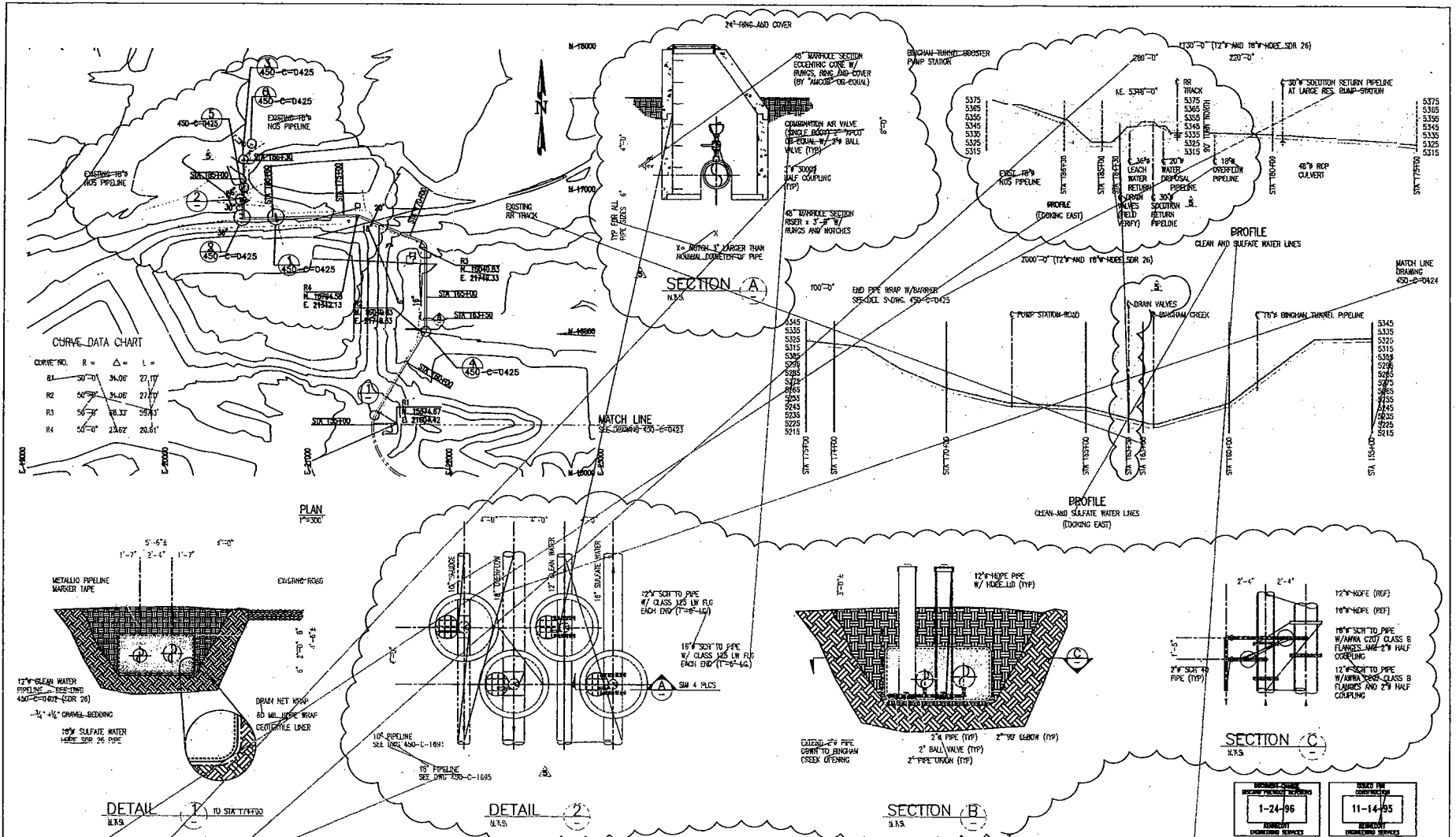


NOTE SEE DETAIL 5
 DIM. 3 1/2" ± DWG. 450-C-0441
 FOLDED ATTACHMENT

- NOTES:**
1. ALL PIPE FITTINGS, SUPPORTS & BOLTS TO BE 304 STAINLESS STEEL.
 2. ALL FITTINGS TO BE WELDED UNLESS NOTED OTHERWISE.
 3. WHERE FLANGES ARE REQUIRED THEY SHOULD BE 304 STAINLESS STEEL WITH STD. D.B. AND MOLT PATTERN FOR SPECIAL PIPE DIMENS.
 4. ALL CABINETS TO BE 1/8" THICK CARLOCK 3000 SERIES MATERIAL.
 5. ALL VALVES TO BE STAINLESS STEEL OR ACID RESISTANT.

