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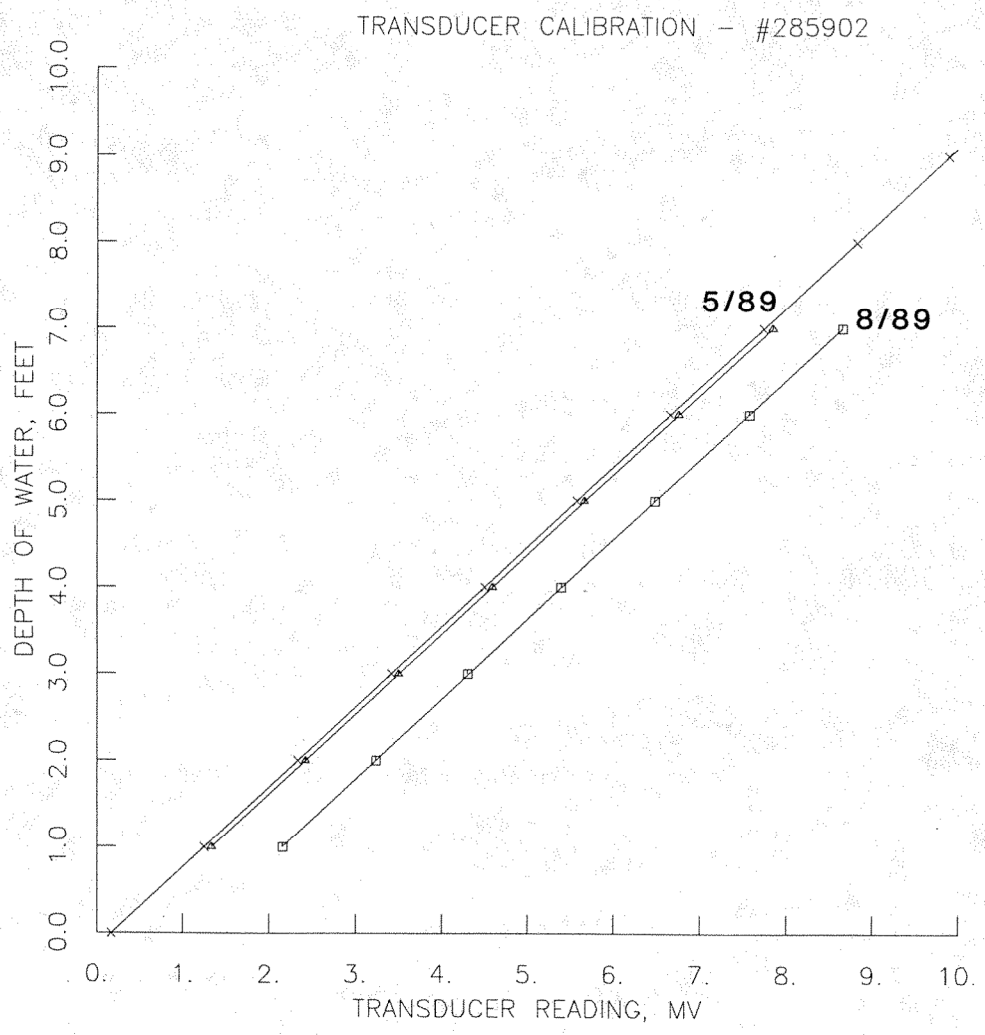
Apr 13 2020

Appendix B

TRANSDUCER CALIBRATIONS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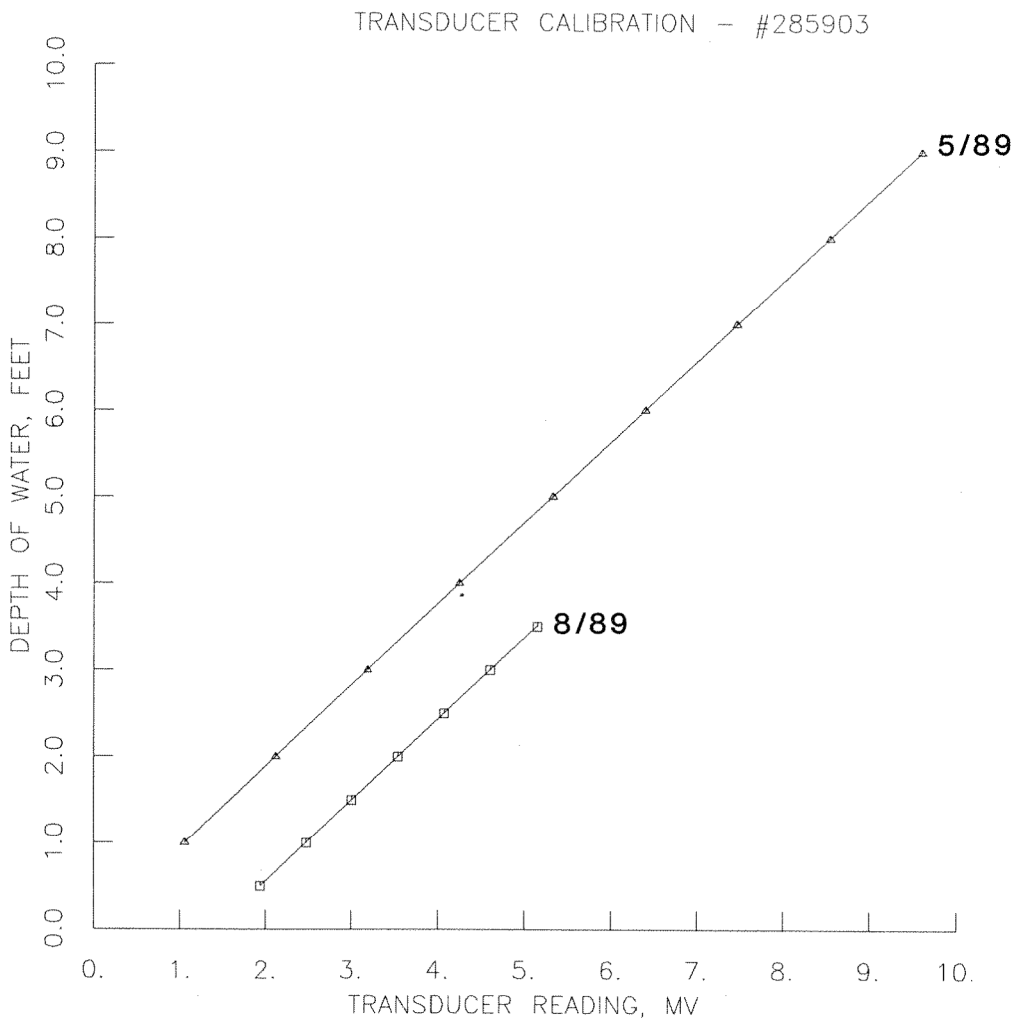
4.0
5.0
6.0
7.0
8.0
9.0
10.0
0.
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.
TRANSDUCER READING, MV
5/89
8/89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8.0
9.0
10.0
0.
1.
2.
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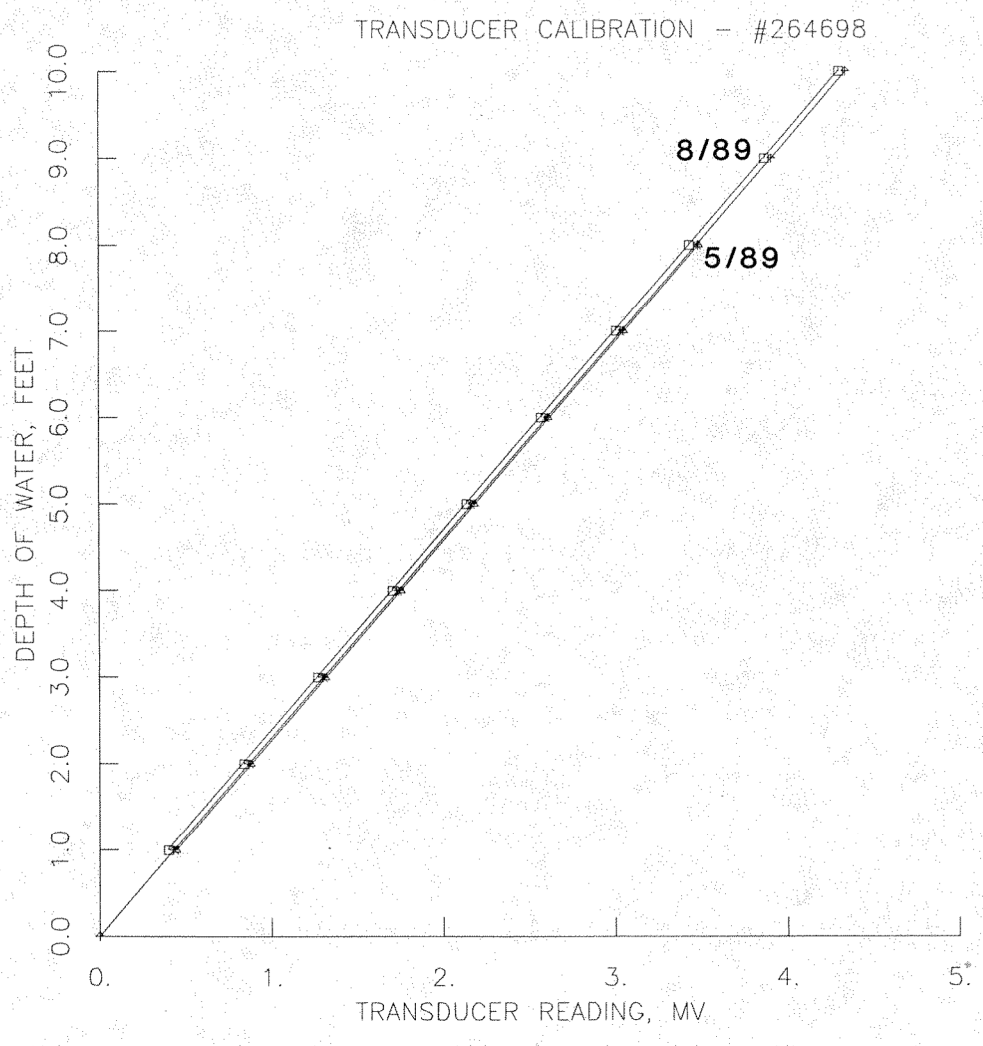
4.
5.
6.
7.
8.
9.
10.
TRANSDUCER READING, MV
5/89
8/89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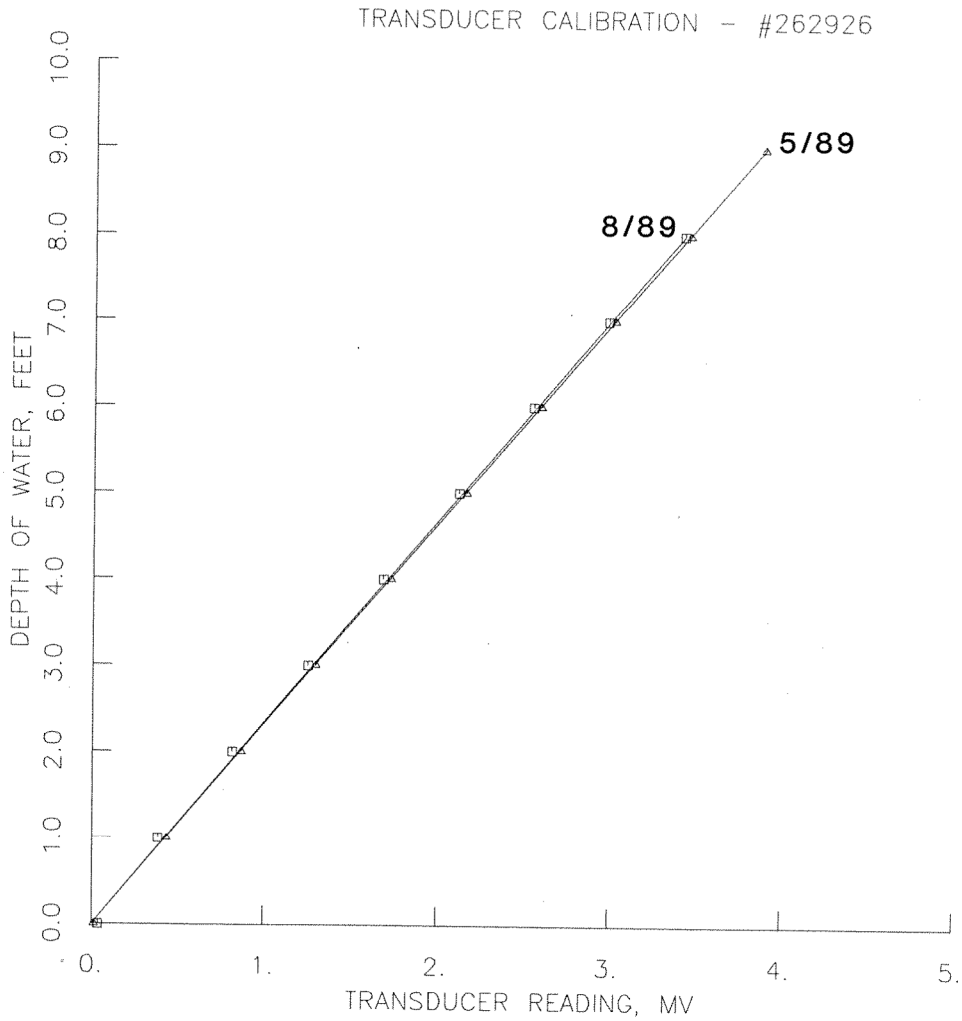
4.0
5.0
6.0
7.0
8.0
9.0
10.0
8/89
5/89
0.
1.
2.
3.
4.
5.
TRANSDUCER READING, MV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5/89
8/89
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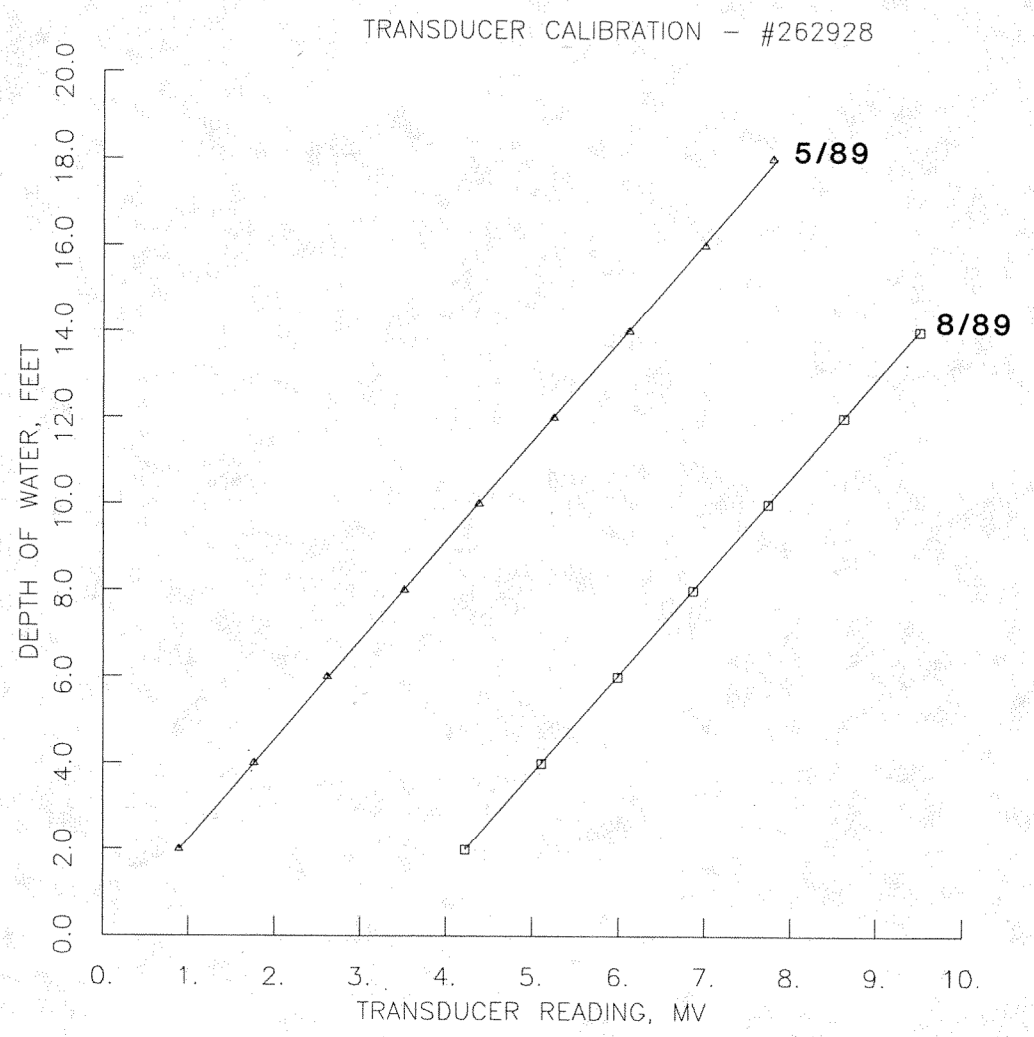
4.0
5.0
6.0
7.0
8.0
9.0
10.0
0.
1.
2.
3.
4.
5.
TRANSDUCER READING, MV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5/89
8/89
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10.0
12.0
14.0
16.0
18.0
20.0
0.
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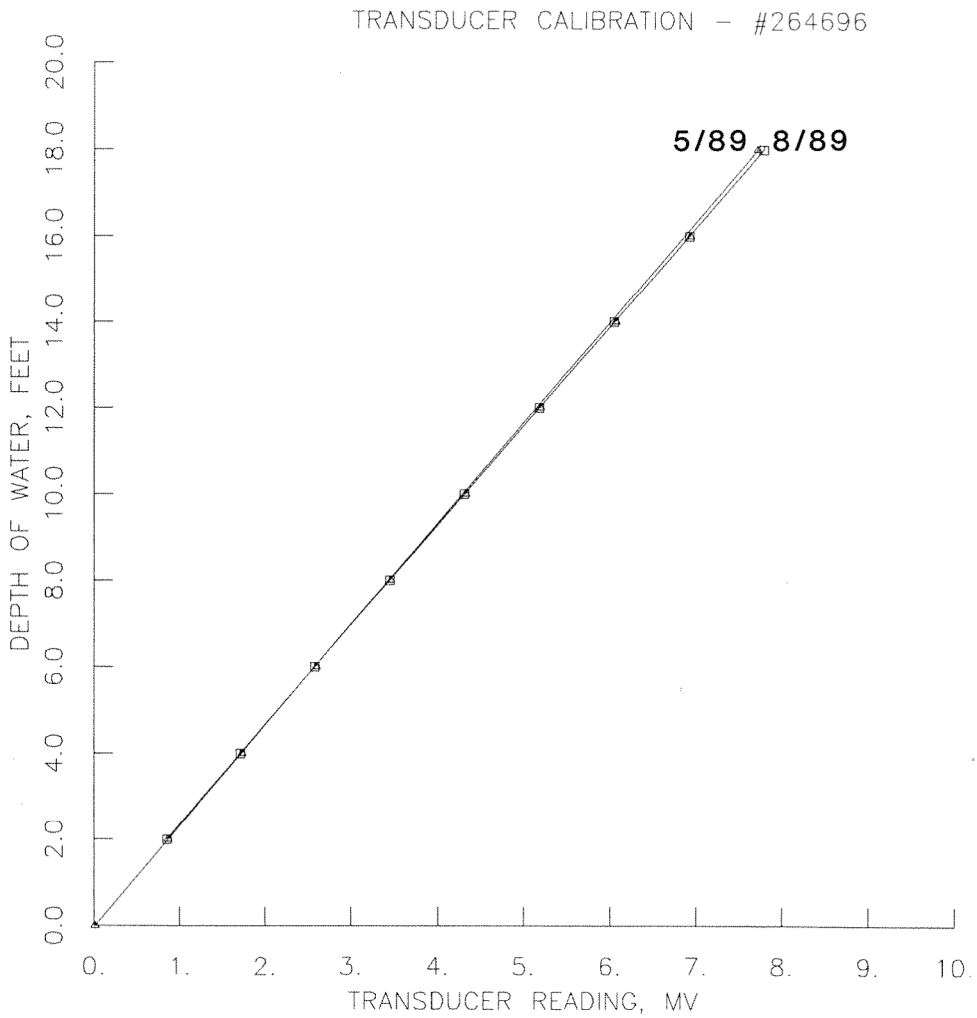
2.
3.
4.
5.
6.
7.
8.
9.
10.
TRANSDUCER READING, MV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6.0
8.0
10.0
12.0
14.0
16.0
18.0
20.0
0.
1.
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9.
10.
TRANSDUCER READING, MV

Appendix C

ANALYTICAL DATA FOR GROUNDWATER SAMPLES

Table C-1

CHEMICAL CHARACTERISTICS OF WATERS FROM ASH DELTA WELLS FROM L STATION, EVENT 1

		Location			
		Sample ID			
		Date Sampled			
		LMW-14		LMW-15	
		L-040		L-041	
		19-Apr-89		19-Apr-89	
PARAMETER	Units	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit
Water Quality Variables					
Electrical Conductivity (Field)	micromhos/cm	2620.0	(10.0)	1870.0	(10.0)
Electrical Conductivity (Lab)	micromhos/cm	3210.0	(10.0)	1920.0	(10.0)
Filterable Residue	mg/L	2910.0	(8.0)	1660.0	(8.0)
Oxid-Red (Eh)	mV	222.0	(10.0)	211.0	(10.0)
Temperature (Field)	Degrees C	19.7	(0.10)	19.8	(0.10)
pH_value	pH Units	4.4	(0.050)	4.2	(0.050)
Anions and Ammonia in Aqueous Media					
Alkalinity	mg HCO3/L	ND	(1.0)	ND	(1.0)
Ammonia	mg N/L	0.040	(0.010)	0.35	(0.010)
Bromide	mg/L	ND	(0.040)	ND	(0.040)
Carbonate	mg HCO3/L	310.0	(6.0)	256.0	(6.0)
Chloride	mg/L	2.3	(0.20)	2.4	(0.20)
Fluoride	mg/L	1.7	(0.0010)	0.52	(0.0010)
Nitrate/Nitrite	mg N/L	0.23	(0.050)	ND	(0.050)
Organic Carbon	mg C/L	NA		ND	(0.50)
Phosphate, total	mg P/L	ND	(0.050)	ND	(0.050)
Silicon	mg Si/L	NA		NA	
Sulfate	mg/L	2060.0	(0.50)	1200.0	(0.50)
Sulfide by Iodine Titn	mg S/L	ND	(0.32)	ND	(0.32)
Sulfite by IC	mg/L	NA		NA	
Sulfite by Iodine Titn	mg/L	NA		NA	
Thiosulfate	mg S2O3/L	0.60	(0.30)	0.50	(0.30)
Thiourea	mg/L	ND	(0.50)	ND	(0.50)
Elements in Aqueous Media by AA					
Arsenic	mg/L	0.0020	(0.0020)	ND	(0.0020)
Calcium	mg/L	470.0	(0.10)	200.0	(0.10)
Chromium	mg/L	ND	(0.0010)	ND	(0.0010)

ND: Not detected at specified detection limit

NA: Not analyzed

Table C-1

CHEMICAL CHARACTERISTICS OF WATERS FROM ASH DELTA WELLS FROM L STATION, EVENT 1

		Location			
		Sample ID			
		Date Sampled			
		LMW-14		LMW-15	
		L-040		L-041	
		19-Apr-89		19-Apr-89	
PARAMETER	Units	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit
Copper	mg/L	0.0050	(0.0010)	0.0040	(0.0010)
Lead	mg/L	ND	(0.0020)	ND	(0.0020)
Magnesium	mg/kg	70.0	(0.10)	19.0	(0.10)
Potassium	mg/kg	12.0	(0.10)	16.0	(0.10)
Selenium	mg/L	ND	(0.0020)	ND	(0.0020)
Sodium	mg/L	12.0	(0.0010)	12.0	(0.0010)
Elements by ICPES					
Aluminum	mg/L	9.1	(0.20)	12.0	(0.20)
Antimony	mg/L	ND	(0.20)	ND	(0.20)
Arsenic	mg/L	0.50	(0.30)	1.0	(0.30)
Barium	mg/L	0.020	(0.010)	0.010	(0.010)
Beryllium	mg/L	0.067	(0.0020)	0.029	(0.0020)
Boron	mg/L	ND	(0.60)	ND	(0.60)
Cadmium	mg/L	ND	(0.0050)	ND	(0.0050)
Calcium	mg/L	430.0	(1.0)	190.0	(1.0)
Chromium	mg/L	ND	(0.030)	ND	(0.030)
Cobalt	mg/L	2.5	(0.010)	0.21	(0.010)
Copper	mg/L	ND	(0.020)	ND	(0.020)
Iron	mg/L	110.0	(0.040)	280.0	(0.040)
Lead	mg/L	ND	(0.050)	ND	(0.050)
Magnesium	mg/L	64.0	(1.0)	18.0	(1.0)
Manganese	mg/L	120.0	(0.010)	10.0	(0.010)
Molybdenum	mg/L	0.10	(0.050)	0.10	(0.050)
Nickel	mg/L	0.77	(0.020)	0.050	(0.020)
Potassium	mg/L	10.0	(3.0)	10.0	(3.0)
Selenium	mg/L	ND	(0.30)	ND	(0.30)
Silicon	mg/L	38.0	(1.0)	14.0	(1.0)
Silver	mg/L	ND	(0.030)	ND	(0.030)
Sodium	mg/L	10.0	(1.0)	11.0	(1.0)

ND: Not detected at specified detection limit

NA: Not analyzed

Table C-1

CHEMICAL CHARACTERISTICS OF WATERS FROM ASH DELTA WELLS FROM L STATION, EVENT 1

		Location			
		Sample ID			
		Date Sampled			
		LMW-14		LMW-15	
		L-040		L-041	
		19-Apr-89		19-Apr-89	
PARAMETER	Units	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit
Strontium	mg/L	0.61	(0.0030)	0.64	(0.0030)
Thallium	mg/L	ND	(0.10)	ND	(0.10)
Vanadium	mg/L	ND	(0.020)	ND	(0.020)
Zinc	mg/L	0.79	(0.020)	0.10	(0.020)

ND: Not detected at specified detection limit

NA: Not analyzed

Table C-2

CHEMICAL CHARACTERISTICS OF WATERS FROM UPGRADIENT WELLS FROM L STATION, EVENT 1

		Location							
		Sample ID							
		Date Sampled							
		LMW-11		LMW-11		LMW-12		LMW-18	
		L-048		L-049		L-037		L-051	
		21-Apr-89		21-Apr-89		18-Apr-89		22-Apr-89	
PARAMETER	Units	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit
Water Quality Variables									
Electrical Conductivity (Field)	micromhos/cm	5.0	(10.0)	NA		56.0	(10.0)	5.0	(10.0)
Electrical Conductivity (Lab)	micromhos/cm	94.0	(10.0)	94.0	(10.0)	94.0	(10.0)	104.0	(10.0)
Filterable Residue	mg/L	104.0	(5.0)	116.0	(5.0)	ND	(8.0)	120.0	(5.0)
Oxid-Red (Eh)	mV	180.0	(10.0)	NA		142.0	(10.0)	164.0	(10.0)
Temperature (Field)	Degrees C	17.3	(0.10)	NA		18.5	(0.10)	17.1	(0.10)
pH_value	pH Units	6.1	(0.050)	NA		6.0	(0.050)	8.3	(0.050)
Anions and Ammonia in Aqueous Media									
Alkalinity	mg HCO3/L	50.0	(1.0)	50.0	(1.0)	39.0	(1.0)	53.0	(1.0)
Ammonia	mg N/L	0.19	(0.010)	0.11	(0.010)	ND	(0.010)	0.10	(0.010)
Bromide	mg/L	ND	(0.040)	ND	(0.040)	ND	(0.040)	ND	(0.040)
Carbonate	mg HCO3/L	264.0	(6.0)	270.0	(6.0)	80.0	(6.0)	70.0	(6.0)
Chloride	mg/L	4.3	(2.0)	4.6	(2.0)	3.1	(2.0)	2.0	(0.20)
Fluoride	mg/L	0.033	(0.010)	0.026	(0.010)	0.054	(0.010)	0.13	(0.010)
Nitrate/Nitrite	mg N/L	2.9	(0.050)	3.0	(0.050)	0.62	(0.050)	0.63	(0.050)
Organic Carbon	mg C/L	4.6	(0.50)	4.2	(0.50)	0.80	(0.50)	4.3	(0.50)
Phosphate, total	mg P/L	0.63	(0.050)	0.56	(0.050)	ND	(0.050)	0.90	(0.050)
Silicon	mg Si/L	15.5	(1.0)	15.8	(1.0)	9.8	(1.0)	17.5	(1.0)
Sulfate	mg/L	2.0	(0.50)	1.9	(0.50)	6.4	(0.50)	4.9	(0.50)
Sulfide by Iodine Titn	mg S/L	ND	(0.34)	ND	(0.33)	ND	(0.33)	ND	(0.32)
Sulfite by IC	mg/L	ND	(0.080)	ND	(0.080)	ND	(0.080)	ND	(0.080)
Sulfite by Iodine Titn	mg/L	ND	(2.0)	ND	(2.0)	ND	(2.0)	ND	(2.0)
Thiosulfate	mg S2O3/L	ND	(0.30)	0.50	(0.30)	0.50	(0.20)	0.30	(0.30)
Thiourea	mg/L	ND	(0.50)	ND	(0.50)	ND	(0.50)	ND	(0.50)
Elements in Aqueous Media by AA									
Arsenic	mg/L	ND	(0.0020)	ND	(0.0020)	ND	(0.0020)	ND	(0.0020)
Calcium	mg/L	8.7	(0.10)	8.7	(0.10)	2.7	(0.10)	9.8	(0.10)
Chromium	mg/L	ND	(0.0010)	ND	(0.0010)	ND	(0.0010)	ND	(0.0010)

