

Table 1. Mine Waste Volumes

Pond	Volume (yd³)
Site A waste rock	4700
Site B waste rock	1750
Site C waste rock	15955
Subtotal waste rock	22405
25% Swell	5600
Total waste rock	28005
Site C tailings	10600
Pond tailings	10600
Subtotal (Tailings only)	21200
35% Swell	7420
Total tailings	28620
Total Waste Volume (Loose Cubic Yards)	56625

Table 2. XRF Analytical Results, Balm Creek - Poorman Mine Site, OR (mg/kg)

No	XLN	Date/Time	Arsenic	Copper	Lead	Manganese	Mercury	Iron	Zinc	Remarks
Balm Creek Site C										
1	420	9/22/00 10:45	<LOD	826	<LOD	<LOD	<LOD	71,885	563	Waste Rock
2	421	9/22/00 10:49	88	<LOD	<LOD	<LOD	<LOD	54,886	<LOD	Waste Rock
3	422	9/22/00 10:50	48	129	<LOD	2,250	<LOD	55,859	184	Waste Rock
4	423	9/22/00 10:53	48	177	<LOD	1,970	<LOD	34,381	165	Waste Rock
5	424	9/22/00 10:57	73	<LOD	<LOD	<LOD	<LOD	63,693	163	Waste Rock
6	425	9/22/00 11:04	<LOD	969	<LOD	3,549	<LOD	101,990	709	Near Headframe
7	426	9/22/00 11:08	135	390	44	3,059	<LOD	75,571	128	Waste Rock
8	427	9/22/00 11:11	93	439	<LOD	<LOD	<LOD	18,099	<LOD	Gray Waste Rock
9	428	9/22/00 11:12	134	2,749	57	2,709	<LOD	77,466	1,030	Gray Waste Rock, Odor
10	429	9/22/00 11:14	177	<LOD	44	3,798	<LOD	77,056	103	Yellow Waste Rock
11	430	9/22/00 11:16	104	679	53	5,930	23	105,984	188	Flat Near Stream
12	431	9/22/00 11:16	285	252	<LOD	3,280	<LOD	65,997	<LOD	Flat Near Stream

Table 2. XRF Analytical Results, Balm Creek - Poorman Mine Site, OR (mg/kg)

No	XLN	Date/Time	Arsenic	Copper	Lead	Manganese	Mercury	Iron	Zinc	Remarks
13	432	9/22/00 11:19	<LOD	180	<LOD	2,539	<LOD	29,594	144	Waste Rock
14	433	9/22/00 11:21	108	<LOD	<LOD	<LOD	<LOD	32,896	117	Waste Rock
15	434	9/22/00 11:22	40	<LOD	48	<LOD	<LOD	13,197	<LOD	Tailings
16	435	9/22/00 11:23	45	<LOD	53	<LOD	<LOD	14,694	<LOD	Tailings
17	436	9/22/00 11:24	62	<LOD	45	<LOD	<LOD	17,894	<LOD	Pink Tailings
18	437	9/22/00 11:25	<LOD	12,595	<LOD	832	<LOD	2,560	4,749	Salt Tailings
19	438	9/22/00 11:26	<LOD	797	<LOD	<LOD	<LOD	28,288	204	Gray Rock
20	439	9/22/00 11:28	112	532	94	3,069	<LOD	61,594	<LOD	Mill Site
21	440	9/22/00 11:29	123	1,789	170	<LOD	<LOD	67,584	409	Mill Site
70	489	9/22/00 15:59	49	481	64	<LOD	<LOD	17,997	132	8" Deep, Top of Tailings
Upper Poorman										
22	441	9/22/00 11:40	NA	NA	NA	NA	NA	NA	NA	Calibration
23	442	9/22/00 11:41	612	3,478	5,418	9,818	72	34,790	6,688	NIST High

Table 2. XRF Analytical Results, Balm Creek - Poorman Mine Site, OR (mg/kg)