DATE: 4/28/73
 PROJECT: ACID WATER EXTRACTION WELL #2

REVISION		BY	CHK	APP	DATE	REASON	REFERENCE DRAWINGS	NUMBER	REFERENCE DRAWINGS	NUMBER	ENGINEERING SERVICES	KENNECOTT UTAH COPPER BINGHAM CANYON WATER MANAGEMENT ACID WATER EXTRACTION WELL #2 RIPING PLAN SECTION AND DETAILS DWG. NO. 450-C-0443 REV 1
1							AW #2 WELL & PUMP HOUSE BOX AND AIR CABINETS WELL #2 CONCRETE BONSULPAGES WELL #2 DISCH. PIPING AND FITTINGS WELL #1 PIPING BONSULPAGES WELL #1 DISCHARGE PIPING WELL #2 PLAN PROFILE	450-C-0442 450-C-0441 450-C-0443 450-C-0438 450-C-0437			DATE: 4/28/73 BY: DALL CHECKED: TLH DESIGNED: RCB DRAWN: HVDO	



NO.	DATE	REVISION	BY	CHK	APP	NON	DATE	REVISION	BY	CHK	APP	NON	DATE	REVISION	BY	CHK	APP	NON	DATE	REVISION	BY	CHK	APP	NON
1	11/95	GENERAL REVISIONS	BBB	RA																				
2	11/95	GENERAL REVISIONS	BBB	RA																				
3	11/95	REVISED CONCRETE LID	BBB	RA																				
4	11/95	REVISED CONCRETE BOX AND LID	BBB	RA																				
5	11/95	ADDED 'SOR 26' TO PIPE DESCRIP	BBB	RA																				
6	11/95	ISSUE FOR CONSTRUCTION	BBB	RA																				
7	11/95	ISSUE FOR REVIEW AND APPROVAL	BBB	RA																				
8	11/95	ISSUE FOR REVIEW AND CHECKING	BBB	RA																				
9	11/95	ISSUE FOR REVIEW AND CHECKING	BBB	RA																				

ENGINEERING SERVICES		APPROVAL		DATE		SCALE		SHEET		NO. OF SHEETS		PROJECT		DATE		JOB NO.		DRAWING NO.		REV	
JC	11-95	BBB	11-95	11-95	11-95	11-95	11-95	11-95	11-95	11-95	11-95	11-95	11-95	11-95	11-95	11-95	11-95	11-95	11-95	11-95	11-95
LM	11-95	BBB	11-95	11-95	11-95	11-95	11-95	11-95	11-95	11-95	11-95	11-95	11-95	11-95	11-95	11-95	11-95	11-95	11-95	11-95	11-95
LA	11-95	RA	11-95	11-95	11-95	11-95	11-95	11-95	11-95	11-95	11-95	11-95	11-95	11-95	11-95	11-95	11-95	11-95	11-95	11-95	11-95

KENNECOTT UTAH COPPER
BINGHAM CANYON WATER MANAGEMENT
EAST SIDE SULFATE & CLEAN WATER PIPELINES
PLAN AND PROFILE (SHEET 4 OF 4)

Job No. _____
 Drawing No. **450-C-0424** REV 5

APPENDIX I

Selected Monitoring Wells

Geologic and Construction Drawings

P-248A

WELL CONSTRUCTION DATA:

WELL P248A

Location: Kennecott Coordinate; N. 15485.079 E. 17874.843
Township & Range Coordinates; SW 1/4 SE 1/4 NW 1/4
of Sec. 17 Twp. 3 S. Rge. 2 W S.L.B.M.
Elevation: Ground; 5334.80 ft. Top of casing; 5337.80 ft.
Completion Date: 3/17/86
Drilling Co: Basin & Range Drilling Inc.
Drilling Method: Cable tool.
Drilling Fluid: Water
Boring: Diameter; 9.0 in. Depth; 100.0 feet.

Surface casing: Diameter; 10.0 in. Depth; 2.0 feet
Casing: Diameter; 4.0 inch Material; Schedule 40 PVC
Depth; from ground to 80.0 feet.
Screen: Diameter; 4.0 inch Material; Schedule 40 PVC with
0.018 inch factory saw cut slots
Depth; from 80.0 to 100.0 ft.
Sand Pack: Type; #16-40 Colorado Silica Sand
Depth; from 73.4 ft. to 100.0 feet.
Bentonite Seal: Depth; from 65.9 to 73.4 ft.
Grout Seal: Type; Neat Cement with 4% Bentonite
Depth; from 0 to 73.4 ft.

ADDITIONAL DATA:

Static water level: Date; 3/18/86
Depth; 61.12 feet below top of casing.
Elevation; 5276.68 ft.
Chemistry: Date; 3/17/86
pH; 3.79 Sp. cond. 7200 micromhos/cm.

GEOLOGIC LOG: P248A

Depths (in feet)

