

Analytical Results from Laboratory (15th. round, 7/July)

1. Quality of Water

Sample	pH	SS mg/L	As μg/L	Sb μg/L	Cd mg/L	Cu mg/L	Cr mg/L	Fe mg/L	Hg μg/L	Mn mg/L	Pb mg/L	Zn mg/L	CN mg/L	COD mg/L
No. 1	8,5	4	6,27	0,15	0,06	0,02	<0,005	0,25	0,69	0,19	0,29	0,29	<0,001	19
No. 2	2,6	1440	7170	0,72	13,0	91,0	0,17	2011	1,55	13,7	0,42	1006	0,001	127
No. 3	2,8	340	5,06	0,59	2,20	7,00	0,12	330	0,65	33,7	0,42	196	0,001	35
No. 4	3,6	19600	1090	0,22	1,90	19,0	0,03	347	0,73	6,55	5,63	452	0,035	150
No. 5	12,2	218000	393	0,23	0,05	2,50	<0,005	0,09	2,52	0,07	0,41	1,90	0,029	119
No. 6	10,9	177000	93,2	0,56	0,04	1,20	0,007	0,15	0,91	0,08	0,34	1,60	0,005	115
No. 7	-	-	-	-	-	-	-	-	-	-	-	-	-	-
No. 8	8,4	380	3,59	0,23	0,02	0,08	<0,005	<0,01	0,64	0,23	0,18	0,22	0,001	123
No. 9	-	-	-	-	-	-	-	-	-	-	-	-	-	-
No. 10	8,7	3540	10,4	0,21	0,03	0,10	<0,005	<0,01	0,77	0,21	0,39	0,56	0,001	89
No. 11	10,4	78600	37,3	0,42	0,05	0,69	<0,005	0,60	1,22	0,1	0,33	0,42	0,001	69
No. 12	10,3	47700	77,6	0,83	0,05	0,66	<0,005	0,10	1,15	0,16	0,29	10,4	0,041	69
No. 13	2,6	160	112	0,50	0,47	14,3	0,05	216	1,43	34,6	0,28	116	0,001	39
No. 14	6,7	18	0,16	0,39	0,18	0,03	<0,005	0,04	0,26	0,64	0,26	125	<0,001	8
No. 15	7,9	3600	9,23	0,74	0,07	0,10	<0,005	0,06	0,65	4,02	0,36	3,20	0,051	62
No. 16	8,2	130	1,09	0,37	0,01	0,00	<0,005	0,29	0,74	0,07	0,28	0,10	0,001	4
No. 17	7,6	6190	8,83	0,61	0,06	0,03	<0,005	0,07	0,92	1,22	0,34	5,00	<0,001	15
No. 18	8,1	7230	81,57	0,65	0,02	0,03	<0,005	0,06	0,21	1,30	0,35	0,50	0,001	15
No. 19	8,1	210	3,16	0,29	0,01	<0,003	<0,005	0,01	0,23	0,15	0,29	0,12	<0,001	4
No. 20	6,2	190	8,38	0,57	0,37	0,01	<0,005	156	0,91	5,21	0,29	106	<0,001	27
No. 21	8,2	100	2,95	0,42	0,02	<0,003	<0,005	0,02	0,31	0,36	0,31	0,13	<0,001	8
No. 22	8,2	6060	22,2	0,73	0,03	0,04	<0,005	0,28	0,09	0,43	0,40	0,73	<0,001	12
No. 23	8,8	100	0,79	0,42	0,02	<0,003	<0,005	0,23	0,39	0,17	0,38	0,04	<0,001	15
No. 24	2,8	380	71,7	0,57	2,30	5,90	0,05	217	0,67	30,5	0,33	734	0,001	23
No. 25	8,5	720	8,65	0,51	0,02	0,01	<0,005	0,11	0,43	0,19	0,44	0,09	<0,001	27

Analytical Results from Laboratory (15th. round, 7/July)

2. Analysis of SS

	(SS) (mg/L)	Ag ppm	As ppm	Sb ppb	Cd ppm	Cu ppm	Cr ppm	Fe ppm	Hg ppb	Mn ppm	Pb ppm	Zn ppm	CN ppm	Sn ppm	S ppm	Ig.Loss %
No. 4	19600	93.9	278	364	35.9	369	17.7	135000	1450	61.0	1940	9590	0.0	3840	121500	9.35
No. 5	218000	112	342	365	45.9	392	17.1	56100	1420	294	2970	9990	0.5	2680	74000	5.35
No. 6	177000	65.0	260	364	54.0	522	16.6	71400	1470	327	2910	11600	0.0	3350	70600	5.05
No.11	78600	77.9	365	346	51.0	366	10.4	72000	1020	500	3080	11200	0.0	2580	67600	4.77
No.12	47700	59.9	327	298	55.0	331	14.4	67000	1420	482	2440	14800	0.5	2390	82800	4.78
No.15	3600	96.0	362	483	54.0	323	16.0	83100	1090	505	3720	13200	1.0	3360	92500	6.97
No.17	6190	97.0	390	478	55.0	410	17.1	105300	1220	494	4350	13600	1.0	3540	104500	7.4

Analytical Results from Laboratory (15th. round, 7/July)

3. Quality of Sediment

Sample	Ag ppm	As ppm	Sb ppb	Cd ppm	Cu ppm	Cr ppm	Fe ppm	Hg ppb	Mn ppm	Pb ppm	Zn ppm	CN ppm	Sn ppm	S ppm	Ig.Loss %
No. 2	377	90.6	157	20.0	97.9	13.3	73600	553	1420	3400	2800	0.5	3830	21500	3.66
No. 3															
No. 4	288	564	765	60.0	502	12.8	279000	1170	79.0	3770	28400	0.0	6710	293000	16.5
No. 5	207	758	1560	136	622	22.4	332000	1500	472	7610	30600	2.0	7660	250000	20.0
No. 6	165	616	1100	107	464	17.9	300000	1330	427	5410	31600	0.0	5270	270000	16.0
No. 8	6.0	49.5	30.1	8.0	25.0	17.5	30700	395	253	1250	511	0.0	1440	6670	2.07
No.10	91.0	154	457	47.0	30.9	14.4	73700	582	35.0	4520	14800	0.0	3630	59600	5.09
No.11	141	578	1520	123	534	10.60	12700	1560	908	6580	33200	0.5	5750	256000	20.0
No.12	105	505	634	75.0	91.9	10.9	16200	1060	710	3690	19900	0.0	4310	204000	11.7
No.13															
No.14															
No.15	109	406	350	49.0	208	9.4	133000	1410	696	3440	14000	0.0	3370	142000	5.10
No.16	10.0	51.4	31.4	6.0	21.9	15.9	26300	504	424	76.7	144	0.0	957	6150	1.62
No.17	75.0	340	247	36.0	236	11.0	91500	664	415	2660	8800	0.0	3660	96800	5.83
No.18	11.5	443	400	50.0	262	5.02	155000	694	607	3420	12400	0.0	4790	162000	9.31
No.19	2.0	16.0	23.0	6.0	24.0	11.5	16700	71.3	168	2430	106	0.0	1440	6730	0.60
No.20	22.0	40.6	134	16.0	54.0	13.5	122000	5540	141	2370	2800	0.0	1920	20700	6.47
No.21															
No.22	100.0	575	837	78.0	474	9.71	244000	1330	790	3100	21600	0.0	5750	210000	15.6
No.23															
No.24	20.0	157	116.0	20.0	132	11.5	52000	367	137	572	2980	0.0	960	26900	9.06
No.25	38.0	221	163	30.0	160.0	12.1	50600	331	420	3360	7200	0.0	2400	47900	5.52

Analytical Results from Laboratory (16th. round, 11/Aug.)

1. Quality of Water

Sample	pH	SS μg/L	As μg/L	Sb μg/L	Cd mg/L	Cu mg/L	Cr mg/L	Fe mg/L	Hg μg/L	Mn mg/L	Pb mg/L	Zn mg/L	CN mg/L	COD mg/L
No. 1	8.0	81	4.45	0.45	0.002	0.02		0.25	1.32	0.12	0.09	0.26		2
No. 2	2.2	142	5.120	2.49	16.0	258		3.767	4.66	19.1	0.71	1.540		115
No. 3	3.0	217	73.5	1.12	1.80	5.30		297	0.77	35.8	0.38	176		30
No. 4	4.2	39.000	268	0.99	1.90	1.50		343	0.91	14.9	3.73	216		166
No. 5	11.9	61.800	107	0.82	0.03	3.00		0.02	1.72	0.02	0.26	0.24		62
No. 6	11.3	26.400	116	0.67	0.04	2.70		0.04	0.65	0.03	0.36	0.12		89
No. 7														
No. 8	8.8	776	4.29	0.71	0.01	0.01		0.36	0.51	0.21	0.05	0.17		115
No. 9														
No. 10	8.4	527	3.81	0.34	0.02	0.01		0.28	0.57	0.26	0.12	0.14		92
No. 11	9.3	76.700	11.9	1.45	0.08	0.63		0.10	0.82	0.49	0.20	0.30		74
No. 12	9.1	65.500	9.16	1.24	0.07	0.50		0.11	0.53	0.67	0.13	0.41		60
No. 13	2.6	68	160	1.10	0.60	17.80		247	0.85	44.50	0.25	140		15
No. 14	7.2	62	0.70	1.09	0.11	0.01		0.06	0.46	1.10	0.19	20.0		4
No. 15	7.6	57.600	6.62	1.29	0.07	0.12		0.05	0.44	4.85	0.27	3.96		89
No. 16	8.3	170	0.69	0.86	0.002	0.003		0.07	0.50	0.04	0.01	0.02		17
No. 17	7.9	11.500	12.7	0.34	0.01	0.06		0.04	0.52	1.47	0.17	1.07		62
No. 18	8.1	9.220	19.3	0.24	0.02	0.03		0.09	0.38	1.53	0.20	0.55		17
No. 19	8.4	119	1.26	0.04	0.05	0.003		0.43	0.74	0.01	0.04	0.01		64
No. 20	6.4	72	41.4	0.49	0.46	0.02		216	0.69	7.75	0.16	270		40
No. 21	8.2	46	1.29	0.27	0.02	0.003		0.02	0.39	0.04	0.06	0.24		6
No. 22	8.0	9.550	17.8	0.42	0.07	0.04		0.08	0.43	1.40	0.15	0.67		23
No. 23	8.8	36	0.98	0.18	0.01	0.01		0.02	0.48	0.01	0.07	0.08		11
No. 24	3.9	7.280	1.13	18.9	0.85	0.54		0.39	0.48	1.11	0.24	166		13
No. 25	8.6	751	7.22	0.16	0.01	0.02		0.01	0.43	0.19	0.11	0.16		8

Analytical Results from Laboratory (16th. round, 11/Aug.)

2. Analysis of SS

	(SS) (mg/L)	Ag ppm	As ppm	Sb ppb	Cd ppm	Cu ppm	Cr ppm	Fe ppm	Hg ppb	Mn ppm	Pb ppm	Zn ppm	CN ppm	Sn ppm	S ppm	Ig.Loss %
No. 4	39.000	144	301	361	46.0	489		92300	283	54.1	2130	12600		3830	91500	7.23
No. 5	61.800	142	281	333	106	334		121000	137	510	1840	17800		4310	114000	7.26
No. 6	26.400	138	295	435	60.0	424		67900	1180	337	3240	12400		4310	80300	5.72
No.11	76.700	120.0	328	545	64.0	310		90700	1360	513	6160	15800		2880	68600	6.03
No.12	65500	110.0	332	456	56.0	272		103000	1390	1360	5380	15400		3840	92700	6.07
No.15	57600	117.0	339	494	50.0	306		97800	1700	1230	4170	14600		3350	64100	6.7
No.17	11500	116	273	455	62.0	312		88800	2130	846	3640	14600		3350	78000	6.65
No.18	9220	100	316	422	48.0	332		84200	1850	1270	5370	13400		2870	79900	5.25

Analytical Results from Laboratory (16th. round, 11/Aug.)

3. Quality of Sediment

Sample	Ag ppm	As ppm	Sb ppb	Cd ppm	Cu ppm	Cr ppm	Fe ppm	Hg ppb	Mn ppm	Pb ppm	Zn ppm	CN ppm	Sn ppm	S ppm	Ig.Loss %
No. 2	138	126	263	28.0	266		56500	1100	104	951	7800		2880	26300	6.14
No. 3															
No. 4	216	866	994	132	572		276000	1240	68.5	4360	40800		8150	327000	18.0
No. 5	310	1260	1570	124	713		269000	1740	615	9430	36400		7670	314000	16.6
No. 6	208	1010	1100	154	642.0		265000	1660	1290	3890	43800		6230	297000	16.6
No. 8	14.0	274	978	2.0	50		31100	1250	245	215	1340		1920	9110	6.6
No. 10	138	280	108	112	116		146000	1510	61.4	6660	36800		6700	169000	9.62
No. 11	172	796	1100	90	362		279000	1800	1060	6150	31200		6700	217000	16.2
No. 12	130	658	775	100	342		179000	1160	2530	3620	32000		4320	172000	10.8
No. 13															
No. 14															
No. 15	154	611	654	61.9	246		170000	861	2070	3070	24800		4310	168000	10.8
No. 16	6.0	11.3	16.3	0.0	24.0		30000	149	411	36.0	176		1440	5700	2.06
No. 17	140	1360	1120	67.9	336		333000	1330	1370	11700	25200		7670	343000	21.4
No. 18	70.0	592	346	30.0	172		85200	638	2330	1240	11400		3360	78300	6.06
No. 19	2.0	69.7	13.1	0.0	20.0		17200	769	196	20.8	136		1920	6230	1.13
No. 20	18.0	139	169	8.0	43.9		283400	1700	117	226	2650		1340	35700	9.00
No. 21															
No. 22	146	642	653	66.0	320		165000	940	3030	574	24000		4310	187000	10.4
No. 23															
No. 24	73.9	268	190	0.0	85.9		68500	342	216	461	1920		956	19000	9.27
No. 25	68.0	404	314	26.0	178		74500	659	554	1160	10200		3630	58700	4.42

Analytical Results from Laboratory (17th. round, 8/Sep.)

1. Quality of Water

Sample	pH	SS mg/L	As μ g/L	Sb μ g/L	Cd mg/L	Cu mg/L	Cr mg/L	Fe mg/L	Hg μ g/L	Mn mg/L	Pb mg/L	Zn mg/L	CN mg/L	COD mg/L
No.1	8,5	121	9,0	0,28	<0,002	0,02		0,15	0,63	0,19	0,29	0,14		12
No.2	2,4	2050	2800	1,74	22,0	1,36		3220	5,74	28,0	0,88	3600		235
No.3	2,8	357	200	0,64	2,0	6,90		334	0,60	47,2	0,59	198		33
No.4	6,1	244000	231	0,65	0,27	0,02		179	0,31	24,2	0,89	235		144
No.5	11,7	124000	136	0,50	0,01	0,95		0,06	1,09	0,06	0,57	0,22		309
No.6	9,6	170000	23,6	0,58	0,02	0,51		0,07	0,40	0,37	0,29	0,13		165
No.7														
No.8	8,3	808	12,1	0,10	0,01	0,01		0,26	0,27	0,29	0,27	0,11		86
No.9														
No.10	8,8	2930	205	0,97	0,01	0,46		0,24	0,57	0,14	0,37	0,13		103
No.11	10,0	183000	165	0,72	0,02	0,44		0,07	0,37	0,07	0,32	0,09		111
No.12	10,2	64600	166	0,95	0,02	0,51		0,04	0,48	0,04	0,29	0,09		65
No.13	2,6	687	407	0,49	0,72	26,0		277	0,33	55,5	0,37	170		37
No.14	7,6	216	124	0,49	0,04	0,01		0,02	0,24	1,21	0,29	110		4
No.15	8,9	62800	7,3	0,82	<0,002	0,23		0,03	3,26	1,07	0,38	0,2		53
No.16	8,6	68	0,3	0,20	<0,002	0,02		0,07	<0,10	0,02	0,22	0,03		4
No.17	7,5	12800	6,5	0,56	0,06	0,10		0,04	0,96	1,54	0,27	120		8
No.18	8,1	8010	26,6	0,48	0,01	0,04		0,06	0,95	1,43	0,32	0,60		8
No.19	8,4	123	1,6	0,35	<0,002	0,01		0,30	<0,10	0,03	0,17	0,05		4
No.20	7,1	110	1,1	0,31	0,03	0,04		0,15	0,49	0,81	0,14	4,90		20
No.21	7,5	81	<0,1	0,28	0,01	0,03		<0,003	0,13	0,04	0,02	0,32		8
No.22	8,0	7850	19,5	0,58	0,02	0,04		0,04	0,54	1,59	0,34	1,06		14
No.23	8,6	77	<0,1	0,25	0,01	0,04		0,01	<0,10	0,01	0,02	0,06		8
No.24	2,8	8270	11,1	0,47	1,90	2,70		55,2	0,15	0,48	0,39	370		4
No.25	8,4	653	1,1	0,31	0,02	0,06		0,02	0,49	0,81	0,14	0,11		12

Analytical Results from Laboratory (17th. round, 8/Sep.)

2. Analysis of SS

	(SS) (mg/L)	Ag ppm	As ppm	Sb ppb	Cd ppm	Cu ppm	Cr ppm	Fe ppm	Hg ppb	Mn ppm	Pb ppm	Zn ppm	CN ppm	Sn ppm	S ppm	Ig.Loss %
No. 4	244000	126	479	800	154,0	448		68400	987	79.1	6720	38400		3350	84800	4,62
No. 5	124000	47,9	514	419	39,9	358		61800	780	138	762	11400		3830	60500	4,89
No. 6	170000	96,0	576	695	116,0	486		60700	2120	151	1930	30800		3830	69800	4,87
No.11	183000	100	556	588	69,9	712		67300	4330	589	3670	13800		2400	62000	7,03
No.12	64600	78,0	433	528	58,0	534		64000	1280	495	3400	13000		2870	59100	4,84
No.15	62800	87,9	1050	610	49,9	379		111000	1800	499	6690	11800		2870	108000	7,61
No.17	12800															

Analytical Results from Laboratory (17th. round, 8/Sep.)

3. Quality of Sediment

Sample	Ag ppm	As ppm	Sb ppb	Cd ppm	Cu ppm	Cr ppm	Fe ppm	Hg ppb	Mn ppm	Pb ppm	Zn ppm	CN ppm	Sn ppm	S ppm	Ig.Loss %
No. 2	76.0	204	302	20.0	182		65700	1720	164	923	4600		1920	20300	6.41
No. 3															
No. 4	424	1180	2270	196	922		324300	2530	126	5520	54500		5270	355000	20.20
No. 5	102	46.4	606	44.0	296		143900	3460	152	1260	12600		3350	153000	9.37
No. 6	138	513	787	130	364		119100	1670	120	1460	38000		1440	133000	7.53
No. 8	2.0	46.5	121	4.0	20.0		28700	1170	244	79.8	560		1440	6980	1.43
No.10	814	965	2510	26.0	2260		430700	3460	23.6	1680	1020		3830	272000	27.1
No.11	266	1130	1410	150	630		277700	2400	2400	5500	45000		2870	284000	16.6
No.12	174	1130	1140	90.0	500		236700	2830	2440	7990	26800		4790	247000	14.8
No.13															
No.14															
No.15	88.0	826	698	64.0	282		151700	1900	2970	3590	17200		3830	153000	9.38
No.16															
No.17	148	1260	1150	63.9	498		319100	2310	2000	4960	16800		9000	305000	20.9
No.18	196	1040	838	53.9	12.0		237900	2060	1130	2340	14000		7190	241000	15.5
No.19	0.0	3.51	116	8.0	44.0		13800	452	141	24.1	80		1470	7240	0.15
No.20	2.0	74.8	135	14.0	248		52400	1290	264	104	1660		958	13100	1.59
No.21															
No.22	57.9	704	482	41.9	56.0		109300	2560	1470	1360	11000		3830	111000	7.03
No.23															
No.24	18.0	482	188.0	14.0	148		91100	1350	185	250	1540		1440	17200	8.54
No.25	30.0	188	285	30.0	352		67300	1920	516	840	7200		2400	58000	3.76

Analytical Results from Laboratory (18th. round, 6/Oct.)

1. Quality of Water

Sample	pH	SS mg/L	As μg/L	Sb μg/L	Cd mg/L	Cu mg/L	Cr mg/L	Fe mg/L	Hg μg/L	Mn mg/L	Pb mg/L	Zn mg/L	CN mg/L	COD mg/L
No. 1	8.7	40	5.94	0.28	<0.002	0.01		0.40	1.34	0.25	0.17	0.17		13
No. 2	2.4	2690	5870	1.27	14.0	167		2850	9.29	28.5	0.42	2200		121
No. 3														
No. 4	3.8	15600	87.7	0.70	2.10	22.0		524	2.34	33.3	5.75	532		260
No. 5	11.8	60900	109	0.52	<0.002	7.10		0.25	2.17	0.01	0.21	0.31		292
No. 6	8.1	48400	8.02	0.77	0.23	4.10		2.40	0.26	12.7	0.24	10.2		121
No. 7														
No. 8	8.4	789	3.60	0.24	<0.002	0.01		0.38	0.90	0.44	0.18	0.14		80
No. 9														
No. 10	8.8	867	4.59	0.18	<0.002	<0.003		0.40	2.37	0.42	0.15	0.11		47
No. 11	10.1	115000	62.1	0.81	<0.002	0.80		0.25	8.10	0.08	0.28	0.09		131
No. 12	10.8	88400	59.3	0.63	0.01	0.53		0.30	6.38	0.03	0.29	0.12		121
No. 13														
No. 14	8.0	54	0.93	0.21	0.06	<0.003		0.25	0.30	1.58	0.24	29.0		7
No. 15	9.8	75500	16.8	0.97	0.03	0.25		0.03	4.06	0.12	0.19	0.23		39
No. 16	8.8	142	1.63	0.27	0.03	0.02		0.07	3.15	0.01	0.12	0.10		11
No. 17	8.4	17100	9.70	0.53	0.07	0.08		<0.008	1.99	1.01	0.16	0.46		31
No. 18	8.4	17100	16.9	0.55	0.05	0.04		0.06	0.35	1.09	0.20	0.36		15
No. 19	8.5	114	4.14	0.21	0.03	0.01		0.19	0.21	1.09	0.12	0.11		15
No. 20	8.0	51	15.7	0.68	0.05	0.04		0.33	1.86	1.09	0.24	2.60		27
No. 21														
No. 22	8.3	14100	2.50	0.39	0.04	0.04		0.09	0.19	0.63	0.17	0.40		23
No. 23	8.7	36	0.39	0.33	0.03	0.02		0.03	0.02	0.02	0.20	0.08		2
No. 24	2.6	1940	37.1	0.15	4.20	11.1		469	7.33	59.0	0.27	267		39
No. 25	8.6	824	6.63	0.40	0.03	0.03		0.03	1.13	0.10	0.23	0.12		15

Analytical Results from Laboratory (18th. round, 6/Oct.)

