

TABLES

Table 1 - Heap Construction Summary

	Heap Leach					
	Phase I	Phase II	Phase III	Phase III-4X	Phase IV-Slot	Phase IV-VLT
Reference Sources ^A	Arimetco (var.) ETA, 1988	Arimetco (var.)	Arimetco, 1990a, 1992a	Arimetco, 1990a, 1992a	Arimetco, 1993?, 1994a,b, 1995a, 1996a	Arimetco, 1993?, 1996b, 1998a
Completion Date	1990	1990	Aug, 1992	Aug, 1995	Mar, 1996	Aug, 1998
Site Investigations	9 test pits, 2 borings	--	--	Test pits, geologic mapping, borings	Inspection, history, borings	Inspection, history, borings
Results of Site Investigations	3 ft sandy fill, alluvium below, bedrock 60ft	--	--	alluvium is appropriate for construction	Located on Anaconda W-3 leached waste, gw at 50 ft	Located on Anaconda W-3 leached waste, gw at 50 ft
Liner Testing	compaction curves, seive analyses	--	--	clay secondary liner lab and field compaction/Atterberg tests and inspection of membrane, MWMP of clay liner	clay secondary liner lab and field compaction/Atterberg tests and inspection of membrane	clay secondary liner lab and field compaction tests and inspection of membrane
Results of Liner Testing	--	--	--	4.7x10 ⁻⁸ cm/s clay permeability, 1x10 ⁻⁶ min specified, 200' grid nuclear density gauge tests passed or passed after compaction, MWMP see Appendix B	2x10 ⁻⁷ cm/s clay permeability, 1x10 ⁻⁶ min specified, 300' grid nuclear density gauge tests passed or passed after compaction	2x10 ⁻⁷ cm/s clay permeability, 1x10 ⁻⁶ min specified, 300' grid nuclear density gauge tests passed or passed after compaction
Leach Materials Testing	--	--	--	--	slope stability analysis, MWMP, Static Test	slope stability and seive analyses, MWMP, Static Test
Results of Leach Materials Testing	--	--	--	--	2.4:1 slope face recommended, See Appendix B	2.4:1 slope face recommended, See Appendix B

Notes:^A See Section 5.0 - References; var. = various Arimetco documents^B Approximate if Year only^C Based on operation records prior to 00, and SRK monitoring thereafter

Table 2 - Heap Leach Geochemical Data

Parameter	Sample Test Results (Whole Rock/ICP Analysis)				Background		
	Phase I/II (USEPA sample T-3)	Phase III South (USEPA sample T-5)	Phase IV Slot (USEPA sample T-1)	Phase IV VLT (USEPA sample T-6)	Yerington Area (Shacklette and Boerngen, 1984)	US Soils (Rose, et al., 1979)	BK-1 (EPA, 2,000)
Aluminum	12,000	9,900	9,200	17,000	70,000	n/a	5,300
Antimony	<20	<20	<20	<20	n/a	2	n/a
Arsenic	10	10	10	6	16 - 100	7.5	n/a
Barium	60	70	90	90	700	300	n/a
Beryllium	0.8	0.2	0.2	0.6	<1	0.5-4	n/a
Cadmium	<1	<1	<1	<1	n/a	0.1-0.5	0.47
Calcium	6,400	900	1,800	12,000	18,000-28,000	n/a	n/a
Chromium	6	6	6	14	30	43	n/a
Cobalt	7	2	2	23	15 - 70	10	2.8
Copper	2,400	1,000	1,100	2,500	50 - 700	15	42
Iron	13,000	22,000	26,000	18,000	30,000	n/a	5,300
Lead	8	4	5	4	30 - 700	17	2.4
Magnesium	8,400	5,600	5,200	12,000	15,000-100,000	n/a	2,500
Manganese	100	50	50	220	700	320	140
Mercury	0.18	0.06	0.55	0.30	0.082-0.13	0.056	n/d
Nickel	9	5	<10	20	15	17	6.3
Potassium	700	2,000	2,000	2,000	25,000-65,000	n/a	n/d
Selenium	3	3	5	<8	0.15-0.2	0.31	n/a
Silver	<2	<2	<2	<2	n/a	n/a	n/a
Sodium	500	100	90	900	15,000-100,000	n/a	n/a
Thallium	<100	<100	<100	<100	n/a	n/a	n/a
Vanadium	21	30	31	43	150-500	n/a	n/a
Zinc	14	16	14	22	190-3,500	36	n/a

Notes:

All values in mg/kg = ppm

n/a = value not available or not measured

Chromium is expressed as total Cr

n/d = not detected

ICP= Inductively-Coupled Plasma

Table 3 - Heap Leach Drain Down Rates, January 1998 to June 2002						
Date	Heap Leach Draindown Flow Rate, gpm					
	Phase I ^A	Phase II ^A	Phase III ^{B,C}	Phase III-4X ^C	Phase IV-Slot ^C	Phase IV-VLT ^C
Jan-98	450	450	na	na	2,200	3,300
Sep-98	na	na	na	1,620	1,615	2,150
Jun-99	na	na	320	na	900	1,030
Nov-99	na	na	na	na	945	520
Jun-00	na	na	na	10	210	175
Nov-00	na	na	0.7	12	164	129
Jun-01	na	na	1.6	5	112	70
Nov-01	na	na	0.4	4	53	40
Jun-02	<1	<1	2.8	3	34	35

Notes:

na indicates not available

^A Jan 98 flow rates based on application rate at cessation of leaching, 02 flow rates anecdotal

^B As measured at Megapond sump for 00 and later data (average rate based on pumping to VLT PLS)