from	to	
0.0	5.0	Gravel, silty with medium to coarse sand and trace of clay, medium to dark brown. Gravel is predominantly quartzite, white to light tan with minor amounts of andesite porphyry, light to medium gray.
5.0	15.0	Grades with more gravel and cobbles.
15.0	20.0	Grades without sand.
20.0	25.0	Gravel and silt with some fine to coarse sand, medium to dark brown.
25.0	30.0	Grades with some clay, medium to dark brown.
30.0	35.0	Silt and gravel, trace of fine sand, medium to dark brown.
35.0	40.0	Sand, fine to coarse grained, some gravel and silt, dark brown.
40.0	45.0	Gravel, some fine to coarse grained sand, silty, medium dark brown.
45.0	50.0	Grades sandier.
50.0	55.0	Grades with more silt.
55.0	60.0	Sand, fine to coarse grained, silty, some gravel and a trace of clay, medium brown.
60.0	65.0	Sand, medium to coarse grained, silty with some gravel, light yellow brown.
65.0	70.0	Grades with a trace of clay.
70.0	75.0	Grades without clay.
75.0	80.0	Gravel, sandy and clayey, few cobbles and boulders light yellow brown.
80.0	85.0	Sand, coarse grained, silty with some gravel, light yellow brown.
85.0	90.0	Grades with more silt.
90.0	95.0	Gravel, silty with medium to coarse sand, light yellow brown.
95.0	100.0	Gravel, silty, light yellow brown. Gravel is predominantly quartzite with lesser amounts of andesite porphyry and andesite, dark gray.

WELL ID: B1G951

LOCATION:

GENERAL LOCATION: East of Large Reservoir, Zone 2

KENNECOTT GRID:

NORTHING: 16322

EASTING: 21727

U.S.G.S: 1447 ft. south 38 ft. west from NE corner of section 17, T3S, R2W, SLBM

U.S. PUBLIC LAND SURVEY GRID: NE1/4 SE1/4 NE1/4 of section 17, T3S, R2W, SLBM

CADASTRAL COORDINATES: (C32) 17 ada SLBM

ELEVATIONS: (KENNECOTT)

NATURAL GROUND: 5237.24

TOP OF STEEL CASING: 5239.53

TOP OF PVC: 5238.71

TOTAL DEPTH OF COMPLETED WELL: 134.3' TOP

START DATE: 12-13-92

COMPLETION DATE: 12-15-92

DRILLING COMPANY: Longyear Exploration Drilling

DRILLING METHOD: Tubex/Casing Driven

DRILLING FLUID: Water, from 0' bgl to 285' bgl

BORING:

DIAMETER: 10 1/2" DEPTH 0-285' bgl

SURFACE CASING:

TYPE: Steel DIAMETER: 8" DEPTH: 3.0' agl - 3.0' bgl

CASING:

TYPE: SCH. 80 PVC DIAMETER: 2.5" DEPTH: 0' TOP - 94.2' TOP

SCREEN:

TYPE: SCH. 80 PVC, 0.02" slot, 1.5" long, 7 slots/inch DIAMETER: 2.5"
DEPTH: 94.2' TOP - 133.8' TOP

COMPLETION MATERIALS:

10-20 MESH SILICA SAND: 94.0' bgl - 131.7' bgl, 155' bgl - 173' bgl
SLOUGH FROM BOREHOLE: 55' bgl - 94.0' bgl, 131.7' bgl - 155' bgl
BENTONITE GROUT SEAL: 15.0' bgl - 55.0' bgl, 173' bgl - 195' bgl
PURE GOLD BENTONITE CLAY GROUT: 195' bgl - 195' bgl
CEMENT SURFACE SEAL: 0 - 15.0' bgl

WELL ID: B1G951

STATIC WATER LEVEL IN OPEN BOREHOLE: 72.80' bgl

DATE: 12-15-92

STATIC WATER LEVEL AFTER WELL COMPLETION: 54.68' TOP

DATE: 12-16-92

WATER QUALITY DURING DRILLING:

DEPTH (ft. bgl)	CONDUCTIVITY (μ mho/cm)	pH	TEMPERATURE (°F)	FLOW RATE (gpm)
90	15000	4.0	50	0.1
95	18000	3.9	56	0.2
105	16000	3.8	52	0.1
115	19000	3.9	54	2
125	11000	4.5	50	0.1
135	19000	4.2	52	0.1
145	17000	4.1	52	0.1
155	20000	4.1	52	6
165	17000	4.2	52	7
175	17000	4.2	58	7
185	15000	4.3	57	7
195	12000	4.2	57	10
205	9100	4.4	57	10
215	8200	4.4	57	20
225	2500	5.3	58	35
235	1500	7.4	60	60
245	1700	7.4	60	60
255	3000	5.7	68	65
265	1100	7.4	58	65
275	800	7.5	58	75
285	2300	6.3	58	80

WATER QUALITY AFTER WELL DEVELOPMENT:

DATE	CONDUCTIVITY (μ mho/cm)	pH	SO ₄ ²⁻ (mg/L)	Cl ⁻ (mg/L)	T.D.S. (mg/L)
12-22-92	29000	3.4	56600	246	71900
2-2-93	30000	3.09	43600	249	76300

BOREHOLE LITHOLOGY:

- 0-65': CLAYEY QUARTZITIC GRAVEL
- 65-105': SANDY QUARTZITIC GRAVEL
- 105-120': SILTY VOLCANIC GRAVEL
- 120-145': CLAYEY VOLCANIC GRAVEL
- 145-285': SILTY VOLCANIC GRAVEL

WELL ID: ECG1115 A, B & D Triple Completion Well

LOCATION:

GENERAL LOCATION: Plume

KENNECOTT GRID:

NORTHING: 14603.4

EASTING: 24662.8

U.S.G.S.: 3166 ft. south, 2898 ft. east from northwest corner of section 16, T3S, R2W, SLBM

