray Units 1 through nine or Christensen Ranch Units 2 and three.

Credit has been taken for groundwater sweep in all Irigaray well field units and Units 2, 3, 4, and 5 at Christensen Ranch.

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3. COGEMA has revised the groundwater restoration costs in several areas by updating the estimate based on the actual methods and processes now in use. Some of the changes include the elimination of costs for barium chloride, hydrogen sulfide, hydrochloric acid, sulfuric acid, and addition of costs for antiscalet, sodium sulfate and elution.
4. COGEMA continues to include the \$400,000 I added, beginning in 1998, for cleanup of the monitor wells in long-term excursion status at Irigaray. This amounts to \$300,000 for the six shallow sand monitor wells plus \$100,000 for the deep monitor well for an additional bond cost of \$400,000.
5. The estimate shows a cost of \$12.00 per cubic yard for disposal of demolition debris at the Edgerton/Midwest landfill. This cost was confirmed with a telephone call to the Town of Midwest which operates this landfill.
6. The estimate continues to show disposal of radiologically contaminated material at Pathfinder's NRC-licensed Shirley Basin mill tailings pond at a cost of \$11.00 per cubic foot.
7. The estimate continues to show a cost for disposal of radiologically contaminated concrete and soil at Pathfinder's NRC-licensed Shirley Basin mill tailings pond at \$3.70 per cubic foot.
8. The estimate includes \$200,000 to cover plugging of the two deep disposal wells.
9. COGEMA set the amount of contingencies totaling 34.5%, an increase over the 21.5% contingency used over the past several years. The increase comes with increase of Project Management Costs from 3% to 5% and Unknowns, or Contingency as it is termed in this year's COGEMA estimate, from 4% to 15%.
10. Review of this estimate was made much more difficult because there was no list of assumptions around which the estimate was constructed. The sources of as many costs as possible should be given. For instance, it is believed that the costs for much of the surface reclamation are based on Land Quality Division Guideline 12 costs, but there was no mention of the sources of any costs. For the next report, a list of assumptions upon which the bond costs are based is requested.

**Review of Bond Estimate**

Attached are printouts of spreadsheets based on revisions and updating of an earlier bond estimate received from COGEMA. Values in red are those that differ from values in

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COGEMA's 2002 estimate. Other values may differ slightly, probably from differences in rounding. A computer diskette containing these spreadsheets is also included.

**Worksheet No. 1, Groundwater Restoration**

1. In Section 1.A, Groundwater Sweep, on Page 1, the cost assumptions for power have been changed back to 1.00 kilowatt/hour per horsepower (Kwh/Hp) as was the case a couple of years ago and is still the case for the Irigaray Mine calculations. The estimate used was 0.75 which is very near the theoretical efficiency of 0.746 Kwh/Hp. Review of the literature has found that downhole pumps are far less efficient.
2. In Section 1A on Page 1 the barium chloride for Christensen Ranch Unit 6 was changed from \$0.00 to \$0.041 per kgal to reflect the cost used for the other Christensen Ranch well fields.
3. In Section 1.B. on Page 2 the costs for the Wellfield Groundwater Sweep have been changed to increase the number of pumps from 5 to 10 for Christensen Ranch Units 2 through six. Given an average flow per pump of 20 g.p.m., 10 pumps are needed to accomplish a total flow of 200 g.p.m., not the 5 pumps listed in the original estimate. The Kwh/Hp has been increased to 1.0 here also for the same well fields.
4. In Section 1.B, Reverse Osmosis, on Page 3, the Kwh/Hp has been increased to 1.0 here also for Christensen well fields 2 through 6.
5. In Section III, Waste Disposal Well, the Kwh/Hp has been increased to 0.90. Review of the literature has found that the very large electric motors driving the injection pumps are capable of 90% efficiency, unlike the much smaller downhole pump motors.
6. On Page 4 the total cost for groundwater restoration has increased to \$5,499,554.00 up from \$4,842,891.00 as a result of the above changes.

**Worksheet No. 2, Plant Equipment and Disposal**

1. This spreadsheet contains a number of minor differences from COGEMA's numbers, believed to be mostly from rounding differences. The total amount has increased from \$212,109.00 to \$213,414.00.

**Worksheet No. 3, Building and Foundation Demolition, Disposal and Soil Cleanup**

1. Here again, apparent rounding differences have resulted in a total of \$587,618.00, nearly the same as COGEMA's cost of \$587,632.00.



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**Worksheet No. 4, Pond Reclamation Cost**

1. **No changes were found necessary for this spreadsheet. However, because of apparent differences in rounding, some subtotals are different and the total is different, \$1,258,180.00, down from COGEMA's total of \$1,259,496.00.**

**Worksheet No. 5, Well Plugging and Abandonment**

1. **The total here is identical to COGEMA's total of \$760,261.00.**

**Worksheet No. 6, Wellfield Equipment Removal and Disposal**

1. **The total here is identical to COGEMA's total of \$832,873.00.**

**Worksheet No. 7, Topsoil Replacement and Revegetation**

1. **In Section II, Ponds, Page 1, the total adds up to \$87,521.00, compared to COGEMA's total of \$71,362.00. The difference appears to be from an error by COGEMA in entering a value instead of an equation in one column so the total did not increase when other values were increased.**
2. **In Section III, Wellfield, Page 2, the amounts in Part C, Spill Cleanup, were changed, apparently because again, instead of equations values were entered which did not update when the spreadsheet was updated. The totals changed only slightly, however.**
3. **In Section VI, Remedial Action, Page 3, the subtotals changed slightly in Revegetation, Section C., for an unknown reason.**
4. **The total for Topsoil and Revegetation changed to \$758,154.00, up slightly from COGEMA's total of \$757,774.00.**

**Worksheet No. 8, Miscellaneous Reclamation**

1. **Only slight differences were found here, attributable to differences in rounding. The total found was \$155,936.00, nearly the same as COGEMA's \$155,926.00 total.**

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**Bond Estimate Summary**

<b>I.</b>	<b>Groundwater Restoration</b>		<b>\$ 5,499,554</b>
<b>II.</b>	<b>Decommissioning and Surface Reclamation</b>		
	<b>A.</b>	<b>Process plants equipment removal and disposal</b>	<b>\$ 213,414</b>
	<b>B.</b>	<b>Plant buildings demolition and disposal</b>	<b>\$ 587,618</b>
	<b>C.</b>	<b>Process pond sludge and liner handling</b>	<b>\$ 1,258,180</b>
	<b>D.</b>	<b>Well abandonment</b>	<b>\$ 760,261</b>
	<b>E.</b>	<b>Wellfield equipment removal and disposal</b>	<b>\$ 832,873</b>
	<b>F.</b>	<b>Topsoil replacement and revegetation</b>	<b>\$ 758,154</b>
	<b>G.</b>	<b>Miscellaneous reclamation activities</b>	<b>\$ 155,936</b>
		<b>Subtotal Decommissioning and Surface Reclamation</b>	<b>\$ 4,566,436</b>
		<b>Subtotal Restoration and Reclamation</b>	<b>\$ 10,065,990</b>
	<b>Contingency</b>		
		<b>Project Design</b>	<b>2%</b>
		<b>Contractor profit and mobilization</b>	<b>8%</b>
		<b>Preconstruction Investigation and Stabilization</b>	<b>1%</b>
		<b>Project management</b>	<b>5%</b>
		<b>On-site monitoring</b>	<b>0.5%</b>
		<b>Site security and liability insurance</b>	<b>1%</b>
		<b>Long-term admin. and accounting</b>	<b>2%</b>
		<b>Unknowns</b>	<b><u>15%</u></b>
		<b>Total Contingency</b>	<b>34.5%</b>
			<b>\$ 3,472,767</b>
			<b>\$ 13,538,757</b>
		<b>Say</b>	<b>\$ 13,539,000</b>

The current bond totals \$13,575,224.00.

**Conclusions**

Review of the 2002 Annual Report for Permit No. 478 found that mining has ceased both at Irigaray Ranch and at Christensen Ranch.

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Restoration of groundwater is in full swing at Christensen and has ended at Irigaray.

There has been no progress in clean up of the shallow zone aquifer at Irigaray where four monitor wells have been in long-term excursion status. The same is true of DM10, a deep zone monitor well which has also been in excursion status for an extended time.

Review of the bond estimate found the need for changes in a few areas. Significant cost increases for groundwater restoration have resulted from a requirement for a more realistic estimate for pump electric motor efficiency. This issue was discussed earlier during review of the 2001 bond estimate.

A list of assumptions and references for the bond costs is requested for the coming year's Annual Report.

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Attachments  
Computer Disk

478an02rv.3gm

COGEMA Mining, Inc.  
 SUMMARY OF RECLAMATION/RESTORATION BOND ESTIMATE  
 WDEQ PERMIT NO. 478/USNRC LICENSE SUA-1341  
 TABLE 1  
 C:\Files\Files1\478IRCR\478bnd03WKTAB1.xls

<b>I</b>	<b>GROUNDWATER RESTORATION - Worksheet 1:</b>	<b>\$5,499,554</b>
<b>II</b>	<b>DECOMMISSIONING AND SURFACE RECLAMATION:</b>	
	A. Process Plant(s) Equipment Removal and Disposal Worksheet 2	\$213,414
	B. Plant Building(s) Demolition and Disposal Worksheet 3	\$587,618
	C. Process Pond Sludge and Liner Handling Worksheet 4	\$1,258,180
	D. Well Abandonment Worksheet 5	\$760,261
	E. Wellfield Equipment Removal and Disposal Worksheet 6	\$832,873
	F. Topsoil Replacement and Revegetation Worksheet 7	\$758,154
	G. Miscellaneous Reclamation Activities Worksheet 8	\$155,936
	<b>Sub Total - Decommissioning and Surface Reclamation</b>	<b>\$4,566,436</b>
	<b>SUBTOTAL RESTORATION AND RECLAMATION</b>	<b>\$10,065,990</b>
	<b>Costs Associated with Third Party Contractors</b>	
	Project Design	2.0%
	Contractor Profit & Mobilization	8.0%
	Preconstruction Investigation	1.0%
	Project Management	5.0%
	On-site Monitoring	0.5%
	Site Security & Liability Assurance	1.0%
	Longterm Administration	2.0%
	Contingency (Unknowns)	15.0%
	<b>TOTAL CONTINGENCY</b>	<b>34.5%</b>
		<b>\$3,472,767</b>
	<b>SUBTOTAL</b>	<b>\$13,538,757</b>
	<b>TOTAL RESTORATION AND RECLAMATION</b>	<b>\$13,538,757</b>

GROUNDWATER RESTORATION

Idgway Mine Unit(s) #1 Thru #5	Kparay Mine Unit(s) #6 Thru #8	Christeen Mine Unit #2	Christeen Mine Unit #3	Christeen Mine Unit #4	Christeen Mine Unit #5	Christeen Mine Unit #6	Christeen Mine Unit #7	Christeen Mine Unit #8
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Technical Assumptions:									
Wellfield Area (FT)	522720	794080	890000	798944	510088	1210968	2021243	1332936	1600000
Wellfield Area (Acres)	12.00	18.00	20.43	18.34	11.71	27.80	48.48	30.80	38.70
Affected Ore Zone Area (FT)	522720	794080	890000	798944	550193	1348004	2068344		
Avg Completed Thickness (FT)	18.0	18.0	11.0	10.0	12.7	19.8	21.8		
Affected Volume:									
Factor For Vertical Plane	20%	20%	20%	20%	20%	20%	20%		
Factor For Horizontal Plane	20%	20%	20%	20%	20%	20%	20%		
Total Volume (FT)	11290792	20323969.8	14097800	11504793.8	10081929.8	39571090.8	64815534.8		
Porosity	26.0%	26.0%	26.0%	26.0%	26.0%	26.0%	26.0%		
Gallons Per Cubic Foot	7.48	7.48	7.48	7.48	7.48	7.48	7.48		
Gallons Per Pore Volume	21958254.5	39524868.06	27417012.5	22374522.8	19598440.7	75013057	125964292		
Number of Wells in Unit(s)									
Production Wells	150	274	153	185	105	217	202	155	
Injection Wells	310	330	173	277	128	277	244	170	
Monitor Wells	180	185	50	48	44	70	85	88	
Average Well Spacing (FT)	35	35	85	70	85	85	100	100	
Average Well Depth (FT)	250	250	345	300	430	490	520	550	