ND: Not detected at specified detection limit

NA: Not analyzed

Table C-2

CHEMICAL CHARACTERISTICS OF WATERS FROM UPGRADIENT WELLS FROM L STATION, EVENT 1

		Location							
		Sample ID							
		Date Sampled							
		LMW-11		LMW-11		LMW-12		LMW-18	
		L-048		L-049		L-037		L-051	
		21-Apr-89		21-Apr-89		18-Apr-89		22-Apr-89	
PARAMETER	Units	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit
Copper	mg/L	0.0030	(0.0010)	ND	(0.0010)	ND	(0.0010)	ND	(0.0010)
Lead	mg/L	ND	(0.0020)	ND	(0.0020)	ND	(0.020)	ND	(0.0020)
Magnesium	mg/kg	3.3	(0.10)	3.3	(0.10)	1.2	(0.10)	3.2	(0.10)
Potassium	mg/kg	4.9	(0.10)	4.7	(0.10)	1.5	(0.10)	4.0	(0.10)
Selenium	mg/L	ND	(0.0020)	ND	(0.0020)	ND	(0.0020)	ND	(0.0020)
Sodium	mg/L	9.7	(0.0010)	9.4	(0.0010)	16.0	(0.0010)	7.5	(0.0010)
Elements by ICPES									
Aluminum	mg/L	ND	(0.20)	ND	(0.20)	ND	(0.20)	ND	(0.20)
Antimony	mg/L	ND	(0.20)	ND	(0.20)	ND	(0.20)	ND	(0.20)
Arsenic	mg/L	ND	(0.30)	ND	(0.30)	ND	(0.30)	ND	(0.30)
Barium	mg/L	0.14	(0.010)	0.089	(0.010)	0.010	(0.010)	0.12	(0.010)
Beryllium	mg/L	ND	(0.0020)	ND	(0.0020)	ND	(0.0020)	ND	(0.0020)
Boron	mg/L	ND	(0.60)	ND	(0.60)	ND	(0.60)	ND	(0.60)
Cadmium	mg/L	ND	(0.0050)	ND	(0.0050)	ND	(0.0050)	ND	(0.0050)
Calcium	mg/L	9.1	(1.0)	9.0	(1.0)	3.0	(1.0)	8.0	(1.0)
Chromium	mg/L	ND	(0.030)	ND	(0.030)	ND	(0.030)	ND	(0.030)
Cobalt	mg/L	ND	(0.010)	ND	(0.010)	ND	(0.010)	ND	(0.010)
Copper	mg/L	ND	(0.020)	ND	(0.020)	ND	(0.020)	ND	(0.020)
Iron	mg/L	ND	(0.040)	0.070	(0.040)	ND	(0.040)	ND	(0.040)
Lead	mg/L	ND	(0.050)	ND	(0.050)	ND	(0.050)	ND	(0.050)
Magnesium	mg/L	3.0	(1.0)	3.0	(1.0)	1.0	(1.0)	3.0	(1.0)
Manganese	mg/L	0.040	(0.010)	0.074	(0.010)	0.16	(0.010)	0.020	(0.010)
Molybdenum	mg/L	ND	(0.050)	ND	(0.050)	ND	(0.050)	ND	(0.050)
Nickel	mg/L	ND	(0.020)	ND	(0.020)	ND	(0.020)	ND	(0.020)
Potassium	mg/L	4.0	(3.0)	4.0	(3.0)	ND	(3.0)	3.0	(3.0)
Selenium	mg/L	ND	(0.30)	ND	(0.30)	ND	(0.30)	ND	(0.30)
Silicon	mg/L	14.0	(1.0)	14.0	(1.0)	9.0	(1.0)	16.0	(1.0)
Silver	mg/L	ND	(0.030)	ND	(0.030)	ND	(0.030)	ND	(0.030)
Sodium	mg/L	9.0	(1.0)	8.6	(1.0)	15.0	(1.0)	7.0	(1.0)

ND: Not detected at specified detection limit

NA: Not analyzed

Table C-2

CHEMICAL CHARACTERISTICS OF WATERS FROM UPGRADIENT WELLS FROM L STATION, EVENT 1

		Location							
		Sample ID							
		Date Sampled							
		LMW-11		LMW-11		LMW-12		LMW-18	
		L-048		L-049		L-037		L-051	
		21-Apr-89		21-Apr-89		18-Apr-89		22-Apr-89	
PARAMETER	Units	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit
Strontium	mg/L	0.11	(0.0030)	0.11	(0.0030)	0.020	(0.0030)	0.029	(0.0030)
Thallium	mg/L	ND	(0.10)	ND	(0.10)	ND	(0.10)	ND	(0.10)
Vanadium	mg/L	ND	(0.020)	ND	(0.020)	ND	(0.020)	ND	(0.020)
Zinc	mg/L	0.090	(0.020)	0.040	(0.020)	ND	(0.020)	0.13	(0.020)

ND: Not detected at specified detection limit

NA: Not analyzed

Table C-2

CHEMICAL CHARACTERISTICS OF WATERS FROM UPGRADIENT WELLS FROM L STATION, EVENT 1

		Location	
		Sample ID	
		Date Sampled	
		LMW-19	
		L-039	
		19-Apr-89	
PARAMETER	Units	Msr'd Val.	Det. Limit
Water Quality Variables			
Electrical Conductivity (Field)	micromhos/cm	71.0	(10.0)
Electrical Conductivity (Lab)	micromhos/cm	64.0	(10.0)
Filterable Residue	mg/L	116.0	(8.0)
Oxid-Red (Eh)	mV	320.0	(10.0)
Temperature (Field)	Degrees C	14.7	(0.10)
pH_value	pH Units	6.2	(0.050)
Anions and Ammonia in Aqueous Media			
Alkalinity	mg HCO3/L	34.0	(1.0)
Ammonia	mg N/L	ND	(0.010)
Bromide	mg/L	ND	(0.040)
Carbonate	mg HCO3/L	69.0	(6.0)
Chloride	mg/L	4.4	(2.0)
Fluoride	mg/L	0.090	(0.010)
Nitrate/Nitrite	mg N/L	0.59	(0.050)
Organic Carbon	mg C/L	1.1	(0.50)
Phosphate, total	mg P/L	ND	(0.050)
Silicon	mg Si/L	17.5	(1.0)
Sulfate	mg/L	2.0	(0.50)
Sulfide by Iodine Titn	mg S/L	ND	(0.32)
Sulfite by IC	mg/L	ND	(0.080)
Sulfite by Iodine Titn	mg/L	NA	
Thiosulfate	mg S2O3/L	ND	(0.20)
Thiourea	mg/L	ND	(0.50)
Elements in Aqueous Media by AA			
Arsenic	mg/L	ND	(0.0020)
Calcium	mg/L	5.3	(0.10)
Chromium	mg/L	ND	(0.0010)

ND: Not detected at specified detection limit

NA: Not analyzed

Table C-2

CHEMICAL CHARACTERISTICS OF WATERS FROM UPGRADIENT WELLS FROM L STATION, EVENT 1

		Location	
		Sample ID	
		Date Sampled	
		LMW-19	
		L-039	
		19-Apr-89	
PARAMETER	Units	Msr'd Val.	Det. Limit
Copper	mg/L	ND	(0.0010)
Lead	mg/L	ND	(0.0020)
Magnesium	mg/kg	2.2	(0.10)
Potassium	mg/kg	1.7	(0.10)
Selenium	mg/L	ND	(0.0020)
Sodium	mg/L	5.3	(0.0010)
Elements by ICPES			
Aluminum	mg/L	ND	(0.20)
Antimony	mg/L	ND	(0.20)
Arsenic	mg/L	ND	(0.30)
Barium	mg/L	0.010	(0.010)
Beryllium	mg/L	ND	(0.0020)
Boron	mg/L	ND	(0.60)
Cadmium	mg/L	ND	(0.0050)
Calcium	mg/L	5.6	(1.0)
Chromium	mg/L	ND	(0.030)
Cobalt	mg/L	ND	(0.010)
Copper	mg/L	ND	(0.020)
Iron	mg/L	ND	(0.040)
Lead	mg/L	ND	(0.050)
Magnesium	mg/L	2.0	(1.0)
Manganese	mg/L	ND	(0.010)
Molybdenum	mg/L	ND	(0.050)
Nickel	mg/L	ND	(0.020)
Potassium	mg/L	ND	(3.0)
Selenium	mg/L	ND	(0.30)
Silicon	mg/L	15.0	(1.0)
Silver	mg/L	ND	(0.030)
Sodium	mg/L	5.0	(1.0)

ND: Not detected at specified detection limit

NA: Not analyzed

Table C-2

CHEMICAL CHARACTERISTICS OF WATERS FROM UPGRADIENT WELLS FROM L STATION, EVENT 1

		Location	
		Sample ID	
		Date Sampled	
		LMW-19	
		L-039	
		19-Apr-89	
PARAMETER	Units	Msr'd Val.	Det. Limit
Strontium	mg/L	0.030	(0.0030)
Thallium	mg/L	ND	(0.10)
Vanadium	mg/L	ND	(0.020)
Zinc	mg/L	ND	(0.020)

ND: Not detected at specified detection limit

NA: Not analyzed

Table C-3

CHEMICAL CHARACTERISTICS OF WATERS FROM DOWNGRADIENT WELLS FROM L STATION, EVENT 1

		Location							
		Sample ID							
		LMW-01		LMW-02		LMW-03		LMW-04	
		L-032		L-045		L-027		L-047	
		Date Sampled							
		17-Apr-89		21-Apr-89		14-Apr-89		21-Apr-89	
PARAMETER	Units	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit
Water Quality Variables									
Electrical Conductivity (Field)	micromhos/cm	156.0	(10.0)	399.0	(10.0)	319.0	(10.0)	NA	
Electrical Conductivity (Lab)	micromhos/cm	192.0	(10.0)	341.0	(10.0)	297.0	(10.0)	404.0	(10.0)
Filterable Residue	mg/L	83.0	(8.0)	327.0	(5.0)	219.0	(8.0)	245.0	(5.0)
Oxid-Red (Eh)	mV	82.0	(10.0)	373.0	(10.0)	98.0	(10.0)	NA	
Temperature (Field)	Degrees C	17.3	(0.10)	18.1	(0.10)	18.0	(0.10)	19.2	(0.10)
pH_value	pH Units	5.7	(0.050)	5.9	(0.050)	6.2	(0.050)	6.7	(0.050)
Anions and Ammonia in Aqueous Media									
Alkalinity	mg HCO3/L	24.0	(1.0)	23.0	(1.0)	28.0	(1.0)	70.0	(1.0)
Ammonia	mg N/L	0.040	(0.010)	0.050	(0.010)	0.31	(0.010)	0.16	(0.010)
Bromide	mg/L	0.073	(0.080)	0.13	(0.040)	0.20	(0.080)	0.10	(0.040)
Carbonate	mg HCO3/L	78.0	(6.0)	53.0	(6.0)	95.0	(6.0)	121.0	(6.0)
Chloride	mg/L	3.5	(2.0)	4.6	(2.0)	7.4	(2.0)	3.8	(2.0)
Fluoride	mg/L	0.050	(0.010)	0.042	(0.010)	0.020	(0.010)	0.30	(0.010)
Nitrate/Nitrite	mg N/L	0.14	(0.050)	0.31	(0.050)	ND	(0.050)	ND	(0.050)
Organic Carbon	mg C/L	4.1	(0.50)	2.6	(0.50)	8.4	(0.50)	7.0	(0.50)
Phosphate, total	mg P/L	ND	(0.050)	0.11	(0.050)	ND	(0.050)	0.73	(0.050)
Silicon	mg Si/L	12.0	(1.0)	16.9	(1.0)	11.2	(1.0)	19.5	(1.0)
Sulfate	mg/L	45.0	(0.50)	146.0	(0.50)	106.0	(0.50)	140.0	(0.50)
Sulfide by Iodine Titn	mg S/L	ND	(0.33)	ND	(0.34)	ND	(0.35)	ND	(0.33)
Sulfite by IC	mg/L	NA		NA		NA		NA	
Sulfite by Iodine Titn	mg/L	ND	(2.0)	ND	(2.0)	ND	(2.0)	NA	
Thiosulfate	mg S2O3/L	0.40	(0.20)	ND	(0.30)	NA		ND	(0.30)
Thiourea	mg/L	ND	(0.50)	ND	(0.50)	ND	(0.50)	ND	(0.50)
Elements in Aqueous Media by AA									
Arsenic	mg/L	ND	(0.0020)	ND	(0.0020)	ND	(0.0020)	ND	(0.0020)
Calcium	mg/L	11.0	(0.10)	30.0	(0.10)	26.0	(0.10)	36.0	(0.10)
Chromium	mg/L	ND	(0.0010)	ND	(0.0010)	ND	(0.0010)	ND	(0.0010)

ND: Not detected at specified detection limit

NA: Not analyzed

Table C-3

CHEMICAL CHARACTERISTICS OF WATERS FROM DOWNGRADIENT WELLS FROM L STATION, EVENT 1

		Location							
		Sample ID							
		Date Sampled							
		LMW-01		LMW-02		LMW-03		LMW-04	
		L-032		L-045		L-027		L-047	
		17-Apr-89		21-Apr-89		14-Apr-89		21-Apr-89	
PARAMETER	Units	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit
Copper	mg/L	0.0030	(0.0010)	0.0030	(0.0010)	ND	(0.0010)	ND	(0.0010)
Lead	mg/L	ND	(0.0020)	ND	(0.0020)	ND	(0.0020)	ND	(0.0020)
Magnesium	mg/kg	6.2	(0.10)	2.0	(0.10)	14.0	(0.10)	22.0	(0.10)
Potassium	mg/kg	2.6	(0.10)	2.0	(0.10)	4.0	(0.10)	4.3	(0.10)
Selenium	mg/L	ND	(0.0020)	ND	(0.0020)	ND	(0.0020)	ND	(0.0020)
Sodium	mg/L	4.7	(0.0010)	11.0	(0.0010)	12.0	(0.0010)	15.0	(0.0010)
Elements by ICPES									
Aluminum	mg/L	ND	(0.20)	ND	(0.20)	ND	(0.20)	ND	(0.20)
Antimony	mg/L	ND	(0.20)	ND	(0.20)	ND	(0.20)	ND	(0.20)
Arsenic	mg/L	ND	(0.30)	ND	(0.30)	ND	(0.30)	ND	(0.30)
Barium	mg/L	0.020	(0.010)	0.078	(0.010)	0.040	(0.010)	0.020	(0.010)
Beryllium	mg/L	ND	(0.0020)	ND	(0.0020)	ND	(0.0020)	ND	(0.0020)
Boron	mg/L	ND	(0.60)	ND	(0.60)	ND	(0.60)	ND	(0.60)
Cadmium	mg/L	ND	(0.0050)	ND	(0.0050)	ND	(0.0050)	ND	(0.0050)
Calcium	mg/L	11.0	(1.0)	29.0	(1.0)	26.0	(1.0)	35.0	(1.0)
Chromium	mg/L	ND	(0.030)	ND	(0.030)	ND	(0.030)	ND	(0.030)
Cobalt	mg/L	ND	(0.010)	ND	(0.010)	ND	(0.010)	ND	(0.010)
Copper	mg/L	ND	(0.020)	ND	(0.020)	ND	(0.020)	ND	(0.020)
Iron	mg/L	ND	(0.040)	ND	(0.040)	0.26	(0.040)	0.95	(0.040)
Lead	mg/L	ND	(0.050)	ND	(0.050)	ND	(0.050)	ND	(0.050)
Magnesium	mg/L	6.0	(1.0)	19.0	(1.0)	13.0	(1.0)	20.0	(1.0)
Manganese	mg/L	2.1	(0.010)	0.11	(0.010)	0.22	(0.010)	1.7	(0.010)
Molybdenum	mg/L	ND	(0.050)	ND	(0.050)	ND	(0.050)	ND	(0.050)
Nickel	mg/L	ND	(0.020)	ND	(0.020)	ND	(0.020)	ND	(0.020)
Potassium	mg/L	ND	(3.0)	ND	(3.0)	3.0	(3.0)	4.0	(3.0)
Selenium	mg/L	ND	(0.30)	ND	(0.30)	ND	(0.30)	ND	(0.30)
Silicon	mg/L	11.0	(1.0)	15.0	(1.0)	10.0	(1.0)	19.0	(1.0)
Silver	mg/L	ND	(0.030)	ND	(0.030)	ND	(0.030)	ND	(0.030)
Sodium	mg/L	4.0	(1.0)	10.0	(1.0)	11.0	(1.0)	14.0	(1.0)

ND: Not detected at specified detection limit

NA: Not analyzed

Table C-3

CHEMICAL CHARACTERISTICS OF WATERS FROM DOWNGRADIENT WELLS FROM L STATION, EVENT 1

		Location							
		Sample ID							
		Date Sampled							
		LMW-01		LMW-02		LMW-03		LMW-04	
		L-032		L-045		L-027		L-047	
		17-Apr-89		21-Apr-89		14-Apr-89		21-Apr-89	
PARAMETER	Units	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit
Strontium	mg/L	0.063	(0.0030)	0.18	(0.0030)	0.22	(0.0030)	0.15	(0.0030)
Thallium	mg/L	ND	(0.10)	ND	(0.10)	ND	(0.10)	ND	(0.10)
Vanadium	mg/L	ND	(0.020)	ND	(0.020)	ND	(0.020)	ND	(0.020)
Zinc	mg/L	ND	(0.020)	0.12	(0.020)	ND	(0.020)	ND	(0.020)

ND: Not detected at specified detection limit

NA: Not analyzed

Table C-3

CHEMICAL CHARACTERISTICS OF WATERS FROM DOWNGRADIENT WELLS FROM L STATION, EVENT 1

		Location							
		Sample ID							
		Date Sampled							
		LMW-05		LMW-06		LMW-07		LMW-08	
		L-028		L-035		L-046		L-043	
		14-Apr-89		17-Apr-89		21-Apr-89		20-Apr-89	
PARAMETER	Units	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit
Water Quality Variables									
Electrical Conductivity (Field)	micromhos/cm	440.0	(10.0)	85.0	(10.0)	NA		370.0	(10.0)
Electrical Conductivity (Lab)	micromhos/cm	411.0	(10.0)	184.0	(10.0)	474.0	(10.0)	297.0	(10.0)
Filterable Residue	mg/L	315.0	(8.0)	ND	(8.0)	371.0	(8.0)	256.0	(5.0)
Oxid-Red (Eh)	mV	180.0	(10.0)	102.0	(10.0)	NA		341.0	(10.0)
Temperature (Field)	Degrees C	17.6	(0.10)	17.5	(0.10)	19.0	(0.10)	16.9	(0.10)
pH_value	pH Units	5.9	(0.050)	5.0	(0.050)	8.4	(0.050)	5.7	(0.050)
Anions and Ammonia in Aqueous Media									
Alkalinity	mg HCO3/L	34.0	(1.0)	3.0	(1.0)	96.0	(1.0)	29.0	(1.0)
Ammonia	mg N/L	0.31	(0.010)	0.020	(0.010)	0.14	(0.010)	ND	(0.010)
Bromide	mg/L	0.18	(0.080)	0.096	(0.080)	0.20	(0.040)	0.15	(0.040)
Carbonate	mg HCO3/L	143.0	(6.0)	67.0	(6.0)	87.0	(6.0)	80.0	(6.0)
Chloride	mg/L	4.4	(2.0)	9.4	(2.0)	5.0	(2.0)	4.5	(2.0)
Fluoride	mg/L	0.041	(0.010)	0.040	(0.010)	0.18	(0.010)	0.040	(0.010)
Nitrate/Nitrite	mg N/L	ND	(0.050)	0.16	(0.050)	0.91	(0.050)	0.24	(0.050)
Organic Carbon	mg C/L	7.9	(0.50)	6.0	(0.50)	6.6	(0.50)	3.7	(0.50)
Phosphate, total	mg P/L	ND	(0.050)	ND	(0.050)	2.4	(0.050)	ND	(0.050)
Silicon	mg Si/L	15.1	(1.0)	4.1	(1.0)	7.0	(1.0)	15.9	(1.0)
Sulfate	mg/L	171.0	(0.50)	51.0	(0.50)	145.0	(0.50)	116.0	(0.50)
Sulfide by Iodine Titn	mg S/L	ND	(0.34)	ND	(0.33)	ND	(0.43)	ND	(0.44)
Sulfite by IC	mg/L	NA		NA		NA		NA	
Sulfite by Iodine Titn	mg/L	ND	(2.0)	ND	(3.0)	ND	(3.0)	ND	(3.0)
Thiosulfate	mg S2O3/L	0.60	(0.20)	0.50	(0.20)	0.40	(0.30)	0.30	(0.30)
Thiourea	mg/L	ND	(0.50)	ND	(0.50)	ND	(0.50)	ND	(0.50)
Elements in Aqueous Media by AA									
Arsenic	mg/L	ND	(0.0020)	ND	(0.0020)	0.0050	(0.0020)	ND	(0.0020)
Calcium	mg/L	39.0	(0.10)	0.78	(0.10)	60.0	(0.10)	20.0	(0.10)
Chromium	mg/L	ND	(0.0010)	0.0020	(0.0010)	ND	(0.0010)	0.0010	(0.0010)

ND: Not detected at specified detection limit

NA: Not analyzed

Table C-3

CHEMICAL CHARACTERISTICS OF WATERS FROM DOWNGRADIENT WELLS FROM L STATION, EVENT 1

		Location							
		Sample ID							
		Date Sampled							
		LMW-05		LMW-06		LMW-07		LMW-08	
		L-028		L-035		L-046		L-043	
		14-Apr-89		17-Apr-89		21-Apr-89		20-Apr-89	
PARAMETER	Units	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit
Copper	mg/L	ND	(0.0010)	ND	(0.0010)	0.0070	(0.0010)	ND	(0.0010)
Lead	mg/L	ND	(0.0020)	ND	(0.0020)	ND	(0.0020)	ND	(0.0020)
Magnesium	mg/kg	18.0	(0.10)	9.5	(0.10)	5.7	(0.10)	16.0	(0.10)
Potassium	mg/kg	4.1	(0.10)	3.5	(0.10)	12.0	(0.10)	2.6	(0.10)
Selenium	mg/L	ND	(0.0020)	ND	(0.0020)	ND	(0.0020)	ND	(0.0020)
Sodium	mg/L	17.0	(0.0010)	8.0	(0.0010)	21.0	(0.0010)	17.0	(0.0010)
Elements by ICPES									
Aluminum	mg/L	ND	(0.20)	ND	(0.20)	ND	(0.20)	ND	(0.20)
Antimony	mg/L	ND	(0.20)	ND	(0.20)	ND	(0.20)	ND	(0.20)
Arsenic	mg/L	ND	(0.30)	ND	(0.30)	ND	(0.30)	ND	(0.30)
Barium	mg/L	0.11	(0.010)	0.24	(0.010)	0.20	(0.010)	0.50	(0.010)
Beryllium	mg/L	ND	(0.0020)	ND	(0.0020)	ND	(0.0020)	ND	(0.0020)
Boron	mg/L	0.80	(0.60)	ND	(0.60)	ND	(0.60)	0.70	(0.60)
Cadmium	mg/L	ND	(0.0050)	ND	(0.0050)	ND	(0.0050)	ND	(0.0050)
Calcium	mg/L	38.0	(1.0)	ND	(1.0)	57.0	(1.0)	19.0	(1.0)
Chromium	mg/L	ND	(0.030)	ND	(0.030)	ND	(0.030)	ND	(0.030)
Cobalt	mg/L	ND	(0.010)	0.076	(0.010)	ND	(0.010)	ND	(0.010)
Copper	mg/L	ND	(0.020)	ND	(0.020)	ND	(0.020)	ND	(0.020)
Iron	mg/L	ND	(0.040)	ND	(0.040)	ND	(0.040)	ND	(0.040)
Lead	mg/L	ND	(0.050)	ND	(0.050)	ND	(0.050)	ND	(0.050)
Magnesium	mg/L	17.0	(1.0)	9.3	(1.0)	5.3	(1.0)	16.0	(1.0)
Manganese	mg/L	0.53	(0.010)	0.71	(0.010)	ND	(0.010)	0.13	(0.010)
Molybdenum	mg/L	ND	(0.050)	ND	(0.050)	ND	(0.050)	ND	(0.050)
Nickel	mg/L	ND	(0.020)	ND	(0.020)	ND	(0.020)	ND	(0.020)
Potassium	mg/L	3.0	(3.0)	3.0	(3.0)	10.0	(3.0)	ND	(3.0)
Selenium	mg/L	ND	(0.30)	ND	(0.30)	ND	(0.30)	ND	(0.30)
Silicon	mg/L	14.0	(1.0)	4.0	(1.0)	6.9	(1.0)	14.0	(1.0)
Silver	mg/L	ND	(0.030)	ND	(0.030)	ND	(0.030)	ND	(0.030)
Sodium	mg/L	15.0	(1.0)	7.2	(1.0)	19.0	(1.0)	16.0	(1.0)

ND: Not detected at specified detection limit

NA: Not analyzed

Table C-3

CHEMICAL CHARACTERISTICS OF WATERS FROM DOWNGRADIENT WELLS FROM L STATION, EVENT 1

		Location							
		Sample ID							
		Date Sampled							
		LMW-05		LMW-06		LMW-07		LMW-08	
		L-028		L-035		L-046		L-043	
		14-Apr-89		17-Apr-89		21-Apr-89		20-Apr-89	
PARAMETER	Units	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit
Strontium	mg/L	0.27	(0.0030)	0.010	(0.0030)	0.28	(0.0030)	0.12	(0.0030)
Thallium	mg/L	ND	(0.10)	ND	(0.10)	ND	(0.10)	ND	(0.10)
Vanadium	mg/L	ND	(0.020)	ND	(0.020)	ND	(0.020)	ND	(0.020)
Zinc	mg/L	ND	(0.020)	0.030	(0.020)	ND	(0.020)	0.40	(0.020)

ND: Not detected at specified detection limit

NA: Not analyzed

Table C-3

CHEMICAL CHARACTERISTICS OF WATERS FROM DOWNGRADIENT WELLS FROM L STATION, EVENT 1

		Location							
		Sample ID							
		Date Sampled							
		LMW-09		LMW-10		LMW-13		LMW-16	
		L-034		L-038		L-044		L-036	
		17-Apr-89		18-Apr-89		20-Apr-89		18-Apr-89	
PARAMETER	Units	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit
Water Quality Variables									
Electrical Conductivity (Field)	micromhos/cm	5.0	(10.0)	5.0	(10.0)	6.0	(10.0)	197.0	(10.0)
Electrical Conductivity (Lab)	micromhos/cm	199.0	(10.0)	177.0	(10.0)	NA		341.0	(10.0)
Filterable Residue	mg/L	144.0	(8.0)	64.0	(8.0)	299.0	(5.0)	154.0	(8.0)
Oxid-Red (Eh)	mV	-108.0	(10.0)	165.0	(10.0)	209.0	(10.0)	117.0	(10.0)
Temperature (Field)	Degrees C	20.6	(0.10)	18.2	(0.10)	16.4	(0.10)	18.4	(0.10)
pH_value	pH Units	4.1	(0.050)	5.4	(0.050)	6.2	(0.050)	6.0	(0.050)
Anions and Ammonia in Aqueous Media									
Alkalinity	mg HCO3/L	71.0	(1.0)	49.0	(1.0)	29.0	(1.0)	51.0	(1.0)
Ammonia	mg N/L	0.17	(0.010)	ND	(0.010)	NA		ND	(0.010)
Bromide	mg/L	0.078	(0.080)	ND	(0.040)	NA		0.18	(0.080)
Carbonate	mg HCO3/L	111.0	(6.0)	321.0	(6.0)	NA		177.0	(6.0)
Chloride	mg/L	5.9	(2.0)	2.2	(0.20)	NA		4.4	(2.0)
Fluoride	mg/L	0.10	(0.010)	0.031	(0.010)	NA		0.040	(0.010)
Nitrate/Nitrite	mg N/L	0.10	(0.050)	0.16	(0.050)	NA		ND	(0.050)
Organic Carbon	mg C/L	12.6	(0.50)	1.8	(0.50)	NA		8.3	(0.50)
Phosphate, total	mg P/L	ND	(0.050)	0.42	(0.050)	NA		0.052	(0.050)
Silicon	mg Si/L	5.1	(1.0)	12.2	(1.0)	NA		15.2	(1.0)
Sulfate	mg/L	62.0	(0.50)	62.0	(0.50)	NA		132.0	(0.50)
Sulfide by Iodine Titn	mg S/L	ND	(0.33)	ND	(0.33)	NA		ND	(0.31)
Sulfite by IC	mg/L	ND	(0.080)	NA		NA		ND	(0.080)
Sulfite by Iodine Titn	mg/L	NA		ND	(2.0)	NA		ND	(2.0)
Thiosulfate	mg S2O3/L	0.50	(0.20)	0.50	(0.20)	NA		0.80	(0.20)
Thiourea	mg/L	ND	(0.50)	ND	(0.50)	NA		ND	(0.50)
Elements in Aqueous Media by AA									
Arsenic	mg/L	ND	(0.0020)	ND	(0.0020)	NA		ND	(0.0020)
Calcium	mg/L	21.0	(0.10)	23.0	(0.10)	NA		37.0	(0.10)
Chromium	mg/L	ND	(0.0010)	ND	(0.0010)	NA		ND	(0.0010)