^C Based on operation records prior to 00, and SRK monitoring thereafter

Table 4 - Summary of Work Plan Procedures							
Procedure	Phase I	Phase II	Phase III South	Phase III-4X	Phase IV-Slot	Phase IV-VLT	Plant Site
Material Volume Calculation by DTM	yes	yes	yes	yes	yes	yes	no
Field Screening	no	no	no	no	no	no	17 locations
Surface Reconnaissance	yes	yes	yes	yes	yes	yes	yes
Flow Rate Measurement	yes	yes	yes	yes	yes	yes	no
Solution Volume Estimation	yes	yes	yes	yes	yes	yes	yes
Component Inventory	yes	yes	yes	yes	yes	yes	yes
Sampling / Analysis	Number of Samples						
ASTM D-442 standard seive analysis	2	2	3	3	3	3	0
Static Test/Acid-Base Accounting	3	3	7	6	9	6	min. 8
Agricultural Parameters Testing	2	2	3	3	3	3	0
Whole Rock Analysis	3	3	7	6	9	6	min. 8
NDEP Profile II Solution Quality	1	1	1	1	1	1	0

Notes:

See Figure 4 and Figure 5 for Heap Leach sample locations.

See Figure 6 for Arimetco Plant screening locations.

Table 3 - Solids Sample Parameter List

Constituent (mg/L)	Method	Method Designation	Detection Limit	Units
Aluminum	ICP-OES	SW – 846 6010A	0.05	mg/kg
Antimony	ICP-MS	SW – 846 6020	1	mg/kg
Arsenic	ICP-MS	SW – 846 6020	1	mg/kg
Barium	ICP-MS	SW – 846 6020	1	mg/kg
Beryllium	ICP-OES	SW – 846 6010A	0.1	mg/kg
Boron	ICP-OES	SW – 846 6010A	0.05	mg/kg
Cadmium	ICP-MS	SW – 846 6020	1	mg/kg
Calcium	ICP-OES	SW – 846 6010A	0.1	mg/kg
Chromium	ICP-MS	SW – 846 6020	1	mg/kg
Cobalt	ICP-MS	SW – 846 6020	1	mg/kg
Copper	ICP-MS	SW – 846 6020	1	mg/kg
Iron	ICP-OES	SW – 846 6010A	0.05	mg/kg
Lead	ICP-MS	SW – 846 6020	1	mg/kg
Magnesium	ICP-OES	SW – 846 6010A	0.1	mg/kg
Manganese	ICP-MS	SW – 846 6020	1	mg/kg
Mercury	AA Cold Vapor	SW - 846 7471	0.05	mg/kg
Molybdenum	ICP-MS	SW – 846 6020	1	mg/kg
Nickel	ICP-MS	SW – 846 6020	1	mg/kg
Potassium	ICP-OES	SW – 846 6010A	0.5	mg/kg
Selenium	ICP-MS	SW – 846 6020	1	mg/kg
Silver	ICP-MS	SW – 846 6020	1	mg/kg
Sodium	ICP-OES	SW – 846 6010A	0.1	mg/kg
Thallium	ICP-MS	SW - 846 6020	1	mg/kg
Vanadium	ICP-MS	SW – 846 6020	1	mg/kg
Zinc	ICP-MS	SW – 846 6020	10	mg/kg

ICP: Inductively-Coupled Plasma

MS: Mass Spectroscopy

OES: Optical Emission Spectroscopy

Table 6 - Water Sample Analyte List

Constituent (mg/L)	Method	Method Designation	Maximum Detection Limits (mg/L unless otherwise noted)
Acidity (total)	-	SM 2320 B	1.0
Aluminum	ICP-OES	EPA 200.7	0.05
Antimony	ICP-MS	EPA 200.8	0.001
Arsenic	ICP-MS	EPA 200.8	0.001
Barium	ICP-MS	EPA 200.8	0.001
Beryllium	ICP-MS	EPA 200.8	0.001
Cadmium	ICP-MS	EPA 200.8	0.001
Calcium	ICP-OES	EPA 200.7	0.1
Chloride	Ion Chromatography	EPA 300.0	0.5
Chromium	ICP-MS	EPA 200.8	0.001
Cobalt	ICP-MS	EPA 200.8	0.001
Copper	ICP-MS	EPA 200.8	0.001
Flouride	Ion Chromatography	EPA 300.0	0.1
Gallium	ICP-MS	EPA 200.8	0.1
Iron	ICP-OES	EPA 200.7	0.05
Lead	ICP-MS	EPA 200.8	0.001
Lithium	ICP-MS	EPA 200.8	0.01
Magnesium	ICP-OES	EPA 200.7	0.1
Manganese	ICP-MS	EPA 200.8	0.001
Mercury	AA Cold Vapor	EPA 245.1	0.0002
Nickel	ICP-MS	EPA 200.8	0.001
Nitrate	Ion Chromatography	EPA 300.0	0.05
pH (+/- 0.1 units)	-	SM 4500 H+B	1
Phosphorus	ICP-MS	EPA 200.8	0.1
Potassium	ICP-OES	EPA 200.7	0.5
Selenium	ICP-MS	EPA 200.8	0.001
Silver	ICP-MS	EPA 200.8	0.01
Sodium	ICP-OES	EPA 200.7	0.1
Strontium	ICP-MS	EPA 200.8	0.001
Sulfate	Ion Chromatography	EPA 300.0	0.2
Thallium	ICP-MS	EPA 200.8	0.001
Tin	ICP-MS	EPA 200.8	0.01
Titanium	ICP-MS	EPA 200.8	0.01
Vanadium	ICP-MS	EPA 200.8	0.001
Zinc	ICP-MS	EPA 200.8	0.005

ICP: Inductively-Coupled Plasma

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