I GROUNDWATER SWEEP									
A. PLANT & OFFICE									
Operating Assumptions:									
Flowrate (gpm)	200	200	200	200	200	200	200		
PV's Required	4	1	1	1	1	1	1		
Total Gallons For Treatment	0	0	0	0	0	0	125964292		
Total KGals for Treatment	0	0	0	0	0	0	125964		
Cost Assumptions:									
Power									
Avg Connected Hp	51.30	51.30	40.00	40.00	40.00	40.00	40.00		
Kwh's/Hp	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
\$/Kwh	\$0.051	\$0.051	\$0.038	\$0.038	\$0.038	\$0.038	\$0.038		
Gallons Per Minute	200	200	200	200	200	200	100		
Gallons Per Hour	12000	12000	12000	12000	12000	12000	6000		
Cost Per Hour	2.82	2.82	1.52	1.52	1.52	1.52	1.52		
Cost Per Gallon	0.00022	0.00022	0.00013	0.00013	0.00013	0.00013	0.00021		
Cost Per KGal (\$)	\$0.218	\$0.218	\$0.127	\$0.127	\$0.127	\$0.127	\$0.205		
Chemicals									
Barium Chloride (\$/KGals)	\$0.041	\$0.041	\$0.041	\$0.041	\$0.041	\$0.041	\$0.041		
Antiscalant (\$/KGals)			\$0.106	\$0.106	\$0.106	\$0.106	\$0.106		
Eluon (\$/KGals)	\$0.098	\$0.098	\$0.098	\$0.098	\$0.098	\$0.098	\$0.098		
Repair & Maintenance (\$/KGals)	\$0.081	\$0.081	\$0.081	\$0.081	\$0.081	\$0.081	\$0.081		
Analysts (\$/KGals)	\$0.184	\$0.081	\$0.081	\$0.181	\$0.082	\$0.084	\$0.084		
Total Cost Per KGal	\$0.583	\$0.510	\$0.527	\$0.597	\$0.528	\$0.530	\$0.808		
Total Treatment Cost	\$0	\$0	\$0	\$0	\$0	\$0	\$78,404		
Utilities									
Power (\$/Month)	\$1,840	\$1,840	\$200	\$200	\$200	\$200	\$200		
Propane (\$/Month)	\$1,000	\$1,000	\$200	\$200	\$200	\$200	\$200		
Time For Treatment									
Minutes For Treatment	0	0	0	0	0	0	628321		
Hours For Treatment	0	0	0	0	0	0	10472		
Days For Treatment	0	0	0	0	0	0	436		
Average Days Per Month	30.4	30.4	30.4	30.4	30.4	30.4	30.4		
Months For Treatment	0.0	0.0	0.0	0.0	0.0	0.0	14.3		
Utilities Cost (\$)	\$0	\$0	\$0	\$0	\$0	\$0	\$5,738		
<b>TOTAL PLANT &amp; OFFICE COST</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$82,142</b>	<b>\$0</b>	<b>\$0</b>

GROUNDWATER RESTORATION

	Irigaray Mine Unit(s) #1 Thru #5	Irigaray Mine Unit(s) #6 Thru #8	Christensen Mine Unit #2	Christensen Mine Unit #3	Christensen Mine Unit #4	Christensen Mine Unit #5	Christensen Mine Unit #6	Christensen Mine Unit #7	Christensen Mine Unit #8
<b>I GROUNDWATER SWEEP (Continued)</b>									
<b>B. WELLFIELD</b>									
Cost Assumptions:									
Power									
Avg Flow/Pump (gpm)	3.88	3.88	20.00	20.00	20.00	20.00	20		
Avg Hp/Pump	1.80	1.50	5.00	5.00	5.00	5.00	5.00		
Avg # of Pumps Required	51.8	51.8	10.0	10.0	10.0	10.0	10.0		
Avg Connected Hp	77.8	77.8	50.0	50.0	50.0	50.0	50.0		
Kwh/Hp	1.000	1.000	1.000	1.000	1.000	1.000	1.000		
\$/Kwh	\$0.051	\$0.051	\$0.038	\$0.038	\$0.038	\$0.038	\$0.038		
Gallons Per Minute	200	200	200	200	200	200	200		
Gallons Per Hour	12000	12000	12000	12000	12000	12000	12000		
Cost Per Hour (\$)	\$3.97	\$3.87	\$1.90	\$1.90	\$1.90	\$1.90	\$1.90		
Cost Per Gallon (\$)	\$0.0003	\$0.0003	\$0.0002	\$0.0002	\$0.0002	\$0.0002	\$0.0002		
Cost Per KGal (\$)	0.331	0.331	0.158	0.158	0.158	0.158	0.158		
Repair & Maintenance (\$/KGal)	\$0.018	\$0.018	\$0.224	\$0.224	\$0.224	\$0.224	\$0.224		
Total Cost Per KGal	\$0.347	\$0.347	\$0.382	\$0.382	\$0.382	\$0.382	\$0.382		
TOTAL WELLFIELD COST	\$0	\$0	\$0	\$0	\$0	\$0	\$48,046	\$0	\$0
TOTAL GROUND WATER SWEEP COST	\$0	\$0	\$0	\$0	\$0	\$0	\$130,198	\$0	\$0

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- 0.0365

**II REVERSE OSMOSIS**

	Irigaray Mine Unit(s) #1 Thru #5	Irigaray Mine Unit(s) #6 Thru #8	Christensen Mine Unit #2	Christensen Mine Unit #3	Christensen Mine Unit #4	Christensen Mine Unit #5	Christensen Mine Unit #6	Christensen Mine Unit #7	Christensen Mine Unit #8
<b>A. PLANT &amp; OFFICE</b>									
Operating Assumptions:									
Flowrate (gpm)	300	300	500	500	500	500	500		
PVs Required	3.0	5.0	5.0	5.0	5.0	5.0	5.0		
Total Gallons For Treatment	65874763.5	197824290.4	137066062	111872613	87842203.3	376066295	626321461		
Total KGals for Treatment	65875	197824	137065	111873	87842	375065	626321		
Feed to RO (gpm)	300	300	500	500	500	500	500		
Permeate Flow (gpm)	240	240	375	400	400	400	400		
Brine Flow (gpm)	60	60	125	100	100	100	100		
Average RO Recovery	80.0%	80.0%	75.0%	75.0%	75.0%	75.0%	75.0%		
Cost Assumptions:									
Power									
Avg Connected Hp	120.00	120.00	580.00	580.00	580.00	580.00	580.00		
Kwh/Hp	1.000	1.000	1.000	1.000	1.000	1.000	1.000		
\$/Kwh	\$0.051	\$0.051	\$0.038	\$0.038	\$0.038	\$0.038	\$0.038		
Gallons Per Minute	300	300	500	500	500	500	500		
Gallons Per Hour	18000	18000	30000	30000	30000	30000	30000		
Cost Per Hour (\$)	\$6.12	\$6.12	\$21.28	\$21.28	\$21.28	\$21.28	\$21.28		
Cost Per Gallon (\$)	\$0.00034	\$0.00034	\$0.00071	\$0.00071	\$0.00071	\$0.00071	\$0.00071		
Cost Per KGal (\$)	\$0.340	\$0.340	\$0.709	\$0.709	\$0.709	\$0.709	\$0.709		
Chemicals									
Sulfuric Acid (\$/KGals)	\$0.078	\$0.078	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000		
Caustic Soda (\$/KGals)	\$0.111	\$0.111	\$0.015	\$0.015	\$0.015	\$0.015	\$0.015		
Hydrochloric Acid (\$/KGals)	\$0.009	\$0.009	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000		
Hydrogen Sulfide (\$/KGals)	\$0.304	\$0.304	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000		
Sodium sulfate (\$/KGal)			\$0.092	\$0.092	\$0.092	\$0.092	\$0.092		
Antiscalant (\$/KGals)			\$0.108	\$0.108	\$0.108	\$0.108	\$0.108		
Elutlon (\$/KGals)			\$0.099	\$0.099	\$0.099	\$0.099	\$0.099		
Repair & Maintenance (\$/KGals)	\$0.278	\$0.278	\$0.120	\$0.120	\$0.120	\$0.120	\$0.120		
Sampling & Analyals (\$/KGals)	\$0.184	\$0.091	\$0.091	\$0.161	\$0.092	\$0.094	\$0.094		
Total Cost Per KGal (\$)	\$1.283	\$1.210	\$1.234	\$1.304	\$1.238	\$1.237	\$1.237		
Total Pumping Cost (\$)	\$64,517	\$238,125	\$168,208	\$145,919	\$120,868	\$464,061	\$777,443		
Utilities									
Power (\$/Month)	\$1,840	\$1,840	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000		
Propane (\$/Month)	\$1,000	\$1,000	\$800	\$800	\$800	\$800	\$800		
Time For Treatment									
Minutes For Treatment	216583	658748	274170	223745	195884	750131	1256643		
Hours For Treatment	3600	10979	4570	3729	3261	12502	20944		
Days For Treatment	152	457	190	155	136	521	873		
Average Days Per Month	30.4	30.4	30.4	30.4	30.4	30.4	30.4		
Months For Treatment	5.0	15.0	8.3	5.1	4.5	17.1	28.7		
Utilities Cost (\$)	\$14,200	\$42,800	\$11,340	\$9,180	\$8,100	\$30,780	\$51,680		
TOTAL PLANT & OFFICE COST	\$96,717	\$281,725	\$189,549	\$155,099	\$128,968	\$494,861	\$828,103	\$0	\$0

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- 0.0365

GROUNDWATER RESTORATION

Irigaray Mine Unit(s) #1 Thru #5	Irigaray Mine Unit(s) #6 Thru #9	Christensen Mine Unit #2	Christensen Mine Unit #3	Christensen Mine Unit #4	Christensen Mine Unit #5	Christensen Mine Unit #6	Christensen Mine Unit #7	Christensen Mine Unit #8
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II REVERSE OSMOSIS (Continued)

B. WELLFIELD

Cost Assumptions:	Irigaray Mine Unit(s) #1 Thru #5	Irigaray Mine Unit(s) #6 Thru #9	Christensen Mine Unit #2	Christensen Mine Unit #3	Christensen Mine Unit #4	Christensen Mine Unit #5	Christensen Mine Unit #6	Christensen Mine Unit #7	Christensen Mine Unit #8
<b>Power</b>									
Avg Flow/Pump (gpm)	3.88	3.88	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Avg Hp/Pump	1.50	1.50	5.00	5.00	5.00	5.00	5.00	5.00	5.00
Avg # of Pumps Required	77.8	77.8	62.4	62.4	62.4	62.4	62.4	62.4	62.4
Avg Connected Hp	118.7	118.7	187.1	187.1	187.1	187.1	187.1	187.1	187.1
Kwh/Hp	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
\$/Kwh	\$0.051	\$0.051	\$0.038	\$0.038	\$0.038	\$0.038	\$0.038	\$0.038	\$0.038
Gallons Per Minute	300	300	500	500	500	500	500	500	500
Gallons Per Hour	18000	18000	30000	30000	30000	30000	30000	30000	30000
Cost Per Hour (\$)	\$5.95	\$5.95	\$7.11	\$7.11	\$7.11	\$7.11	\$7.11	\$7.11	\$7.11
Cost Per Gallon (\$)	\$0.0003	\$0.0003	\$0.0002	\$0.0002	\$0.0002	\$0.0002	\$0.0002	\$0.0002	\$0.0002
Cost Per KGal (\$)	\$0.331	\$0.331	\$0.237	\$0.237	\$0.237	\$0.237	\$0.237	\$0.237	\$0.237
Repair & Maintenance (\$/KGal)	\$0.016	\$0.016	\$0.224	\$0.224	\$0.224	\$0.224	\$0.224	\$0.224	\$0.224
Total Cost Per KGal	\$0.347	\$0.347	\$0.461	\$0.461	\$0.461	\$0.461	\$0.461	\$0.461	\$0.461
<b>TOTAL WELLFIELD COST</b>	<b>\$22,835</b>	<b>\$68,208</b>	<b>\$83,193</b>	<b>\$51,873</b>	<b>\$45,105</b>	<b>\$172,903</b>	<b>\$289,852</b>		<b>\$0</b>
<b>TOTAL REVERSE OSMOSIS COST</b>	<b>\$121,553</b>	<b>\$360,232</b>	<b>\$243,744</b>	<b>\$206,872</b>	<b>\$174,072</b>	<b>\$667,763</b>	<b>\$1,116,755</b>		<b>\$0</b>