No	XLN	Date/Time	Arsenic	Copper	Lead	Manganese	Mercury	Iron	Zinc	Remarks
24	443	9/22/00 11:42	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	Blank
25	444	9/22/00 12:13	<LOD	<LOD	<LOD	<LOD	<LOD	36,582	207	Creek Bank
26	445	9/22/00 12:14	<LOD	1,030	<LOD	<LOD	<LOD	87,859	3,200	Creek Bank
27	446	9/22/00 12:16	<LOD	349	<LOD	<LOD	<LOD	49,690	140	Creek Bank
28	447	9/22/00 12:18	325	<LOD	290	<LOD	<LOD	73,267	446	Course Tailings
29	448	9/22/00 12:20	320	336	1,320	<LOD	<LOD	60,365	331	Yellow/Gray Tailings
30	449	9/22/00 12:22	240	527	2,909	<LOD	<LOD	41,882	2,029	White/Gray Tailings
31	450	9/22/00 12:24	341	271	1,620	<LOD	<LOD	57,856	492	3" Below Surface
32	451	9/22/00 12:25	315	<LOD	1,280	<LOD	<LOD	51,686	607	Yellow Tailings
33	452	9/22/00 12:27	103	<LOD	424	<LOD	<LOD	53,760	586	Brown Tailings
34	453	9/22/00 12:28	85	625	<LOD	<LOD	<LOD	63,590	1,440	Brown Tailings
35	454	9/22/00 12:31	360	<LOD	2,139	3,149	<LOD	30,899	2,370	White Tailings

Table 2. XRF Analytical Results, Balm Creek - Poorman Mine Site, OR (mg/kg)

No	XLN	Date/Time	Arsenic	Copper	Lead	Manganese	Mercury	Iron	Zinc	Remarks
36	455	9/22/00 12:33	<LOD	<LOD	<LOD	<LOD	<LOD	2,669	<LOD	White ???
37	456	9/22/00 12:34	<LOD	406	<LOD	5,309	<LOD	85,965	784	Red/Yellow Pile
38	457	9/22/00 12:35	232	<LOD	540	<LOD	<LOD	65,280	1,110	Red/Yellow Pile
69	488	9/22/00 15:37	<LOD	<LOD	<LOD	<LOD	<LOD	2,410	235	Pipe Contents (Concrete
Lower Poorman										
39	458	9/22/00 12:44	92	218	<LOD	<LOD	<LOD	47,590	141	Side of Bank
40	459	9/22/00 12:45	85	261	<LOD	<LOD	<LOD	54,067	<LOD	Side of Bank
41	460	9/22/00 12:45	101	212	<LOD	<LOD	<LOD	45,389	207	1' Below Ground
42	461	9/22/00 12:46	<LOD	<LOD	120	<LOD	<LOD	58,368	258	Yellow/Brown
43	462	9/22/00 12:48	<LOD	<LOD	<LOD	2,400	<LOD	28,979	146	Side of Bank
44	463	9/22/00 12:51	<LOD	<LOD	61	<LOD	<LOD	15,488	127	Adit
45	464	9/22/00 12:52	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	Side of Bank
46	465	9/22/00 12:54	<LOD	<LOD	589	<LOD	<LOD	30,694	<LOD	Side of Bank

Table 2. XRF Analytical Results, Balm Creek - Poorman Mine Site, OR (mg/kg)

No	XLN	Date/Time	Arsenic	Copper	Lead	Manganese	Mercury	Iron	Zinc	Remarks
47	466	9/22/00 12:54	<LOD	<LOD	131	<LOD	<LOD	76,186	<LOD	Assay Vials ?
48	467	9/22/00 12:55	<LOD	2,379	1,760	<LOD	<LOD	63,488	544	Assay Vials ?
49	468	9/22/00 12:55	<LOD	2,299	23,898	<LOD	<LOD	96,256	464	Assay Vials ?
50	469	9/22/00 12:56	<LOD	524	2,059	<LOD	<LOD	120,934	365	Assay Vials ?
51	470	9/22/00 12:58	<LOD	<LOD	372	<LOD	<LOD	13,990	122	Side of Bank, 1' Deep
52	471	9/22/00 13:02	91	279	230	<LOD	<LOD	96,563	<LOD	Side of Bank
Tailings Deposit, Above Pond within ACEC										
54	473	9/22/00 13:17	93	1,630	62	<LOD	<LOD	22,400	420	Tailings
55	474	9/22/00 13:18	127	652	85	<LOD	<LOD	30,387	148	Tailings
56	475	9/22/00 13:19	101	392	<LOD	<LOD	<LOD	25,395	<LOD	Tailings
57	476	9/22/00 13:22	<LOD	<LOD	<LOD	<LOD	<LOD	21,888	219	Near Creek
Pond										
58	477	9/22/00 13:31	41	<LOD	<LOD	<LOD	<LOD	12,698	<LOD	Bank of Stream