2. Analysis of SS

	2. Analysis of SS														Ig.Loss %	
	(SS) (mg/L)	Ag ppm	As ppm	Sb ppb	Cd ppm	Cu ppm	Cr ppm	Fe ppm	Hg ppb	Mn ppm	Pb ppm	Zn ppm	CN ppm	Sn ppm		S ppm
No. 4	15600	297	99.4	428	78.0	294	84700	878	86.1	2060	22500			2870	83700	6.22
No. 5	60900	321	323	452	44	524	57400	1203	275	3170	10000			3350	58200	4.80
No. 6	48400	220	404	459	56.0	622	61900	1743	294	3230	12400			2870	60800	5.04
No.11	115000	392	485	459	52.0	418	74100	1740	699	4240	10400			3350	72200	5.90
No.12	88400	227	422	463	56.0	488	65800	1485	643	4160	11600			3350	63700	4.88
No.15	75500	102	400	475	62.0	520	58500	1069	602	4940	12400			2870	57600	4.45
No.17	17100	138	418	499	62	630	78000	1960	612	4210	12400			4310	59600	2.93
No.18	17100	249	624	425	54	512	77900	1702	665	3870	11200			4310	31600	5.69

Analytical Results from Laboratory (18th. round, 6/Oct.)

3. Quality of Sediment

Sample	Ag ppm	As ppm	Sb ppb	Cd ppm	Cu ppm	Cr ppm	Fe ppm	Hg ppb	Mn ppm	Pb ppm	Zn ppm	CN ppm	Sn ppm	S ppm	Ig.Loss %
No. 2	46.3	183	287	40.0	444		54800	1280	85	922	6400		1440	31580	13.74
No. 3															
No. 4	160	616	945	158	520		275000	1100	191	2380	45000		5750	279000	15.99
No. 5	104	1370	822	110	472		237000	1300	837	2040	28000		5750	249000	14.11
No. 6	138	1320	865	106	518.0		249000	1350	718	1950	28000		5270	263000	15.38
No. 8	51.2	3.9	86.3	4.0	36		32900	284	363	121	1000		958	9490	8.90
No.10	324	494	1590	36.0	1740		388000	1110	3680	1700	4200		6140	282000	26.15
No.11	75.3	581	520	52.0	204		113000	826	853	1340	13200		3350	116000	7.00
No.12	63.3	859	437	56.0	206		104000	949	878	1110	15600		3630	114000	6.70
No.13															
No.14															
No.15	114	880	765	82.0	368		194000	1220	1100	1760	22500		4310	205000	11.87
No.16															
No.17	87.4	1140	654	52.0	382		202000	1210	812	1530	14400		6230	206000	12.46
No.18	43.9	426	485	42.0	276		117000	981	692	23.9	12400		3830	120000	7.29
No.19	0	8.44	31.0	58.0	12.0		111000	5290	145	46.3	66.0		1440	7300	0.22
No.20															
No.21															
No.22	34.3	627	351	36.0	252		115000	3170	659	1070	9200		3830	112000	7.22
No.23															
No.24	39.1	99.2	224	16.0	120		63500	1610	161	433	3400		2390	22900	8.38
No.25	10.2	314	179	42.0	192		61300	1490	587	871	6800		2870	47500	3.66

Analytical Results from Laboratory (19th. round, 5/Nov.)

1. Quality of Water

Sample	pH	SS mg/L	As μg/L	Sb μg/L	Cd mg/L	Cu mg/L	Cr mg/L	Fe mg/L	Hg μg/L	Mn mg/L	Pb mg/L	Zn mg/L	CN mg/L	COD mg/L
No. 1	8.2	32	5.64	1.33	0.04	0.01		0.12	1.33	0.12	0.06	0.29		20
No. 2	2.4	130	3490	4.35	16.0	150		2150	4.35	30.1	0.28	950		65
No. 3														
No. 4	4.3	8460	602	0.40	1.60	14.7		298	0.40	20.1	0.52	178		335
No. 5	11.7	190000	712	0.92	0.07	2.10		0.03	0.92	0.02	0.22	0.36		159
No. 6	10.7	112000	133	1.69	0.08	2.10		0.04	1.69	0.02	0.19	0.06		184
No. 7														
No. 8	8.3	345	10.4	0.86	0.06	0.02		0.42	0.86	0.37	0.11	0.06		94
No. 9														
No. 10	8.3	9290	20.8	0.97	0.05	0.03		<0.008	0.97	0.34	0.15	0.23		33
No. 11	7.7	207000	54.8	1.14	0.16	0.07		<0.008	1.14	12.8	0.19	6.40		196
No. 12	7.8	37500	20.7	0.57	0.12	0.05		0.06	0.57	5.63	0.21	3.40		94
No. 13	2.8	288	791	0.71	0.89	34.0		753	3.51	69.7	0.19	146		86
No. 14	7.5	35	1.72	0.38	0.21	0.01		0.01	0.44	1.79	0.21	56.0		16
No. 15	6.2	38100	19.0	0.60	0.56	0.02		72.0	0.59	30.5	0.43	120		57
No. 16	8.4	91	0.32	0.40	0.01	<0.003		0.02	0.05	0.05	0.30	0.10		16
No. 17	5.9	22300	21.4	0.57	0.63	0.02		118	0.68	17.0	0.70	126		49
No. 18	7.8	12800	13.6	0.51	0.05	0.03		0.01	1.55	4.67	0.19	3.50		29
No. 19	8.4	197	1.24	0.34	<0.002	0.01		0.18	0.89	0.07	0.13	0.01		12
No. 20	7.4	39	1.83	0.32	0.12	0.03		0.05	0.71	1.44	0.11	13.0		12
No. 21														
No. 22	7.5	7900	20.5	0.45	0.07	0.03		<0.008	1.61	5.23	0.31	7.50		25
No. 23	8.7	53	0.25	0.29	0.05	0.01		0.01	0.15	0.13	0.13	0.08		4
No. 24	4.2	52	0.29	0.53	0.91	0.48		0.12	0.64	26.2	0.35	212		6
No. 25	8.6	321	4.06	0.28	0.04	0.02		0.01	0.20	0.28	0.20	0.07		4

Analytical Results from Laboratory (19th. round, 5/Nov.)

2. Analysis of SS

	(SS) (mg/L)	Ag ppm	As ppm	Sb ppb	Cd ppm	Cu ppm	Cr ppm	Fe ppm	Hg ppb	Mn ppm	Pb ppm	Zn ppm	CN ppm	Sn ppm	S ppm	Ig. Loss %
No. 4	8460	460	270	594	24.0	890		77000	2580	38.8	407	1440		2870	6520	8.11
No. 5	190000	76.0	426	472	42.0	450		61900	2210	217	3850	10600		3350	5870	5.27
No. 6	112000	86.0	428	453	50.0	552		58600	2520	252	4770	11200		3350	5860	5.56
No. 11	207000	80.0	547	409	48.0	314		85800	3070	391	2330	12800		3350	8510	6.76
No. 12	37500	78.0	579	399	50.0	330		88700	2690	511	2450	12800		3350	8340	6.98
No. 15	38100	128	372	670	98.0	720		71300	2640	2520	3070	24400		3830	5300	5.52
No. 17	22300	144	418	775	88.0	1030		73500	3590	3740	5160	21600		4310	4350	6.93
No. 18	12800	108	453	420	76.0	802		58600	4400	1340	6630	19200		3350	3670	6.17

Analytical Results from Laboratory (19th. round, 5/Nov.)

3. Quality of Sediment

Sample	Ag ppm	As ppm	Sb ppb	Cd ppm	Cu ppm	Cr ppm	Fe ppm	Hg ppb	Mn ppm	Pb ppm	Zn ppm	CN ppm	Sn ppm	S ppm	Ig.Loss %
No.2	58.0	110	95.6	18.0	142		47400	1340	105	432	2060		2870	1820	4.67
No.3															
No.4	960	569	1460	96.0	1600		245000	2650	36.3	1680	26200		4310	24800	16.5
No.5	580	2090	2140	212	720		275000	2500	259	1140	66800		6700	26600	17.6
No.6	100	836	426	50.0	332		124000	3370	218	92.8	14800		3350	24400	8.07
No.8	8.0	28.6	79.8	8.0	20.0		34100	356	245	1090	198		1920	280	1.64
No.10	50.0	332	303	44.0	112		76400	2080	169	1090	11600		3830	7180	4.85
No.11	122	903	944	84.0	266		171000	704	564	4370	25600		4790	17400	10.4
No.12	76.0	696	509	50.0	204		134000	940	796	2210	12800		3350	12200	7.76
No.13															
No.14															
No.15	168	760	793	124	462		176000	2220	1400	3430	35600		4310	17400	9.30
No.16	4.0	86.4	57.9	4.0	14.0		26400	232	663	34.5	108		1440	100	1.19
No.17	82.0	472	379	42.0	472		83000	1460	1590	5110	9800		6230	6740	5.77
No.18	70.0	423	387	46.0	250		110000	757	480	947	12800		3350	9250	5.49
No.19	6.0	5.15	46.9	4.0	8.0		9900	1680	116	17.2	106		1440	0	0.08
No.20	6.0	75.7	61.8	14.0	57.9		38500	2010	346	83.8	1400		1910	40	1.25
No.21															
No.22	960	328	531	64.0	686		66400	1580	1200	1680	16200		3350	4400	5.27
No.23															
No.24															
No.25	6.0	64.7	56.5	6.0	30.0		29700	867	387	95.5	760		1440	200	1.07

Analytical Results from Laboratory (20th. round, 17/Nov.)

1. Quality of Water														
Sample	pH	SS mg/L	As µg/L	Sb µg/L	Cd mg/L	Cu mg/L	Cr mg/L	Fe mg/L	Hg µg/L	Mn mg/L	Pb mg/L	Zn mg/L	CN mg/L	COD mg/L
No. 1	7.8	64	4.74	0.17	0.01	0.02		0.50	0.47	0.24	0.36	0.17		16
No. 2	2.5	1570	3640	0.75	12.0	107		1760	5.73	30.3	0.40	1020		82
No. 3														
No. 4	4.2	36400	528	0.48	1.60	12.1		355	0.50	20.5	3.82	390		147
No. 5	11.0	54100	357	0.42	0.02	0.78		0.15	0.69	0.01	0.27	15.0		143
No. 6	6.1	48200	79.9	0.54	0.73	0.11		115	0.20	13.90	0.41	254		131
No. 7														
No. 8	8.4	517	6.40	0.15	<0.002	0.03		0.35	0.26	0.37	0.20	0.15		78
No. 9														
No. 10	8.7	3834	20.8	0.20	<0.002	0.05		0.14	0.37	0.34	0.29	0.23		53
No. 11	6.1	52400	343	0.58	1.40	0.02		121	0.63	37.6	0.69	388		75
No. 12	9.0	54700	769	0.58	0.03	0.07		0.21	0.83	2.07	0.36	0.21		82
No. 13	2.3	159	17.9	0.70	1.01	32.0		632	0.95	69.2	0.40	254		122
No. 14	7.4	46	269	0.32	0.15	<0.003		0.13	0.25	0.94	0.32	43.5		41
No. 15	6.8	10400	0.60	0.46	0.11	0.03		8.40	0.25	9.38	0.33	36.0		47
No. 16	8.0	1030	8.00	0.34	<0.002	0.03		0.05	0.33	0.13	0.33	0.10		20
No. 17	6.9	5850	0.75	0.33	0.08	0.01		2.05	0.22	3.16	0.32	24.00		16
No. 18	7.7	5280	12.0	0.28	0.01	0.03		0.06	0.25	2.14	0.33	0.90		8
No. 19	8.9	630	16.3	0.35	<0.002	0.02		0.36	0.10	0.09	0.33	0.09		8
No. 20	7.3	159	18.4	0.38	0.08	0.02		0.04	0.19	1.73	0.31	9.60		2
No. 21	8.5	1863	2.01	0.37	0.01	0.01		0.21	0.29	0.14	0.45	0.06		14
No. 22	7.6	4070	3.78	0.41	0.02	0.02		0.07	0.20	2.45	0.41	2.90		12
No. 23	8.6	569	0.29	0.46	<0.002	<0.003		0.03	0.18	0.18	0.35	0.05		8
No. 24	4.1	268	1.63	0.37	0.1	0.42		0.18	0.15	20.9	0.35	80.0		212
No. 25	8.2	17300	5.78	0.45	<0.002	0.02		0.05	0.23	0.09	0.34	0.04		4

Analytical Results from Laboratory (20th. round, 17/Nov.)
 2. Analysis of SS

	(SS)														Ig. Loss %	
	(mg/L)	Ag	As	Sb	Cd	Cu	Cr	Fe	Hg	Mn	Pb	Zn	CN	Sn		S
No. 4	36400	322	544	965	46.0	874		135000	1050	144.0	4380	10800		5270	131000	10.4
No. 5	54100	54.0	599	455	36.0	366		73600	659	359	3470	10400		3830	63700	5.59
No. 6	48200	146	682	577	46.0	606		91800	874	226	5380	11800		4310	83500	8.17
No. 11	52400	94.0	507	657	50.0	522		68200	594	2910	8020	12600		3830	51500	6.28
No. 12	54700	90.0	451	585	56.0	492		68700	783	1970	4820	14200		4310	58200	5.91
No. 15	10400	92.0	468	604	44.0	648		73000	935	397	7500	11600		3250	47200	7.02
No. 17	5850	54.0	377	324	42.0	370		67600	975	2440	6130	9600		3830	36500	6.84
No. 18	5280	4.00	98.0	105	8.0	62.0		45600	302	1400	231	1340		1920	4100	4.39

Analytical Results from Laboratory (20th. round, 17/Nov.)

3. Quality of Sediment

Sample	Ag ppm	As ppm	Sb ppb	Cd ppm	Cu ppm	Cr ppm	Fe ppm	Hg ppb	Mn ppm	Pb ppm	Zn ppm	CN ppm	Sn ppm	S ppm	Ig.Loss %
No. 2	46.0	208	198	16.0	110		522	655	167	528	2920		2870	14800	4.02
No. 3															
No. 4	880	1140	2100	52.0	2320		244000	729	85.6	976	10600		4310	255000	16.0
No. 5	192	977	1327	122.0	398		321000	958	541	12500	34400		6700	278000	19.5
No. 6	186	4.73	1370	134.0	366		289000	931	2160	8390	38200		5750	286000	16.8
No. 8	0.0	529	57.9	6.0	14.0		28500	699	224	4540	500		1920	850	1.45
No.10	70.0	564	481	62.0	124		126000	829	171	3622	19600		4790	120000	6.94
No.11	198	708	1760	80.0	368		236000	1220	4570	8980	24000		5270	235000	13.8
No.12	98.0	668	785	46.0	278		168000	953	2290	6410	14200		5270	162000	10.5
No.13															
No.14															
No.15	60.0	399	437	44.0	182		104000	880	586	4730	12000		3830	88800	5.44
No.16	0.0	3.54	54.2	4.0	12.0		24200	182	345	48.8	106		1920	400	1.60
No.17	50.0	373	398	36.0	232		108000	1190	574	6650	11000		3830	96000	6.04
No.18	36.0	335	311	34.0	158		93900	920	546	755	9000		3350	58200	3.83
No.19	0.0	1.53	25.3	2.0	8.0		21300	332	235	633.0	58.0		1440	2450	1.95
No.20	0.0	6.57	51.4	6.0	42.0		40700	438	308	89.1	1020		958	500	1.63
No.21	0.0	25.7	53.1	16.0	18.0		146000	371	420	57.3	620		1440	310	3.03
No.22	32.0	309	236	30.0	158		73300	846	530	715	8000		2870	54800	4.03
No.23	0.0	1.83	52.1	2.0	28.0		48900	66.0	375	71.9	104		2870	600	2.43
No.24															
No.25	12.0	43.50	50.1	12.0	64.0		36300	118	403	124	1840		4310	2300	1.89

Analytical Results from Laboratory (21st. round, 1/Dec.)

1. Quality of Water

Sample	pH	SS mg/L	As μg/L	Sb μg/L	Cd mg/L	Cu mg/L	Cr mg/L	Fe mg/L	Hg μg/L	Mn mg/L	Pb mg/L	Zn mg/L	CN mg/L	COD mg/L
No. 1	8.5	72	6.83	0.18	0.02	0.02		0.32	0.12	0.03	0.29	0.24		36
No. 2	2.5	1320	3654	0.95	13.0	135		1810	3.31	23.6	27.8	920		77
No. 3														
No. 4	5.5	24600	179	0.82	3.40	0.1		319	0.60	25.1	4.39	702		77
No. 5	10.9	80800	65.4	0.86	0.03	0.34		0.21	1.13	0.01	0.24	0.15		145
No. 6	9.4	59500	18.4	0.26	0.06	0.32		0.17	0.02	1.79	0.45	0.17		153
No. 7														
No. 8	8.6	396	4.23	0.17	0.01	0.05		0.26	0.05	0.31	0.41	0.11		115
No. 9														
No. 10	8.9	93100	17.9	0.49	0.07	0.66		0.18	0.47	2.31	0.35	0.45		128
No. 11	8.7	3660	449	0.24	0.02	0.04		0.07	0.14	0.27	0.27	0.15		74
No. 12	2.4	83400	18.8	0.4	0.04	0.38		0.14	0.12	1.64	0.43	0.43		81
No. 13	7.8	191	962	0.46	1.03	29.0		599	1.00	58.1	0.34	157		72
No. 14	6.3	99	5.56	0.12	0.09	0.02		0.08	0.23	2.23	0.21	18.0		34
No. 15	6.3	15300	131	0.32	0.36	0.01		80.0	0.54	11.20	0.53	70.0		51
No. 16	8.3	170	2.09	0.36	<0.002	0.01		0.03	0.18	0.01	0.4	0.05		47
No. 17	6.6	3030	10.5	0.18	0.13	0.02		13.2	0.10	2.73	0.44	17.20		47
No. 18	7.6	2180	20.1	0.15	0.04	0.01		0.04	0.47	2.62	0.41	4.94		47
No. 19	8.4	2280	2.21	0.38	<0.002	0.02		1.05	0.31	0.06	0.33	0.31		26
No. 20	7.1	46	1.23	0.37	0.13	0.03		0.05	0.23	1.68	0.38	13.0		51
No. 21	7.7	43	0.47	0.32	0.05	0.01		0.06	0.19	0.02	0.52	0.30		13
No. 22	7.5	2540	18.0	0.47	0.06	0.02		0.02	0.43	3.03	0.42	14.0		43
No. 23	8.7	2170	1.34	0.22	0.01	0.01		0.10	0.09	0.04	0.24	0.04		89
No. 24	4.3	92	0.61	0.10	0.95	0.42		0.16	0.22	17.2	0.35	172		64
No. 25	8.4	8570	0.58	0.32	0.02	0.01		1.22	0.07	0.03	0.31	0.05		4

Analytical Results from Laboratory (21st. round, 1/Dec.)

2. Analysis of SS

	(SS) (mg/L)	Ag ppm	As ppm	Sb ppb	Cd ppm	Cu ppm	Cr ppm	Fe ppm	Hg ppb	Mn ppm	Pb ppm	Zn ppm	CN ppm	Sn ppm	S ppm	Ig. Loss %
No. 4	24600	540	470	864	158.0	1880		64800	1590	87.8	9920	41600		4310	71100	5.61
No. 5	80800	200	629	798	64.0	748		91600	1260	102	7380	10800		4310	94300	6.29
No. 6	59500	168	580	750	82.0	748		84000	1200	186	5350	16400		4310	82100	6.51
No. 11	3660	46.0	335	349	60.0	140		31300	945	192	5760	14600		3350	38200	8.36
No. 12	83400	62.0	580	664	58.0	334		58700	1840	264	7170	14600		4310	58500	5.69
No. 15	15300															
No. 17	3030	116.0	412	571	78.0	1400		71400	1300	346	7290	19800		5270	58200	5.19
No. 18	2180	136	517	797	68.0	1260		43900	1420	223	7440	17400		4310	47500	4.92
No. 25	8570	4.0	4.04	88.9	4.0	38.0		43400	469	603	6270	380		4310	1340	4.24

Analytical Results from Laboratory (21st. round, 1/Dec.)