3  
0.83  
0.0365

III WASTE DISPOSAL WELL

Operating Assumptions:	Irigaray Mine Unit(s) #1 Thru #5	Irigaray Mine Unit(s) #6 Thru #9	Christensen Mine Unit #2	Christensen Mine Unit #3	Christensen Mine Unit #4	Christensen Mine Unit #5	Christensen Mine Unit #6	Christensen Mine Unit #7	Christensen Mine Unit #8
<b>Annual Evaporation Capacity (Gals)</b>			1917811.9	1917811.9	1917811.9	1917811.9	1917811.9	1917811.9	1917811.9
<b>Avg. Monthly Evap. Capacity (Gals)</b>			159801	159801	159801	159801	159801	159801	159801
<b>Total Disposal Requirement</b>									
RO Brine Total Gallons			34271295.0	27968153.2	24400550.8	83798321.3	157060366		
RO Brine Total KGalons			34271.3	27968.2	24400.6	83798.3	157060.4		
Brine Concentration Factor			60%	60%	60%	60%	60%		
Total Concentrated Brine (Gals)			20962758.4	16780691.9	14678330.5	50256792.8	94248218.1		
Months of RO Operation			6.3	5.1	4.5	17.1	28.7		
Average Monthly Reqmt (Gallons)			3263890	5483682	5436678	5483411	5473183		
Monthly Balance for DDW (Gals)			3104129	5324151	5275677	5323610	5313362		
Total DDW Disposal (Gallons)			19598013.1	27153198.2	23741448.4	91033724.3	152494077		
Total DDW Disposal (KGals)			19598	27153	23741	91034	152494		
<b>Cost Assumptions:</b>									
<b>Power</b>									
Avg Connected Hp			100.00	100.00	100.00	100.00	100.00		
DDW Av. Connected Hp			180.00	180.00	180.00	180.00	180.00		
Kwh/Hp			0.900	0.900	0.900	0.900	0.900		
\$/Kwh			\$0.038	\$0.038	\$0.038	\$0.038	\$0.038		
Gallons Per Minute			150	150	150	150	150		
Gallons Per Hour			9000	9000	9000	9000	9000		
Cost Per Hour (\$)			\$9.58	\$9.58	\$9.58	\$9.58	\$9.58		
Cost Per Gallon (\$)			\$0.0011	\$0.0011	\$0.0011	\$0.0011	\$0.0011		
Cost Per KGal (\$)			\$1.064	\$1.064	\$1.064	\$1.064	\$1.064		
<b>Chemicals (\$/KGals)</b>									
RO Antiscalant (\$/KGals)			0.192	0.192	0.192	0.192	0.192		
DDW Antiscalant (\$/KGals)			0.226	0.226	0.226	0.226	0.226		
Sulfuric Acid (\$/KGal)			0.26	0.26	0.26	0.26	0.26		
Corrosion Inhibitor			\$0.217	\$0.217	\$0.217	\$0.217	\$0.217		
Algicide			\$0.052	\$0.052	\$0.052	\$0.052	\$0.052		
Other			\$0.060	\$0.060	\$0.060	\$0.060	\$0.060		
Repair & Maint (\$/KGals)			\$0.230	\$0.230	\$0.230	\$0.230	\$0.230		
Total Cost Per KGal			\$2.341	\$2.341	\$2.341	\$2.341	\$2.341		
<b>TOTAL WASTE DISPOSAL WELL COST</b>			<b>\$45,781</b>	<b>\$63,868</b>	<b>\$55,579</b>	<b>\$213,110</b>	<b>\$356,899</b>		<b>\$0</b>

See my

\$0.0365

GROUNDWATER RESTORATION	Irgaray	Irgaray	Christensen	Christensen	Christensen	Christensen	Christensen	Christensen	Christensen
	Mine Unit(s) #1 Thru #5	Mine Unit(s) #6 Thru #9	Mine Unit #2	Mine Unit #3	Mine Unit #4	Mine Unit #5	Mine Unit #6	Mine Unit #7	Mine Unit #8
<b>IV STABILIZATION MONITORING</b>									
Operating Assumptions:									
Time of Stabilization (mos)	9	9	9	9	9	9	9	9	9
Frequency of Analysis (mos)	3	3	3	3	3	3	3	3	3
Total Sets of Analyte	3	3	3	3	3	3	3	3	3
Cost Assumptions:									
Power (\$/Month)	\$0	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
Total Power Cost	\$0	\$9,000	\$9,000	\$9,000	\$9,000	\$9,000	\$9,000	\$9,000	\$9,000
Sampling & Analyte (each set)	\$3,600	\$3,600	\$3,600	\$3,600	\$3,600	\$3,600	\$3,600	\$3,600	\$3,600
Total Sampling & Analyte Cost (\$)	\$10,800	\$10,800	\$10,800	\$10,800	\$10,800	\$10,800	\$10,800	\$10,800	\$10,800
Utilities (\$/Month)	\$0	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000
Total Utilities Cost (\$)	\$0	\$18,000	\$18,000	\$18,000	\$18,000	\$18,000	\$18,000	\$18,000	\$18,000
<b>TOTAL STABILIZATION COST</b>	<b>\$10,800</b>	<b>\$37,800</b>	<b>\$37,800</b>	<b>\$37,800</b>	<b>\$37,800</b>	<b>\$37,800</b>	<b>\$37,800</b>	<b>\$37,800</b>	<b>\$0</b>

$$\text{HP/well} \times \frac{\text{Kwh}}{\text{HP}} \times \frac{\text{H}}{\text{Kwh}}$$

$$\text{cost/hr.} = \text{HP} \times \frac{\text{Kwh}}{\text{HP}} \times \frac{\text{H}}{\text{Kwh}} =$$

$$\frac{3}{4} \text{ HP} \times \frac{1.0}{0.25} \times 0.051 = 0.0383 / \text{hr.}$$

480 diesel

<b>V LABOR (Irgaray and Christensen Combined)</b>			
Cost Assumptions	Cost/Hour	Hours/Year	Cost
Crew:			
1 Supervisor	\$25.00	2080	\$52,000
4 Operators	\$20.00	2080	\$83,200
2 Maintenance	\$20.00	2080	\$83,200
2 Vehicles	\$12.00	2080	\$49,920
Cost per Year			\$351,520
Time Required - Years (See Figure 1)	2.6		
<b>TOTAL RESTORATION LABOR COST</b>			<b>\$913,952</b>

Irgaray	Christensen	Total
Mine Unit(s) #1 Thru #9	Mine Unit #2 Thru #4	Christensen & Irgaray

<b>VI RESTORATION CAPITAL REQUIREMENTS</b>			
I Deep Disposal Well(s)		\$0	\$0
II Plug and Abandon DDW		\$200,000	\$200,000
III 500 GPM Reverse Osmosis Unit		\$0	\$0
Total	\$0	\$200,000	\$200,000

Irgaray	Christensen	Total
Mine Unit(s) #1 Thru #9	Mine Unit #2 Thru #7	Christensen & Irgaray

<b>VII RESTORATION OF EXCURSION WELLS</b>			
<b>I Shallow Sand Well(s)</b>			
Total Wells in Excursion	6	0	
Cost of Clean-Up	\$ 50,000	\$ 50,000	
Total Shallow Sand Cleanup	\$ 300,000	\$0.00	\$ 300,000
<b>II Ore Zone Wells</b>			
Total Wells in Excursion	0	0	
Cost of Clean-Up	\$ 50,000	\$ 50,000	
Total Ore Zone Cleanup	\$0.00	\$0.00	
<b>III Deep Zone Wells</b>			
Total Wells in Excursion	1	0	
Cost of Clean-Up	\$ 100,000	\$ 100,000	
Total Deep Zone Cleanup	\$100,000	\$0.00	\$ 100,000
Total Wellfield Cost	\$ 400,000	0.00	\$ 400,000
<b>TOTAL EXCURSION CLEANUP COST</b>	<b>\$ 400,000</b>	<b>0.00</b>	<b>\$ 400,000</b>

Irgaray	Irgaray	Christensen	Christensen	Christensen	Christensen	Christensen	Christensen	Christensen	Christensen	TOTAL
Mine Unit(s) #1 Thru #5	Mine Unit(s) #6 Thru #9	Mine Unit #2	Mine Unit #3	Mine Unit #4	Mine Unit #5	Mine Unit #6	Mine Unit #7	Mine Unit #8	Mine Unit #9	

<b>SUMMARY:</b>										
I GROUNDWATER SWEEP	\$0	\$0	\$0	\$0	\$0	\$0	\$130,166	\$0	\$0	
II REVERSE OSMOSIS	\$121,553	\$350,232	\$243,744	\$206,672	\$174,072	\$667,763	\$1,116,756	\$0	\$0	
III WASTE DISPOSAL WELL	\$0	\$0	\$46,781	\$83,566	\$58,579	\$213,110	\$356,996	\$0	\$0	
IV STABILIZATION	\$10,800	\$37,800	\$37,800	\$37,800	\$37,800	\$37,800	\$37,800	\$0	\$0	
SUB TOTAL	\$132,353	\$388,032	\$327,328	\$306,037	\$267,451	\$918,673	\$1,643,731	\$0	\$0	\$3,985,602
V LABOR										\$913,952
VI CAPITAL										\$200,000
VII EXCURSION CLEANUP										\$400,000
<b>TOTAL GROUNDWATER RESTORATION COST</b>										<b>\$5,499,554</b>



PLANT EQUIPMENT REMOVAL AND DISPOSAL	Irigaray						Christensen					
	Maint Area & Laboratory	Main Process Building	Expension Building	Resin+Sand Filter Media	Dry Pack Area	Restoration Building	Sub Total	Satellite Plant	Resin+Sand Filter Media	Restoration Extension	Wellfield Modules	Sub Total
Volume (Yds <sup>3</sup> )	40	200	180	110	40	40		91	197	42	55	
Quantity Per Truck Load (Yds <sup>3</sup> )	20	20	20	20	20	20		20	20	20	20	
Number of Truck Loads	2.0	10.0	9.0	5.5	2.0	2.0		4.55	9.90	2.1	2.8	
<b>I Decontamination Cost</b>												
Decontamination Cost (\$/Load)	\$550	\$550	\$550	\$550	\$550	\$550		\$550	\$550	\$550	\$550	
Percent Requiring Decontamination	20.0%	100.0%	100.0%	0.0%	100.0%	100.0%		100.0%	0.0%	100.0%	100.0%	
Total Cost	\$220	\$5,500	\$4,950	\$0	\$1,100	\$1,100	\$12,870	\$2,503	\$0	\$1,155	\$1,540	\$5,198
<b>II Dismantle and Loading Cost</b>												
Cost Per Truck Load (\$)	\$715	\$715	\$715	\$715	\$715	\$715		\$715	\$715	\$715	\$715	
Total Cost	\$1,430	\$7,150	\$6,435	\$3,933	\$1,430	\$1,430	\$21,808	\$3,253	\$7,079	\$1,502	\$2,002	\$13,835
<b>III Oversize Charges</b>												
Percent Requiring Permits	40.0%	40.0%	40.0%	0.0%	60.0%	40.0%		40.0%	0.0%	40.0%	0.0%	
Cost Per Truck Load (\$)	\$326	\$326	\$326	\$326	\$326	\$326		\$326	\$326	\$326	\$326	
Total Cost	\$261	\$1,304	\$1,174	\$0	\$391	\$261	\$3,390	\$593	\$0	\$274	\$0	\$867
<b>IV Transportation &amp; Disposal</b>												
<b>A. Landfill</b>												
Percent To Be Shipped	80.0%	80.0%	80.0%	0.0%	50.0%	80.0%		80.0%	0.0%	80.0%	80.0%	
Distance (Miles)	48	48	48	48	48	48		48	48	48	48	
Cost Per Mile (\$)	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58		\$2.58	\$2.58	\$2.58	\$2.58	
Transportation Cost	\$198	\$991	\$892	\$0	\$124	\$198		\$451	\$0	\$208	\$277	
Disposal Fee Per Cubic Yard	\$12.00	\$12.00	\$12.00	\$12.00	\$12.00	\$12.00		\$12.00	\$12.00	\$12.00	\$12.00	
Disposal Cost (\$)	\$384	\$1,920	\$1,728	\$0	\$240	\$384		\$874	\$0	\$403	\$538	
Total Cost	\$582	\$2,911	\$2,620	\$0	\$364	\$582		\$1,324	\$0	\$611	\$815	
<b>B. Licensed Site</b>												
Percent To Be Shipped	20.0%	20.0%	20.0%	100.0%	50.0%	20.0%		20.0%	100.0%	20.0%	20.0%	
Distance (Miles)	150	150	150	150	150	150		150	150	150	150	
Cost Per Mile (\$)	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58		\$2.58	\$2.58	\$2.58	\$2.58	
Transportation Cost	\$155	\$774	\$697	\$2,129	\$387	\$155		\$352	\$3,831	\$163	\$217	
Disposal Cost Per Cubic Foot (\$)	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00		\$11.00	\$11.00	\$11.00	\$11.00	
Quantity Per Truck Load (Yds <sup>3</sup> )	20.0	20.0	20.0	20.0	20.0	20.0		20.0	20.0	20.0	20.0	
Quantity Per Truck Load (Ft <sup>3</sup> )	540	540	540	540	540	540		540	540	540	540	
Disposal Cost	\$2,376	\$11,880	\$10,692	\$32,670	\$5,940	\$2,376		\$5,405	\$58,806	\$2,495	\$3,326	
Total Cost	\$2,531	\$12,654	\$11,389	\$34,799	\$6,327	\$2,531		\$5,758	\$62,637	\$2,857	\$3,543	
Total Cost	\$3,113	\$15,565	\$14,008	\$34,799	\$8,691	\$3,113	\$77,288	\$7,082	\$62,637	\$3,289	\$4,358	\$77,346
<b>TOTAL COST</b>	\$5,024	\$29,519	\$26,567	\$38,731	\$9,612	\$5,904	\$115,356	\$13,431	\$69,716	\$6,547	\$8,364	\$98,058
<b>TOTAL COST - IRIGARAY AND CHRISTENSEN</b>												\$213,414