Table 2. XRF Analytical Results, Balm Creek - Poorman Mine Site, OR (mg/kg)

No	XLN	Date/Time	Arsenic	Copper	Lead	Manganese	Mercury	Iron	Zinc	Remarks
59	478	9/22/00 13:33	<LOD	<LOD	<LOD	2,130	<LOD	15,898	228	Bank of Pond
60	479	9/22/00 13:33	<LOD	347	<LOD	<LOD	<LOD	29,491	316	Bank of Pond
61	480	9/22/00 13:37	38	<LOD	<LOD	<LOD	<LOD	10,400	<LOD	Near Pond
62	481	9/22/00 13:38	<LOD	<LOD	<LOD	<LOD	<LOD	899	96	Near Pond
63	482	9/22/00 13:39	<LOD	290	<LOD	<LOD	<LOD	8,685	<LOD	Near Pond
64	483	9/22/00 13:41	<LOD	120,934	<LOD	1,510	<LOD	29,594	16,896	Inlet Pond
65	484	9/22/00 13:44	40	2,720	<LOD	<LOD	<LOD	12,096	299	Clay
66	485	9/22/00 13:47	<LOD	131,994	<LOD	<LOD	<LOD	22,400	9,606	Confluence Creek/Pond
67	486	9/22/00 13:49	<LOD	2,299	<LOD	<LOD	<LOD	8,608	1,150	Stream Bank

XLN - Location

LOD - Less than detection

Table 3. Total Metals Analytical Results (mg/kg or ppm), Poorman Balm Mine, OR

Analyte	A WR-SPLP	B WR-SPLP	C SPLP-1	C SPLP-2	Pond-Tails SPLP-1	Pond-Tails SPLP-2
Aluminum	33000	14000	15000	3800	2900	8500
Antimony	11	ND	ND	ND	3.4	4.1
Arsenic	210	47	59	44	51	60
Barium	1900	350	2000	1900	1600	1100
Beryllium	0.5	0.25	0.22	0.051	0.051	0.17
Boron	ND	ND	4.8	3.1	2.8	6.2
Cadmium	6	0.28	4.7	0.47	0.40	0.80
Calcium	5200	70	990	220	23	1500
Chromium	86	2.4	4.9	5.5	2.1	6.1
Cobalt	11	1.2	25	0.99	ND	8.7
Copper	580	500	12000	170	97	4200
Iron	1600	12000	24000	17000	19000	39000
Lead	600	23	38	25	21	35
Lithium	11	4.5	4.0	0.69	0.47	1.8
Magnesium	35000	8500	7900	2000	1200	3800
Manganese	1200	250	350	78	43	150
Mercury	2.6	1.1	ND	ND	ND	ND
Molybdenum	25	19	39	42	36	35
Nickel	34	ND	ND	ND	ND	ND
Potassium	1500	2900	2000	920	830	1600
Selenium	13	8.6	ND	ND	ND	7.6
Silver	18	1.5	4.0	2.3	2.3	3.2
Sodium	160	110	ND	ND	ND	ND
Strontium	24	9.6	24	23	19	19
Thallium	ND	2.8	ND	ND	ND	ND
Tin	4	4.5	6.5	7.2	7.3	12
Titanium	490	5.5	7.1	4.8	4.6	18
Vanadium	85	53	9.2	5.9	1.8	17
Zinc	1000	95	910	46	16	190

ND - Non-detect

Table 4. Leachable Metals Analytical Results, Poorman / Balm Creek Mine, OR (mg/L)