3. Quality of Sediment

Sample	Ag ppm	As ppm	Sb ppb	Cd ppm	Cu ppm	Cr ppm	Fe ppm	Hg ppb	Mn ppm	Pb ppm	Zn ppm	CN ppm	Sn ppm	S ppm	Ig-Loss %
No. 2	24.0	84.0	260	18.0	84.0		59300	519	599	826	1320		2400	9770	2.11
No. 3															
No. 4	540	803	1250	58.0	1300		192000	737	45.7	1720	10400		5270	208000	13.2
No. 5	400	4.85	1250	128.0	1420		358000	1280	325	8000	38000		9580	276000	22.7
No. 6	500	5.19	1230	142.0	1380		321000	1310	249	8810	42800		6230	261000	20.2
No. 8	8.0	87.1	50.1	4.0	20.0		28000	435	258	103.0	320		1920	840	2.26
No.10	154	811	1290	100	364		235000	1200	471	6790	22000		6230	237000	14.9
No.11	48.0	547	433	54.0	72.0		107000	649	237	2750	15600		4310	110000	7.05
No.12	96.0	779	756	72.0	296		213000	1560	1060	3830	28400		4790	196000	12.5
No.13															
No.14															
No.15	100	522	665	62.0	312		145000	1200	718	4830	8000		4790	131000	8.28
No.16	0.0	2.11	54.8	28.0	16.0		20900	390	300	61.1	106		1440	400	1.52
No.17	68.0	258	459	58.0	318		126000	1370	387	4440	13800		3350	117000	6.93
No.18	38.0	335	328	28.0	182		79100	812	394	694	8000		1400	53600	8.86
No.19	2.0	376	435	2.0	16.0		15400	1140	377	6140	86.0		3350	650	0.92
No.20	2.0	6.06	56.3	4.0	58.0		32900	420	164	108	1140		2400	1890	1.64
No.21	0.0	4.42	27.4	2.0	28.0		32400	274	313	51.4	480.0		1440	260	1.11
No.22	56.0	557	43.9	34.0	368		65900	321	315	30.2	9800		1440	45900	5.46
No.23	2.0	49.9	13.0	0.0	30.0		51100	294	438	39.3	156.0		1440	1760	2.22
No.24															
No.25	0.0	4.41	117	0.0	24.0		34000	557	410	54.5	158.0		1440	550	2.73

ANNEX 6

Mineral process tests results

Mineral Processing

○ Mineral Processing Test

1) Text

2) Data

- ① Minerals related to Cerro Rico Mine
- ② Grinding Tests Result: Relation between ZnS Liberation Degree and Grinding Time
- ③ Flow-sheet of Pb, Zn Flotation Tests
- ④ Result of Pb, Zn Flotation Tests
- ⑤ Analysis of Pb, Zn Flotation Tests Result
- ⑥ Particle Size of Liberation for Cerro Rico Ore
- ⑦ Flow-sheet of Sn Flotation Tests
- ⑧ Result of Sn Flotation Tests
- ⑨ Analysis of Sn Flotation Tests Result
- ⑩ Flow-sheet of Confirmation Tests

1) Sample

① No. 1: Cerro Rico mine: Potosi (received from Cooperative) about 100 kg

Target: ZnS (sphalerite) {many}, PbS (galena) {many}, Ag {many}, and SnO₂ (cassiterite) {few}

Grade: Zn 9.04%, Pb 1.06%, Ag 16.55DM (* 1), Sn 0.58%

*1: DM 100 g/t

Mineral Composition (legend: ○ > score 10, △ > // 5, × > // 1, • < // 1)

○ SiO₂

△ FeS₂, ZnS

× Cu₁₁ZnSb₄S₁₃, CuPbSbS₃, Cu₂(Fe,Sn)₂S₄, Cu₂FeSnS₄, (Cu,Hg)₁₂As₄S₁₃

• SnO₂ and others

② No. 2: Cerro Rico mines: Pailaviri (received from COMBOL) about 100 kg

Target: ZnS {many}, PbS {few}, Ag {few}, and SnO₂ {many}

Grade: Zn 0.15%, Pb 0.03%, Ag 1.48DM, Sn 1.76%

Mineral Composition (legend: ○ > score 10, △ > // 5, × > // 1, • < // 1)

○ SiO₂, FeS₂

× SnO₂

• Cu₂FeSnS₄, Fe₃Al₁₂(SiO₄)₃, FeTiO₃, Bi₂Te_{1.65}S_{1.35}, ZnS, Cu₂S, CaWO₄, KAlSi₃O₈,

Cu₃As, Cu₂O, Bi₂Te₂S, (Cu,Hg)₁₂As₄S₁₃, Fe_{1-x}S, MnO₂, Al₃(PO₄)₂(OH)₃·5H₂O,

(Fe,Mg)(Ti,Fe)O₃, Ag_{0.93}Cu_{1.07}S, FeCO₃, KAl₂Si₃AlO₁₀(OH)₂, Ni(Sb,As)(S,As),

Cu₂Cl(OH)₃, Zn_{0.9}Cd_{0.1}S

In addition, a list of minerals related to Cerro Rico is shown of A-Table 1

2) Pb, Zn tests: Examination of ore specimen No.1

(1) ZnS liberation test: grinding test

Common tests by crushing it to -2 mm, implemented results to grinding test related to simple separation of ZnS. In order to obtain a 90% simple separation of ZnS, it was necessary to grind for 4 minutes.

Now the simple separation rate for ZnS exceeds 90% as the grain size is -1 mm.

Test results are shown on A-Table 2

(2) Flow of flotation tests

A-Figure 1 shows the flow sheet for Pb, Zn flotation tests

(3) Flotation test conditions and test plan

(3)-1 Grinding

① Grinding concentration (PD: Pulp Density) → fixation factor: 50%

② Grinding time: grain size → control factor: 50%

(3)-2 Pb flotation

① Flotation concentration (PD) → fixation factor: 25%

② With the condition: procedure and time

② -1 pH regulator → control factor: it is described below. : ~ 0 min

② -2 Depressor (two types): depress activity of ZnS and FeS₂ → fixation factor

- : NaCn 50 g/t + ZnSO₄ 100 g/t : 0-9 min
- ② -3 Collector (two types) → control factor: described below : 9-14 min
- ② -4 Frother (one type) → fixation factor: Dow Froth 1012 30g/t : 14-15 min
- ③ Flotation time (*6) → fixation factor : 15-30 min

*6: It will collect float at specified times for the test → flotation curve for
0-1 min, 1-3 min, 3-7 min, 7-15 min, 15 min, 4 samples

(3)-3 Zn flotation

- ① Flotation concentration (PD) → fixation factor
- ② With conditions: procedure and time
- ② -1 pH regulator → control factor: it is described below. : ~ 0 min
- ② -2 Depressor (one type {same as pH regulator}: Ca(OH)₂): to depress FeS₂ →
fixation factor
- ② -3 Activator (one type) CuSO₄ 500 g/t : 0-9 min
- ② -4 Collector (one type: same for Pb flotation) → control factor:
described below : 9-14 min
- ② -5 Frother → fixation factor: Dow Froth 1012 30g/t : 14-15 min
- ③ Flotation time → fixation factor : 15-30 min

(4) Control factor: factor

(4) -1 Grain size: grinding time ⇒ Pb, Zn metal recovery rate, concentrate grade

- ① Standard 1 Ingenio condition : 2.5 min
- ② Standard 2 Examination condition (more detailed than standard
1): ZnS simple separation rate is 90% : 5 min

(4)-2 pH regulator and pH ⇒ for Pb, Zn float, Pb, Zn metal recovery rate

- ① Standard 1 Ingenio condition: Pb flotation: Ca(OH)₂ pH 8.0
Zn Flotation: Ca(OH)₂ pH 10.5
- ② Standard 2 Examination condition: Pb flotation: NaCO₃, pH 7.5
Zn flotation: Ca(OH)₂ pH 10.0

(4)-3 Collector 1: Pb, Zn ⇒ Pb, Zn metal recovery rate

- ① Standard 1 Examination condition: Z-6 Pb 35 g/t, Z-14 Zn 65 g/t
- ② Standard 2 Examination condition: Z-11 Pb 35 g/t, Z-11 Zn 65 g/t
- ③ Standard 3 Examination condition: Z-11 Pb 35 g/t, Z-14 Zn 65 g/t
- ④ Standard 4 Examination condition: Z-14 Pb 35 g/t, Z-14 Zn 65 g/t

Note: Z-6 (potassium Amyl Xanthate), Z-11 (Sodium Isopropyl Xanthate), Z-14 (Sodium Isobutyl Xanthate)

(4)-4 Collector 2: Ag mineral in Pb flotation ⇒ Ag recovery for Pb flotation

Factor	Standard	Significance	Contribution rate %	Condition
A: Pb, Zn Flotation collector	Xan. ① Pb Z-6 35g/t, Zn Z-14 65g/t ② Pb Z-11 35g/t, Zn Z-11 65g/t ③ Pb Z-11 35g/t, Zn Z-14 65g/t ④ Pb Z-14 35g/t, Zn Z-14 65g/t	Present * * (*3)	87.2	A3
B: Pb flotation Grain size of feed	Grinding time ① 2.5 min ② 5.0 min	None None	----	(B2) (*4)
C: pH regulator, pH	① Pb Ca(OH) ₂ : pH 8.0 Zn Ca(OH) ₂ : pH 10.5 ② Pb Na ₂ CO ₃ : pH 7.5 Zn Ca(OH) ₂ : pH 10.0	None None None None	----	(C1) (*4)
D: Pb flotation Ag collector	① Aerofloat 242 0 g/t ② Aerofloat 242 20 g/t	None None	----	(D1) (*4)

Note: *3: 1% intentional

*4: Since it was not intentional, the result is insignificant but () is a relatively better condition.

The forecast of the average process in the best condition is as follows.

83.5 +/- 3.8%: rate of recovery of price value

(8)-2 Analysis

① Accuracy of the results: insufficient because no repeat examination

② Metal recovery rate (metal (%))

Pb: Pb of Pb concentrate was evaluated, max. 76.3% poor

Zn: Zn of Zn concentrate was evaluated, max. 82.8% insufficient

Ag: Ag of Pb, Zn concentrate was evaluated, max. 92.7% good

Ag was good but Pb, Zn were poor and must find better conditions

③ Factor (factor) A: main effect: significance

In the data interval, significance can be recognized (1% intentional). Contribution factor is 87.2% is unusually high, it found an important primary factor in the final examination. In order to increase the Pb, Zn metal recovery rate, it may be necessary to increase the collector amount.

④ Factor (factor) B: main effect

In the data interval, there was no significance that was recognized. However, the metal recovery rate for Zn has a large economic influence. From the grinding test results, the above-mentioned B2 standards are desirable.

⑤ Factor (factor) C: main effect

In the data interval, there was no significance that was recognized. The extraction of Au, Ag is

thought to be good for the above-mentioned C2 standard. Excluding Occidental and other ingenios, most ingenios do not use lime water. The above-mentioned C1 standard is recognized.

⑥ Factor (factor) D: main effect

In the data interval, there was no significance that was recognized. However, the metal recovery rate for Ag has a large economic influence. The significance may not appear because adding 0-20 g/t is insufficient. For the further increase in the metal recovery rate of Ag, it may need additional amounts of collectors, etc.

(8)-3 Optimum conditions (assumption)

In the analysis of (8)-2, the assumptions are as follows.

① Factor (factor) A (Pb, Zn flotation collector)

A3: Pb flotation increase Z-11 35 g/t → 40 g/t

Zn flotation increase Z-14 65 g/t → 75 g/t

② Factor (factor) B (Pb flotation grain size of mined ore)

B2* grinding time: 5.0 min

③ Factor (factor) C (pH regulator, pH)

C1: Pb flotation $\text{Ca}(\text{OH})_2$: pH 8.0

Zn flotation $\text{Ca}(\text{OH})_2$: pH 10.5

④ Factor (factor) D

D2: increase Aerofloat 242 20 g/t → 40 g/t

For increasing the metal recovery of Zn:

① In Pb flotation, increase the activator of ZnS → NaCN 70 g/t + ZnSO₄ 150 g/t

② In Zn flotation, increase the activator of ZnS → CuSO₄ 600 g/t

2) Sn test: test for ore specimen No. 2

(1) SnO₂ liberation test

SnO₂ liberation particle size, A-Table 5 "Cerro Rico Ore Particle Size Liberation Test", is smaller than ZnS, after Pb, Zn flotation, still more grinding is necessary.

(2) Flotation test flow

In A-Figure 2, "Sn Flotation Test Project" is shown.

(3) Flotation test conditions and test plan

(3)-1 Float

① Grinding concentration (PD: Pulp Density) → fixation factor: 50%

② Grinding time: grain size → control factor: 5 min

(3)-2 Desulfurization of mineral flotation

① Flotation concentration (PD) → fixation factor: 25%

② With the condition: procedure and time

② -1 pH regulator → control factor: H₂SO₄, pH 6 : ~ 0 min

② -2 Depressor (one type) → fixation factor: CuSO₄, 50 g/t : 0-5 min

- ② -3 Collector (two types) → control factor: Z-11 35 g/t, Aeroftot 242
5 g/t : 5-10 min
- ② -4 Frother (one type) → fixation factor: Dow Froth 1012 20g/t : 10-11 min
- ③ Flotation time → fixation factor : 11-26 min

(3)-3 Re-grinding → fixation factor: described below (DB)

(3)-4 De-slime → fixation factor: -0.005 mm level

(3)-5 Sn float

- ① Flotation concentration (PD) → fixation factor
- ② With the condition: procedure and time
- ② -1 pH regulator and pH → control factor: DB : ~ 0 min
- ② -2 Dispersant (one type: NiSiO₃) → control factor: DB : 0-5 min
- ② -3 Collector (one type: AP830) → control factor: DB : 5-15 min
- ② -4 Frother (one type: Dow Froth 1012) → control factor: DB : 15-17 min
- ③ Flotation time → fixation factor : 17-32 min

(4) Control factor: factor

- (4)-1 Sn flotation particle size: re-grinding time Factor C: ① 2.5 min ② 5.0 min
- (4)-2 Sn flotation (1) pH (Ca mineral control) Factor A: HF ① pH 2.5 ② 3.0 min
- (4)-3 Sn flotation depressor: SiO₂, etc. Factor D: NaSiO₃ ① 500g/t ② 1000g/t
- (4)-4 Sn flotation collector: SnO₂ Factor B: AP830 ① 50g/t ② 100g/t
- (4)-5 Sn flotation frother Factor E: Dowfroth 1012 ① 10g/t ② 30g/t
- (4)-6 Sn flotation (3) pH (Fe oxidation mineral control) Factor F: ① NaHSO₃ pH3
② NaHSO₃ pH3 after NaOH pH 5.0

(5) Experiment plan: plan depends upon experiment method

(5)-1 Factor: control factor

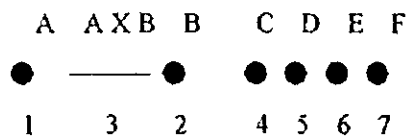
- ① Sn flotation grain size: re-grinding time 2 standards → Factor C
- ② Sn flotation (1) pH (Ca mineral control) 2 standards → Factor A
- ③ Sn flotation depressor: SiO₂ etc. 2 standards → Factor D
- ④ Sn flotation collector: SnO₂ 2 standards → Factor B
- ⑤ Sn flotation frother 2 standards → Factor E
- ⑥ Sn flotation (3) pH (Fe oxidation mineral control) 2 standards → Factor F

(5)-2 Layout: L₃

Test No.	Factor						
	A	B	AXB	C	D	E	F
1	2	3	4	5	6	7	

1	①	①	①	①	①	①	①
2	①	①	①	②	②	②	②
3	①	②	②	①	①	②	②
4	①	②	②	②	②	①	①
5	②	①	②	①	②	①	②
6	②	①	②	②	①	②	①
7	②	②	①	①	②	②	①
8	②	②	①	②	①	①	②

Line point figure



(6) Special values

$$\text{Recovery of total amount} = \frac{\text{value of concentrate for 1 ton of crude ore processed}}{\text{value of 1 ton of crude ore}} \times 100$$

: Object of evaluation Sn in Sn concentrate

(7) Test Results

Shown on A-Table 6

(8) Analysis

Interpretation is shown on the attached sheet #2

(8)-I Analysis on compilation of dispersion results

A-Table 7 Analysis of Separation of Sn in Flotation Test Results

Factor	Standard	Rate of Significance	Contribution rate (%)	Optimum Condition
A: Sn flotation (1) pH; Ca mineral Depressor	HF ① pH 2.5 ② pH 3.0	Present * (*5)	21.2	A2
B: Sn flotation (1) SnO ₂ collector	AP830 ① 50 g/t ② 100g/t	None	18.8	(B2) (* 6)
A X B: A, B Interaction		None	12.5	...
C: Sn flotation	Re-grinding time	None	<7.2	(C1)

grain size	① 2.5 min ② 5.0 min			(* 6)
D: Sn flotation (1)	NaSiO ₃ , ① 500 g/t ② 1,000 g/t	None	<7.2	(D2) (* 6)
E. Sn flotation (1) Frother	Dowfroth 1012 ① 10 g/t ② 30 g/t	None	7.2	(E2) (* 6)
F. Sn flotation (1) pH; Fe oxidation mineral	① NaHSO ₃ , pH 3.0 ② NaHSO ₃ , pH 3.0 NaOH pH 5.0	None	8.8	(F1) (* 6)

Note: * 5: 5% intentional

* 6 : Since it was not intentional, the result is insignificant but () is a relatively better condition. The forecast of the average process in the best condition is as follows.

$$17.5 \pm 7.5 : \text{rate of recovery of price value (\%)}$$

(8)-2 Interpretation

- ① Efficiency: insufficient because it did not carry out repeat tests
- ② Recovery rate (Sn: metal (%))
Sn, evaluated Sn concentrate, Max. 38.6% (*11), very poor
(objective: improve to 70%) *11:: Sn flotation of unprocessed ore
- ③ Factor (factor) A: main effect
In the data range, there was recognition of the significance (5% intentional), but the contribution ratio is low at 21.2%.
Accordingly, it is believed that there were many contributing factors in the main tests (factor).
- ④ Factor (factor) B: main factor
In the data range, there was no recognition of significance. It is thought that this factor has a big influence on the recovery of Sn. In this step, the significance was recognized (5%) and is more important following the factor (factor) A.
- ⑤ Factor (factor) A X B: interaction effect
In the data range, there was no significance.
- ⑥ Factor (factor) C: main effect
Some variation was observed. In the data range, no significance was expected
- ⑦ Factor (factor) D: main effect
Some variation was observed. In the data range, no significance was expected.
- ⑧ Factor (factor) E: main effect
In the data range, no significance was recognized.
- ⑨ Factor (factor) F: main effect

In the data range, no significance was recognized. It is important to make the pH 5.0 by NaHSO₃, but observed no influence.

⑩ Others: minerals

Sn: Before Sn flotation, 30-40% of Sn is collected in sulfide mineral flotation concentrate, etc. The present operating objects for Sn minerals in the ore body include equal amounts of stannite and cassiterite.

Ca: The present operating objects in the crude ore of the ore body is low at 0.1-0.3%. It is thought that the Ca minerals have a small impact.

Fe: Before Sn flotation, 70-80% of Fe is collected in sulfide mineral flotation concentrate, etc. It is believed that Fe minerals do not to have a large impact.

(8)-3 Optimal conditions (assumption)

Depending on the analysis of (8)-2, the following assumptions were made.

① Factor (factor) A (pH; Ca mineral depressor)

A2: HF pH 3.0

② Factor (factor) B (SnO₂ collector)

B2* AP830 large increase → 300 g/t

③ Factor (factor) C (Sn flotation grain size)

C1: re-grinding is necessary; cost increase is closely related to the time, only 2.5 minutes

④ Factor (factor) D (SiO₂ depressor)

NaSiO₃ 1,000 g/t

⑤ Factor (factor) E (froth)

E2: Dowfroth 1012 30 g/t

⑥ Factor (factor) F (pH; Fe oxide mineral depressor)

F1: NaHSO₃ pH 3.0

3) Confirmation tests

2) Pb, Zn tests, 3) examines for confirmation of the optimum conditions for the Sn test.

Confirmation tests flowsheet is shown on A-Figure 3

Annex Table 1 Minerals related to Cerro Rico Mine

Japanese	Chemical Formula	Spanish	English
自然金	Au	oro nativo	native gold
自然銀	Ag	plata nativa	native silver
輝銀鉍	Ag ₂ S	argentita	argentite
濃紅銀鉍	Ag ₃ SbS ₃	pirargirita	pyrargyrite
淡紅銀鉍	Ag ₃ AsS ₃	proustita	proustite
マテル夕鉍	Ag ₂ BiS ₃	matildita	matildite
脆銀鉍	Ag ₂ SbS ₃	estefanita	stephanite
自然銅	Cu	cobre nativo	native copper
黃銅鉍	CuFeS ₂	calcopirita	chalcopyrite
硫砒銅鉍	Cu ₃ AsS ₄	enargita	enargite
斑銅鉍	Cu ₅ FeS ₄	bornita	bornite
銅藍	CuS	covelita, covelina	covellite, covellin
輝銅鉍	Cu ₂ S	calcocina, calcocita	chalcocite
赤銅鉍	Cu ₂ O	cuprita	cuprite
黑銅鉍	CuO	tenorita	tenorite
孔雀石	Cu ₂ (CO ₃)(OH) ₂	malaquita	malachite
孔雀石	CuSiO ₃ ·2H ₂ O	crisocola	chrysocolla
藍銅鉍	Cu ₃ (CO ₃) ₂ ·(OH) ₂	azurita	azurite
四面安銅鉍	(Cu,Fe) ₃ Sb ₂ S ₇	tetrahedrita	tetrahedrite
四面砒銅鉍	(Cu,Fe) ₃ As ₂ S ₇	tennantita	tennantite
含銀四面銅鉍	(Ag,Cu,Fe) ₃ (Sb,As) ₂ S ₇		freibergite
胆ばん	CuSO ₄ ·5H ₂ O	calcantita	chalcantite
方鉛鉍	PbS	galena	galena
硫酸鉛鉍	PbSO ₄	anglesita	anglesite
白鉛鉍	PbCO ₃	cerusita	cerussite
閃亜鉛鉍	ZnS	esfalerita, zinc-blenda	sphalerite, zincblende
鉄閃亜鉛鉍	(Zn,Fe)S	marmatita	marmatite
菱亜鉛鉍	ZnS	wurtzita	wurtzite
異極鉍	ZnCO ₃	smithsonita	smithsonite
珪酸亜鉛鉍	Zn ₂ Si ₂ O ₇ ·(OH) ₂ ·H ₂ O	hemimorfita	hemimorphite
紅亜鉛鉍	Zn ₂ SiO ₄	willemita	willemitite
紅亜鉛鉍	ZnO	cincita	zincite
錫石	SnO ₂	casiterita	cassiterite
黃錫鉍	Cu ₂ FeSnS ₄	estannita, estannina	stannite
磁鉄鉍	FeO·Fe ₂ O ₃	magnetita	magnetite
針鉄鉍	α-FeO(OH)	goetita	goethite
：(褐鉄鉍)		:(limonita)	:(limonite)
菱鉄鉍	FeCO ₃	siderita	siderite
赤鉄鉍	α-Fe ₂ O ₃	hematita	hematite
黃鉄鉍	FeS ₂	pirita	pyrite
白鉄鉍	FeS	marcasita	marcasite
磁硫鉄鉍	Fe ₇ S ₈	pirotina	pyrrhotite
輝安鉍	Sb ₂ S ₃	estibina	stibnite
毛鉍	Pb ₂ FeSb ₂ S ₆	jamesonita	jamesonite
自然砒	As	arsenico nativo	native arsenic
鷄冠石	AsS	rejalgar	realgar
石黃：雄黃	As ₂ S ₃	orpimente	orpiment
硫砒鉄鉍	FeAsS	arsenopirita	arsenopyrite
自然蒼鉛鉍	Bi	bismuto nativo	native bismuth
輝蒼鉛鉍	Bi ₂ O ₃	bismutinita	bismuthinite
蒼鉛鉍	Bi ₂ O ₃	bismita	bismite
石英	SiO ₂	cuarzo	quartz
方解石	CaCO ₃	calcita	calcite
石灰岩	CaCO ₃	pedra caliza	limestone
明礬石	K ₂ Al ₂ (SO ₄) ₆	alunita	alunite
螢石	CaF ₂	fluorita	fluorite
螢石	CaAl ₂ (F,OH) ₆		prosoquite
自然硫黃	S	asufre nativo	native sulphur

