APPENDIX H

COMMERCIAL TESTING & ENGINEERING CO.
GENERAL OFFICES: 1919 SOUTH HIGHLAND AVE., SUITE 210-B, LOMBARD, ILLINOIS 60148 • (312) 953-9300
SINCE 1908
Member of the SGS Group (Société Générale de Surveillance)

PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311

January 23, 1989

Job No.: 9518

Date Rec'd: January 13, 1989

Date Sampled: January 13, 1989

Sampled By: UP&L

UTAH POWER & LIGHT CO.
P.O. Box 1005
Huntington, Utah 84528

Sample ID:

DEER CREEK DISCHARGE
Oil Skimmer
Temperature 56 degrees
Flow 1760 gpm
Rec'd 1210 hr.
Sampled 1135 hr.

WATER ANALYSIS

Acidity	2	mg/l CaCO3	01/19/89 1145 hr.
Alk., Bicarbonate	309	mg/l HCO3	01/19/89 1545 hr.
Alk., Carbonate	1<	mg/l CaCO3	01/19/89 1545 hr.
Alk., Total	253	mg/l CaCO3	01/19/89 1545 hr.
Anions, Total	10.11	meq/l	
Calcium	109.2	mg/l	01/17/89 1315 hr.
Cations, Total	10.89	meq/l	
Chloride	20.0	mg/l	01/17/89 1045 hr.
Conductivity	820	umhos/cm	01/18/89 1000 hr.
Hardness, Total	465	mg/l CaCO3	
Iron	0.94	mg/l	01/17/89 1100 hr.
Iron, Dissolved	0.86	mg/l	01/17/89 1100 hr.
Magnesium	46.70	mg/l	01/17/89 1330 hr.
Manganese	0.01<	mg/l	01/17/89 1300 hr.
Oil and Grease	7.4	mg/l	01/19/89 1500 hr.
Oxygen, Dissolved	7.7	mg/l	01/13/89 1600 hr.
pH	8.10	Units	01/13/89 1315 hr.
Potassium	6.00	mg/l	01/17/89 1415 hr.
Sodium	33.50	mg/l	01/17/89 1400 hr.
Solids, Dissolved	554.0	mg/l	01/19/89 0930 hr.
Solids, Suspended	54.0	mg/l	01/19/89 0930 hr.
Sulfate	220.0	mg/l	01/17/89 1350 hr.

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ANALYST: D. Tipon

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, Huntington Laboratory

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OVER 40 BRANCH LABORATORIES STRATEGICALLY LOCATED IN PRINCIPAL COAL MINING AREAS,
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PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311

February 23, 1989

Job No.: 9540

Date Rec'd: February 16, 1989

Date Sampled: February 16, 1989

Sampled By: UP&L

Sample ID:

DEER CREEK DISCHARGE
Oil Skimmer
Temperature 56 degrees
Flow 1550 gpm
Rec'd 1520 hr.
Sampled 1350 hr.

UTAH POWER & LIGHT CO.
P.O. Box 1005
Huntington, Utah 84528

WATER ANALYSIS

Acidity	7	mg/l CaCO3	Iron, Dissolved	0.61	mg/l
02/19/89	1145 hr.		02/22/89	1400 hr.	
Alk., Bicarbonate	356	mg/l HCO3	Magnesium	43.20	mg/l
02/19/89	1145 hr.		02/17/89	1115 hr.	
Alk., Carbonate	1<	mg/l CaCO3	Manganese	0.01<	mg/l
02/19/89	1145 hr.		02/17/89	1000 hr.	
Alk., Total	292	mg/l CaCO3	Oil and Grease	1.0<	mg/l
02/19/89	1145 hr.		02/22/89	1300 hr.	
Anions, Total	10.56	meq/l	Oxygen, Dissolved	8.2	mg/l
			02/16/89	1600 hr.	
Calcium	100.6	mg/l	pH	7.60	Units
02/17/89	1100 hr.		02/16/89	1545 hr.	
Cations, Total	10.59	meq/l	Potassium	6.50	mg/l
			02/17/89	1030 hr.	
Chloride	20.0	mg/l	Sodium	43.00	mg/l
02/17/89	1550 hr.		02/17/89	1015 hr.	
Conductivity	850	umhos/cm	Solids, Dissolved	608.0	mg/l
02/20/89	0930 hr.		02/22/89	0930 hr.	
Hardness, Total	429	mg/l CaCO3	Solids, Suspended	65.0	mg/l
			02/22/89	0930 hr.	
Iron	0.67	mg/l	Sulfate	205.0	mg/l
02/22/89	1400 hr.		02/19/89	1340 hr.	

ANALYST: D. Tyson

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, Huntington Laboratory

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PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311

February 28, 1989

Job No.: 9552

Date Rec'd: March 8, 1989

Date Sampled: March 8, 1989

Sampled By: UP&L

Sample ID:

DEER CREEK DISCHARGE
Oil Skimmer
Temperature 56 degrees
Flow 400 gpm
Rec'd 1550 hr
Sampled 1450 hr.

UTAH POWER & LIGHT CO.
P.O. Box 1005
Huntington, Utah 84528

WATER ANALYSIS

Acidity	4	mg/l CaCO3	03/08/89 1100 hr.
Alk., Bicarbonate	399	mg/l HCO3	03/08/89 1130 hr.
Alk., Carbonate	1<	mg/l CaCO3	03/08/89 1130 hr.
Alk., Total	327	mg/l CaCO3	03/08/89 1130 hr.
Anions, Total	12.96	meq/l	
Calcium	142.4	mg/l	03/13/89 1400 hr.
Cations, Total	13.06	meq/l	
Chloride	10.0	mg/l	03/10/89 1030 hr.
Conductivity	1100	umhos/cm	03/08/89 1630 hr.
Hardness, Total	559	mg/l CaCO3	
Iron	0.27	mg/l	03/13/89 1430 hr.
Iron, Dissolved	0.24	mg/l	03/13/89 1430 hr.
Magnesium	49.40	mg/l	03/13/89 1300 hr.
Manganese	0.01	mg/l	03/13/89 1500 hr.
Oil and Grease	5.1	mg/l	03/14/89 0930 hr.
Oxygen, Dissolved	7.7	mg/l	03/08/89 1630 hr.
pH	8.00	Units	03/08/89 1615 hr.
Potassium	7.30	mg/l	03/13/89 1315 hr.
Sodium	39.50	mg/l	03/13/89 1330 hr.
Solids, Dissolved	822.0	mg/l	03/15/89 0930 hr.
Solids, Suspended	4.0	mg/l	03/15/89 0930 hr.
Sulfate	300.0	mg/l	1405 hr.

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ANALYST: D. Tyson

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P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311

February 28, 1989

Job No.: 9595

Date Rec'd: April 17, 1989

Date Sampled: April 17, 1989

Sampled By: UP&L

Sample ID:

DEER CREEK DISCHARGE
Temperature 56 degrees
Flow 1300 gpm
Rec'd 1400 hr
Sampled 1030 hr.

UTAH POWER & LIGHT CO.
P.O. Box 1005
Huntington, Utah 84528

WATER ANALYSIS

Acidity	9	mg/l CaCO3	Iron, Dissolved	0.02<	mg/l
04/18/89	1400 hr.		04/18/89	1015 hr.	
Alk., Bicarbonate	351	mg/l HCO3	Magnesium	49.00	mg/l
04/18/89	1300 hr.		04/18/89	1030 hr.	
Alk., Carbonate	1<	mg/l CaCO3	Manganese	0.01<	mg/l
04/18/89	1300 hr.		04/18/89	1130 hr.	
Alk., Total	288	mg/l CaCO3	Oil and Grease	6.9	mg/l
04/18/89	1300 hr.		04/20/89	1130 hr.	
Anions, Total	11.46	meq/l	Oxygen, Dissolved	6.9	mg/l
			04/17/89	1540 hr.	
Calcium	111.5	mg/l	pH	7.70	Units
04/18/89	1115 hr.		04/17/89	1535 hr.	
Cations, Total	11.41	meq/l	Potassium	5.90	mg/l
			04/18/89	1100 hr.	
Chloride	10.0	mg/l	Sodium	38.80	mg/l
04/18/89	1345 hr.		04/18/89	1200 hr.	
Conductivity	1000	umhos/cm	Solids, Dissolved	596.0	mg/l
04/18/89	1430 hr.		04/20/89	1500 hr.	
Hardness, Total	480	mg/l CaCO3	Solids, Suspended	85.0	mg/l
			04/20/89	1500 hr.	
Iron	0.20	mg/l	Sulfate	265.0	mg/l
04/18/89	1000 hr.		04/18/89	1500 hr.	

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ANALYST: D. Tyson

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P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311

June 6, 1989

Job No.: 59 9682

Date Rec'd: May 19, 1989

Date Sampled: May 19, 1989

Sampled By: UP&L

Sample ID: UP&L

DEER CREEK DISCHARGE
Rec'd 1145 hr.
Sampled 1055 hr.
FLOW 2000 GPM (EST.)

Utah Power and Light Co.
P.O. Box 1005
Huntington UT 84528

WATER ANALYSIS

Acidity	12	mg/l CaCO3	Iron, Dissolved	0.48	mg/l
05-30-89 1400 hr.			05-30-89 1315 hr.		
Alk., Bicarbonate	372	mg/l HCO3	Magnesium	47.30	mg/l
05-30-89 1400 hr.			05-30-89 1300 hr.		
Alk., Carbonate	1<	mg/l CaCO3	Manganese	0.01<	mg/l
05-30-89 1400 hr.			05-30-89 1415 hr.		
Alk., Total	305	mg/l CaCO3	Oil and Grease	47.8	mg/l
05-30-89 1400 hr.			05-30-89 1300 hr.		
Anions, Total	11.48	meq/l	Oxygen, Dissolved	2.1	mg/l
05-30-89			05-19-89 1330 hr.		
Calcium	111.3	mg/l	pH	7.70	Units
05-30-89 1330 hr.			05-19-89 1300 hr.		
Cations, Total	11.77	meq/l	Potassium	8.30	mg/l
			05-30-89 1345 hr.		
Chloride	10.0	mg/l	Sodium	49.00	mg/l
05-30-89 1530 hr.			05-30-89 1400 hr.		
Conductivity	1150	umhos/cm	Solids, Dissolved	661.0	mg/l
05-23-89 1405 hr.			05-23-89 0730 hr.		
Hardness, Total	473	mg/l CaCO3	Solids, Suspended	18.0	mg/l
			05-23-89 0730 hr.		
Iron	0.54	mg/l	Sulfate	250.0	mg/l
05-30-89 1315 hr.			05-31-89 1500 hr.		

ANALYST: D. Igoe

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PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311

July 6, 1989

Job No.: 59 9770

Date Rec'd: June 15, 1989

Date Sampled: June 15, 1989

Sampled By: UP&L

Sample ID: UP&L

DEER CREEK DISCHARGE
Rec'd 1210 hr.
Sampled 1044 hr.
FLOW 1500 GPM (EST.)

Utah Power and Light Co.
P.O. Box 1005
Huntington UT 84528

WATER ANALYSIS

Acidity	8	mg/l CaCO3	Iron, Dissolved	0.51	mg/l
06-21-89	1400 hr.		06-28-89	1315 hr.	
Alk., Bicarbonate	334	mg/l HCO3	Magnesium	45.70	mg/l
06-20-89	1400 hr.		06-28-89	1330 hr.	
Alk., Carbonate	1<	mg/l CaCO3	Manganese	0.01<	mg/l
06-20-89	1400 hr.		06-28-89	1345 hr.	
Alk., Total	274	mg/l CaCO3	Oil and Grease	7.7	mg/l
06-20-89	1400 hr.		06-19-89	1400 hr.	
Anions, Total	12.48	meq/l	Oxygen, Dissolved	7.7	mg/l
			06-15-89	1415 hr.	
Calcium	137.7	mg/l	pH	7.65	Units
06-28-89	1300 hr.		06-15-89	1442 hr.	
Cations, Total	12.49	meq/l	Potassium	5.80	mg/l
			06-28-89	1400 hr.	
Chloride	15.0	mg/l	Sodium	39.70	mg/l
06-19-89	1600 hr.		06-28-89	1415 hr.	
Conductivity	2900	umhos/cm	Solids, Dissolved	1854.0	mg/l
06-16-89	1315 hr.		06-19-89	1630 hr.	
Hardness, Total	532	mg/l CaCO3	Solids, Suspended	139.0	mg/l
			06-19-89	1630 hr.	
Iron	0.54	mg/l	Sulfate	320.0	mg/l
06-28-89	1315 hr.		07-05-89	1300 hr.	

ANALYST: D. Tyson

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PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311

August 8, 1989

Job No.: 59 9917

Date Rec'd: August 1, 1989

Date Sampled: August 1, 1989

Sampled By: UP&L

Utah Power and Light Co.
P.O. Box 1005
Huntington UT 84528

Sample ID:

DEER CREEK DISCHARGE
Temp 56
Flow 1800 gpm
Time Sampled 10:10 hr.
Time Rec'd 13:00 hr.
FLOW 1800 GPM (EST.)

WATER ANALYSIS

Acidity 08-03-89	8	mg/l CaCO3 10:00 hr.	Iron, Dissolved 08-02-89	0.53	mg/l 13:30 hr.
Alk., Bicarbonate 08-04-89	376	mg/l HCO3 10:00 hr.	Magnesium 08-02-89	57.50	mg/l 13:15 hr.
Alk., Carbonate 08-04-89	1<	mg/l CaCO3 10:00 hr.	Manganese 08-02-89	0.01<	mg/l 13:00 hr.
Alk., Total 08-04-89	308	mg/l CaCO3 10:00 hr.	Oil and Grease 08-03-89	4.1	mg/l 16:00 hr.
Anions, Total	12.17	meq/l	Oxygen, Dissolved 08-01-89	6.6	mg/l 16:25 hr.
Calcium 08-02-89	117.9	mg/l 13:00 hr.	pH 08-01-89	4.10	Units 16:00 hr.
Cations, Total	12.34	meq/l	Potassium 08-02-89	6.70	mg/l 13:30 hr.
Chloride 08-01-89	10.0	mg/l 17:00 hr.	Sodium 08-02-89	36.10	mg/l 15:00 hr.
Conductivity 08-03-89	900	umhos/cm 09:55 hr.	Solids, Dissolved 08-03-89	728.0	mg/l 17:00 hr.
Hardness, Total	531	mg/l CaCO3	Solids, Suspended 08-03-89	44.0	mg/l 17:00 hr.
Iron 08-02-89	0.54	mg/l 13:00 hr.	Sulfate 08-03-89	280.0	mg/l 10:00 hr.

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ANALYST: _____

Respectfully submitted,
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PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311

September 8, 1989

Job No.: 59 9976

Date Rec'd: August 30, 1989

Date Sampled: August 30, 1989

Sampled By: UP&L

Sample ID: UP&L

DEER CREEK MINE DISCHARGE
No Temperature
Flow 500 gpm (est)
Rec'd 1315 hr.
Sampled 0740 hr.

Utah Power and Light Co.
P.O. Box 1005
Huntington UT 84528

WATER ANALYSIS

Acidity	10	mg/l CaCO3	Iron, Dissolved	0.30	mg/l
09-07-89	1410 hr.		09-08-89	1100 hr.	
Alk., Bicarbonate	421	mg/l HCO3	Magnesium	68.60	mg/l
09-06-89	1300 hr.		09-06-89	1230 hr.	
Alk., Carbonate	1<	mg/l CaCO3	Manganese	0.01<	mg/l
09-06-89	1300 hr.		09-06-89	1330 hr.	
Alk., Total	345	mg/l CaCO3	Oil and Grease	2.3	mg/l
09-06-89	1300 hr.		09-06-89	1300 hr.	
Anions, Total	13.94	meq/l	Oxygen, Dissolved	8.9	mg/l
			08-30-89	1330 hr.	
Calcium	132.2	mg/l	pH	7.70	Units
09-06-89	1100 hr.		08-30-89	1320 hr.	
Cations, Total	14.14	meq/l	Potassium	5.90	mg/l
			09-06-89	1315 hr.	
Chloride	10.0	mg/l	Sodium	40.80	mg/l
09-06-89	0930 hr.		09-06-89	1300 hr.	
Conductivity	1200	umhos/cm	Solids, Dissolved	691.0	mg/l
08-30-89	1340 hr.		09-05-89	1630 hr.	
Hardness, Total	613	mg/l CaCO3	Solids, Suspended	15.0	mg/l
			09-05-89	1630 hr.	
Iron	0.34	mg/l	Sulfate	330.0	mg/l
09-08-89	1100 hr.		09-07-89	1350 hr.	

ANALYST: D. Tyson

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311

October 2, 1989

Job No.: 59 10018

Date Rec'd: September 14, 1989

Date Sampled: September 14, 1989

Sampled By: UP&L

Sample ID: UP&L

DEER CREEK DISCHARGE
Temperature 56 degrees
Flow 2000 gpm
Rec'd 1620 gpm
Sampled 1200 hr.

Utah Power and Light Co.
P.O. Box 1005
Huntington UT 84528

WATER ANALYSIS

Acidity	10	mg/l CaCO3	09-20-89 0900 hr.
Alk., Bicarbonate	401	mg/l HCO3	09-20-89 1115 hr.
Alk., Carbonate	1<	mg/l CaCO3	09-20-89 1115 hr.
Alk., Total	329	mg/l CaCO3	09-20-89 1115 hr.
Anions, Total	11.18	meq/l	
Calcium	100.4	mg/l	09-19-89 1400 hr.
Cations, Total	11.34	meq/l	
Chloride	20.0	mg/l	09-20-89 1540 hr.
Conductivity	900	umhos/cm	09-26-89 1415 hr.
Hardness, Total	470	mg/l CaCO3	
Iron	0.62	mg/l	09-19-89 1445 hr.
Magnesium	53.30	mg/l	09-19-89 1430 hr.
Manganese	0.02	mg/l	09-19-89 1530 hr.
Oil and Grease	3.3	mg/l	09-25-89 1630 hr.
Oxygen, Dissolved	6.8	mg/l	09-14-89 1645 hr.
pH	7.80	Units	09-14-89 1630 hr.
Potassium	5.70	mg/l	09-19-89 1445 hr.
Sodium	41.80	mg/l	09-19-89 1415 hr.
Solids, Dissolved	708.0	mg/l	09-19-89 1600 hr.
Solids, Suspended	68.0	mg/l	09-19-89 1600 hr.
Sulfate	200.0	mg/l	09-21-89 1000 hr.

ANALYST: D. Tyson

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, Huntington Laboratory

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P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311

October 26, 1989

Job No.: 59 10089

Date Rec'd: October 19, 1989

Date Sampled: October 18, 1989

Sampled By: UP&L

Sample ID: UP&L

DEER CREEK DISCHARGE
Temperature 56 degrees
Flow 1200 gpm
Rec'd 1445 hr.
Sampled 1425 hr.

Utah Power and Light Co.
P.O. Box 1005
Huntington UT 84528

WATER ANALYSIS

Acidity	11	mg/l CaCO3	Iron, Dissolved	0.06	mg/l
10-19-89	1500 hr.		10-19-89	1445 hr.	
Alk., Bicarbonate	392	mg/l HCO3	Magnesium	46.60	mg/l
10-19-89	1530 hr.		10-19-89	1400 hr.	
Alk., Carbonate	1<	mg/l CaCO3	Manganese	0.01<	mg/l
10-19-89	1530 hr.		10-19-89	1430 hr.	
Alk., Total	321	mg/l CaCO3	Oil and Grease	1.0<	mg/l
10-19-89	1530 hr.		10-18-89	1700 hr.	
Anions, Total	9.27	meq/l	Oxygen, Dissolved	8.0	mg/l
			10-18-89	1650 hr.	
Calcium	86.9	mg/l	pH	7.80	Units
10-19-89	1330 hr.		10-18-89	1640 hr.	
Cations, Total	9.14	meq/l	Potassium	3.20	mg/l
			10-19-89	1300 hr.	
Chloride	10.0	mg/l	Sodium	20.70	mg/l
10-19-89	1630 hr.		10-19-89	1530 hr.	
Conductivity	1000	umhos/cm	Solids, Dissolved	525.0	mg/l
10-19-89	1425 hr.		10-18-89	1645 hr.	
Hardness, Total	409	mg/l CaCO3	Solids, Suspended	36.0	mg/l
			10-18-89	1645 hr.	
Iron	0.26	mg/l	Sulfate	130.0	mg/l
10-19-89	1445 hr.		10-20-89	1530 hr.	

ANALYST: D. Tyson

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COMMERCIAL TESTING & ENGINEERING CO.

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OVER 40 BRANCH LABORATORIES STRATEGICALLY LOCATED IN PRINCIPAL COAL MINING AREAS,
TIDEWATER AND GREAT LAKES PORTS, AND RIVER LOADING FACILITIES

COMMERCIAL TESTING & ENGINEERING CO.
GENERAL OFFICES: 1919 SOUTH HIGHLAND AVE., SUITE 210-B, LOMBARD, ILLINOIS 60148 • (312) 953-9300
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PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311

November 21, 1989

Job No.: 59 10141

Date Rec'd: November 13, 1989

Date Sampled: November 13, 1989

Sampled By: UP&L

Sample ID: UP&L

DEER CREEK DISCHARGE
Temperature 56 degrees
Flow 1100 gpm
Rec'd 1420 hr.
Sampled 1225 hr.

Utah Power and Light Co.
P.O. Box 1005
Huntington UT 84528

WATER ANALYSIS

Acidity	11	mg/l CaCO3	Iron, Dissolved	0.18	mg/l
11-14-89	1415 hr.		11-15-89	1415 hr.	
Alk., Bicarbonate	409	mg/l HCO3	Magnesium	61.70	mg/l
11-14-89	1400 hr.		11-15-89	1315 hr.	
Alk., Carbonate	1<	mg/l CaCO3	Manganese	0.06	mg/l
11-14-89	1400 hr.		11-15-89	1330 hr.	
Alk., Total	335	mg/l CaCO3	Oil and Grease	3.6	mg/l
11-14-89	1400 hr.		11-20-89	1600 hr.	
Anions, Total	14.30	meq/l	Oxygen, Dissolved	8.2	mg/l
			11-13-89	1415 hr.	
Calcium	151.0	mg/l	pH	7.70	Units
11-15-89	1300 hr.		11-13-89	1400 hr.	
Cations, Total	14.63	meq/l	Potassium	6.60	mg/l
			11-15-89	1400 hr.	
Chloride	45.0	mg/l	Sodium	43.10	mg/l
11-20-89	1030 hr.		11-15-89	1345 hr.	
Conductivity	1000	umhos/cm	Solids, Dissolved	694.0	mg/l
11-14-89	1600 hr.		11-14-89	1515 hr.	
Hardness, Total	631	mg/l CaCO3	Solids, Suspended	268.0	mg/l
			11-14-89	1515 hr.	
Iron	0.91	mg/l	Sulfate	310.0	mg/l
11-15-89	1415 hr.		11-14-89	1300 hr.	

ANALYST: D. Tyson

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TIDEWATER AND GREAT LAKES PORTS, AND RIVER LOADING FACILITIES

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PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311

December 19, 1989

Job No.: 59 10187

Date Rec'd: December 6, 1989

Date Sampled: December 6, 1989

Sampled By: UP&L

Utah Power and Light Co.
P.O. Box 1005
Huntington UT 84528

Sample ID: UP&L

DEER CREEK DISCHARGE
Temperature 56 degrees
Flow 1850 gpm
pH 7.56
D.O. 7.90
Conductivity 768
Rec'd 1630 hr.
Sampled 1300 hr.

WATER ANALYSIS

Acidity	6	mg/l CaCO3	Iron, Dissolved	0.09	mg/l
12-13-89	1230 hr.		12-11-89	1200 hr.	
Alk., Bicarbonate	425	mg/l HCO3	Magnesium	50.60	mg/l
12-07-89	1520 hr.		12-11-89	1115 hr.	
Alk., Carbonate	1<	mg/l CaCO3	Manganese	0.01<	mg/l
12-07-89	1520 hr.		12-11-89	1215 hr.	
Alk., Total	348	mg/l CaCO3	Oil and Grease	2.5	mg/l
12-07-89	1520 hr.		12-14-89	1515 hr.	
Anions, Total	9.59	meq/l	Oxygen, Dissolved	9.5	mg/l
			12-06-89	1655 hr.	
Calcium	84.9	mg/l	pH	7.70	Units
12-11-89	1030 hr.		12-06-89	1710 hr.	
Cations, Total	9.32	meq/l	Potassium	3.50	mg/l
			12-11-89	1130 hr.	
Chloride	10.0	mg/l	Sodium	19.30	mg/l
12-07-89	1315 hr.		12-11-89	1100 hr.	
Conductivity	900	umhos/cm	Solids, Dissolved	594.0	mg/l
12-07-89	1430 hr.		12-14-89	1600 hr.	
Hardness, Total	420	mg/l CaCO3	Solids, Suspended	47.0	mg/l
			12-14-89	1600 hr.	
Iron	0.14	mg/l	Sulfate	120.0	mg/l
12-11-89	1200 hr.		12-08-89	1625 hr.	

ANALYST: D. Lyon

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COMMERCIAL TESTING & ENGINEERING CO.

Manager, Huntington Laboratory

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OVER 40 BRANCH LABORATORIES STRATEGICALLY LOCATED IN PRINCIPAL COAL MINING AREAS,
TIDEWATER AND GREAT LAKES PORTS, AND RIVER LOADING FACILITIES

APPENDIX I

COAL LITHOLOGIC LOG
UTAH POWER & LIGHT COMPANY
DEPT. OF MINING & EXPLORATION

PROJECT: COTTONWOOD MINE - PIEZOMETRIC WELLS DRILL HOLE: WCP-1

LOCATION: 5TH W XC-116 #3
COLLAR ELEV.: 7597 STATION 5998
HOLE TYPE: PLUG/CORE-NC
PLUG INTERVAL: 0 - 10'
CORE INTERVAL: 10' - 145.4'
TOTAL DEPTH: 145.4'
DATE: 24 - MAY - 1990
SCALE: 1" - 10'
GEOLOGIST: SEMBORSKI

GEOPHYSICAL DATA

LOG	FROM	TO
DENSITY:		
H.R.D.:		
E. LOG:		
GAMMA:		
CALIPER:		
S.P.:		

COAL SUMMARY:

SEAM	THICKNESS	INT.

DEPTH	PLUG	CORE	GRAPHIC LOG	FORMATION NAME	LITHOLOGIC DESCRIPTION	R.Q.D.	BOX NO.	RUN NO.	% REC.	SAMPLE
0					PLUGGED INTERVAL 0 - 10' SANDSTONE LT GRAY - BROWN					
10				STARPOINT SANDSTONE	10.0' - 66.8' SANDSTONE LT. GRAY, FINE TO MEDIUM GRAIN, SALT & PEPPER TEXTURE TO 30', FINING DOWNWARD SEQUENCE	99	1 2 3 4 5 6	1 2 3 4 5 6 7 8 9 10 11 12	100%	
20										
30										
40										
50										
55										
60										

COAL LITHOLOGIC LOG

UTAH POWER & LIGHT COMPANY

DEPT. OF MINING & EXPLORATION

COTTONWOOD MINE

PROJECT: PIEZOMETRIC WELLS

DRILL HOLE: WCP-1

PAGE 2 OF 2

DEPTH	PLUG	CORE	GRAPHIC LOG	FORMATION NAME	LITHOLOGIC DESCRIPTION	R.Q.D.	BOX NO.	RUN NO.	% REC.	SAMPLE
60				STARPOINT SANDSTONE		99	7	13	100%	
					66.8'-81.4 INTERBEDS SANDSTONE/MUDSTONE LT-MED GRAY, BIOTURBATED	100	7	14		
70							8	15		
								16		
80					81.4'-95.4' SANDSTONE, LT. GRAY, VERY-FINE-FINE GRAIN	100	9	17		
								18		
90							10	19		
					95.4'-110.8' INTERBEDS, SANDSTONE/MUDSTONE, LT.-MED. GRAY, MUDSTONE 103-105.7	99		20		
100							11	21		
								22		
110					110.8'-143.8' SANDSTONE, LT GRAY, VERY FINE GRAIN, LOWER 16.8' BIOTURBATED ZONES OF INTERBEDS.	100	12	23		
								24		
120							13	25		
								26		
130							14	27		
								28		
140							15	29		
					143.8'-145.4' MUDSTONE, DK GRAY SILTY	100				
150					T.D. 145.4'					

COAL LITHOLOGIC LOG
UTAH POWER & LIGHT COMPANY
DEPT. OF MINING & EXPLORATION

PROJECT: Cottonwood Mine - Piezometric Wells DRILL HOLE: WCP-2

LOCATION: 3RD S XC-14 #4
COLLAR ELEV.: 7578 STATION 6244
HOLE TYPE: CORE/PLUG - NC
PLUG INTERVAL: 0-50.3'
CORE INTERVAL: 50.3'-69.5'
TOTAL DEPTH: 69.5'
DATE: 24-MAY-1990
SCALE: 1'-10'
GEOLOGIST: SEMBORSKI

GEOPHYSICAL DATA

LOG	FROM	TO
DENSITY:		
H.R.D.:		
E. LOG:		
GAMMA:		
CALIPER:		
S.P.:		

COAL SUMMARY:

SEAM	THICKNESS	INT.

DEPTH	PLUG	CORE	GRAPHIC LOG	FORMATION NAME	LITHOLOGIC DESCRIPTION	R.Q.D.	BOX NO.	RUN NO.	% REC.	SAMPLE
0				STARPOINT SANDSTONE	PLUGGED INTERVAL 0'-50.3' SANDSTONE, LT. GRAY					
50					50.3'-63.1' SANDSTONE LT GRAY FINE-MEDIUM GRAIN	100	1	1, 2		
60					63.1'-69.5' IB's SANDSTONE/MUDSTONE, LT-MED GRAY, BIOTURBATED	100	2	3, 4		
70					T.D. 69.5'					

COAL LITHOLOGIC LOG
UTAH POWER & LIGHT COMPANY
DEPT. OF MINING & EXPLORATION

PROJECT: Cottonwood Mine - Piezometric Wells DRILL HOLE: WCP-3

LOCATION: 3RD S XC-44 #5
COLLAR ELEV.: 7610 STATION 7597
HOLE TYPE: CORE/PLUG - NC
PLUG INTERVAL: 0 - 49.9'
CORE INTERVAL: 49.9' - 74.6'
TOTAL DEPTH: 74.6'
DATE: 24 - MAY - 1990
SCALE: 1" - 10'
GEOLOGIST: SEMBOSKI

GEOPHYSICAL DATA

LOG	FROM	TO
DENSITY:		
H.R.D.:		
E. LOG:		
GAMMA:		
CALIPER:		
S.P.:		

COAL SUMMARY:

SEAM	THICKNESS	INT.

DEPTH	PLUG	CORE	GRAPHIC LOG	FORMATION NAME	LITHOLOGIC DESCRIPTION	R.Q.D.	BOX NO.	RUN NO.	% REC.	SAMPLE
0				STARPOINT SANDSTONE	PLUGGED INTERVAL 0' - 49.9 SANDSTONE, LT GRAY					
50					49.9' - 63.1' SANDSTONE, LT GRAY, FINE GRAIN	100	1	1, 2	100%	
60					63.1' - 74.6' INTERBEDS SANDSTONE/MUDSTONE LT GRAY, COAL STRINGERS @ 66.1' - 66.6', LOWER 5.2' IB's SILT/MS/SS; DK GRAY, BIOTURBATED	99	2, 3	3, 4, 5		
70										
80					T.D. 74.6'					

COAL LITHOLOGIC LOG
UTAH POWER & LIGHT COMPANY
DEPT. OF MINING & EXPLORATION

PROJECT: COTTONWOOD MINE - PIEZOMETRIC WELLS DRILL HOLE: WCP-4

LOCATION: 9TH EAST XC-19 #2
COLLAR ELEV.: 7645 STATION 7363
HOLE TYPE: CORE/PLUG - NC
PLUG INTERVAL: 0 - 51.5'
CORE INTERVAL: 51.5' - 80.8'
TOTAL DEPTH: 80.8'
DATE: 24 - MAY - 1990
SCALE: 1" - 10'
GEOLOGIST: SEMBORSKI

GEOPHYSICAL DATA

LOG	FROM	TO
DENSITY:		
H.R.D.:		
E. LOG:		
GAMMA:		
CALIPER:		
S.P.:		

COAL SUMMARY:

SEAM	THICKNESS	INT.

DEPTH	PLUG	CORE	GRAPHIC LOG	FORMATION NAME	LITHOLOGIC DESCRIPTION	R.Q.D.	BOX NO.	RUN NO.	% REC.	SAMPLE
0				STARPOINT SANDSTONE	PLUGGED INTERVAL 0 - 51.5'					
50										
					51.5' - 61.3' SANDSTONE, LT. GRAY, FINE GRAIN	98	1	1, 2	100%	
60					61.3' - 80.8' INTERBEDS, SANDSTONE/MUDSTONE, BIOTURBATED, LOWER 1.8' DK GRAY	100	2, 3	3, 4, 5, 6		
70										
80					T.D. 80.8'					
90										

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TELEPHONE: (801) 653-2311

February 28, 1989

Job No.: 9569

Date Rec'd: March 30, 1989

Date Sampled: March 29, 1989

Sampled By: UP&L

Sample ID:

WILBERG IN MINE
XC-11 2nd South
Rec'd 1045 hr.
Sampled 1240 hr.

UTAH POWER & LIGHT CO.
P.O. Box 1005
Huntington, Utah 84528

WATER ANALYSIS

Alk., Bicarbonate	406	mg/l HCO3	04/03/89 1345 hr.
Alk., Carbonate	1<	mg/l CaCO3	04/03/89 1345 hr.
Alk., Total	333	mg/l CaCO3	04/03/89 1345 hr.
Anions, Total	21.26	meq/l	
Calcium	168.7	mg/l	04/04/89 1215 hr.
Cations, Total	20.54	meq/l	
Chloride	10.0	mg/l	04/03/89 1530 hr.
Conductivity	1250	umhos/cm	04/05/89 1300 hr.
Hardness, Total	975	mg/l CaCO3	
Iron, Dissolved	0.17	mg/l	04/05/89 1330 hr.
Magnesium	134.40	mg/l	04/04/89 1315 hr.
Manganese	0.01<	mg/l	04/04/89 1400 hr.
pH	8.05	Units	03/30/89 1205 hr.
Potassium	4.10	mg/l	04/04/89 1300 hr.
Sodium	22.80	mg/l	04/04/89 1200 hr.
Solids, Dissolved	1156.0	mg/l	04/05/89 1100 hr.
Solids, Suspended	1.0<	mg/l	04/05/89 1100 hr.
Sulfate	690.0	mg/l	04/04/89 1420 hr.

ANALYST: D. Tyson

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

M W

Manager, Huntington Laboratory

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TELEPHONE: (801) 653-2311

February 28, 1989

Job No.: 9568

Date Rec'd: March 30, 1989

Date Sampled: March 29, 1989

Sampled By: UP&L

Sample ID:

WILBERG IN MINE
4th East XC-24 2L
Temperature 54 degrees
Rec'd 1045 hr.
Sampled 1505 hr.

UTAH POWER & LIGHT CO.
P.O. Box 1005
Huntington, Utah 84528

WATER ANALYSIS

Alk., Bicarbonate	565	mg/l HCO3	Iron, Dissolved	0.02<	mg/l
04/03/89 1345 hr.			04/05/89 1330 hr.		
Alk., Carbonate	1<	mg/l CaCO3	Magnesium	223.90	mg/l
04/03/89 1345 hr.			04/04/89 1315 hr.		
Alk., Total	463	mg/l CaCO3	Manganese	0.01<	mg/l
04/03/89 1345 hr.			04/04/89 1400 hr.		
Anions, Total	45.57	meq/l	pH	7.50	Units
			03/30/89 1205 hr.		
Calcium	296.9	mg/l	Potassium	7.50	mg/l
04/04/89 1215 hr.			04/04/89 1300 hr.		
Cations, Total	49.18	meq/l	* Sodium	367.00	mg/l
			04/04/89 1200 hr.		
Chloride	30.0	mg/l	Solids, Dissolved	1314.0	mg/l
04/03/89 1530 hr.			04/05/89 1100 hr.		
Conductivity	2200	umhos/cm	Solids, Suspended	1.0<	mg/l
04/05/89 1300 hr.			04/05/89 1100 hr.		
Hardness, Total	1663	mg/l CaCO3	Sulfate	1700.0	mg/l
			04/04/89 1420 hr.		

* WILL RE-SAMPLE HISTORICAL AVERAGE = 43.73 MG/L

ANALYST: D Tipon

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

W W

Manager, Huntington Laboratory

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PLEASE ADDRESS ALL CORRESPONDENCE TO:
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TELEPHONE: (801) 653-2311

August 10, 1989

Job No.: 59 9836

Date Rec'd: July 17, 1989

Date Sampled: July 17, 1989

Sampled By: UP&L

Sample ID: UP&L

WILBERG-IN-MINE
2nd South XC-11
Temperature 56 degrees
Flow 0.07 gpm
Rec'd 1500 hr.
Sample 0830 hr.

Utah Power and Light Co.
P.O. Box 1005
Huntington UT 84528

WATER ANALYSIS

Acidity 08-03-89	11	mg/l CaCO3 14:00 hr.	Chloride 08-01-89	10.0	mg/l 08:30 hr.
Aluminum 08-02-89	0.01<	mg/l 09:00 hr.	Chromium 08-02-89	0.02<	mg/l 08:30 hr.
Alk., Carbonate 07-24-89	1<	mg/l CaCO3 14:00 hr.	Conductivity 07-24-89	1400	umhos/cm 10:00 hr.
Alk., Total 07-24-89	433	mg/l CaCO3 14:00 hr.	Copper 07-25-89	0.010<	mg/l 10:30 hr.
Arsenic 07-27-89	0.002<	mg/l 09:00 hr.	Fluoride 07-31-89	0.26	mg/l 13:00 hr.
Anions, Total	18.38	meq/l	Hardness, Total	887	mg/l CaCO3
Barium 08-02-89	0.03<	mg/l 09:30 hr.	Iron 07-28-89	0.06	mg/l 14:15 hr.
Beryllium 08-02-89	0.00<	mg/l 08:00 hr.	Iron, Dissolved 07-28-89	0.06	mg/l 14:15 hr.
Boron 08-02-89	0.45	mg/l 10:00 hr.	Lead 07-25-89	0.050<	mg/l 08:00 hr.
Cadmium 07-25-89	0.002<	mg/l 10:00 hr.	Magnesium 07-28-89	114.90	mg/l 13:15 hr.
Calcium 07-28-89	165.8	mg/l 13:00 hr.	Manganese 07-28-89	0.08	mg/l 14:30 hr.
Cations, Total	18.08	meq/l	Mercury 07-26-89	0.002<	mg/l 14:00 hr.

ANALYST: _____

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TELEPHONE: (801) 653-2311

August 10, 1989

Job No.: 59 9836

Date Rec'd: July 17, 1989

Date Sampled: July 17, 1989

Sampled By: UP&L

Utah Power and Light Co.
P.O. Box 1005
Huntington UT 84528

Sample ID: UP&L

WILBERG-IN-MINE
2nd South XC-11
Temperature 56 degrees
Flow 0.07 gpm
Rec'd 1500 hr.
Sample 0830 hr.