Irigaray							Christensen						
Maint Area & Laboratory	Warehouse & Offices	Main Process Building	Expansion Building	Dry Pack Area	Restoration Building	Sub Total	Satellite Plant	Wellfield Modules	Booster Pump Bldgs.	Restoration Extension	Office Building	Warehouse	Sub Total

SOIL REMOVAL & DISPOSAL	Irigaray							Christensen						
	Maint Area & Laboratory	Warehouse & Offices	Main Process Building	Expansion Building	Dry Pack Area	Restoration Building	Sub Total	Satellite Plant	Wellfield Modules	Booster Pump Bldgs.	Restoration Extension	Office Building	Warehouse	Sub Total
Assume removal of 3" of Contaminated Soil under Primary Areas, Disposal at a Licensed facility.														
Removal, Front End Loader (\$50/hr)	\$0	\$0	\$815	\$852	\$259	\$167	\$2,093	\$444	\$0	\$0	\$0	\$0	\$0	\$444
Quantity to be Shipped (Ft³)	0	0	4400	4900	1400	900		2400	0	0	0	0	0	
Distance (Miles)	150	150	150	150	150	150		150	150	150	150	150	150	
Cost Per Mile (\$)	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58		\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	
Transportation Cost (\$)	\$0	\$0	\$3,163	\$3,297	\$1,003	\$645	\$8,098	\$1,720	\$0	\$0	\$0	\$0	\$0	\$1,720
Disposal fee Per Cubic Foot (\$)	\$3.70	\$3.70	\$3.70	\$3.70	\$3.70	\$3.70		\$3.70	\$3.70	\$3.70	\$3.70	\$3.70	\$3.70	
Quantity per Truckload (Ft³)	540	540	540	540	540	540		540	540	540	540	540	540	
Disposal Cost (\$)	\$0	\$0	\$16,260	\$17,020	\$5,180	\$3,330	\$41,810	\$8,880	\$0	\$0	\$0	\$0	\$0	\$8,880
Removal, NPDES Pts.														
Quantity to be Shipped (Ft³)			559					5030						
Distance (Miles)	150	150	150	150	150	150		150	150	150	150	150	150	
Cost per Mile (\$)	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58		\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	
Transportation Cost (\$)	\$0.00	\$0.00	\$401	\$0.00	\$0.00	\$0.00	\$401	\$3,604.83	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
Disposal fee per Cubic Foot (\$)	\$3.70	\$3.70	\$3.70	\$3.70	\$3.70	\$3.70		\$3.70	\$3.70	\$3.70	\$3.70	\$3.70	\$3.70	
Quantity per Truckload (Ft³)	540	540	540	540	540	540		540	540	540	540	540	540	
Disposal Cost (\$)	\$0	\$0	\$2,068	\$0	\$0	\$0	\$2,068	\$18,811	\$0	\$0	\$0	\$0	\$0	
Total Cost	\$0	\$0	\$22,717	\$21,169	\$6,442	\$4,142	\$54,470	\$33,260	\$0	\$0	\$0	\$0	\$0	\$33,260
TOTAL COST	\$0	\$0	\$22,717	\$21,169	\$6,442	\$4,142	\$54,470	\$33,260	\$0	\$0	\$0	\$0	\$0	\$33,260
TOTAL COST IRIGARAY AND CHRISTENSEN														\$87,730

RADIATION SURVEY														
Area required (acres)	0.18	0.18	0.4	0.42	0.13	0.08		0.22	0	0.03	0.08	0	0.02	
Survey Cost (\$/acre)	\$580.00	\$580.00	\$580.00	\$580.00	\$580.00	\$580.00		\$580.00	\$580.00	\$580.00	\$580.00	\$580.00	\$580.00	
TOTAL SURVEY COST	\$104.40	\$92.80	\$232.00	\$243.60	\$75.40	\$46.40	\$795	\$127.60	\$0.00	\$17.40	\$46.40	\$0.00	\$11.60	\$203

TOTAL COST	\$45,787	\$31,346	\$149,720	\$131,818	\$54,558	\$24,820	\$438,049	\$91,944	\$13,847	\$9,722	\$20,193	\$10,150	\$3,712	\$149,589
TOTAL COST IRIGARAY AND CHRISTENSEN														\$587,818

Irigaray							Christensen							
Maint Area & Laboratory	Warehouse & Offices	Main Process Building	Expansion Building	Dry Pack Area	Restoration Building	Sub Total	Satellite Plant	Wellfield Modules	Booster Pump Bldgs.	Restoration Extension	Office Building	Warehouse	Sub Total	

**BUILDING DEMOLITION AND DISPOSAL**

Structural Character	1 Story Steel Frame	1 Story Steel Frame	1 Story Steel Frame	1 Story Steel Frame	3 Story Steel/Masonry	1 Story Steel Frame		2 Story Steel Frame	1 Story Pre Fab (22)	1 Story Pre Fab (4)	2 Story Steel Frame	1 Story Pre-Fab	1 Story Steel Frame	
Demolition Volume (Ft³)	178400	108720	430400	388400	128000	69540		192000	95040	48720	72000	64800	11000	
Cost of Demolition Per Ft³	\$0.131	\$0.131	\$0.131	\$0.131	\$0.131	\$0.131		\$0.131	\$0.131	\$0.131	\$0.131	\$0.131	\$0.131	
Demolition Cost (\$)	\$23,501	\$14,242	\$56,382	\$50,818	\$16,506	\$9,123	\$170,373	\$25,152	\$12,450	\$6,120	\$9,432	\$8,489	\$1,441	\$63,084
Factor For Cutting	15.0%	10.0%	30.0%	10.0%	20.0%	10.0%		20.0%	0.0%	0.0%	20.0%	10.0%	10.0%	
Cost For Cutting (\$)	\$3,525	\$1,424	\$16,915	\$5,062	\$3,301	\$912	\$31,139	\$5,030	\$0	\$0	\$1,886	\$848	\$144	\$7,910
Weight (pounds)	158781	96212	380885	341947	111504	61828		169912	66660	28032	63717	38802	9735	
Weight per Truckload	40000	40000	40000	40000	40000	40000		40000	40000	40000	40000	40000	40000	
Number of Truckloads	4.0	2.4	9.5	8.5	2.8	1.5		4.2	1.7	0.7	1.6	1.0	0.2	
Distance to Landfill	48	48	48	48	48	48		48	48	48	48	48	48	
Cost per Mile	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58		\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	
Transportation Cost	\$492	\$298	\$1,179	\$1,059	\$345	\$191	\$3,563	\$528	\$206	\$87	\$197	\$120	\$30	\$1,167
Disposal Cost per Ton	\$35.70	\$35.70	\$35.70	\$35.70	\$35.70	\$35.70		\$35.70	\$35.70	\$35.70	\$35.70	\$35.70	\$35.70	
Disposal Cost	\$2,834	\$1,717	\$8,799	\$8,104	\$1,890	\$1,100	\$20,544	\$3,033	\$1,190	\$600	\$1,137	\$893	\$174	\$6,727
<b>TOTAL COST</b>	<b>\$30,352</b>	<b>\$17,882</b>	<b>\$81,275</b>	<b>\$82,843</b>	<b>\$22,143</b>	<b>\$11,328</b>	<b>\$225,820</b>	<b>\$33,741</b>	<b>\$13,847</b>	<b>\$8,707</b>	<b>\$12,853</b>	<b>\$10,150</b>	<b>\$1,789</b>	<b>\$78,888</b>
<b>TOTAL COST IRIGARAY AND CHRISTENSEN</b>														<b>\$304,508</b>

**CONCRETE DECONTAMINATION, DEMOLITION & DISPOSAL**

Area (Ft²)	8020	7100	17600	18400	5800	3600		9600	0	1440	3600	0	1000	
Average Thickness (Ft)	0.5	0.5	0.5	0.5	1	0.5		0.5	0.0	0.5	0.5	0.0	0.5	
Volume (Ft³)	4010	3550	8800	9200	5800	1800		4800	0	720	1800	0	500	
Percent Requiring Decontamination	0.0%	0.0%	100.0%	100.0%	100.0%	100.0%		100.0%	0.0%	100.0%	100.0%	0.0%	0.0%	
Percent Decontaminated	0.0%	0.0%	75.0%	75.0%	40.0%	75.0%		75.0%	0.0%	100.0%	100.0%	0.0%	0.0%	
Decontamination (\$/Ft²)	\$0.170	\$0.170	\$0.170	\$0.170	\$0.170	\$0.170		\$0.170	\$0.170	\$0.170	\$0.170	\$0.170	\$0.170	
Decontamination Cost	\$0	\$0	\$2,244	\$2,348	\$391	\$459	\$5,430	\$1,224	\$0	\$245	\$612	\$0	\$0	\$2,081
Demolition (\$/Ft²)	\$1.887	\$1.887	\$1.887	\$1.887	\$1.887	\$1.887		\$1.887	\$1.887	\$1.887	\$1.887	\$1.887	\$1.887	
Demolition Cost	\$15,134	\$13,396	\$33,211	\$34,721	\$10,567	\$6,793	\$113,824	\$18,115	\$0	\$2,717	\$6,793	\$0	\$1,887	\$29,513
Transportation & Disposal														
A. Onsite Disposal														
Percent to be Disposed Onsite	100%	100%	75%	75%	40%	75%		75%	0%	100%	100%	0%	100%	
Transportation Cost	\$0	\$0	\$0	\$0	\$0	\$0		\$0	\$0	\$0	\$0	\$0	\$0	
Disposal Cost per Cubic Foot	\$0.049	\$0.049	\$0.049	\$0.049	\$0.049	\$0.049		\$0.049	\$0.049	\$0.049	\$0.049	\$0.049	\$0.049	
Disposal Cost (\$)	\$196	\$174	\$323	\$338	\$110	\$88	\$1,208	\$178	\$0	\$35	\$88	\$0	\$25	\$324
B. Licensed Site														
Percent to be Shipped	0%	0%	25%	25%	60%	25%		25%	100%	0%	0%	100%	0%	
Distance (Miles)	150	150	150	150	150	150		150	150	150	150	150	150	
Cost per Mile (\$)	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58		\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	
Transportation Cost	\$0	\$0	\$1,577	\$1,648	\$2,408	\$323	\$5,958	\$960	\$0	\$0	\$0	\$0	\$0	\$660
Disposal Cost per Cubic Foot	\$3.70	\$3.70	\$3.70	\$3.70	\$3.70	\$3.70		\$3.70	\$3.70	\$3.70	\$3.70	\$3.70	\$3.70	
Quantity Per Truck Load (Yds³)	20	20	20	20	20	20		20	20	20	20	20	20	
Quantity Per Truck Load (Ft³)	540	540	540	540	540	540		540	540	540	540	540	540	
Disposal Cost (\$)	\$0	\$0	\$8,140	\$8,510	\$12,432	\$1,885	\$30,747	\$4,440	\$0	\$0	\$0	\$0	\$0	\$4,440
<b>TOTAL COST</b>	<b>\$15,330</b>	<b>\$13,572</b>	<b>\$45,495</b>	<b>\$47,563</b>	<b>\$25,898</b>	<b>\$9,306</b>	<b>\$157,164</b>	<b>\$24,818</b>	<b>\$0</b>	<b>\$2,997</b>	<b>\$7,493</b>	<b>\$0</b>	<b>\$1,912</b>	<b>\$37,218</b>
<b>SEN</b>														<b>\$194,382</b>