A-Table 2 Grinding Tests Result: ZnS liberation degree/grinding time

(Table 1) ZnS liberation degree: Grinding time 0min: Feed -2.0mm

No.	Particle size	Weight dist.	Zn grade	Zn metal q.	Rate of ZnS libera.(100%)	Quan. of libera.(100%)	
	μm	a %	b %	axb	c %	axbxc/100	%
1	-2,000+295	67.5	9.28	625.9	38.5	241.0	27.3
2	- 295+208	7.4	9.36	69.6	42.9	29.9	3.4
3	- 208+147	5.4	8.88	48.1	44.8	21.6	2.4
4	- 147+104	4.2	8.32	34.9	56.0	19.6	2.2
5	- 104+ 74	3.3	9.04	29.8	82.9	24.7	2.8
6	- 74+ 53	1.4	8.00	11.0	95.9	10.6	1.2
7	- 53+ 38	2.4	7.68	18.4	97.3	17.9	2.0
8	- 38	8.4	5.44	45.8	98.7	45.2	5.1
計		100.0	8.84	883.7		410.4	46.4

(Table 2) ZnS liberation degree: Grinding time 1min: Feed -2.0mm

No.	Particle size	Weight dist.	Zn grade	Zn metal q.	Rate of ZnS libera.(100%)	Quan. of libera.(100%)	
	μm	a %	b %	axb	c %	axbxc/100	%
1	-2,000+295	27.9	10.80	300.8	44.0	132.3	14.6
2	- 295+208	7.7	11.04	84.7	60.9	51.6	5.7
3	- 208+147	7.9	12.88	101.9	69.4	70.7	7.8
4	- 147+104	7.8	9.76	75.6	74.4	56.3	6.2
5	- 104+ 74	8.3	10.32	86.1	85.3	73.4	8.1
6	- 74+ 53	4.3	8.56	36.6	92.9	34.0	3.8
7	- 53+ 38	5.7	9.20	52.0	95.3	49.5	5.5
8	- 38	30.6	5.44	166.2	97.7	162.4	18.0
計		100.0	9.04	903.8		630.2	69.7

(Table 3) ZnS liberation degree: Grinding time 2.5min: Feed -2.0mm

No.	Particle size	Weight dist.	Zn grade	Zn metal q.	Rate of ZnS libera.(100%)	Quan. of libera.(100%)	
	μm	a %	b %	axb	c %	axbxc/100	%
1	-2,000+295	9.2	9.28	85.6	44.8	38.3	4.4
2	- 295+208	6.1	10.88	65.9	56.0	36.9	4.2
3	- 208+147	8.8	11.28	98.9	77.8	77.0	8.8
4	- 147+104	9.7	10.48	102.0	85.2	86.9	9.9
5	- 104+ 74	10.4	10.08	105.2	89.7	94.4	10.8
6	- 74+ 53	8.1	9.60	77.9	94.4	73.5	8.4
7	- 53+ 38	8.3	9.68	80.4	96.3	77.5	8.8
8	- 38	39.4	6.64	261.4	98.2	256.7	29.3
計		100.0	8.77	877.3		741.2	84.5

(Table 4) ZnS liberation degree: Grinding time 5min: Feed -2.0mm

No.	Particle size	Weight dist.	Zn grade	Zn metal q.	Rate of ZnS libera.(100%)	Quan. of libera.(100%)	
	μm	a %	b %	axb	c %	axbxc/100	%
1	-2,000+295	1.5	9.28	14.2	46.7	6.6	0.8
2	- 295+208	1.5	9.12	13.5	60.7	8.2	0.9
3	- 208+147	3.7	10.88	40.5	73.2	29.6	3.4
4	- 147+104	7.2	11.28	80.8	84.5	68.2	7.8
5	- 104+ 74	7.4	10.48	77.6	90.1	69.9	8.0
6	- 74+ 53	7.8	10.83	84.6	95.0	80.4	9.2
7	- 53+ 38	14.8	10.00	148.0	96.7	143.1	16.4
8	- 38	56.1	7.36	412.9	98.4	406.3	46.6
計		100.0	8.72	872.0		812.3	93.2

(Table 5) ZnS liberation degree: Grinding time 7.5min: Feed -2.0mm

No.	Particle size	Weight dist.	Zn grade	Zn metal q.	Rate of ZnS libera.(100%)	Quan. of libera.(100%)	
	μm	a %	b %	axb	c %	axbxc/100	%
1	-2,000+295	0.6	10.60	6.4	57.9	3.7	0.4
2	- 295+208	0.4	8.16	3.3	76.5	2.5	0.3
3	- 208+147	1.7	9.60	15.9	85.3	13.6	1.6
4	- 147+104	3.9	10.16	39.3	90.3	35.5	4.1
5	- 104+ 74	2.9	10.00	28.6	93.0	26.6	3.1
6	- 74+ 53	10.4	10.48	108.8	94.8	103.1	11.9
7	- 53+ 38	15.9	9.96	158.0	96.5	152.4	17.6
8	- 38	64.4	7.84	504.7	98.3	496.1	57.4
計		100.0	8.65	864.9		833.5	96.4

(Table 6) ZnS liberation degree: Grinding time 10min: Feed -2.0mm

No.	Particle size μm	Weight dist.		Zn grade	Zn metal q.	Rate of ZnS libera.(100%)		Quan. of libera.(100%)	
		a %	b %	axb	c %	axbxc/100	%		
1	-2,000+295	0.5	8.50	4.4	56.3	2.5	0.3		
2	- 295+208	0.2	8.50	1.4	56.3	0.8	0.1		
3	- 208+147	0.7	8.30	5.9	87.9	5.2	0.6		
4	- 147+104	2.2	9.44	21.0	93.1	19.5	2.4		
5	- 104+ 74	3.5	8.80	31.2	95.9	29.9	3.7		
6	- 74+ 53	8.3	9.44	78.4	96.9	76.0	9.4		
7	- 53+ 38	13.0	8.72	113.6	97.9	111.2	13.7		
8	- 38	71.5	7.76	554.9	98.9	548.8	67.7		
計		100.0	8.11	810.9		793.9	97.9		

(Table 7) ZnS liberation degree: Grinding time 15min: Feed -2.0mm

No.	Particle size μm	Weight dist.		Zn grade	Zn metal q.	Rate of ZnS libera.(100%)		Quan. of libera.(100%)	
		a %	b %	axb	c %	axbxc/100	%		
1	-2,000+295	0.2	9.80	1.9	89.6	1.7	0.2		
2	- 295+208	0.1	9.80	0.5	89.6	0.4	0.1		
3	- 208+147	0.2	9.80	1.7	89.6	1.5	0.2		
4	- 147+104	0.8	9.80	8.0	89.6	7.2	0.9		
5	- 104+ 74	3.2	11.40	36.4	93.9	34.1	4.1		
6	- 74+ 53	5.4	10.70	57.6	97.2	56.0	6.7		
7	- 53+ 38	11.1	9.80	108.7	98.1	106.6	12.7		
8	- 38	79.1	7.90	625.0	99.0	618.7	73.7		
計		100.0	8.40	839.6		826.2	98.4		

(Table 8) ZnS liberation degree: Grinding time 20min: Feed -2.0mm

No.	Particle size μm	Weight dist.		Zn grade	Zn metal q.	Rate of ZnS libera.(100%)		Quan. of libera.(100%)	
		a %	b %	axb	c %	axbxc/100	%		
1	-2,000+295	0.3	10.80	3.2	73.8	2.4	0.3		
2	- 295+208	0.0	10.80	0.3	73.8	0.2	0.0		
3	- 208+147	0.1	10.80	0.5	73.8	0.4	0.0		
4	- 147+104	0.2	10.80	2.3	73.8	1.7	0.2		
5	- 104+ 74	1.3	10.50	13.7	93.2	12.7	1.6		
6	- 74+ 53	3.2	10.70	34.3	96.3	33.1	4.1		
7	- 53+ 38	9.6	10.60	101.5	97.5	99.0	12.4		
8	- 38	85.3	7.54	643.3	98.8	635.6	79.5		
計		100.0	7.99	799.2		785.1	98.2		

(Table 9) ZnS liberation degree: Grinding time 30min: Feed -2.0mm

No.	Particle size μm	Weight dist.		Zn grade	Zn metal q.	Rate of ZnS libera.(100%)		Quan. of libera.(100%)	
		a %	b %	axb	c %	axbxc/100	%		
1	-2,000+295	0.3	10.24	3.2					
2	- 295+208	0.0	10.24	0.2					
3	- 208+147	0.0	10.24	0.2					
4	- 147+104	0.1	10.24	0.6					
5	- 104+ 74	0.1	10.24	0.6					
6	- 74+ 53	0.6	10.24	6.2					
7	- 53+ 38	4.1	10.24	42.1					
8	- 38	94.8	8.08	766.1					
計		100.0	8.19	819.2			>98.5		

(Table 10) ZnS liberation degree: Grinding time 60min: Feed -2.0mm

No.	Particle size μm	Weight dist.		Zn grade	Zn metal q.	Rate of ZnS libera.(100%)		Quan. of libera.(100%)	
		a %	b %	axb	c %	axbxc/100	%		
1	-2,000+295	0.1	10.48	1.0					
2	- 295+208	0.0	10.48	0.0					
3	- 208+147	0.0	10.48	0.1					
4	- 147+104	0.0	10.48	0.1					
5	- 104+ 74	0.0	10.48	0.1					
6	- 74+ 53	0.1	10.48	0.6					
7	- 53+ 38	0.8	10.48	8.7					
8	- 38	99.0	8.64	855.2					
計		100.0	8.66	865.9			>98.5		

Annex Table 3 Results of Pb, Zn Flotation Tests

Table (1) Test 1

Products	Grades					Recovery				Note: Recovery time of Conc. min
	Weight %	Sn %	Pb %	Ag g/t	Zn %	Sn %	Pb %	Ag %	Zn %	
PbS-Conc.1	2.21	1.24	20.96	2.364	9.28	4.16	36.38	8.21	2.10	0~1
PbS-Conc.2	1.79	1.34	13.44	8.800	10.08	3.64	18.89	19.12	1.85	1~3
PbS-Conc.3	2.65	1.10	7.00	4.048	8.88	4.43	14.57	16.85	2.41	3~7
PbS-Conc.4	4.23	0.78	1.93	2.063	8.56	5.01	6.41	13.71	3.70	7~15
ZnS-Conc.1	2.78	0.53	0.43	1.615	52.50	2.24	0.94	7.05	14.93	0~1
ZnS-Conc.2	4.64	0.68	0.46	950	52.68	4.79	1.68	6.93	25.09	1~3
ZnS-Conc.3	5.03	1.09	0.58	980	43.38	8.33	2.29	7.74	22.32	3~7
ZnS-Conc.4	6.98	1.46	0.64	740	16.31	15.49	3.51	8.12	11.84	7~15
Tailing	69.70	0.49	0.28	112	2.24	51.90	15.33	12.26	15.97	
Feed.Calcula.	100.01	0.66	1.27	636	9.78	100.00	100.00	100.00	100.00	
Feed Assay	100.00	0.58	1.10	1.655	9.04					

Table (2) Test 2

Products	Grades					Recovery				Note: Recovery time of Conc. min
	Weight %	Sn %	Pb %	Ag g/t	Zn %	Sn %	Pb %	Ag %	Zn %	
PbS-Conc.1	0.42	0.92	15.50	8.789	3.99	0.62	3.65	4.50	0.19	0~1
PbS-Conc.2	1.84	0.87	12.96	6.000	5.28	2.58	13.38	13.45	1.07	1~3
PbS-Conc.3	2.97	0.93	10.44	7.160	6.64	4.46	17.40	25.90	2.18	3~7
PbS-Conc.4	5.89	0.80	6.87	3.605	7.27	7.60	22.71	25.86	4.73	7~15
ZnS-Conc.1	7.71	0.29	4.47	1.235	42.95	3.61	19.34	11.60	36.59	0~1
ZnS-Conc.2	3.31	0.48	2.52	1.248	39.74	2.56	4.68	5.03	14.54	1~3
ZnS-Conc.3	2.22	0.53	5.12	1.304	30.95	1.90	6.38	3.53	7.59	3~7
ZnS-Conc.4	1.08	0.51	1.92	1.904	23.31	0.89	1.16	2.50	2.78	7~15
Tailing	74.57	0.63	0.27	84	3.68	75.78	11.30	7.63	30.33	
Feed.Calcula.	100.01	0.62	1.78	821	9.05	100.00	100.00	100.00	100.00	
Feed Assay	100.00	0.58	1.10	1.655	9.04					

Table (3) Test 3(- Test 9)

Products	Grades					Recovery				Note: Recovery time of Conc. min
	Weight %	Sn %	Pb %	Ag g/t	Zn %	Sn %	Pb %	Ag %	Zn %	
PbS-Conc.1	2.52	1.07	8.69	5.423	12.04	5.12	29.26	14.34	3.69	0~1
PbS-Conc.2	2.08	1.36	7.19	11.938	13.10	5.37	19.99	26.05	3.32	1~3
PbS-Conc.3	1.68	1.51	4.24	3.920	12.96	4.82	9.52	6.91	2.65	3~7
PbS-Conc.4	2.07	0.93	1.94	4.190	6.62	3.66	5.37	9.10	1.67	7~15
ZnS-Conc.1	13.44	0.78	0.27	954	35.84	19.91	4.85	13.45	58.66	0~1
ZnS-Conc.2	4.49	0.95	0.37	864	21.83	8.10	2.22	4.07	11.94	1~3
ZnS-Conc.3	4.82	0.97	0.50	871	10.63	8.88	3.22	4.41	6.24	3~7
ZnS-Conc.4	4.72	0.98	0.52	799	5.36	8.79	3.28	3.96	3.08	7~15
Tailing	64.17	0.29	0.26	263	1.12	35.35	22.30	17.71	8.75	
Feed.Calcula.	99.99	0.53	0.75	953	8.21	100.00	100.00	100.00	100.00	
Feed Assay	100.00	0.58	1.10	1.655	9.04					

Table (4) Test 4(- Test 10)

Products	Grades					Recovery				Note: Recovery time of Conc. min
	Weight %	Sn %	Pb %	Ag g/t	Zn %	Sn %	Pb %	Ag %	Zn %	
PbS-Conc.1	2.43	1.07	7.98	3.911	9.50	4.60	33.22	13.81	2.71	0~1
PbS-Conc.2	1.79	1.12	1.92	7.477	12.39	3.54	5.89	19.45	2.60	1~3
PbS-Conc.3	1.55	0.90	5.37	4.360	11.52	2.47	14.26	9.82	2.10	3~7
PbS-Conc.4	2.69	0.71	1.79	3.237	7.84	3.38	8.25	12.66	2.48	7~15
ZnS-Conc.1	12.25	0.61	0.24	808	38.96	13.21	5.04	14.39	56.05	0~1
ZnS-Conc.2	2.93	0.63	0.35	911	33.17	3.26	1.76	3.88	11.41	1~3
ZnS-Conc.3	5.39	0.66	0.39	719	16.53	6.29	3.60	5.63	10.46	3~7
ZnS-Conc.4	5.33	0.68	0.48	707	7.75	6.41	4.38	5.48	4.85	7~15
Tailing	65.66	0.49	0.21	156	0.95	56.86	23.62	14.89	7.33	
Feed.Calcula.	100.02	0.57	0.58	688	8.51	100.00	100.00	100.00	100.00	
Feed Assay	100.00	0.58	1.10	1.655	9.04					

Table (5) Test 5

Products	Weight %	Grades				Recovery				Note: Recovery time of Conc. min
		Sn %	Pb %	Ag g/t	Zn %	Sn %	Pb %	Ag %	Zn %	
PbS-Conc.1	1.59	1.32	9.98	4.112	6.63	3.14	20.40	8.87	1.26	0~1
PbS-Conc.2	1.14	1.21	12.96	4.800	9.04	2.06	18.99	7.43	1.23	1~3
PbS-Conc.3	3.29	0.63	1.92	7.471	7.75	3.10	8.12	33.35	3.05	3~7
PbS-Conc.4	8.56	0.64	1.16	1.492	6.16	8.19	12.77	17.33	6.31	7~15
ZnS-Conc.1	9.11	0.76	0.36	711	38.85	10.35	4.22	8.79	42.40	0~1
ZnS-Conc.2	5.47	0.90	0.45	686	29.93	7.36	3.16	5.09	19.61	1~3
ZnS-Conc.3	4.03	1.09	0.75	439	17.49	6.57	3.89	2.40	8.44	3~7
ZnS-Conc.4	5.93	1.14	0.55	602	7.65	10.11	4.19	4.84	5.43	7~15
Tailing	60.86	0.54	0.31	144	1.68	49.13	24.26	11.89	12.25	
Feed.Calcula	99.98	0.67	0.78	737	8.35	100.00	100.00	100.00	100.00	
Feed.Assay	100.00	0.58	1.10	1.655	9.04					

Table (6) Test 6

Products	Weight %	Grades				Recovery				Note: Recovery time of Conc. min
		Sn %	Pb %	Ag g/t	Zn %	Sn %	Pb %	Ag %	Zn %	
PbS-Conc.1	2.30	0.92	2.64	7.397	12.79	2.93	10.11	18.88	3.48	0~1
PbS-Conc.2	2.09	1.14	7.65	10.507	5.43	3.30	26.62	24.37	1.34	1~3
PbS-Conc.3	1.45	1.58	2.64	8.277	12.32	3.17	6.37	13.32	2.11	3~7
PbS-Conc.4	0.92	1.87	7.33	10.760	11.20	2.38	11.23	10.99	1.22	7~15
ZnS-Conc.1	6.83	0.68	0.42	1.212	47.65	6.44	4.78	9.19	38.46	0~1
ZnS-Conc.2	2.89	0.93	0.56	1.203	43.26	3.72	2.70	3.86	14.78	1~3
ZnS-Conc.3	6.43	1.21	0.51	720	8.88	10.78	5.46	5.14	6.75	3~7
ZnS-Conc.4	5.98	1.22	0.67	1.052	24.16	10.11	6.67	6.98	17.07	7~15
Tailing	71.12	0.58	0.22	92	1.76	57.16	26.06	7.26	14.79	
Feed.Calcula	100.01	0.72	0.60	901	8.46	100.00	100.00	100.00	100.00	
Feed.Assay	100.00	0.58	1.10	1.655	9.04					

Table (7) Test 7

Products	Weight %	Grades				Recovery				Note: Recovery time of Conc. min
		Sn %	Pb %	Ag g/t	Zn %	Sn %	Pb %	Ag %	Zn %	
PbS-Conc.1	2.51	1.17	9.28	10.640	7.92	2.82	33.69	28.99	2.07	0~1
PbS-Conc.2	2.49	1.31	4.88	10.000	11.68	3.13	17.57	27.03	3.02	1~3
PbS-Conc.3	1.63	1.17	3.41	6.432	12.14	1.83	8.04	11.38	2.06	3~7
PbS-Conc.4	1.93	0.90	2.08	2.200	8.80	1.67	5.81	4.61	1.77	7~15
ZnS-Conc.1	4.50	0.58	0.27	924	45.24	2.50	1.78	4.51	21.16	0~1
ZnS-Conc.2	3.10	0.68	0.27	783	41.93	2.02	1.21	2.63	13.51	1~3
ZnS-Conc.3	3.65	0.81	0.37	703	38.22	2.84	1.95	2.79	14.50	3~7
ZnS-Conc.4	3.74	0.90	0.43	790	21.51	3.23	2.33	3.21	8.36	7~15
Tailing	76.46	1.09	0.25	179	4.22	79.96	27.65	14.86	33.54	
Feed.Calcula	100.01	1.04	0.69	921	9.62	100.00	100.00	100.00	100.00	
Feed.Assay	100.00	0.58	1.10	1.655	9.04					

Table (8) Test 8

Products	Weight %	Grades				Recovery				Note: Recovery time of Conc. min
		Sn %	Pb %	Ag g/t	Zn %	Sn %	Pb %	Ag %	Zn %	
PbS-Conc.1	0.87	0.85	20.45	2.427	22.04	1.08	14.31	3.14	2.07	0~1
PbS-Conc.2	0.69	0.87	27.44	3.960	17.84	0.88	15.23	4.07	1.33	1~3
PbS-Conc.3	1.89	1.83	23.98	3.333	13.03	5.07	36.48	9.38	2.66	3~7
PbS-Conc.4	0.24	2.24	20.53	5.234	12.38	0.79	3.96	1.87	0.32	7~15
ZnS-Conc.1	4.58	0.61	0.59	5.562	46.52	4.09	2.17	37.91	23.06	0~1
ZnS-Conc.2	3.84	0.68	0.60	1.276	43.18	3.83	1.85	7.29	17.94	1~3
ZnS-Conc.3	3.81	0.87	0.99	1.390	38.90	4.86	3.03	7.88	16.04	3~7
ZnS-Conc.4	2.53	1.12	1.30	1.531	33.33	4.15	2.65	5.76	9.12	7~15
Tailing	81.55	0.63	0.31	187	3.11	75.26	20.33	22.70	27.44	
Feed.Calcula	100.00	0.68	1.24	672	9.24	100.00	100.00	100.00	100.00	
Feed.Assay	100.00	0.58	1.10	1.655	9.04					