WATER ANALYSIS

Molybdenum 08-02-89	0.10<	mg/l 10:00 hr.	Silver 08-01-89	0.010<	mg/l 15:00 hr.
Nickel 07-25-89	0.02<	mg/l 11:30 hr.	Sodium 07-28-89	6.40	mg/l 13:30 hr.
Oxygen, Dissolved 07-17-89	5.5	mg/l 16:00 hr.	Solids, Dissolved 07-26-89	1101.0	mg/l 16:00 hr.
pH 07-17-89	7.00	Units 16:00 hr.	Solids, Suspended 07-26-89	1.0<	mg/l 17:00 hr.
Phosphorus, Total 08-04-89	0.20	mg/l 16:00 hr.	Sulfate 07-26-89	460.0	mg/l 13:15 hr.
Potassium 07-28-89	3.70	mg/l 14:00 hr.	Vanadium 08-02-89	0.20<	mg/l 10:30 hr.
Selenium 07-27-89	0.002<	mg/l 11:00 hr.	Zinc 07-25-89	0.01	mg/l 11:00 hr.
Silica 08-04-89	5.20	mg/l 15:45 hr.			

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ANALYST: [illegible]

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.
[illegible]
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PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311

August 10, 1989

Job No.: 59 9835

Date Rec'd: July 17, 1989

Date Sampled: July 17, 1989

Sampled By: UP&L

Utah Power and Light Co.
P.O. Box 1005
Huntington UT 84528

Sample ID: UP&L

WILBERG-IN-MINE
4th East XC-24
Temperature 56 degrees
Flow 0.20 gpm
Rec'd 1500 hr.
Sample 0840 hr.

WATER ANALYSIS

Acidity 08-03-89	10	mg/l CaCO3 09:45 hr.	Chloride 08-01-89	25.0	mg/l 08:30 hr.
Aluminum 08-02-89	0.01<	mg/l 09:00 hr.	Chromium 08-02-89	0.02<	mg/l 08:30 hr.
Alk., Carbonate 07-24-89	1<	mg/l CaCO3 14:00 hr.	Conductivity 07-24-89	2370	umhos/cm 10:00 hr.
Alk., Total 07-24-89	453	mg/l CaCO3 14:00 hr.	Copper 07-25-89	0.010<	mg/l 10:30 hr.
Arsenic 07-27-89	0.002<	mg/l 09:00 hr.	Fluoride 07-31-89	0.36	mg/l 13:00 hr.
Anions, Total	31.58	meq/l	Hardness, Total	1542	mg/l CaCO3
Barium 08-02-89	0.03<	mg/l 09:30 hr.	Iron 07-28-89	0.17	mg/l 14:15 hr.
Beryllium 08-02-89	0.00<	mg/l 08:00 hr.	Iron, Dissolved 07-28-89	0.17	mg/l 14:15 hr.
Boron 08-02-89	0.73	mg/l 10:00 hr.	Lead 07-25-89	0.050<	mg/l 08:00 hr.
Cadmium 07-25-89	0.002<	mg/l 10:00 hr.	Magnesium 07-28-89	189.00	mg/l 13:15 hr.
Calcium 07-28-89	305.7	mg/l 13:00 hr.	Manganese 07-28-89	0.05	mg/l 14:30 hr.
Cations, Total	31.97	meq/l	Mercury 07-26-89	0.002<	mg/l 14:00 hr.

ANALYST: M M

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

M M

Manager, Huntington Laboratory

AUG 11 1989
MINING DIV.
OFFICE

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OVER 40 BRANCH LABORATORIES STRATEGICALLY LOCATED IN PRINCIPAL COAL MINING AREAS, TIDEWATER AND GREAT LAKES PORTS, AND RIVER LOADING FACILITIES

COMMERCIAL TESTING & ENGINEERING CO.
GENERAL OFFICES: 1919 SOUTH HIGHLAND AVE., SUITE 210-B, LOMBARD, ILLINOIS 60148 • (312) 953-9300
SINCE 1908
Member of the SGS Group (Société Générale de Surveillance)

PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311

August 10, 1989

Job No.: 59 9835

Date Rec'd: July 17, 1989

Date Sampled: July 17, 1989

Sampled By: UP&L

Sample ID: UP&L

WILBERG-IN-MINE
4th East XC-24
Temperature 56 degrees
Flow 0.20 gpm
Rec'd 1500 hr.
Sample 0840 hr.

Utah Power and Light Co.
P.O. Box 1005
Huntington UT 84528

WATER ANALYSIS

Molybdenum 08-02-89	0.11	mg/l 10:00 hr.	Silver 08-01-89	0.010<	mg/l 15:00 hr.
Nickel 07-25-89	0.02<	mg/l 11:30 hr.	Sodium 07-28-89	21.70	mg/l 13:30 hr.
Oxygen, Dissolved 07-17-89	5.9	mg/l 16:00 hr.	Solids, Dissolved 07-26-89	2243.0	mg/l 17:00 hr.
Phosphorus, Total 08-04-89	0.21	mg/l 16:00 hr.	Solids, Suspended	1.0<	mg/l 17:00 hr.
Potassium 07-28-89	9.90	mg/l 11:00 hr.	Sulfate 07-26-89	1050.0	mg/l 13:15 hr.
Selenium 07-27-89	0.002<	mg/l 11:00 hr.	Vanadium 08-02-89	0.20<	mg/l 10:30 hr.
Silica 08-04-89	5.20	mg/l 15:45 hr.	Zinc 07-25-89	0.02	mg/l 11:00 hr.

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ANALYST: M W

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

M W
Manager, Huntington Laboratory

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OVER 40 BRANCH LABORATORIES STRATEGICALLY LOCATED IN PRINCIPAL COAL MINING AREAS,
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COMMERCIAL TESTING & ENGINEERING CO.
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PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311

October 2, 1989

Job No.: 59 10013

Date Rec'd: September 14, 1989

Date Sampled: September 14, 1989

Sampled By: UP&L

Utah Power and Light Co.
P.O. Box 1005
Huntington UT 84528

Sample ID: UP&L

WILBERG-IN-MINE
2nd South XC-11
Temperature 54 degrees
Flow 0.08 gpm
Rec'd 1620 hr.
Sampled 1015 hr.

WATER ANALYSIS

Alk., Bicarbonate	544	mg/l HCO3	Magnesium	118.10	mg/l
09-20-89 0900 hr.			09-19-89 1430 hr.		
Alk., Carbonate	1<	mg/l CaCO3	Manganese	0.03	mg/l
09-20-89 0900 hr.			09-19-89 1530 hr.		
Anions, Total	18.43	meq/l	pH	7.20	Units
			09-14-89 1635 hr.		
Calcium	156.6	mg/l	Potassium	7.40	mg/l
09-19-89 1400 hr.			09-19-89 1445 hr.		
Cations, Total	18.64	meq/l	Sodium	21.60	mg/l
			09-19-89 1415 hr.		
Chloride	10.0	mg/l	Solids, Dissolved	1061.0	mg/l
09-20-89 1540 hr.			09-19-89 1600 hr.		
Conductivity	1300	umhos/cm	Solids, Suspended	5.0	mg/l
09-26-89 1415 hr.			09-19-89 1600 hr.		
Hardness, Total	877	mg/l CaCO3	Sulfate	450.0	mg/l
			09-21-89 1000 hr.		
Iron	0.02<	mg/l			
09-19-89 1445 hr.					

OCT - 3 1989
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ANALYST: D. Tyson

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, Huntington Laboratory

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PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311

October 5, 1989

Job No.: 59 10014

Date Rec'd: September 14, 1989

Date Sampled: September 14, 1989

Sampled By: UP&L

Utah Power and Light Co.
P.O. Box 1005
Huntington UT 84528

Sample ID: UP&L

WILBERG-IN-MINE
4th South XC-24
Temperature 53 degrees
Flow 0.20 gpm
Rec'd 1620 hr.
Sampled 1045 hr.

WATER ANALYSIS

Alk., Bicarbonate 09-20-89 1115 hr.	500	mg/l HCO3	Magnesium 09-19-89 1430 hr.	212.10	mg/l
Alk., Carbonate 09-20-89 0900 hr.	100	mg/l CaCO3	Manganese 09-19-89 1530 hr.	0.04	mg/l
Anions, Total	35.49	meq/l	pH 09-14-89 1635 hr.	7.65	Units
Calcium 09-19-89 1400 hr.	321.1	mg/l	Potassium 09-19-89 1445 hr.	11.00	mg/l
Cations, Total	35.44	meq/l	Sodium 09-19-89 1415 hr.	39.70	mg/l
Chloride 09-20-89 1540 hr.	30.0	mg/l	Solids, Dissolved 09-19-89 1600 hr.	2206.0	mg/l
Conductivity 09-26-89 1415 hr.	2350	umhos/cm	Solids, Suspended 09-19-89 1600 hr.	7.0	mg/l
Hardness, Total	1675	mg/l CaCO3	Sulfate 09-21-89 1000 hr.	1225.0	mg/l
Iron 09-19-89 1445 hr.	0.02<	mg/l			

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ANALYST: D. Tyson

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PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311

December 18, 1989

Job No.: 59 10181

Date Rec'd: December 4, 1989

Date Sampled: December 4, 1989

Sampled By: UP&L

Utah Power and Light Co.
P.O. Box 1005
Huntington UT 84528

Sample ID: UP&L

WILBERG-IN-MINE
2nd South XC-11
Temperature 51 degrees
Flow 0.08 gpm
Rec'd 1600 hr.
Sampled 0945 hr.

WATER ANALYSIS

Alk., Bicarbonate	626	mg/l HCO3	Magnesium	103.20	mg/l
12-06-89	1330 hr.		12-11-89	1115 hr.	
Alk., Carbonate	1<	mg/l CaCO3	Manganese	0.02	mg/l
12-06-89	1330 hr.		12-11-89	1215 hr.	
Alk., Total	513	mg/l CaCO3	Oxygen, Dissolved	3.4	mg/l
12-06-89	1330 hr.		12-04-89	1645 hr.	
Anions, Total	17.91	meq/l	pH	7.15	Units
			12-07-89	1630 hr.	
Calcium	176.3	mg/l	Potassium	2.90	mg/l
12-11-89	1030 hr.		12-11-89	1130 hr.	
Cations, Total	18.23	meq/l	Sodium	20.30	mg/l
			12-11-89	1100 hr.	
Chloride	20.0	mg/l	Solids, Dissolved	1049.0	mg/l
12-05-89	0910 hr.		12-05-89	1600 hr.	
Conductivity	1400	umhos/cm	Solids, Suspended	1.0<	mg/l
12-07-89	1430 hr.		12-05-89	1600 hr.	
Hardness, Total	865	mg/l CaCO3	Sulfate	350.0	mg/l
			12-05-89	1130 hr.	
Iron	0.06	mg/l			
12-11-89	1200 hr.				

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ANALYST: D. Tyson

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Dave Connell by DT

Manager, Huntington Laboratory

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PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311

December 18, 1989

Job No.: 59 10180

Date Rec'd: December 4, 1989

Date Sampled: December 4, 1989

Sampled By: UP&L

Utah Power and Light Co.
P.O. Box 1005
Huntington UT 84528

Sample ID: UP&L

WILBERG-IN-MINE
4th EAST XC-24
Temperature 54 degrees
Flow 0.20 gpm
Rec'd 1600 hr.
Sampled 1240 hr.

WATER ANALYSIS

Alk., Bicarbonate	572	mg/l HCO3	Magnesium	166.20	mg/l
12-05-89	1330 hr.		12-11-89	1115 hr.	
Alk., Carbonate	1<	mg/l CaCO3	Manganese	0.06	mg/l
12-05-89	1330 hr.		12-11-89	1215 hr.	
Alk., Total	469	mg/l CaCO3	Oxygen, Dissolved	4.1	mg/l
12-05-89	1330 hr.		12-04-89	1645 hr.	
Anions, Total	31.13	meq/l	pH	7.40	Units
			12-04-89	1630 hr.	
Calcium	320.4	mg/l	Potassium	7.50	mg/l
05-11-89	1030 hr.		12-11-89	1130 hr.	
Cations, Total	31.58	meq/l	Sodium	40.40	mg/l
			12-11-89	1100 hr.	
Chloride	35.0	mg/l	Solids, Dissolved	2331.0	mg/l
12-05-89	0910 hr.		12-15-89	1600 hr.	
Conductivity	2400	umhos/cm	Solids, Suspended	3.0	mg/l
12-07-89	1430 hr.		12-15-89	1600 hr.	
Hardness, Total	1484	mg/l CaCO3	Sulfate	1000.0	mg/l
			12-05-89	1130 hr.	
Iron	0.02<	mg/l			
12-11-89	1200 hr.				

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ANALYST: D. Igoe

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Dave Councilly Dr

Manager, Huntington Laboratory

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OVER 40 BRANCH LABORATORIES STRATEGICALLY LOCATED IN PRINCIPAL COAL MINING AREAS,
TIDEWATER AND GREAT LAKES PORTS, AND RIVER LOADING FACILITIES

APPENDIX J

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PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311

October 31, 1989

Job No.: 59 10106

Date Rec'd: October 26, 1989

Date Sampled: October 25, 1989

Sampled By: UP&L

Utah Power and Light Co.
P.O. Box 1005
Huntington UT 84528

Sample ID: UP&L

WILBERG MINE DISCHARGE
GRIMES WASH
Temperature 54 degrees
Flow 0.42/245 gpm
Rec'd 0830 hr.
Sampled 1440 hr.
FIELD MEASUREMENTS
pH 7.15
DO 9.02
Conductivity 1164

WATER ANALYSIS

Acidity	11	mg/l CaCO3	Magnesium	71.90	mg/l
10-31-89	1550 hr.		10-27-89	1315 hr.	
Alk., Bicarbonate	431	mg/l HCO3	Manganese	0.01<	mg/l
10-31-89	1530 hr.		10-27-89	1430 hr.	
Alk., Carbonate	1<	mg/l CaCO3	Oil and Grease	1.0<	mg/l
10-31-89	1530 hr.		10-30-89	0900 hr.	
Alk., Total	353	mg/l CaCO3	Oxygen, Dissolved	6.6	mg/l
10-31-89	1530 hr.		10-26-89	1230 hr.	
Anions, Total	13.95	meq/l	pH	7.20	Units
			10-26-89	1210 hr.	
Calcium	142.8	mg/l	Potassium	2.50	mg/l
10-27-89	1330 hr.		10-27-89	1415 hr.	
Cations, Total	14.04	meq/l	Sodium	21.80	mg/l
			10-27-89	1300 hr.	
Chloride	20.0	mg/l	Solids, Dissolved	556.0	mg/l
10-31-89	1615 hr.		10-30-89	1700 hr.	
Conductivity	850	umhos/cm	Solids, Settleable	0.05<	mg/l
10-27-89	1520 hr.		10-27-89	1400 hr.	
Hardness, Total	653	mg/l CaCO3	Solids, Suspended	1.0<	mg/l
			10-30-89	1700 hr.	
Iron	0.87	mg/l	Sulfate	310.0	mg/l
10-27-89	1400 hr.		10-31-89	1615 hr.	
Iron, Dissolved	0.02<	mg/l			
10-27-89	1400 hr.				

ANALYST: D. Igoe

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Respectfully submitted,
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Dave Cau DT
Manager, Huntington Laboratory

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OVER 40 BRANCH LABORATORIES STRATEGICALLY LOCATED IN PRINCIPAL COAL MINING AREAS,
TIDEWATER AND GREAT LAKES PORTS, AND RIVER LOADING FACILITIES

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PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311

November 21, 1989

Job No.: 59 10149

Date Rec'd: November 14, 1989

Date Sampled: November 14, 1989

Sampled By: UP&L

Utah Power and Light Co.
P.O. Box 1005
Huntington UT 84528

Sample ID: UP&L

WILBERG DISCHARGE- OUTFALL 001
Temperature 55 degrees
Flow 245 gpm
Rec'd 1630 hr.
Sampled 1410 hr.
FIELD MEASUREMENTS
pH 7.34
DO 7.60
Conductivity 1043

WATER ANALYSIS

Acidity	21	mg/l CaCO3	Iron, Dissolved	0.02<	mg/l
11-20-89	1145 hr.		11-15-89	1315 hr.	
Alk., Bicarbonate	460	mg/l HCO3	Magnesium	64.10	mg/l
11-20-89	1150 hr.		11-15-89	1330 hr.	
Alk., Carbonate	1<	mg/l CaCO3	Manganese	0.04	mg/l
11-20-89	1150 hr.		11-15-89	1630 hr.	
Alk., Total	377	mg/l CaCO3	Oil and Grease	1.0<	mg/l
11-20-89	1150 hr.		11-20-89	1645 hr.	
Anions, Total	14.21	meq/l	Oxygen, Dissolved	5.7	mg/l
			11-14-89	1630 hr.	
Calcium	157.2	mg/l	pH	7.30	Units
11-15-89	1300 hr.		11-14-89	1400 hr.	
Cations, Total	14.26	meq/l	Potassium	2.40	mg/l
			11-15-89	1345 hr.	
Chloride	20.0	mg/l	Sodium	25.10	mg/l
11-20-89	1030 hr.		11-15-89	1515 hr.	
Conductivity	1200	umhos/cm	Solids, Dissolved	868.0	mg/l
11-20-89	1600 hr.		11-20-89	1515 hr.	
Hardness, Total	656	mg/l CaCO3	Solids, Suspended	1.0	mg/l
			11-20-89	1515 hr.	
Iron	0.74	mg/l	Sulfate	300.0	mg/l
11-15-89	1415 hr.		11-20-89	0900 hr.	

ANALYST: D. Tipon

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Respectfully submitted,
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Manager, Huntington Laboratory

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10149
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WILBERG DISCHARGE

PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311

Nov. 27, 1989

REGION VIII GUIDANCE FOR ACUTE WHOLE EFFLUENT REPORTING

PERMITTEE NAME Utah Power and Light Co. NPDES No UT-0022896

20% MORTALITY TEST: X pass ___ fail LC50 n/a % OUTFALL NO 001

TEST ANIMAL & AGE Fathead minnow SAMPLE TIME & DATE Nov. 14 14:10

Analysis Time & Date: Begin Nov. 15 10:00 End Nov. 19 10:00

Receiving Water Hardness 571 Reconstituted Water Hardness (if used) ___

Measurements	Dilutions (% Effluent)*						
	0%	6%	12.5%	25%	50%	75%	100%
No @ Start of Test	20		20	20	20	20	20
No live after 24 hrs	20		20	20	20	20	19
No live after 48 hrs	20		20	18	20	19	19
No live after 72 hrs	20		20	18	20	19	19
No live after 96 hrs	20		20	18	20	19	19
Initial DO: mg/l	8.52		8.00	7.81	7.67	7.44	7.25
DO; 24 hrs: old/new	6.9/7.2	/	7.0 / 7.2	7.1/7.5	7.0/7.1	7.0/7.0	6.9/7.0
DO; 48 hrs: old/new	5.6/7.2	/	5.7 / 7.2	5.8/7.0	6.2/7.0	6.5/6.9	6.3/6.8
DO; 72 hrs: old/new	6.2/7.0	/	6.2 / 7.0	6.2/7.0	6.3/6.9	6.1/6.8	6.8/7.2
DO; 96 hrs:	6.93		6.56	6.44	6.13	6.37	6.26
Initial temp: °C	20		20	20	20	20	20
Temp; 24 hrs: old/new	20/20	/	20 / 20	20 / 20	20/ 20	20 /20	20 / 20
Temp; 48 hrs: old/new	20 /20	/	20 / 20	20 / 20	20/ 20	20 /20	20 / 20
Temp; 72 hrs: old/new	20/20	/	20 / 20	20 / 20	20/ 20	20 /20	20 / 20
Temp; 96 hrs:	21		21	21	21	21	21

Initial alkal. 0% 258 100% 377 Initial Effluent Hardness 656

Initial NH_3 as N 0% .01 100% .01 Initial pH 0% 7.90 100% 7.30

Final pH 0% 8.30 100% 7.95 ANALYST'S NAME David Counsil

LABORATORY CTE-Huntington SIGNATURE/DATE [signature] 11-29-89

* normally, a minimum of five plus control (0%) 6/28/88

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10149
Biomonitoring

WILBERG DISCHARGE
11-14-89

PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311

REGION VIII GUIDANCE FOR ACUTE WHOLE EFFLUENT REPORTING

PERMITTEE NAME Utah Power and Light Co. NPDES No UT-0022896

20% MORTALITY TEST: X pass ___ fail LC50 n/a % OUTFALL NO 001

TEST ANIMAL & AGE Ceriodaphnia 24 h SAMPLE TIME & DATE Nov. 14 14:10

Analysis Time & Date: Begin Nov. 16 12:00 End Nov. 18 12:00

Receiving Water Hardness 571 Reconstituted Water Hardness (if used) ___

Measurements	Dilutions (% Effluent)*						
	0%	6%	12.5%	25%	50%	75%	100%
No @ Start of Test	20		20	20	20	20	20
No live after 24 hrs	20		20	20	20	20	20
No live after 48 hrs	20		20	20	20	20	20
No live after 72 hrs							
No live after 96 hrs							
Initial DO: mg/l	7.17		7.48	7.48	7.12	7.05	6.95
DO; 24 hrs: old/new	7.1/7.2	/	7.4/7.0	7.5/7.0	7.1/7.0	6.8/6.9	6.8/6.8
DO; 48 hrs: old/new	7.0/	/	6.9/	7.1/	7.1/	7.0/	7.0/
DO; 72 hrs: old/new	/	/	/	/	/	/	/
DO; 96 hrs:							
Initial temp: °C	20		20	20	20	20	20
Temp; 24 hrs: old/new	20/20	/	20/20	20/20	20/20	20/20	20/20
Temp; 48 hrs: old/new	20/	/	20/	20/	20/	20/	20/20
Temp; 72 hrs: old/new	/	/	/	/	/	/	/
Temp; 96 hrs:							

Initial alkal. 0% 258 100% 377 Initial Effluent Hardness 656

Initial NH_3 as N 0% .01 100% .01 Initial pH 0% 7.90 100% 7.30

Final pH 0% 8.50 100% 8.10 ANALYST'S NAME David Councill

LABORATORY CTE-Huntington SIGNATURE/DATE [illegible] 6/28/88

* normally, a minimum of five plus control (0%)

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PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311

December 8, 1989

Job No.: 59 10176

Date Rec'd: December 1, 1989

Date Sampled: November 30, 1989

Sampled By: UP&L

Utah Power and Light Co.
P.O. Box 1005
Huntington UT 84528

Sample ID: UP&L

GRIMES WASH OUTFALL 001
Rec'd 0830 hr.
Sampled 1710 hr.

WATER ANALYSIS

Solids, Suspended 1.0< mg/l
12-05-89 1600 hr.

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ANALYST: D. Tyson

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Dave Councill by DT
Manager, Huntington Laboratory

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OVER 40 BRANCH LABORATORIES STRATEGICALLY LOCATED IN PRINCIPAL COAL MINING AREAS,
TIDEWATER AND GREAT LAKES PORTS, AND RIVER LOADING FACILITIES

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PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311

December 19, 1989

Job No.: 59 10194

Date Rec'd: December 11, 1989

Date Sampled: December 11, 1989

Sampled By: UP&L

Utah Power and Light Co.
P.O. Box 1005
Huntington UT 84528

Sample ID: UP&L

WILBERG MINE DISCHARGE @ Grimes Wash
Outfall 001
Flow 240 gpm
Temperature 52 degrees
FIELD MEASUREMENTS
DO 9.78
Conductivity 933
pH 7.38
Rec'd 1300 hr.
Sampled 1055 hr.

WATER ANALYSIS

Acidity	13	mg/l CaCO3	Iron, Dissolved	0.09	mg/l
12-13-89	1230 hr.		12-13-89	1415 hr.	
Alk., Bicarbonate	338	mg/l HCO3	Magnesium	55.20	mg/l
12-13-89	1130 hr.		12-13-89	1330 hr.	
Alk., Carbonate	1<	mg/l CaCO3	Manganese	0.07	mg/l
12-13-89	1130 hr.		12-13-89	1430 hr.	
Alk., Total	277	mg/l CaCO3	Oil and Grease	1.0<	mg/l
12-13-89	1130 hr.		12-19-89	0900 hr.	
Anions, Total	13.31	meq/l	Oxygen, Dissolved	5.5	mg/l
			12-11-89	1625 hr.	
Calcium	162.3	mg/l	pH	7.30	Units
12-13-89	1315 hr.		12-11-89	1610 hr.	
Cations, Total	13.42	meq/l	Potassium	2.14	mg/l
			12-13-89	1400 hr.	
Chloride	20.0	mg/l	Sodium	16.80	mg/l
12-13-89	1535 hr.		12-13-89	1300 hr.	
Conductivity	920	umhos/cm	Solids, Dissolved	1047.0	mg/l
12-13-89	1300 hr.		12-14-89	1600 hr.	
Hardness, Total	633	mg/l CaCO3	Solids, Suspended	20.0	mg/l
			12-14-89	1600 hr.	
Iron	0.47	mg/l	Sulfate	350.0	mg/l
12-13-89	1415 hr.		12-14-89	1015 hr.	

ANALYST: D. Igon

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Manager, Huntington Laboratory

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10194
Biomonitoring

WILBERG MINE DISCHARGE -
Grimes Wash Outfall 001
240 gpm

PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311

REGION VIII GUIDANCE FOR ACUTE WHOLE EFFLUENT REPORTING

PERMITTEE NAME Utah Power and Light Co. NPDES No UT-0024896

20% MORTALITY TEST: X pass ___ fail LC50 n/a % OUTFALL NO 001

TEST ANIMAL & AGE Ceriodaphnia <24h. SAMPLE TIME & DATE Dec 11, 1989 10:55

Analysis Time & Date: Begin Dec 13 11:00 End Dec 15 11:00

Receiving Water Hardness 543 Reconstituted Water Hardness (if used) ___

Measurements	Dilutions (% Effluent)*						
	0%	6%	12.5%	25%	50%	75%	100%
No @ Start of Test	20		20	20	20	20	20
No live after 24 hrs	20		20	20	20	20	20
No live after 48 hrs	20		20	20	20	20	20
No live after 72 hrs							
No live after 96 hrs							
Initial DO: mg/l	8.6		8.5	8.3	8.2	8.0	8.0
DO; 24 hrs: old/new	6.9/6.9	/	7.0/7.0	7.0/7.0	6.9/7.0	6.9/7.0	7.0/7.1
DO; 48 hrs: old/new	6.9/	/	7.0/	7.0/	6.8/	6.5/	6.9/
DO; 72 hrs: old/new	/	/	/	/	/	/	/
DO; 96 hrs:							
Initial temp: °C	20		20	20	20	20	20
Temp; 24 hrs: old/new	20/20	/	20/20	20/20	20/20	20/20	20/20
Temp; 48 hrs: old/new	20/	/	20/	20/	20/	20/	20/
Temp; 72 hrs: old/new	/	/	/	/	/	/	/
Temp; 96 hrs:							

Initial alkal. 0% 298 100% 277 Initial Effluent Hardness 632

Initial NH_3 as N 0% <.01 100% <.01 Initial pH 0% 7.4 100% 7.3

Final pH 0% 8.5 100% 8.2 ANALYST'S NAME David Councill

LABORATORY CTE-Huntington SIGNATURE/DATE [signature] 12/19/89

* normally, a minimum of five plus control (0%) 6/28/88

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TELEPHONE: (801) 653-2311

10194
Biomonitoring

WILBERG MINE DISCHARGE -
Grimes Wash Outfall 001
240 gpm

REGION VIII GUIDANCE FOR ACUTE WHOLE EFFLUENT REPORTING

PERMITTEE NAME Utah Power and Light Co. NPDES No UT-0024896

20% MORTALITY TEST: X pass ___ fail LC50 n/a % OUTFALL NO 001

TEST ANIMAL & AGE Fathead minnow 4d. SAMPLE TIME & DATE Dec. 11, 1989 10:55

Analysis Time & Date: Begin Dec 12 15:00 End Dec 16 15:00

Receiving Water Hardness 543 Reconstituted Water Hardness (if used) ___

Measurements	Dilutions (% Effluent)*						
	0%	6%	12.5%	25%	50%	75%	100%
No @ Start of Test	20		20	20	20	20	20
No live after 24 hrs	20		20	20	19	20	20
No live after 48 hrs	20		20	20	19	20	20
No live after 72 hrs	20		20	20	19	19	20
No live after 96 hrs	20		20	20	19	19	20
Initial DO: mg/l	8.42		8.11	8.01	7.85	7.60	7.25
DO; 24 hrs: old/new	7.7/8.6	/	7.8/8.3	7.8/8.3	7.7/8.2	7.7/8.0	7.5/8.0
DO; 48 hrs: old/new	6.9/6.9	/	7.0/7.0	7.0/7.0	6.9/7.0	6.8/7.0	7.0/7.1
DO; 72 hrs: old/new	6.8/7.6	/	6.5/7.4	6.6/7.4	6.5/7.3	6.6/7.2	5.8/6.6
DO; 96 hrs:	6.5		6.6	6.5	6.3	6.1	6.3
Initial temp: °C	20		20	20	20	20	20
Temp; 24 hrs: old/new	20/20	/	20/20	20/20	20/20	20/20	20/20
Temp; 48 hrs: old/new	20/20	/	20/20	20/20	20/20	20/20	20/20
Temp; 72 hrs: old/new	20/20	/	20/20	20/20	20/20	20/20	20/20
Temp; 96 hrs:	20		20	20	20	20	20

Initial alkal. 0% 298 100% 277 Initial Effluent Hardness 632

Initial NH_3 as N 0% <.01 100% <.01 Initial pH 0% 7.4 100% 7.3

Final pH 0% 8.3 100% 8.0 ANALYST'S NAME David Councill

LABORATORY CTE-Huntington SIGNATURE/DATE [signature] 12-19-89

* normally, a minimum of five plus control (0%)

6/28/88

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P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311

December 29, 1989

Job No.: 59 10213

Date Rec'd: December 19, 1989

Date Sampled: December 19, 1989

Sampled By: UP&L

Sample ID: UP&L

WILBERG MINE DISCHARGE
GRIMES WASH
Flow 240 gpm
Rec'd 1630 hr.
Sampled 1530 hr.

Utah Power and Light Co.
P.O. Box 1005
Huntington UT 84528

WATER ANALYSIS

Solids, Suspended 1.0< mg/l
12-28-89 1600 hr.

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ANALYST: D. Tipon

Respectfully submitted,
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Manager, Huntington Laboratory

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PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311

February 28, 1989

Job No.: 9596

Date Rec'd: April 17, 1989

Date Sampled: April 17, 1989

Sampled By: UP&L

Sample ID:

MILLER CANYON
Temperature 56 degrees
Flow 70 gpm
Rec'd 1630 hr.
Sampled 1500 hr.

UTAH POWER & LIGHT CO.
P.O. Box 1005
Huntington, Utah 84528

WATER ANALYSIS

Acidity	34	mg/l CaCO3	04/18/89 1400 hr.
Alk., Bicarbonate	448	mg/l HCO3	04/18/89 1300 hr.
Alk., Carbonate	1<	mg/l CaCO3	04/18/89 1300 hr.
Alk., Total	367	mg/l CaCO3	04/18/89 1300 hr.
Anions, Total	18.08	meq/l	
Calcium	187.8	mg/l	04/18/89 1115 hr.
Cations, Total	17.90	meq/l	
Chloride	15.0	mg/l	04/18/89 1345 hr.
Conductivity	1600	umhos/cm	04/18/89 1430 hr.
Hardness, Total	800	mg/l CaCO3	
Iron	0.91	mg/l	04/18/89 1000 hr.
Iron, Dissolved	0.02<	mg/l	04/18/89 1015 hr.
Magnesium	80.40	mg/l	04/18/89 1030 hr.
Manganese	0.05	mg/l	04/18/89 1130 hr.
Nitrogen, Ammonia	0.08	mg/l	04/24/89 1300 hr.
Nitrogen, Nitrate	0.05	mg/l	04/21/89 1500 hr.
Nitrogen, Nitrite	0.01	mg/l	04/21/89 1500 hr.
Oil and Grease	1.0<	mg/l	04/20/89 1400 hr.
Oxygen, Dissolved	6.2	mg/l	04/17/89 1700 hr.
pH	7.20	Units	04/17/89 1645 hr.
Potassium	7.70	mg/l	04/18/89 1100 hr.
Sodium	39.90	mg/l	04/18/89 1200 hr.
Solids, Dissolved	1018.0	mg/l	04/20/89 1500 hr.
Solids, Suspended	8.0	mg/l	04/20/89 1500 hr.
Sulfate	500.0	mg/l	04/18/89 1500 hr.

ANALYST: D. Tyson

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PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311

June 2, 1989

Job No.: 59 9684

Date Rec'd: May 19, 1989

Date Sampled: May 19, 1989

Sampled By: UP&L

Sample ID: UP&L

MILLER CANYON BREAKOUT
Temperature 56 degrees
Flow 71 gpm
Rec'd 1620 hr.
Sampled 1515 hr.

Utah Power and Light Co.
P.O. Box 1005
Huntington UT 84528

WATER ANALYSIS

Acidity	39	mg/l CaCO3	Iron, Dissolved	0.12	mg/l
05-30-89	1400 hr.		05-30-89	1315 hr.	
Alk., Bicarbonate	447	mg/l HCO3	Magnesium	82.50	mg/l
05-30-89	1400 hr.		05-30-89	1300 hr.	
Alk., Carbonate	1<	mg/l CaCO3	Manganese	0.06	mg/l
05-30-89	1400 hr.		05-30-89	1415 hr.	
Alk., Total	366	mg/l CaCO3	Oil and Grease	1.0<	mg/l
05-30-89	1400 hr.		05-30-89	1100 hr.	
Anions, Total	17.39	meq/l	Oxygen, Dissolved	6.6	mg/l
05-30-89			05-19-89	1330 hr.	
Calcium	173.7	mg/l	pH	7.30	Units
05-30-89	1330 hr.		05-19-89	1300 hr.	
Cations, Total	17.17	meq/l	Potassium	7.50	mg/l
			05-30-89	1345 hr.	
Chloride	10.0	mg/l	Sodium	35.40	mg/l
05-30-89	1530 hr.		05-30-89	1400 hr.	
Conductivity	1900	umhos/cm	Solids, Dissolved	1039.0	mg/l
05-23-89	1405 hr.		05-23-89	0730 hr.	
Hardness, Total	773	mg/l CaCO3	Solids, Suspended	7.0	mg/l
			05-23-89	0730 hr.	
Iron	0.22	mg/l	Sulfate	475.0	mg/l
05-30-89	1315 hr.		05-31-89	1500 hr.	

ANALYST: D. Lyon

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

M M

Manager, Huntington Laboratory

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PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311

July 6, 1989

Job No.: 59 9771

Date Rec'd: June 15, 1989

Date Sampled: June 16, 1989

Sampled By: UP&L

Sample ID: UP&L

MILLER CANYON
Temperature 58 degrees
Rec'd 1000 hr.
Sampled 1730 hr.

Utah Power and Light Co.
P.O. Box 1005
Huntington UT 84528

WATER ANALYSIS

Acidity	24	mg/l CaCO3	Iron, Dissolved	1.10	mg/l
06-21-89	1400 hr.		06-28-89	1315 hr.	
Alk., Bicarbonate	389	mg/l HCO3	Magnesium	99.40	mg/l
06-20-89	1400 hr.		06-28-89	1330 hr.	
Alk., Carbonate	1<	mg/l CaCO3	Manganese	0.05	mg/l
06-20-89	1400 hr.		06-28-89	1345 hr.	
Alk., Total	319	mg/l CaCO3	Oil and Grease	1.0<	mg/l
06-20-89	1400 hr.		06-19-89	1500 hr.	
Anions, Total	19.24	meq/l	Oxygen, Dissolved	5.1	mg/l
			06-16-89	1600 hr.	
Calcium	187.8	mg/l	pH	7.35	Units
06-28-89	1300 hr.		06-16-89	1545 hr.	
Cations, Total	19.32	meq/l	Potassium	6.80	mg/l
			06-28-89	1400 hr.	
Chloride	15.0	mg/l	Sodium	37.30	mg/l
06-19-89	1600 hr.		06-28-89	1415 hr.	
Conductivity	1350	umhos/cm	Solids, Dissolved	1006.0	mg/l
06-16-89	1315 hr.		06-19-89	1630 hr.	
Hardness, Total	878	mg/l CaCO3	Solids, Suspended	8.0	mg/l
			06-19-89	1630 hr.	
Iron	1.18	mg/l	Sulfate	600.0	mg/l
06-28-89	1315 hr.		07-05-89	1300 hr.	

ANALYST: D. Tyson

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PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311

June 30, 1989

Job No.: 59 9781

Date Rec'd: June 20, 1989

Date Sampled: June 19, 1989

Sampled By: UP&L

Sample ID: UP&L

MILLER CANYON
Rec'd 1500 hr.
No Sampling Time

Utah Power and Light Co.
P.O. Box 1005
Huntington UT 84528

WATER ANALYSIS

Solids, Suspended 4.0 mg/l
06-21-89 1630 hr.

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ANALYST: D. Tyson

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311

August 8, 1989

Job No.: 59 9911

Date Rec'd: July 26, 1989

Date Sampled: July 26, 1989

Sampled By: UP&L

Sample ID:

MILLER CANYON BREAKOUT
Time Sampled 09:20 hr.
Time Rec'd 16:00 hr.
Templ 54
FLOW 65 GPM

Utah Power and Light Co.
P.O. Box 1005
Huntington UT 84528

WATER ANALYSIS

Acidity	40	mg/l CaCO3	Iron, Dissolved	0.96	mg/l
08-03-89		09:35 hr.	07-31-89		13:15 hr.
Alk., Bicarbonate	446	mg/l HCO3	Magnesium	84.10	mg/l
08-01-89		13:00 hr.	07-31-89		13:15 hr.
Alk., Carbonate	1<	mg/l CaCO3	Manganese	0.03	mg/l
08-01-89		13:00 hr.	07-31-89		13:15 hr.
Alk., Total	366	mg/l CaCO3	Oil and Grease	1.0<	mg/l
08-01-89		13:00 hr.	07-26-89		17:00 hr.
Anions, Total	16.69	meq/l	Oxygen, Dissolved	4.4	mg/l
			07-26-89		15:30 hr.
Calcium	160.4	mg/l	pH	6.95	Units
07-28-89		13:00 hr.	07-26-89		15:10 hr.
Cations, Total	16.43	meq/l	Potassium	6.40	mg/l
			07-31-89		13:00 hr.
Chloride	15.0	mg/l	Sodium	31.40	mg/l
		16:00 hr.	07-31-89		13:00 hr.
Conductivity	900	umhos/cm	Solids, Dissolved	827.0	mg/l
08-03-89		09:35 hr.	08-03-89		17:00 hr.
Hardness, Total	747	mg/l CaCO3	Solids, Suspended	1.0<	mg/l
			08-03-89		17:00 hr.
Iron	0.97	mg/l	Sulfate	435.0	mg/l
07-31-89		13:15 hr.	08-03-89		10:00 hr.