U.S. PUBLIC LAND SURVEY GRID: NW1/4, NW1/4, SE1/4 of section 16, T3S, R2W, SLBM

CADASTRAL COORDINATES: (C32) 16 dbb SLBM

ELEVATIONS: (KENNECOTT)

NATURAL GROUND (BOLT IN CEMENT PAD): 5283.98

TOP OF STEEL CASING: 5286.42

TOP OF WELL CASING: A) 5285.14 B) 5285.06 D) 5285.32

TOTAL DEPTH OF COMPLETED WELL: A) 581' TOP B) 861' TOP C) 1078.3' TOP

START DATE: 5-20-94

COMPLETION DATE: 6-17-94

DRILLING COMPANY: Longyear Exploration Drilling

DRILLING METHOD, BIT DIAMETER/TYPE (BOREHOLE DIAMETER), AND DRILLING FLUID:

0-22.5': Conventional Single Wall, 27" tricone, mud.

22.5-320': Conventional Single Wall, 17.5" tricone, mud.

320-545': 9" Casing Driven (Tubex), 10.25" hammer, water.

545-1025': 7" Casing Driven (Tubex), 7.5" hammer, water.

1025-1080': Dual Wall Reverse Circulation, 5.25" tricone, water.

545-1120': Conventional Single Wall, 8" tricone, mud. (To ream hole and drill additional 40')

SURFACE CASING:

TYPE: Steel

DIAMETER: 8"

DEPTH: 3' agl - 2' bgl

TYPE: Steel

DIAMETER: 20"

DEPTH: 0' - 22.5' bgl

CASING:

TYPE: Steel

DIAMETER: 12"

DEPTH: 0' - 320' bgl

A TYPE: PVC, Sch. 80

DIAMETER: 2.0"

DEPTH: 2.5' agl - 538' bgl

B TYPE: PVC, Sch. 80

DIAMETER: 2.0"

DEPTH: 2.5' agl - 838' bgl

D TYPE: Fiberglass

DIAMETER: 2.0"

DEPTH: 2.5' agl - 1045.9' bgl

SCREEN:

A TYPE: PVC, Sch. 80, 0.02" slot, 1.5" long, 21 slots/inch (7 slots/inch x 3 slots around)

DIAMETER: 2.0"

DEPTH: 538' bgl - 578' bgl

B TYPE: PVC, Sch. 80, 0.02" slot, 1.5" long, 21 slots/inch (7 slots/inch x 3 slots around)

DIAMETER: 2.0"

DEPTH: 838' bgl - 858' bgl

D TYPE: Fiberglass, 0.02" slot, 1.5" long, 9 slots/inch (3 slots/inch x 3 slots around)

DIAMETER: 2.0"

DEPTH: 1045.9'bgl-1075' bgl

WELL ID: ECG1115 A, B & D

COMPLETION MATERIALS:

10-20 MESH SILICA SAND: 1040' bgl - 1120' bgl
16-40 MESH SILICA SAND: 1035' bgl - 1040' bgl
100 MESH SILICA SAND: 1032' bgl - 1035' bgl
BENSEAL: 1028' bgl - 1032' bgl
HOLEPLUG: 877' bgl - 1028' bgl
BENSEAL: 876' bgl - 877' bgl
100 MESH SILICA SAND: 875' bgl - 876' bgl
16-40 MESH SILICA SAND: 874' bgl - 875' bgl
10-20 MESH SILICA SAND: 834' bgl - 874' bgl
16-40 MESH SILICA SAND: 832' bgl - 834' bgl
100 MESH SILICA SAND: 830' bgl - 832' bgl
BENSEAL: 826' bgl - 830' bgl
HOLEPLUG: 595' bgl - 826' bgl
BENSEAL: 593' bgl - 595' bgl
100 MESH SILICA SAND: 591' bgl - 593' bgl
16-40 MESH SILICA SAND: 588' bgl - 591' bgl
10-20 MESH SILICA SAND: 533' bgl - 588' bgl
16-40 MESH SILICA SAND: 530' bgl - 533' bgl
100 MESH SILICA SAND: 528' bgl - 530' bgl
BENSEAL: 524' bgl - 528' bgl
HOLEPLUG: 320' bgl - 524' bgl
PURE GOLD BENTONITE CLAY GROUT SEAL: 15' bgl - 320' bgl
CEMENT SURFACE SEAL: 0 - 15' bgl

STATIC WATER LEVEL IN OPEN BOREHOLE: N/A

STATIC WATER LEVEL AFTER WELL COMPLETION: A) 306.74' TOP

DATE: 7-24-94

STATIC WATER LEVEL AFTER WELL COMPLETION: B) 291.23' TOP

DATE: 7-24-94

STATIC WATER LEVEL AFTER WELL COMPLETION: D) 284.55' TOP

DATE: 7-24-94

WATER QUALITY DURING DRILLING (Casing Driven Method to 1025', then Dual Wall Reverse Circulation):