Annex Table 5 Particle Size of Liberation for Cerro Rico Ore : μ m

Ore body	Deposit	Mineral	Liberation degree					Composition of minerals
			25%	50%	75%	90%	95%	
Oxide ore body	Cerro Rico :Bolívar 6	Casiterita:SnO ₂	650	350	110	95	70	Casiterita:SnO ₂ , Cuarzo:SiO ₂ .
		Cuarzo:SiO ₂	1,600	500	120	105	90	Alunita:K-Al-CO ₃ , Limonite: α -FeO(OH),
		Limonite: α -FeO(OH)	1,100	450	115	100	80	Pirita:FeS, Otros Oxidos
		Oxidos	1,700	600	125	110	100	
Sulfide ore body	Cerro Rico :Sample No.123	Casiterita:SnO ₂	850	350	140	70	55	Casiterita:SnO ₂ , Esfalerita:ZnS, Pirita:FeS.
		Esfalerita:ZnS	>2,000	1,600	450	90	70	Alunita:K-Al-CO ₃ , Cuarzo:SiO ₂ , Arsenopirita:FeAsS,
		Pirita:FeS	1,600	500	145	90	70	Calcopirita:CuFeS ₂ , Melnicovita:
Cerro Rico :Sample No.117	Cerro Rico :Sample No.117	Casiterita:SnO ₂	1,400	600	120	100	80	Casiterita:SnO ₂ , Esfalerita:ZnS, Pirita:FeS,
		Esfalerita:ZnS	2,400	1,500	800	220	80	Cuarzo:SiO ₂ , Alunita:K-Al-CO ₃ , Calcopirita:CuFeS ₂ ,
		Pirita:FeS	2,200	1,200	500	350	110	Estannina:Cu ₂ FeSnS ₄ , Calcosina:Cu ₂ S, Covelina:CuS,
Cerro Rico :Sample No.118	Cerro Rico :Sample No.118	Casiterita:SnO ₂	950	550	400	110	100	Bornita: Cu ₅ FeS ₄ ,
		Esfalerita:ZnS	2,000	1,400	800	300	150	Casiterita:SnO ₂ , Esfalerita: ZnS, Pirita: FeS,
		Pirita:FeS	2,100	1,900	1,000	210	110	Galema:PhS, Estannina:Cu ₂ FeSnS ₄ , Cuarzo:SiO ₂ , Sonsita:Calcosina:Cu ₂ S, Alunita: K-Al-CO ₃

Note Source: Table of liberation degree and particle size of liberation in Tesis de Grado: Metodos Opticos Para Determinar Grado de Liberacion: Facultad de Ingenieria Minera Geologia: U.A.T.F.-J

Annex Table 6 Results of Sn Flotation Tests

Table (1) Test 1

Products	Weight %	Grades						Recovery					
		Sn %	Pb %	Ag g/t	Zn %	Ca %	Fe %	Sn %	Pb %	Ag %	Zn %	Ca %	Fe %
Slime	3.89	1.51	0.02	40	0.12	0.10	3.88	3.45	3.08	0.97	5.08	1.48	0.92
Sulfide Minerals	35.81	1.73	0.03	398	0.15	0.66	41.40	36.39	42.57	88.04	58.50	90.02	90.88
Tailing R-T	55.82	1.73	0.02	16	0.04	0.03	1.43	56.73	44.23	5.54	24.32	6.38	4.89
Middling Cl-1	0.96	1.22	0.15	432	0.64	0.02	32.36	0.69	5.71	2.57	6.69	0.07	1.90
Middling Cl-2	0.57	1.41	0.04	212	0.25	0.01	11.70	0.47	0.90	0.75	1.55	0.02	0.41
Sn-Conc. Cl-2	2.95	1.31	0.03	116	0.12	0.18	5.53	2.27	3.51	2.12	3.86	2.02	1.00
Feed Calculation	100.00	1.70	0.03	161	0.09	0.26	16.31	100.00	100.00	100.00	100.00	100.00	100.00
Feed Assay	100.00	1.76	0.03	148	0.15	0.00	16.30						

Table (2) Test 2

Products	Weight %	Grades						Recovery					
		Sn %	Pb %	Ag g/t	Zn %	Ca %	Fe %	Sn %	Pb %	Ag %	Zn %	Ca %	Fe %
Slime	4.73	1.61	0.02	44	0.11	0.04	3.83	4.46	7.09	1.33	5.82	1.35	1.19
Sulfide Minerals	33.67	1.76	0.03	379	0.16	0.39	40.48	34.71	75.75	81.65	60.30	93.51	89.08
Tailing R-T	56.38	1.73	0.00	28	0.03	0.01	1.32	57.13	0.00	10.10	18.93	2.01	4.86
Middling Cl-1	3.18	1.27	0.01	108	0.11	0.01	5.02	2.37	2.38	2.20	3.92	0.23	1.04
Middling Cl-2	1.07	1.36	0.03	312	0.44	0.01	19.99	0.85	2.41	2.14	5.27	0.08	1.40
Sn-Conc. Cl-2	0.97	0.85	0.17	416	0.53	0.41	38.26	0.48	12.37	2.58	5.75	2.83	2.42
Feed Calculation	100.00	1.71	0.01	156	0.09	0.14	15.30	100.00	100.00	100.00	100.00	100.00	100.00
Feed Assay	100.00	1.76	0.03	148	0.15	0.00	16.30						

Table (3) Test 3

Products	Weight %	Grades						Recovery					
		Sn %	Pb %	Ag g/t	Zn %	Ca %	Fe %	Sn %	Pb %	Ag %	Zn %	Ca %	Fe %
Slime	3.55	1.46	0.00	60	0.08	0.05	4.74	2.95	0.00	1.35	3.46	0.13	1.05
Sulfide Minerals	33.99	1.93	0.00	391	0.15	3.89	42.01	37.33	0.00	84.42	62.19	98.90	89.29
Tailing R-T	56.72	1.73	0.01	20	0.03	0.00	1.32	55.83	78.27	7.20	20.75	0.13	4.68
Middling Cl-1	3.70	1.15	0.01	88	0.10	0.05	4.74	2.42	5.11	2.07	4.51	0.14	1.10
Middling Cl-2	1.12	1.61	0.05	283	0.32	0.05	22.34	1.02	7.69	2.00	4.35	0.04	1.56
Sn-Conc. Cl-2	0.92	0.85	0.07	503	0.42	0.96	40.18	0.45	8.93	2.95	4.73	0.66	2.32
Feed Calculation	100.00	1.76	0.01	157	0.08	1.34	15.99	100.00	100.00	100.00	100.00	100.00	100.00
Feed Assay	100.00	1.76	0.03	148	0.15	0.00	16.30						

Table (4) Test 4

Products	Weight %	Grades						Recovery					
		Sn %	Pb %	Ag g/t	Zn %	Ca %	Fe %	Sn %	Pb %	Ag %	Zn %	Ca %	Fe %
Slime	5.59	1.61	0.01	60	0.10	0.00	4.84	5.33	7.20	2.37	1.25	2.04	1.64
Sulfide Minerals	35.38	1.66	0.01	328	0.13	0.01	41.42	34.75	45.55	81.90	10.24	42.95	88.63
Tailing R-T	51.73	1.80	0.00	20	0.58	0.00	0.99	55.10	0.00	7.30	66.82	18.84	3.10
Middling Cl-1	4.62	1.07	0.01	64	1.93	0.05	3.98	2.93	5.95	2.09	19.87	28.06	1.11
Middling Cl-2	0.69	0.98	0.06	204	0.75	0.01	11.87	0.40	5.31	0.99	1.15	0.83	0.49
Sn-Conc. Cl-2	2.00	1.27	0.14	380	0.15	0.03	41.63	1.50	36.00	5.36	0.67	7.27	5.03
Feed Calculation	100.00	1.69	0.01	142	0.45	0.01	16.53	100.00	100.00	100.00	100.00	100.00	100.00
Feed Assay	100.00	1.76	0.03	148	0.15	0.00	16.30						

Table (5) Test 5

Products	Weight %	Grades						Recovery					
		Sn %	Pb %	Ag g t	Zn %	Ca %	Fe %	Sn %	Pb %	Ag %	Zn %	Ca %	Fe %
Slime	6.16	1.49	0.04	128	0.07	0.00	4.25	5.45	5.72	4.74	5.91	0.36	1.67
Sulfide Minerals	35.04	1.95	0.06	439	0.14	0.01	40.69	40.56	48.76	92.37	67.23	25.37	91.11
Tailing R-T	54.23	1.59	0.03	0	0.02	0.00	1.16	51.18	37.73	0.00	14.86	31.41	4.02
Middling CI-1	2.49	1.34	0.07	108	0.15	0.09	5.91	1.98	4.04	1.61	5.11	32.42	0.94
Middling CI-2	1.10	0.61	0.04	116	0.10	0.03	1.14	0.40	1.02	0.77	1.51	4.78	0.08
Sn-Conc. CI-2	0.98	0.76	0.12	88	0.40	0.04	34.79	0.44	2.72	0.52	5.37	5.67	2.18
Feed Calculation	100.00	1.68	0.04	167	0.07	0.01	15.65	100.00	100.00	100.00	100.00	100.00	100.00
Feed Assay	100.00	1.76	0.03	148	0.15	0.00	16.30						

Table (6) Test 6

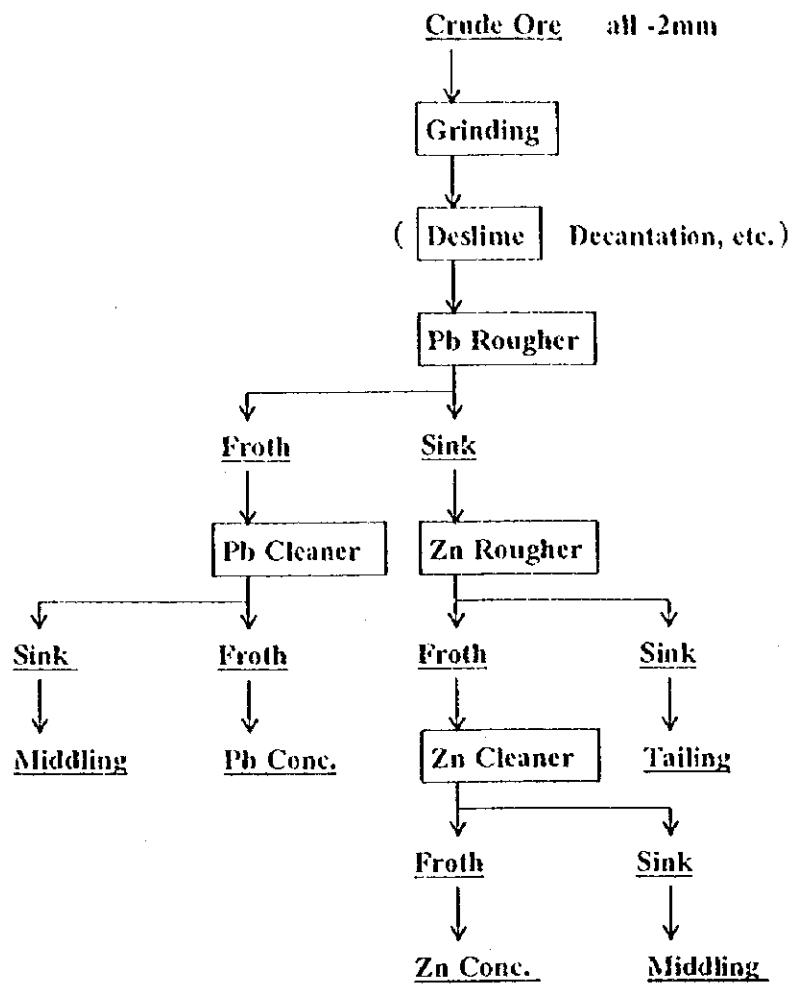
Products	Weight %	Grades						Recovery					
		Sn %	Pb %	Ag g t	Zn %	Ca %	Fe %	Sn %	Pb %	Ag %	Zn %	Ca %	Fe %
Slime	4.66	1.53	0.04	20	0.08	0.00	38.63	4.08	7.90	0.61	3.40	0.00	10.55
Sulfide Minerals	36.15	1.88	0.04	400	0.16	0.02	39.17	38.93	61.33	94.01	52.79	73.95	83.02
Tailing R-T	53.62	1.66	0.01	0	0.02	0.00	0.66	50.99	22.74	0.00	9.79	21.94	2.08
Middling CI-1	3.25	1.59	0.02	56	0.10	0.00	4.53	2.96	2.75	1.18	2.96	1.33	0.86
Middling CI-2	0.39	1.66	0.07	108	0.18	0.02	7.40	0.37	1.16	0.27	0.64	0.80	0.17
Sn-Conc. CI-2	1.94	2.41	0.05	312	1.72	0.01	29.26	2.67	4.11	3.93	30.41	1.98	3.32
Feed Calculation	100.00	1.75	0.02	154	0.11	0.01	17.05	100.00	100.00	100.00	100.00	100.00	100.00
Feed Assay	100.00	1.76	0.03	148	0.15	0.00	16.30						

Table (7) Test 7

Products	Weight %	Grades						Recovery					
		Sn %	Pb %	Ag g t	Zn %	Ca %	Fe %	Sn %	Pb %	Ag %	Zn %	Ca %	Fe %
Slime	3.74	1.51	0.01	0	0.08	0.00	3.70	3.42	1.23	0.00	3.71	0.00	0.90
Sulfide Minerals	35.08	1.95	0.03	412	0.16	0.02	39.75	41.49	34.68	96.25	69.61	62.80	90.55
Tailing R-T	56.90	0.98	0.03	0	0.03	0.01	1.60	33.82	56.25	0.00	21.17	35.65	5.91
Middling CI-1	2.93	7.02	0.05	52	0.05	0.00	4.09	12.47	4.83	1.01	1.82	0.52	0.78
Middling CI-2	0.36	9.36	0.06	88	0.08	0.00	5.69	2.02	0.70	0.21	0.35	0.13	0.13
Sn-Conc. CI-2	1.00	11.17	0.07	379	0.27	0.01	26.72	6.77	2.31	2.52	3.35	0.90	1.74
Feed Calculation	100.00	1.65	0.03	150	0.08	0.01	15.40	100.00	100.00	100.00	100.00	100.00	100.00
Feed Assay	100.00	1.76	0.03	148	0.15	0.00	16.30						

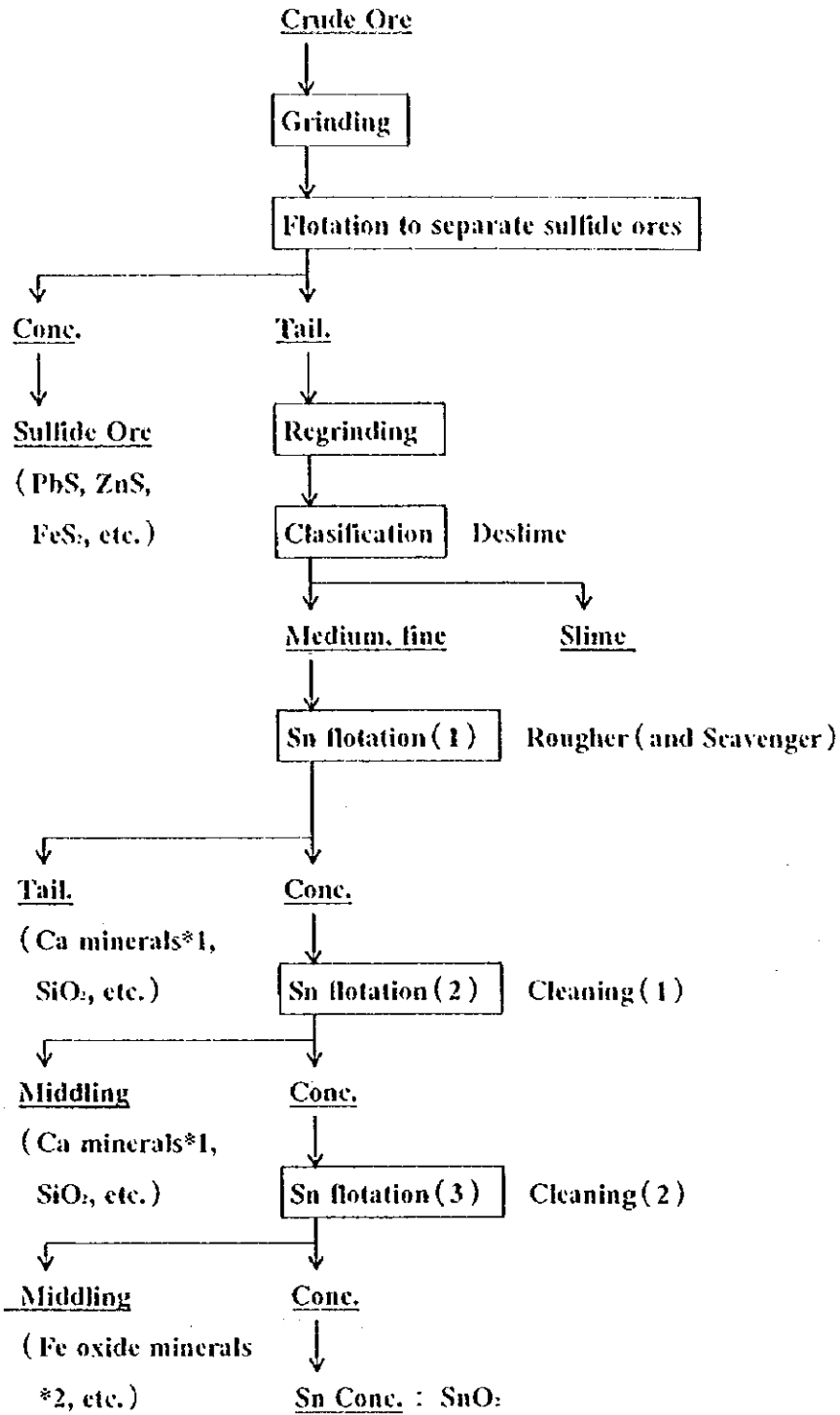
Table (8) Test 8

Products	Weight %	Grades						Recovery					
		Sn %	Pb %	Ag g t	Zn %	Ca %	Fe %	Sn %	Pb %	Ag %	Zn %	Ca %	Fe %
Slime	2.93	1.57	0.04	12	0.09	0.00	3.53	2.89	2.66	0.24	3.24	0.00	0.66
Sulfide Minerals	36.54	1.90	0.05	392	0.15	0.02	38.53	40.61	41.33	95.76	67.34	75.98	90.26
Tailing R-T	54.54	1.51	0.04	0	0.03	0.00	1.60	48.18	49.35	0.00	20.10	22.68	5.59
Middling CI-1	3.92	2.63	0.05	46	0.06	0.00	4.14	6.03	4.43	1.21	2.89	0.00	1.04
Middling CI-2	1.30	2.05	0.04	116	0.23	0.00	15.19	1.56	1.18	1.01	3.68	0.54	1.27
Sn-Conc. CI-2	0.77	2.05	0.06	348	0.29	0.01	23.73	0.92	1.04	1.79	2.74	0.80	1.17
Feed Calculation	100.00	1.71	0.04	149	0.08	0.01	15.60	100.00	100.00	100.00	100.00	100.00	100.00
Feed Assay	100.00	1.76	0.03	143	0.15	0.00	16.30						



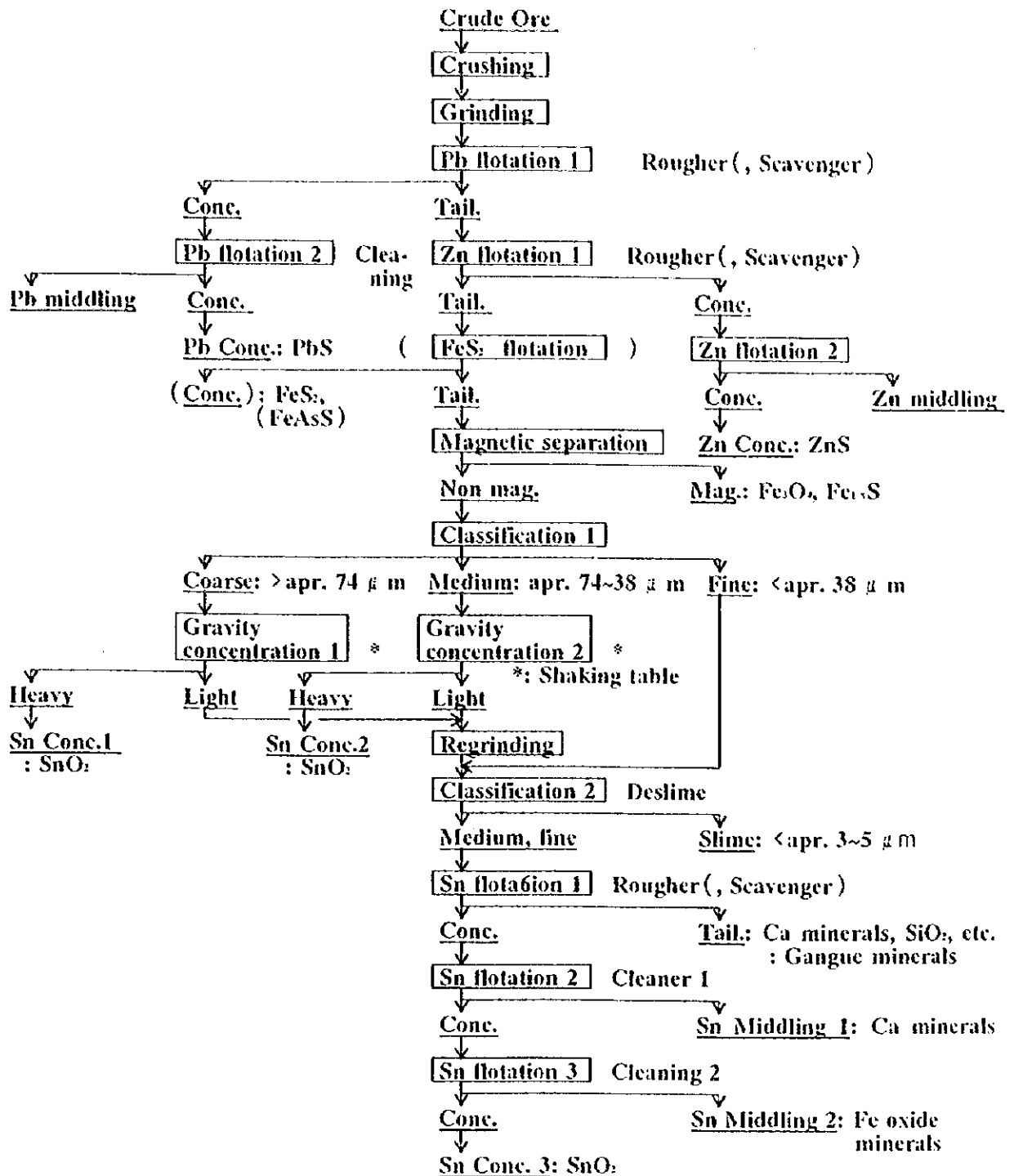
Annex Figure 1 Flow-sheet of Pb, Zn Flotation Tests

Note Deslime process will be omitted in the tests.