Analyte	A WR-SPL P	B WR-SPL P	C SPLP- 1	C SPLP-2	P-Tails- SPLP-1	P-Tails- SPLP-2
Arsenic	ND	ND	ND	ND	ND	ND
Barium	0.053	0.11	0.14	0.061	0.15	ND
Cadmium	ND	ND	0.12	ND	ND	ND
Chromium	0.44	ND	ND	ND	ND	ND
Copper	ND	0.54	71	1.3	ND	5.8
Lead	ND	ND	ND	ND	ND	ND
Mercury	0.0003	ND	ND	ND	ND	0.00027
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Zinc	1.7	0.13	24	0.83	ND	0.97
Cyanide, Weak Acid Dissociable	ND	ND	ND	ND	ND	ND

ND- Non-detect

Table 5. Acid Base Accounting Results, (tons CaCO₃/kiloton)

Analyte	A WR-SPLP	B WR-SPLP	C SPLP-1	C SPLP-2	P-Tails- SPLP-1	P-Tails- SPLP-2
Acid Generation Potential	32	42	96	6	9	17
Acid Neutralization Potential	5	0	0	1	0	0
Acid Base Potential	-27	-42	-96	-5	-9	-17

Table 6. Surface Water Analytical Results, Poorman Balm Site, OR (mg/L)

	Balm Creek	Pond	Down-stream Site	Lower Poorman Adit	Decant Pipe	Head Frame	Above Upper Poorman	Upper Poorman Seep	D/S Lower Poorman	Main Site Puddle	Oregon WQC
Date	9/22/00	9/22/00	9/22/00	9/22/00	4/18/01	4/18/01	4/18/01	4/18/01	4/18/01	4/18/01	
Antimony	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	1.6
Arsenic	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.19
Cadmium	<0.0005	<0.000	<0.000	<0.0005	0.0083	<0.000	<0.0005	<0.005	<0.005	0.013	0.001
Copper	<0.002	0.008	0.007	<0.002	2.24	0.54	0.027	<0.002	0.034	7.96	0.012
Lead	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.003
Mercury	<0.0002	<0.000	<0.000	<0.0002	<0.0002	<0.000	<0.0002	<0.0002	<0.0002	<0.0002	0.00001
Nickel	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.16
Selenium	<0.005	<0.005	<0.005	<0.005	0.017	<0.005	<0.005	<0.005	<0.005	<0.005	0.035
Silver	<0.001	<0.001	<0.001	0.004	0.001	<0.001	<0.001	<0.001	0.004	0.003	0.0001
Thallium	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.04
Zinc	<0.005	0.009	0.008	0.023	1.4	0.366	0.005	0.077	0.034	2.28	0.11
Nitrate	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
Alkalinity	52.3	34.1	38.8	12.1	NA	NA	NA	NA	NA	NA	
Chloride	<1	<1	<1	1	NA	NA	NA	NA	NA	NA	
Conductivit	57.6	151	76.8	1170	NA	NA	NA	NA	NA	NA	
Cyanide-	<0.01	<0.01	<0.01	<0.01	NA	NA	NA	NA	NA	NA	
Cyanide-	<0.005	<0.005	<0.005	<0.005	NA	NA	NA	NA	NA	NA	
Sulfate	1	54	7	700	NA	NA	NA	NA	NA	NA	
pH	7.8	7.2	7.7	5.7	6.2	6.1	7.2	7.3	7.1	3.34	

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Poorman / Balm Creek Mine Site

Table 7. Geotechnical Results for Proposed Repository Site

Sample Test Pit/ Soil Horizon	Soil Texture Class	Permeability (cm/sec)	Max. Dry Density (lbs/ft ³)	Optimum % Moisture	Liquid Limit	Pl
TP 1 Zone C	Sandy lean clay (CL)	7.49×10^{-7}	105.5	17.7	28.2	
TP 3 Top Soil	Sandy lean clay (SC)		103.9	17.2	32.8	
TP 3 Zone C	Clayey sand w/ gravel (SC)	2.76×10^{-7}	103.8	17.4	39.4	
TP 4 Clay - Zone C	Poorly-graded gravel w/clay and sand (GP-GC)	6.85×10^{-5}	109.6	17.4	28.6	
TP 6 Top Soil	Clayey sand (SC)		106.3	16.6	36.2	