ND: Not detected at specified detection limit

NA: Not analyzed

Table C-3

CHEMICAL CHARACTERISTICS OF WATERS FROM DOWNGRADIENT WELLS FROM L STATION, EVENT 1

		Location							
		Sample ID							
		Date Sampled							
		LMW-09		LMW-10		LMW-13		LMW-16	
		L-034		L-038		L-044		L-036	
		17-Apr-89		18-Apr-89		20-Apr-89		18-Apr-89	
PARAMETER	Units	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit
Copper	mg/L	0.0020	(0.0010)	0.0010	(0.0010)	NA		ND	(0.0010)
Lead	mg/L	ND	(0.0020)	ND	(0.0020)	NA		ND	(0.0020)
Magnesium	mg/kg	5.6	(0.10)	8.0	(0.10)	NA		14.0	(0.10)
Potassium	mg/kg	3.8	(0.10)	2.6	(0.10)	NA		4.6	(0.10)
Selenium	mg/L	ND	(0.0020)	ND	(0.0020)	NA		ND	(0.0020)
Sodium	mg/L	10.0	(0.0010)	6.0	(0.0010)	NA		13.0	(0.0010)
Elements by ICPES									
Aluminum	mg/L	ND	(0.20)	ND	(0.20)	NA		ND	(0.20)
Antimony	mg/L	ND	(0.20)	ND	(0.20)	NA		ND	(0.20)
Arsenic	mg/L	ND	(0.30)	ND	(0.30)	NA		ND	(0.30)
Barium	mg/L	0.040	(0.010)	0.040	(0.010)	NA		0.13	(0.010)
Beryllium	mg/L	ND	(0.0020)	ND	(0.0020)	NA		ND	(0.0020)
Boron	mg/L	ND	(0.60)	ND	(0.60)	NA		ND	(0.60)
Cadmium	mg/L	ND	(0.0050)	ND	(0.0050)	NA		ND	(0.0050)
Calcium	mg/L	20.0	(1.0)	22.0	(1.0)	NA		36.0	(1.0)
Chromium	mg/L	ND	(0.030)	ND	(0.030)	NA		ND	(0.030)
Cobalt	mg/L	ND	(0.010)	ND	(0.010)	NA		ND	(0.010)
Copper	mg/L	ND	(0.020)	ND	(0.020)	NA		ND	(0.020)
Iron	mg/L	15.0	(0.040)	ND	(0.040)	NA		ND	(0.040)
Lead	mg/L	ND	(0.050)	ND	(0.050)	NA		ND	(0.050)
Magnesium	mg/L	5.3	(1.0)	7.6	(1.0)	NA		13.0	(1.0)
Manganese	mg/L	4.0	(0.010)	0.42	(0.010)	NA		0.095	(0.010)
Molybdenum	mg/L	ND	(0.050)	ND	(0.050)	NA		ND	(0.050)
Nickel	mg/L	ND	(0.020)	ND	(0.020)	NA		ND	(0.020)
Potassium	mg/L	3.0	(3.0)	ND	(3.0)	NA		4.0	(3.0)
Selenium	mg/L	ND	(0.30)	ND	(0.30)	NA		ND	(0.30)
Silicon	mg/L	5.7	(1.0)	11.0	(1.0)	NA		13.0	(1.0)
Silver	mg/L	ND	(0.030)	ND	(0.030)	NA		ND	(0.030)
Sodium	mg/L	9.3	(1.0)	5.5	(1.0)	NA		11.0	(1.0)

ND: Not detected at specified detection limit

NA: Not analyzed

Table C-3

CHEMICAL CHARACTERISTICS OF WATERS FROM DOWNGRADIENT WELLS FROM L STATION, EVENT 1

		Location							
		Sample ID							
		Date Sampled							
		LMW-09		LMW-10		LMW-13		LMW-16	
		L-034		L-038		L-044		L-036	
		17-Apr-89		18-Apr-89		20-Apr-89		18-Apr-89	
PARAMETER	Units	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit
Strontium	mg/L	0.20	(0.0030)	0.12	(0.0030)	NA		0.20	(0.0030)
Thallium	mg/L	ND	(0.10)	ND	(0.10)	NA		ND	(0.10)
Vanadium	mg/L	ND	(0.020)	ND	(0.020)	NA		ND	(0.020)
Zinc	mg/L	ND	(0.020)	ND	(0.020)	NA		ND	(0.020)

ND: Not detected at specified detection limit

NA: Not analyzed

Table C-3

CHEMICAL CHARACTERISTICS OF WATERS FROM DOWNGRADIENT WELLS FROM L STATION, EVENT 1

		Location	
		Sample ID	
		Date Sampled	
		LMW-17	
		L-042	
		19-Apr-89	
PARAMETER	Units	Msr'd Val.	Det. Limit
Water Quality Variables			
Electrical Conductivity (Field)	micromhos/cm	108.0	(10.0)
Electrical Conductivity (Lab)	micromhos/cm	271.0	(10.0)
Filterable Residue	mg/L	203.0	(8.0)
Oxid-Red (Eh)	mV	290.0	(10.0)
Temperature (Field)	Degrees C	19.4	(0.10)
pH_value	pH Units	5.8	(0.050)
Anions and Ammonia in Aqueous Media			
Alkalinity	mg HCO3/L	27.0	(1.0)
Ammonia	mg N/L	0.070	(0.010)
Bromide	mg/L	0.13	(0.040)
Carbonate	mg HCO3/L	119.0	(6.0)
Chloride	mg/L	5.7	(2.0)
Fluoride	mg/L	0.082	(0.010)
Nitrate/Nitrite	mg N/L	0.070	(0.050)
Organic Carbon	mg C/L	1.6	(0.50)
Phosphate, total	mg P/L	0.13	(0.050)
Silicon	mg Si/L	12.0	(1.0)
Sulfate	mg/L	60.0	(0.50)
Sulfide by Iodine Titn	mg S/L	ND	(0.34)
Sulfite by IC	mg/L	NA	
Sulfite by Iodine Titn	mg/L	ND	(2.0)
Thiosulfate	mg S2O3/L	ND	(0.30)
Thiourea	mg/L	ND	(0.50)
Elements in Aqueous Media by AA			
Arsenic	mg/L	ND	(0.0020)
Calcium	mg/L	11.0	(0.10)
Chromium	mg/L	ND	(0.0010)

ND: Not detected at specified detection limit

NA: Not analyzed

Table C-3

CHEMICAL CHARACTERISTICS OF WATERS FROM DOWNGRADIENT WELLS FROM L STATION, EVENT 1

		Location	
		Sample ID	
		Date Sampled	
		LMW-17	
		L-042	
		19-Apr-89	
PARAMETER	Units	Msr'd Val.	Det. Limit
Copper	mg/L	0.0040	(0.0010)
Lead	mg/L	ND	(0.0020)
Magnesium	mg/kg	9.3	(0.10)
Potassium	mg/kg	0.66	(0.10)
Selenium	mg/L	ND	(0.0020)
Sodium	mg/L	12.0	(0.0010)
Elements by ICPES			
Aluminum	mg/L	ND	(0.20)
Antimony	mg/L	ND	(0.20)
Arsenic	mg/L	ND	(0.30)
Barium	mg/L	0.82	(0.010)
Beryllium	mg/L	ND	(0.0020)
Boron	mg/L	0.90	(0.60)
Cadmium	mg/L	ND	(0.0050)
Calcium	mg/L	11.0	(1.0)
Chromium	mg/L	ND	(0.030)
Cobalt	mg/L	ND	(0.010)
Copper	mg/L	ND	(0.020)
Iron	mg/L	0.25	(0.040)
Lead	mg/L	ND	(0.050)
Magnesium	mg/L	9.2	(1.0)
Manganese	mg/L	0.050	(0.010)
Molybdenum	mg/L	ND	(0.050)
Nickel	mg/L	ND	(0.020)
Potassium	mg/L	ND	(3.0)
Selenium	mg/L	ND	(0.30)
Silicon	mg/L	11.0	(1.0)
Silver	mg/L	ND	(0.030)
Sodium	mg/L	11.0	(1.0)

ND: Not detected at specified detection limit

NA: Not analyzed

Table C-3

CHEMICAL CHARACTERISTICS OF WATERS FROM DOWNGRADIENT WELLS FROM L STATION, EVENT 1

		Location	
		Sample ID	
		Date Sampled	
		LMW-17	
		L-042	
		19-Apr-89	
PARAMETER	Units	Msr'd Val.	Det. Limit
Strontium	mg/L	0.094	(0.0030)
Thallium	mg/L	ND	(0.10)
Vanadium	mg/L	ND	(0.020)
Zinc	mg/L	0.39	(0.020)

ND: Not detected at specified detection limit

NA: Not analyzed

Table C-4

CHEMICAL CHARACTERISTICS OF RIVER AND POND WATERS FROM L STATION, EVENT 1

		Location							
		Sample ID							
		Date Sampled							
		R1		R2		R2		AP1	
		L-029		L-030		L-031		L-033	
		15-Apr-89		15-Apr-89		15-Apr-89		17-Apr-89	
PARAMETER	Units	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit
Water Quality Variables									
Electrical Conductivity (Field)	micromhos/cm	41.0	(10.0)	42.0	(10.0)	42.0	(10.0)	4.0	(10.0)
Electrical Conductivity (Lab)	micromhos/cm	184.0	(10.0)	184.0	(10.0)	192.0	(10.0)	94.0	(10.0)
Filterable Residue	mg/L	44.0	(8.0)	55.0	(8.0)	42.0	(8.0)	59.0	(8.0)
Oxid-Red (Eh)	mV	180.0	(10.0)	82.0	(10.0)	82.0	(10.0)	367.0	(10.0)
Temperature (Field)	Degrees C	14.9	(0.10)	15.8	(0.10)	15.8	(0.10)	19.8	(0.10)
pH_value	pH Units	6.9	(0.050)	7.2	(0.050)	7.2	(0.050)	7.9	(0.050)
Anions and Ammonia in Aqueous Media									
Alkalinity	mg HCO3/L	11.0	(1.0)	ND	(1.0)	13.0	(1.0)	11.0	(1.0)
Ammonia	mg N/L	0.36	(0.010)	0.099	(0.010)	1.3	(0.010)	0.030	(0.010)
Bromide	mg/L	ND	(0.080)	ND	(0.080)	ND	(0.080)	ND	(0.080)
Carbonate	mg HCO3/L	15.0	(6.0)	17.0	(6.0)	17.0	(6.0)	13.0	(6.0)
Chloride	mg/L	2.0	(0.20)	2.0	(0.20)	2.3	(0.20)	2.3	(0.20)
Fluoride	mg/L	0.031	(0.010)	0.034	(0.010)	0.034	(0.010)	0.075	(0.010)
Nitrate/Nitrite	mg N/L	0.34	(0.050)	0.39	(0.050)	0.37	(0.050)	ND	(0.050)
Organic Carbon	mg C/L	2.9	(0.50)	2.7	(0.50)	2.5	(0.50)	1.6	(0.50)
Phosphate, total	mg P/L	ND	(0.050)	ND	(0.050)	ND	(0.050)	ND	(0.050)
Silicon	mg Si/L	4.4	(1.0)	4.5	(1.0)	5.7	(1.0)	4.2	(1.0)
Sulfate	mg/L	2.3	(0.50)	3.1	(0.50)	3.1	(0.50)	33.0	(0.50)
Sulfide by Iodine Titn	mg S/L	ND	(0.33)	ND	(0.32)	ND	(0.34)	ND	(0.32)
Sulfite by IC	mg/L	ND	(0.080)	ND	(0.080)	ND	(0.080)	NA	
Sulfite by Iodine Titn	mg/L	ND	(2.0)	ND	(2.0)	ND	(2.0)	ND	(4.0)
Thiosulfate	mg S2O3/L	ND	(0.20)	0.30	(0.20)	ND	(0.20)	ND	(0.20)
Thiourea	mg/L	ND	(0.50)	ND	(0.50)	ND	(0.50)	ND	(0.50)
Elements in Aqueous Media by AA									
Arsenic	mg/L	ND	(0.0020)	ND	(0.0020)	ND	(0.0020)	0.025	(0.0020)
Calcium	mg/L	2.2	(0.10)	2.3	(0.10)	2.4	(0.10)	10.0	(0.10)
Chromium	mg/L	ND	(0.0010)	ND	(0.0010)	ND	(0.0010)	ND	(0.0010)

ND: Not detected at specified detection limit

NA: Not analyzed

Table C-4

CHEMICAL CHARACTERISTICS OF RIVER AND POND WATERS FROM L STATION, EVENT 1

		Location							
		Sample ID							
		Date Sampled							
		R1		R2		R2		AP1	
		L-029		L-030		L-031		L-033	
		15-Apr-89		15-Apr-89		15-Apr-89		17-Apr-89	
PARAMETER	Units	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit
Copper	mg/L	ND	(0.0010)	ND	(0.0010)	ND	(0.0010)	0.0040	(0.0010)
Lead	mg/L	ND	(0.0020)	ND	(0.0020)	ND	(0.0020)	ND	(0.0020)
Magnesium	mg/kg	0.79	(0.10)	0.87	(0.10)	0.85	(0.10)	1.4	(0.10)
Potassium	mg/kg	0.87	(0.10)	0.70	(0.10)	0.74	(0.10)	4.7	(0.10)
Selenium	mg/L	ND	(0.0020)	ND	(0.0020)	ND	(0.0020)	ND	(0.0020)
Sodium	mg/L	3.4	(0.0010)	3.9	(0.0010)	3.8	(0.0010)	8.7	(0.0010)
Elements by ICPES									
Aluminum	mg/L	ND	(0.20)	ND	(0.20)	ND	(0.20)	ND	(0.20)
Antimony	mg/L	ND	(0.20)	ND	(0.20)	ND	(0.20)	ND	(0.20)
Arsenic	mg/L	ND	(0.30)	ND	(0.30)	ND	(0.30)	ND	(0.30)
Barium	mg/L	0.058	(0.010)	0.15	(0.010)	0.13	(0.010)	0.099	(0.010)
Beryllium	mg/L	ND	(0.0020)	ND	(0.0020)	ND	(0.0020)	ND	(0.0020)
Boron	mg/L	ND	(0.60)	ND	(0.60)	ND	(0.60)	ND	(0.60)
Cadmium	mg/L	ND	(0.0050)	ND	(0.0050)	ND	(0.0050)	ND	(0.0050)
Calcium	mg/L	2.0	(1.0)	3.0	(1.0)	3.0	(1.0)	10.0	(1.0)
Chromium	mg/L	ND	(0.030)	ND	(0.030)	ND	(0.030)	ND	(0.030)
Cobalt	mg/L	ND	(0.010)	ND	(0.010)	ND	(0.010)	ND	(0.010)
Copper	mg/L	ND	(0.020)	ND	(0.020)	ND	(0.020)	ND	(0.020)
Iron	mg/L	0.10	(0.040)	0.24	(0.040)	0.24	(0.040)	ND	(0.040)
Lead	mg/L	ND	(0.050)	ND	(0.050)	ND	(0.050)	ND	(0.050)
Magnesium	mg/L	ND	(1.0)	ND	(1.0)	ND	(1.0)	1.0	(1.0)
Manganese	mg/L	0.076	(0.010)	0.073	(0.010)	0.079	(0.010)	ND	(0.010)
Molybdenum	mg/L	ND	(0.050)	ND	(0.050)	ND	(0.050)	0.050	(0.050)
Nickel	mg/L	ND	(0.020)	ND	(0.020)	ND	(0.020)	ND	(0.020)
Potassium	mg/L	ND	(3.0)	ND	(3.0)	ND	(3.0)	4.0	(3.0)
Selenium	mg/L	ND	(0.30)	ND	(0.30)	ND	(0.30)	ND	(0.30)
Silicon	mg/L	5.3	(1.0)	5.4	(1.0)	5.4	(1.0)	4.0	(1.0)
Silver	mg/L	ND	(0.030)	ND	(0.030)	ND	(0.030)	ND	(0.030)
Sodium	mg/L	3.0	(1.0)	4.0	(1.0)	4.0	(1.0)	7.9	(1.0)

ND: Not detected at specified detection limit

NA: Not analyzed

Table C-4

CHEMICAL CHARACTERISTICS OF RIVER AND POND WATERS FROM L STATION, EVENT 1

		Location							
		Sample ID							
		Date Sampled							
		R1		R2		R2		AP1	
		L-029		L-030		L-031		L-033	
		15-Apr-89		15-Apr-89		15-Apr-89		17-Apr-89	
PARAMETER	Units	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit
Strontium	mg/L	0.018	(0.0030)	0.020	(0.0030)	0.020	(0.0030)	0.19	(0.0030)
Thallium	mg/L	ND	(0.10)	ND	(0.10)	ND	(0.10)	ND	(0.10)
Vanadium	mg/L	ND	(0.020)	ND	(0.020)	ND	(0.020)	ND	(0.020)
Zinc	mg/L	ND	(0.020)	ND	(0.020)	ND	(0.020)	ND	(0.020)

ND: Not detected at specified detection limit

NA: Not analyzed

Table C-5

CHEMICAL CHARACTERISTICS OF QUALITY CONTROL SAMPLES FOR ANALYSIS OF WATERS FROM L STATION, EVENT 1

		Location			
		Sample ID			
		Date Sampled			
		Field Blank		Audit Sample L-1	
		L-050		L-052	
		21-Apr-89		15-Feb-89	
PARAMETER	Units	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit
Water Quality Variables					
Electrical Conductivity (Field)	micromhos/cm	NA		NA	
Electrical Conductivity (Lab)	micromhos/cm	23.0	(10.0)	NA	
Filterable Residue	mg/L	6.0	(5.0)	740.0	(5.0)
Oxid-Red (Eh)	mV	NA		NA	
Temperature (Field)	Degrees C	NA		NA	
pH_value	pH Units	NA		NA	
Anions and Ammonia in Aqueous Media					
Alkalinity	mg HCO3/L	ND	(1.0)	NA	
Ammonia	mg N/L	0.11	(0.010)	NA	
Bromide	mg/L	ND	(0.040)	NA	
Carbonate	mg HCO3/L	0.0	(6.0)	NA	
Chloride	mg/L	ND	(0.20)	NA	
Fluoride	mg/L	0.0050	(0.010)	NA	
Nitrate/Nitrite	mg N/L	ND	(0.050)	NA	
Organic Carbon	mg C/L	0.30	(0.50)	26.9	(0.50)
Phosphate, total	mg P/L	0.55	(0.050)	NA	
Silicon	mg Si/L	ND	(1.0)	NA	
Sulfate	mg/L	ND	(0.50)	NA	
Sulfide by Iodine Titn	mg S/L	ND	(0.33)	NA	
Sulfite by IC	mg/L	ND	(0.080)	NA	
Sulfite by Iodine Titn	mg/L	ND	(2.0)	NA	
Thiosulfate	mg S2O3/L	ND	(0.30)	NA	
Thiourea	mg/L	ND	(0.50)	NA	
Elements in Aqueous Media by AA					
Arsenic	mg/L	ND	(0.0020)	1.0	(0.0020)
Calcium	mg/L	ND	(0.10)	1.0	(0.10)
Chromium	mg/L	ND	(0.0010)	1.0	(0.0010)

ND: Not detected at specified detection limit

NA: Not analyzed

Table C-5

CHEMICAL CHARACTERISTICS OF QUALITY CONTROL SAMPLES FOR ANALYSIS OF WATERS FROM L STATION, EVENT 1

		Location			
		Sample ID			
		Date Sampled			
		Field Blank		Audit Sample L-1	
		L-050		L-052	
		21-Apr-89		15-Feb-89	
PARAMETER	Units	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit
Copper	mg/L	ND	(0.0010)	1.0	(0.0010)
Lead	mg/L	ND	(0.0020)	1.1	()
Magnesium	mg/kg	ND	(0.10)	1.0	(0.10)
Potassium	mg/kg	ND	(0.10)	ND	(0.10)
Selenium	mg/L	ND	(0.0020)	1.0	()
Sodium	mg/L	0.57	(0.0010)	ND	(0.10)
Elements by ICPES					
Aluminum	mg/L	ND	(0.20)	ND	(0.20)
Antimony	mg/L	ND	(0.20)	1.0	(0.20)
Arsenic	mg/L	ND	(0.30)	1.0	(0.30)
Barium	mg/L	0.020	(0.010)	ND	(0.010)
Beryllium	mg/L	ND	(0.0020)	0.96	(0.0020)
Boron	mg/L	ND	(0.60)	ND	(0.60)
Cadmium	mg/L	ND	(0.0050)	1.0	(0.0050)
Calcium	mg/L	ND	(1.0)	1.0	(1.0)
Chromium	mg/L	ND	(0.030)	0.95	(0.030)
Cobalt	mg/L	ND	(0.010)	0.96	(0.010)
Copper	mg/L	ND	(0.020)	0.94	(0.020)
Iron	mg/L	ND	(0.040)	0.96	(0.040)
Lead	mg/L	ND	(0.050)	0.99	(0.050)
Magnesium	mg/L	ND	(1.0)	ND	(1.0)
Manganese	mg/L	ND	(0.010)	0.97	(0.010)
Molybdenum	mg/L	ND	(0.050)	1.0	(0.050)
Nickel	mg/L	ND	(0.020)	0.99	(0.020)
Potassium	mg/L	ND	(3.0)	ND	(3.0)
Selenium	mg/L	ND	(0.30)	1.0	(0.30)
Silicon	mg/L	ND	(1.0)	ND	(1.0)
Silver	mg/L	ND	(0.030)	ND	(0.030)
Sodium	mg/L	ND	(1.0)	ND	(1.0)

ND: Not detected at specified detection limit

NA: Not analyzed

Table C-5

CHEMICAL CHARACTERISTICS OF QUALITY CONTROL SAMPLES FOR ANALYSIS OF WATERS FROM L STATION, EVENT 1

		Location			
		Sample ID			
		Date Sampled			
		Field Blank		Audit Sample L-1	
		L-050		L-052	
		21-Apr-89		15-Feb-89	
PARAMETER	Units	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit
Strontium	mg/L	ND	(0.0030)	ND	(0.0030)
Thallium	mg/L	ND	(0.10)	ND	(0.10)
Vanadium	mg/L	ND	(0.020)	0.97	(0.020)
Zinc	mg/L	ND	(0.020)	ND	(0.020)

ND: Not detected at specified detection limit

NA: Not analyzed

Table C-6

CHEMICAL CHARACTERISTICS OF WATERS FROM ASH DELTA WELLS FROM L STATION, EVENT 2

		Location					
		Sample ID					
		Date Sampled					
		LMW-14		LMW-15		LMW-21	
		L-066		L-067		L-072	
		26-Jul-89		26-Jul-89		31-Jul-89	
PARAMETER	Units	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit
Water Quality Variables							
Electrical Conductivity (Field)	micromhos/cm	2380.0	(10.0)	930.0	(10.0)	NA	
Electrical Conductivity (Lab)	micromhos/cm	2700.0	(10.0)	1865.0	(10.0)	296.0	(10.0)
Filterable Residue	mg/L	2706.0	(5.0)	1835.0	(5.0)	NA	
Oxid-Red (Eh)	mV	71.0	(10.0)	91.0	(10.0)	NA	
Temperature (Field)	Degrees C	18.5	(0.10)	19.3	(0.10)	NA	
pH_value	pH Units	4.2	(0.050)	4.0	(0.050)	5.9	(0.050)
Anions and Ammonia in Aqueous Media							
Alkalinity	mg HCO3/L	ND	(2.0)	ND	(2.0)	NA	
Ammonia	mg N/L	0.10	(0.010)	0.10	(0.010)	NA	
Bromide	mg/L	0.090	(0.040)	0.050	(0.040)	NA	
Carbonate	mg HCO3/L	230.0	(7.0)	257.0	(7.0)	NA	
Chloride	mg/L	3.5	(0.20)	2.7	(0.20)	2.5	(0.20)
Fluoride	mg/L	1.4	(0.0050)	0.49	(0.0050)	NA	
Nitrate/Nitrite	mg N/L	0.098	(0.050)	0.21	(0.050)	NA	
Organic Carbon	mg C/L	34.7	(0.060)	28.3	(0.060)	NA	
Phosphate, total	mg P/L	0.35	(0.050)	0.83	(0.050)	NA	
Sulfate	mg/L	1630.0	(0.70)	1110.0	(0.70)	73.0	(0.60)
Sulfide by Iodine Titn	mg S/L	ND	(0.15)	ND	(0.15)	NA	
Thiourea	mg/L	ND	(0.50)	ND	(0.50)	NA	
Elements in Aqueous Media by AA							
Arsenic	mg/L	ND	(0.0050)	ND	(0.0050)	NA	
Calcium	mg/L	400.8	(0.040)	208.4	(0.040)	23.6	(0.040)
Chromium	mg/L	ND	(0.0010)	ND	(0.0010)	NA	
Copper	mg/L	0.0055	(0.0020)	0.0037	(0.0020)	NA	
Magnesium	mg/L	60.3	(0.024)	18.2	(0.024)	NA	
Potassium	mg/L	10.9	(0.039)	12.1	(0.039)	NA	
Selenium	mg/L	ND	(0.0050)	ND	(0.0050)	NA	

ND: Not detected at specified detection limit

NA: Not analyzed

Table C-6

CHEMICAL CHARACTERISTICS OF WATERS FROM ASH DELTA WELLS FROM L STATION, EVENT 2

		Location					
		Sample ID					
		Date Sampled					
		LMW-14		LMW-15		LMW-21	
		L-066		L-067		L-072	
		26-Jul-89		26-Jul-89		31-Jul-89	
PARAMETER	Units	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit
Sodium	mg/L	8.7	(0.023)	8.3	(0.023)	NA	
Elements by ICPES							
Aluminum	mg/L	7.6	(0.20)	9.0	(0.20)	NA	
Antimony	mg/L	ND	(0.20)	ND	(0.20)	NA	
Arsenic	mg/L	ND	(0.30)	ND	(0.30)	NA	
Barium	mg/L	0.039	(0.010)	0.096	(0.010)	NA	
Beryllium	mg/L	0.061	(0.0020)	0.022	(0.0020)	NA	
Boron	mg/L	ND	(0.60)	ND	(0.60)	NA	
Cadmium	mg/L	ND	(0.0050)	ND	(0.0050)	NA	
Calcium	mg/L	390.0	(1.0)	210.0	(1.0)	NA	
Chromium	mg/L	ND	(0.010)	ND	(0.010)	NA	
Cobalt	mg/L	2.0	(0.010)	0.12	(0.010)	NA	
Copper	mg/L	ND	(0.020)	ND	(0.020)	NA	
Iron	mg/L	120.0	(0.040)	250.0	(0.040)	NA	
Lead	mg/L	ND	(0.050)	ND	(0.050)	NA	
Magnesium	mg/L	59.0	(1.0)	18.0	(1.0)	NA	
Manganese	mg/L	90.0	(0.010)	7.0	(0.010)	NA	
Molybdenum	mg/L	0.097	(0.050)	0.095	(0.050)	NA	
Nickel	mg/L	0.66	(0.020)	0.027	(0.020)	NA	
Potassium	mg/L	4.7	(3.0)	7.4	(3.0)	NA	
Selenium	mg/L	ND	(0.30)	ND	(0.30)	NA	
Silicon	mg/L	40.0	(1.0)	12.0	(1.0)	NA	
Silver	mg/L	ND	(0.010)	ND	(0.010)	NA	
Sodium	mg/L	8.2	(1.0)	8.2	(1.0)	NA	
Strontium	mg/L	0.58	(0.0030)	0.56	(0.0030)	NA	
Thallium	mg/L	ND	(0.10)	ND	(0.10)	NA	
Vanadium	mg/L	ND	(0.020)	ND	(0.020)	NA	
Zinc	mg/L	0.66	(0.020)	0.12	(0.020)	NA	