Annex Figure 2 Flow-sheet of Sn Flotation

Note *1: CaF, etc., *2: FeCO₃, etc.



Annex Figure 3 Flow-sheet of Confirmation Tests
: Recovery of PbS, ZnS (both with Ag) and SnO₂

ANNEX 7

Financial and economic analysis results

FINANCIAL STATEMENTS
ON
BASE CASE A

- Production and Sales Plan
- Income Statements
- Long-term Loan Repayment Schedule
- Financial Internal Rate of Return

*** MINE POLLUTION ASSESSMENT PROJECT, POTOSI ***
 PRODUCTION AND SALES PLAN
 - BASE CASE A -
 (US\$. 1000)

YEAR	-1	0	1	2	3	4	5	6	7	8
WITH RATED CAPACITY (ORE, TPY)	0.	0.	438000.	438000.	438000.	438000.	438000.	438000.	438000.	438000.
CAPACITY UTILIZATION	0.0	0.0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
PRODUCTION (ORE, TPY)	0.	0.	438000.	438000.	438000.	438000.	438000.	438000.	438000.	438000.
WITH RATED CAPACITY (PB, TPY)	0.	0.	7950.	7950.	7950.	7950.	7950.	7950.	7950.	7950.
CAPACITY UTILIZATION	0.0	0.0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
SALES VOLUME (PB, TPY)	0.	0.	7950.	7950.	7950.	7950.	7950.	7950.	7950.	7950.
UNIT SALES PRICE (\$/T)	0.0	0.0	0.5780	0.5780	0.5780	0.5780	0.5780	0.5780	0.5780	0.5780
SALES REVENUE	0.	0.	4595.	4595.	4595.	4595.	4595.	4595.	4595.	4595.
WITH RATED CAPACITY (ZN, TPY)	0.	0.	83460.	83460.	83460.	83460.	83460.	83460.	83460.	83460.
CAPACITY UTILIZATION	0.0	0.0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
SALES VOLUME (ZN, TPY)	0.	0.	83460.	83460.	83460.	83460.	83460.	83460.	83460.	83460.
UNIT SALES PRICE (\$/T)	0.0	0.0	0.2460	0.2460	0.2460	0.2460	0.2460	0.2460	0.2460	0.2460
SALES REVENUE	0.	0.	20531.	20531.	20531.	20531.	20531.	20531.	20531.	20531.
WITH RATED CAPACITY (SN, TPY)	0.	0.	2510.	2510.	2510.	2510.	2510.	2510.	2510.	2510.
CAPACITY UTILIZATION	0.0	0.0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
SALES VOLUME (SN, TPY)	0.	0.	2510.	2510.	2510.	2510.	2510.	2510.	2510.	2510.
UNIT SALES PRICE (\$/T)	0.0	0.0	0.1030	0.1030	0.1030	0.1030	0.1030	0.1030	0.1030	0.1030
SALES REVENUE	0.	0.	259.	259.	259.	259.	259.	259.	259.	259.
W/O RATED CAPACITY (ORE, TPY)	0.	0.	438000.	438000.	438000.	438000.	438000.	438000.	438000.	438000.
CAPACITY UTILIZATION	0.0	0.0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
PRODUCTION (ORE, TPY)	0.	0.	438000.	438000.	438000.	438000.	438000.	438000.	438000.	438000.
W/O RATED CAPACITY (PB, TPY)	0.	0.	7460.	7460.	7460.	7460.	7460.	7460.	7460.	7460.
CAPACITY UTILIZATION	0.0	0.0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
SALES VOLUME (PB, TPY)	0.	0.	7460.	7460.	7460.	7460.	7460.	7460.	7460.	7460.
UNIT SALES PRICE (\$/T)	0.0	0.0	-0.5780	-0.5780	-0.5780	-0.5780	-0.5780	-0.5780	-0.5780	-0.5780
SALES REVENUE	0.	0.	-4312.	-4312.	-4312.	-4312.	-4312.	-4312.	-4312.	-4312.
W/O RATED CAPACITY (ZN, TPY)	0.	0.	81020.	81020.	81020.	81020.	81020.	81020.	81020.	81020.
CAPACITY UTILIZATION	0.0	0.0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
SALES VOLUME (ZN, TPY)	0.	0.	81020.	81020.	81020.	81020.	81020.	81020.	81020.	81020.
UNIT SALES PRICE (\$/T)	0.0	0.0	-0.2460	-0.2460	-0.2460	-0.2460	-0.2460	-0.2460	-0.2460	-0.2460
SALES REVENUE	0.	0.	-19931.	-19931.	-19931.	-19931.	-19931.	-19931.	-19931.	-19931.
TOTAL SALES REVENUE	0.	0.	1142.	1142.	1142.	1142.	1142.	1142.	1142.	1142.
SALES TAX ON REVENUE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

*** MINE POLLUTION ASSESSMENT PROJECT. POTOSI ***
 PRODUCTION AND SALES PLAN
 - BASE CASE A -
 (US\$, 1000)

YEAR	9	10	11	12	13	14	15
WITH RATED CAPACITY (ORE, TPY)	438000.	438000.	438000.	438000.	438000.	438000.	438000.
CAPACITY UTILIZATION	1.000	1.000	1.000	1.000	1.000	1.000	1.000
PRODUCTION (ORE, TPY)	438000.	438000.	438000.	438000.	438000.	438000.	438000.
WITH RATED CAPACITY (PB, TPY)	7950.	7950.	7950.	7950.	7950.	7950.	7950.
CAPACITY UTILIZATION	1.000	1.000	1.000	1.000	1.000	1.000	1.000
SALES VOLUME (PB, TPY)	7950.	7950.	7950.	7950.	7950.	7950.	7950.
UNIT SALES PRICE (\$/T)	0.5780	0.5780	0.5780	0.5780	0.5780	0.5780	0.5780
SALES REVENUE	4595.	4595.	4595.	4595.	4595.	4595.	4595.
WITH RATED CAPACITY (ZN, TPY)	83460.	83460.	83460.	83460.	83460.	83460.	83460.
CAPACITY UTILIZATION	1.000	1.000	1.000	1.000	1.000	1.000	1.000
SALES VOLUME (ZN, TPY)	83460.	83460.	83460.	83460.	83460.	83460.	83460.
UNIT SALES PRICE (\$/T)	0.2460	0.2460	0.2460	0.2460	0.2460	0.2460	0.2460
SALES REVENUE	20531.	20531.	20531.	20531.	20531.	20531.	20531.
WITH RATED CAPACITY (SN, TPY)	2510.	2510.	2510.	2510.	2510.	2510.	2510.
CAPACITY UTILIZATION	1.000	1.000	1.000	1.000	1.000	1.000	1.000
SALES VOLUME (SN, TPY)	2510.	2510.	2510.	2510.	2510.	2510.	2510.
UNIT SALES PRICE (\$/T)	0.1030	0.1030	0.1030	0.1030	0.1030	0.1030	0.1030
SALES REVENUE	259.	259.	259.	259.	259.	259.	259.
W/O RATED CAPACITY (ORE, TPY)	438000.	438000.	438000.	438000.	438000.	438000.	438000.
CAPACITY UTILIZATION	1.000	1.000	1.000	1.000	1.000	1.000	1.000
PRODUCTION (ORE, TPY)	438000.	438000.	438000.	438000.	438000.	438000.	438000.
W/O RATED CAPACITY (PB, TPY)	7460.	7460.	7460.	7460.	7460.	7460.	7460.
CAPACITY UTILIZATION	1.000	1.000	1.000	1.000	1.000	1.000	1.000
SALES VOLUME (PB, TPY)	7460.	7460.	7460.	7460.	7460.	7460.	7460.
UNIT SALES PRICE (\$/T)	-0.5780	-0.5780	-0.5780	-0.5780	-0.5780	-0.5780	-0.5780
SALES REVENUE	-4312.	-4312.	-4312.	-4312.	-4312.	-4312.	-4312.
W/O RATED CAPACITY (ZN, TPY)	81020.	81020.	81020.	81020.	81020.	81020.	81020.
CAPACITY UTILIZATION	1.000	1.000	1.000	1.000	1.000	1.000	1.000
SALES VOLUME (ZN, TPY)	81020.	81020.	81020.	81020.	81020.	81020.	81020.
UNIT SALES PRICE (\$/T)	-0.2460	-0.2460	-0.2460	-0.2460	-0.2460	-0.2460	-0.2460
SALES REVENUE	-19931.	-19931.	-19931.	-19931.	-19931.	-19931.	-19931.
TOTAL SALES REVENUE	1142.	1142.	1142.	1142.	1142.	1142.	1142.
SALES TAX ON REVENUE	0.	0.	0.	0.	0.	0.	0.

*** MINE POLLUTION ASSESSMENT PROJECT, POTOSI ***
 INCOME STATEMENTS
 - BASE CASE A -
 (US\$, 1000)

YEAR	-1	0	1	2	3	4	5	6	7	8
OPERATING INCOME	0.	0.	1142.	1142.	1142.	1142.	1142.	1142.	1142.	1142.
TOTAL SALES REVENUE	0.	0.	1142.	1142.	1142.	1142.	1142.	1142.	1142.	1142.
SALES TAX ON REVENUE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
COST OF SALES	0.	0.	119.	119.	119.	119.	119.	119.	119.	119.
DIRECT COST	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
INDIRECT COST	0.	0.	-24.	-24.	-24.	-24.	-24.	-24.	-24.	-24.
DEPRECIATION AND AMORTIZATION	0.	0.	143.	143.	143.	143.	143.	143.	143.	143.
INC. IN PRODUCT INVENTORY	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
GROSS PROFIT ON SALES	0.	0.	1023.	1023.	1023.	1023.	1023.	1023.	1023.	1023.
SALES EXPENSES	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
OPERATING PROFIT	0.	0.	1023.	1023.	1023.	1023.	1023.	1023.	1023.	1023.
NON-OPERATING EXPENSES	0.	0.	129.	120.	112.	103.	94.	86.	77.	69.
INTEREST ON LONG TERM DEBT	0.	0.	129.	120.	112.	103.	94.	86.	77.	69.
INTEREST ON SHORT TERM DEBT	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
NET PROFIT OR (LOSS) BEFORE TAX	0.	0.	894.	902.	911.	920.	928.	937.	945.	954.
INCOME TAX	0.	0.	223.	226.	228.	230.	232.	234.	236.	238.
NET PROFIT OR (LOSS) AFTER TAX	0.	0.	670.	677.	683.	690.	696.	703.	709.	715.
DIVIDENDS	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
RETAINED EARNINGS	0.	0.	670.	677.	683.	690.	696.	703.	709.	715.

*** MINE POLLUTION ASSESSMENT PROJECT, POTOSI ***
 INCOME STATEMENTS
 -- BASE CASE A --
 (US\$, 1000)

YEAR	9	10	11	12	13	14	15
OPERATING INCOME	1142.	1142.	1142.	1142.	1142.	1142.	1142.
TOTAL SALES REVENUE	1142.	1142.	1142.	1142.	1142.	1142.	1142.
SALES TAX ON REVENUE	0.	0.	0.	0.	0.	0.	0.
COST OF SALES	119.	119.	119.	119.	119.	119.	119.
DIRECT COST	0.	0.	0.	0.	0.	0.	0.
INDIRECT COST	-24.	-24.	-24.	-24.	-24.	-24.	-24.
DEPRECIATION AND AMORTIZATION	143.	143.	143.	143.	143.	143.	143.
INC. IN PRODUCT INVENTORY	0.	0.	0.	0.	0.	0.	0.
GROSS PROFIT ON SALES	1023.	1023.	1023.	1023.	1023.	1023.	1023.
SALES EXPENSES	0.	0.	0.	0.	0.	0.	0.
OPERATING PROFIT	1023.	1023.	1023.	1023.	1023.	1023.	1023.
NON-OPERATING EXPENSES	60.	52.	43.	34.	26.	17.	9.
INTEREST ON LONG TERM DEBT	60.	52.	43.	34.	26.	17.	9.
INTEREST ON SHORT TERM DEBT	0.	0.	0.	0.	0.	0.	0.
NET PROFIT OR (LOSS) BEFORE TAX	962.	971.	930.	988.	997.	1005.	1014.
INCOME TAX	241.	243.	245.	247.	249.	251.	253.
NET PROFIT OR (LOSS) AFTER TAX	722.	728.	735.	741.	748.	754.	760.
DIVIDENDS	0.	0.	0.	0.	0.	0.	0.
RETAINED EARNINGS	722.	728.	735.	741.	748.	754.	760.

*** MINE POLLUTION ASSESSMENT PROJECT. POTOSI ***
 LONG TERM DEBT
 -- BASE CASE A -- (US\$, 1000)

AMOUNT OF DEBT	2146.				
INTEREST RATE	6.000 PER CENT/YEAR				
REPAYMENT	15 YEAR-EQUAL-INSTALLMENT-REPAYMENT (ANNUAL REPAYMENT)				
YEAR	SER.NO	PRINCIPAL	INTEREST	DEBT SERVICE	BALANCE AFT. PAYMENT
-1	1	0.	0.	0.	1073.
0	2	0.	0.	0.	2146.
1	3	143.	129.	272.	2003.
2	4	143.	120.	263.	1860.
3	5	143.	112.	255.	1717.
4	6	143.	103.	246.	1574.
5	7	143.	94.	237.	1431.
6	8	143.	86.	229.	1288.
7	9	143.	77.	220.	1145.
8	10	143.	69.	212.	1001.
9	11	143.	60.	203.	858.
10	12	143.	52.	195.	715.
11	13	143.	43.	186.	572.
12	14	143.	34.	177.	429.
13	15	143.	25.	169.	286.
14	16	143.	17.	160.	143.
15	17	143.	9.	152.	0.
TOTAL		2146.	1030.	3176.	0.

*** MINE POLLUTION ASSESSMENT PROJECT, POTOSI ***
 FINANCIAL RATE OF RETURN ('98 FIXED PRICE)
 - BASE CASE A - (US\$, 1000)

YEAR	FIXED CAPITAL EXPEND.	CHANGE IN (1) WORKING CAPITAL	(1) GROSS CAPITAL EXPENDTR	OPERATING PROFIT	DEPRECIATN (2) CASH IN-FLOW	(2) GROSS CASH IN-FLOW	(3) INCOME TAX	(4) BFR-TAX NET IN-FLOW (2)-(1)	(5) AFT-TAX NET IN-FLOW (4)-(3)
-1	1008.	0.	1008.	0.	0.	0.	0.	-1008.	-1008.
0	1008.	0.	1008.	0.	0.	0.	0.	-1008.	-1008.
1	0.	0.	0.	1023.	143.	1166.	223.	1166.	942.
2	0.	0.	0.	1023.	143.	1166.	226.	1166.	940.
3	0.	0.	0.	1023.	143.	1166.	228.	1166.	938.
4	0.	0.	0.	1023.	143.	1166.	230.	1166.	935.
5	0.	0.	0.	1023.	143.	1166.	232.	1166.	934.
6	0.	0.	0.	1023.	143.	1166.	234.	1166.	931.
7	0.	0.	0.	1023.	143.	1166.	236.	1166.	929.
8	0.	0.	0.	1023.	143.	1166.	238.	1166.	927.
9	0.	0.	0.	1023.	143.	1166.	241.	1166.	925.
10	0.	0.	0.	1023.	143.	1166.	243.	1166.	923.
11	0.	0.	0.	1023.	143.	1166.	245.	1166.	921.
12	0.	0.	0.	1023.	143.	1166.	247.	1166.	919.
13	0.	0.	0.	1023.	143.	1166.	249.	1166.	916.
14	0.	0.	0.	1023.	143.	1166.	251.	1166.	914.
15	-0.	0.	-0.	1023.	143.	1166.	253.	1166.	912.
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	2016.	0.	2016.	15339.	2146.	17485.	3577.	15469.	11891.

INTERNAL RATE OF RETURN

ON (4) BFR-TAX NET IN-FLOW (2)-(1) 46.72 PER CENT

ON (5) AFT-TAX NET IN-FLOW (4)-(3) 38.66 PER CENT

FINANCIAL STATEMENTS
ON
BASE CASE B

- Production and Sales Plan
- Income Statements
- Long-term Loan Repayment Schedule
- Financial Internal Rate of Return

*** NINE POLLUTION ASSESSMENT PROJECT, POTOMI ***
 PRODUCTION AND SALES PLAN
 - BASE CASE B -
 (US\$, 1000)

YEAR	-1	0	1	2	3	4	5	6	7	8
WITH RATED CAPACITY (ORE, TPY)	0.0	0.0	438000.	438000.	438000.	438000.	438000.	438000.	438000.	438000.
CAPACITY UTILIZATION	0.0	0.0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
PRODUCTION (ORE, TPY)	0.0	0.0	438000.	438000.	438000.	438000.	438000.	438000.	438000.	438000.
WITH RATED CAPACITY (PB, TPY)	0.0	0.0	7950.	7950.	7950.	7950.	7950.	7950.	7950.	7950.
CAPACITY UTILIZATION	0.0	0.0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
SALES VOLUME (PB, TPY)	0.0	0.0	7950.	7950.	7950.	7950.	7950.	7950.	7950.	7950.
UNIT SALES PRICE (\$/T)	0.0	0.0	0.5780	0.5780	0.5780	0.5780	0.5780	0.5780	0.5780	0.5780
SALES REVENUE	0.0	0.0	4595.	4595.	4595.	4595.	4595.	4595.	4595.	4595.
WITH RATED CAPACITY (ZN, TPY)	0.0	0.0	83460.	83460.	83460.	83460.	83460.	83460.	83460.	83460.
CAPACITY UTILIZATION	0.0	0.0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
SALES VOLUME (ZN, TPY)	0.0	0.0	83460.	83460.	83460.	83460.	83460.	83460.	83460.	83460.
UNIT SALES PRICE (\$/T)	0.0	0.0	0.2460	0.2460	0.2460	0.2460	0.2460	0.2460	0.2460	0.2460
SALES REVENUE	0.0	0.0	20531.	20531.	20531.	20531.	20531.	20531.	20531.	20531.
WITH RATED CAPACITY (SN, TPY)	0.0	0.0	10820.	10820.	10820.	10820.	10820.	10820.	10820.	10820.
CAPACITY UTILIZATION	0.0	0.0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
SALES VOLUME (SN, TPY)	0.0	0.0	10820.	10820.	10820.	10820.	10820.	10820.	10820.	10820.
UNIT SALES PRICE (\$/T)	0.0	0.0	0.1030	0.1030	0.1030	0.1030	0.1030	0.1030	0.1030	0.1030
SALES REVENUE	0.0	0.0	1114.	1114.	1114.	1114.	1114.	1114.	1114.	1114.
W/O RATED CAPACITY (ORE, TPY)	0.0	0.0	438000.	438000.	438000.	438000.	438000.	438000.	438000.	438000.
CAPACITY UTILIZATION	0.0	0.0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
PRODUCTION (ORE, TPY)	0.0	0.0	438000.	438000.	438000.	438000.	438000.	438000.	438000.	438000.
W/O RATED CAPACITY (PB, TPY)	0.0	0.0	7460.	7460.	7460.	7460.	7460.	7460.	7460.	7460.
CAPACITY UTILIZATION	0.0	0.0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
SALES VOLUME (PB, TPY)	0.0	0.0	7460.	7460.	7460.	7460.	7460.	7460.	7460.	7460.
UNIT SALES PRICE (\$/T)	0.0	0.0	-0.5780	-0.5780	-0.5780	-0.5780	-0.5780	-0.5780	-0.5780	-0.5780
SALES REVENUE	0.0	0.0	-4312.	-4312.	-4312.	-4312.	-4312.	-4312.	-4312.	-4312.
W/O RATED CAPACITY (ZN, TPY)	0.0	0.0	81020.	81020.	81020.	81020.	81020.	81020.	81020.	81020.
CAPACITY UTILIZATION	0.0	0.0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
SALES VOLUME (ZN, TPY)	0.0	0.0	81020.	81020.	81020.	81020.	81020.	81020.	81020.	81020.
UNIT SALES PRICE (\$/T)	0.0	0.0	-0.2460	-0.2460	-0.2460	-0.2460	-0.2460	-0.2460	-0.2460	-0.2460
SALES REVENUE	0.0	0.0	-19931.	-19931.	-19931.	-19931.	-19931.	-19931.	-19931.	-19931.
TOTAL SALES REVENUE	0.0	0.0	1998.	1998.	1998.	1998.	1998.	1998.	1998.	1998.
SALES TAX ON REVENUE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

*** MINE POLLUTION ASSESSMENT PROJECT, POTOSI ***
 PRODUCTION AND SALES PLAN
 - BASE CASE B -
 (US\$, 1000)

YEAR	9	10	11	12	13	14	15
WITH RATED CAPACITY (ORE, TPY)	438000.	438000.	438000.	438000.	438000.	438000.	438000.
CAPACITY UTILIZATION	1.000	1.000	1.000	1.000	1.000	1.000	1.000
PRODUCTION (ORE, TPY)	438000.	438000.	438000.	438000.	438000.	438000.	438000.
WITH RATED CAPACITY (PB, TPY)	7950.	7950.	7950.	7950.	7950.	7950.	7950.
CAPACITY UTILIZATION	1.000	1.000	1.000	1.000	1.000	1.000	1.000
SALES VOLUME (PB, TPY)	7950.	7950.	7950.	7950.	7950.	7950.	7950.
UNIT SALES PRICE (\$/T)	0.5780	0.5780	0.5780	0.5780	0.5780	0.5780	0.5780
SALES REVENUE	4595.	4595.	4595.	4595.	4595.	4595.	4595.
WITH RATED CAPACITY (ZN, TPY)	83460.	83460.	83460.	83460.	83460.	83460.	83460.
CAPACITY UTILIZATION	1.000	1.000	1.000	1.000	1.000	1.000	1.000
SALES VOLUME (ZN, TPY)	83460.	83460.	83460.	83460.	83460.	83460.	83460.
UNIT SALES PRICE (\$/T)	0.2460	0.2460	0.2460	0.2460	0.2460	0.2460	0.2460
SALES REVENUE	20531.	20531.	20531.	20531.	20531.	20531.	20531.
WITH RATED CAPACITY (SN, TPY)	10820.	10820.	10820.	10820.	10820.	10820.	10820.
CAPACITY UTILIZATION	1.000	1.000	1.000	1.000	1.000	1.000	1.000
SALES VOLUME (SN, TPY)	10820.	10820.	10820.	10820.	10820.	10820.	10820.
UNIT SALES PRICE (\$/T)	0.1030	0.1030	0.1030	0.1030	0.1030	0.1030	0.1030
SALES REVENUE	1114.	1114.	1114.	1114.	1114.	1114.	1114.
W/O RATED CAPACITY (ORE, TPY)	438000.	438000.	438000.	438000.	438000.	438000.	438000.
CAPACITY UTILIZATION	1.000	1.000	1.000	1.000	1.000	1.000	1.000
PRODUCTION (ORE, TPY)	438000.	438000.	438000.	438000.	438000.	438000.	438000.
W/O RATED CAPACITY (PB, TPY)	7460.	7460.	7460.	7460.	7460.	7460.	7460.
CAPACITY UTILIZATION	1.000	1.000	1.000	1.000	1.000	1.000	1.000
SALES VOLUME (PB, TPY)	7460.	7460.	7460.	7460.	7460.	7460.	7460.
UNIT SALES PRICE (\$/T)	-0.5780	-0.5780	-0.5780	-0.5780	-0.5780	-0.5780	-0.5780
SALES REVENUE	-4312.	-4312.	-4312.	-4312.	-4312.	-4312.	-4312.
W/O RATED CAPACITY (ZN, TPY)	81020.	81020.	81020.	81020.	81020.	81020.	81020.
CAPACITY UTILIZATION	1.000	1.000	1.000	1.000	1.000	1.000	1.000
SALES VOLUME (ZN, TPY)	81020.	81020.	81020.	81020.	81020.	81020.	81020.
UNIT SALES PRICE (\$/T)	-0.2460	-0.2460	-0.2460	-0.2460	-0.2460	-0.2460	-0.2460
SALES REVENUE	-19931.	-19931.	-19931.	-19931.	-19931.	-19931.	-19931.
TOTAL SALES REVENUE	1998.	1998.	1998.	1998.	1998.	1998.	1998.
SALES TAX ON REVENUE	0.	0.	0.	0.	0.	0.	0.