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ANALYST: _____

Respectfully submitted,
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PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311

August 15, 1989

Job No.: 59 9935

Date Rec'd: August 8, 1989

Date Sampled: August 8, 1989

Sampled By: UP&L

Utah Power and Light Co.
P.O. Box 1005
Huntington UT 84528

Sample ID: UP&L

MILLER CANYON BREAKOUT
Temperature 56 degrees
Flow 78 gpm
Sampled 0825 hr.

pH HOLDING EXCEED -
Resampled 8/15/89

WATER ANALYSIS

Alk., Bicarbonate	479	mg/l HCO3	Iron, Dissolved	0.41	mg/l
08-11-89	1500 hr.		08-11-89	1345 hr.	
Alk., Carbonate	1<	mg/l CaCO3	Magnesium	83.40	mg/l
08-11-89	1500 hr.		08-11-89	1415 hr.	
Alk., Total	393	mg/l CaCO3	Manganese	0.04	mg/l
08-11-89	1500 hr.		08-11-89	1330 hr.	
Anions, Total	17.32	meq/l	Oil and Grease	4.5	mg/l
			08-09-89	0900 hr.	
Calcium	179.2	mg/l	Potassium	6.30	mg/l
08-11-89	1400 hr.		08-11-89	1300 hr.	
Cations, Total	17.34	meq/l	Sodium	32.00	mg/l
			08-11-89	1300 hr.	
Chloride	15.0	mg/l	Solids, Dissolved	996.0	mg/l
08-11-89	1500 hr.		08-10-89	1600 hr.	
Conductivity	1300	umhos/cm	Solids, Suspended	1.0<	mg/l
08-14-89	1330 hr.		08-10-89	1600 hr.	
Hardness, Total	791	mg/l CaCO3	Sulfate	440.0	mg/l
			08-09-89	1000 hr.	

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ANALYST: D. Tyson

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, Huntington Laboratory

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OVER 40 BRANCH LABORATORIES STRATEGICALLY LOCATED IN PRINCIPAL COAL MINING AREAS,
TIDEWATER AND GREAT LAKES PORTS, AND RIVER LOADING FACILITIES

COMMERCIAL TESTING & ENGINEERING CO.
GENERAL OFFICES: 1919 SOUTH HIGHLAND AVE., SUITE 210-B, LOMBARD, ILLINOIS 60148 • (312) 953-9300
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Member of the SGS Group (Société Générale de Surveillance)

PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311

August 16, 1989

Job No.: 59 9941

Date Rec'd: August 15, 1989

Date Sampled: August 15, 1989

Sampled By: UP&L

Sample ID: UP&L

MILLER CANYON BREADOUT
Resampled on 8/15/89 for
pH only
Rec'd 1530 hr.

Utah Power and Light Co.
P.O. Box 1005
Huntington UT 84528

WATER ANALYSIS

pH	8.40	Units
08-15-89		1730 hr.

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Dave Cornell by D.T.
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PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311

September 18, 1989

Job No.: 59 9975

Date Rec'd: August 29, 1989

Date Sampled: August 29, 1989

Sampled By: UP&L

Sample ID: UP&L

MILLER CANYON BREAKOUT
Temperature 54 degrees F.
Flow 70 gpm
Rec'd 1200 hrs.
Sampled 0940 hrs.

Utah Power and Light Co.
P.O. Box 1005
Huntington UT 84528

WATER ANALYSIS

Acidity	25	mg/l CaCO3	Cations, Total	15.23	meq/l
08-30-89	0930 hr.				
Aluminum	0.01<	mg/l	Chloride	20.0	mg/l
09-08-89	1300 hr.		08-30-89	1310 hr.	
Alk., Bicarbonate	434	mg/l HCO3	Chromium	0.05	mg/l
08-30-89	1000 hr.		09-08-89	1000 hr.	
Alk., Carbonate	1<	mg/l CaCO3	Conductivity	1500	umhos/cm
08-30-89	1000 hr.		08-30-89	1150 hr.	
Alk., Total	356	mg/l CaCO3	Copper	0.010<	mg/l
08-30-89	1000 hr.		09-07-89	1500 hr.	
Arsenic	0.002<	mg/l	Fluoride	0.34	mg/l
09-07-89	1000 hr.		09-08-89	1330 hr.	
Anions, Total	15.06	meq/l	Hardness, Total	689	mg/l CaCO3
Barium	0.03<	mg/l	Iron	0.25	mg/l
09-08-89	1300 hr.		08-29-89	1415 hr.	
Beryllium	0.00<	mg/l	Iron, Dissolved	0.25	mg/l
09-08-89	1000 hr.		08-29-89	1415 hr.	
Boron	0.40	mg/l	Lead	0.050<	mg/l
09-08-89	1000 hr.		09-07-89	1500 hr.	
Cadmium	0.002<	mg/l	Magnesium	80.20	mg/l
09-07-89	1500 hr.		08-29-89	1315 hr.	
Calcium	143.6	mg/l	Manganese	0.04	mg/l
08-29-89	1300 hr.		08-29-89	1400 hr.	

ANALYST: D. Tyson

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, Huntington Laboratory

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TELEPHONE: (801) 653-2311

September 18, 1989

Job No.: 59 9975

Date Rec'd: August 29, 1989

Date Sampled: August 29, 1989

Sampled By: UP&L

Sample ID: UP&L

MILLER CANYON BREAKOUT
Temperature 54 degrees F.
Flow 70 gpm
Rec'd 1200 hrs.
Sampled 0940 hrs.

Utah Power and Light Co.
P.O. Box 1005
Huntington UT 84528

WATER ANALYSIS

Mercury	0.002<	mg/l	09-06-89 1400 hr.
Molybdenum	0.10<	mg/l	09-08-89 1300 hr.
Nickel	0.03	mg/l	09-07-89 1500 hr.
Nitrogen, Ammonia	0.00	mg/l	09-15-89 1400 hr.
Nitrogen, Nitrate	0.17	mg/l	09-08-89 1515 hr.
Nitrogen, Nitrite	0.01<	mg/l	09-08-89 1515 hr.
Nitrogen, Kjeldahl	0.00	mg/l	09-15-89 1400 hr.
Oil and Grease	1.0<	mg/l	09-08-89 1000 hr.
Oxygen, Dissolved	4.5	mg/l	08-29-89 1540 hr.
pH	6.90	Units	08-29-89 1600 hr.
Phosphorus, Total	0.01<	mg/l	09-11-89 1330 hr.
Potassium	6.30	mg/l	08-29-89 1345 hr.
Selenium	0.009	mg/l	09-07-89 1100 hr.
Silica	4.20	mg/l	09-08-89 1000 hr.
Silver	0.010<	mg/l	09-07-89 1500 hr.
Sodium	30.40	mg/l	08-29-89 1330 hr.
Solids, Dissolved	963.0	mg/l	09-05-89 1630 hr.
Solids, Suspended	1.0<	mg/l	09-05-89 1630 hr.
Sulfate	360.0	mg/l	08-30-89 1100 hr.
Sulfide	0.00	mg/l	09-07-89 1455 hr.
Vanadium	0.20<	mg/l	09-08-89 1300 hr.
Zinc	0.04	mg/l	09-07-89 1500 hr.

ANALYST: D. Tyson

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COMMERCIAL TESTING & ENGINEERING CO.

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Manager, Huntington Laboratory

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PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311

September 25, 1989

Job No.: 59 10010

Date Rec'd: September 12, 1989

Date Sampled: September 12, 1989

Sampled By: UP&L

Utah Power and Light Co.
P.O. Box 1005
Huntington UT 84528

Sample ID: UP&L

MILLER CANYON BREAKOUT
Temperature 58 degrees
Flow 62.0 gpm
Rec'd 1600 hr.
Sampled 1400 hr.
FIELD MEASUREMENTS
pH 7.81
D.O. 6.70
Conductivity 1171

WATER ANALYSIS

Acidity	19	mg/l CaCO3	Iron, Dissolved	0.11	mg/l
09-20-89	1500 hr.		09-19-89	1500 hr.	
Alk., Bicarbonate	459	mg/l HCO3	Magnesium	93.10	mg/l
09-13-89	1130 hr.		09-19-89	1430 hr.	
Alk., Carbonate	1<	mg/l CaCO3	Manganese	0.06	mg/l
09-13-89	1130 hr.		09-19-89	1530 hr.	
Alk., Total	376	mg/l CaCO3	Oil and Grease	1.0<	mg/l
09-13-89	1130 hr.		09-20-89	0900 hr.	
Anions, Total	16.85	meq/l	Potassium	5.30	mg/l
			09-19-89	1445 hr.	
Calcium	153.3	mg/l	Sodium	28.40	mg/l
09-19-89	1400 hr.		09-19-89	1415 hr.	
Cations, Total	16.66	meq/l	Solids, Dissolved	967.0	mg/l
			09-13-89	1340 hr.	
Chloride	25.0	mg/l	Solids, Suspended	2.0	mg/l
09-13-89	1500 hr.		09-13-89	1340 hr.	
Hardness, Total	766	mg/l CaCO3	Sulfate	420.0	mg/l
			09-13-89	1415 hr.	
Iron	0.13	mg/l			
09-19-89	1500 hr.				

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ANALYST: A. Tipon

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P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311

October 20, 1989

Job No.: 59 10081

Date Rec'd: October 17, 1989

Date Sampled: October 17, 1989

Sampled By: UP&L

Utah Power and Light Co.
P.O. Box 1005
Huntington UT 84528

Sample ID: UP&L

MILLER CANYON BREAKOUT
Temperature 52 degrees
Flow 40.0 gpm
Rec'd 1030 hr.
Sampled 0915 hr.
Field Measurements
pH 7.12
D.O. 7.92
Conductivity 1190

WATER ANALYSIS

Acidity	57	mg/l CaCO3	Magnesium	79.60	mg/l
10-17-89	1300 hr.		10-19-89	1400 hr.	
Alk., Bicarbonate	442	mg/l HCO3	Manganese	0.01<	mg/l
10-17-89	1300 hr.		10-19-89	1430 hr.	
Alk., Carbonate	1<	mg/l CaCO3	Oil and Grease	1.0<	mg/l
10-17-89	1300 hr.		10-17-89	1630 hr.	
Alk., Total	362	mg/l CaCO3	Oxygen, Dissolved	3.3	mg/l
10-17-89	1300 hr.		10-17-89	1145 hr.	
Anions, Total	12.59	meq/l	pH	7.00	Units
			10-17-89	1115 hr.	
Calcium	95.8	mg/l	Potassium	5.70	mg/l
10-19-89	1630 hr.		10-19-89	1300 hr.	
Cations, Total	12.86	meq/l	Sodium	32.50	mg/l
			10-19-89	1530 hr.	
Chloride	10.0	mg/l	Solids, Dissolved	936.0	mg/l
10-17-89	1300 hr.		10-18-89	1645 hr.	
Conductivity	1200	umhos/cm	Solids, Suspended	1.0<	mg/l
10-17-89	1155 hr.		10-18-89	1645 hr.	
Hardness, Total	567	mg/l CaCO3	Sulfate	250.0	mg/l
			10-18-89	1000 hr.	
Iron	0.06	mg/l			
10-19-89	1445 hr.				

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ANALYST: D. Tipon

Respectfully submitted,
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10081
Biomoinitoring

Miller Canyon Breakout
10-17-89

PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311

REGION VIII GUIDANCE FOR ACUTE WHOLE EFFLUENT REPORTING

PERMITTEE NAME Utah Power and Light Co. NPDES No UT-0022896

20% MORTALITY TEST: X pass ___ fail LC50 n/a % OUTFALL NO 004

TEST ANIMAL & AGE Fathead minnow 4 d. SAMPLE TIME & DATE Oct 17, 1989 9:30 am

Analysis Time & Date: Begin 10-17-89 10 am End 10-21-89 10 am

Receiving Water Hardness 310 Reconstituted Water Hardness (if used) ___

Measurements	Dilutions (% Effluent)*						
	0%	6%	12.5%	25%	50%	75%	100%
No @ Start of Test	20		20	20	20	20	20
No live after 24 hrs	20		20	20	20	20	19
No live after 48 hrs	20		20	20	20	20	19
No live after 72 hrs	20		20	20	20	20	19
No live after 96 hrs	20		20	20	20	20	19
Initial DO: mg/l	8.93		8.02	7.67	6.98	6.02	4.74
DO; 24 hrs: old/new	6.4/7.6	/	6.4 / 7.4	6.4 / 7.1	6.1/ 6.5	5.9 /6.0	5.7 /5.0
DO; 48 hrs: old/new	6.4/7.5	/	6.5 / 7.4	6.7 / 7.3	6.4/ 7.1	6.1 /6.8	6.3 /6.1
DO; 72 hrs: old/new	7.1/7.5	/	6.8 / 7.4	6.5 / 7.3	6.7/ 7.2	6.6 /6.9	6.6 /6.1
DO; 96 hrs:	6.67		6.70	6.90	6.94	7.10	5.26
Initial temp: °C	22		22	22	22	22	22
Temp; 24 hrs: old/new	21/21	/	21 / 21	21 / 21	21 / 21	21 / 21	21 / 21
Temp; 48 hrs: old/new	21/21	/	21 / 21	21 / 21	21 / 21	21 / 21	21 / 21
Temp; 72 hrs: old/new	21/21	/	21 / 21	21 / 21	21 / 21	21 / 21	21 / 21
Temp; 96 hrs:	21		21	21	21	21	21

Initial alkal. 0% 287 100% 362 Initial Effluent Hardness 567

Initial NH_3 as N 0% <0.01 100% <0.01 Initial pH 0% 8.25 100% 7.00

Final pH 0% 8.20 100% 8.00 ANALYST'S NAME David Councill

LABORATORY CTE-Huntington SIGNATURE/DATE [signature] 26 Oct 89

* normally, a minimum of five plus control (0%) OCT 2 0 1989 6/28/88

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10081
Biomonitoring

Miller Canyon Breakout
10-17-89

PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311

REGION VIII GUIDANCE FOR ACUTE WHOLE EFFLUENT REPORTING

PERMITTEE NAME Utah Power and Light Co. NPDES No UT-0022896

20% MORTALITY TEST: X pass ___ fail LC50 n/a % OUTFALL NO 004

TEST ANIMAL & AGE Ceriodaphnia <24 hr. SAMPLE TIME & DATE 10-17-89 9:30 am

Analysis Time & Date: Begin 10-18-89 10 am End 10-20-89 10 am

Receiving Water Hardness 310 Reconstituted Water Hardness (if used) ___

Measurements	Dilutions (% Effluent)*						
	0%	6%	12.5%	25%	50%	75%	100%
No @ Start of Test	20		20	20	20	20	20
No live after 24 hrs	20		20	20	20	20	20
No live after 48 hrs	20		20	20	20	20	20
No live after 72 hrs							
No live after 96 hrs							
Initial DO: mg/l	7.60		7.40	7.06	6.54	6.00	5.02
DO; 24 hrs: old/new	6.5/7.5	/	6.7 / 7.4	6.7 / 7.2	6.2/ 7.1	5.8 / 6.8	5.4/ 6.1
DO; 48 hrs: old/new	5.8/	/	6.1 /	6.1 /	6.3/	5.9 /	5.9/
DO; 72 hrs: old/new	/	/	/	/	/	/	/
DO; 96 hrs:							
Initial temp: °C	21		21	21	21	21	21
Temp; 24 hrs: old/new	21/ 21	/	21 / 21	21 / 21	21 / 21	21 / 21	21 / 21
Temp; 48 hrs: old/new	21/	/	21 /	21 /	21 /	21 /	21 /
Temp; 72 hrs: old/new	/	/	/	/	/	/	/
Temp; 96 hrs:							

Initial alkal. 0% 287 100% 362 Initial Effluent Hardness 567

Initial NH_3 as N 0% <0.01 100% <0.01 Initial pH 0% 8.25 100% 7.00

Final pH 0% 8.3 100% 8.1 ANALYST'S NAME David Councill

LABORATORY CTE-Huntington SIGNATURE/DATE 10-26-89

* normally, a minimum of five plus control (0%)

OCT 2 1989

6/28/88

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PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311

October 27, 1989

Job No.: 59 10107

Date Rec'd: October 26, 1989

Date Sampled: October 25, 1989

Sampled By: UP&L

Sample ID: UP&L

MILLER CANYON BREAKOUT
Temperature 52 degrees
Flow 36 gpm
Rec'd 0830 hr.
Sampled 1400 hr.

Utah Power and Light Co.
P.O. Box 1005
Huntington UT 84528

WATER ANALYSIS

Solids, Suspended 1630 hr.	1.0<	mg/l

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ANALYST: D. Tyson

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

David Cornell
Manager, Huntington Laboratory

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PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311

November 21, 1989

Job No.: 59 10150

Date Rec'd: November 14, 1989

Date Sampled: November 14, 1989

Sampled By: UP&L

Utah Power and Light Co.
P.O. Box 1005
Huntington UT 84528

Sample ID: UP&L

MILLER CANYON BREAKOUT- OUTFALL 004
Temperature 50 degrees
Flow 35 gpm
Rec'd 1630 hr.
Sampled 1520 hr.
FIELD MEASUREMENTS
pH 7.42
DO 8.67
Conductivity 1134

WATER ANALYSIS

Acidity	26	mg/l CaCO3	
11-20-89	1145 hr.		
Alk., Bicarbonate	432	mg/l HCO3	
11-20-89	1150 hr.		
Alk., Carbonate	1<	mg/l CaCO3	
11-20-89	1150 hr.		
Alk., Total	354	mg/l CaCO3	
11-20-89	1150 hr.		
Anions, Total	14.60	meq/l	
Calcium	141.2	mg/l	
11-15-89	1300 hr.		
Cations, Total	14.67	meq/l	
Chloride	20.0	mg/l	
11-20-89	1030 hr.		
Conductivity	1300	umhos/cm	
11-20-89	1600 hr.		
Hardness, Total	663	mg/l CaCO3	
Iron	0.02<	mg/l	
11-15-89	1415 hr.		
Iron, Dissolved	0.02<	mg/l	
11-15-89	1415 hr.		
Magnesium	75.40	mg/l	
11-15-89	1330 hr.		
Manganese	0.02	mg/l	
11-15-89	1345 hr.		
Oil and Grease	1.0<	mg/l	
11-21-89	0930 hr.		
Oxygen, Dissolved	4.8	mg/l	
11-14-89	1645 hr.		
pH	7.00	Units	
11-14-89	1650 hr.		
Potassium	5.30	mg/l	
11-15-89	1400 hr.		
Sodium	30.10	mg/l	
11-15-89	1345 hr.		
Solids, Dissolved	929.0	mg/l	
11-20-89	1515 hr.		
Solids, Suspended	1.0<	mg/l	
11-20-89	1515 hr.		
Sulfate	340.0	mg/l	
11-20-89	0900 hr.		

ANALYST: D. Igpon

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Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, Huntington Laboratory

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10150
Biomonitoring

MILLER CANYON BREAKOUT
11-14-89

PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311

REGION VIII GUIDANCE FOR ACUTE WHOLE EFFLUENT REPORTING

PERMITTEE NAME Utah Power and Light Co. NPDES No UT-0022896

20% MORTALITY TEST: X pass ___ fail LC50 n/a % OUTFALL NO 004

TEST ANIMAL & AGE Pimephales 5 d. SAMPLE TIME & DATE Nov. 14 15:20

Analysis Time & Date: Begin 11-15 09:00 End 11-19 09:00

Receiving Water Hardness 571 Reconstituted Water Hardness (if used) ___

Measurements	Dilutions (% Effluent)*						
	0%	6%	12.5%	25%	50%	75%	100%
No @ Start of Test	20		20	20	20	20	20
No live after 24 hrs	20		20	20	20	18	19
No live after 48 hrs	20		20	20	20	18	19
No live after 72 hrs	20		20	20	20	18	19
No live after 96 hrs	20		20	19	20	18	19
Initial DO: mg/l	8.52		7.05	7.05	7.12	7.08	6.89
DO; 24 hrs: old/new	6.9/7.2	/	6.9/7.3	6.9/7.5	7.2/7.2	6.9/6.9	6.7/6.4
DO; 48 hrs: old/new	5.6/7.2	/	6.1/6.9	6.2/7.0	6.0/6.8	6.0/6.8	6.1/6.7
DO; 72 hrs: old/new	6.2/7.0	/	5.9/6.8	5.9/6.9	6.3/6.9	6.8/6.8	6.0/6.7
DO; 96 hrs:	6.9		6.5	6.2	6.4	6.4	6.2
Initial temp: °C	20		20	20	20	20	20
Temp; 24 hrs: old/new	20/20	/	20/20	20/20	20/20	20/20	20/20
Temp; 48 hrs: old/new	20/21	/	20/21	20/21	20/21	20/21	20/21
Temp; 72 hrs: old/new	20/20	/	20/20	20/20	20/20	20/20	20/20
Temp; 96 hrs:	21		21	21	21	21	21

Initial alkal. 0% 258 100% 354 Initial Effluent Hardness 663

Initial NH_3 as N 0% .01 100% .01 Initial pH 0% 7.90 100% 7.00

Final pH 0% 8.30 100% 8.00 ANALYST'S NAME David Councill

LABORATORY CTE-Huntington SIGNATURE/DATE [illegible] 6/28/88

* normally, a minimum of five plus control (0%)

NOV 30 1989

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COMMERCIAL TESTING & ENGINEERING CO.
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Member of the SGS Group (Société Générale de Surveillance)

10150
Biomonitoring

MILLER CANYON BREAKOUT
11-14-89

PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311

Nov. 27, 1989

REGION VIII GUIDANCE FOR ACUTE WHOLE EFFLUENT REPORTING

PERMITTEE NAME Utah Power and Light Co. NPDES No UT-0022896

20% MORTALITY TEST: X pass ___ fail LC50 n/a % OUTFALL NO 004

TEST ANIMAL & AGE Ceriodaphnia 24 h SAMPLE TIME & DATE 14 Nov 15:20

Analysis Time & Date: Begin Nov 16 13:00 End Nov 18 13:00

Receiving Water Hardness 571 Reconstituted Water Hardness (if used) ___

Measurements	Dilutions (% Effluent)*						
	0%	6%	12.5%	25%	50%	75%	100%
No @ Start of Test	20		20	20	20	20	20
No live after 24 hrs	20		20	20	20	20	20
No live after 48 hrs	20		20	20	20	20	20
No live after 72 hrs							
No live after 96 hrs							
Initial DO: mg/l	7.2		7.3	7.5	7.2	6.9	6.4
DO; 24 hrs: old/new	7.0/7.2	/	7.0/6.9	7.0/7.0	7.0/6.8	6.9/6.8	6.5/6.7
DO; 48 hrs: old/new	7.0/	/	6.9/	6.9/	6.8/	6.9/	6.7/
DO; 72 hrs: old/new	/	/	/	/	/	/	/
DO; 96 hrs:							
Initial temp: °C	20		20	20	20	20	20
Temp; 24 hrs: old/new	20/20	/	20/20	20/20	20/20	20/20	20/20
Temp; 48 hrs: old/new	20/	/	20/	20/	20/	20/	20/
Temp; 72 hrs: old/new	/	/	/	/	/	/	/
Temp; 96 hrs:							

Initial alkal. 0% 258 100% 354 Initial Effluent Hardness 663

Initial NH_3 as N 0% .01 100% .01 Initial pH 0% 7.90 100% 7.00

Final pH 0% 8.5 100% 8.2 ANALYST'S NAME David Councill

LABORATORY CTE-Huntington SIGNATURE/DATE [illegible] -89

* normally, a minimum of five plus control (0%) 6/28/88

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PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311

December 8, 1989

Job No.: 59 10177

Date Rec'd: December 1, 1989

Date Sampled: November 30, 1989

Sampled By: UP&L

Utah Power and Light Co.
P.O. Box 1005
Huntington UT 84528

Sample ID: UP&L

MILLER CANYON DISCHARGE OUTFALL 004
Temperature 42 degrees
Flow 26 gpm
Rec'd 0830 hr.
Sampled 1730 hr.

WATER ANALYSIS

Solids, Suspended	1.0<	mg/l
12-05-89 1600 hr.		

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ANALYST: D. Lyon

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Dave Councill Mgr

Manager, Huntington Laboratory

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PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311

December 19, 1989

Job No.: 59 10195

Date Rec'd: December 11, 1989

Date Sampled: December 11, 1989

Sampled By: UP&L

Utah Power and Light Co.
P.O. Box 1005
Huntington UT 84528

Sample ID: UP&L

WILBERG MINE DISCHARGE @ MILLER CANYON
Flow 46 gpm Outfall 004
Temperature 46 degrees
FIELD MEASUREMENTS
DO 8.93
Conductivity 1129
pH 7.71
Rec'd 1300 hr.
Sampled 1130 hr.

WATER ANALYSIS

Acidity	27	mg/l CaCO3	Iron, Dissolved	0.09	mg/l
12-13-89	1230 hr.		12-13-89	1415 hr.	
Alk., Bicarbonate	418	mg/l HCO3	Magnesium	69.10	mg/l
12-13-89	1130 hr.		12-13-89	1330 hr.	
Alk., Carbonate	1<	mg/l CaCO3	Manganese	0.03	mg/l
12-13-89	1130 hr.		12-13-89	1430 hr.	
Alk., Total	338	mg/l CaCO3	Oil and Grease	1.2	mg/l
12-13-89	1130 hr.		12-19-89	0900 hr.	
Anions, Total	15.55	meq/l	Oxygen, Dissolved	4.4	mg/l
			12-11-89	1625 hr.	
Calcium	172.0	mg/l	pH	7.00	Units
12-13-89	1315 hr.		12-11-89	1610 hr.	
Cations, Total	15.53	meq/l	Potassium	5.43	mg/l
			12-13-89	1400 hr.	
Chloride	20.0	mg/l	Sodium	26.20	mg/l
12-13-89	1535 hr.		12-13-89	1300 hr.	
Conductivity	1000	umhos/cm	Solids, Dissolved	911.0	mg/l
12-13-89	1300 hr.		12-14-89	1600 hr.	
Hardness, Total	714	mg/l CaCO3	Solids, Suspended	6.0	mg/l
			12-14-89	1600 hr.	
Iron	0.15	mg/l	Sulfate	400.0	mg/l
12-13-89	1415 hr.		12-14-89	1015 hr.	

ANALYST: D. Tyson

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Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, Huntington Laboratory

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P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311

10195
Biomonitoring

WILBERG MINE DISCHARGE
@ Miller Canyon
28 gpm

REGION VIII GUIDANCE FOR ACUTE WHOLE EFFLUENT REPORTING

PERMITTEE NAME Utah Power and Light Co. NPDES No UT-0024896

20% MORTALITY TEST: X pass ___ fail LC50 n/a % OUTFALL NO ___

TEST ANIMAL & AGE Ceriodaphnia <24h. SAMPLE TIME & DATE Dec 11, 1989 11:30

Analysis Time & Date: Begin 12/13 10:00 End 12/15 10:00

Receiving Water Hardness 543 Reconstituted Water Hardness (if used) ___

Measurements	Dilutions (% Effluent)*						
	0%	6%	12.5%	25%	50%	75%	100%
No @ Start of Test	20		20	20	20	20	20
No live after 24 hrs	20		20	20	20	20	20
No live after 48 hrs	20		20	20	20	20	20
No live after 72 hrs							
No live after 96 hrs							
Initial DO: mg/l	8.6		8.4	8.1	7.6	8.0	7.3
DO; 24 hrs: old/new	6.9/6.9	/	6.9/7.0	6.9/6.9	7.0/7.2	6.9/7.2	6.6/6.5
DO; 48 hrs: old/new	6.9/	/	6.6/	6.8/	6.8/	6.7/	6.7/
DO; 72 hrs: old/new	/	/	/	/	/	/	/
DO; 96 hrs:							
Initial temp: °C	20		20	20	20	20	20
Temp; 24 hrs: old/new	20/20	/	20/20	20/20	20/20	20/20	20/20
Temp; 48 hrs: old/new	20/	/	20/	20/	20/	20/	20/
Temp; 72 hrs: old/new	/	/	/	/	/	/	/
Temp; 96 hrs:							

Initial alkal. 0% 298 100% 338 Initial Effluent Hardness 714

Initial NH_3 as N 0% <.01 100% <.01 Initial pH 0% 7.4 100% 7.0

Final pH 0% 8.5 100% 8.2 ANALYST'S NAME David Councill

LABORATORY CTE-Huntington SIGNATURE/DATE [signature] 12/19/89

* normally, a minimum of five plus control (0%) 6/28/88

COMMERCIAL TESTING & ENGINEERING CO.
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10195 WILBERG MINE DISCHARGE
Biomonitoring @ Miller Canyon
28 gpm

PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311

REGION VIII GUIDANCE FOR ACUTE WHOLE EFFLUENT REPORTING

PERMITTEE NAME Utah Power and Light Co. NPDES No UT-0024896

20% MORTALITY TEST: X pass ___ fail LC50 n/a % OUTFALL NO ___

TEST ANIMAL & AGE Fathead Minnow 4d SAMPLE TIME & DATE 12-11-89 11:30

Analysis Time & Date: Begin 12-12 16:00 End 12-16 16:00

Receiving Water Hardness 543 Reconstituted Water Hardness (if used) ___

Measurements	Dilutions (% Effluent)*						
	0%	6%	12.5%	25%	50%	75%	100%
No @ Start of Test	20		20	20	20	20	20
No live after 24 hrs	20		20	20	19	20	20
No live after 48 hrs	20		20	20	19	20	20
No live after 72 hrs	20		20	20	19	20	20
No live after 96 hrs	20		20	20	19	20	20
Initial DO: mg/l	8.4		7.9	7.6	7.5	7.3	6.6
DO; 24 hrs: old/new	7.7/8.6	/	7.6/8.4	7.5/8.1	7.5/7.6	7.8/8.0	7.6/7.3
DO; 48 hrs: old/new	6.9/6.9	/	6.7/7.0	6.7/6.9	6.6/7.2	6.8/7.2	6.8/6.5
DO; 72 hrs: old/new	6.8/7.6	/	6.8/7.5	6.9/7.6	5.9/7.5	6.8/6.9	6.5/7.0
DO; 96 hrs:	6.5		6.4	6.4	6.2	5.9	5.9
Initial temp: °C	20		20	20	20	20	20
Temp; 24 hrs: old/new	20/20	/	20/20	20/20	20/20	20/20	20/20
Temp; 48 hrs: old/new	20/20	/	20/20	20/20	20/20	20/20	20/20
Temp; 72 hrs: old/new	20/20	/	20/20	20/20	20/20	20/20	20/20
Temp; 96 hrs:	20		20	20	20	20	20

Initial alkal. 0% 298 100% 338 Initial Effluent Hardness 714

Initial NH_3 as N 0% <.01 100% <.01 Initial pH 0% 7.4 100% 7.0

Final pH 0% 8.3 100% 8.0 ANALYST'S NAME David Councill

LABORATORY CTE-Huntington SIGNATURE/DATE [signature] 12-19-89

* normally, a minimum of five plus control (0%) 6/28/88

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PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311

December 29, 1989

Job No.: 59 10214

Date Rec'd: December 19, 1989

Date Sampled: December 19, 1989

Sampled By: UP&L

Sample ID: UP&L

WILBERG MINE DISCHARGE
MILLER CANYON
Flow 21 gpm
Rec'd 1630 hr.
Sampled 1425 hr.

Utah Power and Light Co.
P.O. Box 1005
Huntington UT 84528

WATER ANALYSIS

Solids, Suspended	2.0	mg/l
12-28-89 1600 hr.		

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ANALYST: D. Tyson

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, Huntington Laboratory

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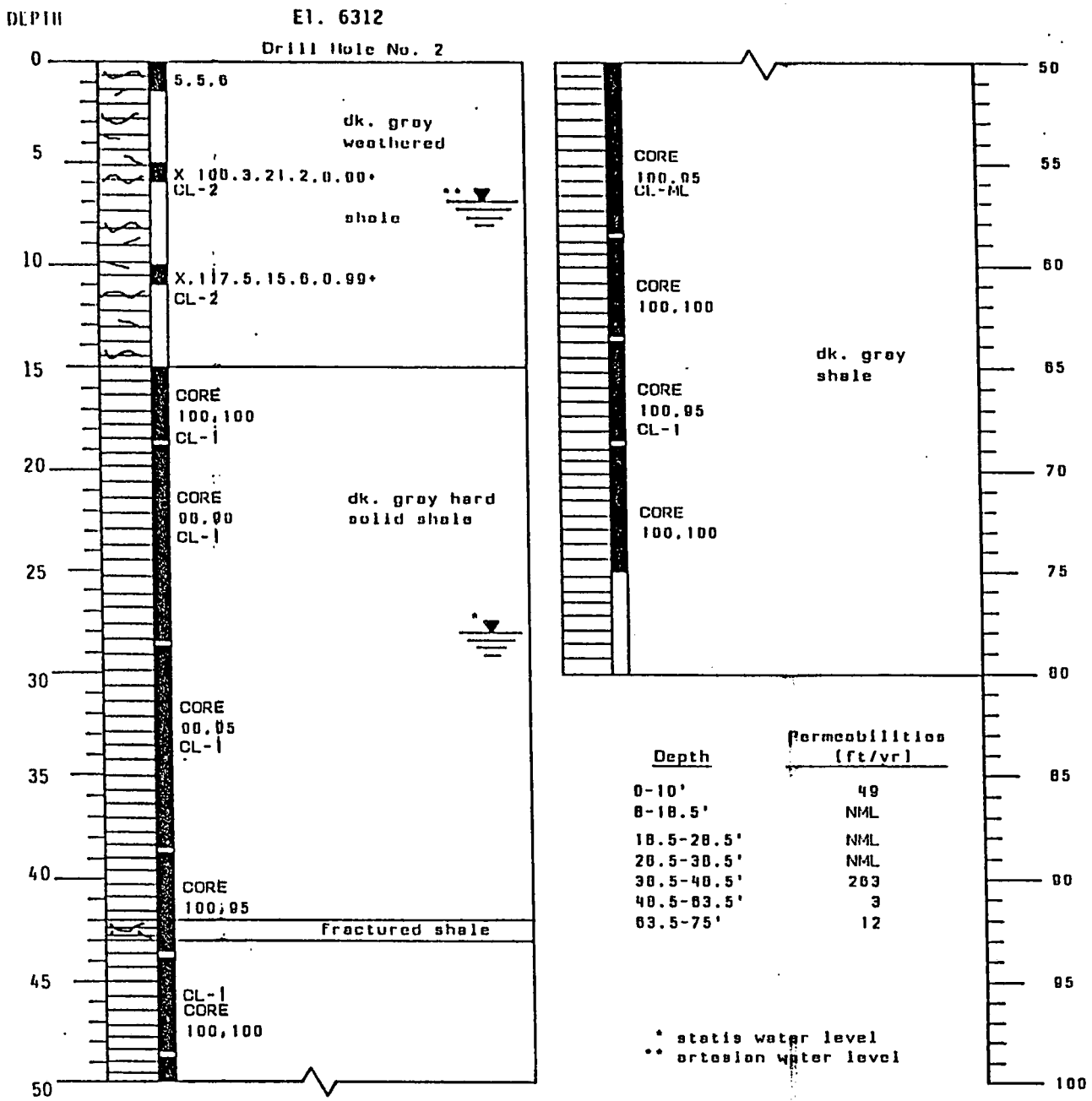
OVER 40 BRANCH LABORATORIES STRATEGICALLY LOCATED IN PRINCIPAL COAL MINING AREAS,
TIDEWATER AND GREAT LAKES PORTS, AND RIVER LOADING FACILITIES

APPENDIX K



Depth	Permeabilities (ft/yr)
0-10'	49
8-18.5'	NML
18.5-28.5'	NML
28.5-38.5'	NML
38.5-48.5'	263
48.5-63.5'	3
63.5-75'	12

* statis water level
** artesian water level

LEGEND

sample location

X,0.30 torvane value

undisturbed sample

5,6,6 no. of blows per 6" with std. spoon

100,100% recovery,RQD

groundwater elevation

ROLLINS, BROWN AND GUNNELL, INC.
PROFESSIONAL ENGINEERS

Log of Boring for:
DEER CREEK MINE
WASTE ROCK STORAGE FACILITY

COMMERCIAL TESTING & ENGINEERING CO.
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PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311

June 13, 1989

Job No.: 9683

Date Rec'd: May 19, 1989

Date Sampled: May 19, 1989

Sampled By: UP&L

Sample ID:

DEER CREEK WR1
Rec'd 1145 hr.
Sampled 1030 hr.
DEPTH 4.0'

UTAH POWER & LIGHT CO.
P.O. Box 1005
Huntington, Utah 84528

WATER ANALYSIS

Acidity	16	mg/l CaCO3	05/30/89 1400 hr.
Alk., Bicarbonate	700	mg/l HCO3	05/30/89 1330 hr.
Alk., Carbonate	1<	mg/l CaCO3	05/30/89 1330 hr.
Alk., Total	574	mg/l CaCO3	05/30/89 1330 hr.
Anions, Total	366.65	meq/l	
Calcium	211.5	mg/l	06/01/89 1300 hr.
Cations, Total	364.07	meq/l	
Chloride	770.0	mg/l	05/30/89 1530 hr.
Conductivity	22000	umhos/cm	05/23/89 1405 hr.
Hardness, Total	1343	mg/l CaCO3	
Iron	0.33	mg/l	05/30/89 1300 hr.
Iron, Dissolved	0.33	mg/l	05/30/89 1300 hr.
Magnesium	197.80	mg/l	05/30/89 1330 hr.
Manganese	0.05	mg/l	05/30/89 1345 hr.
Oil and Grease	1.0<	mg/l	05/24/89 0900 hr.
Oxygen, Dissolved	6.7	mg/l	05/19/89 1300 hr.
pH	7.90	Units	05/19/89 1245 hr.
Potassium	22.60	mg/l	05/30/89 1400 hr.
Sodium	7830.00	mg/l	05/30/89 1315 hr.
Solids, Dissolved	21057.0	mg/l	05/23/89 0730 hr.
Solids, Suspended	10.0	mg/l	05/23/89 0730 hr.
Sulfate	15900.0	mg/l	06/12/89 1335 hr.

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ANALYST: D. Tipon

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COMMERCIAL TESTING & ENGINEERING CO.

Manager, Huntington Laboratory

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PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311

September 6, 1989

Job No.: 59 9959

Date Rec'd: August 25, 1989

Date Sampled: August 25, 1989

Sampled By: UP&L

Sample ID: UP&L

DEER CREEK WASTE ROCK SITE
MONITORING WELL
Rec'd 1300 hr.
Sampled 1150 hr.
WELL DEPTH 4.5'

Utah Power and Light Co.
P.O. Box 1005
Huntington UT 84528

WATER ANALYSIS

Acidity	1<	mg/l CaCO3	Magnesium	150.90	mg/l
08-28-89	0945 hr.		08-28-89	1300 hr.	
Alk., Carbonate	1<	mg/l CaCO3	Manganese	0.02	mg/l
08-28-89	0925 hr.		08-28-89	1315 hr.	
Alk., Total	584	mg/l CaCO3	Oil and Grease	1.0<	mg/l
08-28-89	0925 hr.		08-28-89	1000 hr.	
Anions, Total	246.52	meq/l	pH	7.50	Units
			08-25-89	1415 hr.	
Calcium	165.3	mg/l	Potassium	43.80	mg/l
08-29-89	1000 hr.		08-28-89	1100 hr.	
Cations, Total	246.24	meq/l	Sodium	5220.00	mg/l
			08-29-89	1030 hr.	
Chloride	710.0	mg/l	Solids, Dissolved	20975.0	mg/l
08-25-89	1630 hr.		08-29-89	1630 hr.	
Conductivity	22000	umhos/cm	Solids, Settleable	0.05<	mg/l
08-25-89	1525 hr.		08-25-89	1500 hr.	
Hardness, Total	1034	mg/l CaCO3	Solids, Suspended	4.0	mg/l
			08-29-89	1630 hr.	
Iron	0.15	mg/l	Sulfate	10250.0	mg/l
08-29-89	1330 hr.		08-25-89	1510 hr.	
Iron, Dissolved	0.11	mg/l			
08-29-89	1330 hr.				

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ANALYST: D. Tepon

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PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311

October 2, 1989

Job No.: 59 10028

Date Rec'd: September 21, 1989

Date Sampled: September 21, 1989

Sampled By: UP&L

Sample ID: UP&L

DEER CREEK WASTE ROCK SITE
Temperature 58 degrees
Water Depth 4.5'
Rec'd 1500 hr.
Sampled 1410hr.