DEPTH (ft. bgl)	CONDUCTIVITY (μ mho/cm)	pH	TEMPERATURE (°F)	FLOW RATE (gpm)
325	925	7.9	64	2
335	4050	5.5	64	<0.25
345	3350	5.4	64	<0.25
355	4700	4.9	58	<0.25
365	24000	3.5	68	6
375	13500	3.8	63	--
385	2700	6.1	56	<0.25
395	25000	3.0	66	7.5
405	24500	3.2	78	3.2
415	22500	3.4	78	5.0
425	25000	3.3	71	13.6
435	24500	3.4	70	25
445	25500	3.3	68	30

WELL ID: ECG1115 A, B & D

WATER QUALITY DURING DRILLING (Continued):

DEPTH (ft. bgl)	CONDUCTIVITY (μ mho/cm)	pH	TEMPERATURE (°F)	FLOW RATE (gpm)
455	24000	3.4	71	6.7
465	26000	3.1	64	30
475	24000	3.4	65	37.5
485	25000	3.3	65	60
495	23500	3.4	64	40
505	25500	3.2	63	75
515	23500	3.3	63	60
525	23500	3.2	63	75-100
535	23000	3.2	62	75-100
545	22000	3.3	62	120
565	18000	3.8	61	60
575	24000	3.6	64	30
585	25000	3.7	62	27
595	24000	3.7	63	26.5
605	16000	4.1	--	--
615	16000	4.2	63	4
625	23500	3.9	62	30
635	22500	3.8	62	23
645	25000	3.8	64	20
655	25000	3.8	63	21
665	25000	3.7	61	50
675	24500	3.7	62	17.5
685	24000	3.6	62	27
695	23500	3.7	62	15
705	23500	3.8	62	7
715	21500	3.8	62	10
725	20500	3.9	62	7
735	15000	4.2	62	5
745	20000	4.0	63	15
755	20500	3.9	62	4
765	19500	3.9	60	45
785	10900	4.0	61	100
795	9350	4.2	61	10
805	9000	4.2	61	68
825	4450	4.7	61	150
841	4950	4.3	57	65
865	3850	7.4	61	75
885	4400	7.5	54	--
905	4150	7.7	57	100
925	4200	7.7	62	65

WELL ID: ECG1115 A, B & D

WATER QUALITY DURING DRILLING (Continued):

DEPTH (ft. bgl)	CONDUCTIVITY (μ mho/cm)	pH	TEMPERATURE (°F)	FLOW RATE (gpm)
935	5250	7.7	58	100
945	8650	7.3	56	100
965	10500	5.2	61	113
985	2400	7.1	60	15
1005	2450	7.6	56	45
1025	810	7.8	60	50
1040	735	7.6	59	50
1060	880	7.5	61	75

WATER QUALITY AFTER WELL DEVELOPMENT:

WELL	DATE	pH	Cond. (μ mho/cm)	SO ₄ ²⁻ (mg/L)	Cl ⁻ (mg/L)	T.D.S. (mg/L)	Cu (mg/L)
ECG1115A	6-20-94	3.9	38000	32000	210	44000	46
ECG1115B	6-19-94	7.8	3900	2500	130	3900	0.021
ECG1115D	6-18-94	8.0	700	110	84	490	0.007

BOREHOLE LITHOLOGY:

- 0' - 16': SILTY QUARTZITIC GRAVEL
- 16' - 20': CLAYEY SILT
- 20' - 180': SILTY QUARTZITIC GRAVEL
- 180' - 200': SANDY QUARTZITIC GRAVEL
- 200' - 970': QUARTZITIC GRAVEL
- 970' - 1120': SILTY VOLCANIC GRAVELS

WELL ID: BSG1148 A, B & C Triple Completion Well

LOCATION:

GENERAL LOCATION: Bastian Sink

KENNECOTT GRID:

NORTHING: 11276.1

EASTING: 28859.0

U.S.G.S: 1197 ft. south, 1778 ft. east from northwest corner of section 22, T3S, R2W,
SLBM

U.S. PUBLIC LAND SURVEY GRID: SW1/4, NE1/4, NW1/4 of section 22, T3S, R2W,
SLBM

CADASTRAL COORDINATES: (C32) 22 bac SLBM

ELEVATIONS: (KENNECOTT)

NATURAL GROUND: 5109.99

TOP OF STEEL CASING: 5112.73

TOP OF PVC: A) 5112.31 B) 5112.04 C) 5112.10

TOTAL DEPTH OF COMPLETED WELL: A) 533' TOP B) 603' TOP C) 723' TOP

START DATE: 6-14-95

COMPLETION DATE: 6-23-95

DRILLING COMPANY: Longyear Exploration Drilling

DRILLING METHOD, BIT DIAMETER/TYPE (BOREHOLE DIAMETER), AND DRILLING FLUID:

0-20': Conventional Single Wall, 14.75" tricone, mud.

20-1055': Conventional Single Wall, 9.875" tricone, mud.