*** MINE POLLUTION ASSESSMENT PROJECT, POTOSI ***
 INCOME STATEMENTS
 - BASE CASE B -
 (US\$, 1000)

YEAR	-1	0	1	2	3	4	5	6	7	8
OPERATING INCOME	0.	0.	1998.	1998.	1998.	1998.	1998.	1998.	1998.	1998.
TOTAL SALES REVENUE	0.	0.	1998.	1998.	1998.	1998.	1998.	1998.	1998.	1998.
SALES TAX ON REVENUE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
COST OF SALES	0.	0.	2090.	2090.	2090.	2090.	2090.	2090.	2090.	2090.
DIRECT COST	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
INDIRECT COST	0.	0.	-63.	-63.	-63.	-63.	-63.	-63.	-63.	-63.
DEPRECIATION AND AMORTIZATION	0.	0.	2153.	2153.	2153.	2153.	2153.	2153.	2153.	2153.
INC. IN PRODUCT INVENTORY	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
GROSS PROFIT ON SALES	0.	0.	-92.	-92.	-92.	-92.	-92.	-92.	-92.	-92.
SALES EXPENSES	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
OPERATING PROFIT	0.	0.	-92.	-92.	-92.	-92.	-92.	-92.	-92.	-92.
NON-OPERATING EXPENSES	0.	0.	1938.	2012.	2093.	2182.	2281.	2389.	2508.	2638.
INTEREST ON LONG TERM DEBT	0.	0.	1938.	1809.	1680.	1550.	1421.	1292.	1163.	1034.
INTEREST ON SHORT TERM DEBT	0.	0.	0.	203.	413.	632.	859.	1097.	1345.	1605.
NET PROFIT OR (LOSS) BEFORE TAX	0.	0.	-2030.	-2104.	-2185.	-2275.	-2373.	-2481.	-2600.	-2731.
INCOME TAX	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
NET PROFIT OR (LOSS) AFTER TAX	0.	0.	-2030.	-2104.	-2185.	-2275.	-2373.	-2481.	-2600.	-2731.
DIVIDENDS	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
RETAINED EARNINGS	0.	0.	-2030.	-2104.	-2185.	-2275.	-2373.	-2481.	-2600.	-2731.

*** MINE POLLUTION ASSESSMENT PROJECT, POTOSI ***
 INCOME STATEMENTS
 - BASE CASE B -
 (US\$, 1000)

YEAR	9	10	11	12	13	14	15
OPERATING INCOME	1998.	1998.	1998.	1998.	1998.	1998.	1998.
TOTAL SALES REVENUE	0.	0.	0.	0.	0.	0.	0.
SALES TAX ON REVENUE	0.	0.	0.	0.	0.	0.	0.
COST OF SALES	2090.	2090.	2090.	2090.	2090.	2090.	2090.
DIRECT COST	0.	0.	0.	0.	0.	0.	0.
INDIRECT COST	-63.	-63.	-63.	-63.	-63.	-63.	-63.
DEPRECIATION AND AMORTIZATION INC. IN PRODUCT INVENTORY	2153.	2153.	2153.	2153.	2153.	2153.	2153.
GROSS PROFIT ON SALES	-92.	-92.	-92.	-92.	-92.	-92.	-92.
SALES EXPENSES	0.	0.	0.	0.	0.	0.	0.
OPERATING PROFIT	-92.	-92.	-92.	-92.	-92.	-92.	-92.
NON-OPERATING EXPENSES	2782.	2941.	3115.	3306.	3517.	3749.	4004.
INTEREST ON LONG TERM DEBT	904.	775.	646.	517.	388.	258.	129.
INTEREST ON SHORT TERM DEBT	1878.	2165.	2469.	2789.	3129.	3490.	3874.
NET PROFIT OR (LOSS) BEFORE TAX	-2875.	-3033.	-3207.	-3399.	-3609.	-3841.	-4096.
INCOME TAX	0.	0.	0.	0.	0.	0.	0.
NET PROFIT OR (LOSS) AFTER TAX	-2875.	-3033.	-3207.	-3399.	-3609.	-3841.	-4096.
DIVIDENDS	0.	0.	0.	0.	0.	0.	0.
RETAINED EARNINGS	-2875.	-3033.	-3207.	-3399.	-3609.	-3841.	-4096.

*** MINE POLLUTION ASSESSMENT PROJECT, POTOSI ***
 LONG TERM DEBT
 -- BASE CASE B -- (US\$, 1000)

YEAR	SER.NO	PRINCIPAL	INTEREST	DEBT SERVICE	BALANCE AFT. PAYMENT
-1	1	0.	0.	0.	16150.
0	2	0.	0.	0.	32300.
1	3	2153.	1938.	4091.	30147.
2	4	2153.	1809.	3962.	27993.
3	5	2153.	1680.	3833.	25840.
4	6	2153.	1550.	3704.	23687.
5	7	2153.	1421.	3575.	21533.
6	8	2153.	1292.	3445.	19380.
7	9	2153.	1163.	3316.	17227.
8	10	2153.	1034.	3187.	15073.
9	11	2153.	904.	3058.	12920.
10	12	2153.	775.	2929.	10767.
11	13	2153.	646.	2799.	8613.
12	14	2153.	517.	2670.	6460.
13	15	2153.	388.	2541.	4307.
14	16	2153.	258.	2412.	2153.
15	17	2153.	129.	2283.	0.
TOTAL		32300.	15504.	47804.	0.

*** MINE POLLUTION ASSESSMENT PROJECT, POTOSI ***
 FINANCIAL RATE OF RETURN ('98 FIXED PRICE)
 - BASE CASE B - (US\$, 1000)

YEAR	FIXED CAPITAL EXPEND.	CHANGE IN (1) WORKING CAPITAL	GROSS CAPITAL EXPENDITURE	OPERATING PROFIT	DEPRECIATION	GROSS CASH IN-FLOW	(3) INCOME TAX	(4) BFR-TAX NET IN-FLOW	(5) AFT-TAX NET IN-FLOW
							(2)-(1)	(2)-(1)	(4)-(3)
-1	15175.	0.	15175.	0.	0.	0.	-15175.	-15175.	-15175.
0	15175.	0.	15175.	0.	0.	0.	-15175.	-15175.	-15175.
1	0.	0.	0.	-92.	2153.	2061.	2061.	2061.	2061.
2	0.	0.	0.	-92.	2153.	2061.	2061.	2061.	2061.
3	0.	0.	0.	-92.	2153.	2061.	2061.	2061.	2061.
4	0.	0.	0.	-92.	2153.	2061.	2061.	2061.	2061.
5	0.	0.	0.	-92.	2153.	2061.	2061.	2061.	2061.
6	0.	0.	0.	-92.	2153.	2061.	2061.	2061.	2061.
7	0.	0.	0.	-92.	2153.	2061.	2061.	2061.	2061.
8	0.	0.	0.	-92.	2153.	2061.	2061.	2061.	2061.
9	0.	0.	0.	-92.	2153.	2061.	2061.	2061.	2061.
10	0.	0.	0.	-92.	2153.	2061.	2061.	2061.	2061.
11	0.	0.	0.	-92.	2153.	2061.	2061.	2061.	2061.
12	0.	0.	0.	-92.	2153.	2061.	2061.	2061.	2061.
13	0.	0.	0.	-92.	2153.	2061.	2061.	2061.	2061.
14	0.	0.	0.	-92.	2153.	2061.	2061.	2061.	2061.
15	-0.	0.	-0.	-92.	2153.	2061.	2061.	2061.	2061.
	30350.	0.	30350.	-1385.	32300.	30915.	0.	565.	565.

INTERNAL RATE OF RETURN

ON (4) BFR-TAX NET IN-FLOW (2)-(1) 0.22 PER CENT

ON (5) AFT-TAX NET IN-FLOW (4)-(3) 0.22 PER CENT

FINANCIAL STATEMENTS
ON
BASE CASE C

- Production and Sales Plan
- Income Statements
- Long-term Loan Repayment Schedule
- Financial Internal Rate of Return

*** NINE POLLUTION ASSESSMENT PROJECT. POTOS: ***
 PRODUCTION AND SALES PLAN
 -- BASE CASE C --
 (US\$, 1000)

YEAR	-1	0	1	2	3	4	5	6	7	8
RATED CAPACITY (ORE, TPY)	0.	0.	495000.	495000.	495000.	495000.	495000.	495000.	495000.	495000.
CAPACITY UTILIZATION	0.0	0.0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
PRODUCTION (ORE, TPY)	0.	0.	495000.	495000.	495000.	495000.	495000.	495000.	495000.	495000.
RATED CAPACITY (PB, TPY)	0.0	0.0	7920.	7920.	7920.	7920.	7920.	7920.	7920.	7920.
CAPACITY UTILIZATION	0.0	0.0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
PRODUCTION (PB, TPY)	0.	0.	7920.	7920.	7920.	7920.	7920.	7920.	7920.	7920.
INCREASE IN INVENTORY	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
SALES VOLUME (PB, TPY)	0.0	0.0	0.7050	0.7050	0.7050	0.7050	0.7050	0.7050	0.7050	0.7050
UNIT SALES PRICE (\$/T)			5584.	5584.	5584.	5584.	5584.	5584.	5584.	5584.
SALES REVENUE	0.	0.	5584.	5584.	5584.	5584.	5584.	5584.	5584.	5584.
RATED CAPACITY (ZN, TPY)	0.	0.	86630.	86630.	86630.	86630.	86630.	86630.	86630.	86630.
CAPACITY UTILIZATION	0.0	0.0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
PRODUCTION (ZN, TPY)	0.	0.	86630.	86630.	86630.	86630.	86630.	86630.	86630.	86630.
INCREASE IN INVENTORY	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
SALES VOLUME (ZN, TPY)	0.0	0.0	0.2600	0.2600	0.2600	0.2600	0.2600	0.2600	0.2600	0.2600
UNIT SALES PRICE (\$/T)			22524.	22524.	22524.	22524.	22524.	22524.	22524.	22524.
SALES REVENUE	0.	0.	22524.	22524.	22524.	22524.	22524.	22524.	22524.	22524.
RATED CAPACITY (SN, TPY)	0.	0.	10820.	10820.	10820.	10820.	10820.	10820.	10820.	10820.
CAPACITY UTILIZATION	0.0	0.0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
PRODUCTION (SN, TPY)	0.	0.	10820.	10820.	10820.	10820.	10820.	10820.	10820.	10820.
INCREASE IN INVENTORY	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
SALES VOLUME (SN, TPY)	0.0	0.0	0.1030	0.1030	0.1030	0.1030	0.1030	0.1030	0.1030	0.1030
UNIT SALES PRICE (\$/T)			1114.	1114.	1114.	1114.	1114.	1114.	1114.	1114.
SALES REVENUE	0.	0.	1114.	1114.	1114.	1114.	1114.	1114.	1114.	1114.
TOTAL SALES REVENUE	0.	0.	29222.	29222.	29222.	29222.	29222.	29222.	29222.	29222.
SALES TAX ON REVENUE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

*** NINE POLLUTION ASSESSMENT PROJECT, POTOSI ***
 PRODUCTION AND SALES PLAN
 - BASE CASE C -
 (US\$, 1000)

YEAR	9	10	11	12	13	14	15
RATED CAPACITY (ORE, TPY)	495000.	495000.	495000.	495000.	495000.	495000.	495000.
CAPACITY UTILIZATION	1.000	1.000	1.000	1.000	1.000	1.000	1.000
PRODUCTION (ORE, TPY)	495000.	495000.	495000.	495000.	495000.	495000.	495000.
RATED CAPACITY (PB, TPY)	7920.	7920.	7920.	7920.	7920.	7920.	7920.
CAPACITY UTILIZATION	1.000	1.000	1.000	1.000	1.000	1.000	1.000
PRODUCTION (PB, TPY)	7920.	7920.	7920.	7920.	7920.	7920.	7920.
INCREASE IN INVENTORY	0.	0.	0.	0.	0.	0.	0.
SALES VOLUME (PB, TPY)	7920.	7920.	7920.	7920.	7920.	7920.	7920.
UNIT SALES PRICE (\$/T)	0.7050	0.7050	0.7050	0.7050	0.7050	0.7050	0.7050
SALES REVENUE	5584.	5584.	5584.	5584.	5584.	5584.	5584.
RATED CAPACITY (ZN, TPY)	86630.	86630.	86630.	86630.	86630.	86630.	86630.
CAPACITY UTILIZATION	1.000	1.000	1.000	1.000	1.000	1.000	1.000
PRODUCTION (ZN, TPY)	86630.	86630.	86630.	86630.	86630.	86630.	86630.
INCREASE IN INVENTORY	0.	0.	0.	0.	0.	0.	0.
SALES VOLUME (ZN, TPY)	86630.	86630.	86630.	86630.	86630.	86630.	86630.
UNIT SALES PRICE (\$/T)	0.2600	0.2600	0.2600	0.2600	0.2600	0.2600	0.2600
SALES REVENUE	22524.	22524.	22524.	22524.	22524.	22524.	22524.
RATED CAPACITY (SN, TPY)	10820.	10820.	10820.	10820.	10820.	10820.	10820.
CAPACITY UTILIZATION	1.000	1.000	1.000	1.000	1.000	1.000	1.000
PRODUCTION (SN, TPY)	10820.	10820.	10820.	10820.	10820.	10820.	10820.
INCREASE IN INVENTORY	0.	0.	0.	0.	0.	0.	0.
SALES VOLUME (SN, TPY)	10820.	10820.	10820.	10820.	10820.	10820.	10820.
UNIT SALES PRICE (\$/T)	0.1030	0.1030	0.1030	0.1030	0.1030	0.1030	0.1030
SALES REVENUE	1114.	1114.	1114.	1114.	1114.	1114.	1114.
TOTAL SALES REVENUE	29222.	29222.	29222.	29222.	29222.	29222.	29222.
SALES TAX ON REVENUE	0.	0.	0.	0.	0.	0.	0.

*** MINE POLLUTION ASSESSMENT PROJECT, POTOSI ***
 INCOME STATEMENTS
 - BASE CASE C -
 (US\$, 1000)

YEAR	-1	0	1	2	3	4	5	6	7	8
OPERATING INCOME	0.	0.	29222.	29222.	29222.	29222.	29222.	29222.	29222.	29222.
TOTAL SALES REVENUE	0.	0.	29222.	29222.	29222.	29222.	29222.	29222.	29222.	29222.
SALES TAX ON REVENUE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
COST OF SALES	0.	0.	24083.	24083.	24083.	24083.	24083.	24083.	24083.	24083.
DIRECT COST	0.	0.	17424.	17424.	17424.	17424.	17424.	17424.	17424.	17424.
INDIRECT COST	0.	0.	3211.	3211.	3211.	3211.	3211.	3211.	3211.	3211.
DEPRECIATION AND AMORTIZATION	0.	0.	3448.	3448.	3448.	3448.	3448.	3448.	3448.	3448.
INC. IN PRODUCT INVENTORY	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
GROSS PROFIT ON SALES	0.	0.	5139.	5139.	5139.	5139.	5139.	5139.	5139.	5139.
SALES EXPENSES	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
OPERATING PROFIT	0.	0.	5139.	5139.	5139.	5139.	5139.	5139.	5139.	5139.
NON-OPERATING EXPENSES	0.	0.	3103.	2896.	2689.	2483.	2276.	2069.	1862.	1655.
INTEREST ON LONG TERM DEBT	0.	0.	3103.	2896.	2689.	2483.	2276.	2069.	1862.	1655.
INTEREST ON SHORT TERM DEBT	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
NET PROFIT OR (LOSS) BEFORE TAX	0.	0.	2036.	2243.	2450.	2657.	2863.	3070.	3277.	3484.
INCOME TAX	0.	0.	509.	561.	612.	664.	716.	768.	819.	871.
NET PROFIT OR (LOSS) AFTER TAX	0.	0.	1527.	1682.	1837.	1992.	2148.	2303.	2458.	2613.
DIVIDENDS	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
RETAINED EARNINGS	0.	0.	1527.	1682.	1837.	1992.	2148.	2303.	2458.	2613.

*** MINE POLLUTION ASSESSMENT PROJECT, POTOSI ***
 INCOME STATEMENTS
 - BASE CASE C - (US\$, 1000)

YEAR	9	10	11	12	13	14	15
OPERATING INCOME	29222.	29222.	29222.	29222.	29222.	29222.	29222.
TOTAL SALES REVENUE	29222.	29222.	29222.	29222.	29222.	29222.	29222.
SALES TAX ON REVENUE	0.	0.	0.	0.	0.	0.	0.
COST OF SALES	24083.	24083.	24083.	24083.	24083.	24083.	24083.
DIRECT COST	17424.	17424.	17424.	17424.	17424.	17424.	17424.
INDIRECT COST	3211.	3211.	3211.	3211.	3211.	3211.	3211.
DEPRECIATION AND AMORTIZATION	3448.	3448.	3448.	3448.	3448.	3448.	3448.
INC. IN PRODUCT INVENTORY	0.	0.	0.	0.	0.	0.	0.
GROSS PROFIT ON SALES	5139.	5139.	5139.	5139.	5139.	5139.	5139.
SALES EXPENSES	0.	0.	0.	0.	0.	0.	0.
OPERATING PROFIT	5139.	5139.	5139.	5139.	5139.	5139.	5139.
NON-OPERATING EXPENSES	1448.	1241.	1034.	828.	621.	414.	207.
INTEREST ON LONG TERM DEBT	1448.	1241.	1034.	828.	621.	414.	207.
INTEREST ON SHORT TERM DEBT	0.	0.	0.	0.	0.	0.	0.
NET PROFIT OR (LOSS) BEFORE TAX	3691.	3898.	4105.	4312.	4518.	4725.	4932.
INCOME TAX	923.	974.	1026.	1078.	1130.	1181.	1233.
NET PROFIT OR (LOSS) AFTER TAX	2768.	2923.	3079.	3234.	3389.	3544.	3699.
DIVIDENDS	0.	0.	0.	0.	0.	0.	0.
RETAINED EARNINGS	2768.	2923.	3079.	3234.	3389.	3544.	3699.

*** NINE POLLUTION ASSESSMENT PROJECT, POTOSI ***
 LONG TERM DEBT
 - BASE CASE C -
 (US\$. 1000)

AMOUNT OF DEBT	51720.				
INTEREST RATE	6.000 PER CENT/YEAR				
REPAYMENT	15 YEAR-EQUAL-INSTALLMENT-REPAYMENT (ANNUAL REPAYMENT)				
YEAR	SER. NO	PRINCIPAL	INTEREST	DEBT SERVICE	BALANCE AFT. PAYMENT
-1	1	0.	0.	0.	25860.
0	2	0.	0.	0.	51720.
1	3	3448.	3103.	6551.	48272.
2	4	3448.	2896.	6344.	44824.
3	5	3448.	2689.	6137.	41376.
4	6	3448.	2483.	5931.	37928.
5	7	3448.	2276.	5724.	34480.
6	8	3448.	2069.	5517.	31032.
7	9	3448.	1862.	5310.	27584.
8	10	3448.	1655.	5103.	24136.
9	11	3448.	1448.	4896.	20688.
10	12	3448.	1241.	4689.	17240.
11	13	3448.	1034.	4482.	13792.
12	14	3448.	828.	4276.	10344.
13	15	3448.	621.	4069.	6896.
14	16	3448.	414.	3862.	3448.
15	17	3448.	207.	3655.	0.
TOTAL		51720.	24826.	76546.	0.