Utah Power and Light Co.
P.O. Box 1005
Huntington UT 84528

WATER ANALYSIS

Acidity	1<	mg/l CaCO3	
09-27-89	1315 hr.		
Aluminum	0.58	mg/l	
09-22-89	1500 hr.		
Alk., Bicarbonate	705	mg/l HCO3	
09-27-89	1130 hr		
Alk., Carbonate	1<	mg/l CaCO3	
09-27-89	1130 hr.		
Alk., Total	578	mg/l CaCO3	
09-27-89	1130 hr.		
Arsenic	0.002<	mg/l	
09-25-89	1000 hr.		
Anions, Total	281.75	meq/l	
Barium	0.03<	mg/l	
09-22-89	1500 hr.		
Boron	1.00	mg/l	
09-25-89	0930 hr.		
Cadmium	0.002<	mg/l	
09-22-89	1429 hr.		
Calcium	193.7	mg/l	
09-22-89	0845 hr.		
Cations, Total	288.22	meq/l	
Chloride	660.0	mg/l	
09-27-89	1430 hr.		
Chromium	0.02<	mg/l	
09-22-89	1500 hr.		
Conductivity	22000	umhos/cm	
09-26-89	1415 hr.		
Copper	0.060	mg/l	
09-22-89	1525 hr.		
Fluoride	0.85	mg/l	
09-25-89	1300 hr.		
Hardness, Total	1161	mg/l CaCO3	
Iron	0.20	mg/l	
09-22-89	1100 hr.		
Iron, Dissolved	0.17	mg/l	
	1100 hr.		
Lead	0.060	mg/l	
09-22-89	1417 hr.		
Magnesium	164.40	mg/l	
09-22-89	0900 hr.		
Manganese	0.05	mg/l	
09-22-89	1015 hr.		
Mercury	0.002<	mg/l	
09-26-89	1300 hr.		

ANALYST: D. Tyson

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Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, Huntington Laboratory

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PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311

October 2, 1989

Job No.: 59 10028

Date Rec'd: September 21, 1989

Date Sampled: September 21, 1989

Sampled By: UP&L

Sample ID: UP&L

DEER CREEK WASTE ROCK SITE
Temperature 58 degrees
Water Depth 4.5'
Rec'd 1500 hr.
Sampled 1410hr.

Utah Power and Light Co.
P.O. Box 1005
Huntington UT 84528

WATER ANALYSIS

Molybdenum	0.10<	mg/l	09-22-89 1500 hr.
Nickel	0.14	mg/l	09-22-89 1432 hr.
Nitrogen, Ammonia	0.02	mg/l	09-29-89 1300 hr.
Nitrogen, Nitrate	0.30	mg/l	09-22-89 1320 hr.
Nitrogen, Nitrite	0.05	mg/l	09-22-89 1320 hr.
Oil and Grease	1.0<	mg/l	09-25-89 1530 hr.
Oxygen, Dissolved	4.0	mg/l	09-21-89 1530 hr.
pH	8.10	Units	09-21-89 1530 hr.
Phosphorus, Total	0.01<	mg/l	09-22-89 1030 hr.
Potassium	23.40	mg/l	09-22-89 1000 hr.
Selenium	0.002<	mg/l	09-28-89 1100 hr.
Sodium	6150.00	mg/l	09-22-89 0920 hr.
Solids, Dissolved	20492.0	mg/l	09-27-89 1630 hr.
Solids, Settleable	0.05<	mg/l	1630 hr.
Solids, Suspended	38.0	mg/l	09-27-89 1630 hr.
Sulfate	12000.0	mg/l	09-27-89 1000 hr.
Sulfide	0.01	mg/l	09-26-89 0830 hr.
Zinc	0.06	mg/l	09-22-89 1414 hr.

ANALYST: D. Tyson

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Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, Huntington Laboratory

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COMMERCIAL TESTING & ENGINEERING CO.
GENERAL OFFICES: 1919 SOUTH HIGHLAND AVE., SUITE 210-B, LOMBARD, ILLINOIS 60148 • (312) 953-9300
SINCE 1908
Member of the SGS Group (Société Générale de Surveillance)

PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311

December 22, 1989

Job No.: 59 10193

Date Rec'd: December 6, 1989

Date Sampled: December 6, 1989

Sampled By: UP&L

Utah Power and Light Co.
P.O. Box 1005
Huntington UT 84528

Sample ID: UP&L

DEER CREEK WASTE ROCK
Depth 3.6'
Temperature 52 degrees
FIELD MEASUREMENTS
DO 6.8
Conductivity above range
pH 7.34
Rec'd 1630 hr.
Sampled 1500 hr.

WATER ANALYSIS

Aluminum 12-19-89	0.01< 14:00 hr.	mg/l	Chromium 12-19-89	0.02< 14:00 hr.	mg/l
Alk., Bicarbonate 12-07-89	698 15:20 hr.	mg/l HCO3	Conductivity 12-07-89	26000 14:30 hr.	umhos/cm
Alk., Carbonate 12-07-89	1< 15:20 hr.	mg/l CaCO3	Copper 12-19-89	0.050 11:00 hr.	mg/l
Alk., Total 12-07-89	572 15:20 hr.	mg/l CaCO3	Fluoride 12-19-89	0.81 14:00 hr.	mg/l
Arsenic 12-21-89	0.002< 10:00 hr.	mg/l	Hardness, Total 12-11-89	951	mg/l CaCO3
Anions, Total	281.21	meq/l	Iron 12-11-89	0.08 12:00 hr.	mg/l
Barium 12-19-89	0.03< 14:00 hr.	mg/l	Iron, Dissolved 12-11-89	0.08 12:00 hr.	mg/l
Boron 12-22-89	1.23	mg/l	Lead 12-19-89	0.180 11:00 hr.	mg/l
Cadmium 12-19-89	0.002< 11:00 hr.	mg/l	Magnesium 12-11-89	144.60 11:15 hr.	mg/l
Calcium 12-11-89	142.2 10:30 hr.	mg/l	Manganese 12-11-89	0.05 12:15 hr.	mg/l
Cations, Total	284.12	meq/l	Mercury 12-20-89	0.002< 17:00 hr.	mg/l
Chloride 12-07-89	645.0 13:15 hr.	mg/l	Molybdenum 12-19-89	0.10< 14:00 hr.	mg/l

ANALYST: _____

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Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, Huntington Laboratory

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OVER 40 BRANCH LABORATORIES STRATEGICALLY LOCATED IN PRINCIPAL COAL MINING AREAS,
TIDEWATER AND GREAT LAKES PORTS, AND RIVER LOADING FACILITIES

COMMERCIAL TESTING & ENGINEERING CO.
GENERAL OFFICES: 1919 SOUTH HIGHLAND AVE., SUITE 210-B, LOMBARD, ILLINOIS 60148 • (312) 953-9300
ESTABLISHED 1908
Member of the SGS Group (Société Générale de Surveillance)

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TELEPHONE: (801) 653-2311

December 22, 1989

Job No.: 59 10193

Date Rec'd: December 6, 1989

Date Sampled: December 6, 1989

Sampled By: UP&L

Utah Power and Light Co.
P.O. Box 1005
Huntington UT 84528

Sample ID: UP&L

DEER CREEK WASTE ROCK
Depth 3.6'
Temperature 52 degrees
FIELD MEASUREMENTS
DO 6.8
Conductivity above range
pH 7.34
Rec'd 1630 hr.
Sampled 1500 hr.

WATER ANALYSIS

Nickel	0.14	mg/l	
12-19-89	11:00 hr.		
Nitrogen, Ammonia	0.23	mg/l	
12-13-89	15:50 hr.		
Nitrogen, Nitrate	0.23	mg/l	
12-08-89	13:00 hr.		
Nitrogen, Nitrite	0.02	mg/l	
12-08-89	13:00 hr.		
Oxygen, Dissolved	7.7	mg/l	
12-06-89	16:55 hr.		
pH	8.40	Units	
12-06-89	17:10 hr.		
Phosphorus, Total	0.01<	mg/l	
12-19-89	09:30 hr.		
Potassium	27.10	mg/l	
12-11-89	11:30 hr.		
Selenium	0.002<	mg/l	
12-21-89	11:00 hr.		
Sodium	6150.00	mg/l	
12-11-89	11:00 hr.		
Solids, Dissolved	21671.0	mg/l	
12-14-89	16:00 hr.		
Solids, Suspended	54.0	mg/l	
12-14-89	16:00 hr.		
Sulfate	12000.0	mg/l	
12-08-89	16:25 hr.		
Sulfide	29.00	mg/l	
12-07-89	08:30 hr.		
Zinc	0.03	mg/l	
12-19-89	11:00 hr.		

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ANALYST: [signature]

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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Manager, Huntington Laboratory

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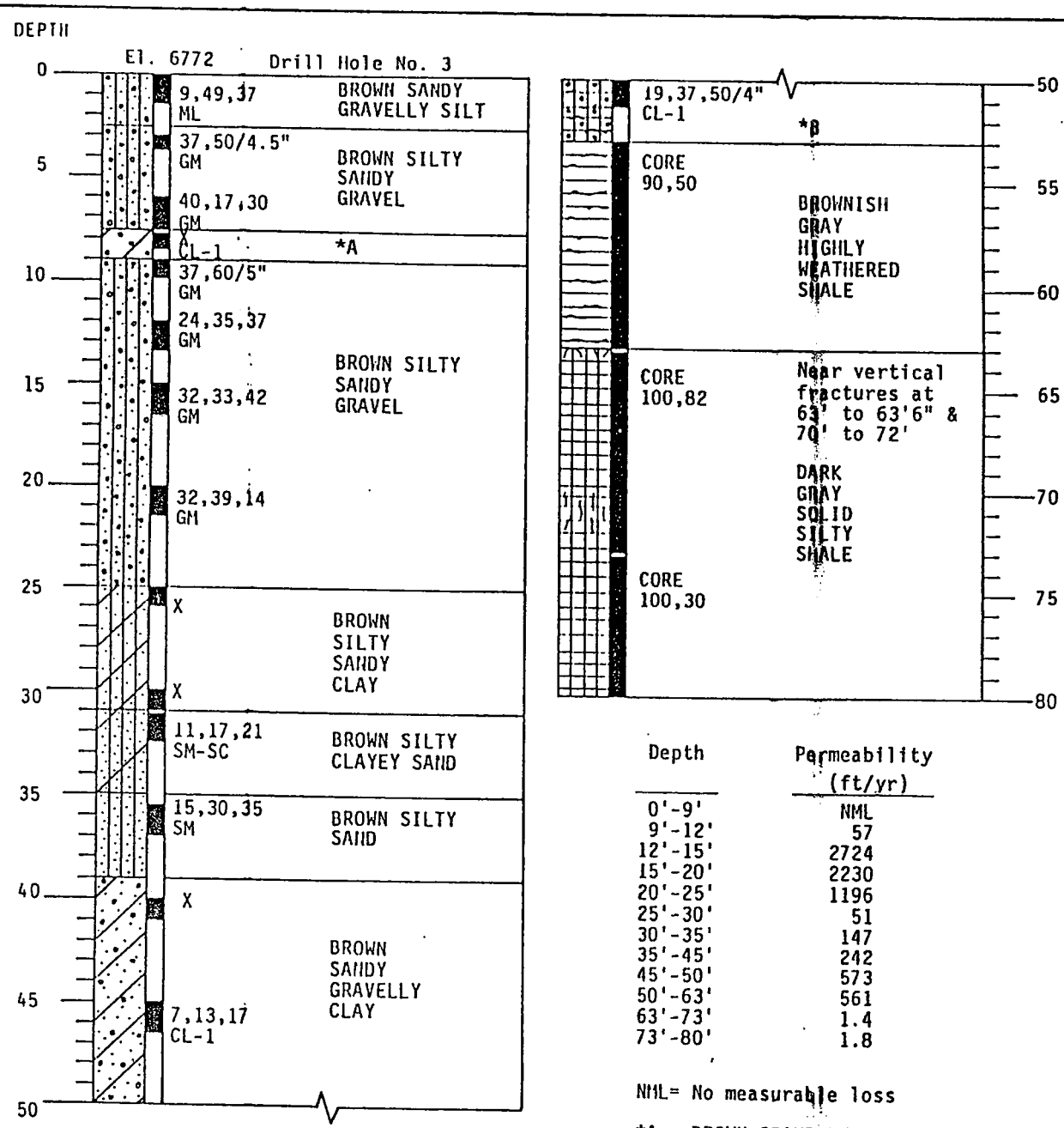
TIDEWATER AND GREAT LAKES PORTS, AND RIVER LOADING FACILITIES



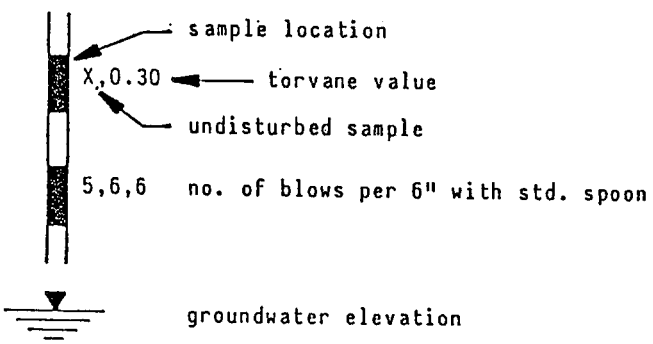
Depth	Permeability (ft/yr)
0'-9'	NML
9'-12'	57
12'-15'	2724
15'-20'	2230
20'-25'	1196
25'-30'	51
30'-35'	147
35'-45'	242
45'-50'	573
50'-63'	561
63'-73'	1.4
73'-80'	1.8

NML= No measurable loss

*A - BROWN GRAVELLY CLAY

*B - BROWN SILTY GRAVEL W/ WEATHERED SHALE

LEGEND



ROLLINS, BROWN AND GUNNELL, INC.
PROFESSIONAL ENGINEERS

Log of Borings for:
COTTONWOOD/WILBERG MINE
WASTE ROCK STORAGE FACILITY

COMMERCIAL TESTING & ENGINEERING CO.
GENERAL OFFICES: 1919 SOUTH HIGHLAND AVE., SUITE 210-B, LOMBARD, ILLINOIS 60148 • (312) 953-9300
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PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311

December 22, 1989

Job No.: 59 10184

Date Rec'd: December 5, 1989

Date Sampled: December 5, 1989

Sampled By: UP&L

Utah Power and Light Co.
P.O. Box 1005
Huntington UT 84528

Sample ID: UP&L

COTTONWOOD WASTE ROCK WELL
Depth 57'
FIELD MEASUREMENTS
pH 7.07
D.O. 7.03
Conductivity 10666

WATER ANALYSIS

Aluminum 12-19-89	61.00 14:00 hr.	mg/l	Chromium 12-19-89	0.28 14:00 hr.	mg/l
Alk., Bicarbonate 12-07-89	414 15:20 hr.	mg/l HCO3	Conductivity 12-07-89	10000 11:00 hr.	umhos/cm
Alk., Carbonate 12-07-89	1< 15:20 hr.	mg/l CaCO3	Copper 12-19-89	0.320 15:30 hr.	mg/l
Alk., Total 12-07-89	339 15:20 hr.	mg/l CaCO3	Fluoride 12-06-89	0.85 15:30 hr.	mg/l
Arsenic 12-21-89	0.008 9:00 hr.	mg/l	Hardness, Total 12-13-89	4037	mg/l CaCO3
Anions, Total	119.73	meq/l	Iron 12-11-89	5.01 12:00 hr.	mg/l
Barium 12-19-89	0.03< 14:00 hr.	mg/l	Lead 12-19-89	0.470 11:00 hr.	mg/l
Boron 12-22-89	1.59 14:00 hr.	mg/l	Magnesium 12-13-89	292.00 13:30 hr.	mg/l
Cadmium 12-19-89	0.020 11:00 hr.	mg/l	Manganese 12-11-89	2.48 12:15 hr.	mg/l
Calcium 12-13-89	1135.0 13:15 hr.	mg/l	Mercury 12-20-89	0.002< 17:00 hr.	mg/l
Cations, Total	120.38	meq/l	Molybdenum 12-19-89	0.15 14:00 hr.	mg/l
Chloride 12-07-89	815.0 13:15 hr.	mg/l	Nickel 12-19-89	0.57 11:00 hr.	mg/l

ANALYST: [signature]

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

[signature]
Manager, Huntington Laboratory

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TELEPHONE: (801) 653-2311

December 22, 1989

Job No.: 59 10184

Date Rec'd: December 5, 1989

Date Sampled: December 5, 1989

Sampled By: UP&L

Utah Power and Light Co.
P.O. Box 1005
Huntington UT 84528

Sample ID: UP&L

COTTONWOOD WASTE ROCK WELL
Depth 57'
FIELD MEASUREMENTS
pH 7.07
D.O. 7.03
Conductivity 10666

WATER ANALYSIS

Nitrogen, Ammonia	1.23	mg/l	
12-05-89	16:00 hr.		
Nitrogen, Nitrate	0.09	mg/l	
12-08-89	13:00 hr.		
Nitrogen, Nitrite	0.01<	mg/l	
12-08-89	13:00 hr.		
Oxygen, Dissolved	7.4	mg/l	
12-05-89	16:45 hr.		
pH	7.85	Units	
12-05-89	17:00 hr.		
Phosphorus, Total	0.80	mg/l	
12-06-89	13:00 hr.		
Potassium	119.10	mg/l	
12-13-89	14:00 hr.		
Selenium	0.002<	mg/l	
12-21-89	10:00 hr.		
Sodium	851.00	mg/l	
12-13-89	13:00 hr.		
Solids, Dissolved	9316.0	mg/l	
12-14-89	16:00 hr.		
Solids, Suspended	15754.0	mg/l	
12-14-89	16:00 hr.		
Sulfate	4300.0	mg/l	
12-14-89	10:15 hr.		
Sulfide	9.80	mg/l	
12-07-89	08:30 hr.		
Zinc	1.06	mg/l	
12-19-89	11:00		

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ANALYST: [illegible]

Respectfully submitted,
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OVER 40 BRANCH LABORATORIES STRATEGICALLY LOCATED IN PRINCIPAL COAL MINING AREAS,
TIDEWATER AND GREAT LAKES PORTS, AND RIVER LOADING FACILITIES

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PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311

January 11, 1990

Job No.: 59 10212

Date Rec'd: December 19, 1990

Date Sampled: December 19, 1990

Sampled By: UP&L

Sample ID: UP&l

COTTONWOOD WASTE ROCK WELL
Rec'd 1630 hr.
Sampled 1500 hr.

Utah Power and Light Co.
P.O. Box 1005
Huntington UT 84528

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WATER ANALYSIS

Acidity	10	mg/l CaCO3	Chloride	280.0	mg/l
12-28-89	1500 hr.		12-29-89	1815 hr.	
Aluminum	4.00	mg/l	Chromium	0.05	mg/l
01-10-90	1300 hr.		01-10-90	1300 hr.	
Alk., Bicarbonate	798	mg/l HCO3	Conductivity	32000	umhos/cm
12-28-89	1430 hr.		01-08-90	1500 hr.	
Alk., Carbonate	1<	mg/l CaCO3	Copper	0.070	mg/l
12-28-89	1430 hr.		01-10-90	0900 hr.	
Alk., Total	654	mg/l CaCO3	Fluoride	0.80	mg/l
12-28-89	1430 hr.		01-09-90	0930 hr.	
Arsenic	0.006	mg/l	Hardness, Total	3354	mg/l CaCO3
01-11-90	1100 hr.				
Anions, Total	150.79	meq/l	Iron	11.30	mg/l
			01-08-90	1000 hr.	
Barium	0.03<	mg/l	Iron, Dissolved	9.00	mg/l
01-10-90	1300 hr.		01-08-90	1000 hr.	
Boron	0.69	mg/l	Lead	0.050<	mg/l
01-09-90	1600 hr.		01-10-90	0900 hr.	
Cadmium	0.002<	mg/l	Magnesium	473.00	mg/l
01-10-90	0900 hr.		01-08-90	1400 hr.	
Calcium	563.0	mg/l	Manganese	0.89	mg/l
01-08-90	1415 hr.		01-08-90	0930 hr.	
Cations, Total	149.93	meq/l	Mercury	0.002<	mg/l
			01-11-90	0900 hr.	

ANALYST: D. Tyson

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, Huntington Laboratory

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OVER 40 BRANCH LABORATORIES STRATEGICALLY LOCATED IN PRINCIPAL COAL MINING AREAS,
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P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311

January 11, 1990

Job No.: 59 10212

Date Rec'd: December 19, 1990

Date Sampled: December 19, 1990

Sampled By: UP&L

Sample ID: UP&l

COTTONWOOD WASTE ROCK WELL
Rec'd 1630 hr.
Sampled 1500 hr.

Utah Power and Light Co.
P.O. Box 1005
Huntington UT 84528

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WATER ANALYSIS

Molybdenum	01-10-90 1300 hr.	0.10<	mg/l
Nickel	01-10-90 0900 hr.	0.14	mg/l
Nitrogen, Ammonia	01-04-90 1330 hr.	0.14	mg/l
Nitrogen, Nitrate	01-09-90 1500 hr.	0.48	mg/l
Nitrogen, Nitrite	01-09-90 1500 hr.	0.12	mg/l
Oil and Grease	12-29-89 1100 hr.	1.0<	mg/l
Oxygen, Dissolved	12-19-89 1730 hr.	3.3	mg/l
pH	12-19-89 1700 hr.	7.70	Units
Phosphorus, Total	01-04-90 1105 hr.	0.29	mg/l
Potassium	01-08-90 1315 hr.	41.60	mg/l
Selenium	01-11-90 1315 hr.	0.002<	mg/l
Sodium	01-08-90 1300 hr.	1905.00	mg/l
Solids, Dissolved	01-03-90 1600 hr.	8714.0	mg/l
Solids, Settleable	12-19-89 1645 hr.	13.0	mg/l
Solids, Suspended	01-03-90 1600 hr.	8000.0	mg/l
Sulfate	01-08-90 1645 hr.	6200.0	mg/l
Sulfide	12-29-89 1745 hr.	19.80	mg/l
Zinc	01-10-90 0900 hr.	0.35	mg/l

ANALYST: O. Tyson

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, Huntington Laboratory

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OVER 40 BRANCH LABORATORIES STRATEGICALLY LOCATED IN PRINCIPAL COAL MINING AREAS,
TIDEWATER AND GREAT LAKES PORTS, AND RIVER LOADING FACILITIES

APPENDIX L

JANUARY 1989
FIELD DATA

GRIMES WASH - RIGHT FORK 01/31/89				GRIMES WASH - LEFT FORK 01/31/89				GRIMES WASH - BELOW THE MINE			
	pH	uS	DO-ppm	F	pH	uS	DO-ppm	F	pH	uS	DO-ppm	F
	DRY				DRY				8.00	4290.00	6.30	38
AVERAGE									8.00	4290.00	6.30	

DEER CREEK - ABOVE MINE 01/31/89				DEER CREEK - @ PERMIT BOUNDARY 01/31/89				DEER CREEK - BELOW THE MINE			
	pH	uS	DO-ppm	F	pH	uS	DO-ppm	F	pH	uS	DO-ppm	F
	FROZEN				FROZEN				DRY			
AVERAGE												

MEETINGHOUSE CANYON 01/31/89				COTTONWOOD CANYON CREEK 01/31/89			
	pH	uS	DO-ppm	F	pH	uS	DO-ppm	F
	DRY				8.20	580.00	8.50	34
AVERAGE					8.20	580.00	8.50	

FEBRUARY 1989
FIELD DATA

	GRIMES WASH - RIGHT FORK 02/27/89				GRIMES WASH - LEFT FORK 02/27/89				GRIMES WASH - BELOW THE MINE 02/[illegible]/89			
	pH	uS	DO-ppm	F	pH	uS	DO-ppm	F	pH	uS	DO-ppm	F
	DRY				DRY				7.76	3275.00	7.80	30
AVERAGE									7.76	3275.00	7.80	

	DEER CREEK - ABOVE MINE 02/27/89				DEER CREEK - @ PERMIT BOUNDARY 02/27/89				DEER CREEK - BELOW THE MINE 02/27/89			
	pH	uS	DO-ppm	F	pH	uS	DO-ppm	F	pH	uS	DO-ppm	F
	FROZEN				FROZEN				DRY			
AVERAGE												

	MEETINGHOUSE CANYON 02/27/89				COTTONWOOD CANYON CREEK 02/27/89			
	pH	uS	DO-ppm	F	pH	uS	DO-ppm	F
	DRY				8.00	476.00	8.10	38
AVERAGE					8.00	476.00	8.10	

MARCH 1989
FIELD DATA

GRIMES WASH - RIGHT FORK 03/30/89				GRIMES WASH - LEFT FORK 03/30/89				GRIMES WASH - BELOW THE MINE 03/30/89			
pH	uS	DO-ppm	F	pH	uS	DO-ppm	F	pH	uS	DO-ppm	F
DRY				DRY				8.05	2280	7.1	47
AVERAGE								8.05	2280.00	7.10	

DEER CREEK - ABOVE MINE 03/30/89				DEER CREEK - @ PERMIT BOUNDARY 03/30/89				DEER CREEK - BELOW THE MINE 03/30/89			
pH	uS	DO-ppm	F	pH	uS	DO-ppm	F	pH	uS	DO-ppm	F
FROZEN				FROZEN				DRY			
AVERAGE											

MEETINGHOUSE CANYON 03/30/89				COTTONWOOD CANYON CREEK 03/30/89			
pH	uS	DO-ppm	F	pH	uS	DO-ppm	F
DRY				7.82	553	7.82	46
AVERAGE				AVERAGE	7.82	553.00	

APRIL 17,1989
FIELD DATA

	GRIMES WASH - RIGHT FORK				GRIMES WASH - LEFT FORK				GRIMES WASH - BELOW THE MINE			
	pH	uS	DO-ppm	F	pH	uS	DO-ppm	F	pH	uS	DO-ppm	F
	DRY				DRY				7.95	1976	8.4	49
AVERAGE									7.95	1976.00	8.40	

	DEER CREEK - ABOVE THE MINE				DEER CREEK - @ PERMIT BOUNDARY				DEER CREEK - BELOW THE MINE			
	pH	uS	DO-ppm	F	pH	uS	DO-ppm	F	pH	uS	DO-ppm	F
	DRY				DRY				DRY			
AVERAGE												

	MEETINGHOUSE CANYON				COTTONWOOD CANYON CREEK			
	pH	uS	DO-ppm	F	pH	uS	DO-ppm	F
	DRY				7.96	413	9.8	60
AVERAGE					7.96	413.00	9.80	

MAY 19,1989
FIELD DATA

	GRIMES WASH - RIGHT FORK				GRIMES WASH - LEFT FORK				GRIMES WASH - BELOW THE MINE			
	pH	uS	DO-ppm	F	pH	uS	DO-ppm	F	pH	uS	DO-ppm	F
	DRY				DRY				7.28	1516	7 2	62
VERAGE									7.28	1516.00	7.20	

	DEER CREEK - ABOVE THE MINE				DEER CREEK - @ PERMIT BOUNDARY				DEER CREEK - BELOW THE MINE			
	pH	uS	DO-ppm	F	pH	uS	DO-ppm	F	pH	uS	DO-ppm	F
	DRY				DRY				DRY			
VERA												

	MEETINGHOUSE CANYON				COTTONWOOD CANYON CREEK			
	pH	uS	DO-ppm	F	pH	uS	DO-ppm	F
	DRY				8.06	396	8.8	58
VERAGE					8.06	396.00	8.80	

EAST MOUNTAIN SPRINGS

	79-10	SHEBA	ELK	79-35	79-29	79-26	84-56	80-44	80-46	BURNT TREE	79-23	82-52
H	7.00	7.02	BATTERY FAILURE		==========>							
S	425.00	348.00										
C	8.77	13.54										
	42.00	40.00										

JUNE 19,1989
FIELD DATA

	GRIMES WASH - RIGHT FORK				GRIMES WASH - LEFT FORK				GRIMES WASH - BELOW THE MINE			
	pH	uS	DO-ppm	F	pH	uS	DO-ppm	F	pH	uS	DO-ppm	F
	DRY				DRY				7.38	1648	6.2	63
AVERAGE									7.38	1648.00	6.20	

	DEER CREEK - ABOVE THE MINE				DEER CREEK - @ PERMIT BOUNDARY				DEER CREEK - BELOW THE MINE			
	pH	uS	DO-ppm	F	pH	uS	DO-ppm	F	pH	uS	DO-ppm	F
	DRY				DRY				DRY			
AVERAGE												

	MEETINGHOUSE CANYON				COTTONWOOD CANYON CREEK			
	pH	uS	DO-ppm	F	pH	uS	DO-ppm	F
	DRY				7.94	611	7.82	50
AVERAGE					7.94	611.00	7.82	

EAST MOUNTAIN SPRINGS

	79-10	SHEBA	ELK	79-35	79-29	79-26	84-56	80-44	80-46	BURNT TREE	79-23	82-52
pH	8.08	7.83	7.49	DRY	7.39	DRY	7.38	DRY	DRY	7.94	DRY	8.12
uS	349	394	363		378		362			341		442
DO	6.62	9.72	11.2		7.59		7.62			8.68		6.82
F	45	40	41		43		41			44		42

JULY 19,1989
FIELD DATA

	GRIMES WASH - RIGHT FORK				GRIMES WASH - LEFT FORK				GRIMES WASH - BELOW THE MINE			
	pH	uS	DO-ppm	F	pH	uS	DO-ppm	F	pH	uS	DO-ppm	F
	DRY				DRY				8.06	1296	7.39	59
AVERAGE									8.06	1296.00	7.39	

	DEER CREEK - ABOVE THE MINE				DEER CREEK - @ PERMIT BOUNDARY				DEER CREEK - BELOW THE MINE			
	pH	uS	DO-ppm	F	pH	uS	DO-ppm	F	pH	uS	DO-ppm	F
	DRY				DRY				DRY			
AVERAGE									0.00	0.00		

	MEETINGHOUSE CANYON				COTTONWOOD CANYON CREEK			
	pH	uS	DO-ppm	F	pH	uS	DO-ppm	F
	DRY				8.03	431	9.16	68
AVERAGE					8.03	431.00	9.16	

EAST MOUNTAIN SPRINGS

	79-10	SHEBA	ELK	79-35	79-29	79-26	84-56	80-44	80-46	BURNT TREE	79-23	82-52
pH	7.89	7.95	8.3	DRY	7.84	7.84	7.96	DRY	DRY	8.06	DRY	7.74
uS	402	356	356		400	391	446			430		549
DO	8.08	8.68	11.3		8.9	9.8	8.34			8.66		8.08
F	42	46	40		41	52	41			43		48

AUGUST,1989
FIELD DATA

8-16-89

GRIMES WASH - RIGHT FORK

pH	uS	DO-ppm	F
DRY			

GRIMES WASH - LEFT FORK

pH	uS	DO-ppm	F
DRY			

GRIMES WASH - BELOW THE MINE

pH	uS	DO-ppm	F
7.8	2000	6.8	68

AVERAGE

8-15-89

DEER CREEK - ABOVE THE MINE

pH	uS	DO-ppm	F
DRY			

DEER CREEK - @ PERMIT BOUNDARY

pH	uS	DO-ppm	F
DRY			

DEER CREEK - BELOW THE MINE

pH	uS	DO-ppm	F
DRY			

VERAGE

8-15-89

MEETINGHOUSE CANYON

pH	uS	DO-ppm	F
DRY			

8-15-89

COTTONWOOD CANYON CREEK

pH	uS	DO-ppm	F
8.5	710	6.6	64

ERAGE

8-25-89

EAST MOUNTAIN SPRINGS

79-10	SHEBA	ELK	79-35	79-29	79-26	84-56	80-44	80-46	BURNT TREE	79-23	82-52
7.7	7.65	7.95	DRY	8.28	DRY	8.42	DRY	DRY	7.71	DRY	8.2
394	396	346		451		489			422		570
8.19	8.36	8.2		8.08		8.06			7.92		8.00
43	49	44		42		42			43		46

SEPTEMBER,1989
FIELD DATA

9-12-89

GRIMES WASH - RIGHT FORK				GRIMES WASH - LEFT FORK				GRIMES WASH - BELOW THE MINE			
pH	uS	DO-ppm	F	pH	uS	DO-ppm	F	pH	uS	DO-ppm	F
DRY				DRY				7.7	1708	7.83	53

ERAGE

9-14-89

DEER CREEK - ABOVE THE MINE				DEER CREEK - @ PERMIT BOUNDARY				DEER CREEK - BELOW THE MINE			
pH	uS	DO-ppm	F	pH	uS	DO-ppm	F	pH	uS	DO-ppm	F
DRY				DRY				DRY			

ERAGE

9-14-89

MEETINGHOUSE CANYON			
pH	uS	DO-ppm	F
DRY			

9-12-89

COTTONWOOD CANYON CREEK			
pH	uS	DO-ppm	F
7.95	670	7.86	54

ERAGE

9-11&12-89
EAST MOUNTAIN SPRINGS

79-10	SHEBA	ELK	79-35	79-29	79-26	84-56	80-44	80-46	BURNT TREE	79-23	82-52
7.48	7.87	7.59	DRY	7.99	DRY	8.01	DRY	DRY	8.02	DRY	7.88
415	406	367		514		525			490		591
6.68	8.27	9.12		6.04		9.27			8.32		9.42
41	44	40		41		41			47		40

OCTOBER,1989
FIELD DATA

GRIMES WASH - RIGHT FORK

	pH	uS	DO-ppm	F
	DRY			
AVERAGE				

GRIMES WASH - LEFT FORK

	pH	uS	DO-ppm	F
	DRY			

GRIMES WASH - BELOW THE MINE

	pH	uS	DO-ppm	F
	7.46	1597	10.77	51
AVERAGE	7.46	1597.00	10.77	

DEER CREEK - ABOVE THE MINE

	pH	uS	DO-ppm	F
	DRY			
AVERAGE				

DEER CREEK - @ PERMIT BOUNDARY

	pH	uS	DO-ppm	F
	DRY			

DEER CREEK - BELOW THE MINE

	pH	uS	DO-ppm	F
	DRY			

MEETINGHOUSE CANYON

	pH	uS	DO-ppm	F
	DRY			
AVERAGE				

COTTONWOOD CANYON CREEK

	pH	uS	DO-ppm	F
	7.77	562	13.1	46
AVERAGE	7.77	562.00	13.10	

EAST MOUNTAIN SPRINGS

	79-10	SHEBA	ELK	79-35	79-29	79-26	84-56	80-44	80-46	BURNT TREE	79-23	82-52
H	8.23	7.91	8.22	DRY	7.96	DRY	7.94	DRY	DRY	7.72	DRY	7.54
S	438	410	370		497		507			451		582
O	11.11	11.17	12.20		10.14		10.45			10.90		10.44
	43	43	39		39		44			44		40

NOVEMBER,1989
FIELD DATA

	GRIMES WASH - RIGHT FORK				GRIMES WASH - LEFT FORK				GRIMES WASH - BELOW THE MINE			
	pH	uS	DO-ppm	F	pH	uS	DO-ppm	F	pH	uS	DO-ppm	F
	DRY				DRY				7.23	1092	9.34	44
VERAGE									7.23	1092.00	9.34	

	DEER CREEK - ABOVE THE MINE				DEER CREEK - @ PERMIT BOUNDARY				DEER CREEK - BELOW THE MINE			
	pH	uS	DO-ppm	F	pH	uS	DO-ppm	F	pH	uS	DO-ppm	F
	DRY				DRY				DRY			
VERAGE												

	MEETINGHOUSE CANYON				COTTONWOOD CANYON CREEK			
	pH	uS	DO-ppm	F	pH	uS	DO-ppm	F
	DRY				7.68	521	8.35	38
VERAGE					7.68	521.00	8.35	

EAST MOUNTAIN SPRINGS

	79-10	SHEBA	ELK	79-35	79-29	79-26	84-56	80-44	80-46	BURNT TREE	79-23	82-52
	INACCESSIBLE											
pH												
uS												
DO												
F												

DECEMBER,1989
FIELD DATA

	GRIMES WASH - RIGHT FORK				GRIMES WASH - LEFT FORK				GRIMES WASH - BELOW THE MINE			
	pH	uS	DO-ppm	F	pH	uS	DO-ppm	F	pH	uS	DO-ppm	F
	DRY				DRY				7.7	1509	9.13	36
AVERAGE									7.70	1509.00	9.13	

	DEER CREEK - ABOVE THE MINE				DEER CREEK - @ PERMIT BOUNDARY				DEER CREEK - BELOW THE MINE			
	pH	uS	DO-ppm	F	pH	uS	DO-ppm	F	pH	uS	DO-ppm	F
	DRY				DRY				DRY			
AVERAGE												

	MEETINGHOUSE CANYON				COTTONWOOD CANYON CREEK			
	pH	uS	DO-ppm	F	pH	uS	DO-ppm	F
	DRY				7.88	499	6.8	34
AVERAGE					7.88	499.00	6.80	

EAST MOUNTAIN SPRINGS

	79-10	SHEBA	ELK	79-35	79-29	79-26	84-56	80-44	80-46	BURNT TREE	79-23	82-52
pH	INACCESSIBLE											
uS												
DO												
F												

UP&L MINING DIVISION
TECHNICAL SERVICES - HYDROLOGIC MONITORING

SURFACE PIEZOMETRIC DATA

	Cottonwood Canyon(EM-31)	Rilda Canyon(EM-47)	P - 1	P - 2	P - 3	P - 4	P - 5
* Collar Elevation	7417.8	8045	7516.8	7612.7	7635.1	7579.3	7564.8
Date	Reading Level	Reading Level	Reading Level	Reading Level	Reading Level	Reading Level	Reading Level
01-24-86	-41.1 7376.7	inaccessilbe	==========	==========	==========	==========	==========
02-11-86	-40.9 7376.9	inaccessilbe	==========	==========	==========	==========	==========
03-12-86	-40.6 7377.2	inaccessilbe	==========	==========	==========	==========	==========
04-07-86	-40.6 7377.2	inaccessilbe	==========	==========	==========	==========	==========
05-13-86	-40.7 7377.1	-190.9 7854.1					
JUNE-86	METER OUT OF SERVICE						
07-18-86		-200.7 7844.3	-23.3 7493.5	-38.4 7574.3	-22.6 7612.5	-18.5 7560.8	-7.0 7557.8
07-24-86	-41.8 7376.0						
08-13-86	-41.8 7376.0						
08-14-86		-199.7 7845.3	-22.6 7494.2	-38.5 7574.2	-23.2 7611.9	-18.4 7560.9	-7.0 7557.8
09-08-86	-40.8 7377.0						
09-19-86		-200.8 7844.2	-24.4 7492.4	-37.9 7574.8	-24.7 7610.4	-18.6 7560.7	-6.8 7558.0
10-07-86		-204.6 7840.4	-23.5 7493.3	-37.8 7574.9	-28.9 7606.2	-19.2 7560.1	-7.4 7557.4
10-14-86	-40.6 7377.2						
11-10-86		-206.4 7838.6	-22.4 7494.4	-38.8 7573.9	-31.3 7603.8	-18.1 7561.2	-7.0 7557.8
11-14-86	-41.0 7376.8						
12-09-86	-40.6 7377.2	-205.8 7839.2	-21.8 7495.0	-38.5 7574.2	dry	-18.5 7560.8	-7.0 7557.8
JAN-87	inaccessilbe	==========	==========	==========	==========	==========	==========
02-13-87	-40.8 7377.0	inaccessilbe	==========	==========	==========	==========	==========
03-03-87	-40.8 7377.0	inaccessilbe	==========	==========	==========	==========	==========
04-08-87	-40.6 7377.2	inaccessilbe	==========	==========	==========	==========	==========
05-20-87		-206.5 7838.5	-22.8 7494.0	-40.5 7572.2	-25.5 7609.6	-18.5 7560.8	-6.8 7558.0
05-21-87	-40.7 7377.1						
06-16-87	-40.8 7377.0	-204.8 7840.2	-22.8 7494.0	-39.0 7573.7	-23.8 7611.3	-14.4 7564.9	-5.9 7558.9
07-15-87	-40.8 7377.0	-205.1 7839.9	-22.6 7494.2	-38.5 7574.2	-23.5 7611.6	-16.8 7562.5	-6.1 7558.7
08-11-87	-40.9 7376.9						
08-18-87		-206.3 7838.7	-23.0 7493.8	-38.7 7574.0	-24.4 7610.7	-18.7 7560.6	-7.1 7557.7
SEP-87							
09-22-87	-40.6 7377.2						
10-21-87	-40.1 7377.7						
OCT-87							
10-21-87	-40.1 7377.7						
NOV-87							
12-15-87	-40.4 7377.4						
DEC-87	inaccessilbe	==========	==========	==========	==========	==========	==========
JAN-88	inaccessilbe	==========	==========	==========	==========	==========	==========
02-12-88	-41.3 7376.5	inaccessilbe	==========	==========	==========	==========	==========
03-23-88	-40.8 7377.0	inaccessilbe	==========	==========	==========	==========	==========
04-18-88	-40.8 7377.0	inaccessilbe	-22.8 7494.0	-40.8 7571.9	DRY	-19.0 7560.8	-7.0 7509.8
05-16-88	-40.8 7377.0	-211.5 7833.5	-22.5 7494.3	-41.0 7571.7	-83.8 7601.3	-18.7 7560.6	-7.1 7509.7
JUNE	METER OUT OF SERVICE						
JULY	METER OUT OF SERVICE						
AUGUST	METER OUT OF SERVICE						
09-13-88	-43.8 7374.0	-208.5 7836.5	-22.6 7494.2	-39.7 7573.0	DRY	-18.5 7560.8	-7.4 7509.4
10-11-88	-43.8 7374.0	-210.5 7834.5	-22.5 7494.3	-39.2 7573.5	DRY	-18.8 7560.5	-7.8 7509.0
10-12-88	-44.0 7373.8						
11-14-88	-42.8 7375.0						

WELL DATA - SURFACE

UP&L MINING DIVISION
TECHNICAL SERVICES - HYDROLOGIC MONITORING

SURFACE PIEZOMETRIC DATA

	Cottonwood Canyon(EM-31)	Rilda Canyon(EM-47)	P - 1	P - 2	P - 3	P - 4	P - 5
* Collar Elevation	7417.8	8045	7516.8	7612.7	7635.1	7579.3	7564.8
Date	Reading Level	Reading Level	Reading Level	Reading Level	Reading Level	Reading Level	Reading Level
11-16-88		DAMP	-23.1 7493.7	-38.8 7573.9	DRY	-19.3 7560.0	-7.2 7509.6
12-15-88	-42.4 7375.4	inaccessilbe	==========	==========	==========	==========	==========
01-31-89	-42.9 7374.9	inaccessilbe	==========	==========	==========	==========	==========
02-27-89	-42.6 7375.2	inaccessilbe	==========	==========	==========	==========	==========
03-13-89	-42.4 7375.4	inaccessilbe	-21.8 7495.0	inaccessilbe	==========)	-18.5 7560.8	-6.8 7510.0
04-17-89	-42.5 7375.3	-218.7 7826.3	-22.8 7494.0	-42.2 7570.5	DRY	-18.8 7560.5	-7.7 7509.1
05-09-89	-43.6 7374.2						
05-11-89		-210.0 7835.0	-23.0 7493.8	-42.0 7570.7	-25.2 7609.9	-18.9 7560.4	-7.2 7509.6
06-12-89		-208.5 7836.5	-23.1 7493.7	-40.5 7572.2	-24.5 7610.6	-18.8 7560.5	-6.9 7509.9
06-19-89	-44.0 7373.8						
07-15-89	-44.2 7373.6						
07-30-89		-209.5 7835.5	-22.6 7494.2	-40.0 7572.7	-30.6 7604.5	-18.8 7560.5	-7.0 7509.8
08-15-89	-44.2 7373.6	-211.0 7834.0	-21.7 7495.1	-39.6 7573.1	-34.5 7600.6	-19.1 7560.2	-7.2 7509.6
09-14-89	-44.0 7373.8						
09-12-89		-214.5 7830.5	-22.5 7494.3	-41.5 7571.2	DRY	-20.3 7559.0	-7.7 7509.1
10-10-89	-44.2 7373.6						
10-12-89		-218.5 7826.5	-21.8 7495.0	-40.0 7572.7	DRY	-20.3 7559.0	-7.7 7509.1
11-13-89		-218.5 7826.5	-20.7 7496.1	-40.5 7572.2	DRY	-20.0 7559.3	-8.7 7508.1
11-14-89	-43.8 7374.0						
12-05-89	-43.9 7373.9						
12-06-89		inaccessilbe	-23.1 7493.7	-41.6 7571.1	DRY	-21.6 7557.7	-8.5 7508.3

* Elevations corrected, surveyed August 27,1987.