SURFACE CASING:

TYPE: Steel	DIAMETER: 8"	DEPTH: 3.0' agl - 2.0' bgl
TYPE: Steel	DIAMETER: 10"	DEPTH: 0' - 20' bgl

CASING:

A TYPE: PVC, Sch. 80	DIAMETER: 2.0"	DEPTH: 2.5' agl - 510' bgl
B TYPE: PVC, Sch. 80	DIAMETER: 2.0"	DEPTH: 2.5' agl - 580' bgl
C TYPE: PVC, Sch. 80	DIAMETER: 2.0"	DEPTH: 2.5' agl - 700' bgl

SCREEN:

A TYPE: PVC, Sch. 80, 0.02" slot, 1.5" long, 21 slots/inch (7 slots/inch x 3 slots around)	DIAMETER: 2.0"	DEPTH: 510' bgl - 530' bgl
B TYPE: PVC, Sch. 80, 0.02" slot, 1.5" long, 21 slots/inch (7 slots/inch x 3 slots around)	DIAMETER: 2.0"	DEPTH: 580' bgl - 600' bgl
C TYPE: PVC, Sch. 80, 0.02" slot, 1.5" long, 21 slots/inch (7 slots/inch x 3 slots around)	DIAMETER: 2.0"	DEPTH: 700' bgl - 720' bgl

COMPLETION MATERIALS:

HOLEPLUG: 725' - 1055' bgl

BENSEAL: 723' - 725' bgl

16-40 MESH SILICA SAND: 721' - 723' bgl

10-20 MESH SILICA SAND: 695' - 721' bgl

16-40 MESH SILICA SAND: 693' - 695' bgl

BENSEAL: 689' - 693' bgl

WELL ID: BSG1148 A, B & C

COMPLETION MATERIALS (Continued):

HOLEPLUG: 611' - 689' bgl
BENSEAL: 607' - 611' bgl
16-40 MESH SILICA SAND: 605' - 607' bgl
10-20 MESH SILICA SAND: 575' - 605' bgl
16-40 MESH SILICA SAND: 573' - 575' bgl
BENSEAL: 569' - 573' bgl
HOLEPLUG: 540' - 569' bgl
BENSEAL: 536' - 540' bgl
16-40 MESH SILICA SAND: 534' - 536' bgl
10-20 MESH SILICA SAND: 504' - 534' bgl
16-40 MESH SILICA SAND: 502' - 504 bgl
BENSEAL: 498' - 502' bgl
HOLEPLUG: 318' - 498' bgl
AQUAGUARD: 15' - 318' bgl
CEMENT: 0 - 15' bgl

STATIC WATER LEVEL OPEN BOREHOLE: 357.5' bgl DATE: 6-26-95
STATIC WATER LEVEL AFTER WELL COMPLETION: A) 369.98' TOP DATE: 8-22-95
STATIC WATER LEVEL AFTER WELL COMPLETION: B) 370.64' TOP DATE: 8-22-95
STATIC WATER LEVEL AFTER WELL COMPLETION: C) 369.78' TOP DATE: 8-22-95

WATER QUALITY AFTER WELL DEVELOPMENT:

WELL	DATE	pH	Cond. (μ mho/cm)	SO ₄ ²⁻ (mg/L)	Cl ⁻ (mg/L)	T.D.S. (mg/L)	Cu (mg/L)
BSG1148A	6-26-95	8.19	1400	449	123	1110	.0140
BSG1148B	6-25-95	7.96	1300	450	93.3	1050	.0062
BSG1148C	6-24-95	7.98	1550	521	104	1130	.0243

BOREHOLE LITHOLOGY:

0 - 94': SILTY QUARTZITIC GRAVEL
94' - 108': TUFF
108' - 283': SILTY QUARTZITIC GRAVEL
283' - 315': SILTY VOLCANIC AND QUARTZITIC GRAVEL
315' - 438': SILTY QUARTZITIC GRAVEL
438' - 484': SILTY QUARTZITIC GRAVEL
484' - 496': MIXED SILTY QUARTZITIC AND VOLCANIC GRAVEL
496' - 499': SILTY QUARTZITIC GRAVEL
499' - 550': SILTY, CLAYEY MIXED QUARTZITIC AND VOLCANIC GRAVEL
550' - 556': SILTY QUARTZITIC GRAVEL
556' - 570': SILTY, CLAYEY MIXED QUARTZITIC AND VOLCANIC GRAVEL
570' - 608': SILTY QUARTZITIC GRAVEL WITH VOLCANIC GRAVEL
608' - 678': CLAYEY MIXED VOLCANIC AND QUARTZITIC GRAVEL
678' - 682': SILTY QUARTZITIC GRAVEL
682' - 760': SILTY QUARTZITIC GRAVEL WITH INCREASED VOLCANIC GRAVEL
760' - 810': CLAYEY VOLCANIC GRAVEL
810' - 982': SILTY CLAYEY VOLCANIC GRAVEL
982' - 1055': LACUSTRINE CLAY

WELL ID: BSG1180 A, B & C Triple Completion Well

LOCATION:

GENERAL LOCATION: Bastian Sink, 0.75 mile east of Highway U111 on south side of landfill

KENNECOTT GRID:

NORTHING: 13817.31
EASTING: 31356.15

U.S.G.S: 1355 ft. north, 1003 ft. west from southeast corner of Section 15, T3S, R2W, SLBM