ND: Not detected at specified detection limit

NA: Not analyzed

Table C-7

CHEMICAL CHARACTERISTICS OF WATERS FROM UPGRADIENT WELLS FROM L STATION, EVENT 2

		Location							
		Sample ID							
		Date Sampled							
		LMW-11		LMW-12		LMW-18		LMW-19	
		L-063		L-064		L-070		L-071	
		25-Jul-89		24-Jul-89		27-Jul-89		27-Jul-89	
PARAMETER	Units	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit
Water Quality Variables									
Electrical Conductivity (Field)	micromhos/cm	1.0	(10.0)	57.0	(10.0)	3.0	(10.0)	2.0	(10.0)
Electrical Conductivity (Lab)	micromhos/cm	118.0	(10.0)	111.0	(10.0)	88.0	(10.0)	58.0	(10.0)
Filterable Residue	mg/L	120.0	(5.0)	59.0	(5.0)	102.0	(5.0)	99.0	(5.0)
Oxid-Red (Eh)	mV	89.0	(10.0)	79.0	(10.0)	75.0	(10.0)	66.0	(10.0)
Temperature (Field)	Degrees C	18.5	(0.10)	24.3	(0.10)	16.9	(0.10)	19.8	(0.10)
pH_value	pH Units	5.3	(0.050)	6.2	(0.050)	6.3	(0.050)	6.1	(0.050)
Anions and Ammonia in Aqueous Media									
Alkalinity	mg HCO3/L	49.0	(2.0)	38.0	(2.0)	48.0	(2.0)	28.0	(2.0)
Ammonia	mg N/L	0.060	(0.010)	0.11	(0.010)	0.11	(0.010)	0.21	(0.010)
Bromide	mg/L	0.14	(0.040)	0.060	(0.040)	ND	(0.040)	0.040	(0.040)
Carbonate	mg HCO3/L	281.0	(7.0)	61.0	(7.0)	80.0	(7.0)	73.0	(7.0)
Chloride	mg/L	5.4	(0.30)	1.4	(0.20)	1.6	(0.20)	3.5	(0.30)
Fluoride	mg/L	0.016	(0.0010)	0.089	(0.0010)	0.062	(0.0050)	0.068	(0.0050)
Nitrate/Nitrite	mg N/L	2.9	(0.050)	1.6	(0.050)	1.8	(0.050)	0.050	(0.050)
Organic Carbon	mg C/L	28.7	(0.060)	13.4	(0.060)	5.0	(0.060)	5.9	(0.060)
Phosphate, total	mg P/L	0.82	(0.050)	1.0	(0.050)	ND	(0.050)	ND	(0.050)
Sulfate	mg/L	1.5	(0.60)	11.0	(0.60)	2.2	(0.60)	1.4	(0.60)
Sulfide by Iodine Titn	mg S/L	ND	(0.15)	ND	(0.15)	ND	(0.15)	ND	(0.15)
Thiourea	mg/L	ND	(0.50)	ND	(0.50)	ND	(0.50)	ND	(0.50)
Elements in Aqueous Media by AA									
Arsenic	mg/L	ND	(0.0050)	ND	(0.0050)	ND	(0.0050)	ND	(0.0050)
Calcium	mg/L	8.8	(0.040)	7.2	(0.040)	6.8	(0.040)	3.6	(0.040)
Chromium	mg/L	ND	(0.0010)	ND	(0.0010)	ND	(0.0010)	ND	(0.0010)
Copper	mg/L	0.0077	(0.0020)	0.0067	(0.0020)	ND	(0.0020)	0.0087	(0.0020)
Magnesium	mg/L	3.2	(0.024)	2.4	(0.024)	2.4	(0.024)	1.7	(0.024)
Potassium	mg/L	4.3	(0.039)	1.2	(0.039)	3.9	(0.039)	1.6	(0.039)
Selenium	mg/L	ND	(0.0050)	ND	(0.0050)	ND	(0.0050)	ND	(0.0050)

ND: Not detected at specified detection limit

NA: Not analyzed

Table C-7

CHEMICAL CHARACTERISTICS OF WATERS FROM UPGRADIENT WELLS FROM L STATION, EVENT 2

		Location							
		Sample ID							
		Date Sampled							
		LMW-11		LMW-12		LMW-18		LMW-19	
		L-063		L-064		L-070		L-071	
		25-Jul-89		24-Jul-89		27-Jul-89		27-Jul-89	
PARAMETER	Units	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit
Sodium	mg/L	8.3	(0.023)	8.5	(0.023)	5.5	(0.023)	3.4	(0.023)
Elements by ICPES									
Aluminum	mg/L	ND	(0.20)	ND	(0.20)	ND	(0.20)	ND	(0.20)
Antimony	mg/L	ND	(0.20)	ND	(0.20)	ND	(0.20)	ND	(0.20)
Arsenic	mg/L	ND	(0.30)	ND	(0.30)	ND	(0.30)	ND	(0.30)
Barium	mg/L	0.071	(0.010)	0.014	(0.010)	0.021	(0.010)	0.013	(0.010)
Beryllium	mg/L	ND	(0.0020)	ND	(0.0020)	ND	(0.0020)	ND	(0.0020)
Boron	mg/L	ND	(0.60)	ND	(0.60)	ND	(0.60)	ND	(0.60)
Cadmium	mg/L	ND	(0.0050)	ND	(0.0050)	ND	(0.0050)	ND	(0.0050)
Calcium	mg/L	9.8	(1.0)	7.7	(1.0)	7.4	(1.0)	4.2	(1.0)
Chromium	mg/L	ND	(0.010)	ND	(0.010)	ND	(0.010)	ND	(0.010)
Cobalt	mg/L	ND	(0.010)	ND	(0.010)	ND	(0.010)	ND	(0.010)
Copper	mg/L	ND	(0.020)	ND	(0.020)	ND	(0.020)	0.027	(0.020)
Iron	mg/L	ND	(0.040)	ND	(0.040)	ND	(0.040)	0.14	(0.040)
Lead	mg/L	ND	(0.050)	ND	(0.050)	ND	(0.050)	ND	(0.050)
Magnesium	mg/L	3.1	(1.0)	2.6	(1.0)	2.6	(1.0)	1.9	(1.0)
Manganese	mg/L	0.12	(0.010)	0.23	(0.010)	0.13	(0.010)	0.071	(0.010)
Molybdenum	mg/L	ND	(0.050)	ND	(0.050)	ND	(0.050)	ND	(0.050)
Nickel	mg/L	ND	(0.020)	ND	(0.020)	ND	(0.020)	ND	(0.020)
Potassium	mg/L	ND	(3.0)	ND	(3.0)	ND	(3.0)	ND	(3.0)
Selenium	mg/L	ND	(0.30)	ND	(0.30)	ND	(0.30)	ND	(0.30)
Silicon	mg/L	15.0	(1.0)	9.3	(1.0)	18.0	(1.0)	15.0	(1.0)
Silver	mg/L	ND	(0.010)	ND	(0.010)	ND	(0.010)	ND	(0.010)
Sodium	mg/L	9.3	(1.0)	11.0	(1.0)	6.4	(1.0)	3.8	(1.0)
Strontium	mg/L	0.12	(0.0030)	0.029	(0.0030)	0.026	(0.0030)	0.023	(0.0030)
Thallium	mg/L	ND	(0.10)	ND	(0.10)	ND	(0.10)	ND	(0.10)
Vanadium	mg/L	ND	(0.020)	ND	(0.020)	ND	(0.020)	ND	(0.020)
Zinc	mg/L	0.023	(0.020)	0.039	(0.020)	0.028	(0.020)	ND	(0.020)

ND: Not detected at specified detection limit

NA: Not analyzed

Table C-8

CHEMICAL CHARACTERISTICS OF WATERS FROM DOWNGRADIENT WELLS FROM L STATION, EVENT 2

		Location							
		Sample ID							
		Date Sampled							
		LMW-01		LMW-02		LMW-03		LMW-03	
		L-053		L-054		L-055		L-108	
		24-Jul-89		27-Jul-89		31-Jul-89		31-Jul-89	
PARAMETER	Units	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit
Water Quality Variables									
Electrical Conductivity (Field)	micromhos/cm	84.0	(10.0)	380.0	(10.0)	4.0	(10.0)	4.0	(10.0)
Electrical Conductivity (Lab)	micromhos/cm	146.0	(10.0)	390.0	(10.0)	NA		251.0	(10.0)
Filterable Residue	mg/L	117.0	(5.0)	213.0	(5.0)	195.0	(5.0)	203.0	(5.0)
Oxid-Red (Eh)	mV	70.0	(10.0)	41.0	(10.0)	11.0	(10.0)	7.0	(10.0)
Temperature (Field)	Degrees C	19.8	(0.10)	21.6	(0.10)	19.4	(0.10)	20.2	(0.10)
pH_value	pH Units	5.6	(0.050)	5.7	(0.050)	5.6	(0.050)	5.6	(0.050)
Anions and Ammonia in Aqueous Media									
Alkalinity	mg HCO3/L	23.0	(2.0)	22.0	(2.0)	23.0	(2.0)	24.0	(2.0)
Ammonia	mg N/L	0.060	(0.010)	0.030	(0.010)	0.24	(0.010)	0.070	(0.010)
Bromide	mg/L	0.080	(0.040)	0.15	(0.040)	0.11	(0.040)	0.12	(0.040)
Carbonate	mg HCO3/L	63.0	(7.0)	123.0	(7.0)	NA		89.0	(7.0)
Chloride	mg/L	4.2	(0.30)	5.3	(0.30)	7.1	(0.30)	6.8	(0.30)
Fluoride	mg/L	0.047	(0.0010)	0.036	(0.0010)	0.021	(0.0010)	0.023	(0.0050)
Nitrate/Nitrite	mg N/L	0.56	(0.050)	0.24	(0.050)	0.17	(0.050)	0.078	(0.050)
Organic Carbon	mg C/L	8.3	(0.060)	13.1	(0.060)	11.4	(0.060)	7.7	(0.060)
Phosphate, total	mg P/L	0.74	(0.050)	0.95	(0.050)	0.92	(0.050)	0.36	(0.050)
Sulfate	mg/L	45.0	(0.60)	145.0	(0.60)	87.0	(0.60)	92.0	(0.60)
Sulfide by Iodine Titn	mg S/L	ND	(0.15)	ND	(0.15)	ND	(0.15)	ND	(0.15)
Thiourea	mg/L	ND	(0.50)	ND	(0.50)	ND	(0.50)	ND	(0.50)
Elements in Aqueous Media by AA									
Arsenic	mg/L	ND	(0.0050)	ND	(0.0050)	ND	(0.0050)	ND	(0.0050)
Calcium	mg/L	10.8	(0.040)	30.1	(0.040)	18.8	(0.040)	19.2	(0.040)
Chromium	mg/L	ND	(0.0010)	0.0016	(0.0010)	ND	(0.0010)	0.0011	(0.0010)
Copper	mg/L	0.0047	(0.0020)	ND	(0.0020)	ND	(0.0020)	0.0044	(0.0020)
Magnesium	mg/L	5.8	(0.024)	18.2	(0.024)	11.9	(0.024)	12.4	(0.024)
Potassium	mg/L	2.7	(0.039)	2.0	(0.039)	2.3	(0.039)	2.7	(0.039)
Selenium	mg/L	ND	(0.0050)	ND	(0.0050)	ND	(0.0050)	ND	(0.0050)

ND: Not detected at specified detection limit

NA: Not analyzed

Table C-8

CHEMICAL CHARACTERISTICS OF WATERS FROM DOWNGRADIENT WELLS FROM L STATION, EVENT 2

		Location							
		Sample ID							
		Date Sampled							
		LMW-01		LMW-02		LMW-03		LMW-03	
		L-053		L-054		L-055		L-108	
		24-Jul-89		27-Jul-89		31-Jul-89		31-Jul-89	
PARAMETER	Units	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit
Sodium	mg/L	4.4	(0.023)	9.8	(0.023)	9.2	(0.023)	9.7	(0.023)
Elements by ICPES									
Aluminum	mg/L	ND	(0.20)	ND	(0.20)	ND	(0.20)	ND	(0.20)
Antimony	mg/L	ND	(0.20)	ND	(0.20)	ND	(0.20)	ND	(0.20)
Arsenic	mg/L	ND	(0.30)	ND	(0.30)	ND	(0.30)	ND	(0.30)
Barium	mg/L	0.027	(0.010)	0.021	(0.010)	0.031	(0.010)	0.031	(0.010)
Beryllium	mg/L	ND	(0.0020)	ND	(0.0020)	ND	(0.0020)	ND	(0.0020)
Boron	mg/L	ND	(0.60)	ND	(0.60)	ND	(0.60)	0.60	(0.60)
Cadmium	mg/L	ND	(0.0050)	ND	(0.0050)	ND	(0.0050)	ND	(0.0050)
Calcium	mg/L	12.0	(1.0)	32.0	(1.0)	20.0	(1.0)	21.0	(1.0)
Chromium	mg/L	ND	(0.010)	ND	(0.010)	ND	(0.010)	ND	(0.010)
Cobalt	mg/L	ND	(0.010)	ND	(0.010)	ND	(0.010)	ND	(0.010)
Copper	mg/L	ND	(0.020)	ND	(0.020)	ND	(0.020)	ND	(0.020)
Iron	mg/L	ND	(0.040)	ND	(0.040)	0.22	(0.040)	0.30	(0.040)
Lead	mg/L	ND	(0.050)	ND	(0.050)	ND	(0.050)	ND	(0.050)
Magnesium	mg/L	6.6	(1.0)	20.0	(1.0)	13.0	(1.0)	13.0	(1.0)
Manganese	mg/L	2.1	(0.010)	0.068	(0.010)	0.12	(0.010)	0.13	(0.010)
Molybdenum	mg/L	ND	(0.050)	ND	(0.050)	ND	(0.050)	ND	(0.050)
Nickel	mg/L	ND	(0.020)	ND	(0.020)	ND	(0.020)	ND	(0.020)
Potassium	mg/L	ND	(3.0)	ND	(3.0)	ND	(3.0)	ND	(3.0)
Selenium	mg/L	ND	(0.30)	ND	(0.30)	ND	(0.30)	ND	(0.30)
Silicon	mg/L	12.0	(1.0)	17.0	(1.0)	10.0	(1.0)	10.0	(1.0)
Silver	mg/L	ND	(0.010)	ND	(0.010)	ND	(0.010)	ND	(0.010)
Sodium	mg/L	5.8	(1.0)	ND	(1.0)	11.0	(1.0)	12.0	(1.0)
Strontium	mg/L	0.074	(0.0030)	0.21	(0.0030)	0.14	(0.0030)	0.15	(0.0030)
Thallium	mg/L	ND	(0.10)	ND	(0.10)	ND	(0.10)	ND	(0.10)
Vanadium	mg/L	ND	(0.020)	ND	(0.020)	ND	(0.020)	ND	(0.020)
Zinc	mg/L	ND	(0.020)	ND	(0.020)	ND	(0.020)	0.043	(0.020)

ND: Not detected at specified detection limit

NA: Not analyzed

Table C-8

CHEMICAL CHARACTERISTICS OF WATERS FROM DOWNGRADIENT WELLS FROM L STATION, EVENT 2

		Location							
		Sample ID							
		Date Sampled							
		LMW-04		LMW-05		LMW-06		LMW-07	
		L-056		L-057		L-058		L-059	
		28-Jul-89		31-Jul-89		31-Jul-89		01-Aug-89	
PARAMETER	Units	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit
Water Quality Variables									
Electrical Conductivity (Field)	micromhos/cm	333.0	(10.0)	5.0	(10.0)	3.0	(10.0)	6.0	(10.0)
Electrical Conductivity (Lab)	micromhos/cm	320.0	(10.0)	430.0	(10.0)	140.0	(10.0)	253.0	(10.0)
Filterable Residue	mg/L	231.0	(5.0)	302.0	(5.0)	94.0	(5.0)	384.0	(5.0)
Oxid-Red (Eh)	mV	33.0	(10.0)	35.0	(10.0)	48.0	(10.0)	-1.0	(10.0)
Temperature (Field)	Degrees C	NA		19.6	(0.10)	19.1	(0.10)	19.5	(0.10)
pH_value	pH Units	6.9	(0.050)	5.6	(0.050)	4.8	(0.050)	7.2	(0.050)
Anions and Ammonia in Aqueous Media									
Alkalinity	mg HCO3/L	44.0	(2.0)	33.0	(2.0)	5.0	(2.0)	90.0	(2.0)
Ammonia	mg N/L	0.060	(0.010)	0.080	(0.010)	0.11	(0.010)	0.10	(0.010)
Bromide	mg/L	0.10	(0.040)	0.19	(0.040)	0.10	(0.040)	0.26	(0.040)
Carbonate	mg HCO3/L	122.0	(7.0)	155.0	(7.0)	79.0	(7.0)	79.0	(7.0)
Chloride	mg/L	4.2	(0.30)	5.5	(0.20)	8.0	(0.20)	5.4	(0.20)
Fluoride	mg/L	0.16	(0.0010)	0.027	(0.0010)	0.036	(0.0010)	0.12	(0.0010)
Nitrate/Nitrite	mg N/L	0.10	(0.050)	0.050	(0.050)	0.25	(0.050)	0.18	(0.050)
Organic Carbon	mg C/L	17.4	(0.060)	15.0	(0.060)	10.4	(0.060)	6.0	(0.060)
Phosphate, total	mg P/L	1.4	(0.050)	0.98	(0.050)	0.88	(0.050)	0.92	(0.050)
Sulfate	mg/L	114.0	(0.60)	171.0	(0.60)	49.0	(0.60)	142.0	(0.60)
Sulfide by Iodine Titn	mg S/L	ND	(0.15)	ND	(0.15)	0.15	(0.15)	0.23	(0.15)
Thiourea	mg/L	ND	(0.50)	ND	(0.50)	ND	(0.50)	ND	(0.50)
Elements in Aqueous Media by AA									
Arsenic	mg/L	ND	(0.0050)	ND	(0.0050)	ND	(0.0050)	ND	(0.0050)
Calcium	mg/L	24.4	(0.040)	40.1	(0.040)	0.80	(0.040)	72.1	(0.040)
Chromium	mg/L	ND	(0.0010)	ND	(0.0010)	0.0017	(0.0010)	ND	(0.0010)
Copper	mg/L	0.0031	(0.0020)	0.0064	(0.0020)	ND	(0.0020)	ND	(0.0020)
Magnesium	mg/L	13.4	(0.024)	18.0	(0.024)	8.5	(0.024)	17.3	(0.024)
Potassium	mg/L	2.7	(0.039)	3.5	(0.039)	3.1	(0.039)	12.9	(0.039)
Selenium	mg/L	ND	(0.0050)	ND	(0.0050)	ND	(0.0050)	ND	(0.0050)

ND: Not detected at specified detection limit

NA: Not analyzed

Table C-8

CHEMICAL CHARACTERISTICS OF WATERS FROM DOWNGRADIENT WELLS FROM L STATION, EVENT 2

		Location							
		Sample ID							
		Date Sampled							
		LMW-04		LMW-05		LMW-06		LMW-07	
		L-056		L-057		L-058		L-059	
		28-Jul-89		31-Jul-89		31-Jul-89		01-Aug-89	
PARAMETER	Units	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit
Sodium	mg/L	9.7	(0.023)	14.7	(0.023)	6.9	(0.023)	11.5	(0.023)
Elements by ICPES									
Aluminum	mg/L	ND	(0.20)	ND	(0.20)	ND	(0.20)	ND	(0.20)
Antimony	mg/L	ND	(0.20)	ND	(0.20)	ND	(0.20)	ND	(0.20)
Arsenic	mg/L	ND	(0.30)	ND	(0.30)	ND	(0.30)	ND	(0.30)
Barium	mg/L	0.31	(0.010)	0.091	(0.010)	0.25	(0.010)	0.069	(0.010)
Beryllium	mg/L	ND	(0.0020)	ND	(0.0020)	ND	(0.0020)	ND	(0.0020)
Boron	mg/L	ND	(0.60)	0.91	(0.60)	ND	(0.60)	ND	(0.60)
Cadmium	mg/L	ND	(0.0050)	ND	(0.0050)	ND	(0.0050)	ND	(0.0050)
Calcium	mg/L	26.0	(1.0)	42.0	(1.0)	ND	(1.0)	76.0	(1.0)
Chromium	mg/L	ND	(0.010)	ND	(0.010)	ND	(0.010)	ND	(0.010)
Cobalt	mg/L	0.014	(0.010)	ND	(0.010)	0.078	(0.010)	ND	(0.010)
Copper	mg/L	ND	(0.020)	ND	(0.020)	ND	(0.020)	ND	(0.020)
Iron	mg/L	1.4	(0.040)	ND	(0.040)	ND	(0.040)	ND	(0.040)
Lead	mg/L	ND	(0.050)	ND	(0.050)	ND	(0.050)	ND	(0.050)
Magnesium	mg/L	14.0	(1.0)	19.0	(1.0)	9.3	(1.0)	18.0	(1.0)
Manganese	mg/L	0.68	(0.010)	0.52	(0.010)	0.74	(0.010)	0.051	(0.010)
Molybdenum	mg/L	ND	(0.050)	ND	(0.050)	ND	(0.050)	ND	(0.050)
Nickel	mg/L	ND	(0.020)	ND	(0.020)	ND	(0.020)	ND	(0.020)
Potassium	mg/L	ND	(3.0)	ND	(3.0)	ND	(3.0)	8.7	(3.0)
Selenium	mg/L	ND	(0.30)	ND	(0.30)	ND	(0.30)	ND	(0.30)
Silicon	mg/L	18.0	(1.0)	15.0	(1.0)	4.8	(1.0)	13.0	(1.0)
Silver	mg/L	ND	(0.010)	ND	(0.010)	ND	(0.010)	ND	(0.010)
Sodium	mg/L	11.0	(1.0)	16.0	(1.0)	7.1	(1.0)	11.0	(1.0)
Strontium	mg/L	0.14	(0.0030)	0.31	(0.0030)	0.012	(0.0030)	0.24	(0.0030)
Thallium	mg/L	ND	(0.10)	ND	(0.10)	ND	(0.10)	ND	(0.10)
Vanadium	mg/L	ND	(0.020)	ND	(0.020)	ND	(0.020)	ND	(0.020)
Zinc	mg/L	0.20	(0.020)	ND	(0.020)	0.064	(0.020)	0.038	(0.020)

ND: Not detected at specified detection limit

NA: Not analyzed

Table C-8

CHEMICAL CHARACTERISTICS OF WATERS FROM DOWNGRADIENT WELLS FROM L STATION, EVENT 2

		Location							
		Sample ID							
		Date Sampled							
		LMW-08		LMW-09		LMW-10		LMW-13	
		L-060		L-061		L-062		L-065	
		28-Jul-89		27-Jul-89		24-Jul-89		28-Jul-89	
PARAMETER	Units	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit
Water Quality Variables									
Electrical Conductivity (Field)	micromhos/cm	5.0	(10.0)	4.0	(10.0)	11.0	(10.0)	210.0	(10.0)
Electrical Conductivity (Lab)	micromhos/cm	320.0	(10.0)	220.0	(10.0)	246.0	(10.0)	360.0	(10.0)
Filterable Residue	mg/L	234.0	(5.0)	206.0	(5.0)	185.0	(5.0)	249.0	(5.0)
Oxid-Red (Eh)	mV	31.0	(10.0)	35.0	(10.0)	71.0	(10.0)	23.0	(10.0)
Temperature (Field)	Degrees C	20.2	(0.10)	18.8	(0.10)	18.3	(0.10)	19.6	(0.10)
pH_value	pH Units	5.6	(0.050)	6.3	(0.050)	5.5	(0.050)	5.8	(0.050)
Anions and Ammonia in Aqueous Media									
Alkalinity	mg HCO3/L	28.0	(2.0)	60.0	(2.0)	48.0	(2.0)	39.0	(2.0)
Ammonia	mg N/L	0.040	(0.010)	0.39	(0.010)	0.020	(0.010)	0.070	(0.010)
Bromide	mg/L	0.15	(0.040)	0.090	(0.040)	0.060	(0.040)	0.19	(0.040)
Carbonate	mg HCO3/L	129.0	(7.0)	117.0	(7.0)	295.0	(7.0)	173.0	(7.0)
Chloride	mg/L	5.1	(0.20)	4.0	(0.20)	2.3	(0.20)	5.4	(0.20)
Fluoride	mg/L	0.039	(0.0010)	0.077	(0.0010)	0.033	(0.0010)	0.038	(0.0010)
Nitrate/Nitrite	mg N/L	0.29	(0.050)	0.11	(0.050)	0.97	(0.050)	1.9	(0.050)
Organic Carbon	mg C/L	16.8	(0.060)	14.4	(0.060)	30.2	(0.060)	18.2	(0.060)
Phosphate, total	mg P/L	0.25	(0.050)	0.41	(0.050)	0.95	(0.050)	0.84	(0.050)
Sulfate	mg/L	125.0	(0.60)	77.0	(0.60)	79.0	(0.60)	136.0	(0.60)
Sulfide by Iodine Titn	mg S/L	0.16	(0.15)	ND	(0.15)	ND	(0.15)	ND	(0.15)
Thiourea	mg/L	ND	(0.50)	ND	(0.50)	ND	(0.50)	ND	(0.50)
Elements in Aqueous Media by AA									
Arsenic	mg/L	ND	(0.0050)	ND	(0.0050)	ND	(0.0050)	ND	(0.0050)
Calcium	mg/L	22.0	(0.040)	15.6	(0.040)	24.8	(0.040)	27.7	(0.040)
Chromium	mg/L	0.0018	(0.0010)	ND	(0.0010)	ND	(0.0010)	ND	(0.0010)
Copper	mg/L	ND	(0.0020)	0.0056	(0.0020)	ND	(0.0020)	ND	(0.0020)
Magnesium	mg/L	15.8	(0.024)	6.8	(0.024)	8.8	(0.024)	17.0	(0.024)
Potassium	mg/L	2.3	(0.039)	3.9	(0.039)	2.7	(0.039)	3.5	(0.039)
Selenium	mg/L	ND	(0.0050)	ND	(0.0050)	ND	(0.0050)	ND	(0.0050)

ND: Not detected at specified detection limit

NA: Not analyzed

Table C-8

CHEMICAL CHARACTERISTICS OF WATERS FROM DOWNGRADIENT WELLS FROM L STATION, EVENT 2

		Location							
		Sample ID							
		Date Sampled							
		LMW-08		LMW-09		LMW-10		LMW-13	
		L-060		L-061		L-062		L-065	
		28-Jul-89		27-Jul-89		24-Jul-89		28-Jul-89	
PARAMETER	Units	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit
Sodium	mg/L	13.6	(0.023)	9.4	(0.023)	9.9	(0.023)	10.8	(0.023)
Elements by ICPES									
Aluminum	mg/L	ND	(0.20)	ND	(0.20)	ND	(0.20)	ND	(0.20)
Antimony	mg/L	ND	(0.20)	ND	(0.20)	ND	(0.20)	ND	(0.20)
Arsenic	mg/L	ND	(0.30)	ND	(0.30)	ND	(0.30)	ND	(0.30)
Barium	mg/L	0.051	(0.010)	0.068	(0.010)	0.037	(0.010)	0.10	(0.010)
Beryllium	mg/L	ND	(0.0020)	ND	(0.0020)	ND	(0.0020)	ND	(0.0020)
Boron	mg/L	ND	(0.60)	ND	(0.60)	ND	(0.60)	0.71	(0.60)
Cadmium	mg/L	ND	(0.0050)	ND	(0.0050)	ND	(0.0050)	ND	(0.0050)
Calcium	mg/L	24.0	(1.0)	17.0	(1.0)	27.0	(1.0)	30.0	(1.0)
Chromium	mg/L	ND	(0.010)	ND	(0.010)	ND	(0.010)	ND	(0.010)
Cobalt	mg/L	ND	(0.010)	0.018	(0.010)	ND	(0.010)	0.015	(0.010)
Copper	mg/L	ND	(0.020)	ND	(0.020)	ND	(0.020)	ND	(0.020)
Iron	mg/L	ND	(0.040)	11.0	(0.040)	ND	(0.040)	ND	(0.040)
Lead	mg/L	ND	(0.050)	ND	(0.050)	ND	(0.050)	ND	(0.050)
Magnesium	mg/L	16.0	(1.0)	6.9	(1.0)	8.6	(1.0)	18.0	(1.0)
Manganese	mg/L	0.024	(0.010)	6.2	(0.010)	0.31	(0.010)	0.31	(0.010)
Molybdenum	mg/L	ND	(0.050)	ND	(0.050)	ND	(0.050)	ND	(0.050)
Nickel	mg/L	ND	(0.020)	ND	(0.020)	ND	(0.020)	ND	(0.020)
Potassium	mg/L	ND	(3.0)	ND	(3.0)	ND	(3.0)	ND	(3.0)
Selenium	mg/L	ND	(0.30)	ND	(0.30)	ND	(0.30)	ND	(0.30)
Silicon	mg/L	15.0	(1.0)	6.9	(1.0)	10.0	(1.0)	12.0	(1.0)
Silver	mg/L	ND	(0.010)	ND	(0.010)	ND	(0.010)	ND	(0.010)
Sodium	mg/L	14.0	(1.0)	9.6	(1.0)	9.2	(1.0)	14.0	(1.0)
Strontium	mg/L	0.14	(0.0030)	0.14	(0.0030)	0.15	(0.0030)	0.18	(0.0030)
Thallium	mg/L	ND	(0.10)	ND	(0.10)	ND	(0.10)	ND	(0.10)
Vanadium	mg/L	ND	(0.020)	ND	(0.020)	ND	(0.020)	ND	(0.020)
Zinc	mg/L	ND	(0.020)	ND	(0.020)	ND	(0.020)	ND	(0.020)