POND RECLAMATION COST

	Irigaray								517				Christensen				
	Pond A	Pond B	Pond C	Pond D	Pond E	Pond RA	Pond RB	Pond 1	Pond 2A	Pond 2B	Pond 2C	Brine Pond 1	Brine Pond 2	Brine Pond 3	Brine Pond 4	Permeate Pond	
<b>POND SLUDGE:</b>																	
Average Sludge Depth (Ft)	0.188	0.158	0.123	0.135	0.227	0.188	0.158					0.168	0.222	0.143	0.088	0.000	
Average Area of Sludge (Ft²)	50845	50804	62291	62291	29583	50845	50804					20909	20909	20909	20909		
Volume of Sludge (Ft³)	9569	7894	7662	8409	6715	9569	7894					3471	4842	2990	1422		
Volume of Sludge (Yds³)	354	292	284	311	249	354	292	0	0	0	0	129	172	111	53	0	
Volume of Sludge Per Truck Load (Yds³)	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	
# of Truck Loads of Sludge	17.7	14.8	14.2	15.6	12.5	17.7	14.8	0.0	0.0	0.0	0.0	6.5	8.8	5.6	2.7	0.0	
Sludge Handling Cost Per Load (\$)	\$238.00	\$238.00	\$238.00	\$238.00	\$238.00	\$238.00	\$238.00	\$238.00	\$238.00	\$238.00	\$238.00	\$238.00	\$238.00	\$238.00	\$238.00	\$238.00	
Total Sludge Handling Cost (\$)	\$4,213	\$3,475	\$3,380	\$3,715	\$2,975	\$4,213	\$3,475	\$0	\$0	\$0	\$0	\$1,547	\$2,047	\$1,333	\$643	\$0	
<b>Transportation &amp; Disposal</b>																	
Percent To Be Shipped	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
Distance (Miles)	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	
Cost Per Mile (\$)	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	
Transportation Cost (\$)	\$8,650	\$5,850	\$5,495	\$8,037	\$4,638	\$8,650	\$5,850	\$0	\$0	\$0	\$0	\$2,518	\$3,328	\$2,167	\$1,045	\$0	
Disposal Cost Per Cubic Foot (\$)	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00	
Quantity Per Truck Load (Yds³)	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	
Quantity Per Truck Load (Ft³)	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	
Disposal Cost (\$)	\$105,138	\$96,724	\$84,348	\$92,684	\$74,250	\$105,138	\$96,724	\$0	\$0	\$0	\$0	\$38,810	\$51,084	\$33,264	\$16,038	\$0	
Total Transportation & Disposal (\$)	\$111,988	\$92,374	\$89,843	\$98,701	\$78,088	\$111,988	\$92,374	\$0	\$0	\$0	\$0	\$41,128	\$54,412	\$35,431	\$17,083	\$0	
<b>TOTAL SLUDGE COST (\$)</b>	<b>\$116,201</b>	<b>\$95,849</b>	<b>\$93,223</b>	<b>\$102,414</b>	<b>\$82,063</b>	<b>\$116,201</b>	<b>\$95,849</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$42,673</b>	<b>\$56,459</b>	<b>\$38,764</b>	<b>\$17,728</b>	<b>\$0</b>	
<b>POND LINER:</b>																	
Total Pond Area (Acres)	1.75	1.72	1.75	1.72	0.78	2.17	2.17					1.10	1.10	1.10	1.10	0.00	
Total Pond Area (Ft²)	78230	74923.2	78230	74923.2	33978.8	84525.2	84525.2	0	0	0	0	47916	47916	47916	47916	0	
Factor For Sloping Sides	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	
Total Liner Area (Ft²)	91478	89908	91478	89908	40772	113430	113430	0	0	0	0	57499	57499	57499	57499	0	
Liner Thickness (Millimeters)	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	
Liner Thickness (Inches)	0.1181	0.1181	0.1181	0.1181	0.1181	0.1181	0.1181	0.1181	0.1181	0.1181	0.1181	0.1181	0.1181	0.1181	0.1181	0.1181	
Liner Thickness (Ft)	0.0098	0.0098	0.0098	0.0098	0.0098	0.0098	0.0098	0.0098	0.0098	0.0098	0.0098	0.0098	0.0098	0.0098	0.0098	0.0098	
"Swell" Factor	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	
Liner Volume (Ft³)	1121	1101	1121	1101	499	1390	1390	0	0	0	0	704	704	704	704	0	
Truck Loads of Liner	2.1	2.0	2.1	2.0	0.9	2.6	2.6	0.0	0.0	0.0	0.0	1.3	1.3	1.3	1.3	0.0	
<b>Liner Handling Cost (\$)</b>																	
Labor Crew Cost per Hour (\$)	\$120	\$120	\$120	\$120	\$120	\$120	\$120	\$120	\$120	\$120	\$120	\$120	\$120	\$120	\$120	\$120	
Hours per Load	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Liner Handling Cost Per Load (\$)	\$240.00	\$240.00	\$240.00	\$240.00	\$240.00	\$240.00	\$240.00	\$240.00	\$240.00	\$240.00	\$240.00	\$240.00	\$240.00	\$240.00	\$240.00	\$240.00	
Total Liner Handling Cost (\$)	\$504	\$480	\$504	\$480	\$216	\$624	\$624	\$0	\$0	\$0	\$0	\$312	\$312	\$312	\$312	\$0	
<b>Transportation &amp; Disposal</b>																	
Percent To Be Shipped	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
Distance (Miles)	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	
Cost Per Mile (\$)	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	
Transportation Cost (\$)	\$813	\$774	\$813	\$774	\$348	\$1,008	\$1,008	\$0	\$0	\$0	\$0	\$503	\$503	\$503	\$503	\$0	
Disposal Cost Per Cubic Foot (\$)	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00	
Quantity Per Truck Load (Ft³)	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	
Disposal Cost (\$)	\$12,474	\$11,880	\$12,474	\$11,880	\$5,348	\$15,444	\$15,444	\$0	\$0	\$0	\$0	\$7,722	\$7,722	\$7,722	\$7,722	\$0	
Total Transportation & Disposal (\$)	\$13,287	\$12,654	\$13,287	\$12,654	\$5,694	\$16,450	\$16,450	\$0	\$0	\$0	\$0	\$8,225	\$8,225	\$8,225	\$8,225	\$0	
<b>TOTAL LINER COST (\$)</b>	<b>\$13,791</b>	<b>\$13,134</b>	<b>\$13,791</b>	<b>\$13,134</b>	<b>\$5,910</b>	<b>\$17,074</b>	<b>\$17,074</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$8,537</b>	<b>\$8,537</b>	<b>\$8,537</b>	<b>\$8,537</b>	<b>\$0</b>	
<b>POND BACKFILL:</b>																	
Backfill required (Yds³)	8740	8580	8740	8580	2517	14817	16319	2345	1837	1537	163	9048	9048	9048	9048	18070	
Backfill Cost (\$/Yd³)	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	
<b>TOTAL BACKFILL COST (\$)</b>	<b>\$8,740</b>	<b>\$8,580</b>	<b>\$8,740</b>	<b>\$8,580</b>	<b>\$2,517</b>	<b>\$14,817</b>	<b>\$16,319</b>	<b>\$2,345</b>	<b>\$1,837</b>	<b>\$1,537</b>	<b>\$163</b>	<b>\$9,048</b>	<b>\$9,048</b>	<b>\$9,048</b>	<b>\$9,048</b>	<b>\$18,070</b>	

POND RECLAMATION COST	Irigaray								S17				Christensen				
	Pond A	Pond B	Pond C	Pond D	Pond E	Pond RA	Pond RB	Pond 1	Pond 2A	Pond 2B	Pond 2C	Brine Pond 1	Brine Pond 2	Brine Pond 3	Brine Pond 4	Permeate Pond	
<b>RADIATION SURVEY</b>																	
Areal Required (acres)	1.75	1.72	1.78	1.72	0.78	2.17	2.17	0.00	0.00	0.00	0.00	1.10	1.10	1.10	1.10	0.00	
Survey Cost (\$/acre)	\$580	\$580	\$580	\$580	\$580	\$580	\$580	\$580	\$580	\$580	\$580	\$580	\$580	\$580	\$580	\$580	
<b>TOTAL SURVEY COST (\$)</b>	<b>\$1,015</b>	<b>\$998</b>	<b>\$1,015</b>	<b>\$998</b>	<b>\$452</b>	<b>\$1,259</b>	<b>\$1,259</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$638</b>	<b>\$638</b>	<b>\$638</b>	<b>\$638</b>	<b>\$0</b>	
<b>LEAK DETECTION SYSTEM REMOVAL</b>																	
Volume of Gravel and Piping (Yd <sup>3</sup> ) (Assume 3")			14337	13851				\$0									
Quantity per Truckload (F <sup>3</sup> )			540	540				\$540									
Quantity to be Shipped			28.6	25.7				0.0									
Distance (Miles)			150	150				150									
Cost per Mile (\$)			\$2.58	\$2.58				\$2.58									
Transportation Cost (\$)			\$10,275	\$9,927				\$0									
Handling Cost (\$238/Load)			\$6,319	\$6,105				\$0									
Disposal Fee per Cubic Foot (\$)			\$3.70	\$3.70				\$3.70									
Disposal Cost (\$)			\$53,047	\$51,249				\$0									
<b>TOTAL LEAK DETECTION SYSTEM REMOVAL</b>	<b>\$0</b>	<b>\$0</b>	<b>\$89,641</b>	<b>\$67,280</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$136,921</b>	
<b>TOTAL POND RECLAMATION COST</b>	<b>\$139,746</b>	<b>\$118,581</b>	<b>\$186,409</b>	<b>\$192,408</b>	<b>\$90,842</b>	<b>\$149,150</b>	<b>\$130,501</b>	<b>\$2,345</b>	<b>\$1,837</b>	<b>\$1,537</b>	<b>\$183</b>	<b>\$60,898</b>	<b>\$74,682</b>	<b>\$54,987</b>	<b>\$35,949</b>	<b>\$18,070</b>	

**SUMMARY - IRIGARAY:**

TOTAL SLUDGE COST (\$)	\$701,799
TOTAL LINER COST (\$)	\$83,906
TOTAL BACKFILL COST (\$)	\$73,875
TOTAL RADIATION SURVEY COST (\$)	\$8,895
LEAK DETECTION SYSTEM REMOVAL	\$136,921
<b>TOTAL POND RECLAMATION COST</b>	<b>\$1,013,597</b>

**SUMMARY - CHRISTENSEN:**

TOTAL SLUDGE COST (\$)	\$153,621
TOTAL LINER COST (\$)	\$34,148
TOTAL BACKFILL COST (\$)	\$54,262
TOTAL RADIATION SURVEY COST (\$)	\$2,562
LEAK DETECTION SYSTEM REMOVAL	\$0
<b>TOTAL POND RECLAMATION COST</b>	<b>\$244,583</b>

**TOTAL PROJECT COST - CR and IR (\$)** **\$1,258,180**

COGEMA Mining, Inc.  
 Restoration and Reclamation Costs  
 Wyoming Operations  
 WORKSHEET 5

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	Irigaray				Christensen			
	Mine Units #1 Thru #9	517 USMT Test Sites	Monitor/ Trend	Sub Total	Mine Units #2 Thru #7	Monitor/ Trend	Misc. Regional	Sub Total
Number of Wells	1064	11	314	1389	2062	327	137	2526
Average Depth	250	250	250		410	410	410	
Average Diameter	4.5	4.5	4.5		4.5	4.5	4.5	
<b>Materials</b>								
Bentonite Chips Required (Ft <sup>3</sup> /Well)	11.6	11.6	11.6		11.6	11.6	11.6	
Bags of Chips Required/Well	15.0	15.0	15.0		15.0	15.0	15.0	
Cost Per Bag (\$)	\$4.50	\$4.50	\$4.50		\$4.50	\$4.50	\$4.50	
Cost/Well Bentonite Chips (\$)	\$67.50	\$67.50	\$67.50		\$67.50	\$67.50	\$67.50	
Gravel Fill Required (Ft <sup>3</sup> /Well)	15.7	15.7	15.7		33.6	33.6	33.6	
Gravel Fill Required (Yd <sup>3</sup> /Well)	0.6	0.6	0.6		1.2	1.2	1.2	
Cost of Gravel/Yd <sup>3</sup> (\$)	\$17.53	\$17.53	\$17.53		\$17.53	\$17.53	\$17.53	
Cost/Well Gravel Fill (\$)	\$10.19	\$10.19	\$10.19		\$21.82	\$21.82	\$21.82	
Cement Cone/Markers Req'd/Well	1.0	1.0	1.0		1.0	1.0	1.0	
Cost of Cement Cones/Markers (\$)	\$4.00	\$4.00	\$4.00		\$4.00	\$4.00	\$4.00	
Total Materials Cost per Well	\$81.69	\$81.69	\$81.69		\$93.32	\$93.32	\$93.32	
<b>Labor</b>								
Hours Required per Well	1.0	1.0	1.0		1.0	1.0	1.0	
Labor Cost per Hour	\$70.00	\$70.00	\$70.00		\$70.00	\$70.00	\$70.00	
Total Labor Cost per Well (\$)	\$70.00	\$70.00	\$70.00		\$70.00	\$70.00	\$70.00	
<b>Equipment Rental</b>								
Hours Required per Well	1.0	1.0	1.0		1.0	1.0	1.0	
Backhoe w/Operator Cost/Hr (\$)	\$35.00	\$35.00	\$35.00		\$35.00	\$35.00	\$35.00	
Total Equipment Cost per Well (\$)	\$35.00	\$35.00	\$35.00		\$35.00	\$35.00	\$35.00	
Total Cost per Well (\$)	\$186.69	\$186.69	\$186.69		\$198.32	\$198.32	\$198.32	
<b>TOTAL WELL ABANDONMENT COST (\$)</b>	<b>\$198,642</b>	<b>\$2,054</b>	<b>\$58,622</b>	<b>\$259,317</b>	<b>\$408,926</b>	<b>\$64,849</b>	<b>\$27,169</b>	<b>\$500,944</b>
<b>GRAND TOTAL IRIGARAY AND CHRISTENSEN</b>							<b>\$760,261</b>	