** Readings cancelled due to Rilda Canyon bridge failure & replacement.

COTTONWOOD\WILBERG IN - MINE WELLS

UP&L MINING DIVISION
TECHNICAL SERVICES - HYDROLOGIC MONITORING

COTTONWOOD\WILBERG IN -MINE PIEZOMETRIC DATA

	WCP - 1 5th W. xc-16		WCP - 2 3rd S. xc-14		WCP - 3 3rd S. xc-44		WCP - 4 9th E. xc-19	
Elevation	7597		7578		7610		7645	
DRILL DEPTH	145.4		69.6		80.8		74.6	
Date	Conspec Reading	Level	Conspec Reading	Level	Conspec Reading	Level	Conspec Reading	Level
06-08-89	118.7	7570.3	61.1	7569.5	19.3	7548.5	25.7	7596.1
06-15-89	119.4	7571.0	62.4	7570.8	19.3	7548.5	26.2	7596.6
06-22-89	119.8	7571.4	62.1	7570.5	19.1	7548.3	26.0	7596.4
06-28-89	119.1	7570.7	61.5	7569.9	18.8	7548.0	26.0	7596.4
07-06-89	119.8	7571.4	61.6	7570.0	18.2	7547.4	25.5	7595.9
07-12-89	119.8	7571.4	61.6	7570.0	19.3	7548.5	26.4	7596.8
07-19-89	118.7	7570.3	61.0	7569.4	18.5	7547.7	25.5	7595.9
07-26-89	119.2	7570.8	61.4	7569.8	18.8	7548.0	26.1	7596.5
08-02-89	120.4	7572.0	61.6	7570.0	19.1	7548.3	26.5	7596.9
08-09-89	120.7	7572.3	61.7	7570.1	19.3	7548.5	26.7	7597.1
08-[illegible]-89	121.4	7573.0	61.4	7569.8	18.3	7547.5	26.4	7596.8
08-23-89	121.8	7573.4	61.5	7569.9	19.1	7548.3	26.4	7596.8
08-31-89	121.8	7573.4	61.5	7569.9	19.1	7548.3	26.4	7596.8
09-06-89	120.8	7572.4	61.8	7570.2	18.9	7548.1	26.7	7597.1
09-15-89	120.1	7571.7	61.8	7570.2	19.3	7548.5	27.5	7597.9
09-19-89	119.3	7570.9	61.6	7570.0	19.6	7548.8	27.1	7597.5
09-26-89	118.8	7570.4	61.4	7569.8	19.3	7548.5	26.9	7597.3
10-04-89	118.8	7570.4	61.6	7570.0	19.5	7548.7	27.4	7597.8
10-10-89	118.8	7570.4	61.7	7570.1	19.4	7548.6	27.6	7598.0
10-17-89	117.9	7569.5	61.2	7569.6	19.6	7548.8	27.7	7598.1
10-29-89	117.5	7569.1	60.9	7569.3	19.5	7548.7	inaccessilbe	
11-06-89	118.1	7569.7	61.1	7569.5	19.4	7548.6		
11-14-89	118.9	7570.5	61.7	7570.1	19.9	7549.1		
11-20-89	118.2	7569.8	61.3	7569.7	19.7	7548.9		
11-30-89	118.7	7570.3	61.3	7569.7	19.5	7548.7		
12-06-89	119.4	7571.0	61.8	7570.2	19.7	7548.9		
12-14-89	119.4	7571.0	61.6	7570.0	19.8	7549.0		
12-20-89	119.0	7570.6	61.7	7570.1	19.9	7549.1		
12-27-89	119.3	7570.9	61.9	7570.3	19.9	7549.1		
01-03-90	119.2	7570.8	62.1	7570.5	20.4	7549.6		
01-10-90	118.7	7570.3	61.6	7570.0	19.9	7549.1		

DEER CREEK IN - MINE WELLS

UP&L MINING DIVISION
TECHNICAL SERVICES - HYDROLOGIC MONITORING

DEER CREEK IN -MINE PIEZOMETRIC DATA

	DCP - 1 3rd N. xc-8		DCP - 2 3rd N. xc-29		DCP - 3 3rd N. xc-55		DCP - 4 1st WM xc-29	
Elevation	7530		7567		7577		7529	
DRILL DEPTH	155.4		170.5		148.9		169.6	
Date	Pressure Gauge	Level	Reading	Level	Reading	Level	Pressure Gauge	Level
12-20-89	0.4	7530.2	35.5	7531.5	56.3	7520.2	4.0	7530.7

WASTE ROCK DISPOSAL WELLS DATA

	DEER CREEK WR1		WILBERG\COTTONWOOD WCWR1		
* Collar Elevation	6312			6772	
Date	Reading	Level	Date	Reading	Level
05-19-89	-4.0	6308.0	12-05-89	-57.0	6715.0
08-25-89	-4.5	6307.5			
09-21-89	-4.5	6307.5			
12-06-89	-3.6	6308.4			

COTTONWOOD CANYON CREEK - USGS FLUME

UP&L MINING DIVISION
TECHNICAL SERVICES - HYDROLOGIC MONITORING

COTTONWOOD CANYON CREEK

Date	Time	Temp.	Flow ft.	Flow GPM	pH	Cond. (uS)	Dissolved Oxygen	Weather
	<---------- Field Measurements						---------->	
24-Jan-86	1050	32	1.1	1,593				clear 20's
11-Feb-86	1000	34	0.95	1,248				PC 20's
12-Mar-86	1100	35	0.9	1,172				cloudy 30's
07-Apr-86	1310	44	0.95	1,248				PC 50's
13-May-86	1445	52	1.2	1,822				clear 60's
10-Jun-86	1150	56	1.5	2,563				PC 60's
24-Jul-86	1120	52	0.91	1,194				PC 60's
13-Aug-86	830	50	0.83	1,037				clear 60's
08-Sep-86	900	48	0.83	1,037				PC 50's
14-Oct-86	1000	39	0.79	961				clear 50's
14-Nov-86	1400	38	0.78	943				clear 50's
09-Dec-86	1100	34	0.8	977				PC 20's
13-Jan-87	1515	34	0.79	961				cloudy 30's
24-Feb-87	900	38	0.8	977				cloudy 30's
17-Mar-87	1340	42	0.77	925				PC 30's
08-Apr-87	900	41	0.75	889				PC 40's
21-May-87	1035	44	0.85	1,075	8.27	486	14.2	rain 50's
16-Jun-87	1450	62	0.85	1,075	8.2	482.4	13.05	clear 80's
15-Jul-87	934	50	0.75	889	8.66	528	11.5	clear 80's
11-Aug-87	1235	59	0.66	730	7.1	528	10.67	clear 70's
17-Sep-87	1510	57	0.63	680	8.9	537	*	clear 70's
21-Oct-87	1310	48	0.59	615	6.98	516	*	clear 60's
17-Nov-87	920	32	0.6	631	7.09	581	*	snow 20's
15-Dec-87	1014	33	0.52	507	7.99	655	*	PC 20'S
19-Jan-88	1000	Frozen over - inaccessible						PC 10'S
12-Feb-88	1220	34	0.71	816	8.15	582	*	PC 20'S
23-Mar-88	1130	35	0.6	631	7.74	506	*	cloudy 40's
18-Apr-88	915	43	0.65	713	7.95	434	*	rain 40's
16-May-88	900	52	0.92	1,213	7.51	422	*	clear 60's
07-Jun-88	1255	50	0.66	730	7.98	526	*	clear 70's
14-Jul-88	1055	62	0.58	599	*	*	*	PC 80's
15-Aug-88	1405	64	0.56	547	*	*	*	PC 80's
13-Sep-88	1440	48	0.6	631	7.01	502	10.22	snow 30's
12-Oct-88	1039	46	0.59	615	7.74	465	11.56	rain 40's
14-Nov-88	1255	41	0.61	647	7.26	490	9.28	cloudy 30's
15-Dec-88	1300	37	0.55	552	7.81	562	10.38	cloudy 10's
31-Jan-89	1345	34	0.55	552	8.2	580	8.5	PC 20's
27-Feb-89	1330	38	0.56	547	8	476	8.1	PC 40's
30-Mar-89	1430	46	0.58	599	7.82	553	10.3	PC 30's
17-Apr-89	1520	60	0.6	631	7.96	413	9.8	PC 60's
11-May-89	930	64	0.55	552	8.01	572	7.9	PC 60's
19-Jun-89	1550	64	0.55	552	7.94	611	7.82	PC 80's
19-Jul-89	930	68	0.52	507	8.03	431	9.16	PC 80's
15-Aug-89	1450	64	0.58	599	8.5	710	6.6	PC 70's
12-Sep-89	1415	54	0.56	547	7.95	670	7.86	rain 40's
10-Oct-89	955	39	0.57	583	7.77	562	13.1	PC 60's
14-Nov-89	1455	38	0.51	492	7.68	521	8.35	clear 40's
05-Dec-89	1126	34	0.5	477	7.88	499	6.8	clear 30's

* meter out of service

DEER CREEK RUNOFF

UP&L MINING DIVISION
TECHNICAL SERVICES - HYDROLOGIC MONITORING

DEER CREEK FLOW & QUALITY

ABOVE THE MINE

Date	Time	Temp.	Field Measurements: Flow ft.	Flow GPM	pH	Cond. (uS)	Dissolved Oxygen	Weather
13-Jan-86	1055	32	<5.0					cloudy 20's
12-Feb-86	1500	33	0.1	12.6				snow 20's
11-Mar-86	1330	36	0.1	12.6				cloudy 30's
09-Apr-86	1000	35	0.27	58.8				cloudy 40's
13-May-86	1000	38	1.7	1020				clear 50's
11-Jun-86	900	44	1.7	1020				clear 60's
07-Jul-86	1010	47	0.89	371.6				cloudy 70's
13-Aug-86	1120	51	0.42	116.7				PC 70's
19-Sep-86	945	46	0.23	45.8				PC 50's
17-Oct-86	1055	32	0.22	42.6				PC 40's
10-Nov-86	1150	31	0.1	12.6	6.9	594	13.97	clear 30's
12-Dec-86	1300		no flow					PC 20's
13-Jan-87	900		no flow					cloudy 30's
13-Feb-87	930	33	0.1	12.6	*	*	*	clear 20's
17-Mar-87	1030	38	0.1	12.6	*	*	*	snow 20's
08-Apr-87	1039	38	-	25 es	7.58	1220	12.75	clear 40's
2[illegible]-May-87	1420	42	1.6	921.2	8.33	418.8	12.44	rain 50's
1[illegible]-Jun-87	1220	48	1.2	590.3	8.33	401.2	14.89	clear 70's
16-Jul-87	1000	49	0.64	223.1	7.9	471.6	12.97	clear 80's
18-Aug-87	1145	48	0.34	83.9	7.99	497	12.77	clear 70's
22-Sep-87	1020	48	0.22	42.6	8.7	553	*	clear 70's
21-Oct-87	1025	34	0.18	31.4	7.52	608	*	clear 40's
10-Nov-87	1050	36	0.34	83.9	7.83	687	*	cloudy 30's
10-Dec-87	1120	34	-	10	7.9	908	*	PC 10's
21-Jan-88	1420	32	0.1	12.6	7.57	1519	*	clear 20's
12-Feb-88	1100	34	0.1	12.6	7.93	1140	*	PC 20's
23-Mar-88	1030		frozen - no flow					cloudy 40's
18-Apr-88	1325	41	0.69	250.4	8.38	425	*	rain 40's
16-May-88	1530	44	-	1200 e	8.15	376	*	PC 70'S
07-Jun-88	1100	42	1.6	921.2	8.22	434	*	clear 70's
14-Jul-88	1220	62	0.65	228.5	*	*	*	clear 90's
16-Aug-88	935	58	0.32	76.3	*	*	*	clear 80's
14-Sep-88	1550	54	0.27	58.8	7.32	538	10.76	snow 30's
17-Oct-88	1130	38	0.24	48.9	6.94	548	9.6	clear 50's
16-Nov-88	1030		frozen - no flow					cloudy 30's
15-Dec-88	1015		frozen - no flow					cloudy 10's
31-Jan-89	915		frozen - no flow					PC 30's
27-Feb-89	1045		frozen - no flow					PC 30's
30-Mar-89	945		dry					PC 30's
17-Apr-89	1030		dry					PC 60's
19-May-89	1600		dry					PC 60'S
1[illegible]-Jun-89	830		dry					PC 70'S
1[illegible]-Jul-89	1230		dry					PC 80'S
15-Aug-89	1000		dry					PC 70'S
14-Sep-89	1150		dry					clear 60's
12-Oct-89	1330		dry					PC 50's
13-Nov-89	1240		dry					PC 40's
06-Dec-89	1230		dry					clear 30's

* meter out of service

DEER CREEK RUNOFF

UP&L MINING DIVISION
TECHNICAL SERVICES - HYDROLOGIC MONITORING

DEER CREEK FLOW & QUALITY

@ PERMIT BOUNDARY

Date	Time	Temp.	Flow ft.	Flow GPM	pH	Cond. (uS)	Dissolved Oxygen	Weather
	<----------Field Measurement---------->							
13-Jan-86	1115		no flow					cloudy 20's
12-Feb-86	1430	33	0.1	12.6				snow 20's
11-Mar-86	1345	37	0.1	12.6				cloudy 30's
09-Apr-86	1020	43	0.27	58.8				cloudy 40's
13-May-86	950	39	1.7	833.7				clear 50's
11-Jun-86	910	45	1.7	833.7				clear 60's
07-Jul-86	1030	49	0.9	378.4				cloudy 70's
13-Aug-86	1135	58	0.45	129.7				PC 70's
19-Sep-86	1000	42	0.28	61.9				PC 50's
17-Oct-86	1100	38	0.3	69.1				PC 40's
10-Nov-86	1225	32	0.1	12.6				clear 30's
12-Dec-86	1320	39	0.93	398.1**				PC 20's
13-Jan-87	930							cloudy 30's
13-Feb-87	950	42	-	670**				clear 20's
17-Mar-87	1045	40	0.15	23.8				snow 20's
08-Apr-87	1130	38	-	35 est				clear 40's
20-May-87	1440	44	1.6	921.2	8.32	684.5	12.48	rain 50's
16-Jun-87	1240	53	1.2	590.3	*	529.1	14.5	clear 70's
16-Jul-87	1029	53	0.73	273.8	8.46	660.3	13.86	clear 80's
18-Aug-87	1220	50	0.5	152.2	8.31	985	11.93	clear 70's
22-Sep-87	1040	58	0.24	48.9	8.8	905	*	clear 70's
21-Oct-87	1035	42	0.18	31.4	7.79	1228	*	clear 40's
10-Nov-87	1100	40	0.36	92	7.89	1221	*	cloudy 30's
10-Dec-87	1140		no flow					PC 10's
21-Jan-88	1435		no flow					clear 20's
12-Feb-88	1115		no flow					PC 20's
23-Mar-88	1045		no flow					cloudy 40's
18-Apr-88	1400	40	0.8	315.1	8.27	1382	*	rain 40's
16-May-88	1620	46	-	1200es	8.16	474	*	PC 70'S
07-Jun-88	1150	47	1.6	921	8.42	324	*	clear 70's
14-Jul-88	1230	66	0.65	228	*	*	*	clear 90's
16-Aug-88	1000	64	0.3	69.1	*	*	*	clear 80's
14-Sep-88	1600	53		1400**	7.83	1006	9.42	snow 30's
17-Oct-88	1120	40	0.24	48.9	6.8	853	9.3	clear 50's
16-Nov-88	1045	31	0.02	1.04	7.08	972	8.81	cloudy 30's
15-Dec-88	1025		frozen - no flow					cloudy 10's
31-Jan-89	930		frozen - no flow					PC 30's
27-Feb-89	1100		frozen - no flow					PC 30's
30-Mar-89	950		dry					PC 30's
17-Apr-89	1020		dry					PC 60's
19-May-89	1610		dry					PC 60'S
19-Jun-89	840		dry					PC 70'S
19-Jul-89	1235		dry					PC 80'S
15-Aug-89	1005		dry					PC 70'S
14-Sep-89	1210		dry					clear 60's

DEER CREEK RUNOFF

UP&L MINING DIVISION
TECHNICAL SERVICES - HYDROLOGIC MONITORING

DEER CREEK FLOW & QUALITY

@ PERMIT BOUNDARY

		<----------Field Measurement---------->					
			Flow		Cond.	Dissolved	
Date	Time	Temp.	ft.	GPM	pH	(uS)	Oxygen	Weather
12-Oct-89	1335		dry					PC 50's
13-Nov-89	1245		dry					PC 40's
06-Dec-89	1235		dry					clear 30's

* meter out of service
** includes sediment pond discharge

DEER CREEK RUNOFF

UP&L MINING DIVISION
TECHNICAL SERVICES - HYDROLOGIC MONITORING

DEER CREEK FLOW & QUALITY

BELOW THE MINE

	<----------Field Measuremen---------->						
Date	Time	Temp.	Flow ft.	Flow GPM	pH	Cond. (uS)	Dissolved Oxygen	Weather
13-Jan-86	1125		no flow					cloudy 20's
12-Feb-86	1415	33	0.1	12.6				snow 20's
11-Mar-86	1400		no flow					cloudy 30's
09-Apr-86	1030	44	0.27	58.8				cloudy 40's
13-May-86	940	41	1.7	833.				clear 50's
11-Jun-86	920	49	1.7	833.				clear 60's
07-Jul-86	1035	58	0.85	352.				cloudy 70's
13-Aug-86	1050	62	0.48	143.				PC 70's
19-Sep-86	1015	44	0.28	61.9				PC 50's
17-Oct-86	1135	45		55				PC 40's
10-Nov-86	1245	31	0.1	12.6	7.8	1572	13.56	clear 30's
12-Dec-86	1345	42	0.98	431.3**				PC 20's
13-Jan-87	945		no flow					cloudy 30's
13-Feb-87	1010	40	-	670**				clear 20's
17-Mar-87	1100	42	0.15	23.8				snow 20's
08-Apr-87	1130	50.4	-	35est	7.81	2284	14.86	clear 40's
20-May-87	1450	50	-	1200e	8.13	827.5	11.84	rain 50's
16-Jun-87	1255	64	1.2	590.	8.19	708.6	11.89	clear 70's
16-Jul-87	1040	64	0.71	262.	8.5	910.3	9.79	clear 80's
18-Aug-87	1240	66	0.5	152.	8.26	1365	11.93	clear 70's
22-Sep-87	1050	64	0.24	48.9	7.42	1462	*	clear 70's
21-Oct-87	1045	48	0.18	31.4	7.95	1625	*	clear 40's
10-Nov-87	1110	48	0.36	92	8.03	1562	*	cloudy 30's
10-Dec-87	1200		no flow					PC 10's
21-Jan-88	1445		no flow					clear 20's
12-Feb-88	1125		no flow					PC 20's
23-Mar-88	1100		no flow					cloudy 40's
18-Apr-88	1420	46	0.85	352.	8.33	1114	*	rain 40's
16-May-88	1630	46	-	1200e	8.19	612	*	PC 70'S
07-Jun-88	1210	58	1.6	921	8.18	678	*	clear 70's
14-Jul-88	1240	68	0.65	228	*	*	*	clear 90's
16-Aug-88	1010	69	0.27	58.8	*	*	*	clear 80's
14-Sep-88	1620	56		1400*	8.05	1061	9.18	snow 30's
17-Oct-88	1130	46	0.25	52.5	6.7	954	8.8	clear 50's
16-Nov-88	1100	32	0.04	3.06	7.44	1816	13.87	cloudy 30's
15-Dec-88	1035		frozen - no flow					cloudy 10's
11-Jan-89	940		frozen - no flow					PC 30's
17-Feb-89	1105		frozen - no flow					PC 30's
10-Mar-89	1015		dry					PC 30's
17-Apr-89	1015		dry					PC 60's
19-May-89	1615		dry					PC 60'S
19-Jun-89	845		dry					PC 70'S
19-Jul-89	1240		dry					PC 80'S
15-Aug-89	1010		dry					PC 70'S
14-Sep-89	1215		dry					clear 60's
12-Oct-89	1340		dry					PC 50's
13-Nov-89	1250		dry					PC 40's
16-Dec-89	1240		dry					clear 30's

* meter out of service

GRIMES WASH RUNOFF

UP&L MINING DIVISION
TECHNICAL SERVICES - HYDROLOGIC MONITORING

GRIMES WASH FLOW & QUALITY

RIGHT FORK

Date	Time	Temp.	Flow ft.	Flow GPM	pH	Cond. (uS)	Dissolved Oxygen	Weather
08-Jan-86	1500		no flow					clear 30's
11-Feb-86	1100		no flow					PC 20's
12-Mar-86	1050		no flow					cloudy 30's
07-Apr-86	1410	48	0.1	12.5				PC 50's
13-May-86	1530	54	0.18	31.4				clear 60's
10-Jun-86	1320	48	0.17	28.7				PC 60's
08-Jul-86	1330	61	0.1	12.6				PC 80's
13-Aug-86	940	52	0.09	10.7				PC 70's
08-Sep-86	1150	54	0.02	1.04				PC 60's
17-Oct-86	1000	38	0.03	1.96				PC 40's
13-Nov-86	1330		no flow					clear 40's
09-Dec-86	1145		no flow					PC 20's
09-Jan-87	1000		no flow					PC 20's
13-Feb-87	1250		no flow					clear 20's
18-Mar-87	1300		no flow					PC 20's
08-Apr-87	1355	35.3	2250est		8.11	147	13.02	PC 50's
[illegible]-May-87	1125	43.5	-	1	8.22	547	11.05	rain 50's
[illegible]-Jun-87	1550	-	no flow					clear 80's
15-Jul-87	1000	-	no flow					clear 80's
11-Aug-87	1300	-	no flow					clear 70's
17-Sep-87	1350	-	no flow					clear 70's
21-Oct-87	1115	-	no flow					clear 50's
17-Nov-87	1000	-	no flow					snow 20's
15-Dec-87	1430	-	no flow					PC 20's
21-Jan-88	1300	-	no flow					PC 10's
12-Feb-88	1300	-	no flow					PC 20's
23-Mar-88	1235	36	0.4	108.2	7.21	201	*	cloudy 40's
18-Apr-88	1025	46	0.1	12.6	8.18	375	*	rain 40's
16-May-88	1120	-	no flow					PC 60's
07-Jun-88	1335	-	no flow					clear 70's
14-Jul-88	1130	-	no flow					PC 80's
15-Aug-88	1425	-	no flow					PC 80's
13-Sep-88	1325	-	no flow					rain 40's
12-Oct-88	1030	-	no flow					rain 40's
14-Nov-88	1330	-	no flow					cloudy 30's
15-Dec-88	1345	-	no flow					cloudy 10's
31-Jan-89	1120	-	no flow					PC 30'S
27-Feb-89	1330	-	no flow					PC 30'S
30-Mar-89	1310	-	no flow					PC 30'S
17-Apr-89	1400	-	no flow					PC 60'S
19-May-89	1030	-	no flow					PC 60'S
19-Jun-89	1005	-	no flow					PC 70'S
[illegible]-Jul-89	1000	-	no flow					PC 80'S
16-Aug-89	1450	-	no flow					cloudy 70's
12-Sep-89	1350	-	no flow					rain 40's
10-Oct-89	1015	-	no flow					PC 60's
14-Nov-89	1355	-	no flow					clear 40's
15-Dec-89	1305	-	no flow					clear 30's

* meter out of service

UP&L MINING DIVISION
TECHNICAL SERVICES - HYDROLOGIC MONITORING

GRIMES WASH FLOW & QUALITY

LEFT FORK

Date	Time	Temp.	Flow ft.	Flow GPM	pH	Cond. (uS)	Dissolved Oxygen	Weather
08-Jan-86	1520	33	0.01	0.35				clear 30's
11-Feb-86	1045		no flow					PC 20's
12-Mar-86	1115	39	0.05	8.3				cloudy 30's
07-Apr-86	1420	49	0.15	44.9				PC 50's
13-May-86	1515	48	0.43	242.4				clear 60's
10-Jun-86	1305	46	0.37	188.5				PC 60's
08-Jul-86	1340	58	0.24	98.7				PC 80's
13-Aug-86	930	50	0.17	53.9				PC 70's
08-Sep-86	1140	59	0.11	26.9				PC 60's
17-Oct-86	900	36	0.1	22.4				PC 40's
13-Nov-86	1330	38	0.05	8.3	8.01	453	9.35	clear 40's
09-Dec-86	1130	36	0.01	0.35	*	*	*	PC 20's
09-Jan-87	1010		no flow					PC 20's
13-Feb-87	1305		no flow					clear 20's
18-Mar-87	1330	no flow						PC 20's
08-Apr-87	1330	51.6	0.2	71.8	7.74	337	14.12	PC 50's
21-May-87	1100	44	-	88.4	8.26	508.8	13.71	rain 50's
16-Jun-87	1540	53	-	42.6	8.1	473.7	14.53	clear 80's
15-Jul-87	1008	55	-	51.1	8.12	550.6	11.69	clear 80's
11-Aug-87	1315	62	0.11	28.3	8.33	558	9.83	clear 70's
17-Sep-87	1400	66	0.06	5.7	8.56	619	*	clear 70's
21-Oct-87	1120		no flow					clear 50's
17-Nov-87	950		no flow					snow 20's
15-Dec-87	1420		no flow					PC 20's
21-Jan-88	1330		no flow					PC 10's
12-Feb-88	1330		no flow					PC 20's
23-Mar-88	1220		no flow					cloudy 40's
18-Apr-88	1100	49	0.12	32.4	8.07	456	*	rain 40's
16-May-88	1115	60	0.22	84.5	7.83	1055	*	PC 60's
07-Jun-88	1340	56	0.2	72.7	8.45	559	*	clear 70's
14-Jul-88	1115	61	0.16	51.1	*	*	*	PC 80's
15-Aug-88	1430	68	0.1	24.3	*	*	*	PC 80's
13-Sep-88	1330	-	damp					rain 40's
12-Oct-88	1045	-	damp					rain 40's
14-Nov-88	1345	-	damp					cloudy 30's
15-Dec-88	1350	-	no flow					cloudy 10's
31-Jan-89	1115	-	no flow					PC 30'S
27-Feb-89	1335	-	no flow					PC 30'S
30-Mar-89	1320	-	no flow					PC 30'S
17-Apr-89	1350	-	no flow					PC 60'S
19-May-89	1040	-	no flow					PC 60'S
19-Jun-89	1010	-	no flow					PC 70'S
19-Jul-89	1010	-	no flow					PC 80'S
16-Aug-89	1500	-	no flow					cloudy 70's
12-Sep-89	1355	-	no flow					rain 40's
10-Oct-89	1020	-	no flow					PC 60's
14-Nov-89	1400	-	no flow					clear 40's
15-Dec-89	1310	-	no flow					clear 30's

* meter out of service

GRIMES WASH RUNOFF

UP&L MINING DIVISION
TECHNICAL SERVICES - HYDROLOGIC MONITORING

GRIMES WASH FLOW & QUALITY

BELOW THE MINE

Date	Time	Temp.	Field Measurement: Flow ft.	Flow GPM	pH	Cond. (uS)	Dissolved Oxygen	Weather
08-Jan-86	1630	33		5-10				clear 30's
11-Feb-86	1005	33		10-15				PC 20's
12-Mar-86	1130	38		10-15				cloudy 30's
07-Apr-86	1430	47		65				PC 50's
13-May-86	1615	48		280				clear 60's
10-Jun-86	1300	48		225				PC 60's
08-Jul-86	1350	54		110				PC 80's
13-Aug-86	915	52		70				PC 70's
08-Sep-86	1040	52		30				PC 60's
17-Oct-86	1005	44		40				PC 40's
13-Nov-86	1400	40.1		60*	6.10	1618	11.6	clear 40's
09-Dec-86	1200	36		55*	*	*	*	PC 20's
09-Jan-87	1030	34		35*	*	*	*	PC 20's
13-Feb-87	1335	38		45*	*	*	*	clear 20's
18-Mar-87	1400	42		12.5				PC 20's
08-Apr-87	1430	39.3		2350est	7.96	232	12.94	PC 50's
21-May-87	1220	50		70	7.69	1685.	11.94	rain 50's
16-Jun-87	1600	58		60	7.50	1444.	15.01	clear 80's
15-Jul-87	1020	55		75	8.24	1327.	11.89	clear 80's
11-Aug-87	1400	60		50	8.05	1578	10.87	clear 70's
17-Sep-87	1420	66		25	8.56	1779	*	clear 70's
21-Oct-87	1125	48		50	8.06	1791	*	clear 50's
17-Nov-87	940	38		45	7.16	1985	*	snow 20's
15-Dec-87	1500	32		25	7.81	4065	*	PC 20's
21-Jan-88	1400	32		12	7.74	14132	*	PC 10's
12-Feb-88	1310	36		12	7.92	4763	*	PC 20's
23-Mar-88	1200	36		150	7.21	1021	*	cloudy 40's
18-Apr-88	1000	48		125	8.18	375	*	rain 40's
16-May-88	1110	58		110	7.92	1090	*	PC 60's
07-Jun-88	1350	56		100	8.20	1118	*	clear 70's
14-Jul-88	1100	64		75	*	*	*	PC 80's
15-Aug-88	1440	66		50	*	*	*	PC 80's
13-Sep-88	1340	49		65	7.00	1677	10.92	rain 40's
12-Oct-88	1105	52		35	7.54	1658	10.13	rain 40's
14-Nov-88	1407	46		46	7.12	1548	9.69	cloudy 30's
15-Dec-88	1430	41		25	7.98	3680	9.88	cloudy 10's
31-Jan-89	1130	38		45	8.00	4290	6.30	PC 30'S
27-Feb-89	1340	37		30	7.76	3275	7.80	PC 30'S
30-Mar-89	1350	47		60	8.05	2280	7.10	PC 30'S
17-Apr-89	1330	49		25	7.95	1976	8.40	PC 60'S
19-May-89	1045	62		25	7.28	1516	7.20	PC 60'S
19-Jun-89	1020	63		19	7.38	1648	6.20	PC 70'S
19-Jul-89	1015	59		15	8.06	1296	7.39	PC 80'S
16-Aug-89	1505	68		20	7.80	2000	6.80	cloudy 70's
12-Sep-89	1440	53		40	7.70	1708	7.83	rain 40's
10-Oct-89	1035	54		45	7.46	1597	10.77	PC 60's
14-Nov-89	1405	44		300	7.23	1092	9.34	clear 40's
15-Dec-89	1320	36		40	7.70	1509	9.13	clear 30's

* meter out of service

MEETINGHOUSE FLUME - LEFT FORK

UP&L MINING DIVISION
TECHNICAL SERVICES - HYDROLOGIC MONITORING

MEETINGHOUSE CANYON

Date	Time	Temp.	Flow ft.	Flow GPM	pH	Cond. (uS)	Dissolved Oxygen	Weather
13-Jan-86	1230		no flow					cloudy 20's
12-Feb-86	1445		no flow					snow 20's
11-Mar-86	1430		no flow					cloudy 30's
09-Apr-86	930		no flow					cloudy 40's
13-May-86	1150	45	0.7	799				clear 60's
10-Jun-86	900	51	1.13	1,661				PC 60's
07-Jul-86	1030	52	0.59	615				cloudy 70's
13-Aug-86	1015	56	0.2	117				PC 70's
19-Sep-86	1030	42	0.11	45				PC 50's
17-Oct-86	1155	38	0.1	40				PC 40's
10-Nov-86	1120		no flow					clear 30's
12-Dec-86	1030		no flow					PC 20'S
13-Jan-87	1100		no flow					rain 30's
13-Feb-87	1015		no flow					snow 20's
17-Mar-87	1145		no flow					clear 40's
08-Apr-87	950		no flow					clear 40's
20-May-86	1350	44	0.89	1,153	8.36	362	13.79	rain 50's
16-Jun-86	1150	55	0.65	713	8.39	380.7	14.42	clear 70's
15-Jul-87	1430	58	0.27	186	8.39	387.3	8.98	clear 80's
18-Aug-87	1100	58	0.13	61	7.47	420	12.14	clear 70's
22-Sep-87	1000	58	0.05	14	8.47	442	*	clear 70's
21-Oct-87	950	36	0.05	14	8.34	485	*	clear 30's
10-Nov-87	1005	33	0.09	35	7.65	478	*	cloudy 30's
15-Dec-87	830		no flow					PC 20'S
21-Jan-88	1300		no flow					PC 10'S
12-Feb-88	900		no flow					clear 20's
23-Mar-88	1000		no flow					cloudy 30's
18-Apr-88	1305	39	0.25	165	8.45	358	*	rain 40's
16-May-88	1500	49	1.15	1,213	8.21	314	*	PC 70's
07-Jun-88	1015	58	0.7	798	7.01	354	*	clear 70's
14-Jul-88	1302	60	0.22	136	*	*	*	PC 80's
16-Aug-88	910	61	0.15	76	*	*	*	clear 70's
13-Sep-88	1230	46	0.2	117	7.02	384	10.92	snow 30's
17-Oct-88	1025	41	0.13	61	7.13	450	10.00	clear 50's
16-Nov-88	1015		no flow					cloudy 30's
15-Dec-88	900		no flow					cloudy 10's
31-Jan-89	955		no flow					PC 20's
27-Feb-89	1120		no flow					PC 40's
30-Mar-89	1040		no flow					PC 30's
17-Apr-89	1030		no flow					PC 60's
19-May-89	1630		no flow					PC 60's
19-Jun-89	915		no flow					PC 80's
19-Jul-89	1305		no flow					PC 80's
15-Aug-89	1025		no flow					PC 70's
14-Sep-89	1225		no flow					clear 60's
12-Oct-89	1420		no flow					PC 50's
13-Nov-89	1300		no flow					PC 40's
06-Dec-89	1305		no flow					clear 30's

* meter out of service

RILDA CANYON FLUME 1 -LEFT FORK

UP&L MINING DIVISION
TECHNICAL SERVICES - HYDROLOGIC MONITORING

RILDA CANYON FLOW & QUALITY

RILDA CANYON - FLUME #1 (RCF1)

Date	Time	Temp.	Flow ft.	Flow GPM	pH	Cond. (uS)	Dissolved Oxygen	Weather
04-17-89	1120		DRY					PC 60's
05-11-89	925		DRY					PC 60'S
06-12-89	1505	54	0.15	189.9	performed @ lab			PC 70'S
07-19-89	1330		DRY					PC 80'S
08-15-89	1045		DRY					PC 70'S
09-14-89	1250		DRY					clear 60'S
10-12-89	1430		DRY					PC 50's
11-13-89	1300		DRY					PC 40's
12-06-89			INACCESSIBLE					clear 30's