U.S. PUBLIC LAND SURVEY GRID: SW1/4, NE1/4, SE1/4 of Section 15, T3S, R2W, SLBM

CADASTRAL COORDINATES: (C32) 15 dac SLBM

ELEVATIONS (KENNECOTT):

NATURAL GROUND (BOLT IN CEMENT PAD): not surveyed as of 7/16/97

TOP OF STEEL CASING: 5073.61

TOP OF WELL CASING: A) 5073.49 B) 5073.44 C) 5073.54

TOTAL DEPTH OF COMPLETED WELL: A) 465.5' bgl B) 680.5' bgl C) 826' bgl

START DATE: 6-3-97

COMPLETION DATE: 6-13-97

DRILLING COMPANY: Lang Exploratory Drilling

DRILLING METHOD, BIT DIAMETER/TYPE (BOREHOLE DIAMETER), AND DRILLING FLUID:

0-15.5': Conventional Mud Rotary, 24" tricone, mud.

15.5-155': Conventional Mud Rotary, 12.25" tricone, mud.

155-975': Dual Wall Flooded Reverse Circulation, 12.25" tricone, mud.

SURFACE CASING:

TYPE: Steel DIAMETER: 10" DEPTH: 3' agl - 2' bgl

TYPE: Steel DIAMETER: 16" DEPTH: 0' - 15.5' bgl

CASING:

A TYPE: PVC, Sch. 80 DIAMETER: 2.5" DEPTH: 3' agl - 445' bgl

B TYPE: PVC, Sch. 80 DIAMETER: 2.5" DEPTH: 3' agl - 660' bgl

C TYPE: Fiberglass DIAMETER: 2.0" DEPTH: 3' agl - 826' bgl

SCREEN:

A TYPE: PVC, Sch. 80, 0.02" slot, 1.5" long, 21 slots/inch (7 slots/inch x 3 slots around)

DIAMETER: 2.5" DEPTH: 445' bgl - 465' bgl

B TYPE: PVC, Sch. 80, 0.02" slot, 1.5" long, 21 slots/inch (7 slots/inch x 3 slots around)

DIAMETER: 2.5" DEPTH: 660' bgl - 680' bgl

C TYPE: Fiberglass, 0.02" slot, 1.5" long, 9 slots/inch (3 slots/inch x 3 slots around)

DIAMETER: 2.0" DEPTH: 798' bgl - 818.3' bgl

COMPLETION MATERIALS:

SLOUGH: 1032' bgl - 1035' bgl

HOLEPLUG: 828' bgl - 1032' bgl

BENSEAL: 826' bgl - 828' bgl

16-40 MESH SILICA SAND: 824' bgl - 828' bgl

10-20 MESH SILICA SAND: 794' bgl - 824' bgl

16-40 MESH SILICA SAND: 791' bgl - 794' bgl

BENSEAL: 788' bgl - 791' bgl

HOLEPLUG: 689' bgl - 788' bgl

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BENSEAL: 687' bgl - 689' bgl
16-40 MESH SILICA SAND: 684' bgl - 687' bgl
10-20 MESH SILICA SAND: 653' bgl - 684' bgl
16-40 MESH SILICA SAND: 651' bgl - 653' bgl
BENSEAL: 648' bgl - 651' bgl
HOLEPLUG: 474' bgl - 648' bgl
BENSEAL: 471' bgl - 474' bgl
16-40 MESH SILICA SAND: 467.5' bgl - 471' bgl
10-20 MESH SILICA SAND: 442' bgl - 467.5' bgl
16-40 MESH SILICA SAND: 439' bgl - 442' bgl
BENSEAL: 436' bgl - 439' bgl
HOLEPLUG: 350' bgl - 436' bgl
GROUT-WELL BENTONITE GROUT: 15' bgl - 350' bgl
CEMENT SURFACE SEAL: 0 - 15' bgl

STATIC WATER LEVEL IN OPEN BOREHOLE: Unknown due to drilling with mud.

STATIC WATER LEVEL AFTER WELL COMPLETION: A) 344.22' TOP

DATE: 6-25-97

STATIC WATER LEVEL AFTER WELL COMPLETION: B) 350.92' TOP

DATE: 6-25-97

STATIC WATER LEVEL AFTER WELL COMPLETION: C) 341.99' TOP

DATE: 6-25-97

WATER QUALITY AFTER WELL DEVELOPMENT:

WELL	DATE	pH	Cond. (μ mho/cm)	SO ₄ ²⁻ (mg/L)	Cl ⁻ (mg/L)	T.D.S. (mg/L)	Cu (mg/L)
BSG1180A	6-17-97	7.9	3890	2100	157	3410	<0.02
BSG1180B	6-17-97	3.5	19200	24400*	183	33400	7.78
BSG1180C	6-16-97	7.4	5000	3310	157	4830	<0.02

* Sulfate result on lab certificate of analysis from laboratory. Charge balance suggests this concentration may be too high. Rushed result from laboratory was 20,400 mg/L.