WELLFIELD EQUIPMENT REMOVAL & DISPOSAL

Irigaray Mine Unit(s) #1 Thru #9	Christensen Mine Units #2 Thru #4	Christensen Mine Unit #5	Christensen Mine Unit #6	Christensen Mine Unit #7	Christensen Mine Unit #8	Total Christensen & Irigaray
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I Wellfield Piping						
<b>A. Removal</b>						
Length/Well (Ft)	100	300	300	300		
Total Number of Wells	1064	1021	494	446		
Total Quantity (Ft)	106400	306300	148200	133800		
Cost of Removal (\$/Ft)	\$0.193	\$0.193	\$0.193	\$0.193		
Cost of Removal (\$)	\$20,535	\$59,116	\$28,603	\$25,823		\$134,077
Average OD (Inches)	3.0	3.0	3.0	3.0		
Chipped Volume Reduction (Ft <sup>3</sup> /Ft)	0.016	0.016	0.016	0.016		
Chipped Volume (Ft <sup>3</sup> )	1,702	4,901	2,371	2,141		
Quantity Per Truck Load (Ft <sup>3</sup> )	540	540	540	540		
Total Number of Truck Loads	3.2	9.1	4.4	4.0		
<b>B. Survey &amp; Decontamination</b>						
Percent Requiring Decontamination	0%	0%	#REF!	0%		
Loads for Decontamination	0.0	0.0	0.0	0.0		
Cost for Decontamination (\$/Load)	\$550.00	\$550.00	\$550.00	\$500.00		
Cost for Decontamination (\$)	\$0	\$0	\$0	\$0		\$0
<b>C. Transport &amp; Disposal</b>						
1.) Landfill						
a. Transportation						
Percent To Be Shipped	0.0%	0.0%	0.0%	0.0%		
Loads To Be Shipped	0.0	0.0	0.0	0.0		
Distance (Miles)	48	48	48	48		
Transportation Cost (\$/mile)	\$2.58	\$2.58	\$2.58	\$2.58		
Transportation Cost (\$)	\$0	\$0	\$0	\$0		\$0
b. Disposal						
Disposal Fee Per Yd <sup>3</sup>	\$12.00	\$12.00	\$12.00	\$12.00		
Yds <sup>3</sup> Per Load	20	20	20	20		
Disposal Cost (\$)	\$0	\$0	\$0	\$0		
Total Cost - Landfill	\$0	\$0	\$0	\$0		\$0
2.) Licensed Site						
a. Transportation						
Percent To Be Shipped	100.0%	100.0%	100.0%	100.0%		
Loads To Be Shipped	3.2	9.1	4.4	4.0		
Distance (Miles)	150	150	150	150		
Cost Per Mile (\$/mile)	\$2.58	\$2.58	\$2.58	\$2.58		
Transportation Cost (\$)	\$1,238	\$3,522	\$1,703	\$1,548		\$8,011
b. Disposal						
Disposal Cost Per Ft <sup>3</sup>	\$11.00	\$11.00	\$11.00	\$11.00		
Disposal Fee Per Yd <sup>3</sup>	\$297.00	\$297.00	\$297.00	\$297.00		
Quantity Per Truck Load (Yds <sup>3</sup> )	20	20	20	20		
Disposal Cost (\$)	\$19,008	\$54,054	\$26,136	\$23,760		\$122,958
Total Cost - Licensed Site	\$20,246	\$57,576	\$27,839	\$25,308		\$130,969
Total Cost - Transport & Disposal	\$20,246	\$57,576	\$27,839	\$25,308		\$130,969
<b>Total Cost - WF Piping Removal &amp; Disposal</b>	<b>\$40,782</b>	<b>\$116,692</b>	<b>\$56,441</b>	<b>\$51,131</b>	<b>\$0</b>	<b>\$0</b>

WELLFIELD EQUIPMENT REMOVAL & DISPOSAL	Irigaray Mine Unit(s) #1 Thru #9	Christensen Mine Units #2 Thru #4	Christensen Mine Unit #5	Christensen Mine Unit #6	Christensen Mine Unit #7	Christensen Mine Unit #8	Total Christensen & Irigaray
<b>II Production Well Pumps</b>							
<b>A. Pump and Tubing Removal</b>							
Number of Production Wells	424	443	217	202			
Cost of Removal (\$/well)	\$21.44	\$21.44	\$21.44	\$21.44			
Cost of Removal (\$)	\$9,091	\$9,498	\$4,652	\$4,331			\$27,572
Number of Pumps Per Truck Load	180	180	180	180			
Number of Truck Loads (Pumps)	2.4	2.5	1.2	1.1			
<b>B. Survey &amp; Decontamination (Pumps)</b>							
Percent Requiring Decontamination	50.0%	50.0%	50.0%	50.0%			
Loads for Decontamination	1.2	1.3	0.6	0.6			
Cost for Decontamination (\$/Load)	\$550.00	\$550.00	\$550.00	\$550.00			
Cost for Decontamination (\$)	\$660	\$715	\$330	\$330			\$2,035
<b>C. Tubing Volume Reduction &amp; Loading</b>							
Length per Well (Ft)	100	300	300	450			
Total Quantity (Ft)	42,400	132,900	65,100	90,900			
Cost of Removal (\$/Ft)	\$0.02	\$0.02	\$0.02	\$0.02			
Cost of Removal (\$)	\$1,018	\$3,190	\$1,562	\$2,182			\$7,951
Average OD (Inches)	3.0	3.0	3.0	3.0			
Chipped Volume Reduction (Ft <sup>3</sup> /Ft)	0.016	0.016	0.016	0.016			
Chipped Volume (Ft <sup>3</sup> )	678	2,126	1,042	1,454			
Quantity per Truckload (Ft <sup>3</sup> )	540	540	540	540			
Number of Truck Loads	1.3	3.9	1.9	2.7			
<b>D. Transport &amp; Disposal</b>							
<b>1.) Landfill</b>							
<b>a. Transportation</b>							
Percent To Be Shipped (Pumps)	50.0%	50.0%	50.0%	50.0%			
Loads To Be Shipped	1.2	1.3	0.6	0.6			
Distance (Miles)	48	48	48	48			
Cost Per Mile (\$/mile)	\$2.58	\$2.58	\$2.58	\$2.58			
Transportation Cost (\$)	\$149	\$161	\$74	\$74			\$458
<b>b. Disposal</b>							
Disposal Fee Per Yd <sup>3</sup>	\$12.00	\$12.00	\$12.00	\$12.00			
Yds <sup>3</sup> Per Load	20	20	20	20			
Disposal Cost (\$)	\$288	\$312	\$144	\$144			\$888
<b>Total Cost - Landfill</b>	<b>\$437</b>	<b>\$473</b>	<b>\$218</b>	<b>\$218</b>			<b>\$1,346</b>
<b>2.) Licensed Site</b>							
<b>a. Transportation</b>							
Percent To Be Shipped (Pumps)	50.0%	50.0%	50.0%	50.0%			
Percent To Be Shipped (Tubing)	100.0%	100.0%	100.0%	100.0%			
Loads To Be Shipped	2.5	5.2	2.5	3.2			
Distance (Miles)	150	150	150	150			
Cost Per Mile (\$/mile)	\$2.58	\$2.58	\$2.58	\$2.58			
Transportation Cost (\$)	\$951	\$2,008	\$979	\$1,255			\$5,192
<b>b. Disposal</b>							
Disposal Cost Per Ft <sup>3</sup>	\$11.00	\$11.00	\$11.00	\$11.00			
Disposal Fee Per Yd <sup>3</sup>	\$297.00	\$297.00	\$297.00	\$297.00			
Quantity Per Truck Load (Yds <sup>3</sup> )	20	20	20	20			
Disposal Cost (\$)	\$14,590	\$30,815	\$15,022	\$18,265			\$79,693
<b>Total Cost - Licensed Site</b>	<b>\$15,541</b>	<b>\$32,823</b>	<b>\$16,000</b>	<b>\$20,521</b>			<b>\$84,885</b>
<b>Total Cost - Transport &amp; Disposal</b>	<b>\$15,978</b>	<b>\$33,296</b>	<b>\$16,219</b>	<b>\$20,739</b>			<b>\$86,231</b>
<b>Total Cost - Pump Removal &amp; Disposal</b>	<b>\$26,746</b>	<b>\$46,699</b>	<b>\$22,763</b>	<b>\$27,581</b>	<b>\$0</b>	<b>\$0</b>	<b>\$123,789</b>



WELLFIELD EQUIPMENT REMOVAL & DISPOSAL	Irigaray Mine Unit(s) #1 Thru #9	Christensen Mine Units #2 Thru #4	Christensen Mine Unit #5	Christensen Mine Unit #6	Christensen Mine Unit #7	Christensen Mine Unit #8	Total Christensen & Irigaray
<b>III Surface Trunkline Piping</b>							
<b>A. Removal</b>							
Total Quantity (Ft)	44700	0	0	0			
Cost of Removal (\$/Ft)	\$0.143	\$0.143	\$0.143	\$0.143			
Cost of Removal (\$)	\$6,392	\$0	\$0	\$0			\$6,392
Average OD (Inches)	8.750	8.750	0.000	0.000			
Chipped Volume Reduction (Ft <sup>3</sup> /Ft)	0.088	0.088	0.088	0.088			
Chipped Volume (Ft <sup>3</sup> )	3934	0	0	0			
Quantity Per Truck Load (Ft <sup>3</sup> )	540	540	540	540			
Total Number of Truck Loads	7.3	0.0	0.0	0.0			
<b>B. Survey &amp; Decontamination</b>							
Percent Requiring Decontamination	0.0%	0.0%	0.0%	0.0%			
Loads for Decontamination	0.0	0.0	0.0	0.0			
Cost for Decontamination (\$/Load)	\$550.00	\$550.00	\$550.00	\$550.00			
Cost for Decontamination (\$)	\$0	\$0	\$0	\$0			\$0
<b>C. Transport &amp; Disposal</b>							
<b>1.) Landfill</b>							
<b>a. Transportation</b>							
Percent To Be Shipped	0.0%	0.0%	0.0%	0.0%			
Loads To Be Shipped	0.0	0.0	0.0	0.0			
Distance (Miles)	48	48	48	48			
Cost Per Mile (\$/mile)	\$2.58	\$2.58	\$2.58	\$2.58			
Transportation Cost (\$)	\$0	\$0	\$0	\$0			\$0
<b>b. Disposal</b>							
Disposal Fee Per Yd <sup>3</sup>	\$12.00	\$12.00	\$12.00	\$12.00			
Yds <sup>3</sup> Per Load	20	20	20	20			
Disposal Cost (\$)	\$0	\$0	\$0	\$0			\$0
Total Cost - Landfill	\$0	\$0	\$0	\$0			
<b>2.) Licensed Site</b>							
<b>a. Transportation</b>							
Percent To Be Shipped	100.0%	100.0%	100.0%	100.0%			
Loads To Be Shipped	7.3	0.0	0.0	0.0			
Distance (Miles)	150	150	150	150			
Cost Per Mile (\$/mile)	\$2.58	\$2.58	\$2.58	\$2.58			
Transportation Cost (\$)	\$2,819	\$0	\$0	\$0			\$2,819
<b>b. Disposal</b>							
Disposal Cost Per Ft <sup>3</sup>	\$11.00	\$11.00	\$11.00	\$11.00			
Disposal Fee Per Yd <sup>3</sup>	\$297.00	\$297.00	\$297.00	\$297.00			
Quantity Per Truck Load (Yds <sup>3</sup> )	20	20	20	20			
Disposal Cost (\$)	\$43,270	\$0	\$0	\$0			\$43,270
Total Cost - Licensed Site	\$46,089	\$0	\$0	\$0			\$46,089
Total Cost - Transport & Disposal	\$46,089	\$0	\$0	\$0			\$46,089
<b>Total Cost - Surface Trunkline Removal &amp; Disposal</b>	<b>\$52,481</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$52,481</b>