Table 8. Borrow Material Geotechnical Laboratory Results

Sample	Soil Texture Class	Permeability cm/sec	Max. Dry Density lbs/ft ³	Direct Shear	Proctor Optimum Moisture %
Tailings Pond, Site C	Silty Sand (ML)	1.6E6-	101.9	See Appendix	19.9
West Slope Holding pond	Silty Sand (SM)	1.8E7-	NA		
Center Pit, S. end above creek xing		1.2E6-	NA		
Blend 0-2'	Silty Sand (ML)	NA	NA		
Blend 2-4'		NA	NA		
Borrow Area West of Site C Topsoil (TP-3)	Silty Sand		111.3		14.0
Borrow Area West of Site C 11.5'(TP-3)	Sandy Clay		99.5		22.1
Barrow Area West of Site C 2'-5' (TP-2)	Sandy Clay		99.3		22.9
Barrow Area West of Site C Topsoil (TP-2)	Sandy Silt		105.0		21.4

Table 9. Borrow Soils Agronomic Results

Analyte / Units	W. Drainage Borrow	S. End Borrow Area	Repository
Paste pH*	7.6	7.4	7.7
EC (mmhos/cm)*	0.4	0.5	0.5
Lime Estimate	Low	Low	Low
% Organic Matter*	0.7	2.4	1.1
NO ₃ -N ppm	1.7	5.6	3.2
Phosphorus ppm	1	14.4	7.4
Potassium ppm	135	720	199
Zinc ppm	0.61	1.52	1.38
Iron ppm	5.1	11.7	10.6
Manganese ppm	0.82	2.11	1.31
Copper ppm	1.32	1.57	1.8
Texture	Clay Loam	Loam	Loam
Calcium meq/L	1.4	1.9	1.8
Magnesium meq/L	0.8	1	1.4
Sodium meq/L	2.2	1.2	1.7
Potassium meq/L	<0.1	0.7	0.1
SAR*	2.1	1	1.4

*Soils are rated as good if they contain pH 6-8, EC <3, % organic matter >1, SAR<4 (BLM, 1992).

Table 10. Summary of HELP Model Analysis

Trial Description	Modeled Layer Configuration	Annual Average Percolation (inches/year)
2 Layer Cap	2 ft native soil material 0.5 ft capillary barrier (geonet) 15ft tailings/waste rock	<0.15

**Table 11. Comparison of Analytical Results and Risk Management Criteria
Tailings Results (mg/kg or ppm) and Surface Water (ug/l)**

ANALYTE	C-SPLP-1	Wildlife RMC median	Leaching RMC	Camper RMC
<i>Antimony</i>	ND		NA	50
<i>Arsenic</i>	59	275	NA	20
<i>Cadmium</i>	4.7+	3	NA	70
<i>Copper</i>	12000++	136	322	5000
<i>Lead</i>	38	125	NA	1000
<i>Manganese</i>	350	NA	NA	NA
<i>Mercury</i>	ND	8	NA	40
<i>Nickel</i>	ND	NA	NA	2700
<i>Selenium</i>	ND	NA	NA	700
<i>Silver</i>	4	NA	NA	700
<i>Zinc</i>	910+	307	527	40000
<i>Dissolved Metals - Surface Water (µg/l)</i>				
ANALYTE	Main Site Puddle (9/00)		Oregon WQC	
<i>Arsenic</i>	ND		190	
<i>Cadmium*</i>	13++		1.1	
<i>Copper*</i>	7960+++		12	
<i>Cyanide-</i>	ND		5	
<i>Lead*</i>	ND		3	
<i>Manganese</i>	ND		50	
<i>Mercury</i>	ND		.01	
<i>Nickel*</i>	ND		160	
<i>Selenium</i>	ND		35	
<i>Silver*</i>	3++		0.12	
<i>Zinc*</i>	2280++		110	

NA indicates not analyzed or not available. ND indicates not detected.