BOREHOLE LITHOLOGY:

0' - 748': QUARTZITIC GRAVEL
748' - 775': SILTY VOLCANIC GRAVEL
775' - 846': SILTY QUARTZITIC GRAVEL
846' - 858': SILTY VOLCANIC GRAVEL
858' - 954': SILTY VOLCANIC GRAVEL WITH 2' - 8' THICK SILTY VOLCANIC GRAVEL LENSES
954' - 966': CLAYEY VOLCANIC GRAVEL
966' - 993': SILTY QUARTZITIC GRAVEL
993' - 1002': CLAYEY VOLCANIC GRAVEL
1002' - 1035': LACUSTRINE CLAY

WELL ID: BFG1195 A & B Double Completion Well

LOCATION:

GENERAL LOCATION: Bingham Flats, K60 - K109 area.

KENNECOTT GRID:

NORTHING: 16434.14

EASTING: 33104.03

U.S.G.S: 1330 ft. south, 761 ft. east from northwest corner of Section 14, T3S, R2W, SLBM

U.S. PUBLIC LAND SURVEY GRID: NE1/4, SW1/4, NW1/4 of Section 14, T3S, R2W, SLBM

CADASTRAL COORDINATES: (C32) 14 bca SLBM

ELEVATIONS (KENNECOTT):

NATURAL GROUND (BOLT IN CEMENT PAD): 5012.45

TOP OF STEEL CASING: 5014.60

TOP OF WELL CASING: A) 5014.10 B) 5013.44

TOTAL DEPTH OF COMPLETED WELL: A) 578.5' bgl B) 699.0' bgl

START DATE: 08-26-98

COMPLETION DATE: 09-01-98

DRILLING COMPANY: Lang Exploratory Drilling

DRILLING METHOD, BIT DIAMETER/TYPE (BOREHOLE DIAMETER), AND DRILLING FLUID:

0-20': Air Rotary, 14.25" tricone, dry.

20-170': Conventional Mud Rotary, 9.875" tricone, mud.

170-770': Flooded Dual Wall Reverse Circulation, 9.875" tricone, mud.

SURFACE CASING:

TYPE: Steel	DIAMETER: 10"	DEPTH: 2.5' - 2.5' bgl
TYPE: Steel	DIAMETER: 12"	DEPTH: 0' agl - 20' bgl

CASING:

A TYPE: PVC, Sch. 80	DIAMETER: 2.5"	DEPTH: 2' agl - 558' bgl
B TYPE: PVC, Sch. 80	DIAMETER: 2.5"	DEPTH: 1.8' agl - 678.5' bgl

SCREEN:

A TYPE: PVC, Sch. 80, 0.02" slot, 1.5" long, 21 slots/inch (7 slots/inch x 3 slots around)	DIAMETER: 2.5"	DEPTH: 558' bgl - 578' bgl
B TYPE: PVC, Sch. 80, 0.02" slot, 1.5" long, 21 slots/inch (7 slots/inch x 3 slots around)	DIAMETER: 2.5"	DEPTH: 678.5' bgl - 698.5' bgl

COMPLETION MATERIALS:

HOLEPLUG: 710' bgl - 770' bgl
BENSEAL: 707' bgl - 710' bgl
16-40 MESH SILICA SAND: 704' bgl - 707' bgl
10-20 MESH SILICA SAND: 675' bgl - 704' bgl
16-40 MESH SILICA SAND: 672' bgl - 675' bgl
BENSEAL: 670' bgl - 672' bgl
HOLEPLUG: 588' bgl - 670' bgl

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COMPLETION MATERIALS (Continued):

BENSEAL: 585' bgl - 588' bgl
16-40 MESH SILICA SAND: 582' bgl - 585' bgl
10-20 MESH SILICA SAND: 555' bgl - 582' bgl
16-40 MESH SILICA SAND: 551' bgl - 555' bgl
BENSEAL: 547' bgl - 551' bgl
HOLEPLUG: 355' bgl - 547' bgl
AQUAGUARD BENTONITE CLAY GROUT SEAL: 15' bgl - 355' bgl
CEMENT GROUT SURFACE SEAL: 0 - 15' bgl

STATIC WATER LEVEL IN OPEN BOREHOLE: Unknown due to drilling with mud.

STATIC WATER LEVEL AFTER WELL COMPLETION: A) 403.25' TOP DATE: 09-14-98

STATIC WATER LEVEL AFTER WELL COMPLETION: B) 402.08' TOP DATE: 09-14-98

WATER QUALITY AFTER WELL DEVELOPMENT:

WELL	DATE	pH	Cond. (μ mho/cm)	SO ₄ ²⁻ (mg/L)	Cl (mg/L)	T.D.S. (mg/L)	Cu (mg/L)
BFG1195A	9-12-98	7.6	3300	1550	182	3030	<0.02
BFG1195B	9-11-98	7.6	2090	864	176	1580	<0.02

BOREHOLE LITHOLOGY:

0' - 60': SILTY QUARTZITIC GRAVEL
60' - 120': SILTY CLAYEY QUARTZITIC GRAVEL
120' - 445': SILTY SANDY QUARTZITIC GRAVEL
445' - 545': SANDY QUARTZITIC GRAVEL
545' - 555': SILTY QUARTZITIC GRAVEL
555' - 770': SANDY QUARTZITIC GRAVEL

GEOPHYSICAL LOGS: 16" and 32" normal resistivity, natural gamma, single point resistance.