ND: Not detected at specified detection limit

NA: Not analyzed

Table C-8

CHEMICAL CHARACTERISTICS OF WATERS FROM DOWNGRADIENT WELLS FROM L STATION, EVENT 2

		Location							
		Sample ID							
		Date Sampled							
		LMW-16		LMW-17		PIEZ-3		SEEP-A	
		L-068		L-069		L-106		L-098	
		31-Jul-89		28-Jul-89		29-Jul-89		31-Jul-89	
PARAMETER	Units	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit
Water Quality Variables									
Electrical Conductivity (Field)	micromhos/cm	6.0	(10.0)	211.0	(10.0)	NA		187.0	(10.0)
Electrical Conductivity (Lab)	micromhos/cm	370.0	(10.0)	190.0	(10.0)	90.0	(10.0)	400.0	(10.0)
Filterable Residue	mg/L	214.0	(5.0)	152.0	(5.0)	NA		NA	
Oxid-Red (Eh)	mV	31.0	(10.0)	40.0	(10.0)	NA		26.0	(10.0)
Temperature (Field)	Degrees C	19.3	(0.10)	17.4	(0.10)	NA		17.6	(0.10)
pH_value	pH Units	5.7	(0.050)	5.7	(0.050)	5.8	(0.050)	6.4	(0.050)
Anions and Ammonia in Aqueous Media									
Alkalinity	mg HCO3/L	47.0	(2.0)	27.0	(2.0)	NA		NA	
Ammonia	mg N/L	0.030	(0.010)	0.050	(0.010)	NA		NA	
Bromide	mg/L	0.22	(0.040)	0.15	(0.040)	NA		NA	
Carbonate	mg HCO3/L	192.0	(7.0)	133.0	(7.0)	NA		NA	
Chloride	mg/L	5.2	(0.20)	0.40	(0.20)	NA		NA	
Fluoride	mg/L	0.037	(0.0010)	0.070	(0.0010)	NA		NA	
Nitrate/Nitrite	mg N/L	0.062	(0.050)	0.060	(0.050)	NA		NA	
Organic Carbon	mg C/L	18.1	(0.060)	12.9	(0.060)	NA		NA	
Phosphate, total	mg P/L	0.91	(0.050)	0.98	(0.050)	NA		NA	
Sulfate	mg/L	122.0	(0.60)	58.0	(0.60)	14.0	(0.54)	49.0	(0.70)
Sulfide by Iodine Titn	mg S/L	ND	(0.15)	ND	(0.15)	NA		NA	
Thiourea	mg/L	ND	(0.50)	ND	(0.50)	NA		NA	
Elements in Aqueous Media by AA									
Arsenic	mg/L	ND	(0.0050)	ND	(0.0050)	NA		NA	
Calcium	mg/L	35.3	(0.040)	13.2	(0.040)	7.6	(0.040)	11.6	(0.040)
Chromium	mg/L	ND	(0.0010)	ND	(0.0010)	NA		NA	
Copper	mg/L	ND	(0.0020)	ND	(0.0020)	NA		NA	
Magnesium	mg/L	13.6	(0.024)	10.5	(0.024)	NA		NA	
Potassium	mg/L	3.9	(0.039)	0.78	(0.039)	NA		NA	
Selenium	mg/L	ND	(0.0050)	ND	(0.0050)	NA		NA	

ND: Not detected at specified detection limit

NA: Not analyzed

Table C-8

CHEMICAL CHARACTERISTICS OF WATERS FROM DOWNGRADIENT WELLS FROM L STATION, EVENT 2

		Location							
		Sample ID							
		LMW-16		LMW-17		PIEZ-3		SEEP-A	
		L-068		L-069		L-106		L-098	
		Date Sampled							
		31-Jul-89		28-Jul-89		29-Jul-89		31-Jul-89	
PARAMETER	Units	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit
Sodium	mg/L	10.8	(0.023)	7.8	(0.023)	NA		NA	
Elements by ICPES									
Aluminum	mg/L	ND	(0.20)	ND	(0.20)	NA		NA	
Antimony	mg/L	ND	(0.20)	ND	(0.20)	NA		NA	
Arsenic	mg/L	ND	(0.30)	ND	(0.30)	NA		NA	
Barium	mg/L	0.16	(0.010)	0.021	(0.010)	NA		NA	
Beryllium	mg/L	ND	(0.0020)	ND	(0.0020)	NA		NA	
Boron	mg/L	ND	(0.60)	0.97	(0.60)	NA		NA	
Cadmium	mg/L	ND	(0.0050)	ND	(0.0050)	NA		NA	
Calcium	mg/L	37.0	(1.0)	14.0	(1.0)	NA		NA	
Chromium	mg/L	ND	(0.010)	ND	(0.010)	NA		NA	
Cobalt	mg/L	ND	(0.010)	ND	(0.010)	NA		NA	
Copper	mg/L	ND	(0.020)	ND	(0.020)	NA		NA	
Iron	mg/L	ND	(0.040)	ND	(0.040)	NA		NA	
Lead	mg/L	ND	(0.050)	ND	(0.050)	NA		NA	
Magnesium	mg/L	14.0	(1.0)	11.0	(1.0)	NA		NA	
Manganese	mg/L	0.084	(0.010)	0.044	(0.010)	NA		NA	
Molybdenum	mg/L	ND	(0.050)	ND	(0.050)	NA		NA	
Nickel	mg/L	ND	(0.020)	ND	(0.020)	NA		NA	
Potassium	mg/L	ND	(3.0)	ND	(3.0)	NA		NA	
Selenium	mg/L	ND	(0.30)	ND	(0.30)	NA		NA	
Silicon	mg/L	15.0	(1.0)	12.0	(1.0)	NA		NA	
Silver	mg/L	ND	(0.010)	ND	(0.010)	NA		NA	
Sodium	mg/L	11.0	(1.0)	8.2	(1.0)	NA		NA	
Strontium	mg/L	0.20	(0.0030)	0.12	(0.0030)	NA		NA	
Thallium	mg/L	ND	(0.10)	ND	(0.10)	NA		NA	
Vanadium	mg/L	ND	(0.020)	ND	(0.020)	NA		NA	
Zinc	mg/L	ND	(0.020)	ND	(0.020)	NA		NA	

ND: Not detected at specified detection limit

NA: Not analyzed

Table C-9

CHEMICAL CHARACTERISTICS OF RIVER AND POND WATERS FROM L STATION, EVENT 2

		Location							
		Sample ID							
		Date Sampled							
		PPA-1		PPA-2		PPB-1		PPB-2	
		L-074		L-075		L-080		L-081	
		31-Jul-89		31-Jul-89		01-Aug-89		01-Aug-89	
PARAMETER	Units	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit
Water Quality Variables									
Electrical Conductivity (Field)	micromhos/cm	3.0	(10.0)	2.0	(10.0)	28.0	(10.0)	4.0	(10.0)
Electrical Conductivity (Lab)	micromhos/cm	122.0	(10.0)	130.0	(10.0)	126.0	(10.0)	122.0	(10.0)
Oxid-Red (Eh)	mV	7.0	(10.0)	5.0	(10.0)	-14.0	(10.0)	-13.0	(10.0)
Temperature (Field)	Degrees C	31.8	(0.10)	27.3	(0.10)	29.6	(0.10)	29.1	(0.10)
pH_value	pH Units	10.1	(0.050)	8.5	(0.050)	9.8	(0.050)	9.7	(0.050)
Anions and Ammonia in Aqueous Media									
Alkalinity	mg HCO3/L	NA		NA		NA		NA	
Sulfate	mg/L	36.0	(0.70)	38.0	(0.70)	39.0	(0.70)	38.0	(0.54)
Elements in Aqueous Media by AA									
Calcium	mg/L	12.0	(0.040)	13.2	(0.040)	12.0	(0.040)	11.2	(0.040)

ND: Not detected at specified detection limit

NA: Not analyzed

Table C-9

CHEMICAL CHARACTERISTICS OF RIVER AND POND WATERS FROM L STATION, EVENT 2

		Location							
		Sample ID							
		Date Sampled							
		PPB-3		PPB-4		TDA		TDB	
		L-082		L-083		L-094		L-095	
		01-Aug-89		01-Aug-89		28-Jul-89		28-Jul-89	
PARAMETER	Units	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit
Water Quality Variables									
Electrical Conductivity (Field)	micromhos/cm	4.0	(10.0)	4.0	(10.0)	2.0	(10.0)	3.0	(10.0)
Electrical Conductivity (Lab)	micromhos/cm	126.0	(10.0)	173.0	(10.0)	28.0	(10.0)	166.0	(10.0)
Oxid-Red (Eh)	mV	-6.0	(10.0)	-45.0	(10.0)	34.0	(10.0)	35.0	(10.0)
Temperature (Field)	Degrees C	26.6	(0.10)	23.6	(0.10)	27.2	(0.10)	17.1	(0.10)
pH_value	pH Units	7.8	(0.050)	7.8	(0.050)	7.1	(0.050)	6.7	(0.050)
Anions and Ammonia in Aqueous Media									
Alkalinity	mg HCO3/L	NA		NA		NA		NA	
Chloride	mg/L	NA		NA		NA		5.1	(0.20)
Sulfate	mg/L	36.0	(0.70)	42.0	(0.54)	2.7	(0.70)	57.0	(0.60)
Elements in Aqueous Media by AA									
Calcium	mg/L	12.8	(0.040)	17.6	(0.040)	2.0	(0.040)	14.0	(0.040)

ND: Not detected at specified detection limit

NA: Not analyzed

Table C-9

CHEMICAL CHARACTERISTICS OF RIVER AND POND WATERS FROM L STATION, EVENT 2

		Location			
		Sample ID			
		Date Sampled			
		US		DS	
		L-092		L-093	
		26-Jul-89		26-Jul-89	
PARAMETER	Units	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit
Water Quality Variables					
Electrical Conductivity (Field)	micromhos/cm	1.0	(10.0)	1.0	(10.0)
Electrical Conductivity (Lab)	micromhos/cm	25.0	(10.0)	38.0	(10.0)
Filterable Residue	mg/L	51.0	(5.0)	32.0	(5.0)
Oxid-Red (Eh)	mV	57.0	(10.0)	54.0	(10.0)
Temperature (Field)	Degrees C	26.0	(0.10)	25.9	(0.10)
pH_value	pH Units	6.6	(0.050)	7.0	(0.050)
Anions and Ammonia in Aqueous Media					
Alkalinity	mg HCO3/L	15.0	(2.0)	13.0	(2.0)
Ammonia	mg N/L	0.080	(0.010)	0.010	(0.010)
Bromide	mg/L	ND	(0.040)	0.050	(0.040)
Carbonate	mg HCO3/L	16.0	(7.0)	18.0	(7.0)
Chloride	mg/L	1.7	(0.30)	1.7	(0.30)
Fluoride	mg/L	0.045	(0.0050)	0.046	(0.0050)
Nitrate/Nitrite	mg N/L	0.27	(0.050)	0.30	(0.050)
Organic Carbon	mg C/L	3.1	(0.060)	2.8	(0.060)
Phosphate, total	mg P/L	ND	(0.050)	ND	(0.050)
Sulfate	mg/L	2.3	(0.60)	3.4	(0.60)
Sulfide by Iodine Titn	mg S/L	ND	(0.15)	ND	(0.15)
Thiourea	mg/L	ND	(0.50)	ND	(0.50)
Elements in Aqueous Media by AA					
Arsenic	mg/L	ND	(0.0050)	ND	(0.0050)
Calcium	mg/L	2.0	(0.040)	2.0	(0.040)
Chromium	mg/L	ND	(0.0010)	ND	(0.0010)
Copper	mg/L	ND	(0.0020)	0.0034	(0.0020)
Magnesium	mg/L	0.73	(0.024)	0.73	(0.024)
Potassium	mg/L	1.2	(0.039)	0.78	(0.039)
Selenium	mg/L	ND	(0.0050)	ND	(0.0050)

ND: Not detected at specified detection limit

NA: Not analyzed

Table C-9

CHEMICAL CHARACTERISTICS OF RIVER AND POND WATERS FROM L STATION, EVENT 2

		Location			
		Sample ID			
		Date Sampled			
		US		DS	
		L-092		L-093	
		26-Jul-89		26-Jul-89	
PARAMETER	Units	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit
Sodium	mg/L	2.8	(0.023)	3.4	(0.023)
Elements by ICPES					
Aluminum	mg/L	ND	(0.20)	ND	(0.20)
Antimony	mg/L	ND	(0.20)	ND	(0.20)
Arsenic	mg/L	ND	(0.30)	ND	(0.30)
Barium	mg/L	0.099	(0.010)	0.20	(0.010)
Beryllium	mg/L	ND	(0.0020)	ND	(0.0020)
Boron	mg/L	ND	(0.60)	ND	(0.60)
Cadmium	mg/L	ND	(0.0050)	ND	(0.0050)
Calcium	mg/L	2.2	(1.0)	2.5	(1.0)
Chromium	mg/L	ND	(0.010)	ND	(0.010)
Cobalt	mg/L	ND	(0.010)	ND	(0.010)
Copper	mg/L	ND	(0.020)	ND	(0.020)
Iron	mg/L	0.28	(0.040)	0.16	(0.040)
Lead	mg/L	ND	(0.050)	ND	(0.050)
Magnesium	mg/L	ND	(1.0)	ND	(1.0)
Manganese	mg/L	0.034	(0.010)	0.049	(0.010)
Molybdenum	mg/L	ND	(0.050)	ND	(0.050)
Nickel	mg/L	ND	(0.020)	ND	(0.020)
Potassium	mg/L	ND	(3.0)	ND	(3.0)
Selenium	mg/L	ND	(0.30)	ND	(0.30)
Silicon	mg/L	5.4	(1.0)	5.3	(1.0)
Silver	mg/L	ND	(0.010)	ND	(0.010)
Sodium	mg/L	3.3	(1.0)	4.4	(1.0)
Strontium	mg/L	0.017	(0.0030)	0.022	(0.0030)
Thallium	mg/L	ND	(0.10)	ND	(0.10)
Vanadium	mg/L	ND	(0.020)	ND	(0.020)
Zinc	mg/L	0.032	(0.020)	0.029	(0.020)

ND: Not detected at specified detection limit

NA: Not analyzed

Table C-9

CHEMICAL CHARACTERISTICS OF RIVER AND POND WATERS FROM L STATION, EVENT 2

		Location					
		Sample ID					
		Date Sampled					
		TDC		SP		PPA-1	
		L-096		L-097		L-109	
		31-Jul-89		26-Jul-89		26-Jul-89	
PARAMETER	Units	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit
Water Quality Variables							
Electrical Conductivity (Field)	micromhos/cm	4.0	(10.0)	3.0	(10.0)	3.0	(10.0)
Electrical Conductivity (Lab)	micromhos/cm	90.0	(10.0)	126.0	(10.0)	131.0	(10.0)
Filterable Residue	mg/L	NA		NA		95.0	(5.0)
Oxid-Red (Eh)	mV	36.0	(10.0)	53.0	(10.0)	59.0	(10.0)
Temperature (Field)	Degrees C	19.1	(0.10)	28.7	(0.10)	29.2	(0.10)
pH_value	pH Units	6.6	(0.050)	8.6	(0.050)	9.9	(0.050)
Anions and Ammonia in Aqueous Media							
Alkalinity	mg HCO3/L	NA		NA		27.0	(2.0)
Ammonia	mg N/L	NA		NA		0.040	(0.010)
Bromide	mg/L	NA		NA		ND	(0.040)
Carbonate	mg HCO3/L	NA		NA		12.0	(7.0)
Chloride	mg/L	NA		NA		1.9	(0.30)
Fluoride	mg/L	NA		NA		0.11	(0.0050)
Nitrate/Nitrite	mg N/L	NA		NA		0.050	(0.050)
Organic Carbon	mg C/L	NA		NA		2.6	(0.060)
Phosphate, total	mg P/L	NA		NA		ND	(0.050)
Sulfate	mg/L	28.0	(0.70)	41.0	(0.54)	39.0	(0.60)
Sulfide by Iodine Titn	mg S/L	NA		NA		0.16	(0.15)
Thiourea	mg/L	NA		NA		ND	(0.50)
Elements in Aqueous Media by AA							
Arsenic	mg/L	NA		NA		0.10	(0.025)
Calcium	mg/L	5.2	(0.040)	12.4	(0.040)	11.2	(0.040)
Chromium	mg/L	NA		NA		0.0012	(0.0010)
Copper	mg/L	NA		NA		0.0077	(0.0020)
Magnesium	mg/L	NA		NA		1.2	(0.024)
Potassium	mg/L	NA		NA		5.9	(0.039)
Selenium	mg/L	NA		NA		ND	(0.0050)

ND: Not detected at specified detection limit

NA: Not analyzed

Table C-9

CHEMICAL CHARACTERISTICS OF RIVER AND POND WATERS FROM L STATION, EVENT 2

		Location					
		Sample ID					
		Date Sampled					
		TDC		SP		PPA-1	
		L-096		L-097		L-109	
		31-Jul-89		26-Jul-89		26-Jul-89	
PARAMETER	Units	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit
Sodium	mg/L	NA		NA		8.3	(0.023)
Elements by ICPES							
Aluminum	mg/L	NA		NA		0.37	(0.20)
Antimony	mg/L	NA		NA		ND	(0.20)
Arsenic	mg/L	NA		NA		ND	(0.30)
Barium	mg/L	NA		NA		0.12	(0.010)
Beryllium	mg/L	NA		NA		ND	(0.0020)
Boron	mg/L	NA		NA		ND	(0.60)
Cadmium	mg/L	NA		NA		ND	(0.0050)
Calcium	mg/L	NA		NA		12.0	(1.0)
Chromium	mg/L	NA		NA		ND	(0.010)
Cobalt	mg/L	NA		NA		ND	(0.010)
Copper	mg/L	NA		NA		ND	(0.020)
Iron	mg/L	NA		NA		ND	(0.040)
Lead	mg/L	NA		NA		ND	(0.050)
Magnesium	mg/L	NA		NA		1.2	(1.0)
Manganese	mg/L	NA		NA		ND	(0.010)
Molybdenum	mg/L	NA		NA		0.053	(0.050)
Nickel	mg/L	NA		NA		ND	(0.020)
Potassium	mg/L	NA		NA		ND	(3.0)
Selenium	mg/L	NA		NA		ND	(0.30)
Silicon	mg/L	NA		NA		4.9	(1.0)
Silver	mg/L	NA		NA		ND	(0.010)
Sodium	mg/L	NA		NA		9.1	(1.0)
Strontium	mg/L	NA		NA		0.30	(0.0030)
Thallium	mg/L	NA		NA		ND	(0.10)
Vanadium	mg/L	NA		NA		0.026	(0.020)
Zinc	mg/L	NA		NA		ND	(0.020)

ND: Not detected at specified detection limit

NA: Not analyzed

Table C-10

CHEMICAL CHARACTERISTICS OF WASTEWATERS FROM L STATION, EVENT 2

		Location					
		Sample ID					
		Date Sampled					
		SLUICE-N		SLUICE-S		SLUICE-N	
		L-102		L-103		L-110	
		26-Jul-89		26-Jul-89		07-Jul-89	
PARAMETER	Units	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit
Water Quality Variables							
Electrical Conductivity (Field)	micromhos/cm	3.0	(10.0)	2.0	(10.0)	4.0	(10.0)
Electrical Conductivity (Lab)	micromhos/cm	26.0	(10.0)	30.0	(10.0)	313.0	(10.0)
Oxid-Red (Eh)	mV	58.0	(10.0)	57.0	(10.0)	50.0	(10.0)
Temperature (Field)	Degrees C	26.7	(0.10)	27.2	(0.10)	28.0	(0.10)
pH_value	pH Units	6.8	(0.050)	6.9	(0.050)	8.4	(0.050)
Anions and Ammonia in Aqueous Media							
Alkalinity	mg HCO3/L	NA		NA		NA	
Sulfate	mg/L	2.9	(0.70)	4.1	(0.54)	9.6	(4.8)
Elements in Aqueous Media by AA							
Calcium	mg/L	2.4	(0.040)	2.8	(0.040)	207.6	(0.040)

ND: Not detected at specified detection limit

NA: Not analyzed

Table C-11

CHEMICAL CHARACTERISTICS OF QUALITY CONTROL SAMPLES FOR ANALYSIS OF WATERS FROM L STATION, EVENT 2

		Location			
		Sample ID			
		Date Sampled			
		Field Blank		Audit Sample L-2	
		L-111		L-107	
		01-Aug-89			
PARAMETER	Units	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit
Water Quality Variables					
Electrical Conductivity (Lab)	micromhos/cm	9.5	(10.0)	NA	
Filterable Residue	mg/L	22.0	(5.0)	80.0	(11.0)
Anions and Ammonia in Aqueous Media					
Alkalinity	mg HCO3/L	2.0	(2.0)	NA	
Ammonia	mg N/L	0.14	(0.010)	0.21	(0.010)
Bromide	mg/L	ND	(0.040)	NA	
Carbonate	mg HCO3/L	2.0	(7.0)	131.0	(7.0)
Chloride	mg/L	ND	(0.20)	5.9	(0.20)
Fluoride	mg/L	0.0040	(0.0010)	NA	
Nitrate/Nitrite	mg N/L	0.19	(0.050)	0.20	(0.050)
Organic Carbon	mg C/L	0.60	(0.060)	7.8	(0.060)
Phosphate, total	mg P/L	ND	(0.050)	0.60	(0.050)
Sulfate	mg/L	ND	(0.50)	80.0	(0.50)
Sulfide by Iodine Titn	mg S/L	ND	(0.15)	NA	
Elements in Aqueous Media by AA					
Arsenic	mg/L	ND	(0.0050)	1.0	(0.25)
Calcium	mg/L	0.040	(0.040)	0.80	(0.040)
Chromium	mg/L	0.018	(0.0010)	0.99	(0.020)
Copper	mg/L	0.012	(0.0020)	1.1	(0.0020)
Magnesium	mg/L	ND	(0.024)	0.97	(0.024)
Potassium	mg/L	ND	(0.039)	ND	(0.039)
Selenium	mg/L	ND	(0.0050)	1.2	(0.13)
Sodium	mg/L	ND	(0.023)	0.023	(0.023)
Elements by ICPES					
Aluminum	mg/L	ND	(0.20)	ND	(0.20)
Antimony	mg/L	ND	(0.20)	0.98	(0.20)

ND: Not detected at specified detection limit

NA: Not analyzed

Table C-11

CHEMICAL CHARACTERISTICS OF QUALITY CONTROL SAMPLES FOR ANALYSIS OF WATERS FROM L STATION, EVENT 2

		Location			
		Sample ID			
		Date Sampled			
		Field Blank		Audit Sample L-2	
		L-111		L-107	
		01-Aug-89			
PARAMETER	Units	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit
Water Quality Variables					
Electrical Conductivity (Lab)	micromhos/cm	9.5	(10.0)	NA	
Filterable Residue	mg/L	22.0	(5.0)	80.0	(11.0)
Anions and Ammonia in Aqueous Media					
Alkalinity	mg HCO3/L	2.0	(2.0)	NA	
Ammonia	mg N/L	0.14	(0.010)	0.21	(0.010)
Bromide	mg/L	ND	(0.040)	NA	
Carbonate	mg HCO3/L	2.0	(7.0)	131.0	(7.0)
Chloride	mg/L	ND	(0.20)	5.9	(0.20)
Fluoride	mg/L	0.0040	(0.0010)	NA	
Nitrate/Nitrite	mg N/L	0.19	(0.050)	0.20	(0.050)
Organic Carbon	mg C/L	0.60	(0.060)	7.8	(0.060)
Phosphate, total	mg P/L	ND	(0.050)	0.60	(0.050)
Sulfate	mg/L	ND	(0.50)	80.0	(0.50)
Sulfide by Iodine Titn	mg S/L	ND	(0.15)	NA	
Elements in Aqueous Media by AA					
Arsenic	mg/L	ND	(0.0050)	1.0	(0.25)
Calcium	mg/L	0.040	(0.040)	0.80	(0.040)
Chromium	mg/L	0.018	(0.0010)	0.99	(0.020)
Copper	mg/L	0.012	(0.0020)	1.1	(0.0020)
Magnesium	mg/L	ND	(0.024)	0.97	(0.024)
Potassium	mg/L	ND	(0.039)	ND	(0.039)
Selenium	mg/L	ND	(0.0050)	1.2	(0.13)
Sodium	mg/L	ND	(0.023)	0.023	(0.023)
Elements by ICPES					
Aluminum	mg/L	ND	(0.20)	ND	(0.20)
Antimony	mg/L	ND	(0.20)	0.98	(0.20)

ND: Not detected at specified detection limit

NA: Not analyzed

Table C-11

CHEMICAL CHARACTERISTICS OF QUALITY CONTROL SAMPLES FOR ANALYSIS OF WATERS FROM L STATION, EVENT 2

		Location			
		Sample ID			
		Date Sampled			
		Field Blank		Audit Sample L-2	
		L-111		L-107	
		01-Aug-89			
PARAMETER	Units	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit
Arsenic	mg/L	ND	(0.30)	1.1	(0.30)
Barium	mg/L	ND	(0.010)	ND	(0.010)
Beryllium	mg/L	ND	(0.0020)	1.0	(0.0020)
Boron	mg/L	ND	(0.60)	ND	(0.60)
Cadmium	mg/L	ND	(0.0050)	1.1	(0.0050)
Calcium	mg/L	ND	(1.0)	1.1	(1.0)
Chromium	mg/L	ND	(0.010)	1.0	(0.010)
Cobalt	mg/L	ND	(0.010)	1.0	(0.010)
Copper	mg/L	ND	(0.020)	1.0	(0.020)
Iron	mg/L	ND	(0.040)	1.0	(0.040)
Lead	mg/L	ND	(0.050)	0.95	(0.050)
Magnesium	mg/L	ND	(1.0)	1.1	(1.0)
Manganese	mg/L	ND	(0.010)	1.0	(0.010)
Molybdenum	mg/L	ND	(0.050)	0.99	(0.050)
Nickel	mg/L	ND	(0.020)	1.1	(0.020)
Potassium	mg/L	ND	(3.0)	ND	(3.0)
Selenium	mg/L	ND	(0.30)	ND	(0.30)
Silicon	mg/L	ND	(1.0)	ND	(1.0)
Silver	mg/L	ND	(0.010)	ND	(0.010)
Sodium	mg/L	ND	(1.0)	ND	(1.0)
Strontium	mg/L	ND	(0.0030)	ND	(0.0030)
Thallium	mg/L	ND	(0.10)	ND	(0.10)
Vanadium	mg/L	ND	(0.020)	1.0	(0.020)
Zinc	mg/L	ND	(0.020)	ND	(0.020)