RILDA CANYON FLUME - 2 (ABOVE NEWUA)

UP&L MINING DIVISION
TECHNICAL SERVICES - HYDROLOGIC MONITORING

RILDA CANYON FLOW & QUALITY

RILDA CANYON - FLUME #2 (RCF2)

	<----------Field Measurement---------->						
Date	Time	Temp.	Flow ft.	Flow GPM	pH	Cond. (uS)	Dissolved Oxygen	Weather
04-17-89	1130		DRY					PC 60's
05-11-89	935		DRY					PC 60'S
06-12-89	1525		0.1	78.02				PC 70'S
07-19-89	1325		DRY					PC 80'S
08-15-89	1320		DRY					PC 70'S
09-14-89	1320		DRY					clear 60'S
10-12-89	1440		DRY					PC 50's
11-13-89	1320		DRY					PC 40's
12-06-89	1340		DRY					clear 30's

RILDA CANYON FLUME - 3 (BELOW NEWUA)

UP&L MINING DIVISION
TECHNICAL SERVICES - HYDROLOGIC MONITORING

RILDA CANYON FLOW & QUALITY

RILDA CANYON - FLUME #3 (RCF3)

	<----------Field Measurement---------->							
			Flow			Cond.	Dissolved	
Date	Time	Temp.	ft.	GPM	pH	(uS)	Oxygen	Weather
04-17-89	1215	52	0.04	19.06				PC 60's
05-11-89	940	56	0.1	78.02				PC 60'S
06-12-89	1530	62	0.1	78.02	performed @ lab			PC 70'S
07-19-89	1330	66	0.06	35.40	7.81	546	7.11	PC 80'S
08-15-89	1200	64	0.07	45.08	8.00	825	7.50	PC 70'S
09-14-89	1320	47	0.06	35.60	7.45	682	7.20	clear 60'S
10-12-89	1500	54	0.08	55.40	7.31	709	11.53	PC 50's
11-13-89	1325	38	0.03	12.20	7.23	766	8.67	PC 40's
12-06-89	1345	38	0.05	26.90	7.77	641	5.04	clear 30's

RILDA CANYON WEIR - 4 (NEAR HWY 31)

UP&L MINING DIVISION
TECHNICAL SERVICES - HYDROLOGIC MONITORING

RILDA CANYON FLOW & QUALITY

RILDA CANYON - WEIR #4 (RCF4)

Date	Time	Temp.	Flow ft.	Flow GPM	pH	Cond. (uS)	Dissolved Oxygen	Weather
04-17-89	staff gage needed							PC 60's
05-11-89	staff gage needed							PC 60'S
06-12-89	1540	54	0.40	114.9	performed @ lab			PC 70'S
07-19-89	1450	64	0.37	93.4	8.06	588	7.11	PC 80'S
08-15-89	1215	68	0.40	114.9	8.30	800	7.60	PC 70'S
09-14-89	1340	52	0.39	103.9	7.47	682	7.18	clear 60'S
10-12-89	1515	49	0.41	117.8	7.53	654	12.08	PC 50's
11-13-89	1340	42	0.41	117.8	7.35	751	9.23	PC 40's
12-06-89	1400	37	0.36	85.1	8.04	570	6.40	clear 30's

EAST MOUNTAIN SPRINGS DISCHARGE

Spring	Date Sampled	Flow (GPM)	Temp. F	Date Sampled	Flow (GPM)	Temp. F	Seasonal Net Change %
Sheba	07-17-89	1.1	46	10-16-89	0.1	43	-0.92
Elk Spring	07-11-89	78.5	40	10-17-89	36.8	39	-0.53
Burnt Tree	07-18-89	6.4	43	10-16-89	5.0	44	-0.22
Jerk Water							
Pine Springs							
Pine Sp. Trough							
Ted's Tub	07-18-89	pond level above spring		10-17-89	dry		
79-1							
79-2	07-17-89	2.7	45	10-16-89	1.7	42	-0.37
79-3							
79-4							
79-5							
79-6							
79-7							
79-8							
79-9							
79-10	07-17-89	7.0	42	10-16-89	2.7	43	-0.61
79-11							
79-12	07-18-89	dry		10-17-89	dry		
79-13							
79-14							
79-15	07-18-89	2.9	45	10-17-89	1.2	44	-0.59
79-16							
79-17							
79-18							
79-19							
79-20							
79-21							
79-22							
79-23	07-18-89	dry		10-16-89	dry		
79-24	07-18-89	dry		10-16-89	dry		
79-25							
79-26	07-11-89	0.3	52	10-16-89	dry		
79-27							
79-28	07-11-89	1.3	47	10-16-89	0.3	43	
79-29	07-11-89	1.1	41	10-16-89	0.7	39	-0.36
79-30							
79-31							
79-32	07-11-89	0.5	50	10-17-89	dry		
79-33							
79-34	07-18-89	dry		10-17-89	dry		
79-35	07-18-89	dry		10-17-89	dry		
79-36							
79-37							
79-38	07-18-89	1.1	52	10-17-89	1.7	40	0.55
79-39							
79-40	07-17-89	dry		10-17-89	dry		
80-41	07-17-89	dry		10-17-89	dry		

EAST MOUNTAIN SPRINGS DISCHARGE

Spring	Date Sampled	Flow (GPM)	Temp. F	Date Sampled	Flow (GPM)	Temp. F	Seasona Net Change %
80-42							
80-43	07-17-89	dry		10-17-89	dry		
80-44	07-17-89	dry		10-17-89	dry		
80-45							
80-46	07-17-89	dry		10-16-89	dry		
80-47	07-17-89	4.6	45	10-16-89	0.5	40	-0.89
80-48							
80-49							
80-50							
82-51	07-17-89	dry		10-17-89	dry		
82-52	07-18-89	2.6	48	10-16-89	2.4	40	-0.08
84-53	07-11-89	1.4	48	10-16-89	1.0	41	
84-54							
84-55							
84-56	07-17-89	1.6	41	10-16-89	1.3	44	-0.19
85-57							
86-58							
86-59							
89-60	07-18-89	2.7	48	10-17-89	damp		
89-61	07-12-89	30	40	10-17-89	24.0	39	
89-62	07-12-89	6	41				
89-63	07-12-89	6	53				
89-64	07-13-89	3.2	44				
89-65	07-13-89	0.5	43	10-17-89	0.7	44	
89-66	07-13-89	damp		10-17-89	dry		
89-67	07-13-89	3.2	39	10-17-89	2.4	39	
89-68	07-13-89	dry		10-17-89	dry		
89-69	07-13-89	dry					
89-70	07-13-89	dry					
89-71	07-18-89	10.9	40				

Average Net Change -0.38

UTAH POWER & LIGHT CO
MINNG DIVISION
SPRING DISCHARGE RECESSION STUDY

YEAR 1989

SPRING		MAY 22	JUN 16	JUL 11/18	AUG 25	SEP 11/12	OCT 16/17
79-10	F	6.0	6.0	7.0	3.0	4.9	2.7
	T	42	45	42	43	41	43
SHEBA SPRINGS	F	8.7	2.0	1.1	0.5	0.2	0.1
	T	40	40	46	49	44	43
ELK SPRING	F	130.8	130.8	78.5	41.4	41.4	36.8
	T	40	41	40	44	40	39
79-35	F	DAMP	DRY	DRY	DRY	DRY	DRY
	T						
79-26	F	0.1	DAMP	0.3	DRY	DRY	DRY
	T	58		52			
79-29	F	1.2	1.2	1.1	0.8	1.0	0.7
	T	47	43	41	42	41	39
84-56	F	1.8	1.7	1.6	0.9	1.3	1.3
	T	42	41	41	42	41	44
80-44	F	DAMP	DRY	DRY	DRY	DRY	DRY
	T						
80-46	F	DAMP	DRY	DRY	DAMP	DRY	DRY
	T						
BURNT TREE	F	6.0	6.6	6.4	3.9	5.7	5.0
	T	44	44	43	43	47	44
79-23	F	DRY	DRY	DRY	DRY	DRY	DRY
	T						
82-52	F	4.0	3.4	2.6	2.0	2.8	2.4
	T	40	42	48	42	40	40

DEER CREEK MINE DISCHARGE

UP&L MINING DIVISION
TECHNICAL SERVICES - HYDROLOGIC MONITORING

DEER CREEK DISCHARGE QUALITY AND QUANTITY

Quality				Quantity		
Date	Time	GPM	Temp.(F)	Month		Gallons/day
01-29-86	1000	200	52	Jan-86		350,000est
02-26-86	1330	453.3	52	Feb		791,142
03-25-86	1440	364	56	Mar		713,583
04-25-86	900	453.3	52	Apr		818,470
05-29-86	1400		56	May		750,000est
07-07-86	1020	300est	56	Jun		750,000est
08-04-86	1500	650	56	Jul		750,000est
08-28-86	930	680	53	Aug		1,047,593
10-01-86	1000	650	56	Sep		884,178
10-29-86	1030	525	53	Oct		705,284
11-26-86	920	510	51	Nov		800,000est
12-15-86	930	668	52	Dec		200,000est
01-30-87	1400	650est	54	Jan-87		800,000est
02-27-87	1400	400est	52	Feb		350,000est
04-06-87	1240	450	52	Mar		550,000es
04-29-87	1100	550	55	Apr		927,066
06-01-87	1300	600	58	May		1,239,270
06-24-87	1000	1100	54	Jun		1,042,636
07-16-87	1030	950	53	Jul		1,052,546
08-18-87	1155	450	55	Aug		934,830
09-22-87	1030	700	56	Sep		1,152,242
10-21-87	1015	1050	56	Oct		1,109,403
11-10-87	1035	700	56	Nov		1,329,328
12-10-87	1110	850	57	Dec		1,303,875
01-21-88	1400	1000	55	Jan-88		1,363,633
02-12-88	1030	1200	56	Feb		1,203,024
03-23-88	1045	1200	55	Mar		1,216,595
04-18-88	1300	650	56	Apr		1,835,355
05-16-88	1550	1550	58	May		1,952,000
06-07-88	1115	750	56	Jun		1,731,815
07-28-88	1700	1400	56	Jul		1,731,815
08-16-88	940	960	58	Aug		1,673,439
09-28-88	1610	780	54	Sep		1,651,790
10-17-88	1100	1000	55	Oct		1,569,102
11-30-88	1515	1250	56	Nov		1,258,861
12-15-88	1340	1270	54	Dec		1,703,900
01-13-89	1135	1760	56	Jan-89		1,589,781
02-16-89	1350	1550	56	Feb		1,624,882
03-08-89	1450	400	56	Mar	*	1,500,000
04-17-89	1030	1300	56	Apr	*	1,800,000
05-19-89	1055	2000	55	May	*	1,800,000
06-15-89	1044	1500	55	Jun	*	1,500,000
08-01-89	1010	1800	56	Jul	*	1,800,000
08-30-89	740	500	56	Aug	*	1,800,000
09-14-89	1200	2000	56	Sep	*	1,800,000

DEER CREEK MINE DISCHARGE

UP&L MINING DIVISION
TECHNICAL SERVICES - HYDROLOGIC MONITORING

DEER CREEK DISCHARGE QUALITY AND QUANTITY

Quality				Quantity		
Date	Time	GPM	Temp.(F)	Month		Gallons/day
10-19-89	1425	1200	56	Oct	*	2,000,000
11-13-89	1225	1100	56	Nov	*	2,000,000
12-06-89	1300	1850	56	Dec		2,277,143

* estimated

WILBERG MINE DISCHARGE - GRIMES WASH

UP&L MINING DIVISION
TECHNICAL SERVICES - HYDROLOGIC MONITORING

WILBERG MINE - GRIMES WASH
PERMIT # 0022896-001A

Left Fork Grimes Wash

Quality				Quantity	
Date	Time	GPM	Temp. (F)	Month	Gallons/day
Jan-Jul 86			NO DISCHARGE	Jan-Jul 86	NO DISCHARGE
Aug				Aug	76,296
Sep-Dec 86			NO DISCHARGE	Sep-Dec 86	NO DISCHARGE
Jan-Dec 87			NO DISCHARGE	Jan-Dec 87	NO DISCHARGE
Jan-Dec 88			NO DISCHARGE	Jan-Jul 88	NO DISCHARGE
Jan-Sep 89			NO DISCHARGE	Jan-Sep 89	NO DISCHARGE
10-25-89	1440	245	54	Oct	336,644
11-14-89	1410	245	55	Nov	83,093
12-11-89	1055	240	52	Dec	216,385

WILBERG MINE DISCHARGE - MILLER CANYON

UP&L MINING DIVISION
TECHNICAL SERVICES - HYDROLOGIC MONITORING

WILBERG MINE - MILLER CANYON
PERMIT # 0022896-004A

Miller Canyon Breakout

	Quality				Quantity	
Date	Time	GPM	Temp. (F)		Month	Gallons/day
Jan-Sep 86			NO DISCHARGE		Jan-Sep 86	NO DISCHARGE
11-29-1986	1300	25	46		Oct	36,000
Nov-May 87			NO DISCHARGE		Nov-May 87	NO DISCHARGE
06-29-87	1300	<5	52		Jun	3,600
07-28-87	1205	10-15	50		Jul	17,419
Aug-Dec 87			NO DISCHARGE		Aug-Dec 87	NO DISCHARGE
Jan-Aug 88			NO DISCHARGE		Jan-Aug 88	NO DISCHARGE
Sep	1500	4.3	52		Sept	185,760
Oct			NO DISCHARGE		Oct	NO DISCHARGE
11-30-88	1315	12	54		Nov	259,200
Dec 88			NO DISCHARGE		Dec	NO DISCHARGE
Jan-Mar 89			NO DISCHARGE		Jan-Mar 89	NO DISCHARGE
04-17-89	1500	70	56		Apr	100,800
05-19-89	1515	71	56		May	102,240
06-15-89	1730	58	60		Jun	86,400
07-26-89	920	54	65		Jul	93,600
08-08-89	825	78	56		Aug	106,560
08-29-89	940	70	54		Sep	89,280
09-12-89	1400	62	58		Oct	54,720
10-17-89	915	40	52		Nov	43,920
11-14-89	1520	35	50		Dec	53,280
12-11-89	1130	46	46			

DEER CREEK IN-MINE

UP&L MINING DIVISION
TECHNICAL SERVICES - HYDROLOGIC MONITORING

DEER CREEK IN-MINE QUALTIY & LONG TERM FLOW

Date	Location	QUALITY Time	Temp.(F)	GPM	Date	LONG TERM FLOW(GPM) Site #1	Site #2	Site #3
03-25-86	EM - 3	1138	54	2.91	03-25-86		5.8	
03-25-86	3rd S XC-33	1220	56	0.2	08-04-86		5.5	
08-04-86	1st S XC-40	1430	55	0.38	09-26-86		5	
08-04-86	3rd SB XC-21	1330	53	0.57	12-22-86		5	
09-26-86	3rd N XC-41	950	54	5	03-26-87			
09-26-86	EM - 3	1045	56	2.5	03-31-87		4.3	
12-22-86	EM - 3	1050	56	2.5	07-09-87		4.1	
12-22-86	3rd SB XC-21	1120	52	0.5	10-07-87		4.1	
03-26-87	3rd N XC-41	1230	52	4.3	12-14-87		3.85	
03-31-87	EM - 3	1330	54	2.2	03-25-88		3.76	
07-09-87	3rd SB XC-21	1300	52	0.46	07-30-88	103.7	3.7	
07-09-87	EM-3	1320	54	2	10-26-88	120.7	3.5	
10-07-87	3rd N XC-41	1350	50	4.1	12-15-88	112.2	4.1	38
10-07-87	EM - 3	1450	53	1.8	03-08-89	99.6	3.1	25
12-14-87	EM - 3	1510	57	1.57	06-06-89	10.7	3.2	16.7
12-14-87	3rd SB XC-21	1444	55	0.53	09-14-89	0.35	2.6	8.6
03-25-88	3rd N XC-41	1300	54	3.76	12-06-89	damp	3.2	.5
03-25-88	3rd SB XC-21	1245	56	0.41				
07-30-88	3rd N XC-41	1450	54	3.7				
07-30-88	1st W XC-25	1420	56	103.7				
10-26-88	3rd N XC-41	1100	55	3.5				
10-26-88	1st W XC-25	1045	56	120.7				
12-15-88	3rd N XC-41	1040	56	4.1				
12-15-88	1st W XC-25	1050	55	112.2				
12-15-88	TW-10	1200	44	38				
03-08-89	3rd N XC-41	1410	54	3.1				
03-08-89	1st W XC-25	1430	52	99.6				
03-08-89	TW-10	1400	44	25				
06-06-89	1st W XC-25	1000	54	10.7				
06-06-89	TW-10	1030	48	16.7				
09-14-89	1st W XC-25	1040	54	0.35				
09-14-89	TW-10	1115	43	8.6				
09-14-89	3rd N XC-41	1100	50	2.6				
12-06-89	TW-10	1130	46	4.5				
12-06-89	3rd N XC-41	1115	52	3.2				

Site #1 1st West XC-25 - flume
Site #2 3rd North XC-41 2R, (hose to belt entry pump)
Site #3 3rd North XC-65 2R, TW-10

EM - 3, 3rd South cross cut 77, terminated as of 3/87 (deteriorating roof conditions)
3rd South "B" cross cut 21, terminated as 7/88 (poor access)

WILBERG IN-MINE

UP&L MINING DIVISION
TECHNICAL SERVICES - HYDROLOGIC MONITORING

WILBERG-COTTONWOOD IN-MINE QUALTIY & LONG TERM FLOW

QUALITY					LONG TERM FLOW(GPM)			
Date	Location	Time	Temp.(F)	GPM	Date	Site #1	Site #2	Site #3
03-14-86	2nd S XC-11	1400	57	0.09	03-14-86	0.09	1.61	0.08
03-14-86	4th E XC-40	1510	54	0.08	07-29-86	0.09	1.04	0.03
07-29-86	2nd S XC-11	1300	52	0.09	09-27-86	0.09	1.08	dry
07-29-86	4th E XC-24	1245	54	1.04	12-29-86	0.08	0.63	
09-27-86	2nd S XC-11	1350	56	0.09	03-31-87	0.11	0.72	
09-27-86	4th E XC-24	1430	56	1.08	07-07-87	0.06	0.52	
12-29-86	2nd S XC-11	1255	56	0.08	09-30-87	0.08	0.46	
12-29-86	4th E XC-24	1300	54	0.63	12-15-87	0.09	0.40	
03-31-87	2nd S XC-11	915	54	0.11	03-23-88	0.07	0.30	
03-31-87	4th E XC-24	930	52	0.72	07-27-88	0.03	0.27	
07-07-87	2nd S XC-11	1150	52	0.06	10-26-88	0.08	0.25	
07-07-87	4th E XC-24	1240	53	0.52	12-15-88	0.08	0.23	
09-30-87	2nd S XC-11	1500	53	0.08	03-29-89	0.08	0.21	
09-30-87	4th E XC-24	1530	55	0.46	07-17-89	0.07	0.20	
12-15-87	2nd S XC-11	1225	56	0.09	09-14-89	0.08	0.20	
12-15-87	4th E XC-24	1400	55	0.40	12-04-89	0.08	0.20	
03-[illegible]-88	2nd S XC-11	1330	54	0.07				
03-23-88	4th E XC-24	1445	54	0.30				
07-27-88	2nd S XC-11	1020	56	0.03				
07-27-88	4th E XC-24	1320	55	0.27				
10-26-88	2nd S XC-11	1015	56	0.08				
10-26-88	4th E XC-24	1330	58	0.25				
12-15-88	2nd S XC-11	1355	53	0.08				
12-15-88	4th E XC-24	1330	54	0.23				
03-29-89	2nd S XC-11	1240	55	0.08				
03-29-89	4th E XC-24	1505	54	0.21				
07-17-89	2nd S XC-11	830	56	0.07				
07-17-89	4th E XC-24	840	56	0.20				
09-14-89	2nd S XC-11	1015	54	0.08				
09-14-89	4th E XC-24	1045	53	0.20				
12-04-89	2nd S XC-11	945	51	0.08				
12-04-89	4th E XC-24	1240	54	0.20				

Site #1 2nd South cross-cut 11
Site #2 4th East cross cut 24
Site #3 4th East cross cut 40, terminated as of 9-26-86

COTTONWOOD CANYON CREEK SEDIMENT POND

UP&L MINING DIVISION
TECHNICAL SERVICES - HYDROLOGIC MONITORING

Sediment Pond Analysis

Cottonwood Canyon Creek
Permit # 0022896-002A

Date	Time	GPM	Temp.(F)	Weather	Comments
Jan.-Dec., 1986	no discharge				
Jan.-Mar., 1987	no discharge				
Apr.-Jun., 1987	no discharge				
Jul.-Dec., 1987	no discharge				
Jan.-Dec., 1988	no discharge				
Jan.-Dec., 1989	no discharge				

DEER CREEK MINE SEDIMENT POND

UP&L MINING DIVISION
TECHNICAL SERVICES - HYDROLOGIC MONITORING

Sediment Pond Analysis

Deer Creek
Permit # 0023604-001

Date	Time	GPM	Temp.(F)	Weather	Comments
1-13-1986	1115	<5	34	cloudy 20's	
Feb.-Aug.	no discharge				
9-11-86	928	20.0		clear 50's	
10-24-86	1110	16.7		cloudy 40's	
11-10-86	1210	3.0	34	clear 20's	
12-10-86	1500	650.0		PC 10's	
12-15-86	947	668.0	42	cloudy 20's	
1-31-87	1410	650.0	42.2	PC 20's	
2-19-87	905	200.0	45	cloudy 10's	
Mar.	no discharge				
Apr.	no discharge				
05-27-87	1330	40.0	54	PC 60'S	
Jun.	no discharge				
07-21-87	1400	30.0	59	PC 80'S	
A[illegible]-Sep. 87	no discharge				
Jan.-Aug. 88	no discharge				
Sept. 12-18, 88		1283.0		PC 50'S	mine discharge division
Oct.-Dec.,88	no discharge				
01-13-89	1148	4.0	38	cloudy 10's	
02-28-89	1350	21.0	43	PC 30's	
03-22-89	1145	20.0	36	PC 40's	
04-14-89	1150	6.5	46	PC 70's	
05-2,8,9,15,18 21,24,26-89	NA	26.1 AVG.	NA	PC 70's	draining for sed. removal
06-5,6,9,12-89	NA	15.9	NA	PC 70'S	draining for sed. removal
Jul 89	no discharge				
8-14-89	1155	400.0	NA	PC 70'S	draining for sed. removal
Sep 89	no discharge				
Oct 89	no discharge				
11-16-89	1345	4.2	38	clear 40's	
12-06-89	1310	4.2	36	PC 20's	

DES-BEE-DOVE SEDIMENT POND

UP&L MINING DIVISION
TECHNICAL SERVICES - HYDROLOGIC MONITORING

Sediment Pond Analysis

Des-Bee-Dove
Permit # 0023591-001

Date	Time	GPM	Temp.(F)	Weather	Comments
Jan.-Feb.,1986	no discharge				
3-21-86	1500	<1.0		PC 40's	
Apr.-Aug.	no discharge				
9-26-86	1425	100	57	PC 40's	
10-13-86	1700	20	40	clear 40's	
Nov.-Dec.	no discharge				
Jan.-Dec.,1987	no discharge				
Jan.-Dec.,1988	no discharge				
Jan.-Dec.,1989	no discharge				

WILBERG MINE SEDIMENT POND

UP&L MINING DIVISION
TECHNICAL SERVICES - HYDROLOGIC MONITORING

Sediment Pond Analysis

Wilberg Mine
Permit # 0022896-003A

Date	Time	GPM	Temp.(F)	Weather	Comments
Jan., 1986	no discharge				
2-26-86	1435	5	48	clear 40's	
March	no discharge				
4-17-86	1030	15	41		
May	no discharge				
June	no discharge				
Jul.-Oct	no discharge				
11-13-86	1400	50	40.4	PC 30's	
12-29-86	1330	8	34	clear 20's	
01-13-87	1400	30	40	PC 30's	
02-03-87	1135	20	43	PC 30's	
03-02-87	915	35		clear 40's	
Apr.-Oct 87	no discharge				
11-30-87	1400	12	38	PC 20's	
12-15-87	1525	8	32	PC 10's	
Jan.-Feb. 88	no discharge				
03-01-88	1310	5.5	34	clear 40's	
04-18-88	1010	55	43	rain 40's	
05-16-88	1600	2.85	53	PC 60's	
Jun - Dec, 1988	no discharge				
Jan - Feb, 1989	no discharge				
03-29-89	1530	30	46	PC 30's	
Apr. 89	no discharge				
05-31-89	1400	5	52	PC 60'S	
06-20-89	1430	8	61	PC 70'S	
Jul. 89	no discharge				
08-16-89	1455	6.7	62	PC 70'S	
09-13-89	1435	18	51	rain 40's	LESS THAN 10Y/24H
10-10-89	1025	21	52	PC 40's	
10-25-89	830	16	48	rain 30's	LESS THAN 10Y/24H
11-14-89	1415	35	42	PC 30's	
11-30-89	1720	8.1	40	clear 30's	
12-05-89	1330	26	36	clear 30's	

UTAH POWER & LIGHT MINING DIVISION
EAST MOUNTAIN PRECIPITATION
HISTORICAL COMPARISON

	1981	1982	1983	1984	1985	1986	1987	1988	1989	MEAN	ST DEV
OCT	1.28	1.93	0.38	0.76	3.27	1.15	1.57	2.77	0.61	1.52	0.93
NOV	0.39	0.53	2.90	2.43	0.97	2.38	0.39	1.91	0.43	1.37	0.97
DEC	0.05	0.97	1.39	2.42	1.67	0.87	0.16	1.29	1.56	1.15	0.70
JAN	0.29	3.22	1.30	0.27	0.49	0.30	1.37	1.42	1.00	1.07	0.89
FEB	0.52	0.14	1.81	0.65	0.59	2.10	1.37	0.00	0.68	0.87	0.68
MAR	2.77	1.67	1.98	1.22	1.77	1.43	1.65	0.99	1.03	1.61	0.52
APR	0.64	0.00	0.92	0.50	1.35	1.05	1.16	2.08	0.26	0.89	0.59
MAY	0.87	0.45	0.71	0.22	1.73	0.38	1.77	1.03	0.47	0.85	0.54
JUN	0.11	0.09	0.61	1.18	0.28	0.53	0.58	0.81	0.43	0.51	0.33
JUL	0.57	1.86	1.27	1.90	2.47	0.87	2.49	0.45	1.19	1.45	0.72
AUG	0.85	1.10	4.83	2.33	0.12	2.24	1.16	0.96	2.44	1.78	1.31
SEP	2.55	2.61	1.62	0.64	2.31	1.63	0.06	0.91	0.49	1.42	0.89
TOTAL	10.90	14.57	19.71	14.53	17.02	14.92	13.73	14.62	10.59	14.51	2.64

UTAH POWER & LIGHT CO.
MINING DIVISION
EAST MOUNTAIN PRECIPITATION 1989

DATE	TIME		INCHES PRECIPITATION	
06-Oct-88	11:42 AM	START		
06-Oct-88	01:35 PM	STOP	0.03	
06-Oct-88	05:42 PM	START		
06-Oct-88	10:11 PM	STOP	0.08	
08-Oct-88	07:56 AM	START		
08-Oct-88	02:17 PM	STOP	0.11	
12-Oct-88	10:08 AM	START		
12-Oct-88	03:45 PM	STOP	0.09	
12-Oct-88	07:06 PM	START		
13-Oct-88	12:23 PM	START	0.29	0.61 INCHES PRECIP.
03-Nov-88	12:35 PM	START		
03-Nov-88	06:35 PM	START	0.04	
17-Nov-88	07:04 AM	START		
17-Nov-88	01:17 PM	START	0.09	
03-Nov-88	06:11 PM	START		
03-Nov-88	12:37 AM	START	0.03	
18-Nov-88	12:59 PM	START		
18-Nov-88	08:34 PM	STOP	0.03	
24-Nov-88	03:18 AM	START		
24-Nov-88	05:42 AM	STOP	0.06	
25-Nov-88	08:21 PM	START		
26-Nov-88	05:55 AM	STOP	0.08	
26-Nov-88	04:46 PM	START		
27-Nov-88	02:44 AM	STOP	0.08	
28-Nov-88	12:04 PM	START		
28-Nov-88	05:25 PM	STOP	0.03	0.43 INCHES PRECIP.
14-Dec-88	12:58 PM	START		
15-Dec-88	10:33 AM	START	0.17	
19-Dec-88	04:40 AM	START		
19-Dec-88	12:34 PM	START	0.01	
20-Dec-88	03:58 PM	START		
22-Dec-88	12:35 PM	STOP	0.61	
22-Dec-88	04:43 PM	START		
23-Dec-88	03:53 PM	STOP	0.26	
24-Dec-88	06:32 AM	START		
25-Dec-88	01:51 AM	STOP	0.16	
25-Dec-88	04:06 AM	START		
26-Dec-88	07:07 PM	STOP	0.30	
28-Dec-88	04:33 PM	START		
31-Dec-88	06:36 PM	STOP	0.06	1.56 INCHES PRECIP.
01-Jan-89	06:36 PM	START		
01-Jan-89	07:25 AM	STOP	0.01	
04-Jan-89	06:03 AM	START		

UTAH POWER & LIGHT CO.
MINING DIVISION
EAST MOUNTAIN PRECIPITATION 1989

DATE	TIME		INCHES PRECIPITATION		
05-Jan-89	07:41 AM	STOP	0.45		
07-Jan-89	09:50 PM	START			
08-Jan-89	04:20 AM	START	0.06		
08-Jan-89	02:08 PM	START			
08-Jan-89	10:26 PM	START	0.03		
09-Jan-89	11:59 PM	START			
10-Jan-89	11:18 AM	STOP	0.03		
12-Jan-89	01:37 PM	START			
13-Jan-89	05:09 PM	STOP	0.08		
26-Jan-89	03:37 AM	START			
27-Jan-89	01:31 AM	STOP	0.30		
29-Jan-89	11:00 PM	START			
30-Jan-89	06:58 AM	STOP	0.05	1.00	INCHES PRECIP.
03-Feb-89	11:21 AM	START			
03-Feb-89	10:32 PM	START	0.31		
04-Feb-89	01:10 AM	START			
04-Feb-89	03:18 PM	START	0.18		
04-Feb-89	05:10 PM	START			
05-Feb-89	01:21 AM	STOP	0.02		
09-Feb-89	12:15 PM	START			
11-Feb-89	01:59 AM	STOP	0.06		
19-Feb-89	04:17 AM	START			
20-Feb-89	06:18 AM	STOP	0.09	0.68	INCHES PRECIP.
03-Mar-89	07:29 AM	START			
04-Mar-89	01:24 AM	STOP	0.61		
19-Mar-89	10:33 AM	START			
19-Mar-89	11:41 AM	START	0.06		
25-Mar-89	06:34 PM	START			
26-Mar-89	08:00 AM	START	0.34		
26-Mar-89	12:08 PM	START			
26-Mar-89	05:22 PM	STOP	0.02	1.03	INCHES PRECIP.
02-Apr-89	07:23 AM	START			
02-Apr-89	12:35 AM	STOP	0.20		
26-Apr-89	03:21 PM	START			
27-Apr-89	12:48 PM	START	0.05	0.26	INCHES PRECIP.
12-May-89	05:02 PM	START			
12-May-89	09:31 PM	START	0.01		
14-May-89	06:34 AM	START			
14-May-89	12:55 PM	START	0.12		
14-May-89	03:11 PM	START			
14-May-89	10:15 PM	STOP	0.21		
15-May-89	05:23 AM	START			

UTAH POWER & LIGHT CO.
MINING DIVISION
EAST MOUNTAIN PRECIPITATION 1989

DATE	TIME		INCHES PRECIPITATION		
16-May-89	04:38 AM	STOP	0.04		
16-May-89	11:48 AM	START			
17-May-89	09:32 AM	STOP	0.10	0.47	INCHES PRECIP.
08-Jun-89	10:25 AM	START			
08-Jun-89	10:38 AM	START	0.14		
11-Jun-89	01:59 PM	START			
11-Jun-89	08:58 PM	START	0.15		
25-Jun-89	05:09 PM	START			
25-Jun-89	05:17 PM	STOP	0.10		
28-Jun-89	06:22 PM	START			
28-Jun-89	06:48 PM	STOP	0.04	0.43	INCHES PRECIP.
12-Jul-89	04:15 AM	START			
12-Jul-89	04:02 AM	START	0.42		
12-Jul-89	03:15 PM	START			
12-Jul-89	04:24 PM	START	0.10		
21-Jul-89	06:28 PM	START			
21-Jul-89	08:22 PM	STOP	0.07		
22-Jul-89	06:47 PM	START			
22-Jul-89	05:46 PM	STOP	0.33		
23-Jul-89	08:20 AM	START			
23-Jul-89	09:53 AM	STOP	0.10		
23-Jul-89	12:08 PM	START			
23-Jul-89	12:54 PM	STOP	0.06		
23-Jul-89	03:53 PM	START			
23-Jul-89	05:03 PM	STOP	0.11	1.19	INCHES PRECIP.
01-Aug-89	12:01 AM	START			
01-Aug-89	12:53 AM	STOP	0.05		
02-Aug-89	01:52 PM	START			
02-Aug-89	02:16 PM	STOP	0.07		
09-Aug-89	09:44 PM	START			
09-Aug-89	10:55 PM	START	0.04		
10-Aug-89	09:48 AM	START			
10-Aug-89	10:37 AM	START	0.05		
10-Aug-89	04:16 PM	START			
10-Aug-89	04:40 PM	STOP	0.02		
11-Aug-89	05:03 AM	START			
11-Aug-89	08:00 AM	STOP	0.77		
14-Aug-89	12:35 PM	START			
14-Aug-89	04:01 PM	STOP	0.33		
15-Aug-89	01:24 PM	START			
15-Aug-89	10:50 PM	STOP	0.03		
16-Aug-89	12:42 PM	START			
16-Aug-89	03:22 PM	STOP	0.03		

UTAH POWER & LIGHT CO.
MINING DIVISION
EAST MOUNTAIN PRECIPITATION 1989

DATE	TIME	INCHES PRECIPITATION		
17-Aug-89	12:01 AM START			
17-Aug-89	12:48 AM STOP	0.03		
17-Aug-89	10:33 AM START			
18-Aug-89	04:13 AM STOP	0.84		
20-Aug-89	06:09 AM START			
20-Aug-89	07:46 AM STOP	0.09		
21-Aug-89	02:56 AM START			
21-Aug-89	04:29 AM STOP	0.05		
22-Aug-89	01:52 AM START			
22-Aug-89	03:26 AM STOP	0.04	2.44	INCHES PRECIP.
12-Sep-89	10:22 PM START			
13-Sep-89	12:55 AM START	0.03		
20-Sep-89	03:04 AM START			
20-Sep-89	12:38 PM START	0.44		
26-Sep-89	06:54 PM START			
26-Sep-89	09:29 PM STOP	0.02	0.49	INCHES PRECIP.
				YEARLY TOTAL
			10.58	INCHES PRECIP.