WELLFIELD EQUIPMENT REMOVAL & DISPOSAL	Irigaray Mine Unit(s) #1 Thru #9	Christensen Mine Units #2 Thru #4	Christensen Mine Unit #5	Christensen Mine Unit #6	Christensen Mine Unit #7	Christensen Mine Unit #8	Total Christensen & Irigaray
<b>IV Buried Trunkline</b>							
<b>A. Removal</b>							
Total Quantity (Ft)	7300	11555	24500	47000			
Cost of Removal (\$/Ft)	\$2.80	\$2.80	\$2.80	\$2.80			
Cost of Removal (\$)	\$20,440	\$32,382	\$68,600	\$131,600			\$253,022
Average OD (Inches)	8.750	8.750	8.750	12.000			
Chipped Volume Reduction (Ft <sup>3</sup> /Ft)	0.088	0.088	0.088	0.130			
Chipped Volume (Ft <sup>3</sup> )	642	1018	2156	6110			
Quantity Per Truck Load (Ft <sup>3</sup> )	540	540	540	540			
Number of Truck Loads	1.2	1.9	4.0	11.3			
<b>B. Survey &amp; Decontamination</b>							
Percent Requiring Decontamination	0.0%	0.0%	0.0%	0.0%			
Loads for Decontamination	0.0	0.0	0.0	0.0			
Cost for Decontamination. (\$/Load)	\$550.00	\$550.00	\$550.00	\$550.00			
Cost for Decontamination. (\$)	\$0	\$0	\$0	\$0			\$0
<b>C. Transport &amp; Disposal</b>							
<b>1.) Landfill</b>							
<b>a. Transportation</b>							
Percent To Be Shipped	0.0%	0.0%	0.0%	0.0%			
Loads To Be Shipped	0.0	0.0	0.0	0.0			
Distance (Miles)	48	48	48	48			
Cost Per Mile (\$/mile)	\$2.58	\$2.58	\$2.58	\$2.58			
Transportation Cost (\$)	\$0	\$0	\$0	\$0			\$0
<b>b. Disposal</b>							
Disposal Fee Per Yd <sup>3</sup>	\$12.00	\$12.00	\$12.00	\$12.00			
Yds <sup>3</sup> Per Load	20	20	20	20			
Disposal Cost (\$)	\$0	\$0	\$0	\$0			\$0
Total Cost - Landfill	\$0	\$0	\$0	\$0			
<b>2.) Licensed Site</b>							
<b>a. Transportation</b>							
Percent To Be Shipped	100.0%	100.0%	100.0%	100.0%			
Loads To Be Shipped	1.2	1.9	4.0	11.3			
Distance (Miles)	150	150	150	150			
Cost Per Mile (\$/mile)	\$2.58	\$2.58	\$2.58	\$2.58			
Transportation Cost (\$)	\$464	\$735	\$1,548	\$4,373			\$7,121
<b>b. Disposal</b>							
Disposal Cost Per Ft <sup>3</sup>	\$11.00	\$11.00	\$11.00	\$11.00			
Disposal Fee Per Yd <sup>3</sup>	\$297.00	\$297.00	\$297.00	\$297.00			
Quantity Per Truck Load (Yds <sup>3</sup> )	20	20	20	20			
Disposal Cost (\$)	\$7,128	\$11,286	\$23,760	\$67,122			\$109,296
Total Cost - Licensed Site	\$7,592	\$12,021	\$25,308	\$71,495			\$116,417
Total Cost - Transport & Disposal	\$7,592	\$12,021	\$25,308	\$71,495			\$116,417
<b>Total Cost - Buried Trunkline Removal &amp; Disposal</b>	<b>\$28,032</b>	<b>\$44,403</b>	<b>\$93,908</b>	<b>\$203,095</b>			<b>\$369,439</b>

WELLFIELD EQUIPMENT REMOVAL & DISPOSAL	Irigaray Mine Unit(s) #1 Thru #9	Christensen Mine Units #2 Thru #4	Christensen Mine Unit #5	Christensen Mine Unit #6	Christensen Mine Unit #7	Christensen Mine Unit #8	Total Christensen & Irigaray
<b>V Manholes</b>							
<b>A. Removal</b>							
Total Quantity	5	8	5	11			
Cost of Removal (\$ Each)	\$130.00	\$130.00	\$130.00	\$130.00			
Cost of Removal (\$)	\$650	\$1,040	\$650	\$1,430			\$3,770
Quantity Per Truck Load	10	10	10	10			
Number of Truck Loads	0.5	0.8	0.5	1.1			
<b>B. Survey &amp; Decontamination</b>							
Percent Requiring Decontamination	0.0%	0.0%	0.0%	0.0%			
Loads for Decontamination	0.0	0.0	0.0	0.0			
Cost for Decontamination (\$/Load)	\$550.00	\$550.00	\$550.00	\$550.00			
Cost for Decontamination (\$)	\$0	\$0	\$0	\$0			\$0
<b>C. Transport &amp; Disposal</b>							
1.) Landfill							
a. Transportation							
Percent To Be Shipped	0.0%	0.0%	0.0%	0.0%			
Loads To Be Shipped	0.0	0.0	0.0	0.0			
Distance (Miles)	48	48	48	48			
Cost Per Mile (\$/mile)	\$2.58	\$2.58	\$2.58	\$2.58			
Transportation Cost (\$)	\$0	\$0	\$0	\$0			\$0
b. Disposal							
Disposal Fee Per Yd <sup>3</sup> (\$)	\$12.00	\$12.00	\$12.00	\$12.00			
Yds <sup>3</sup> Per Load	20	20	20	20			
Disposal Cost (\$)	\$0	\$0	\$0	\$0			\$0
Total Cost - Landfill	\$0	\$0	\$0	\$0			
2.) Licensed Site							
a. Transportation							
Percent To Be Shipped	100.0%	100.0%	100.0%	100.0%			
Loads To Be Shipped	0.5	0.8	0.5	1.1			
Distance (Miles)	150	150	150	150			
Cost Per Mile (\$/mile)	\$2.58	\$2.58	\$2.58	\$2.58			
Transportation Cost (\$)	\$194	\$310	\$194	\$426			\$1,122
b. Disposal							
Disposal Cost Per Ft <sup>2</sup>	\$11.00	\$11.00	\$11.00	\$11.00			
Disposal Fee Per Yd <sup>3</sup>	\$297.00	\$297.00	\$297.00	\$297.00			
Quantity Per Truck Load (Yds <sup>3</sup> )	20	20	20	20			
Disposal Cost (\$)	\$2,970	\$4,752	\$2,970	\$6,534			\$17,226
Total Cost - Licensed Site	\$3,164	\$5,062	\$3,164	\$6,960			\$18,348
Total Cost - Transport & Disposal	\$3,164	\$5,062	\$3,164	\$6,960			\$18,348
Total Cost Manhole Removal & Disposal	\$3,814	\$6,102	\$3,814	\$8,390	\$0	\$0	\$22,118
<b>TOTAL COST - WELLFIELD EQUIP REMOVAL &amp; DISP</b>	<b>\$151,854</b>	<b>\$213,895</b>	<b>\$176,926</b>	<b>\$290,198</b>	<b>\$0</b>	<b>\$0</b>	<b>\$832,873</b>

TOPSOIL REPLACEMENT & REVEGETATION

	Irigaray Mine Unit(s) #1 Thru #9	Christensen Mine Units #2 Thru #4	Christensen Mine Unit #5	Christensen Mine Unit #6	Christensen Mine Unit #7	Christensen Mine Unit #8	Total Christensen & Irigaray
<b>I Process Plant and Office Building</b>							
<b>A. Topsoil Handling &amp; Grading</b>							
Affected Area (Acres)	5.0	2.5	0.0	0.0	0.0	0.0	
Average Affected Thickness (Ins)	12.0	12.0	0.0	0.0	0.0	0.0	
Topsoil Volume (Yds <sup>3</sup> )	8067	4033	0	0	0	0	
Unit Cost - Haul/Place (\$/Yd <sup>3</sup> )	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	
Topsoil Handling Cost (\$)	\$8,067	\$4,033	\$0	\$0	\$0	\$0	
Unit Cost - Grading (\$/Ac)	\$50.00	\$50.00	\$50.00	\$50.00	\$50.00	\$50.00	
Grading Cost (\$)	\$250	\$125	\$0	\$0	\$0	\$0	
Sub Total - Topsoil	\$8,317	\$4,158	\$0	\$0	\$0	\$0	\$12,475
<b>B. Radiation Survey &amp; Soil Analysis</b>							
Unit Cost (\$/Ac)	\$580.00	\$580.00	\$580.00	\$580.00	\$580.00	\$580.00	
Sub Total - Survey & Analysis	\$2,900	\$1,450	\$0	\$0	\$0	\$0	\$4,350
<b>C. Revegetation</b>							
Fertilizer (\$/Ac)	\$46.49	\$46.49	\$46.49	\$46.49	\$46.49	\$46.49	
Seeding Prep & Seeding (\$/Ac)	\$168.68	\$168.68	\$168.68	\$168.68	\$168.68	\$168.68	
Mulching & Crimping (\$/Ac)	\$276.54	\$276.54	\$276.54	\$276.54	\$276.54	\$276.54	
Sub Total Cost/Acre	\$491.71	\$491.71	\$491.71	\$491.71	\$491.71	\$491.71	
Sub Total - Revegetation	\$2,459	\$1,229	\$0	\$0	\$0	\$0	\$3,688
Sub Total - Process Plant and Office Bldg.	\$13,675	\$6,838	\$0	\$0	\$0	\$0	\$20,513
<b>II Ponds</b>							
<b>A. Topsoil Handling &amp; Grading</b>							
Affected Area (Acres)	20.0	12.0	0.0	0.0	0.0	0.0	
Average Affected Thickness (Ins)	12	12	0	0	0	0	
Topsoil Volume (Yds <sup>3</sup> )	32267	19360	0	0	0	0	
Unit Cost - Haul/Place (\$/Yd <sup>3</sup> )	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	
Topsoil Handling Cost (\$)	\$32,267	\$19,360	\$0	\$0	\$0	\$0	
Unit Cost - Grading (\$/Ac)	\$50.00	\$50.00	\$50.00	\$50.00	\$50.00	\$50.00	
Grading Cost (\$)	\$1,000	\$600	\$0	\$0	\$0	\$0	
Sub Total - Topsoil	\$33,267	\$19,960	\$0	\$0	\$0	\$0	\$53,227
<b>B. Radiation Survey &amp; Soil Analysis</b>							
Unit Cost (\$/Ac)	\$580.00	\$580.00	\$580.00	\$580.00	\$580.00	\$580.00	
Sub Total - Survey & Analysis	\$11,600	\$6,960	\$0	\$0	\$0	\$0	\$18,560
<b>C. Revegetation</b>							
Fertilizer (\$/Ac)	\$46.49	\$46.49	\$46.49	\$46.49	\$46.49	\$46.49	
Seeding Prep & Seeding (\$/Ac)	\$168.68	\$168.68	\$168.68	\$168.68	\$168.68	\$168.68	
Mulching & Crimping (\$/Ac)	\$276.54	\$276.54	\$276.54	\$276.54	\$276.54	\$276.54	
Sub Total Cost/Acre	\$491.71	\$491.71	\$491.71	\$491.71	\$491.71	\$491.71	
Sub Total - Revegetation	\$9,834	\$5,901	\$0	\$0	\$0	\$0	\$15,735
Sub Total - Ponds	\$54,701	\$32,821	\$0	\$0	\$0	\$0	\$87,521

COGEMA Mining, Inc.  
 Restoration and Reclamation Costs  
 Wyoming Operations  
 WORKSHEET 7

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TOPSOIL REPLACEMENT & REVEGETATION