ND: Not detected at specified detection limit

NA: Not analyzed

Appendix D

ANALYTICAL DATA FOR SOIL AND ASH SAMPLES

Table D-1

MAJOR OXIDE CONCENTRATIONS

Element	Element Oxide	LMW-12 L-010 SS[a] (Wt.%)	LMW-12 L-011 SR[b] (Wt.%)	LMW-12 L-012 SS (Wt.%)	LMW-12 L-013 SS (Wt.%)	LMW-14 L-014 AS[c] (Wt.%)	LMW-14 L-015 AS (Wt.%)	LMW-14 L-016 AS (Wt.%)	LMW-14 L-017 AS (Wt.%)	LMW-14 L-018 AS (Wt.%)	LMW-14 L-019 AS (Wt.%)	LMW-14 L-019 DUP AS (Wt.%)	LMW-14 L-020 SS (Wt.%)	LMW-14 L-020 DUP SS (Wt.%)	LMW-14 L-021 SS (Wt.%)	LMW-14 L-022 SS (Wt.%)	LMW-14 L-023 SS (Wt.%)
Aluminum	Al2O3	24.56	26.45	18.71	17.95	20.78	19.84	22.67	22.67	20.78	16.25	17.76	24.56	24.56	26.45	26.45	26.45
Calcium	CaO	0.97	0.87	6.44	5.88	0.99	1.07	0.42	0.92	0.91	0.39	0.81	0.16	0.25	0.22	0.18	0.38
Iron	Fe2O3	17.16	15.73	14.30	10.58	18.59	20.30	8.44	15.73	22.88	24.31	25.73	15.73	17.16	14.30	15.73	14.30
Magnesium	MgO	3.32	3.15	5.64	4.48	1.04	0.91	1.11	0.81	0.88	0.63	0.65	3.48	3.32	2.65	2.16	2.32
Potassium	K2O	1.69	1.69	1.93	1.69	2.65	2.46	3.37	2.05	2.29	1.57	1.45	2.89	2.65	1.69	1.07	1.05
Silicon	SiO2	49.21	53.49	49.21	55.63	55.63	48.57	51.35	53.49	51.35	44.93	51.35	42.79	51.35	51.35	42.79	53.49
Sodium	Na2O	0.49	0.50	1.89	2.43	0.70	0.47	0.81	0.59	0.78	0.53	0.61	0.40	0.23	0.42	0.36	0.31
Total		97.38	101.87	98.10	98.62	100.39	93.61	88.17	96.26	99.87	88.60	98.35	90.01	99.51	97.08	88.74	98.29
Undetermined		2.62	-1.87	1.90	1.38	-0.39	6.39	11.83	3.74	0.13	11.40	1.65	9.99	0.49	2.92	11.26	1.71

Element	Element Oxide	LMW-14 L-024 SS (Wt.%)	Fusion Blank (Wt.%)	NBS SRM 1633 Fly Ash (Wt.%)	NBS Certified (Wt. %)	Recovery (Measured/ Certified) %
Aluminum	Al2O3	20.78	<0.08	25.13	--	
Calcium	CaO	0.87	0.14*	1.69	1.55	109
Iron	Fe2O3	10.87	<0.009	12.88	13.4	96
Magnesium	MgO	3.32	0.007	0.75	0.754	100
Potassium	K2O	1.57	<0.002	2.24	2.26	99
Silicon	SiO2	59.91	<0.4	44.93	48.8	92
Sodium	Na2O	1.08	0.06*	0.47	0.23	206
Total		98.38	<0.72	88.10		
Undetermined		1.62	>99.28	11.90		

[a]SS = soil sample
[b]SR = soil replicate (field replicate)
[c]AS = ash sample

Table D-2

CHEMICAL CHARACTERISTICS OF SOIL AND DISPOSED ASH FROM L STATION, EVENT 1

		Location					
		Sample ID					
		Date Sampled					
		LMW-14		LMW-14		LMW-14	
		L-022		L-023		L-024	
		04-May-89		04-May-89		04-May-89	
PARAMETER	Units	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit
Manganese	mg/kg	340.0	(2.5)	660.0	(2.5)	770.0	(2.5)
Molybdenum	mg/kg	ND	(12.0)	ND	(13.0)	ND	(12.0)
Nickel	mg/kg	ND	(5.0)	ND	(5.0)	6.6	(5.0)
Potassium	mg/kg	ND	(750.0)	ND	(750.0)	ND	(750.0)
Selenium	mg/kg	ND	(75.0)	ND	(75.0)	ND	(75.0)
Silicon	mg/kg	560.0	(250.0)	1000.0	(250.0)	1300.0	(250.0)
Silver	mg/kg	ND	(2.5)	ND	(2.5)	ND	(2.5)
Sodium	mg/kg	590.0	(250.0)	720.0	(250.0)	660.0	(250.0)
Strontium	mg/kg	1.3	(0.75)	2.6	(0.75)	3.4	(0.75)
Thallium	mg/kg	ND	(25.0)	ND	(25.0)	ND	(25.0)
Vanadium	mg/kg	31.0	(5.0)	34.0	(5.0)	15.0	(5.0)
Zinc	mg/kg	ND	(5.0)	6.4	(5.0)	12.0	(5.0)
Anions in Aqueous Extracts of Solids by IC							
Bromide	mg/kg	ND	(1.6)	ND	(1.6)	ND	(1.6)
Chloride	mg/kg	2.9	(1.0)	3.0	(1.0)	2.3	(1.0)
Fluoride	mg/kg	0.20	(0.20)	ND	(0.20)	ND	(0.20)
Nitrate	mg/kg	ND	(3.0)	ND	(3.0)	ND	(3.0)
Sulfate	mg/kg	520.0	(10.0)	506.0	(10.0)	501.0	(10.0)
Anions in Hydrochloric Acid Extracts of Solids by IC							
Sulfate	mg/kg	3539.0	(2600.0)	NA		NA	

ND: Not detected at specified detection limit

NA: Not analyzed

Table D-2

CHEMICAL CHARACTERISTICS OF SOIL AND DISPOSED ASH FROM L STATION, EVENT 1

		Location							
		Sample ID							
		Date Sampled							
		LMW-12		LMW-12		LMW-12		LMW-12	
		L-010		L-011		L-012		L-013	
		04-May-89		04-May-89		04-May-89		04-May-89	
PARAMETER	Units	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit
Vanadium	mg/kg	220.0	(3.0)	88.0	(5.0)	48.0	(5.0)	130.0	(5.0)
Zinc	mg/kg	170.0	(3.0)	140.0	(5.0)	93.0	(5.0)	94.0	(5.0)
Elemental Conc. in Solids Dissolved by LiBO2									
Aluminum	mg/kg	130000	()	140000	()	99000.0	()	95000.0	()
Calcium	mg/kg	6900.0	()	6200.0	()	46000.0	()	42000.0	()
Iron	mg/kg	120000	()	110000	()	100000	()	74000.0	()
Magnesium	mg/kg	20000.0	()	19000.0	()	34000.0	()	27000.0	()
Potassium	mg/kg	14000.0	()	14000.0	()	16000.0	()	14000.0	()
Silicon	mg/kg	230000	()	250000	()	230000	()	260000	()
Sodium	mg/kg	3600.0	()	3700.0	()	14000.0	()	18000.0	()
Hydroxylamine-Extractable Elemental Conc. in Solids by ICP									
Aluminum	mg/kg	1200.0	(50.0)	1300.0	(50.0)	970.0	(50.0)	970.0	(50.0)
Antimony	mg/kg	ND	(50.0)	ND	(50.0)	ND	(50.0)	ND	(50.0)
Arsenic	mg/kg	ND	(75.0)	ND	(75.0)	ND	(75.0)	ND	(75.0)
Barium	mg/kg	89.0	(2.5)	91.0	(2.5)	92.0	(2.5)	71.0	(2.5)
Beryllium	mg/kg	0.50	(0.50)	0.75	(0.50)	0.75	(0.50)	0.50	(0.50)
Boron	mg/kg	ND	(150.0)	ND	(150.0)	ND	(150.0)	ND	(150.0)
Cadmium	mg/kg	ND	(1.2)	ND	(1.2)	ND	(1.2)	ND	(1.3)
Calcium	mg/kg	730.0	(250.0)	400.0	(250.0)	3500.0	(250.0)	3100.0	(250.0)
Chromium	mg/kg	ND	(2.5)	ND	(2.5)	ND	(2.5)	ND	(2.5)
Cobalt	mg/kg	43.0	(2.5)	32.0	(2.5)	8.0	(2.5)	6.5	(2.5)
Copper	mg/kg	ND	(5.0)	ND	(5.0)	ND	(5.0)	ND	(5.0)
Iron	mg/kg	1000.0	(10.0)	1200.0	(10.0)	1250.0	(10.0)	1000.0	(10.0)
Lead	mg/kg	ND	(12.0)	ND	(12.0)	ND	(12.0)	ND	(13.0)
Magnesium	mg/kg	ND	(250.0)	ND	(250.0)	370.0	(250.0)	560.0	(250.0)
Manganese	mg/kg	870.0	(2.5)	640.0	(2.5)	230.0	(2.5)	170.0	(2.5)
Molybdenum	mg/kg	ND	(12.0)	ND	(12.0)	ND	(12.0)	ND	(13.0)
Nickel	mg/kg	6.5	(5.0)	5.5	(5.0)	ND	(5.0)	ND	(5.0)

ND: Not detected at specified detection limit

NA: Not analyzed

Table D-2

CHEMICAL CHARACTERISTICS OF SOIL AND DISPOSED ASH FROM L STATION, EVENT 1

		Location							
		Sample ID							
		Date Sampled							
		LMW-12		LMW-12		LMW-12		LMW-12	
		L-010		L-011		L-012		L-013	
		04-May-89		04-May-89		04-May-89		04-May-89	
PARAMETER	Units	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit
Potassium	mg/kg	ND	(750.0)	ND	(750.0)	ND	(750.0)	ND	(750.0)
Selenium	mg/kg	ND	(75.0)	ND	(75.0)	ND	(75.0)	ND	(75.0)
Silicon	mg/kg	650.0	(250.0)	840.0	(250.0)	790.0	(250.0)	1100.0	(250.0)
Silver	mg/kg	ND	(2.5)	ND	(2.5)	ND	(2.5)	ND	(2.5)
Sodium	mg/kg	810.0	(250.0)	800.0	(250.0)	750.0	(250.0)	530.0	(250.0)
Strontium	mg/kg	2.5	(0.75)	1.7	(0.75)	6.0	(0.75)	8.8	(0.75)
Thallium	mg/kg	ND	(25.0)	ND	(25.0)	ND	(25.0)	ND	(25.0)
Vanadium	mg/kg	10.0	(5.0)	13.0	(5.0)	6.0	(5.0)	ND	(5.0)
Zinc	mg/kg	9.7	(5.0)	8.2	(5.0)	6.2	(5.0)	6.5	(5.0)
Anions in Aqueous Extracts of Solids by IC									
Bromide	mg/kg	ND	(1.6)	ND	(1.6)	ND	(1.6)	ND	(1.6)
Chloride	mg/kg	5.9	(1.0)	5.7	(1.0)	11.7	(1.0)	1.4	(1.0)
Fluoride	mg/kg	ND	(0.20)	ND	(0.20)	ND	(0.20)	0.40	(0.20)
Nitrate	mg/kg	ND	(3.0)	ND	(3.0)	ND	(3.0)	ND	(3.0)
Sulfate	mg/kg	ND	(5.0)	ND	(5.0)	ND	(5.0)	ND	(5.0)

ND: Not detected at specified detection limit

NA: Not analyzed

Table D-2

CHEMICAL CHARACTERISTICS OF SOIL AND DISPOSED ASH FROM L STATION, EVENT 1

		Location							
		Sample ID							
		Date Sampled							
		LMW-14		LMW-14		LMW-14		LMW-14	
		L-014		L-015		L-016		L-017	
		04-May-89		04-May-89		04-May-89		04-May-89	
PARAMETER	Units	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit
Weight Loss on Heating for Solids									
Loss on Ignition	Wt. %	8.7	(0.70)	24.5	(0.70)	4.0	(0.70)	6.7	(0.70)
Moisture Content	g Moisture/100g solid	ND	(2.0)	3.3	(2.0)	ND	(2.0)	ND	(2.0)
Boron in Sodium Carbonate Fusion of Solids									
Boron	mg/L	NA		NA		ND	(100.0)	NA	
Elemental Conc. in Solids Dissolved by Microwave Digestion									
Aluminum	mg/kg	24000.0	(49.0)	26000.0	(49.0)	30000.0	()	17000.0	(50.0)
Antimony	mg/kg	ND	(50.0)	ND	(50.0)	ND	(50.0)	ND	(50.0)
Arsenic	mg/kg	ND	(75.0)	ND	(75.0)	440.0	()	ND	(75.0)
Barium	mg/kg	1200.0	(2.5)	1200.0	(2.5)	1000.0	()	990.0	(2.5)
Beryllium	mg/kg	10.0	(0.49)	7.5	(0.49)	12.0	()	5.9	(0.50)
Boron	mg/kg	NA		NA		NA		NA	
Cadmium	mg/kg	6.6	(1.2)	7.2	(1.2)	ND	(1.2)	7.1	(1.3)
Calcium	mg/kg	5300.0	(250.0)	4900.0	(250.0)	3600.0	()	4200.0	(250.0)
Chromium	mg/kg	97.0	(2.5)	84.0	(2.5)	120.0	()	100.0	(2.5)
Cobalt	mg/kg	41.0	(2.5)	36.0	(2.5)	45.0	()	43.0	(2.5)
Copper	mg/kg	95.0	(4.9)	94.0	(4.9)	110.0	()	92.0	(5.0)
Iron	mg/kg	100000	(9.8)	120000	(9.9)	54000.0	()	120000	(10.0)
Lead	mg/kg	49.0	(12.0)	48.0	(12.0)	ND	(13.0)	62.0	(13.0)
Magnesium	mg/kg	2300.0	(250.0)	2400.0	(250.0)	2100.0	()	1500.0	(250.0)
Manganese	mg/kg	500.0	(2.5)	500.0	(2.5)	150.0	()	320.0	(2.5)
Motybdenum	mg/kg	13.0	(12.0)	16.0	(12.0)	140.0	()	ND	(13.0)
Nickel	mg/kg	95.0	(4.9)	92.0	(4.9)	97.0	()	120.0	(5.0)
Potassium	mg/kg	16000.0	(740.0)	14000.0	(740.0)	23000.0	()	16000.0	(750.0)
Selenium	mg/kg	180.0	(74.0)	200.0	(74.0)	950.0	()	140.0	(75.0)
Silicon	mg/kg	14000.0	(250.0)	13000.0	(250.0)	19000.0	()	11000.0	(250.0)
Silver	mg/kg	7.5	(2.5)	7.5	(2.5)	ND	(1.7)	7.5	(2.5)

ND: Not detected at specified detection limit

NA: Not analyzed

Table D-2

CHEMICAL CHARACTERISTICS OF SOIL AND DISPOSED ASH FROM L STATION, EVENT 1

		Location							
		Sample ID							
		Date Sampled							
		LMW-14		LMW-14		LMW-14		LMW-14	
		L-014		L-015		L-016		L-017	
		04-May-89		04-May-89		04-May-89		04-May-89	
PARAMETER	Units	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit
Sodium	mg/kg	3200.0	(250.0)	2500.0	(250.0)	3700.0	()	2100.0	(250.0)
Strontium	mg/kg	590.0	(0.74)	470.0	(0.74)	540.0	()	520.0	(0.75)
Thallium	mg/kg	48.0	(25.0)	52.0	(25.0)	58.0	()	42.0	(25.0)
Vanadium	mg/kg	140.0	(4.9)	120.0	(4.9)	190.0	()	120.0	(5.0)
Zinc	mg/kg	62.0	(4.9)	70.0	(4.9)	120.0	()	92.0	(5.0)
Elemental Conc. in Solids Dissolved by LiBO2									
Aluminum	mg/kg	110000	()	105000	()	120000	()	120000	()
Calcium	mg/kg	7100.0	()	7670.0	()	3000.0	()	6600.0	()
Iron	mg/kg	130000	()	142000	()	59000.0	()	110000	()
Magnesium	mg/kg	6300.0	()	5470.0	()	6700.0	()	4900.0	()
Potassium	mg/kg	22000.0	()	20400.0	()	28000.0	()	17000.0	()
Silicon	mg/kg	260000	()	227000	()	240000	()	250000	()
Sodium	mg/kg	5200.0	()	3470.0	()	6000.0	()	4400.0	()
Hydroxylamine-Extractable Elemental Conc. in Solids by ICP									
Aluminum	mg/kg	620.0	(50.0)	740.0	(50.0)	1100.0	(50.0)	1100.0	(50.0)
Antimony	mg/kg	ND	(50.0)	ND	(50.0)	ND	(50.0)	ND	(50.0)
Arsenic	mg/kg	ND	(75.0)	ND	(75.0)	150.0	(75.0)	ND	(75.0)
Barium	mg/kg	270.0	(2.5)	310.0	(2.5)	180.0	(2.5)	230.0	(2.5)
Beryllium	mg/kg	ND	(0.50)	ND	(0.50)	ND	(0.50)	ND	(0.50)
Boron	mg/kg	ND	(150.0)	ND	(150.0)	ND	(150.0)	ND	(150.0)
Cadmium	mg/kg	ND	(1.2)	ND	(1.3)	ND	(1.2)	ND	(1.3)
Calcium	mg/kg	1200.0	(250.0)	1200.0	(250.0)	1800.0	(250.0)	1200.0	(250.0)
Chromium	mg/kg	ND	(2.5)	ND	(2.5)	4.3	(2.5)	ND	(2.5)
Cobalt	mg/kg	ND	(2.5)	ND	(2.5)	ND	(2.5)	ND	(2.5)
Copper	mg/kg	11.0	(5.0)	9.8	(5.0)	13.0	(5.0)	11.0	(5.0)
Iron	mg/kg	980.0	(10.0)	1200.0	(10.0)	1100.0	(10.0)	1300.0	(10.0)
Lead	mg/kg	ND	(12.0)	ND	(13.0)	ND	(12.0)	ND	(13.0)
Magnesium	mg/kg	ND	(250.0)	ND	(250.0)	ND	(250.0)	ND	(250.0)

ND: Not detected at specified detection limit

NA: Not analyzed

Table D-2

CHEMICAL CHARACTERISTICS OF SOIL AND DISPOSED ASH FROM L STATION, EVENT 1

		Location							
		Sample ID							
		Date Sampled							
		LMW-14		LMW-14		LMW-14		LMW-14	
		L-014		L-015		L-016		L-017	
		04-May-89		04-May-89		04-May-89		04-May-89	
PARAMETER	Units	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit
Manganese	mg/kg	23.0	(2.5)	33.0	(2.5)	8.5	(2.5)	19.0	(2.5)
Molybdenum	mg/kg	ND	(12.0)	ND	(13.0)	ND	(12.0)	ND	(13.0)
Nickel	mg/kg	ND	(5.0)	ND	(5.0)	ND	(5.0)	ND	(5.0)
Potassium	mg/kg	ND	(750.0)	ND	(750.0)	ND	(750.0)	ND	(750.0)
Selenium	mg/kg	ND	(75.0)	ND	(75.0)	ND	(75.0)	ND	(75.0)
Silicon	mg/kg	1300.0	(250.0)	1600.0	(250.0)	1200.0	(250.0)	1700.0	(250.0)
Silver	mg/kg	ND	(2.5)	ND	(2.5)	ND	(2.5)	ND	(2.5)
Sodium	mg/kg	550.0	(250.0)	690.0	(250.0)	740.0	(250.0)	660.0	(250.0)
Strontium	mg/kg	28.0	(0.75)	32.0	(0.75)	38.0	(0.75)	38.0	(0.75)
Thallium	mg/kg	ND	(25.0)	ND	(25.0)	ND	(25.0)	ND	(25.0)
Vanadium	mg/kg	ND	(5.0)	6.5	(5.0)	17.0	(5.0)	8.7	(5.0)
Zinc	mg/kg	ND	(5.0)	5.4	(5.0)	6.4	(5.0)	8.6	(5.0)
Anions in Aqueous Extracts of Solids by IC									
Bromide	mg/kg	ND	(1.6)	ND	(1.6)	ND	(1.6)	ND	(1.6)
Chloride	mg/kg	2.2	(1.0)	ND	(1.0)	1.5	(1.0)	ND	(1.0)
Fluoride	mg/kg	ND	(0.20)	ND	(0.20)	ND	(0.20)	0.20	(0.20)
Nitrate	mg/kg	ND	(3.0)	ND	(3.0)	ND	(3.0)	ND	(3.0)
Sulfate	mg/kg	56.0	(5.0)	ND	(5.0)	975.0	(10.0)	781.0	(10.0)
Anions in Hydrochloric Acid Extracts of Solids by IC									
Sulfate	mg/kg	NA		NA		ND	(2600.0)	NA	

ND: Not detected at specified detection limit

NA: Not analyzed

Table D-2

CHEMICAL CHARACTERISTICS OF SOIL AND DISPOSED ASH FROM L STATION, EVENT 1

		Location							
		Sample ID							
		Date Sampled							
		LMW-14		LMW-14		LMW-14		LMW-14	
		L-018		L-019		L-020		L-021	
		04-May-89		04-May-89		04-May-89		04-May-89	
PARAMETER	Units	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit
Weight Loss on Heating for Solids									
Loss on Ignition	Wt. %	10.3	(0.70)	7.9	(0.70)	7.2	(0.70)	9.3	(0.70)
Moisture Content	g Moisture/100g solid	ND	(2.0)	ND	(2.0)	4.1	(2.0)	3.1	(2.0)
Boron in Sodium Carbonate Fusion of Solids									
Boron	mg/L	NA		ND	(100.0)	ND	(100.0)	NA	
Elemental Conc. in Solids Dissolved by Microwave Digestion									
Aluminum	mg/kg	19000.0	(49.0)	16000.0	()	20000.0	()	21000.0	(50.0)
Antimony	mg/kg	ND	(50.0)	ND	(50.0)	ND	(50.0)	ND	(50.0)
Arsenic	mg/kg	ND	(75.0)	250.0	()	250.0	()	ND	(75.0)
Barium	mg/kg	1000.0	(2.5)	830.0	()	230.0	()	230.0	(2.5)
Beryllium	mg/kg	6.5	(0.49)	6.9	()	4.8	()	2.7	(0.50)
Boron	mg/kg	NA		NA		NA		NA	
Cadmium	mg/kg	5.4	(1.2)	ND	(1.3)	1.2	()	6.1	(1.3)
Calcium	mg/kg	4200.0	(250.0)	3500.0	()	1200.0	()	1200.0	(250.0)
Chromium	mg/kg	110.0	(2.5)	140.0	()	51.0	()	48.0	(2.5)
Cobalt	mg/kg	43.0	(2.5)	56.0	()	52.0	()	47.0	(2.5)
Copper	mg/kg	86.0	(4.9)	120.0	()	23.0	()	14.0	(5.0)
Iron	mg/kg	88000.0	(9.8)	140000	()	84000.0	()	79000.0	(10.0)
Lead	mg/kg	47.0	(12.0)	ND	(13.0)	ND	(13.0)	44.0	(13.0)
Magnesium	mg/kg	1400.0	(250.0)	1300.0	()	6700.0	()	6500.0	(250.0)
Manganese	mg/kg	270.0	(2.5)	390.0	()	820.0	()	820.0	(2.5)
Molybdenum	mg/kg	13.0	(12.0)	140.0	()	130.0	()	ND	(13.0)
Nickel	mg/kg	110.0	(4.9)	130.0	()	38.0	()	67.0	(5.0)
Potassium	mg/kg	16000.0	(740.0)	11000.0	()	16000.0	()	11000.0	(750.0)
Selenium	mg/kg	150.0	(74.0)	1100.0	()	1000.0	()	150.0	(75.0)
Silicon	mg/kg	13000.0	(250.0)	21000.0	()	9700.0	()	62000.0	(250.0)
Silver	mg/kg	7.5	(2.5)	ND	(1.7)	ND	(1.7)	7.5	(2.5)

ND: Not detected at specified detection limit

NA: Not analyzed

Table D-2

CHEMICAL CHARACTERISTICS OF SOIL AND DISPOSED ASH FROM L STATION, EVENT 1

		Location							
		Sample ID							
		Date Sampled							
		LMW-14		LMW-14		LMW-14		LMW-14	
		L-018		L-019		L-020		L-021	
		04-May-89		04-May-89		04-May-89		04-May-89	
PARAMETER	Units	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit
Sodium	mg/kg	2800.0	(250.0)	2500.0	()	1100.0	()	700.0	(250.0)
Strontium	mg/kg	620.0	(0.74)	480.0	()	25.0	()	13.0	(0.75)
Thallium	mg/kg	40.0	(25.0)	60.0	()	ND	(25.0)	40.0	(25.0)
Vanadium	mg/kg	140.0	(4.9)	130.0	()	230.0	()	210.0	(5.0)
Zinc	mg/kg	80.0	(4.9)	79.0	()	120.0	()	110.0	(5.0)
Elemental Conc. in Solids Dissolved by LiBO2									
Aluminum	mg/kg	110000	()	86000.0	()	130000	()	140000	()
Calcium	mg/kg	6500.0	()	2800.0	()	1120.0	()	1600.0	()
Iron	mg/kg	160000	()	170000	()	110000	()	100000	()
Magnesium	mg/kg	5300.0	()	3800.0	()	21000.0	()	16000.0	()
Potassium	mg/kg	19000.0	()	13000.0	()	24000.0	()	14000.0	()
Silicon	mg/kg	240000	()	210000	()	200000	()	240000	()
Sodium	mg/kg	5800.0	()	3900.0	()	3000.0	()	3100.0	()
Hydroxylamine-Extractable Elemental Conc. in Solids by ICP									
Aluminum	mg/kg	880.0	(52.0)	580.0	(51.0)	1000.0	(50.0)	870.0	(50.0)
Antimony	mg/kg	ND	(52.0)	ND	(51.0)	ND	(50.0)	ND	(50.0)
Arsenic	mg/kg	ND	(77.0)	ND	(76.0)	ND	(75.0)	ND	(75.0)
Barium	mg/kg	183.0	(2.6)	220.0	(2.5)	130.0	(2.5)	110.0	(2.5)
Beryllium	mg/kg	ND	(0.52)	ND	(0.51)	0.70	(0.50)	0.70	(0.50)
Boron	mg/kg	ND	(150.0)	ND	(150.0)	ND	(150.0)	ND	(150.0)
Cadmium	mg/kg	ND	(1.3)	ND	(1.3)	ND	(1.2)	ND	(1.2)
Calcium	mg/kg	970.0	(260.0)	750.0	(250.0)	690.0	(250.0)	850.0	(250.0)
Chromium	mg/kg	ND	(2.6)	ND	(2.5)	ND	(2.5)	ND	(2.5)
Cobalt	mg/kg	ND	(2.6)	3.4	(2.5)	4.0	(2.5)	6.3	(2.5)
Copper	mg/kg	7.2	(5.2)	7.0	(5.1)	ND	(5.0)	ND	(5.0)
Iron	mg/kg	1100.0	(10.0)	1200.0	(10.0)	3600.0	(10.0)	1900.0	(10.0)
Lead	mg/kg	ND	(13.0)	ND	(13.0)	ND	(12.0)	ND	(12.0)
Magnesium	mg/kg	ND	(260.0)	ND	(250.0)	ND	(250.0)	ND	(250.0)

ND: Not detected at specified detection limit

NA: Not analyzed

Table D-2

CHEMICAL CHARACTERISTICS OF SOIL AND DISPOSED ASH FROM L STATION, EVENT 1

		Location							
		Sample ID							
		Date Sampled							
		LMW-14		LMW-14		LMW-14		LMW-14	
		L-018		L-019		L-020		L-021	
		04-May-89		04-May-89		04-May-89		04-May-89	
PARAMETER	Units	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit
Manganese	mg/kg	25.0	(2.6)	38.0	(2.5)	220.0	(2.5)	280.0	(2.5)
Molybdenum	mg/kg	ND	(13.0)	ND	(13.0)	ND	(12.0)	ND	(12.0)
Nickel	mg/kg	ND	(5.2)	ND	(5.1)	ND	(5.0)	ND	(5.0)
Potassium	mg/kg	ND	(770.0)	ND	(760.0)	ND	(750.0)	ND	(750.0)
Selenium	mg/kg	ND	(77.0)	ND	(76.0)	ND	(75.0)	ND	(75.0)
Silicon	mg/kg	1500.0	(260.0)	1200.0	(250.0)	860.0	(250.0)	620.0	(250.0)
Silver	mg/kg	ND	(2.6)	ND	(2.5)	ND	(2.5)	ND	(2.5)
Sodium	mg/kg	550.0	(260.0)	620.0	(250.0)	750.0	(250.0)	660.0	(250.0)
Strontium	mg/kg	32.0	(0.77)	20.0	(0.76)	4.3	(0.75)	1.8	(0.75)
Thallium	mg/kg	ND	(26.0)	ND	(25.0)	ND	(25.0)	ND	(25.0)
Vanadium	mg/kg	6.1	(5.2)	5.1	(5.1)	33.0	(5.0)	32.0	(5.0)
Zinc	mg/kg	8.9	(5.2)	ND	(5.1)	ND	(5.0)	6.4	(5.0)
Anions in Aqueous Extracts of Solids by IC									
Bromide	mg/kg	ND	(1.6)	ND	(1.6)	ND	(1.6)	ND	(1.6)
Chloride	mg/kg	ND	(1.0)	1.2	(1.0)	3.2	(1.0)	2.5	(1.0)
Fluoride	mg/kg	0.30	(0.20)	0.50	(0.20)	ND	(0.20)	ND	(0.20)
Nitrate	mg/kg	ND	(3.0)	ND	(3.0)	ND	(3.0)	ND	(3.0)
Sulfate	mg/kg	520.0	(10.0)	294.0	(10.0)	230.0	(10.0)	174.0	(10.0)
Anions in Hydrochloric Acid Extracts of Solids by IC									
Sulfate	mg/kg	NA		3985.0	(2600.0)	3148.0	(2600.0)	NA	