*** MINE POLLUTION ASSESSMENT PROJECT, POTOSI ***
 FINANCIAL RATE OF RETURN ('98 FIXED PRICE)
 -- BASE CASE C --
 (US\$, 1000)

YEAR	FIXED CAPITAL EXPEND.	CHANGE IN WORKING CAPITAL	(1) GROSS CAPITAL EXPENDTR	OPERATING PROFIT	DEPRECIATN	(2) GROSS CASH IN-FLOW	(3) INCOME TAX	(4) BFR-TAX NET IN-FLOW (2)-(1)	(5) AFT-TAX NET IN-FLOW (4)-(3)
-1	24295.	0.	24295.	0.	0.	0.	0.	-24295.	-24295.
0	24295.	0.	24295.	0.	0.	0.	0.	-24295.	-24295.
1	0.	0.	0.	5139.	3448.	8587.	509.	8587.	8078.
2	0.	0.	0.	5139.	3448.	8587.	561.	8587.	8026.
3	0.	0.	0.	5139.	3448.	8587.	612.	8587.	7975.
4	0.	0.	0.	5139.	3448.	8587.	664.	8587.	7923.
5	0.	0.	0.	5139.	3448.	8587.	716.	8587.	7871.
6	0.	0.	0.	5139.	3448.	8587.	768.	8587.	7820.
7	0.	0.	0.	5139.	3448.	8587.	819.	8587.	7768.
8	0.	0.	0.	5139.	3448.	8587.	871.	8587.	7716.
9	0.	0.	0.	5139.	3448.	8587.	923.	8587.	7664.
10	0.	0.	0.	5139.	3448.	8587.	974.	8587.	7613.
11	0.	0.	0.	5139.	3448.	8587.	1026.	8587.	7561.
12	0.	0.	0.	5139.	3448.	8587.	1078.	8587.	7509.
13	0.	0.	0.	5139.	3448.	8587.	1130.	8587.	7457.
14	0.	0.	0.	5139.	3448.	8587.	1181.	8587.	7406.
15	-0.	0.	-0.	5139.	3448.	8587.	1233.	8587.	7354.
	48590.		48590.	77087.	51720.	128806.	13065.	80217.	67151.

INTERNAL RATE OF RETURN

ON (4) BFR-TAX NET IN-FLOW (2)-(1) 14.26 PER CENT

ON (5) AFT-TAX NET IN-FLOW (4)-(3) 12.59 PER CENT

ANNEX

ECONOMIC ANALYSIS CALCULATION SHEET
ON
OVERALL CASE AND SINGLE CASE

- Economic Internal Rate of Return

*** MINE POLLUTION ASSESSMENT PROJECT, POTOSI ***
 ECONOMIC RATE OF RETURN 1 ('98 FIXED PRICE)
 - OVERALL CASE C -
 (US\$ 1000)

YEAR	FIXED CAPITAL EXPEND.	OPERATING COST	(1) TOTAL CASH OUT-FLOW	DIRECT BENEFIT	INDIRECT BENEFIT	(2) TOTAL CASH IN-FLOW	(3) INCOME TAX	(4) BFR-TAX NET IN-FLOW (2)-(1)	(5) AFT-TAX NET IN-FLOW (4)-(3)
-1	24295.	0.	24295.	0.	0.	0.	0.	-24295.	-24295.
0	24295.	0.	24295.	0.	0.	0.	0.	-24295.	-24295.
1	0.	20635.	20635.	29222.	0.	29222.	0.	8587.	8587.
2	0.	20635.	20635.	29222.	0.	29222.	0.	8587.	8587.
3	0.	20635.	20635.	29222.	0.	29222.	0.	8587.	8587.
4	0.	20635.	20635.	29222.	0.	29222.	0.	8587.	8587.
5	0.	20635.	20635.	29222.	0.	29222.	0.	8587.	8587.
6	0.	20635.	20635.	29222.	0.	29222.	0.	8587.	8587.
7	0.	20635.	20635.	29222.	0.	29222.	0.	8587.	8587.
8	0.	20635.	20635.	29222.	0.	29222.	0.	8587.	8587.
9	0.	20635.	20635.	29222.	0.	29222.	0.	8587.	8587.
10	0.	20635.	20635.	29222.	0.	29222.	0.	8587.	8587.
11	0.	20635.	20635.	29222.	0.	29222.	0.	8587.	8587.
12	0.	20635.	20635.	29222.	0.	29222.	0.	8587.	8587.
13	0.	20635.	20635.	29222.	0.	29222.	0.	8587.	8587.
14	0.	20635.	20635.	29222.	0.	29222.	0.	8587.	8587.
15	-0.	20635.	20635.	29222.	0.	29222.	0.	8587.	8587.
	48590.	309521.	358110.	438327.	0.	438327.	0.	80217.	80217.

INTERNAL RATE OF RETURN

ON (4) BFR-TAX NET IN-FLOW (2)-(1) 14.26 PER CENT

ON (5) AFT-TAX NET IN-FLOW (4)-(3) 14.26 PER CENT

*** NINE POLLUTION ASSESSMENT PROJECT, POTOSI ***
 ECONOMIC RATE OF RETURN 1 ('98 FIXED PRICE)
 - OVERALL CASE D-1 -
 (US\$, 1000)

YEAR	FIXED CAPITAL EXPEND.	OPERATING COST	(1) TOTAL CASH OUT-FLOW	DIRECT BENEFIT	INDIRECT BENEFIT	(2) TOTAL CASH IN-FLOW	(3) INCOME TAX	(4) BFR-TAX NET IN-FLOW (2)-(1)	(5) AFT-TAX NET IN-FLOW (4)-(3)
-1	27545.	0.	27545.	0.	0.	0.	0.	-27545.	-27545.
0	27545.	0.	27545.	0.	0.	0.	0.	-27545.	-27545.
1	0.	21285.	21285.	29222.	1571.	30793.	0.	9508.	9508.
2	0.	21285.	21285.	29222.	1571.	30793.	0.	9508.	9508.
3	0.	21285.	21285.	29222.	1571.	30793.	0.	9508.	9508.
4	0.	21285.	21285.	29222.	1571.	30793.	0.	9508.	9508.
5	0.	21285.	21285.	29222.	1571.	30793.	0.	9508.	9508.
6	0.	21285.	21285.	29222.	1571.	30793.	0.	9508.	9508.
7	0.	21285.	21285.	29222.	1571.	30793.	0.	9508.	9508.
8	0.	21285.	21285.	29222.	1571.	30793.	0.	9508.	9508.
9	0.	21285.	21285.	29222.	1571.	30793.	0.	9508.	9508.
10	0.	21285.	21285.	29222.	1571.	30793.	0.	9508.	9508.
11	0.	21285.	21285.	29222.	1571.	30793.	0.	9508.	9508.
12	0.	21285.	21285.	29222.	1571.	30793.	0.	9508.	9508.
13	0.	21285.	21285.	29222.	1571.	30793.	0.	9508.	9508.
14	0.	21285.	21285.	29222.	1571.	30793.	0.	9508.	9508.
15	0.	21285.	21285.	29222.	1571.	30793.	0.	9508.	9508.
	55090.	319271.	374360.	438327.	23565.	461892.	0.	87532.	87532.

INTERNAL RATE OF RETURN

ON (4) BFR-TAX NET IN-FLOW (2)-(1) 13.83 PER CENT

ON (5) AFT-TAX NET IN-FLOW (4)-(3) 13.83 PER CENT

*** MINE POLLUTION ASSESSMENT PROJECT, POTOSI ***
 ECONOMIC RATE OF RETURN 1 ('98 FIXED PRICE)
 - OVERALL CASE D-2 - (US\$ 1000)

YEAR	FIXED CAPITAL EXPEND.	OPERATING COST	(1) TOTAL CASH OUT-FLOW	DIRECT BENEFIT	INDIRECT BENEFIT	(2) TOTAL CASH IN-FLOW	(3) INCOME TAX	(4) BFR-TAX NET IN-FLOW (2)-(1)	(5) AFT-TAX NET IN-FLOW (4)-(3)
-1	27545.	0.	27545.	0.	0.	0.	0.	-27545.	-27545.
0	27545.	0.	27545.	0.	0.	0.	0.	-27545.	-27545.
1	0.	21123.	21123.	29222.	366.	29588.	0.	8465.	8465.
2	0.	21123.	21123.	29222.	366.	29588.	0.	8465.	8465.
3	0.	21123.	21123.	29222.	366.	29588.	0.	8465.	8465.
4	0.	21123.	21123.	29222.	366.	29588.	0.	8465.	8465.
5	0.	21123.	21123.	29222.	366.	29588.	0.	8465.	8465.
6	0.	21123.	21123.	29222.	366.	29588.	0.	8465.	8465.
7	0.	21123.	21123.	29222.	366.	29588.	0.	8465.	8465.
8	0.	21123.	21123.	29222.	366.	29588.	0.	8465.	8465.
9	0.	21123.	21123.	29222.	366.	29588.	0.	8465.	8465.
10	0.	21123.	21123.	29222.	366.	29588.	0.	8465.	8465.
11	0.	21123.	21123.	29222.	366.	29588.	0.	8465.	8465.
12	0.	21123.	21123.	29222.	366.	29588.	0.	8465.	8465.
13	0.	21123.	21123.	29222.	366.	29588.	0.	8465.	8465.
14	0.	21123.	21123.	29222.	366.	29588.	0.	8465.	8465.
15	-0.	21123.	21123.	29222.	366.	29588.	0.	8465.	8465.
	55090.	316841.	371930.	438327.	5490.	443817.	0.	71887.	71887.

INTERNAL RATE OF RETURN

ON (4) BFR-TAX NET IN-FLOW (2)-(1) 11.78 PER CENT

ON (5) AFT-TAX NET IN-FLOW (4)-(3) 11.78 PER CENT

*** MINE POLLUTION ASSESSMENT PROJECT, POTOSI ***
 ECONOMIC RATE OF RETURN 1 ('98 FIXED PRICE)
 - OVERALL CASE E-1 - (US\$ 1000)

YEAR	FIXED CAPITAL EXPEND.	OPERATING COST	(1) TOTAL CASH OUT-FLOW	DIRECT BENEFIT	INDIRECT BENEFIT	(2) TOTAL CASH IN-FLOW	(3) INCOME TAX	(4) BFR-TAX NET IN-FLOW (2)-(1)	(5) AFT-TAX NET IN-FLOW (4)-(3)
-1	27545.	0.	27545.	0.	0.	0.	0.	-27545.	-27545.
0	27545.	0.	27545.	0.	0.	0.	0.	-27545.	-27545.
1	0.	21935.	21935.	29222.	5253.	34475.	0.	12540.	12540.
2	0.	21935.	21935.	29222.	5253.	34475.	0.	12540.	12540.
3	0.	21935.	21935.	29222.	5253.	34475.	0.	12540.	12540.
4	0.	21935.	21935.	29222.	5253.	34475.	0.	12540.	12540.
5	0.	21935.	21935.	29222.	5253.	34475.	0.	12540.	12540.
6	0.	21935.	21935.	29222.	5253.	34475.	0.	12540.	12540.
7	0.	21935.	21935.	29222.	5253.	34475.	0.	12540.	12540.
8	0.	21935.	21935.	29222.	5253.	34475.	0.	12540.	12540.
9	0.	21935.	21935.	29222.	5253.	34475.	0.	12540.	12540.
10	0.	21935.	21935.	29222.	5253.	34475.	0.	12540.	12540.
11	0.	21935.	21935.	29222.	5253.	34475.	0.	12540.	12540.
12	0.	21935.	21935.	29222.	5253.	34475.	0.	12540.	12540.
13	0.	21935.	21935.	29222.	5253.	34475.	0.	12540.	12540.
14	0.	21935.	21935.	29222.	5253.	34475.	0.	12540.	12540.
15	-0.	21935.	21935.	29222.	5253.	34475.	0.	12540.	12540.
	55090.	329020.	384110.	438327.	78795.	517122.	0.	133011.	133011.

INTERNAL RATE OF RETURN

ON (4) BFR-TAX NET IN-FLOW (2)-(1) 19.29 PER CENT

ON (5) AFT-TAX NET IN-FLOW (4)-(3) 19.29 PER CENT

*** MINE POLLUTION ASSESSMENT PROJECT, POTOSI ***
 ECONOMIC RATE OF RETURN 1 ('98 FIXED PRICE)
 - OVERALL CASE E-2 - (US\$ 1000)

YEAR	FIXED CAPITAL EXPEND.	OPERATING COST	(1) TOTAL CASH OUT-FLOW	DIRECT BENEFIT	INDIRECT BENEFIT	(2) TOTAL CASH IN-FLOW	(3) INCOME TAX	(4) BFR-TAX NET IN-FLOW (2)-(1)	(5) AFT-TAX NET IN-FLOW (4)-(3)
-1	27545.	0.	27545.	0.	0.	0.	0.	-27545.	-27545.
0	27545.	0.	27545.	0.	0.	0.	0.	-27545.	-27545.
1	0.	21285.	21285.	29222.	1499.	30721.	0.	9436.	9436.
2	0.	21285.	21285.	29222.	1499.	30721.	0.	9436.	9436.
3	0.	21285.	21285.	29222.	1499.	30721.	0.	9436.	9436.
4	0.	21285.	21285.	29222.	1499.	30721.	0.	9436.	9436.
5	0.	21285.	21285.	29222.	1499.	30721.	0.	9436.	9436.
6	0.	21285.	21285.	29222.	1499.	30721.	0.	9436.	9436.
7	0.	21285.	21285.	29222.	1499.	30721.	0.	9436.	9436.
8	0.	21285.	21285.	29222.	1499.	30721.	0.	9436.	9436.
9	0.	21285.	21285.	29222.	1499.	30721.	0.	9436.	9436.
10	0.	21285.	21285.	29222.	1499.	30721.	0.	9436.	9436.
11	0.	21285.	21285.	29222.	1499.	30721.	0.	9436.	9436.
12	0.	21285.	21285.	29222.	1499.	30721.	0.	9436.	9436.
13	0.	21285.	21285.	29222.	1499.	30721.	0.	9436.	9436.
14	0.	21285.	21285.	29222.	1499.	30721.	0.	9436.	9436.
15	-0.	21285.	21285.	29222.	1499.	30721.	0.	9436.	9436.
	55090.	319271.	374360.	438327.	22485.	460812.	0.	86452.	86452.

INTERNAL RATE OF RETURN

ON (4) BFR-TAX NET IN-FLOW (2)-(1) 13.69 PER CENT

ON (5) AFT-TAX NET IN-FLOW (4)-(3) 13.69 PER CENT

*** MINE POLLUTION ASSESSMENT PROJECT, POTOSI ***
 ECONOMIC RATE OF RETURN 2 ('98 FIXED PRICE)
 - SINGLE CASE D-1 -
 (US\$ 1000)

YEAR	FIXED CAPITAL EXPEND.	OPERATING (1) TOTAL CASH OUT-FLOW	BENEFIT AGRICULTURE	BENEFIT BREEDING	(2) TOTAL CASH IN-FLOW	(3) INCOME TAX	(4) BFR-TAX NET IN-FLOW (2)-(1)	(5) AFT-TAX NET IN-FLOW (4)-(3)
-1	3250.	0.	0.	0.	0.	0.	-3250.	-3250.
0	3250.	0.	0.	0.	0.	0.	-3250.	-3250.
1	0.	650.	1060.	511.	1571.	0.	921.	921.
2	0.	650.	1060.	511.	1571.	0.	921.	921.
3	0.	650.	1060.	511.	1571.	0.	921.	921.
4	0.	650.	1060.	511.	1571.	0.	921.	921.
5	0.	650.	1060.	511.	1571.	0.	921.	921.
6	0.	650.	1060.	511.	1571.	0.	921.	921.
7	0.	650.	1060.	511.	1571.	0.	921.	921.
8	0.	650.	1060.	511.	1571.	0.	921.	921.
9	0.	650.	1060.	511.	1571.	0.	921.	921.
10	0.	650.	1060.	511.	1571.	0.	921.	921.
11	0.	650.	1060.	511.	1571.	0.	921.	921.
12	0.	650.	1060.	511.	1571.	0.	921.	921.
13	0.	650.	1060.	511.	1571.	0.	921.	921.
14	0.	650.	1060.	511.	1571.	0.	921.	921.
15	-0.	650.	1060.	511.	1571.	0.	921.	921.
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	6500.	9750.	15900.	7665.	23565.	0.	7315.	7315.

INTERNAL RATE OF RETURN

ON (4) BFR-TAX NET IN-FLOW (2)-(1) 10.42 PER CENT

ON (5) AFT-TAX NET IN-FLOW (4)-(3) 10.42 PER CENT

*** MINE POLLUTION ASSESSMENT PROJECT, POTOSI ***
 ECONOMIC RATE OF RETURN 2 ('98 FIXED PRICE)
 - SINGLE CASE D-2 -
 (US\$ 1000)

YEAR	FIXED CAPITAL EXPEND.	OPERATING COST	(1) TOTAL CASH OUT-FLOW	BENEFIT AGRICULTURE	BENEFIT BREEDING	(2) TOTAL CASH IN-FLOW	INCOME TAX	(4) 8FR-TAX NET IN-FLOW (2)-(1)	(5) AFT-TAX NET IN-FLOW (4)-(3)
-1	3250.	0.	3250.	0.	0.	0.	0.	-3250.	-3250.
0	3250.	0.	3250.	0.	0.	0.	0.	-3250.	-3250.
1	0.	488.	488.	162.	204.	366.	0.	-122.	-122.
2	0.	488.	488.	162.	204.	366.	0.	-122.	-122.
3	0.	488.	488.	162.	204.	366.	0.	-122.	-122.
4	0.	488.	488.	162.	204.	366.	0.	-122.	-122.
5	0.	488.	488.	162.	204.	366.	0.	-122.	-122.
6	0.	488.	488.	162.	204.	366.	0.	-122.	-122.
7	0.	488.	488.	162.	204.	366.	0.	-122.	-122.
8	0.	488.	488.	162.	204.	366.	0.	-122.	-122.
9	0.	488.	488.	162.	204.	366.	0.	-122.	-122.
10	0.	488.	488.	162.	204.	366.	0.	-122.	-122.
11	0.	488.	488.	162.	204.	366.	0.	-122.	-122.
12	0.	488.	488.	162.	204.	366.	0.	-122.	-122.
13	0.	488.	488.	162.	204.	366.	0.	-122.	-122.
14	0.	488.	488.	162.	204.	366.	0.	-122.	-122.
15	-0.	488.	488.	162.	204.	366.	0.	-122.	-122.
	6500.	7320.	13820.	2430.	3050.	5490.	0.	-8330.	-8330.

***** IRR CAN NOT BE OBTAINED, BECAUSE OF EXTREMELY HIGH OR LOW *****

*** NINE POLLUTION ASSESSMENT PROJECT, POTOSI ***
 ECONOMIC RATE OF RETURN 2 ('98 FIXED PRICE)
 - SINGLE CASE E-1 - (US\$ 1000)

YEAR	FIXED CAPITAL EXPEND.	OPERATING (1) TOTAL CASH OUT-FLOW	BENEFIT AGRICULTURE	BENEFIT BREEDING	(2) TOTAL CASH IN-FLOW	(3) INCOME TAX	(4) BFR-TAX NET IN-FLOW	(5) AFT-TAX NET IN-FLOW
							(2)-(1)	(4)-(3)
-1	3250.	0.	0.	0.	0.	0.	-3250.	-3250.
0	3250.	0.	0.	0.	0.	0.	-3250.	-3250.
1	0.	1300.	2372.	2881.	5253.	0.	3953.	3953.
2	0.	1300.	2372.	2881.	5253.	0.	3953.	3953.
3	0.	1300.	2372.	2881.	5253.	0.	3953.	3953.
4	0.	1300.	2372.	2881.	5253.	0.	3953.	3953.
5	0.	1300.	2372.	2881.	5253.	0.	3953.	3953.
6	0.	1300.	2372.	2881.	5253.	0.	3953.	3953.
7	0.	1300.	2372.	2881.	5253.	0.	3953.	3953.
8	0.	1300.	2372.	2881.	5253.	0.	3953.	3953.
9	0.	1300.	2372.	2881.	5253.	0.	3953.	3953.
10	0.	1300.	2372.	2881.	5253.	0.	3953.	3953.
11	0.	1300.	2372.	2881.	5253.	0.	3953.	3953.
12	0.	1300.	2372.	2881.	5253.	0.	3953.	3953.
13	0.	1300.	2372.	2881.	5253.	0.	3953.	3953.
14	0.	1300.	2372.	2881.	5253.	0.	3953.	3953.
15	-0.	1300.	2372.	2881.	5253.	0.	3953.	3953.
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	6500.	19500.	35580.	43215.	78795.	0.	52795.	52795.

INTERNAL RATE OF RETURN

ON (4) BFR-TAX NET IN-FLOW (2)-(1) 48.77 PER CENT

ON (5) AFT-TAX NET IN-FLOW (4)-(3) 48.77 PER CENT

*** MINE POLLUTION ASSESSMENT PROJECT, POTOSI ***
 ECONOMIC RATE OF RETURN 2 ('98 FIXED PRICE)
 - SINGLE CASE E-2 - (US\$ 1000)

YEAR	FIXED CAPITAL EXPEND.	OPERATING COST	(1) TOTAL CASH OUT-FLOW	BENEFIT AGRICULTURE	BENEFIT BREEDING	(2) TOTAL CASH IN-FLOW	(3) INCOME TAX	(4) BFR-TAX NET IN-FLOW (2)-(1)	(5) AFT-TAX NET IN-FLOW (4)-(3)
-1	3250.	0.	3250.	0.	0.	0.	0.	-3250.	-3250.
0	3250.	0.	3250.	0.	0.	0.	0.	-3250.	-3250.
1	0.	650.	650.	347.	1152.	1499.	0.	849.	849.
2	0.	650.	650.	347.	1152.	1499.	0.	849.	849.
3	0.	650.	650.	347.	1152.	1499.	0.	849.	849.
4	0.	650.	650.	347.	1152.	1499.	0.	849.	849.
5	0.	650.	650.	347.	1152.	1499.	0.	849.	849.
6	0.	650.	650.	347.	1152.	1499.	0.	849.	849.
7	0.	650.	650.	347.	1152.	1499.	0.	849.	849.
8	0.	650.	650.	347.	1152.	1499.	0.	849.	849.
9	0.	650.	650.	347.	1152.	1499.	0.	849.	849.
10	0.	650.	650.	347.	1152.	1499.	0.	849.	849.
11	0.	650.	650.	347.	1152.	1499.	0.	849.	849.
12	0.	650.	650.	347.	1152.	1499.	0.	849.	849.
13	0.	650.	650.	347.	1152.	1499.	0.	849.	849.
14	0.	650.	650.	347.	1152.	1499.	0.	849.	849.
15	-0.	650.	650.	347.	1152.	1499.	0.	849.	849.
	6500.	9750.	16250.	5205.	17280.	22485.	0.	6235.	6235.

INTERNAL RATE OF RETURN

ON (4) BFR-TAX NET IN-FLOW (2)-(1) 9.12 PER CENT

ON (5) AFT-TAX NET IN-FLOW (4)-(3) 9.12 PER CENT