EAST MOUNTAIN TEMPERATURES - HISTORICAL SUMMARY

OCTOBER SUMMARY

	HIGH	LOW
AVG.	45.8	30.1
MAX.	59.6	41.7
MIN.	22.3	9.5

NOVEMBER SUMMARY

	HIGH	LOW
AVG.	34.1	21.2
MAX.	48.4	36.1
MIN.	13.0	1.9

DECEMBER SUMMARY

	HIGH	LOW
AVG.	29.4	13.3
MAX.	43.6	27.1
MIN.	2.7	-8.8

JANUARY SUMMARY

	HIGH	LOW
AVG.	29.8	14.6
MAX.	45.3	28.6
MIN.	2.0	-15.2

FEBRUARY SUMMARY

	HIGH	LOW
AVG.	32.1	15.2
MAX.	46.3	30.1
MIN.	-2.3	-14.7

MARCH SUMMARY

	HIGH	LOW
AVG.	37.0	19.7
MAX.	50.3	31.0
MIN.	13.3	0.1

APRIL SUMMARY

	HIGH	LOW
AVG.	46.0	26.3
MAX.	62.1	40.8
MIN.	12.7	-0.3

MAY SUMMARY

	HIGH	LOW
AVG.	52.2	32.6
MAX.	69.9	45.6
MIN.	15.8	3.4

JUNE SUMMARY

	HIGH	LOW
AVG.	66.2	43.4
MAX.	78.5	58.1
MIN.	27.7	13.1

JULY SUMMARY

	HIGH	LOW
AVG.	72.4	51.0
MAX.	83.5	59.4
MIN.	48.5	20.4

AUGUST SUMMARY

	HIGH	LOW
AVG.	70.2	50.2
MAX.	80.4	58.4
MIN.	47.6	32.7

SEPTEMBER SUMMARY

	HIGH	LOW
AVG.	59.7	41.0
MAX.	75.1	53.4
MIN.	31.6	20.0

HISTORICAL SUMMARY

PARAMETER	DATE	TEMP
AVERAGE HIGH		47.9
MAXIMUM HIGH	04-Jul-85	86.9
AVG. MAX. HIGH		84.2
MINIMUM HIGH	05-Feb-89	-2.3
AVG. MIN. HIGH		6.6
AVERAGE LOW		30.2
MAXIMUM LOW	03-Jun-89	67.0
AVG. MAX. LOW		61.5
MINIMUM LOW	31-Jan-85	-15.2
AVG. MIN. LOW		-6.5

EAST MOUNTAIN TEMPERATURES - 1989 WATER YEAR SUMMARY

Oct-88 SUMMARY

	HIGH	LOW
AVG.	51.0	36.6
MAX.	69.2	47.4
MIN.	40.4	28.8

Nov-88 SUMMARY

	HIGH	LOW
AVG.	32.4	14.5
MAX.	47.5	40.0
MIN.	13.0	1.9

Dec-88 SUMMARY

	HIGH	LOW
AVG.	28.2	14.0
MAX.	43.6	29.2
MIN.	8.8	-5.3

Jan-89 SUMMARY

	HIGH	LOW
AVG.	27.9	12.2
MAX.	50.7	27.8
MIN.	5.5	-2.5

Feb-89 SUMMARY

	HIGH	LOW
AVG.	29.3	11.1
MAX.	48.4	32.1
MIN.	-2.3	-14.7

Mar-89 SUMMARY

	HIGH	LOW
AVG.	43.4	24.5
MAX.	58.2	40.0
MIN.	13.3	3.5

Apr-89 SUMMARY

	HIGH	LOW
AVG.	52.1	32.0
MAX.	69.4	51.9
MIN.	31.6	13.8

May-89 SUMMARY

	HIGH	LOW
AVG.	57.9	35.7
MAX.	72.4	51.9
MIN.	38.0	21.5

Jun-89 SUMMARY

	HIGH	LOW
AVG.	64.3	36.3
MAX.	75.1	67.0
MIN.	43.9	25.4

Jul-89 SUMMARY

	HIGH	LOW
AVG.	74.1	49.5
MAX.	85.8	58.1
MIN.	58.1	42.5

Aug-89 SUMMARY

	HIGH	LOW
AVG.	64.6	42.9
MAX.	75.5	51.7
MIN.	52.5	32.7

Sep-89 SUMMARY

	HIGH	LOW
AVG.	59.9	37.6
MAX.	71.9	48.2
MIN.	35.9	25.7

1989 SUMMARY

PARAMETER	DATE	TEMP
AVG. HIGH	NA	48.8
MAX. HIGH	06-Jul-89	85.8
MIN. HIGH	05-Feb-89	-2.3
AVG. LOW	NA	30.4
MAX. LOW	03-Jun-88	67.0
MIN. LOW	25-Dec-88	-5.3

UTAH POWER & LIGHT CO. MINING DIVISION
TEMPERATURES-1989 WATER YEAR
EAST MOUNTAIN STATION

DATE	TIME	TEMPERATURE (DEG. F)		
01-Oct-88	08:26 AM	64.7		HIGH
01-Oct-88	05:02 PM		43.1	LOW
02-Oct-88	07:36 AM	65.3		HIGH
02-Oct-88	09:14 PM		43.7	LOW
03-Oct-88	08:14 AM	69.2		HIGH
03-Oct-88	04:38 PM		47.4	LOW
04-Oct-88	07:03 AM	60.1		HIGH
04-Oct-88	09:45 PM		39.9	LOW
05-Oct-88	01:30 AM		39.9	LOW
05-Oct-88	09:16 AM	58.7		HIGH
06-Oct-88	06:38 AM	50.7		HIGH
06-Oct-88	08:21 PM		33.9	LOW
07-Oct-88	12:29 AM		33.9	LOW
07-Oct-88	08:53 AM	48.1		HIGH
08-Oct-88	05:43 AM	53.4		HIGH
08-Oct-88	08:00 AM		37.7	LOW
09-Oct-88	07:54 AM	53.3		HIGH
09-Oct-88	07:58 PM		29.3	LOW
10-Oct-88	12:35 AM		32.5	LOW
10-Oct-88	07:38 AM	50.8		HIGH
11-Oct-88	07:56 AM	54.8		HIGH
11-Oct-88	05:07 PM		37.2	LOW
12-Oct-88	01:54 AM	40.4		HIGH
12-Oct-88	09:04 PM		28.8	LOW
13-Oct-88	01:57 AM		28.8	LOW
13-Oct-88	11:25 AM	45.5		HIGH
14-Oct-88	09:26 AM	47.2		HIGH
14-Oct-88	07:29 PM		33.6	LOW
15-Oct-88	03:15 AM		33.3	LOW
15-Oct-88	12:28 PM	54.9		HIGH
16-Oct-88	01:05 AM		41.1	LOW
16-Oct-88	12:09 PM	57.6		HIGH
17-Oct-88	01:01 AM		40.9	LOW
17-Oct-88	12:09 PM	58.5		HIGH
18-Oct-88	02:48 AM		40.7	LOW
18-Oct-88	12:52 PM	57.9		HIGH
19-Oct-88	12:19 PM	53.5		HIGH
19-Oct-88	06:15 PM		39.5	LOW
20-Oct-88	04:57 AM		38.9	LOW
20-Oct-88	01:35 PM	57.1		HIGH
21-Oct-88	03:49 AM		37.6	LOW
21-Oct-88	01:56 PM	56.9		HIGH
22-Oct-88	05:41 AM		39.0	LOW
22-Oct-88	11:44 AM	51.4		HIGH
23-Oct-88	01:33 PM	57.4		HIGH
23-Oct-88	10:21 PM		38.3	LOW
24-Oct-88	04:42 AM		38.2	LOW
24-Oct-88	01:55 PM	57.6		HIGH
25-Oct-88	12:15 PM	53.6		HIGH

DATE	TIME	TEMPERATURE (DEG. F)		
25-Oct-88	07:42 PM		37.0	LOW
26-Oct-88	05:06 AM		37.1	LOW
26-Oct-88	11:54 AM	54.1		HIGH
27-Oct-88	03:59 AM		34.8	LOW
27-Oct-88	01:41 PM	49.3		HIGH
28-Oct-88	01:14 PM	52.4		HIGH
28-Oct-88	10:06 PM		36.3	LOW
29-Oct-88	12:50 PM	48.8		HIGH
29-Oct-88	08:39 PM		32.1	LOW
30-Oct-88	04:21 AM		31.7	LOW
30-Oct-88	11:05 AM	49.8		HIGH
31-Oct-88	03:16 AM		29.8	LOW
31-Oct-88	01:12 PM	49.0		HIGH
01-Nov-88	03:43 AM		31.0	LOW
01-Nov-88	11:17 AM	46.2		HIGH
02-Nov-88	04:06 AM		31.1	LOW
02-Nov-88	11:50 AM	47.5		HIGH
03-Nov-88	10:39 AM		40.0	LOW
03-Nov-88	07:27 PM		31.1	LOW
04-Nov-88	01:19 AM	31.8		HIGH
04-Nov-88	06:05 AM		26.1	LOW
05-Nov-88	05:47 AM		22.8	LOW
05-Nov-88	02:15 PM	42.1		HIGH
06-Nov-88	06:24 AM		26.5	LOW
06-Nov-88	01:40 PM	42.8		HIGH
07-Nov-88	06:39 AM		22.3	LOW
07-Nov-88	12:46 PM	37.8		HIGH
08-Nov-88	01:13 PM	33.4		HIGH
08-Nov-88	07:55 PM		24.2	LOW
09-Nov-88	06:11 AM		20.7	LOW
09-Nov-88	12:45 PM	35.4		HIGH
10-Nov-88	05:41 AM		22.7	LOW
10-Nov-88	01:29 PM	37.9		HIGH
11-Nov-88	12:01 AM	25.8		HIGH
11-Nov-88	07:23 PM		16.8	LOW
12-Nov-88	02:55 AM		12.6	LOW
12-Nov-88	01:36 PM	31.5		HIGH
13-Nov-88	03:48 AM		22.0	LOW
13-Nov-88	01:42 PM	37.5		HIGH
14-Nov-88	11:30 AM	39.2		HIGH
14-Nov-88	09:03 PM		14.4	LOW
15-Nov-88	08:26 AM	22.1		HIGH
15-Nov-88	09:29 PM		10.4	LOW
16-Nov-88	01:27 AM		10.0	LOW
16-Nov-88	07:23 AM	27.2		HIGH
17-Nov-88	07:34 AM	26.2		HIGH
17-Nov-88	09:15 PM		12.1	LOW
18-Nov-88	06:30 AM	19.3		HIGH
18-Nov-88	07:36 PM		7.8	LOW
19-Nov-88	12:48 AM		7.7	LOW
19-Nov-88	08:38 AM	22.4		HIGH
20-Nov-88	01:09 AM		12.8	LOW
20-Nov-88	08:14 AM	26.9		HIGH
21-Nov-88	01:33 AM		14.3	LOW

Oct-88 SUMMARY

	HIGH	LOW
AVG.	51.0	36.6
MAX.	69.2	47.4
MIN.	40.4	28.8

DATE	TIME	TEMPERATURE (DEG. F)		
21-Nov-88	09:32 AM	28.8		HIGH
22-Nov-88	01:30 AM		18.1	LOW
22-Nov-88	09:08 AM	28.9		HIGH
23-Nov-88	07:48 AM	31.2		HIGH
23-Nov-88	09:02 PM		11.3	LOW
24-Nov-88	06:28 AM	20.6		HIGH
24-Nov-88	09:16 PM		6.4	LOW
25-Nov-88	05:20 AM	19.2		HIGH
25-Nov-88	06:33 PM		9.0	LOW
26-Nov-88	01:37 AM	13.0		HIGH
26-Nov-88	04:05 PM		1.9	LOW
27-Nov-88	04:01 AM	18.9		HIGH
27-Nov-88	07:26 PM		9.6	LOW
28-Nov-88	02:08 AM	24.3		HIGH
28-Nov-88	05:38 PM		8.1	LOW
29-Nov-88	02:48 AM	22.1		HIGH
29-Nov-88	10:38 AM		10.5	LOW
30-Nov-88	05:35 AM	31.7		HIGH
30-Nov-88	08:58 PM		20.0	LOW
01-Dec-88	04:34 AM	35.1		HIGH
01-Dec-88	10:16 AM		22.6	LOW
02-Dec-88	04:32 AM	36.8		HIGH
02-Dec-88	06:54 PM		25.1	LOW
03-Dec-88	06:18 AM	39.6		HIGH
03-Dec-88	08:18 PM		22.9	LOW
04-Dec-88	06:39 AM	35.7		HIGH
04-Dec-88	03:31 PM		21.7	LOW
05-Dec-88	07:21 AM	35.3		HIGH
05-Dec-88	05:26 PM		22.1	LOW
06-Dec-88	10:18 AM	37.1		HIGH
06-Dec-88	07:37 PM		18.4	LOW
07-Dec-88	03:19 AM	21.9		HIGH
07-Dec-88	09:02 PM		13.4	LOW
08-Dec-88	02:43 AM		13.7	LOW
08-Dec-88	06:06 AM	27.7		HIGH
09-Dec-88	12:05 AM		17.0	LOW
09-Dec-88	07:57 AM	35.3		HIGH
10-Dec-88	07:44 AM	37.7		HIGH
10-Dec-88	06:39 PM		23.4	LOW
11-Dec-88	05:52 AM	37.0		HIGH
11-Dec-88	06:27 PM		25.6	LOW
12-Dec-88	01:47 AM		29.2	LOW
12-Dec-88	07:20 AM	43.2		HIGH
13-Dec-88	07:57 AM	43.6		HIGH
13-Dec-88	09:54 PM		28.9	LOW
14-Dec-88	07:18 AM	34.2		HIGH
14-Dec-88	09:39 PM		14.7	LOW
15-Dec-88	05:59 AM	23.6		HIGH
15-Dec-88	10:37 AM		14.1	LOW
16-Dec-88	01:00 AM		16.6	LOW
16-Dec-88	04:51 AM	28.3		HIGH
17-Dec-88	12:57 AM		20.5	LOW
17-Dec-88	05:15 AM	33.1		HIGH
18-Dec-88	06:15 AM	35.3		HIGH

Nov-88 SUMMARY

	HIGH	LOW
AVG.	32.4	14.5
MAX.	47.5	40.0
MIN.	13.0	1.9

DATE	TIME	TEMPERATURE (DEG. F)	
18-Dec-88	09:04 PM	16.5	LOW
19-Dec-88	04:28 AM	25.7	HIGH
19-Dec-88	08:41 PM	10.9	LOW
20-Dec-88	01:09 AM	10.9	LOW
20-Dec-88	04:47 AM	25.7	HIGH
21-Dec-88	05:27 AM	19.9	HIGH
21-Dec-88	10:11 AM	8.9	LOW
22-Dec-88	01:16 AM	9.2	LOW
22-Dec-88	03:45 AM	19.1	HIGH
23-Dec-88	03:13 AM	11.0	HIGH
23-Dec-88	01:34 PM	0.5	LOW
24-Dec-88	07:28 AM	17.8	HIGH
24-Dec-88	09:06 PM	2.5	LOW
25-Dec-88	08:04 AM	-5.3	LOW
25-Dec-88	02:25 PM	10.0	HIGH
26-Dec-88	10:57 AM	8.8	HIGH
26-Dec-88	07:41 PM	-3.6	LOW
27-Dec-88	02:51 AM	-2.7	LOW
27-Dec-88	09:09 AM	16.1	HIGH
28-Dec-88	07:04 AM	28.7	HIGH
28-Dec-88	08:56 PM	4.6	LOW
29-Dec-88	01:59 AM	4.1	LOW
29-Dec-88	07:34 AM	16.2	HIGH
30-Dec-88	07:27 AM	25.4	HIGH
30-Dec-88	09:18 PM	14.5	LOW
31-Dec-88	02:47 AM	12.5	LOW
31-Dec-88	12:50 PM	27.9	HIGH
01-Jan-89	03:24 AM	18.7	LOW
01-Jan-89	10:09 AM	35.7	HIGH
02-Jan-89	12:02 PM	30.1	HIGH
02-Jan-89	07:18 PM	20.3	LOW
03-Jan-89	03:46 AM	24.9	LOW
03-Jan-89	12:22 PM	31.0	HIGH
04-Jan-89	02:09 AM	19.3	LOW
04-Jan-89	02:24 PM	33.6	HIGH
05-Jan-89	11:58 AM	29.0	HIGH
05-Jan-89	12:52 PM	17.3	LOW
06-Jan-89	12:13 AM	16.2	HIGH
06-Jan-89	08:20 PM	-1.1	LOW
07-Jan-89	08:16 AM	5.5	HIGH
07-Jan-89	03:13 PM	-2.3	LOW
08-Jan-89	03:29 AM	-2.5	LOW
08-Jan-89	09:00 AM	10.6	HIGH
09-Jan-89	03:16 AM	6.2	LOW
09-Jan-89	09:30 AM	27.0	HIGH
10-Jan-89	09:01 AM	23.3	HIGH
10-Jan-89	08:55 PM	5.5	LOW
11-Jan-89	06:51 AM	7.0	HIGH
11-Jan-89	08:08 PM	-1.2	LOW
12-Jan-89	08:20 AM	12.5	HIGH
12-Jan-89	08:40 PM	3.3	LOW
13-Jan-89	08:57 AM	17.7	HIGH
13-Jan-89	08:31 PM	-1.0	LOW
14-Jan-89	08:29 AM	16.0	HIGH

Dec-88 SUMMARY

	HIGH	LOW
AVG.	28.2	1[illegible]
MAX.	43.6	2[illegible]
MIN.	8.8	-5.3

DATE	TIME	TEMPERATURE (DEG. F)	
14-Jan-89	10:09 PM	1.7	LOW
15-Jan-89	02:05 AM	0.5	LOW
15-Jan-89	08:44 AM	18.7	HIGH
16-Jan-89	01:17 AM	9.7	LOW
16-Jan-89	09:51 AM	29.3	HIGH
17-Jan-89	02:50 AM	19.5	LOW
17-Jan-89	09:36 AM	35.8	HIGH
18-Jan-89	03:18 AM	20.1	LOW
18-Jan-89	08:42 AM	38.3	HIGH
19-Jan-89	11:16 AM	38.7	HIGH
19-Jan-89	09:56 PM	21.8	LOW
20-Jan-89	07:58 AM	31.6	HIGH
20-Jan-89	01:56 PM	16.2	LOW
21-Jan-89	01:56 AM	14.7	LOW
21-Jan-89	08:40 AM	32.1	HIGH
22-Jan-89	08:41 AM	35.1	HIGH
22-Jan-89	09:55 PM	16.9	LOW
23-Jan-89	01:20 AM	15.6	LOW
23-Jan-89	08:16 AM	33.4	HIGH
24-Jan-89	05:49 AM	29.3	HIGH
24-Jan-89	05:27 PM	10.7	LOW
25-Jan-89	07:53 AM	21.9	HIGH
25-Jan-89	08:26 PM	6.5	LOW
26-Jan-89	01:12 AM	6.3	LOW
26-Jan-89	08:52 AM	31.3	HIGH
27-Jan-89	08:29 AM	36.5	HIGH
27-Jan-89	07:17 PM	14.6	LOW
28-Jan-89	10:01 AM	27.4	HIGH
28-Jan-89	01:53 PM	18.7	LOW
29-Jan-89	12:26 AM	23.0	LOW
29-Jan-89	08:20 AM	38.4	HIGH
30-Jan-89	02:07 AM	27.8	LOW
30-Jan-89	10:38 AM	50.7	HIGH
31-Jan-89	08:05 AM	40.7	HIGH
31-Jan-89	02:57 PM	25.6	LOW
01-Feb-89	03:30 AM	24.1	LOW
01-Feb-89	08:07 AM	39.9	HIGH
02-Feb-89	11:18 AM	33.9	HIGH
02-Feb-89	05:50 PM	20.4	LOW
03-Feb-89	07:14 AM	25.7	HIGH
03-Feb-89	08:17 PM	16.1	LOW
04-Feb-89	04:53 AM	13.2	HIGH
04-Feb-89	08:27 PM	-8.4	LOW
05-Feb-89	05:41 AM	-2.3	HIGH
05-Feb-89	02:16 PM	-14.7	LOW
06-Feb-89	12:39 AM	-12.1	LOW
06-Feb-89	07:19 AM	0.4	HIGH
07-Feb-89	12:18 AM	-8.8	LOW
07-Feb-89	06:30 AM	10.2	HIGH
08-Feb-89	12:41 AM	-4.3	LOW
08-Feb-89	06:03 AM	17.9	HIGH
09-Feb-89	12:53 AM	10.6	LOW
09-Feb-89	05:27 AM	27.7	HIGH
10-Feb-89	06:32 AM	35.1	HIGH

Jan-89 SUMMARY

	HIGH	LOW
AVG.	27.9	12.2
MAX.	50.7	27.8
MIN.	5.5	-2.5

DATE	TIME	TEMPERATURE (DEG. F)	
10-Feb-89	08:37 PM	14.6	LOW
11-Feb-89	06:59 AM	31.2	HIGH
11-Feb-89	08:06 PM	9.6	LOW
12-Feb-89	05:48 AM	25.0	HIGH
12-Feb-89	08:41 PM	3.0	LOW
13-Feb-89	05:45 AM	22.4	HIGH
13-Feb-89	07:42 PM	1.2	LOW
14-Feb-89	06:28 AM	22.3	HIGH
14-Feb-89	05:16 PM	3.1	LOW
14-Feb-89	11:49 PM	5.1	LOW
15-Feb-89	06:26 AM	26.3	HIGH
16-Feb-89	12:31 AM	10.0	LOW
16-Feb-89	05:40 AM	31.5	HIGH
17-Feb-89	12:57 AM	18.9	LOW
17-Feb-89	06:41 AM	37.2	HIGH
18-Feb-89	06:25 AM	36.4	HIGH
18-Feb-89	08:49 PM	19.6	LOW
19-Feb-89	07:25 AM	31.6	HIGH
19-Feb-89	09:24 PM	14.6	LOW
20-Feb-89	07:02 AM	24.6	HIGH
20-Feb-89	08:34 PM	9.8	LOW
21-Feb-89	12:03 AM	12.4	LOW
21-Feb-89	09:22 AM	36.0	HIGH
22-Feb-89	06:26 AM	44.0	HIGH
22-Feb-89	04:18 PM	22.7	LOW
23-Feb-89	08:44 AM	43.7	HIGH
23-Feb-89	09:31 PM	25.7	LOW
24-Feb-89	01:14 AM	26.7	LOW
24-Feb-89	07:07 AM	46.6	HIGH
25-Feb-89	07:58 AM	48.4	HIGH
25-Feb-89	05:16 PM	32.1	LOW
26-Feb-89	04:23 AM	39.6	HIGH
26-Feb-89	09:23 PM	21.8	LOW
27-Feb-89	02:25 AM	18.2	LOW
27-Feb-89	09:00 AM	31.8	HIGH
28-Feb-89	12:35 AM	19.2	LOW
28-Feb-89	08:13 AM	40.6	HIGH
01-Mar-89	12:21 AM	23.1	LOW
01-Mar-89	09:58 AM	45.2	HIGH
02-Mar-89	04:57 AM	35.9	HIGH
02-Mar-89	07:48 PM	13.9	LOW
03-Mar-89	12:13 AM	13.3	HIGH
03-Mar-89	07:02 PM	3.5	LOW
04-Mar-89	10:48 PM	3.6	LOW
04-Mar-89	06:07 AM	28.3	HIGH
05-Mar-89	12:26 AM	15.4	LOW
05-Mar-89	06:28 AM	37.4	HIGH
06-Mar-89	01:16 AM	26.3	LOW
06-Mar-89	02:46 PM	45.8	HIGH
07-Mar-89	08:37 AM	28.3	LOW
07-Mar-89	03:22 PM	46.2	HIGH
08-Mar-89	08:30 AM	30.8	LOW
08-Mar-89	04:48 PM	50.3	HIGH
09-Mar-89	09:14 AM	35.8	LOW

Feb-89 SUMMARY

	HIGH	LOW
AVG.	29.3	11.1
MAX.	48.4	32.1
MIN.	-2.3	-14.7

DATE	TIME	TEMPERATURE (DEG. F)		
09-Mar-89	04:31 PM	58.1		HIGH
10-Mar-89	07:51 AM		40.0	LOW
10-Mar-89	04:26 PM	58.2		HIGH
11-Mar-89	05:41 AM		39.3	LOW
11-Mar-89	03:58 PM	54.5		HIGH
12-Mar-89	07:48 AM		39.7	LOW
12-Mar-89	03:33 PM	56.4		HIGH
13-Mar-89	11:56 AM	43.4		HIGH
13-Mar-89	09:28 PM		22.3	LOW
14-Mar-89	08:39 AM		14.1	LOW
14-Mar-89	03:35 PM	24.3		HIGH
15-Mar-89	12:52 AM		23.2	LOW
15-Mar-89	03:06 PM	43.8		HIGH
16-Mar-89	04:39 AM		24.7	LOW
16-Mar-89	02:08 PM	48.9		HIGH
17-Mar-89	05:49 AM		15.9	LOW
17-Mar-89	02:22 PM	36.1		HIGH
18-Mar-89	05:21 AM		26.3	LOW
18-Mar-89	12:26 PM	46.5		HIGH
19-Mar-89	10:19 AM	37.8		HIGH
19-Mar-89	09:46 PM		21.0	LOW
20-Mar-89	07:15 AM		16.4	LOW
20-Mar-89	05:26 PM	33.5		HIGH
21-Mar-89	05:49 AM		19.8	LOW
21-Mar-89	03:16 PM	44.9		HIGH
22-Mar-89	04:23 AM		29.4	LOW
22-Mar-89	04:20 PM	49.2		HIGH
23-Mar-89	07:36 AM		32.4	LOW
23-Mar-89	03:41 PM	49.9		HIGH
24-Mar-89	07:32 AM		32.3	LOW
24-Mar-89	02:03 PM	52.6		HIGH
25-Mar-89	06:51 AM		28.9	LOW
25-Mar-89	02:17 PM	49.3		HIGH
26-Mar-89	01:55 PM	35.5		HIGH
26-Mar-89	09:41 PM		25.0	LOW
27-Mar-89	07:04 AM		20.8	LOW
27-Mar-89	01:44 PM	39.6		HIGH
28-Mar-89	01:02 AM		25.9	LOW
28-Mar-89	02:28 PM	51.8		HIGH
29-Mar-89	01:34 PM	39.9		HIGH
29-Mar-89	09:57 PM		27.5	LOW
30-Mar-89	06:53 AM		25.4	LOW
30-Mar-89	03:44 PM	40.0		HIGH
31-Mar-89	03:54 AM		27.4	LOW
31-Mar-89	02:26 PM	47.5		HIGH
01-Apr-89	07:53 AM		25.1	LOW
01-Apr-89	02:24 PM	46.0		HIGH
02-Apr-89	08:38 AM		30.4	LOW
02-Apr-89	01:26 PM	39.2		HIGH
03-Apr-89	12:11 PM	31.6		HIGH
03-Apr-89	06:02 PM		24.1	LOW
04-Apr-89	04:26 AM		23.6	LOW
04-Apr-89	01:29 PM	36.9		HIGH
05-Apr-89	03:08 AM		25.9	LOW

Mar-89 SUMMARY

	HIGH	LOW
AVG.	43.4	24.5
MAX.	58.2	40.0
MIN.	13.3	3.5

DATE	TIME	TEMPERATURE (DEG. F)		
05-Apr-89	02:50 PM	51.4		HIGH
06-Apr-89	01:01 AM		36.7	LOW
06-Apr-89	02:22 PM	54.2		HIGH
07-Apr-89	02:02 PM	60.4		HIGH
07-Apr-89	10:20 PM		43.3	LOW
08-Apr-89	04:39 AM		36.6	LOW
08-Apr-89	01:54 PM	54.1		HIGH
09-Apr-89	12:22 PM	46.3		HIGH
09-Apr-89	08:40 PM		28.8	LOW
10-Apr-89	03:59 AM		13.8	LOW
10-Apr-89	02:14 PM	45.9		HIGH
11-Apr-89	04:22 AM		27.7	LOW
11-Apr-89	01:37 PM	48.6		HIGH
12-Apr-89	12:35 AM		27.9	LOW
12-Apr-89	01:58 PM	44.5		HIGH
13-Apr-89	03:10 AM		28.2	LOW
13-Apr-89	03:49 PM	56.5		HIGH
14-Apr-89	03:33 AM		35.6	LOW
14-Apr-89	12:58 PM	60.0		HIGH
15-Apr-89	01:08 PM	61.3		HIGH
15-Apr-89	09:38 PM		38.4	LOW
16-Apr-89	04:30 AM		36.1	LOW
16-Apr-89	02:52 PM	56.4		HIGH
17-Apr-89	04:39 AM		38.7	LOW
17-Apr-89	12:59 PM	61.4		HIGH
18-Apr-89	02:33 AM		40.3	LOW
18-Apr-89	12:24 PM	65.2		HIGH
19-Apr-89	04:09 AM		44.6	LOW
19-Apr-89	12:43 PM	63.5		HIGH
20-Apr-89	03:08 PM	69.4		HIGH
20-Apr-89	09:56 PM		51.9	LOW
21-Apr-89	05:15 AM		46.1	LOW
21-Apr-89	12:44 PM	68.8		HIGH
22-Apr-89	04:14 AM		42.8	LOW
22-Apr-89	02:07 PM	63.3		HIGH
23-Apr-89	05:52 AM		37.3	LOW
23-Apr-89	01:49 PM	61.1		HIGH
24-Apr-89	04:04 AM		33.2	LOW
24-Apr-89	12:12 PM	57.2		HIGH
25-Apr-89	04:42 AM		29.9	LOW
25-Apr-89	10:41 AM	49.3		HIGH
26-Apr-89	11:23 AM	34.7		HIGH
26-Apr-89	05:05 PM		22.7	LOW
27-Apr-89	11:14 AM	41.1		HIGH
27-Apr-89	09:19 PM		21.4	LOW
28-Apr-89	01:37 AM		20.3	LOW
28-Apr-89	11:31 AM	41.3		HIGH
29-Apr-89	01:24 AM		21.6	LOW
29-Apr-89	01:03 PM	43.4		HIGH
30-Apr-89	01:07 AM		25.9	LOW
30-Apr-89	02:02 PM	51.0		HIGH
01-May-89	03:12 AM		34.6	LOW
01-May-89	11:48 AM	54.7		HIGH
02-May-89	02:15 AM		37.6	LOW

Apr-89 SUMMARY

	HIGH	LOW
AVG.	52.1	32.0
MAX.	69.4	51.9
MIN.	31.6	1[illegible]

DATE	TIME	TEMPERATURE (DEG. F)		
02-May-89	01:52 PM	55.5		HIGH
03-May-89	03:29 AM		41.6	LOW
03-May-89	11:05 AM	51.3		HIGH
04-May-89	04:07 AM		39.4	LOW
04-May-89	12:38 PM	54.5		HIGH
05-May-89	02:01 AM		37.8	LOW
05-May-89	12:59 PM	66.2		HIGH
06-May-89	01:15 AM		48.3	LOW
06-May-89	01:11 PM	68.6		HIGH
07-May-89	02:07 AM		49.2	LOW
07-May-89	12:41 PM	72.2		HIGH
08-May-89	02:48 AM		51.9	LOW
08-May-89	11:45 AM	69.1		HIGH
09-May-89	11:03 AM	68.2		HIGH
09-May-89	07:33 PM		44.6	LOW
10-May-89	01:14 AM		42.0	LOW
10-May-89	09:42 AM	60.6		HIGH
11-May-89	11:24 AM	57.2		HIGH
11-May-89	07:54 PM		21.6	LOW
12-May-89	05:50 AM	40.7		HIGH
12-May-89	08:13 PM		21.5	LOW
13-May-89	01:06 AM		21.5	LOW
13-May-89	10:40 AM	48.4		HIGH
14-May-89	06:05 AM	38.1		HIGH
14-May-89	05:15 PM		27.4	LOW
15-May-89	10:09 AM	38.0		HIGH
15-May-89	07:08 PM		28.4	LOW
16-May-89	01:08 AM		31.5	LOW
16-May-89	04:55 AM	45.1		HIGH
17-May-89	12:12 AM		35.0	LOW
17-May-89	11:35 AM	53.7		HIGH
18-May-89	10:46 AM	66.5		HIGH
18-May-89	08:53 PM		31.4	LOW
19-May-89	01:23 AM		29.0	LOW
19-May-89	11:05 AM	54.9		HIGH
20-May-89	01:44 AM		37.7	LOW
20-May-89	01:02 PM	66.2		HIGH
21-May-89	11:52 AM	64.7		HIGH
21-May-89	08:26 PM		46.7	LOW
22-May-89	01:11 AM		45.4	LOW
22-May-89	11:53 AM	72.4		HIGH
23-May-89	08:25 AM	67.7		HIGH
23-May-89	09:19 PM		34.2	LOW
24-May-89	09:49 AM	51.1		HIGH
24-May-89	08:55 PM		27.5	LOW
25-May-89	01:24 AM		27.3	LOW
25-May-89	10:58 AM	50.8		HIGH
26-May-89	01:26 AM		32.0	LOW
26-May-89	12:22 PM	60.5		HIGH
27-May-89	01:11 AM		39.7	LOW
27-May-89	10:42 AM	68.7		HIGH
28-May-89	11:23 AM	71.5		HIGH
28-May-89	09:50 PM		43.8	LOW
29-May-89	10:25 AM	62.2		HIGH
29-May-89	08:15 PM		39.2	LOW

May-89 SUMMARY

DATE	TIME	TEMPERATURE (DEG. F)		
30-May-89	07:24 AM	47.9		HIGH
30-May-89	07:27 PM		25.7	LOW
31-May-89	07:10 AM	48.6		HIGH
31-May-89	07:28 PM		34.4	LOW
01-Jun-89	12:01 AM		35.5	LOW
01-Jun-89	09:55 AM	59.5		HIGH
02-Jun-89	01:22 AM		44.0	LOW
02-Jun-89	11:40 AM	69.2		HIGH
03-Jun-89	11:37 AM		67.0	LOW
03-Jun-89	08:49 PM		43.8	LOW
04-Jun-89	02:14 AM		40.4	LOW
04-Jun-89	11:36 AM	59.6		HIGH
05-Jun-89	02:22 AM		40.0	LOW
05-Jun-89	11:46 AM	66.1		HIGH
19-Jun-89	12:35 PM	75.1		HIGH
19-Jun-89	09:33 PM		54.8	LOW
20-Jun-89	10:18 AM	68.8		HIGH
20-Jun-89	08:04 PM		25.4	LOW
21-Jun-89	01:10 AM		25.9	LOW
21-Jun-89	10:25 AM	53.1		HIGH
21-Jun-89	11:59 PM		28.0	LOW
22-Jun-89	09:00 AM	51.5		HIGH
23-Jun-89	06:31 AM	43.9		HIGH
23-Jun-89	08:29 PM		30.2	LOW
24-Jun-89	12:39 AM		31.9	LOW
24-Jun-89	10:31 AM	51.9		HIGH
25-Jun-89	05:02 AM	55.8		HIGH
25-Jun-89	04:54 PM		34.9	LOW
26-Jun-89	01:12 AM		41.4	LOW
26-Jun-89	09:09 AM	61.0		HIGH
27-Jun-89	08:47 AM	65.4		HIGH
27-Jun-89	09:44 PM		42.4	LOW
28-Jun-89	01:21 AM		42.0	LOW
28-Jun-89	08:24 AM	63.6		HIGH
29-Jun-89	12:30 AM		43.0	LOW
29-Jun-89	10:31 AM	72.1		HIGH
30-Jun-89	01:20 AM		46.2	LOW
30-Jun-89	11:59 AM	77.0		HIGH
01-Jul-89	11:14 AM	74.6		HIGH
01-Jul-89	08:58 PM		48.6	LOW
02-Jul-89	12:19 AM		48.5	LOW
02-Jul-89	12:16 PM	79.1		HIGH
03-Jul-89	01:59 AM		53.8	LOW
03-Jul-89	12:42 PM	80.4		HIGH
04-Jul-89	01:58 AM		54.0	LOW
04-Jul-89	01:23 PM	84.9		HIGH
05-Jul-89	02:45 AM		57.8	LOW
05-Jul-89	02:18 PM	82.8		HIGH
06-Jul-89	04:46 AM		56.4	LOW
06-Jul-89	02:16 PM	85.8		HIGH
07-Jul-89	04:45 AM		58.1	LOW
07-Jul-89	12:28 PM	84.1		HIGH
08-Jul-89	04:16 AM		58.1	LOW

	HIGH	LOW
AVG.	57.9	35.7
MAX.	72.4	51.9
MIN.	38.0	21.5

Jun-89 SUMMARY

	HIGH	LOW
AVG.	64.3	36.3
MAX.	75.1	67.0
MIN.	43.9	25.4

DATE	TIME	TEMPERATURE (DEG. F)		
08-Jul-89	11:48 AM	81.0		HIGH
09-Jul-89	12:43 PM	80.0		HIGH
09-Jul-89	09:12 PM		51.9	LOW
10-Jul-89	03:15 AM		47.5	LOW
10-Jul-89	11:56 AM	70.7		HIGH
11-Jul-89	02:11 PM	74.3		HIGH
11-Jul-89	08:27 PM		44.6	LOW
12-Jul-89	02:02 AM		42.9	LOW
12-Jul-89	02:59 PM	58.1		HIGH
13-Jul-89	02:28 AM		43.7	LOW
13-Jul-89	02:37 PM	67.1		HIGH
14-Jul-89	02:08 AM		46.0	LOW
14-Jul-89	01:18 PM	73.1		HIGH
15-Jul-89	03:41 AM		51.7	LOW
15-Jul-89	02:13 PM	78.8		HIGH
16-Jul-89	04:03 AM		52.6	LOW
16-Jul-89	02:28 PM	75.6		HIGH
17-Jul-89	03:27 AM		49.0	LOW
17-Jul-89	12:58 PM	70.9		HIGH
18-Jul-89	12:16 AM		48.5	LOW
18-Jul-89	02:16 PM	77.2		HIGH
19-Jul-89	04:10 AM		53.5	LOW
19-Jul-89	12:11 PM	79.1		HIGH
20-Jul-89	04:40 AM		56.7	LOW
20-Jul-89	01:47 PM	79.6		HIGH
21-Jul-89	09:45 AM	71.8		HIGH
21-Jul-89	03:31 PM		50.5	LOW
22-Jul-89	11:01 AM	72.3		HIGH
22-Jul-89	01:33 PM		50.6	LOW
23-Jul-89	10:01 AM	61.4		HIGH
23-Jul-89	03:59 PM		42.5	LOW
24-Jul-89	12:01 AM		44.1	LOW
24-Jul-89	01:09 PM	64.4		HIGH
25-Jul-89	12:01 AM		48.2	LOW
25-Jul-89	02:24 PM	69.9		HIGH
26-Jul-89	01:09 PM	72.6		HIGH
26-Jul-89	07:45 PM		47.9	LOW
27-Jul-89	01:52 AM		44.9	LOW
27-Jul-89	10:10 AM	65.0		HIGH
28-Jul-89	12:34 AM		44.5	LOW
28-Jul-89	11:52 AM	65.9		HIGH
29-Jul-89	01:15 AM		43.2	LOW
29-Jul-89	11:30 AM	63.9		HIGH
30-Jul-89	12:02 AM		45.0	LOW
30-Jul-89	12:23 PM	74.2		HIGH
31-Jul-89	03:56 AM		50.5	LOW
31-Jul-89	02:40 PM	77.0		HIGH
01-Aug-89	08:15 AM	60.5		HIGH
01-Aug-89	06:08 PM		46.9	LOW
02-Aug-89	01:50 AM		42.9	LOW
02-Aug-89	03:46 PM	65.7		HIGH
03-Aug-89	07:21 AM		50.8	LOW
03-Aug-89	06:03 PM	71.1		HIGH
04-Aug-89	12:40 PM	69.8		HIGH

Jul-89 SUMMARY

	HIGH	LOW
AVG.	74.1	49.5
MAX.	85.8	58.1
MIN.	58.1	42.5

DATE	TIME	TEMPERATURE (DEG. F)		
04-Aug-89	08:36 PM		50.7	LOW
05-Aug-89	12:56 AM		49.6	LOW
05-Aug-89	10:30 AM	73.7		HIGH
06-Aug-89	02:33 AM		48.2	LOW
06-Aug-89	02:15 PM	71.2		HIGH
07-Aug-89	02:42 AM		49.3	LOW
07-Aug-89	10:06 AM	73.4		HIGH
08-Aug-89	10:46 AM	75.5		HIGH
08-Aug-89	09:42 PM		51.7	LOW
09-Aug-89	01:17 PM	65.8		HIGH
09-Aug-89	10:38 PM		44.1	LOW
10-Aug-89	02:44 AM		44.1	LOW
10-Aug-89	09:42 AM	62.7		HIGH
11-Aug-89	06:56 AM	55.1		HIGH
11-Aug-89	09:03 AM		41.0	LOW
12-Aug-89	02:10 AM		41.9	LOW
12-Aug-89	11:00 AM	64.9		HIGH
13-Aug-89	01:14 AM		44.5	LOW
13-Aug-89	10:54 AM	69.5		HIGH
14-Aug-89	11:40 AM	65.3		HIGH
14-Aug-89	02:01 PM		41.7	LOW
15-Aug-89	09:11 AM	61.6		HIGH
15-Aug-89	09:55 PM		39.2	LOW
16-Aug-89	01:09 AM		38.8	LOW
16-Aug-89	10:31 AM	64.6		HIGH
17-Aug-89	07:16 AM	60.1		HIGH
17-Aug-89	06:09 PM		36.9	LOW
18-Aug-89	01:32 AM		36.6	LOW
18-Aug-89	10:12 AM	52.5		HIGH
19-Aug-89	10:31 AM	57.3		HIGH
19-Aug-89	10:16 PM		38.3	LOW
20-Aug-89	01:04 AM		37.7	LOW
20-Aug-89	08:33 AM	56.1		HIGH
21-Aug-89	07:14 AM	53.9		HIGH
21-Aug-89	08:36 PM		40.7	LOW
22-Aug-89	01:21 AM		40.2	LOW
22-Aug-89	12:18 PM	62.2		HIGH
23-Aug-89	12:48 PM	66.0		HIGH
23-Aug-89	09:52 PM		41.4	LOW
24-Aug-89	10:45 AM	52.5		HIGH
24-Aug-89	09:54 PM		36.5	LOW
25-Aug-89	02:09 AM		32.7	LOW
25-Aug-89	11:04 AM	57.8		HIGH
26-Aug-89	02:13 AM		38.4	LOW
26-Aug-89	01:06 PM	65.6		HIGH
27-Aug-89	03:18 AM		42.6	LOW
27-Aug-89	01:14 PM	68.0		HIGH
28-Aug-89	02:37 AM		46.6	LOW
28-Aug-89	12:28 PM	70.5		HIGH
29-Aug-89	03:35 AM		44.1	LOW
29-Aug-89	01:53 PM	70.8		HIGH
30-Aug-89	01:01 PM	71.4		HIGH
30-Aug-89	10:05 PM		46.8	LOW
31-Aug-89	03:53 AM		44.1	LOW
31-Aug-89	12:01 PM	67.4		HIGH

Aug-89 SUMMARY

	HIGH	LOW
AVG.	64.6	42.9
MAX.	75.5	51.7
MIN.	52.5	32.7

DATE	TIME	TEMPERATURE (DEG. F)	
01-Sep-89	04:01 AM	43.2	LOW
01-Sep-89	01:28 PM	70.4	HIGH
02-Sep-89	04:01 AM	46.9	LOW
02-Sep-89	12:44 PM	70.2	HIGH
03-Sep-89	12:26 PM	65.8	HIGH
03-Sep-89	09:26 PM	46.2	LOW
04-Sep-89	04:39 AM	44.7	LOW
04-Sep-89	02:45 PM	68.5	HIGH
05-Sep-89	06:35 AM	46.5	LOW
05-Sep-89	02:22 PM	71.9	HIGH
06-Sep-89	05:43 AM	48.2	LOW
06-Sep-89	01:21 PM	70.1	HIGH
07-Sep-89	04:14 AM	46.1	LOW
07-Sep-89	02:05 PM	70.1	HIGH
08-Sep-89	11:15 AM	53.7	HIGH
08-Sep-89	08:48 PM	34.7	LOW
09-Sep-89	04:09 AM	31.9	LOW
09-Sep-89	12:25 PM	57.8	HIGH
10-Sep-89	10:32 AM	54.3	HIGH
10-Sep-89	09:21 PM	35.3	LOW
11-Sep-89	10:04 AM	52.1	HIGH
11-Sep-89	09:17 PM	27.5	LOW
12-Sep-89	08:56 AM	37.8	HIGH
12-Sep-89	08:35 PM	25.8	LOW
13-Sep-89	12:59 AM	26.5	LOW
13-Sep-89	11:31 AM	51.6	HIGH
14-Sep-89	02:40 AM	33.1	LOW
14-Sep-89	01:53 PM	58.1	HIGH
15-Sep-89	03:33 AM	38.9	LOW
15-Sep-89	01:37 PM	62.8	HIGH
16-Sep-89	02:36 AM	41.3	LOW
16-Sep-89	02:34 PM	64.4	HIGH
17-Sep-89	12:18 PM	64.6	HIGH
17-Sep-89	06:07 PM	40.3	LOW
18-Sep-89	09:00 AM	54.6	HIGH
18-Sep-89	09:26 PM	33.2	LOW
19-Sep-89	10:32 AM	56.9	HIGH
19-Sep-89	09:29 PM	26.2	LOW
20-Sep-89	11:00 AM	35.9	HIGH
20-Sep-89	09:18 PM	25.8	LOW
21-Sep-89	12:38 AM	25.7	LOW
21-Sep-89	10:59 AM	49.8	HIGH
22-Sep-89	01:15 PM	50.1	HIGH
22-Sep-89	09:09 PM	34.7	LOW
23-Sep-89	03:10 AM	34.7	LOW
23-Sep-89	12:44 PM	58.1	HIGH
24-Sep-89	03:33 AM	42.4	LOW
24-Sep-89	01:04 PM	64.2	HIGH
25-Sep-89	03:05 AM	43.9	LOW
25-Sep-89	02:51 PM	65.0	HIGH
26-Sep-89	10:47 AM	59.7	HIGH
26-Sep-89	05:24 PM	42.4	LOW
27-Sep-89	02:25 AM	42.5	LOW
27-Sep-89	12:10 PM	61.7	HIGH

DATE	TIME	TEMPERATURE (DEG. F)		
28-Sep-89	03:12 AM	42.7	LOW	
28-Sep-89	12:35 PM	65.1	HIGH	
29-Sep-89	03:28 AM	44.2	LOW	
29-Sep-89	02:38 PM	66.5	HIGH	
30-Sep-89	12:39 PM	64.3	HIGH	
30-Sep-89	07:48 PM	31.8	LOW	

Sep-89 SUMMARY

	HIGH	LOW
AVG.	59.9	37.6
MAX.	71.9	48.2
MIN.	35.9	25.7

PRINTED IN U.S.A.