ND: Not detected at specified detection limit

NA: Not analyzed

Table D-2

CHEMICAL CHARACTERISTICS OF SOIL AND DISPOSED ASH FROM L STATION, EVENT 1

		Location					
		Sample ID					
		Date Sampled					
		LMW-14		LMW-14		LMW-14	
		L-022		L-023		L-024	
		04-May-89		04-May-89		04-May-89	
PARAMETER	Units	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit
Weight Loss on Heating for Solids							
Loss on Ignition	Wt. %	12.4	(0.70)	11.3	(0.70)	7.6	(0.70)
Moisture Content	g Moisture/100g solid	5.2	(2.0)	3.4	(2.0)	2.5	(2.0)
Boron in Sodium Carbonate Fusion of Solids							
Boron	mg/L	ND	(100.0)	NA		NA	
Elemental Conc. in Solids Dissolved by Microwave Digestion							
Aluminum	mg/L	23000.0	()	36000.0	(49.0)	34000.0	(50.0)
Antimony	mg/L	ND	(50.0)	ND	(50.0)	ND	(50.0)
Arsenic	mg/L	260.0	()	ND	(75.0)	ND	(75.0)
Barium	mg/L	220.0	()	280.0	(2.5)	200.0	(2.5)
Beryllium	mg/L	5.8	()	3.7	(0.49)	3.7	(0.50)
Boron	mg/kg	NA		NA		NA	
Cadmium	mg/L	ND	(1.3)	6.7	(1.2)	4.6	(1.3)
Calcium	mg/L	1100.0	()	1900.0	(250.0)	5000.0	(250.0)
Chromium	mg/L	55.0	()	45.0	(2.5)	46.0	(2.5)
Cobalt	mg/L	53.0	()	61.0	(2.5)	69.0	(2.5)
Copper	mg/L	20.0	()	17.0	(4.9)	10.0	(5.0)
Iron	mg/L	88000.0	()	84000.0	(9.9)	62000.0	(10.0)
Lead	mg/L	ND	(13.0)	42.0	(12.0)	30.0	(13.0)
Magnesium	mg/L	3600.0	()	6600.0	(250.0)	13000.0	(250.0)
Manganese	mg/L	590.0	()	1100.0	(2.5)	1400.0	(2.5)
Molybdenum	mg/L	130.0	()	13.0	(12.0)	ND	(13.0)
Nickel	mg/L	45.0	()	70.0	(4.9)	74.0	(5.0)
Potassium	mg/L	6400.0	()	7200.0	(740.0)	11000.0	(750.0)
Selenium	mg/L	1000.0	()	200.0	(74.0)	170.0	(75.0)
Silicon	mg/L	23000.0	()	66000.0	(250.0)	45000.0	(250.0)
Silver	mg/L	ND	(1.7)	7.5	(2.5)	7.5	(2.5)

ND: Not detected at specified detection limit

NA: Not analyzed

Table D-2

CHEMICAL CHARACTERISTICS OF SOIL AND DISPOSED ASH FROM L STATION, EVENT 1

		Location					
		Sample ID					
		Date Sampled					
		LMW-14		LMW-14		LMW-14	
		L-022		L-023		L-024	
		04-May-89		04-May-89		04-May-89	
PARAMETER	Units	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit
Sodium	mg/L	980.0	()	700.0	(250.0)	4100.0	(250.0)
Strontium	mg/kg	16.0	()	15.0	(0.74)	41.0	(0.75)
Thallium	mg/L	32.0	()	39.0	(25.0)	40.0	(25.0)
Vanadium	mg/L	240.0	()	220.0	(4.9)	160.0	(5.0)
Zinc	mg/L	79.0	()	95.0	(4.9)	140.0	(5.0)
Elemental Conc. in Solids Dissolved by LiBO2							
Aluminum	mg/kg	140000	()	140000	()	110000	()
Calcium	mg/kg	1300.0	()	2700.0	()	6200.0	()
Iron	mg/kg	110000	()	100000	()	76000.0	()
Magnesium	mg/kg	13000.0	()	14000.0	()	20000.0	()
Potassium	mg/kg	8900.0	()	8700.0	()	13000.0	()
Silicon	mg/kg	200000	()	250000	()	280000	()
Sodium	mg/kg	2700.0	()	2300.0	()	8000.0	()
Hydroxylamine-Extractable Elemental Conc. in Solids by ICP							
Aluminum	mg/kg	870.0	(50.0)	1400.0	(50.0)	1600.0	(50.0)
Antimony	mg/kg	ND	(50.0)	ND	(50.0)	ND	(50.0)
Arsenic	mg/kg	ND	(75.0)	ND	(75.0)	ND	(75.0)
Barium	mg/kg	120.0	(2.5)	160.0	(2.5)	120.0	(2.5)
Beryllium	mg/kg	1.0	(0.50)	1.3	(0.50)	0.82	(0.50)
Boron	mg/kg	ND	(150.0)	ND	(150.0)	ND	(150.0)
Cadmium	mg/kg	ND	(1.2)	ND	(1.3)	ND	(1.2)
Calcium	mg/kg	1200.0	(250.0)	1200.0	(250.0)	1400.0	(250.0)
Chromium	mg/kg	ND	(2.5)	ND	(2.5)	ND	(2.5)
Cobalt	mg/kg	11.0	(2.5)	22.0	(2.5)	25.0	(2.5)
Copper	mg/kg	ND	(5.0)	ND	(5.0)	ND	(5.0)
Iron	mg/kg	2000.0	(10.0)	3300.0	(10.0)	1700.0	(10.0)
Lead	mg/kg	ND	(12.0)	ND	(13.0)	ND	(12.0)
Magnesium	mg/kg	ND	(250.0)	290.0	(250.0)	510.0	(250.0)

ND: Not detected at specified detection limit

NA: Not analyzed

Table D-2

CHEMICAL CHARACTERISTICS OF SOIL AND DISPOSED ASH FROM L STATION, EVENT 1

		Location					
		Sample ID					
		Date Sampled					
		LMW-14		LMW-14		LMW-14	
		L-022		L-023		L-024	
		04-May-89		04-May-89		04-May-89	
PARAMETER	Units	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit	Msr'd Val.	Det. Limit
Manganese	mg/kg	340.0	(2.5)	660.0	(2.5)	770.0	(2.5)
Molybdenum	mg/kg	ND	(12.0)	ND	(13.0)	ND	(12.0)
Nickel	mg/kg	ND	(5.0)	ND	(5.0)	6.6	(5.0)
Potassium	mg/kg	ND	(750.0)	ND	(750.0)	ND	(750.0)
Selenium	mg/kg	ND	(75.0)	ND	(75.0)	ND	(75.0)
Silicon	mg/kg	560.0	(250.0)	1000.0	(250.0)	1300.0	(250.0)
Silver	mg/kg	ND	(2.5)	ND	(2.5)	ND	(2.5)
Sodium	mg/kg	590.0	(250.0)	720.0	(250.0)	660.0	(250.0)
Strontium	mg/kg	1.3	(0.75)	2.6	(0.75)	3.4	(0.75)
Thallium	mg/kg	ND	(25.0)	ND	(25.0)	ND	(25.0)
Vanadium	mg/kg	31.0	(5.0)	34.0	(5.0)	15.0	(5.0)
Zinc	mg/kg	ND	(5.0)	6.4	(5.0)	12.0	(5.0)
Anions in Aqueous Extracts of Solids by IC							
Bromide	mg/kg	ND	(1.6)	ND	(1.6)	ND	(1.6)
Chloride	mg/kg	2.9	(1.0)	3.0	(1.0)	2.3	(1.0)
Fluoride	mg/kg	0.20	(0.20)	ND	(0.20)	ND	(0.20)
Nitrate	mg/kg	ND	(3.0)	ND	(3.0)	ND	(3.0)
Sulfate	mg/kg	520.0	(10.0)	506.0	(10.0)	501.0	(10.0)
Anions in Hydrochloric Acid Extracts of Solids by IC							
Sulfate	mg/kg	3539.0	(2600.0)	NA		NA	

ND: Not detected at specified detection limit

NA: Not analyzed

DEPTH TRENDS IN ASH AND SOIL FOR SELECTED ELEMENTS

Depth trends of selected elements (Ba, Ca, Sr, Mn, Cr, Ni, and Zn) in total elemental extracts and reducing agent extracts are shown in the attached figures. The elements plotted (LMW-14: L014 through L024; see Figure 4-4) were chosen because they represent either major chemicals found in the ash, or elements which display depth trends typical of the majority of trace chemicals. On each graph the concentrations of elements for the control location (LMW-12; average of duplicates L010 and L011; L012; and L013) are plotted on a separate scale. However, identification of leaching or attenuation trends was hampered by stratification within the ash and control zones and the inability to obtain a control soil with stratigraphy similar to that of the soils underlying the ash fill. Control soil samples were collected deep below the surface (approximately 24 to 34 feet) from relatively unweathered saprolite as compared to finer-textured and well-oxidized soils below the ash pond.

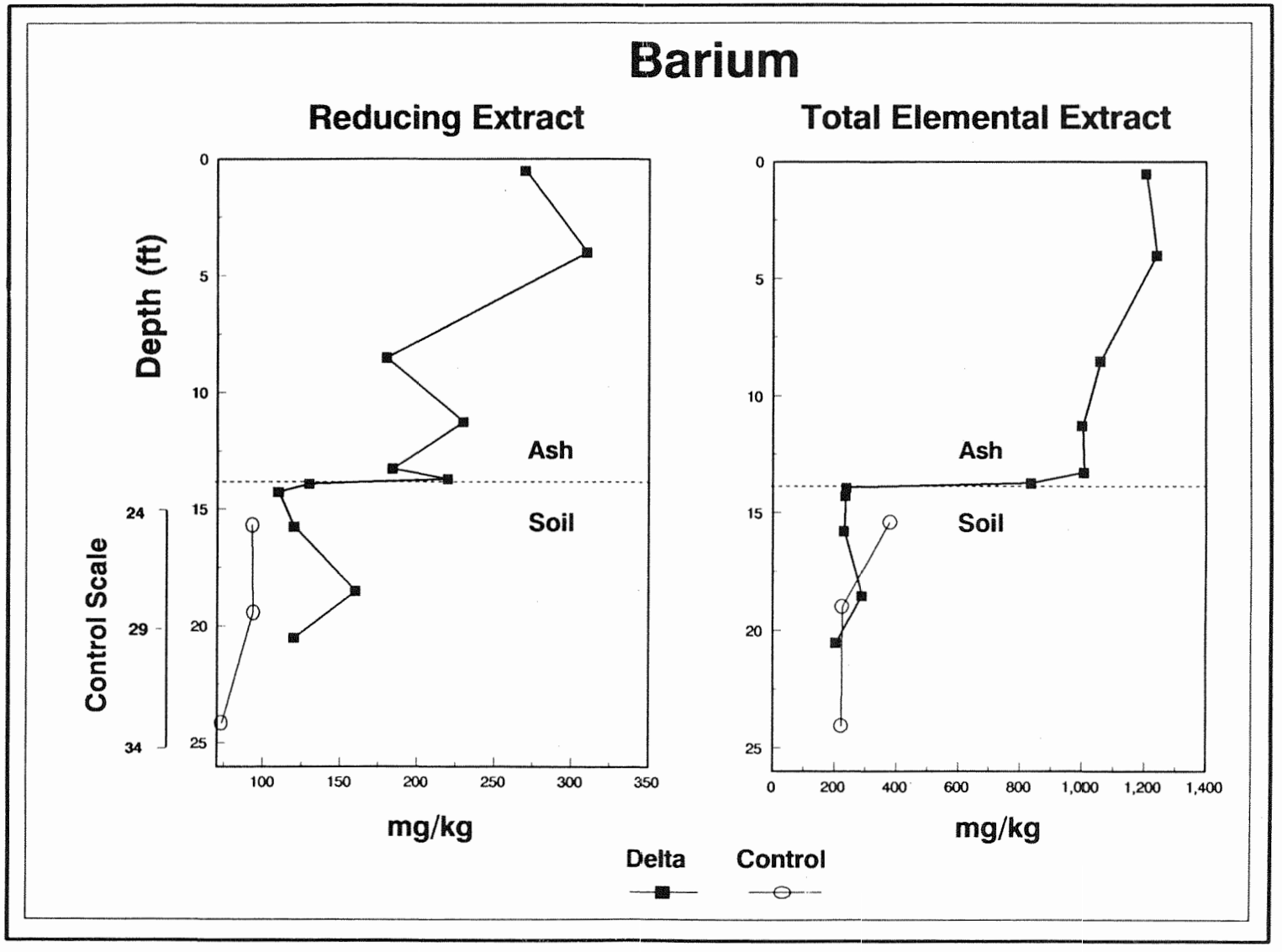
The alkaline earth metals (Ba, Ca, and Sr) all display consistent trends of much higher total concentrations in the ash compared to the underlying soils. Except for Ca, alkaline earth metal concentrations are also much higher in reducing extracts of ash compared to underlying soils. About one-third of the total Ba and Ca and about one-tenth of the total Sr present were extracted by the reducing agent (hydroxylamine hydrochloride). The trends for these elements in the two extracts show little or no indication of downward leaching of these chemicals from the ash and attenuation in the underlying soils.

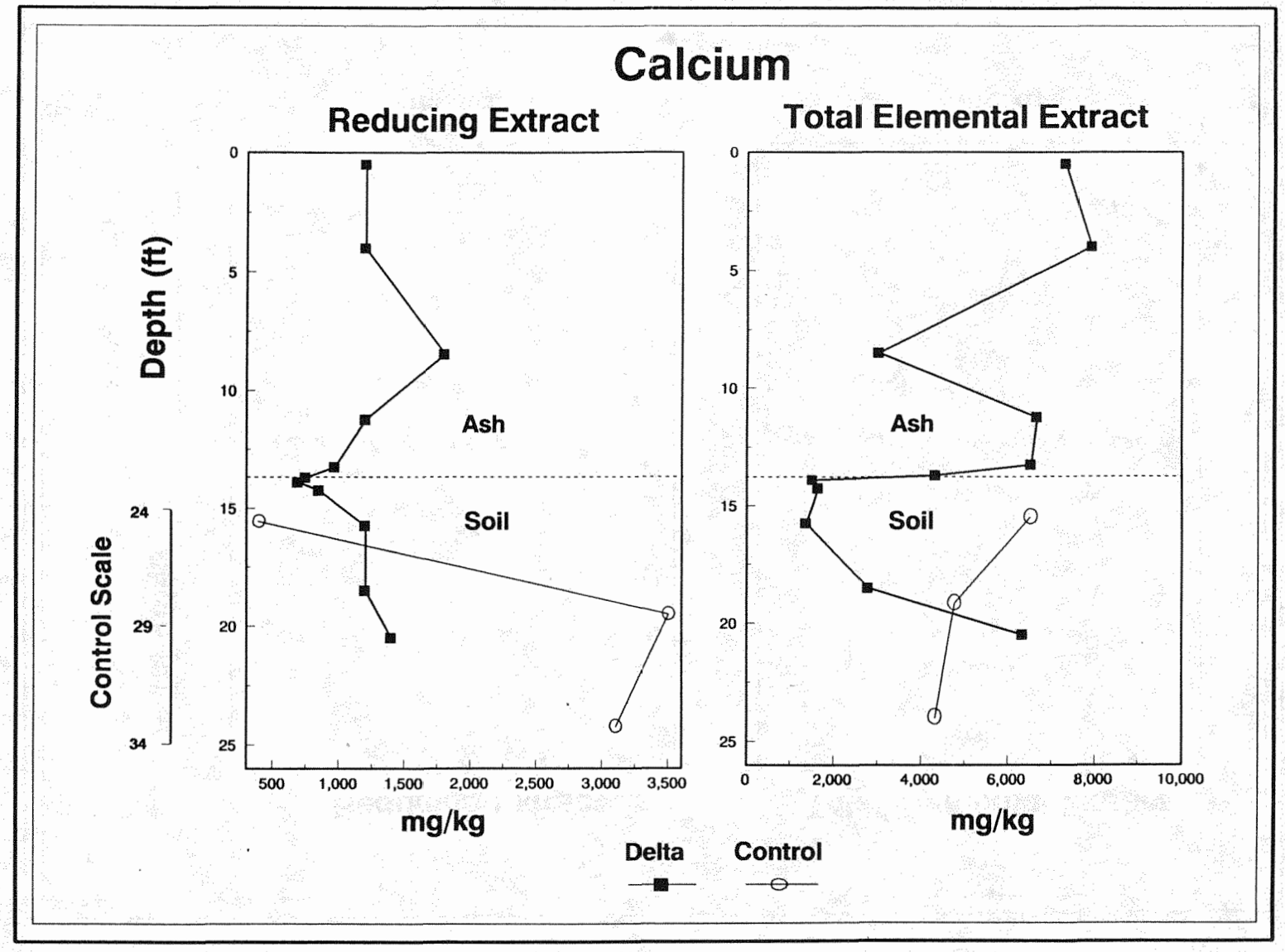
In contrast to the alkaline earth metals, the depth trend for Mn, a transition series metal, shows much lower concentrations in the ash compared to soils beneath the ash pond for both total and reducible forms of Mn. Consequently, leaching of Mn from the ash and attenuation in the underlying soils is not expected. About half of the Mn present in the soils occurs as either manganese oxide or some other reducible form of Mn.

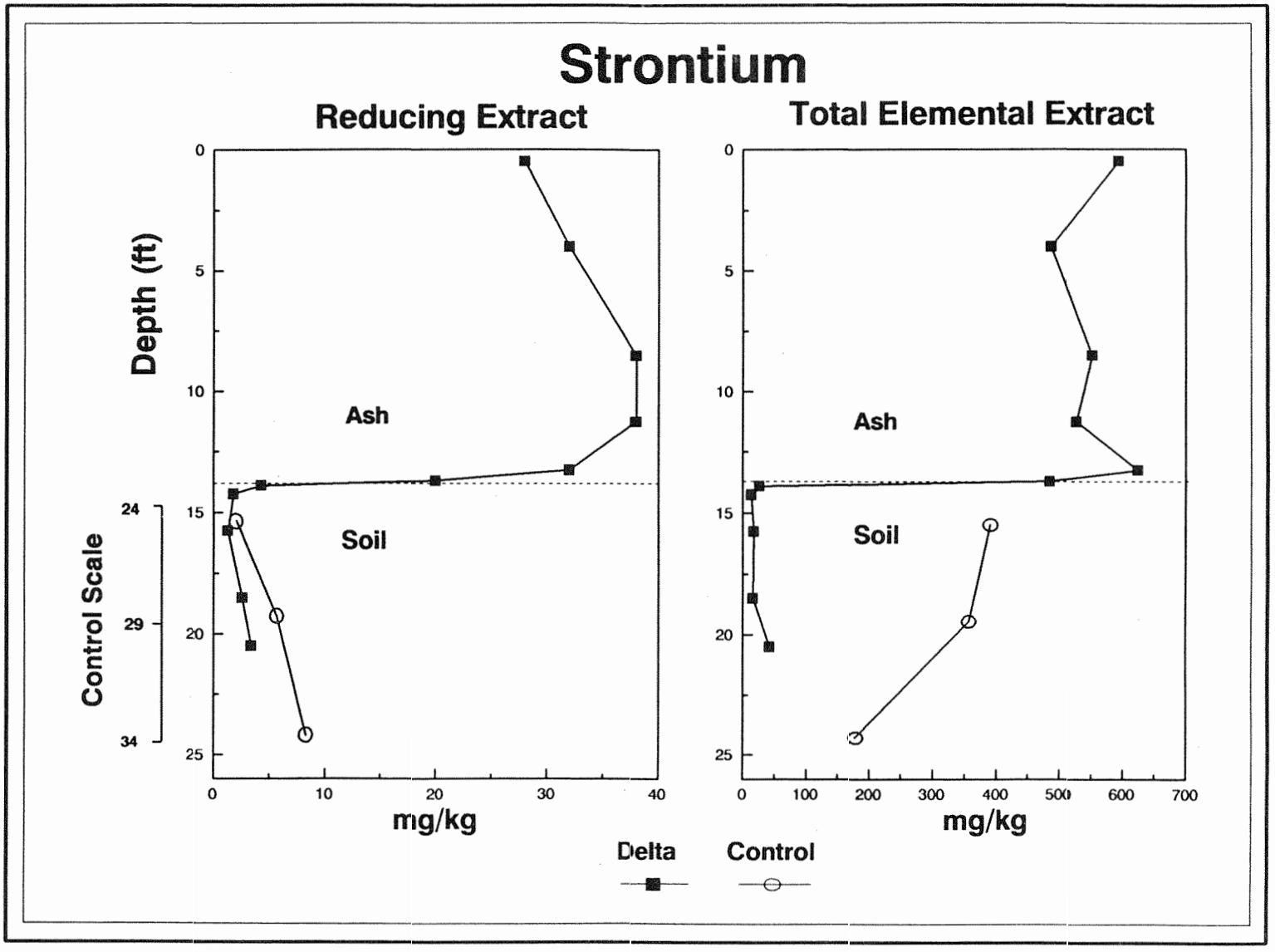
The attached figures display typical trends for trace metals. Cr and Ni are both present in higher concentrations in the ash compared to the underlying soil, with the highest concentrations found in the lowermost ash sample. Only about one percent of the Ni and Cr was extracted by hydroxylamine hydrochloride. Because this

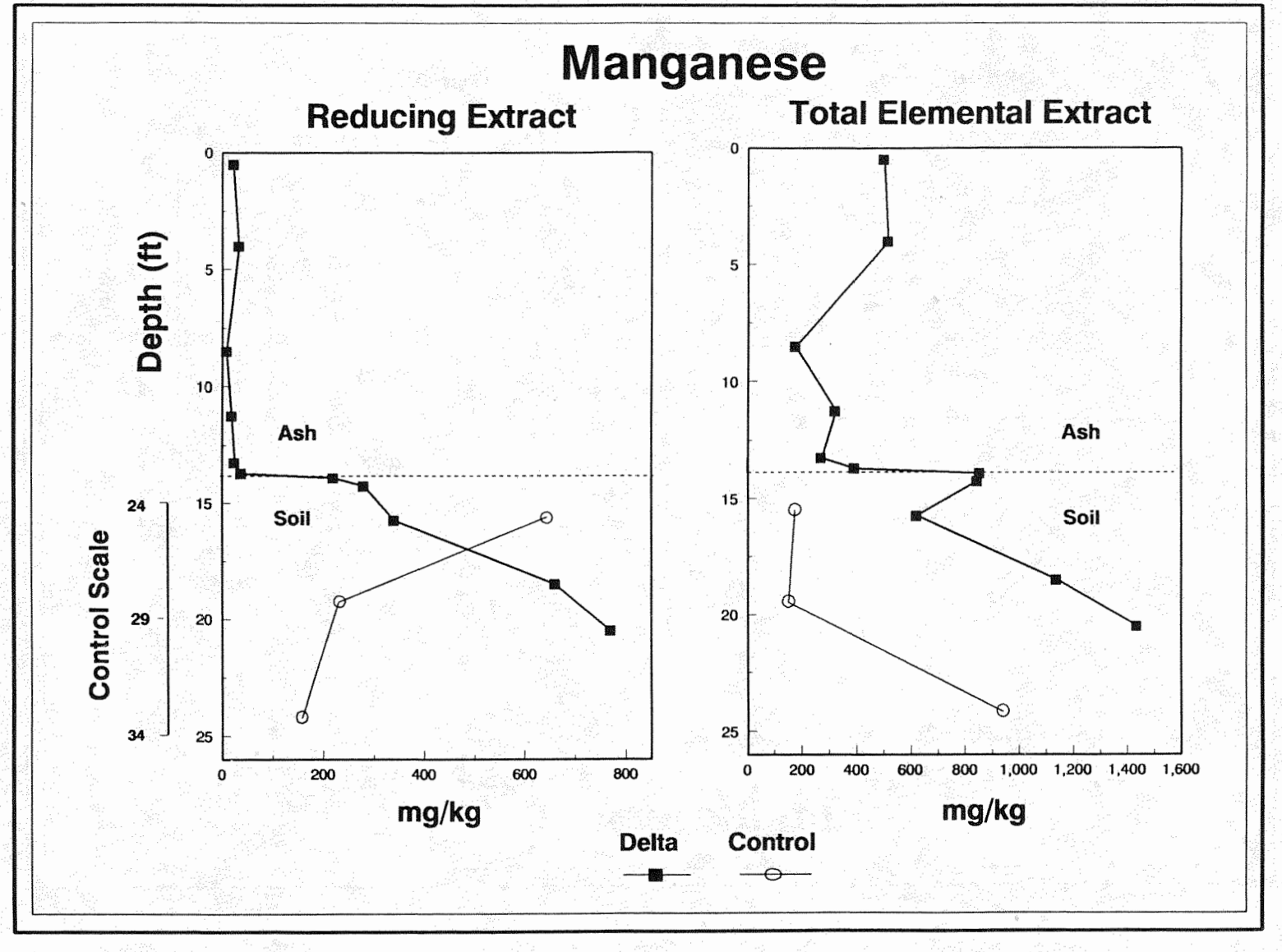
extract has been found to solubilize mineral forms of elements which are relatively mobile, any attenuated elemental species should be detected. The depth plots show that with the exception of Cr in one ash sample, both Cr and Ni were below detection limits throughout the entire core. Therefore, the distribution of these elements in the total extract probably reflects stratification of the soil and ash rather than any leaching/attenuation trends.

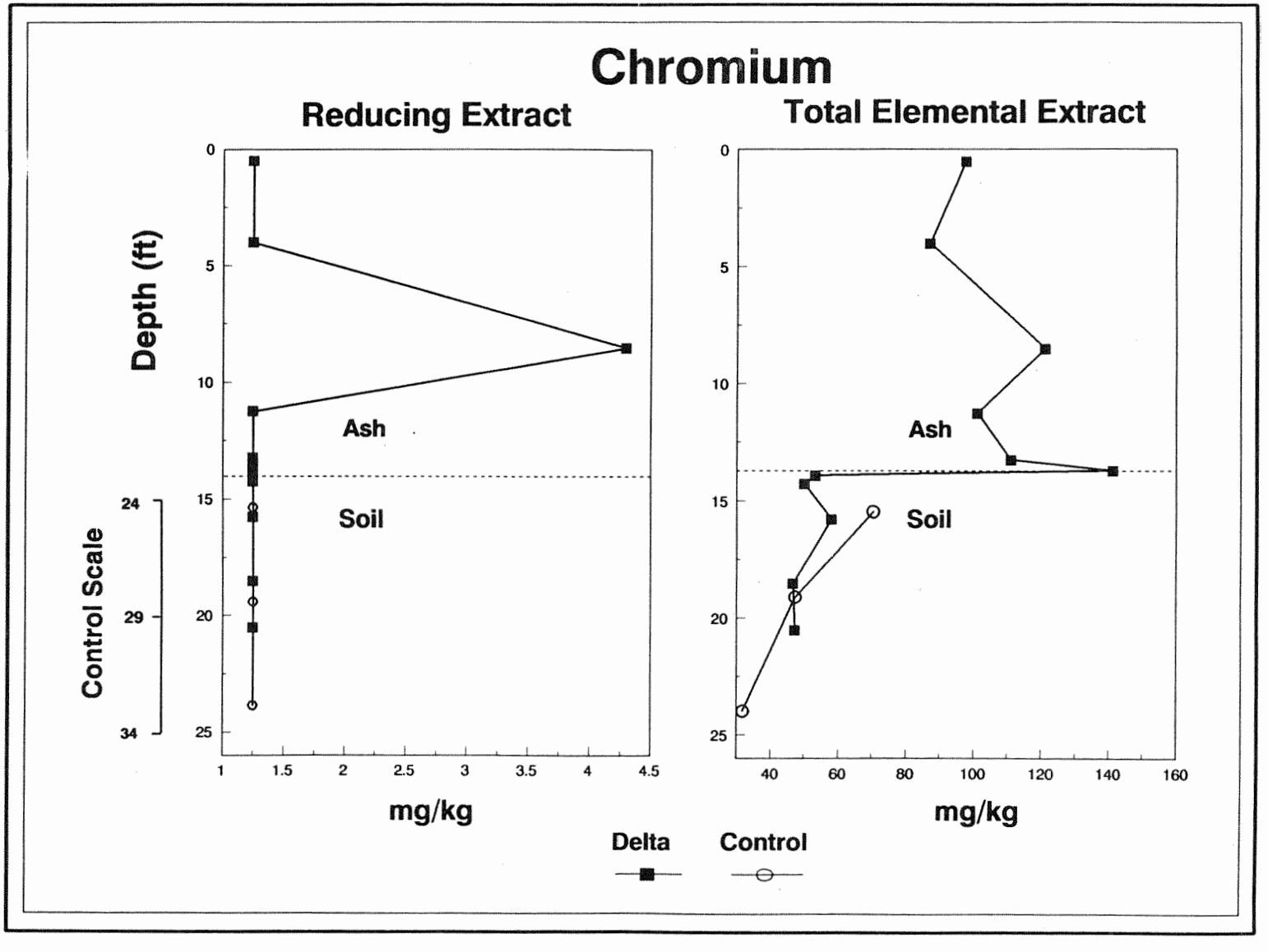
A more complex picture exists for Zn. The reducing extract, which represents less than one-tenth of the total Zn present, shows an increase toward the base of the ash. The total Zn content decreases in this zone and then increases in the soil immediately underlying the ash. While the depth trend could be construed as indicating possible downward migration of Zn in the ash, coupled with precipitation as a relatively insoluble mineral phase in the adjacent soils, an alternative hypothesis is favored. More likely the trend is again the result of stratification of the ash and soils. This interpretation is based on a decrease in the reducible Zn content of the soil beneath the ash, and similarities between total Zn and total Mn. Like total Zn, Mn also shows an increase in the soils immediately below the ash. The reducing extract solution used preferentially dissolves all manganese oxides, yet the reducible fraction only accounts for about one-fourth of the Mn increase in this zone. The major portion of the Mn (and Zn) increase in the soils below the ash is therefore attributed to an unknown mineral phase which is apparently not mobile in the soil environment.