Irigaray Mine Unit(s) #1 Thru #9	Christensen Mine Units #2 Thru #4	Christensen Mine Unit #5	Christensen Mine Unit #6	Christensen Mine Unit #7	Christensen Mine Unit #8	Total Christensen & Irigaray
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III Wellfields							
<b>A. Topsoil Handling &amp; Grading</b>							
Affected Area (Acres)	40.0	55.0	30.0	50.0	35.0	40.0	
Average Affected Thickness (Ins)	3.5	0.0	0.0	0.0	0.0	0.0	
Topsoil Volume (Yds <sup>3</sup> )	18822	0	0	0	0	0	
Unit Cost - Haul/Place (\$/Yd <sup>3</sup> )	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	
Topsoil Handling Cost (\$)	\$18,822	\$0	\$0	\$0	\$0	\$0	
Unit Cost - Grading (\$/Ac)	\$50.00	\$50.00	\$50.00	\$50.00	\$50.00	\$0.00	
Grading Cost (\$)	\$2,000	\$2,750	\$1,500	\$2,500	\$1,750	\$0	
Sub Total - Topsoil	\$20,822	\$2,750	\$1,500	\$2,500	\$1,750	\$0	\$29,322
<b>B. Radiation Survey &amp; Soil Analysis</b>							
Unit Cost (\$/Ac)	\$580.00	\$580.00	\$580.00	\$580.00	\$0.00	\$0.00	
Sub Total - Survey & Analysis	\$23,200	\$31,900	\$17,400	\$29,000	\$0	\$0	\$101,500
<b>C. Spill Cleanup</b>							
Affected Area (Acres)	0.054	0.036	0	0	0	0	
Affected Area (ft <sup>2</sup> )	2352	1588	0	0	0	0	
Affected Area Thickness (ft)	0.25	0.25	0.25	0.25	0.25	0.25	
Affected Volume (ft <sup>3</sup> )	588	392	0	0	0	0	
Quantity per Truckload (ft <sup>3</sup> )	540	540	540	540	540	540	
Quantity to be Shipped (Loads)	1.1	0.7	0.0	0.0	0.0	0.0	
Distance (miles)	150	150	150	150	150	150	
Cost per Mile (\$)	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	\$2.58	
Transportation Cost (\$)	\$425.70	\$270.90	\$0.00	\$0.00	\$0.00	\$0.00	
Handling Cost (\$200/Load)	\$220.00	\$140.00	\$0.00	\$0.00	\$0.00	\$0.00	
Disposal Fee per Cubic Foot (\$)	\$3.70	\$3.70	\$3.70	\$3.70	\$3.70	\$3.70	
Disposal Cost	\$2,175.82	\$1,450.55	\$0,000	\$0,000	\$0,000	\$0,000	
Subtotal - Spill Cleanup	\$2,821.52	\$1,861.45	\$0.00	\$0.00	\$0.00	\$0.00	\$4,683
<b>D. Revegetation</b>							
Fertilizer (\$/Ac)	\$46.49	\$46.49	\$46.49	\$46.49	\$46.49	\$46.49	
Seeding Prep & Seeding (\$/Ac)	\$168.68	\$168.68	\$168.68	\$168.68	\$168.68	\$168.68	
Mulching & Crimping (\$/Ac)	\$276.54	\$276.54	\$276.54	\$276.54	\$276.54	\$276.54	
Sub Total Cost/Acre	\$491.71	\$491.71	\$491.71	\$491.71	\$491.71	\$491.71	
Sub Total - Revegetation	\$19,668	\$27,044	\$14,751	\$24,586	\$17,210	\$19,668	\$122,928
Sub Total - Wellfields (\$)	\$66,512	\$83,555	\$33,651	\$58,086	\$18,960	\$19,668	\$258,433
<b>IV Roads</b>							
<b>A. Topsoil Handling &amp; Grading</b>							
Affected Area (Acres)	25.0	20.0	15.0	21.0	0.0	0.0	
Average Affected Thickness (Ins)	12	12	12	12	12	12	
Topsoil Volume (Yds <sup>3</sup> )	40333	32267	24200	33880	0	0	
Unit Cost - Haul/Place (\$/Yd <sup>3</sup> )	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	
Topsoil Handling Cost (\$)	\$40,333	\$32,267	\$24,200	\$33,880	\$0	\$0	
Unit Cost - Grading (\$/Ac)	\$50.00	\$50.00	\$50.00	\$50.00	\$50.00	\$50.00	
Grading Cost (\$)	\$1,250	\$1,000	\$750	\$1,050	\$0	\$0	
Sub Total - Topsoil	\$41,583	\$33,267	\$24,950	\$34,930	\$0	\$0	\$134,730
<b>B. Radiation Survey &amp; Soil Analysis</b>							
Unit Cost (\$/Ac)	\$580.00	\$580.00	\$580.00	\$580.00	\$0.00	\$0.00	
Sub Total - Survey & Analysis	\$14,500	\$11,600	\$8,700	\$12,180	\$0	\$0	\$46,980
<b>C. Revegetation</b>							
Fertilizer (\$/Ac)	\$46.49	\$46.49	\$46.49	\$46.49			
Seeding Prep & Seeding (\$/Ac)	\$168.68	\$168.68	\$168.68	\$168.68			
Mulching & Crimping (\$/Ac)	\$276.54	\$276.54	\$276.54	\$276.54			
Sub Total Cost/Acre	\$491.71	\$491.71	\$491.71	\$491.71			
Sub Total - Revegetation	\$12,293	\$9,834	\$7,376	\$10,326	\$0	\$0	\$39,829
Sub Total - Roads (\$)	\$68,376	\$54,701	\$41,026	\$57,436	\$0	\$0	\$221,539

TOPSOIL REPLACEMENT & REVEGETATION

	Irigaray Mine Unit(s) #1 Thru #9	Christensen Mine Units #2 Thru #4	Christensen Mine Unit #5	Christensen Mine Unit #6	Christensen Mine Unit #7	Christensen Mine Unit #8	Total Christensen & Irigaray
<b>V Other</b>							
<b>A. Topsoil Handling &amp; Grading</b>							
Affected Area (Acres)	41.0	19.0	5.0	5.0	0.0	0.0	
Average Affected Thickness (Ins)	0.0	0.0	0	0	0	0	
Topsoil Volume (Yds <sup>3</sup> )	0	0	0	0	0	0	
Unit Cost - Haul/Place (\$/Yd <sup>3</sup> )	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	
Topsoil Handling Cost (\$)	\$0	\$0	\$0	\$0	\$0	\$0	
Unit Cost - Grading (\$/Ac)	\$50.00	\$50.00	\$50.00	\$50.00	\$0.00	\$0.00	
Grading Cost (\$)	\$2,050	\$950	\$250	\$250	\$0	\$0	
Sub Total - Topsoil	\$2,050	\$950	\$250	\$250	\$0	\$0	\$3,500
<b>B. Radiation Survey &amp; Soil Analysis</b>							
Unit Cost (\$/Ac)	\$580.00	\$580.00	\$580.00	\$580.00	\$0.00	\$0.00	
Sub Total - Survey & Analysis	\$23,780	\$11,020	\$2,900	\$2,900	\$0	\$0	\$40,600
<b>C. Revegetation</b>							
Fertilizer (\$/Ac)	\$46.49	\$46.49	\$46.49	\$46.49	\$0.00	\$0.00	
Seeding Prep & Seeding (\$/Ac)	\$168.68	\$168.68	\$168.68	\$168.68	\$0.00	\$0.00	
Mulching & Crimping (\$/Ac)	\$278.54	\$278.54	\$278.54	\$278.54	\$0.00	\$0.00	
Sub Total Cost/Acre	\$491.71	\$491.71	\$491.71	\$491.71	\$0.00	\$0.00	
Sub Total - Revegetation	\$20,160	\$9,343	\$2,459	\$2,459	\$0	\$0	\$34,420
Sub Total - Other	\$45,890	\$21,313	\$5,609	\$5,609	\$0	\$0	\$78,520
<b>VI Remedial Action</b>							
<b>A. Topsoil Handling &amp; Grading</b>							
Affected Area (Acres)	65.5	54.3	25.0	38.0	17.5	20.0	
Average Affected Thickness (Ins)	0.0	0.0	0.0	0.0	0.0	0.0	
Topsoil Volume (Yds <sup>3</sup> )	0	0	0	0	0	0	
Unit Cost - Haul/Place (\$/Yd <sup>3</sup> )	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	
Topsoil Handling Cost (\$)	\$0	\$0	\$0	\$0	\$0	\$0	
Unit Cost - Grading (\$/Ac)	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
Grading Cost (\$)	\$0	\$0	\$0	\$0	\$0	\$0	
Sub Total - Topsoil	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>B. Radiation Survey &amp; Soil Analysis</b>							
Unit Cost (\$/Ac)	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
Sub Total - Survey & Analysis	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>C. Revegetation</b>							
Fertilizer (\$/Ac)	\$46.49	\$46.49	\$46.49	\$46.49	\$46.49	\$46.49	
Seeding Prep & Seeding (\$/Ac)	\$168.68	\$168.68	\$168.68	\$168.68	\$0.00	\$0.00	
Mulching & Crimping (\$/Ac)	\$278.54	\$278.54	\$278.54	\$278.54	\$0.00	\$0.00	
Sub Total Cost/Acre	\$491.71	\$491.71	\$491.71	\$491.71	\$46.49	\$46.49	
Sub Total - Revegetation	\$32,207	\$26,700	\$12,293	\$18,685	\$814	\$930	\$91,628
Sub Total - Remedial Action	\$32,207	\$26,700	\$12,293	\$18,685	\$814	\$930	\$91,628
<b>TOTAL COST - TOPSOIL &amp; REVEGETATION</b>	<b>\$281,461</b>	<b>\$205,927</b>	<b>\$92,578</b>	<b>\$137,615</b>	<b>\$19,773</b>	<b>\$20,598</b>	<b>\$758,154</b>

COGEMA Mining, Inc.  
 Restoration and Reclamation Costs  
 Wyoming Operations  
 WORKSHEET 8

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MISCELLANEOUS RECLAMATION

	Irigaray Mine Unit(s) #1 Thru #9	Christensen Mine Units #2 Thru #4	Christensen Mine Unit #5	Christensen Mine Unit #6	Christensen Mine Unit #7	Christensen Mine Unit #8	Total Christensen & Irigaray
<b>I Fence Removal &amp; Disposal</b>							
Quantity (Feet)	15240	35260	20000	9000	0	0	
Cost of Removal/Disposal (\$/Ft)	\$0.68	\$0.68	\$0.68	\$0.68	\$0.68	\$0.68	
Cost of Removal/Disposal (\$)	\$10,363	\$23,977	\$13,600	\$6,120	\$0	\$0	\$54,060
<b>II Powerline Removal &amp; Disposal</b>							
Quantity (Feet)	9450	10565	18000	18000			
Cost of Removal/Disposal (\$/Ft)	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
Cost of Removal/Disposal (\$)	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>III Powerpole Removal &amp; Disposal</b>							
Quantity	25	30	60	60	0	0	
Cost of Removal/Disposal (\$/Each)	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
Cost of Removal/Disposal (\$)	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>IV Transformer Removal &amp; Disposal</b>							
Quantity	3	1	0	18	0	0	
Cost of Removal/Disposal (\$/Each)	\$2,428	\$2,428	\$2,428	\$595	\$595	\$595	
Cost of Removal/Disposal (\$)	\$7,284	\$2,428	\$0	\$10,710	\$0	\$0	\$20,422
<b>V Booster Pump Assembly Removal &amp; Disposal</b>							
Quantity	0	6	5	5	0	0	
Cost of Removal/Disposal (\$/Each)	\$298	\$298	\$298	\$298	\$298	\$298	
Cost of Removal/Disposal (\$)	\$0	\$1,788	\$1,490	\$1,490	\$0	\$0	\$4,768
<b>VI Culvert Removal &amp; Disposal</b>							
Quantity (Feet)	150	1200	1000	1000	0	0	
Cost of Removal/Disposal (\$/Ft)	\$3.48	\$3.48	\$3.48	\$3.48	\$3.48	\$3.48	
Cost of Removal/Disposal (\$)	\$522	\$4,176	\$3,480	\$3,480	\$0	\$0	\$11,658
<b>VII Guardrail Removal</b>							
Quantity (Feet)	200	3000	0	0			
Cost of Removal/Disposal (\$/Ft)	\$6.19	\$6.19	\$6.19	\$6.19	\$6.19	\$6.19	
Cost of Removal/Disposal (\$)	\$1,238	\$18,570	\$0	\$0	\$0	\$0	\$19,808
<b>VIII Low Water Stream Crossing</b>							
Quantity	0	1	1	0	0	0	
Cost of Removal/Disposal (\$/Each)	\$8,330	\$8,330	\$8,330	\$8,330	\$8,330	\$8,330	
Cost of Removal/Disposal (\$)	\$0	\$8,330	\$8,330	\$0	\$0	\$0	\$16,660
<b>IX Utilities Cost</b>							
Quantity (Mos)	4	8	4	4	0	0	
Cost Per Month (\$/Month)	\$2,380	\$1,190	\$1,190	\$1,190	\$1,190	\$1,190	
Total Cost (\$)	\$9,520	\$9,520	\$4,760	\$4,760	\$0	\$0	\$28,560
<b>TOTAL MISCELLANEOUS COST</b>	<b>\$28,927</b>	<b>\$68,789</b>	<b>\$31,660</b>	<b>\$26,560</b>	<b>\$0</b>	<b>\$0</b>	<b>\$155,936</b>