Barium
Reducing Extract
Total Elemental Extract
Depth (ft)
Control Scale
24
29
34
Ash
Soil
0
5
10
15
20
25
100
150
200
250
300
350
0
200
400
600
800
1,000
1,200
1,400
mg/kg
mg/kg
Delta
Control

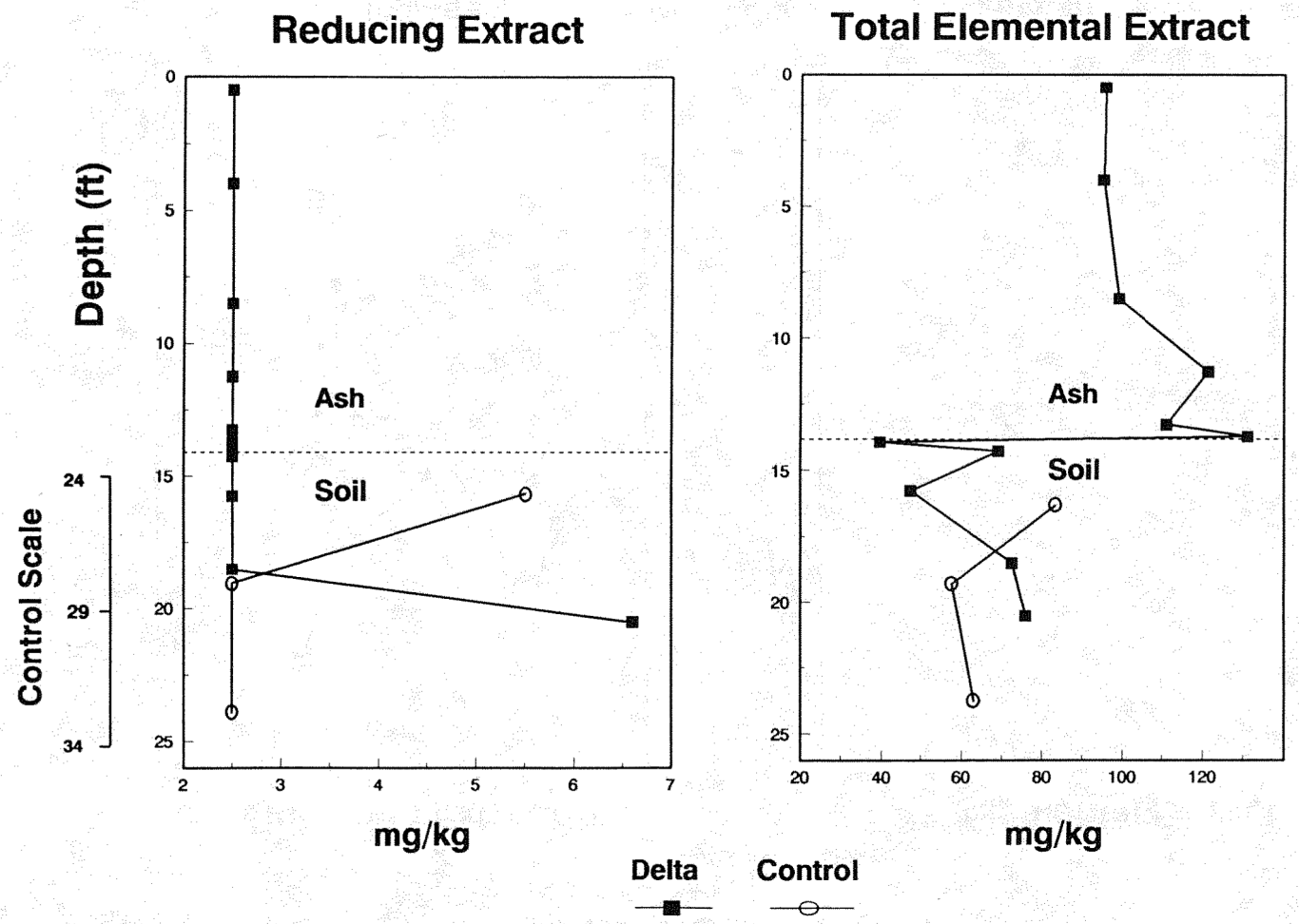

Calcium
Reducing Extract
Total Elemental Extract
Depth (ft)
Control Scale
24
29
34
Ash
Soil
0
5
10
15
20
25
500
1,000
1,500
2,000
2,500
3,000
3,500
0
2,000
4,000
6,000
8,000
10,000
mg/kg
mg/kg
Delta
Control

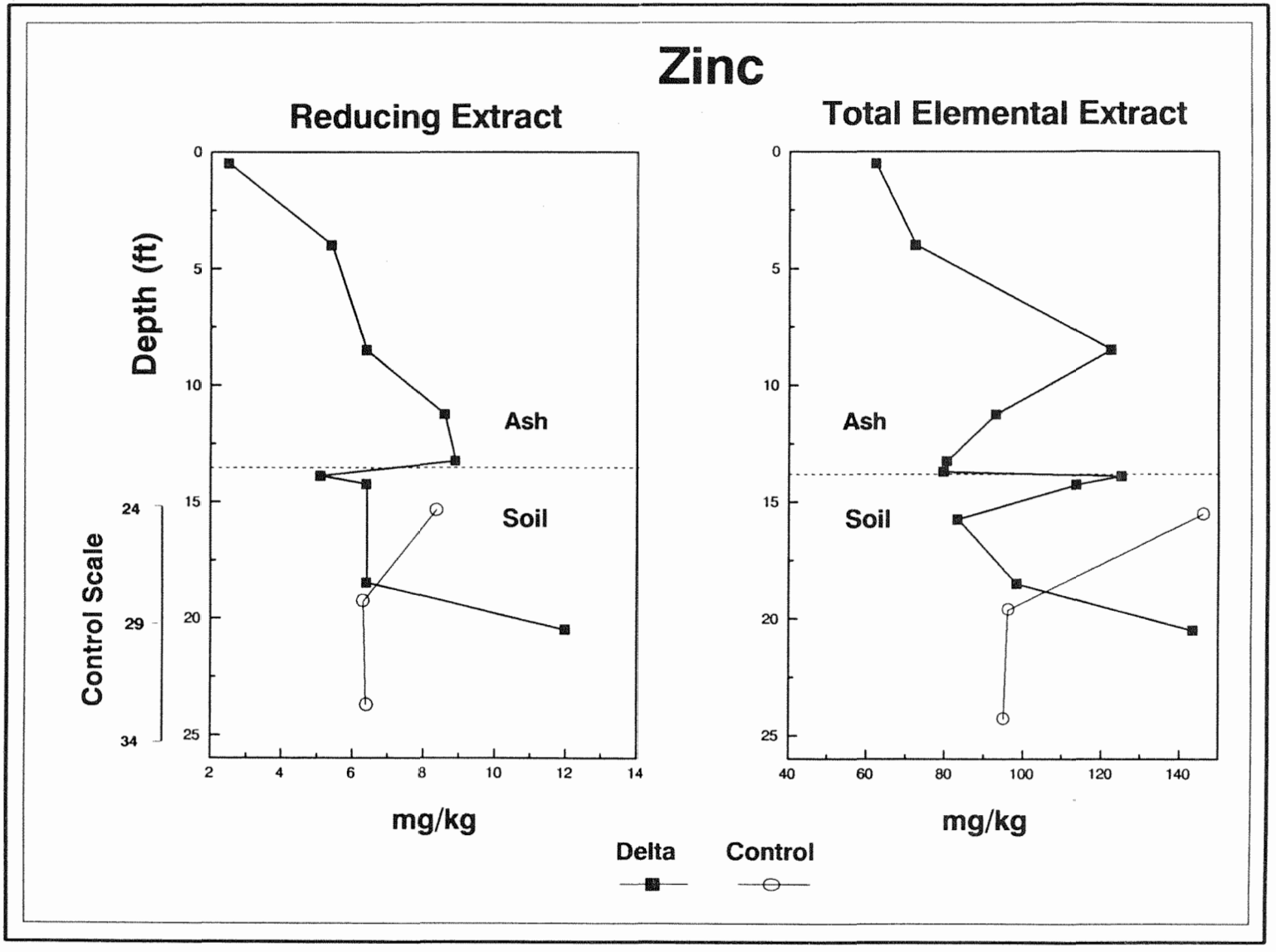

Strontium
Reducing Extract
Total Elemental Extract
Depth (ft)
Control Scale
24
29
34
Ash
Soil
Ash
Soil
0
5
10
15
20
25
0
10
20
30
40
0
100
200
300
400
500
600
700
mg/kg
mg/kg
Delta
Control


Manganese
Reducing Extract
Total Elemental Extract
Depth (ft)
Control Scale
24
29
34
Ash
Soil
0
5
10
15
20
25
0
200
400
600
800
1,000
1,200
1,400
1,600
mg/kg
Delta
Control


Chromium
Reducing Extract
Total Elemental Extract
Depth (ft)
Control Scale
24
29
34
Ash
Soil
Ash
Soil
0
5
10
15
20
25
1
1.5
2
2.5
3
3.5
4
4.5
40
60
80
100
120
140
160
mg/kg
mg/kg
Delta
Control

Nickel


Reducing Extract
Total Elemental Extract
Depth (ft)
Control Scale
24
29
34
Ash
Soil
0
5
10
15
20
25
2
3
4
5
6
7
20
40
60
80
100
120
mg/kg
mg/kg
Delta
Control


Zinc
Reducing Extract
Total Elemental Extract
Depth (ft)
Control Scale
24
29
34
Ash
Soil
mg/kg
Delta
Control

Appendix E

PORE WATER, EXTRACTABLE IRON, AND EXCHANGEABLE IONS

Table E-1

CONCENTRATION DATA:PORE WATER EXTRACTIONS
(mg/L)

	Detection Limit	1 LC12(14-16') Freon	2 LC12(14-16') N2 Filter	3 LC20-2A Freon	4 LC20-2A N2 Filter
pH	==	4.58	4.58	6.13	6.13
Eh	==	420	420	115	115
Al	0.03	0	0	0	0
As(III)	0.0003	0	0	0.023	0.004
As(V)	0.0002	0	0	0.002	0.032
B	0.01	0.45	0.47	0.1	0.6
Ba	0.002	0.18	0.19	0	0
C(IN)	0.1	0.2	0.6	0.4	0.6
Ca	0.1	0.26	0.2	367.2	341.7
Cd	0.002	0	0	0	0
Cl	0.05	10.56	10.79	15.24	14.19
Cr	0.01	0	0	0	0
Cu	0.005	0	0	0	0
F	0.01	0.02	0.03	0.33	0.37
Fe+2	0.02	0	0	122	177
Fe+3	0.02	0	0	4.6	4.1
K	0.3	1.9	2	21.4	26.5
Li	0.005	0	0	0.23	0.22
Mg	0.06	4.9	4.79	17.34	20.91
Mn+2	0.001	0.54	0.53	8.36	7.73
Mo	0.01	0	0	0	0.33
Na	0.01	5.9	6	6.1	9
Ni	0.01	0	0	0	0
P	0.1	0	0	0	0
SO4	0.05	26.8	27.5	1198.6	1278.3
Si	0.02	3.98	4.28	9.18	8.98
Sr	0.001	0	0	1.73	1.68
Zn	0.01	0	0	0.2	0.12

Table E-1

CONCENTRATION DATA:PORE WATER EXTRACTIONS
(mg/L)

	5 LC20-3 Freon	6 LC20-3 N2 Filter	7 LC19 Freon	8 LC19 N2 Filter
pH	3.92	3.92	7.23	7.23
Eh	347	347	-173	-173
Al	12.44	12.14	0	0
As(III)	0	0	0.14	0.0034
As(V)	0.001	0.003	0	0.0016
B	0.8	0.7	0.62	0.64
Ba	0	0	0	0
C(IN)	0.3	0.2	11.3	19.1
Ca	196.9	193.8	612	602
Cd	0	0	0	0
Cl	43.58	43.83	31.09	33.95
Cr	0	0	0	0
Cu	0	0	0	0
F	0.81	0.66	0.42	0.42
Fe+2	318	295	56.5	70.1
Fe+3	7.2	7.3	2	2.1
K	25.5	28.6	37.3	37.8
Li	0.09	0.1	0.18	0.19
Mg	18.36	18.16	16.22	16.83
Mn+2	8.01	7.93	2.77	2.93
Mo	0	0.14	0	0
Na	11.5	11.5	10.3	10.5
Ni	0	0	0	0
P	0.7	1	0.8	1
SO4	1194.1	1213.3	1569.5	1547.3
Si	22.85	23.26	12.95	14.48
Sr	1.01	1.01	3.06	3.09
Zn	0.2	0.27	0	

Table E-2

CATION EXCHANGE CAPACITY,EXTRACTABLE FE & EXCHANGEABLE CATIONS

		LC12 A	LC12 B	LC20-2A A	LC20-2A B
CEC	MEQ/100G	5.01	4.44	1.25	1.43
EXCHANGEABLE CATIONS					
Al	MEQ/100G	1.19	1.19	0.014	0.036
Ba	MEQ/100G	0.24	0.24	0.077	0.071
Ca	MEQ/100G	0.12	0.12	1.16	1.46
Fe	MEQ/100G				0.069
K	MEQ/100G	0.45	0.47	0.12	0.12
Mg	MEQ/100G	2.27	2.26	0.11	0.14
Mn	MEQ/100G	0.12	0.1	0.023	0.026
Na	MEQ/100G	0.075	0.071	0.012	0.012
Sr	MEQ/100G	0.0012	0.0013	0.015	0.015
TOTAL	MEQ/100G	4.47	4.46	1.54	1.96
NH2OH-HCL EXTRACTABLE FE	UG/G	186	178	167	137

Table E-2

CATION EXCHANGE CAPACITY,EXTRACTABLE FE & EXCHANGEABLE CATIONS
(in meq/100g)

	LC20-3 A	LC20-3 B	LC19 A	LC19 B
CEC	6.76	5.98	2.01	1.43
EXCHANGEABLE CATIONS				
Al	4.94	4.49		
Ba	0.031	0.032		0.024
Ca	2.26	2.01		8.78
Fe	1.91	1.6		0.0006
K	0.95	0.81		0.14
Mg	0.34	0.31		0.11
Mn	0.063	0.057		0.032
Na	0.051	0.054		0.0047
Sr	0.016	0.015		0.054
TOTAL	10.56	9.38		9.14
NH2OH-HCL EXTRACTABLE FE	93	98	609	495

Appendix F

pH MANIPULATION CONCENTRATION DATA

Table F-1

CONCENTRATION DATA: FLY ASH LC19 pH MANIPULATION
(mg/L, except as noted)

LC19	DETECTION LIMIT	NOMINAL pH				
		2.0	2.5	3.0	3.5	4.0
Eh (mV)		450	454	433	420	280
Al	0.03	266	125	31.6	5.39	0.18
As	0.01	0.426	0.031	0.634	0.319	0.402
B	0.02	0.75	0.46	0.26	0.19	0.11
Ba	0.002	0.223	0.146	0.097	0.065	0.052
C	0.05	0.08	0.08	0.08	0.88	0.84
Ca	0.01	266	199	164	170	151
Cd	0.0001	0.0091	0.0103	0.004	0.0034	0.0008
Cl	0.15	1745.54	934.04	504.74	264.01	174.69
Cr	0.0005	0.2683	0.0672	0.0194		
Cu	0.005	1.21	0.657	0.05	0.013	0.01
F	0.1	0.33	0.57	0.97	1.01	0.28
Fe	0.005	260	147	224	94.8	81.8
pH units (ACTUAL)		3.15	3.51	3.93	4.33	5.58
K	0.1	42.9	17.4	8.9	6.9	4.5
Li	0.005	0.292	0.153	0.083	0.057	0.028
Mg	0.1	34.7	19.9	11.7	8	3.8
Mn	0.005	5.54	3.61	4.73	2.99	2.42
Mo	0.01	0.05	0.02			
Na	0.03	5.21	2.43	1.25	1.03	0.76
Ni	0.02	0.32	0.2	0.12	0.09	0.04
P	0.1	1.6	0.41	0.26	0.13	0.13
SO4	0.15	312.09	251.9	230.26	253.96	284.56
Si	0.02	132	90.6	53.7	39.3	20.7
Sr	0.002	5.76	3.6	2.26	1.97	1.54
Zn	0.005	1.05	0.739	0.639	0.49	0.172

Table F-1

CONCENTRATION DATA: FLY ASH LC19 pH MANIPULATION
(mg/L except as noted)

LC19	4.5	5.0	5.5	6.0	6.5	7.0	7.5
Eh (mV)	267	137	1.6	70	61	55	33
Al	0.05	0.1	0.06	0.05	0.08	0.04	0.11
As	0.182	0.609	0.664	0.552	0.521	0.362	0.45
B	0.11	0.07	0.06	0.06	0.06	0.07	0.06
Ba	0.048	0.048	0.048	0.047	0.05	0.048	0.056
C	3.36	2.68	10.88	8.48	13.92	15.8	25.96
Ca	156	131	136	135	128	119	173
Cd							
Cl	117.38	101.88	70.84	44.93	20.23	5.63	2.78
Cr							
Cu	0.051	0.012	0.016	0.01	0.01	0.011	0.015
F	0.28	0.49	0.51	0.57	0.6	0.6	0.7
Fe	36.9	52.4	37.8	22.9	11.2	5.64	0.9
pH units (ACTUAL)	4.69	6.37	6.49	6.7	7.28	7.41	7.82
K	5.4	4.1	3.6	3.8	3.8	3.2	10.2
Li	0.028	0.021	0.022	0.025	0.023	0.021	0.017
Mg	4.4	1.6	1.5	1.4	1.1	1.2	1.2
Mn	2.15	1.58	1.24	1.09	0.715	0.7	0.23
Mo							
Na	0.8	0.71	0.71	0.7	0.622	0.634	0.633
Ni							
P		0.18	0.13	0.18	0.17	0.12	0.22
SO4	296.41	266.24	289.7	289.49	284.59	267.88	387.81
Si	19.6	11	10.4	9.23	8	7.51	5.48
Sr	1.51	1.36	1.26	1.23	1.11	1.08	0.904
Zn	0.114	0.09	0.072	0.043	0.041	0.053	0.065

Table F-1

CONCENTRATION DATA: FLY ASH LC19 pH MANIPULATION
(mg/L, except as noted)

LC19	8.0	8.5	9.0	9.5	10.0	10.5	11.0
Eh (mV)	20	-24	-26	-55	-87	-103	-166
Al	0.06	0.1	0.07	0.36	1.13	1.9	4.76
As	0.463	0.286	0.423	0.101	0.216	0.203	0.18
B	0.05	0.06	0.06	0.06	0.1	0.09	0.09
Ba	0.059	0.057	0.084	0.066	0.07	0.069	0.062
C	18.84	21.32	19.52	14.2	8.88	6.68	8.92
Ca	104	119	96.8	85.6	55.1	54.3	41.4
Cd							
Cl	2.36	4.31	19.43	2.26	2.37	1.93	2.29
Cr							
Cu	0.01	0.012	0.009	0.012	0.01	0.011	0.011
F	0.68	0.35	0.62	0.51	0.51	0.52	0.78
Fe	1.32	0.536	0.191	0.015	0.012	0.078	0.055
pH units (ACTUAL)	7.73	7.71	8.2	8.97	9.77	10.18	10.81
K	22.5	39.7	69.1	92.8	161	154	226
Li	0.017	0.014					
Mg	1	1.1	1	0.4	0.1		
Mn	0.306	0.201	0.102	0.005		0.009	
Mo							
Na	0.736	0.885	1.01	1.16	1.48	1.39	1.73
Ni							
P	0.19	0.26	0.21	0.13	0.11	0.1	
SO4	256.68	306.3	270.45	294.63	307.45	294.99	312.11
Si	5.94	4.9	4.23	2.17	2.1	2.81	4.52
Sr	0.891	0.88	0.676	0.621	0.488	0.482	0.37
Zn	0.082	0.063	0.086	0.024	0.016	0.145	0.022

Table F-1

CONCENTRATION DATA: FLY ASH LC19 pH MANIPULATION
(mg/L, except as noted)

LC19	11.5	12.0	N-1	N-2	N-3
Eh (mV)	-179	-182	-73	-65	-49
Al	10.3	31.5	0.1	0.1	0.04
As	0.293	0.952	0.446	0.359	0.202
B	0.12		0.07	0.06	0.06
Ba	0.055	0.038	0.056	0.052	0.043
C	5.24	9.36	16.88	15.32	12.24
Ca	27.2	4.53	130	131	126
Cd				0.0006	0.001
Cl	1.73	1.46	2.28	2.36	2.48
Cr					
Cu	0.016	0.08	0.019	0.017	0.017
F	1.06	1.34	0.66	0.67	0.64
Fe	0.022		4.33	4.19	1.66
pH units (ACTUAL)	11.56	12.08	7.43	7.54	7.47
K	409	1050	4.5	10.3	4.1
Li			0.021	0.021	0.012
Mg			1.1	1.1	1.8
Mn			0.549	0.525	0.419
Mo					
Na	2.68	5.4	0.734	0.748	0.624
Ni					
P	0.1				
SO4	313	303.1	303.13	313.97	302.74
Si	12.1	29	7.2	7.12	7.51
Sr	0.301	0.08	1.1	1.03	1.1
Zn	0.014			0.09	0.059

Table F-2

CONCENTRATION DATA: FLY ASH LC20-2A pH MANIPULATION
(mg/L, except as noted)

LC20-2A	DETECTION LIMIT	NOMINAL pH				
		2.0	2.5	3.0	3.5	4.0
Eh (mV)		555	508	490	411	451
Al	0.03	210	77	24.7	0.11	8.82
As	0.01	0.489	0.21	0.158	0.12	0.145
B	0.02	0.36	0.21	0.14	0.08	0.11
Ba	0.002	1.18	0.715	0.636	0.519	0.499
C	0.05	0.08	0.04	0.24	0.44	0.32
Ca	0.01	65.6	46.2	33.5	260	29.8
Cd	0.0001	0.0105	0.0075	0.0041	0.0005	0.0027
Cl	0.15	1325.47	480.54	217.7	502.05	157.71
Cr	0.0005	0.141	0.0305	0.0092	0.001	0.0029
Cu	0.005	0.571	0.0935			
F	0.1	0.26	0.63	1.15	0.32	1.16
Fe	0.005	158	69	57.6	32.1	50.1
pH units (ACTUAL)		2.35	3.51	3.89	5.48	4.15
K	0.1	26.6	9	5.1	4.6	4.9
Li	0.005	0.216	0.091	0.062	0.028	0.045
Mg	0.1	14.7	6.4	4	4.5	3.2
Mn	0.005	2.94	1.52	1.31	1.07	1.23
Mo	0.01					
Na	0.03	4.02	2.36	1.99	1.82	2.01
Ni	0.02	0.27	0.17	0.08	0.03	0.06
P	0.1	5.9	0.4	0.1		
SO4	0.15	49.8	34.21	19.63	30.25	17.06
Si	0.02	96	55	29.2	12.4	21.2
Sr	0.002	4.04	1.85	0.972	0.895	0.776
Zn	0.005	0.788	0.655	0.484	0.191	0.411

Table F-2

CONCENTRATION DATA: FLY ASH LC20-2A pH MANIPULATION
(mg/L, except as noted)

LC20-2A

	4.5	5.0	5.5	6.0	6.5	7.0	7.5
Eh (mV)	209	174	197	182	192	167	167
Al	0.04	0.07	0.06	0.06	0.05	0.08	0.14
As	0.117	0.143	0.122	0.124	0.089	0.113	0.089
B	0.08	0.06	0.06	0.06	0.06	0.06	0.06
Ba	0.208	0.147	0.147	0.128	0.135	0.128	0.127
C	0.64	0.52	0.92	3.72	6.2	3.56	6.64
Ca	22.2	15.3	14	12.9	10.1	11.6	10.2
Cd							
Cl	84.45	20.84	14.1	2.18	1.57	1.8	1.91
Cr							
Cu							
F	0.21	0.36	0.4	0.48	0.56	0.63	0.53
Fe	45.6	14.7	9.44	2.32	0.804	0.645	0.175
pH units (ACTUAL)	5.94	6.53	6.52	6.84	6.98	7.12	7.31
K	4.3	2.6	2.2	6.3	8.9	13.9	17.7
Li	0.024	0.011	0.011	0.009			
Mg	2.5	1.3	1.2	1	0.8	0.88	0.77
Mn	1.42	0.651	0.504	0.324	0.213	0.196	0.11
Mo							
Na	1.78	1.67	1.65	1.72	1.67	1.75	1.73
Ni							
P							0.1
SO4	34.08	35.82	35.25	39.89	35.48	40.52	41.6
Si	10.7	6.5	6.51	5.1	4.45	4.38	3.74
Sr	0.51	0.351	0.337	0.299	0.293	0.26	0.226
Zn	0.115	0.069	0.076	0.058	0.047	0.06	0.044

Table F-2

CONCENTRATION DATA: FLY ASH LC20-2A pH MANIPULATION
(mg/L, except as noted)

LC20-2A

	8.0	8.5	9.0	9.5	10.0	10.5	11.0
Eh (mV)	163	126	116	156	-138	-147	-174
OAl	0.15	0.18	0.32	6.11	20.8	32.6	48.9
As	0.098	0.106	0.098	0.116	0.381	0.407	0.62
B	0.06	0.06	0.06	0.05	0.06	0.08	0.08
Ba	0.125	0.112	0.064	0.031	0.018	0.034	0.007
C	7.16	5.64	7.08	6.76	19.08	9.56	9.12
Ca	9.21	7.65	2.91	0.61	0.33	0.09	
Cd				0.008	0.011	0.012	0.017
Cl	2.21	2.38	2.72	1.92	1.92	2.14	1.34
Cr							
Cu				0.0054			
F	0.95	1.12	2.36	1.56	1.61	1.65	1.51
Fe	0.135	0.061	0.012	0.011	0.028		0.033
pH units (ACTUAL)	7.65	7.74	8.54	9.29	10.05	10.54	11.26
K	26.5	32.4	49.8	62.6	110	113	250
Li							
Mg	0.68	0.5	0.13				
Mn	0.06	0.037					
Mo							
Na	1.83	1.9	2.03	1.91	2.1	2.26	2.59
Ni							
P	1	0.1	0.3	0.8	1.8	2.4	2.6
SO4	50.17	47.74	53.47	51.17	48.94	53.2	51.66
Si	3.81	3.56	2.2	1.43	2.24	3.58	10.9
Sr	0.222	0.188	0.091	0.022	0.012	0.006	0.003
Zn	0.043	0.019	0.008	0.009	0.011	0.007	0.012

Table F-2

CONCENTRATION DATA: FLY ASH LC20-2A pH MANIPULATION
(mg/L, except as noted)

LC20-2A

	11.5	12.0	N-1	N-2	N-3
Eh (mV)	-198	-207	115	167	887
Al	20.5	73	0.08	0.04	0.04
As	0.602	0.057	0.094	0.051	0.129
B	0.1	0.11	0.07	0.06	0.07
Ba	0.007	0.019	0.127	0.139	0.12
C	34.88	14.24	2	2.36	4.16
Ca	0.14		12.5	13.2	14.1
Cd	0.016	0.012			
Cl	1.82	0.87	2.13	3.1	1.98
Cr					
Cu					
F	3.62	0.93	0.39	0.24	0.4
Fe	0.025	0.069	4.06	0.754	6.03
pH units (ACTUAL)	11.55	12.16	7.06	6.56	6.85
K	370	1010	3.4	4.2	2.3
Li					
Mg			1	1.1	1
Mn			0.406	0.393	0.457
Mo					
Na	3.31	5.83	1.66	1.7	1.63
Ni					
P	0.7	1.5			
SO4	41.44	49.12	38.93	37.83	43.21
Si	46.9	33	5.43	6.31	5.46
Sr	0.004	0.006	0.283	0.304	0.3
Zn	0.038	0.055	0.091	0.056	0.082