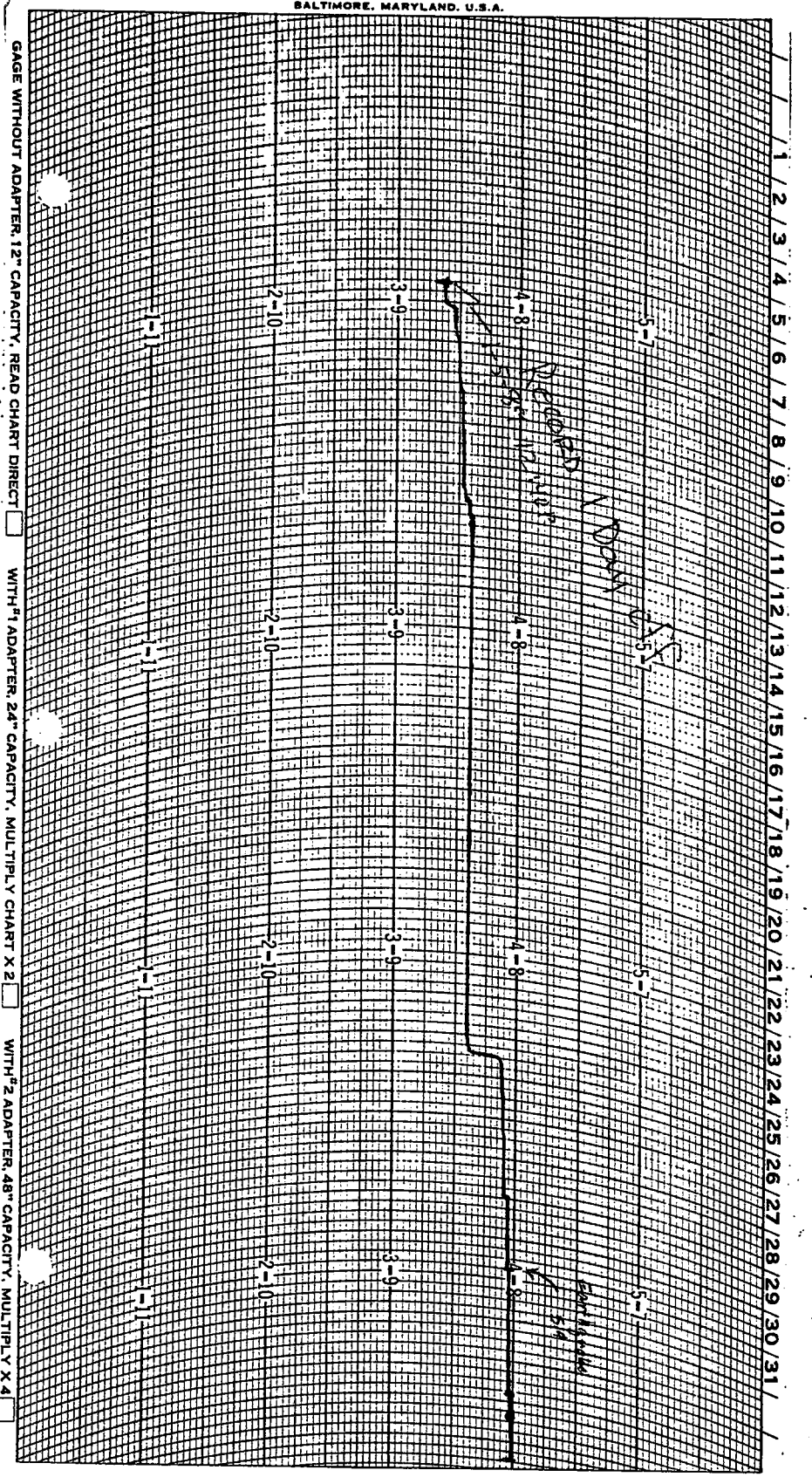
CHART NO. 15668

12-INCH DUAL TRAVERSE MONTHLY-861 HRS.

UNIVERSAL RAIN GAGE

BELFORT INSTRUMENT COMPANY

BALTIMORE, MARYLAND, U.S.A.



GAGE WITHOUT ADAPTER, 12" CAPACITY, READ CHART DIRECT ☐ WITH #1 ADAPTER, 24" CAPACITY, MULTIPLY CHART X 2 ☐ WITH #2 ADAPTER, 48" CAPACITY, MULTIPLY X 4 ☐

OBSERVER K. SNIDER

STATION EM

ON 12:40 A.M. P.M. 1-5 19 89

OFF 1015 A.M. P.M. 2-3 19 89

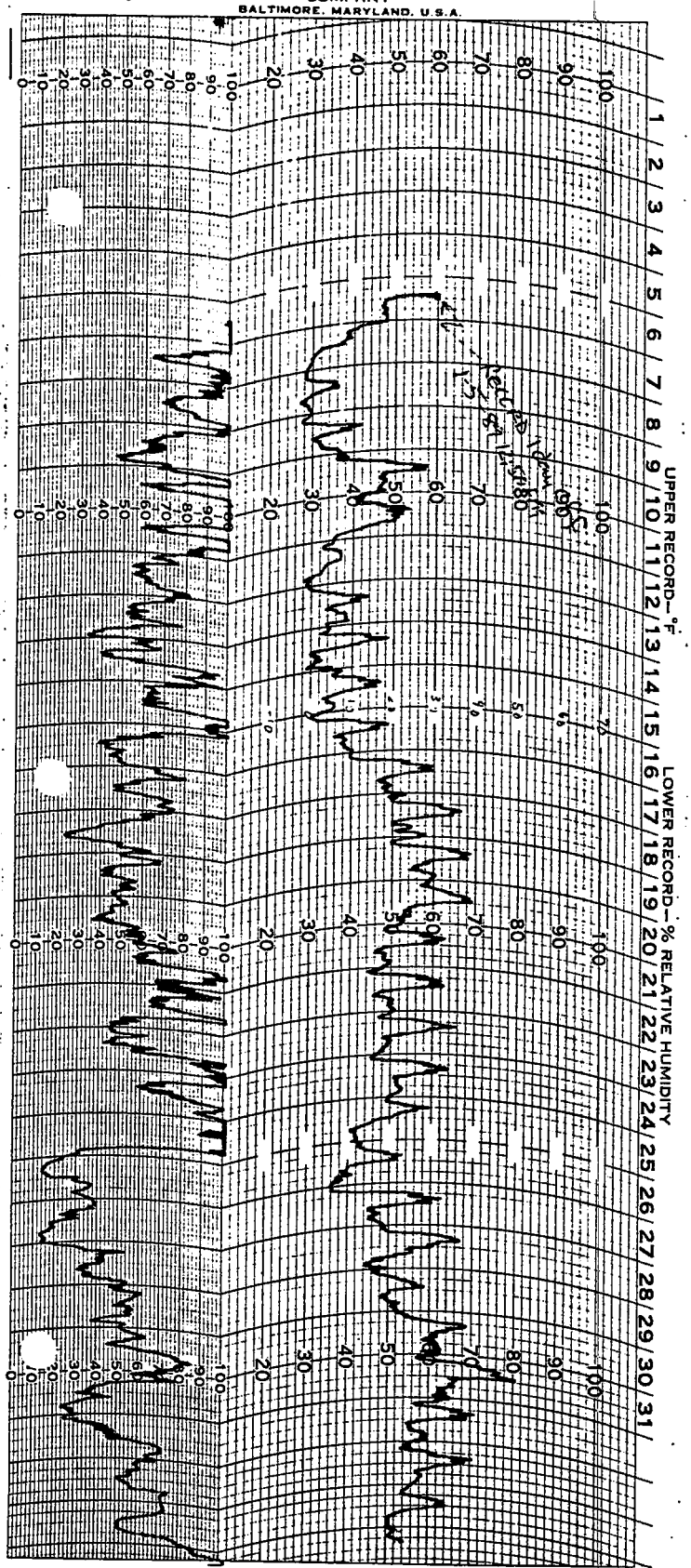
HYGROTHERMOGRAPH

CHART NO. 15627

MONTHLY-861 HRS.

BELFORT INSTRUMENT COMPANY

BALTIMORE, MARYLAND, U.S.A.



OBSERVER K SNIDER ON 12:50 A.M. P.M. 1-6 1989

STATION E1 OFF 11:20 A.M. P.M. 2-3 1989

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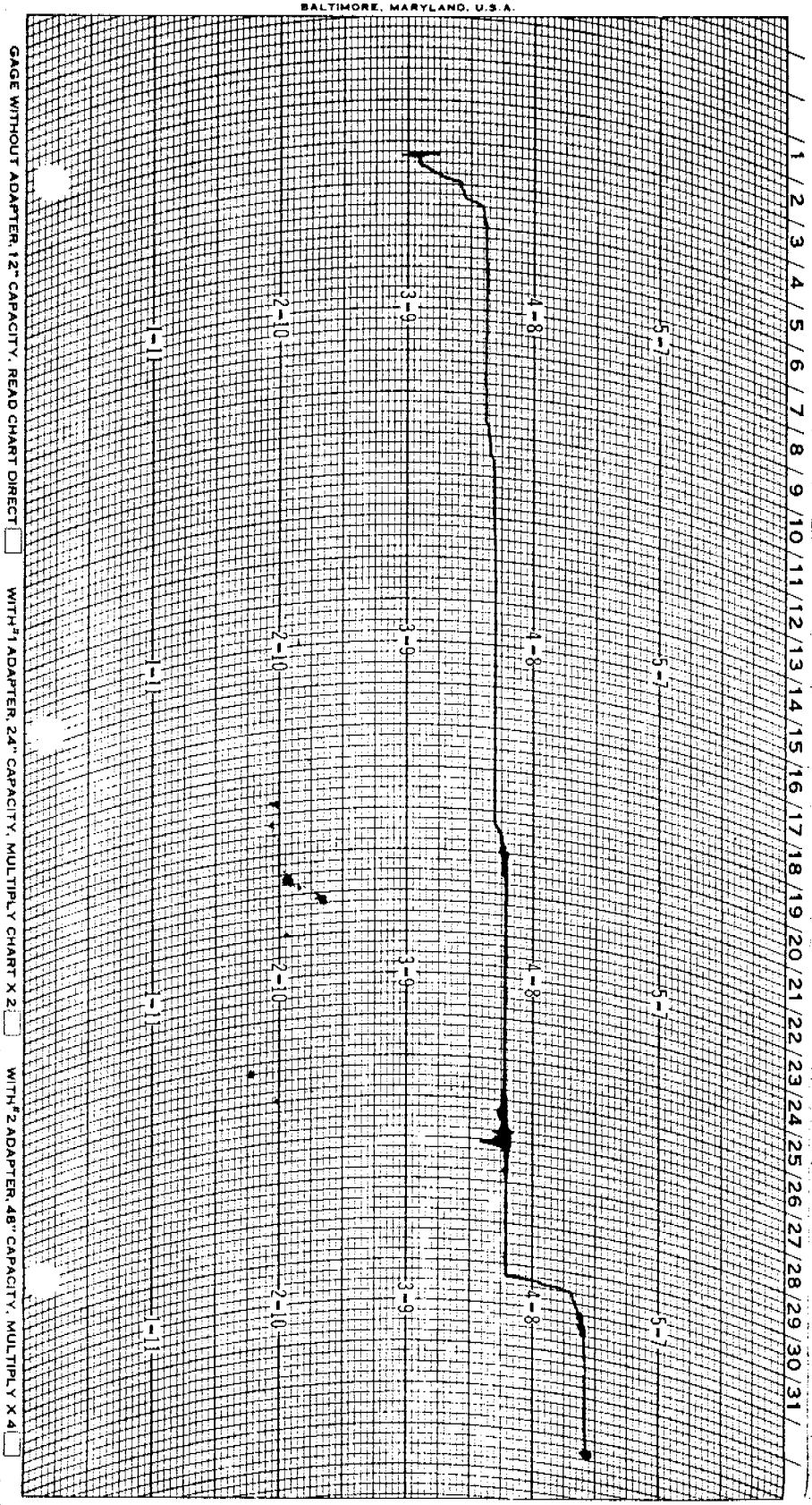
CHART NO. 15668

12-INCH DUAL TRAVERSE MONTHLY-861 HRS.
UNIVERSAL RAIN GAGE

BELFORT INSTRUMENT COMPANY
BALTIMORE, MARYLAND, U.S.A.



GAGE WITHOUT ADAPTER, 12" CAPACITY, READ CHART DIRECT ☐ WITH #1 ADAPTER, 24" CAPACITY, MULTIPLY CHART X 2 ☐ WITH #2 ADAPTER, 48" CAPACITY, MULTIPLY X 4 ☐

OBSERVER SEMBORSKI/SNIDER ON 10 20 A.M. P.M. 2-3 1989

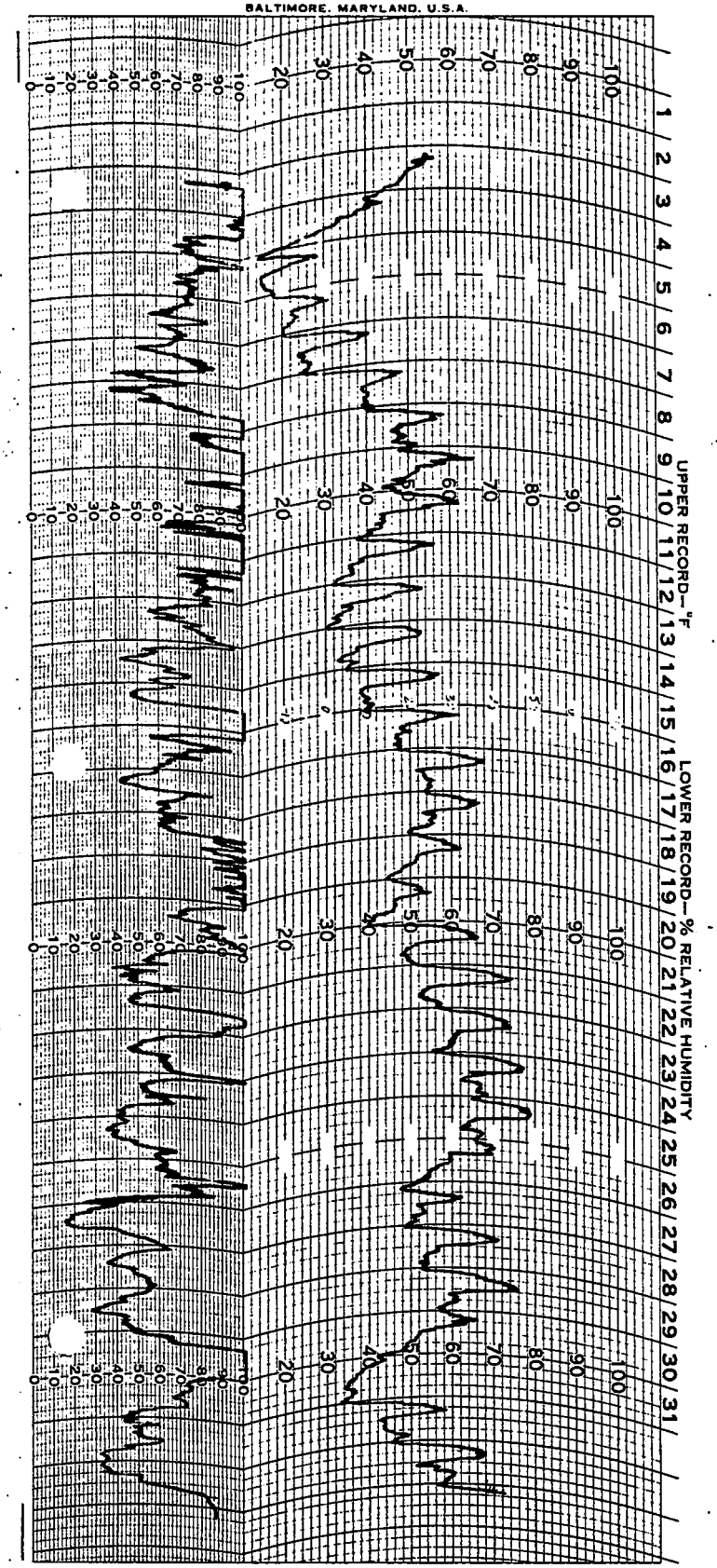
STATION EAST MTN. OFF 11 A.M. P.M. 3-6 1989

CHART NO. 15627

MONTHLY-861 HRS.

BELFORT INSTRUMENT COMPANY

BALTIMORE, MARYLAND, U.S.A.



OBSERVER K. Smith ON 10:15 A.M. P.M. 2-5 1987

STATION EM OFF 11:00 A.M. P.M. 3-6 1987

PRINTED IN U.S.A.

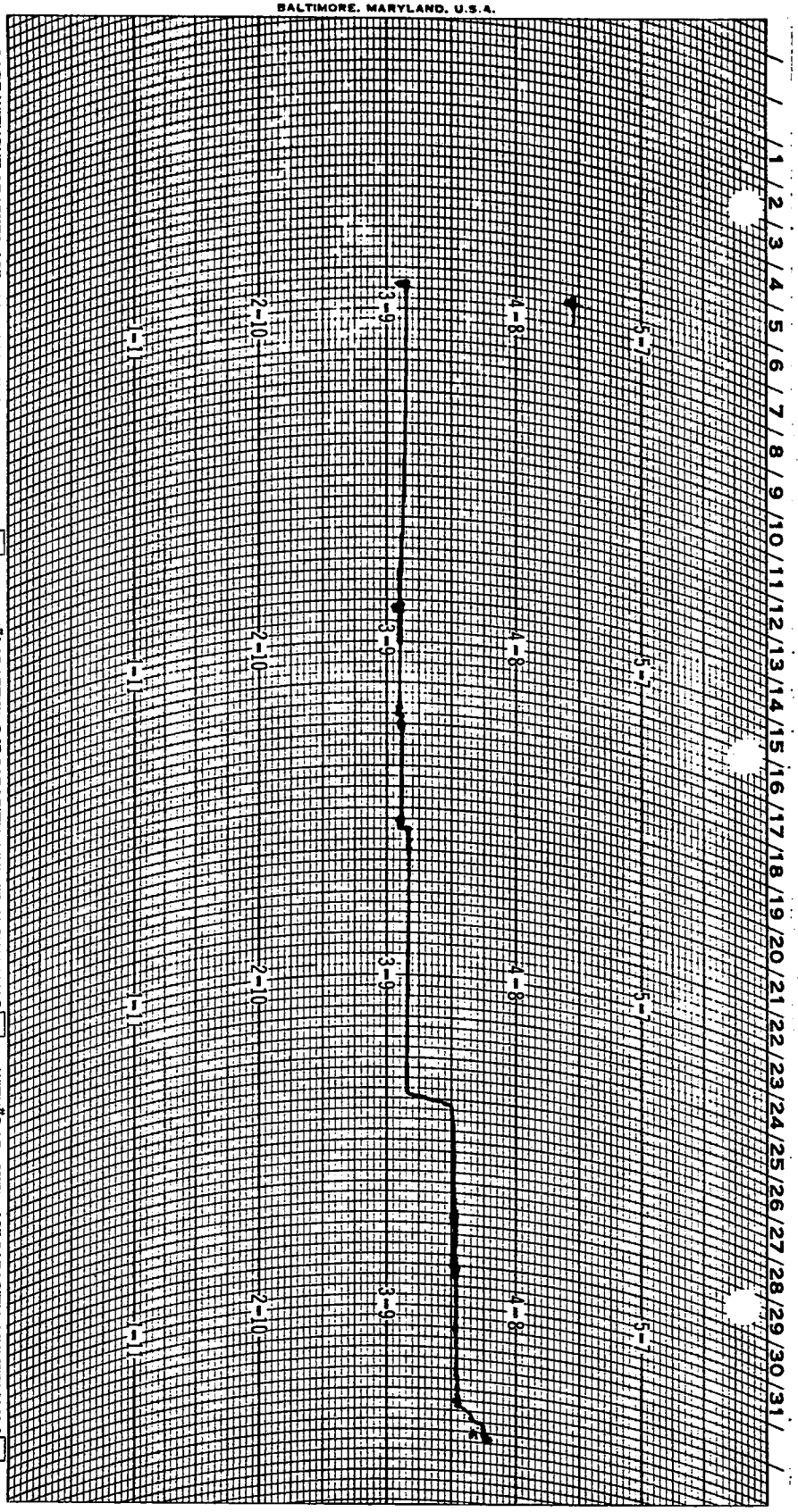
CHART NO. 15668

12-INCH DUAL TRAVERSE MONTHLY-861 HRS.

UNIVERSAL RAIN GAGE

BELFORT INSTRUMENT COMPANY

BALTIMORE, MARYLAND, U.S.A.



GAGE WITHOUT ADAPTER, 12" CAPACITY, READ CHART DIRECT ☐ WITH #1 ADAPTER, 24" CAPACITY, MULTIPLY CHART X 2 ☐ WITH #2 ADAPTER, 48" CAPACITY, MULTIPLY X 4 ☐

OBSERVER Snider / Sombowski ON 11.00 A.M. P.M. Mar 6 19 87

STATION EAST MTN OFF A.M. P.M. 19

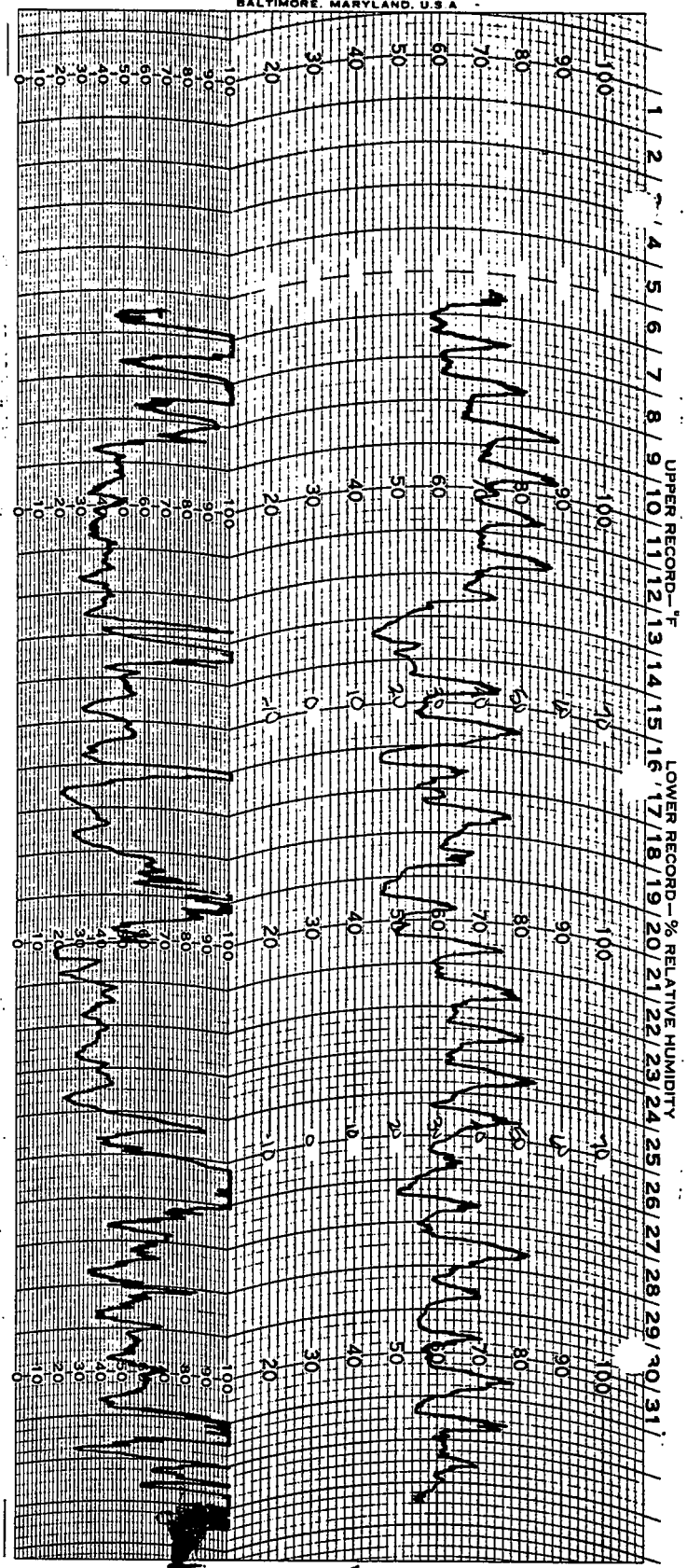
HYGROTHERMOGRAPH

CHART NO. 15627

MONTHLY-861 HRS.

BELFORT INSTRUMENT COMPANY

BALTIMORE, MARYLAND, U.S.A.



OBSERVER Seimborski/Snider ON 11:00 A.M. P.M. 3/6 1989

STATION East Mountain OFF 10:40 A.M. P.M. 4/4 1989

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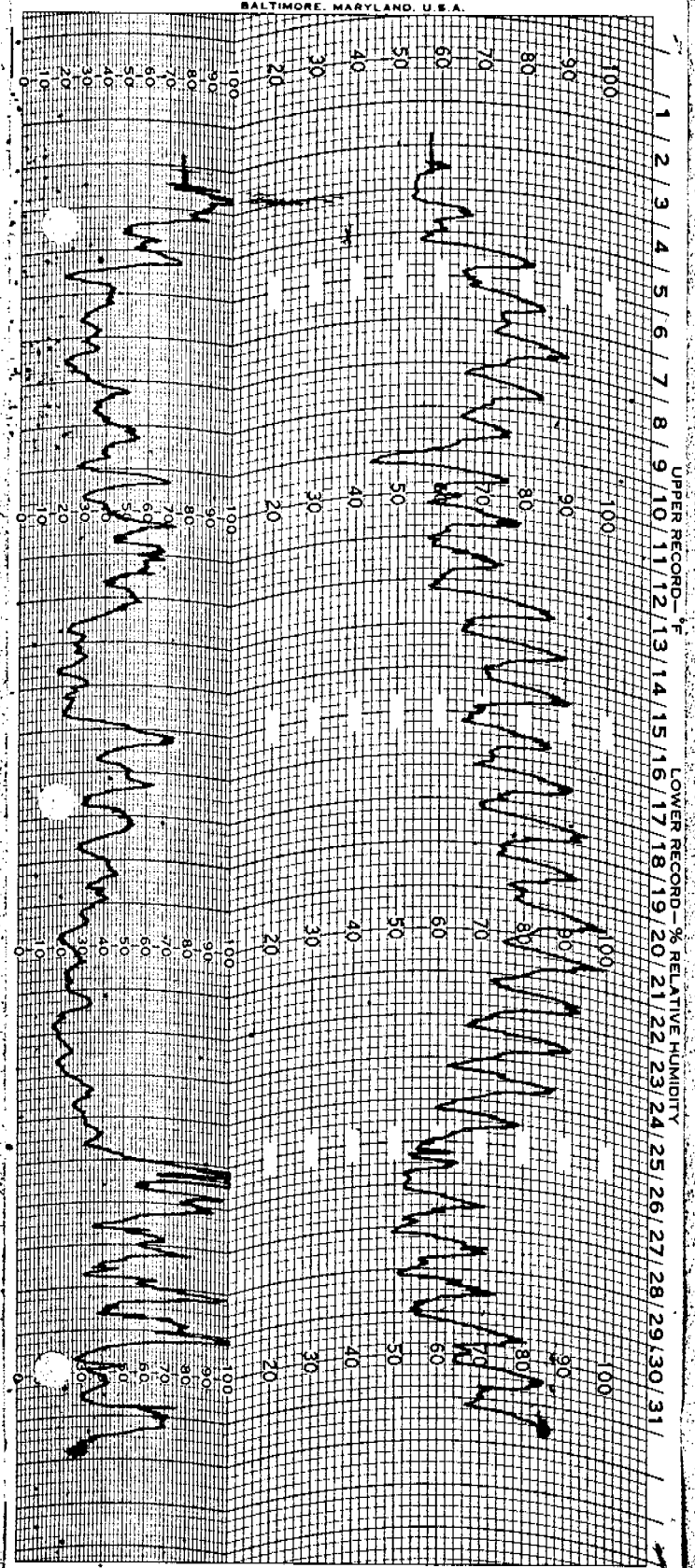
HYGROTHERMOGRAPH

CHART NO. 15627

MONTHLY-861 HRS.

BELFORT INSTRUMENT COMPANY

BALTIMORE, MARYLAND, U.S.A.



OBSERVER R Fry ON 10:40 A.M. P.M. 4-3 1989

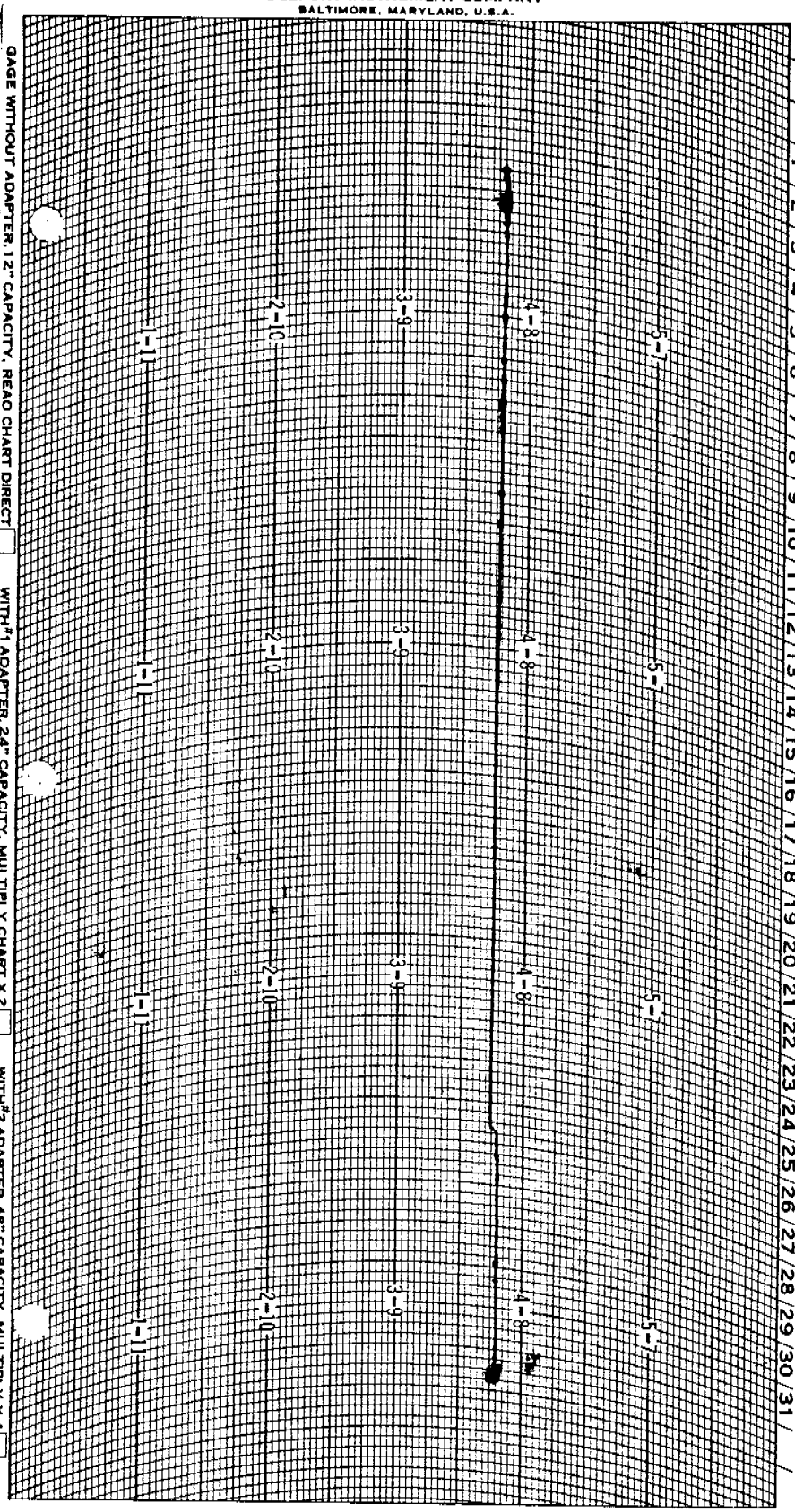
ATION OFF 3:00 A.M. P.M. 5-2 1989

PRINTED IN U.S.A.

CHART NO. 15668

12-INCH DUAL TRAVERSE MONTHLY-861 HRS.
UNIVERSAL RAIN GAGE

BELFORT INSTRUMENT COMPANY
BALTIMORE, MARYLAND, U.S.A.



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OBSERVER _____ ON 10:40 A.M. P.M. 4-3 19 87

STATION _____ OFF 300 A.M. P.M. 5-2 19 89

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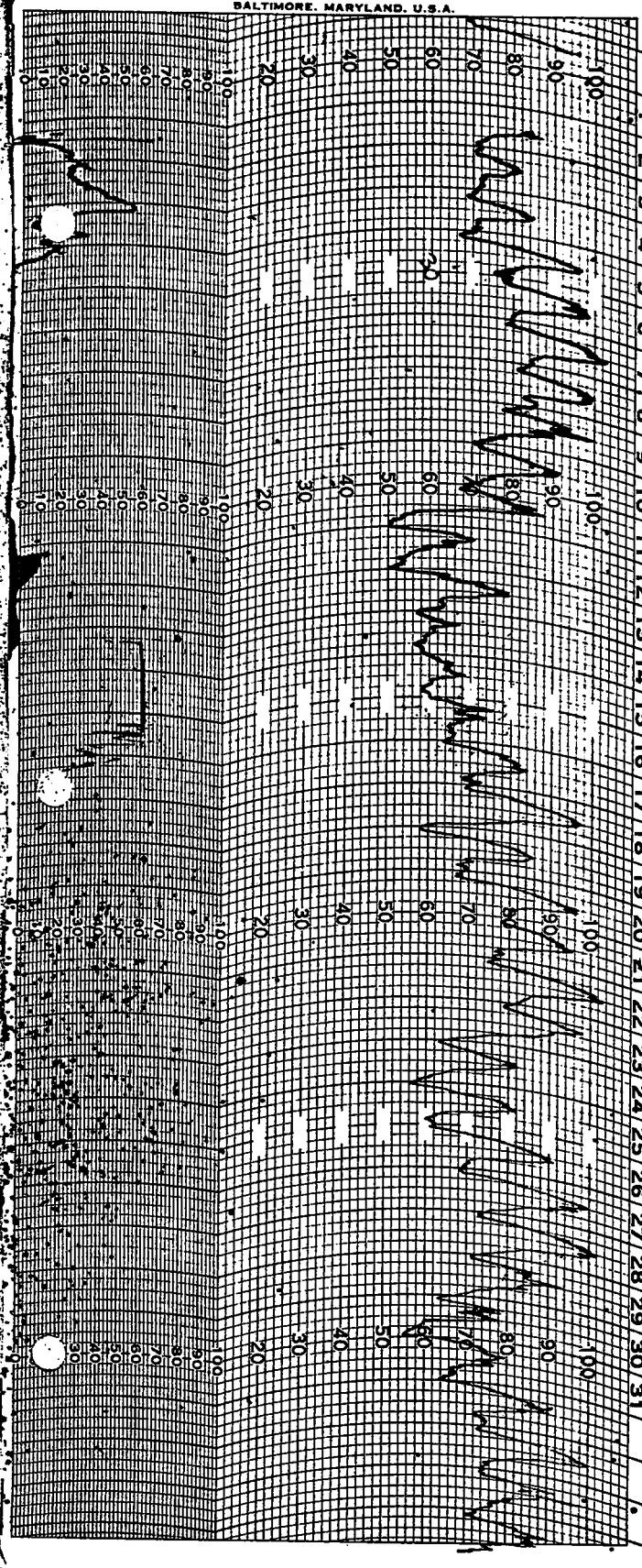
CHART NO. 15627

MONTHLY-861 HRS.

BELFORT INSTRUMENT COMPANY

BALTIMORE, MARYLAND, U.S.A.



OBSERVER R Fry ON 3:00 AM (P.M) 5-2 1989

STATION East Mtn OFF 2:35 AM (P.M) 6/5 1989

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CHART NO. 15668

12-INCH DUAL TRAVERSE MONTHLY-861 HRS.
UNIVERSAL RAIN GAGE

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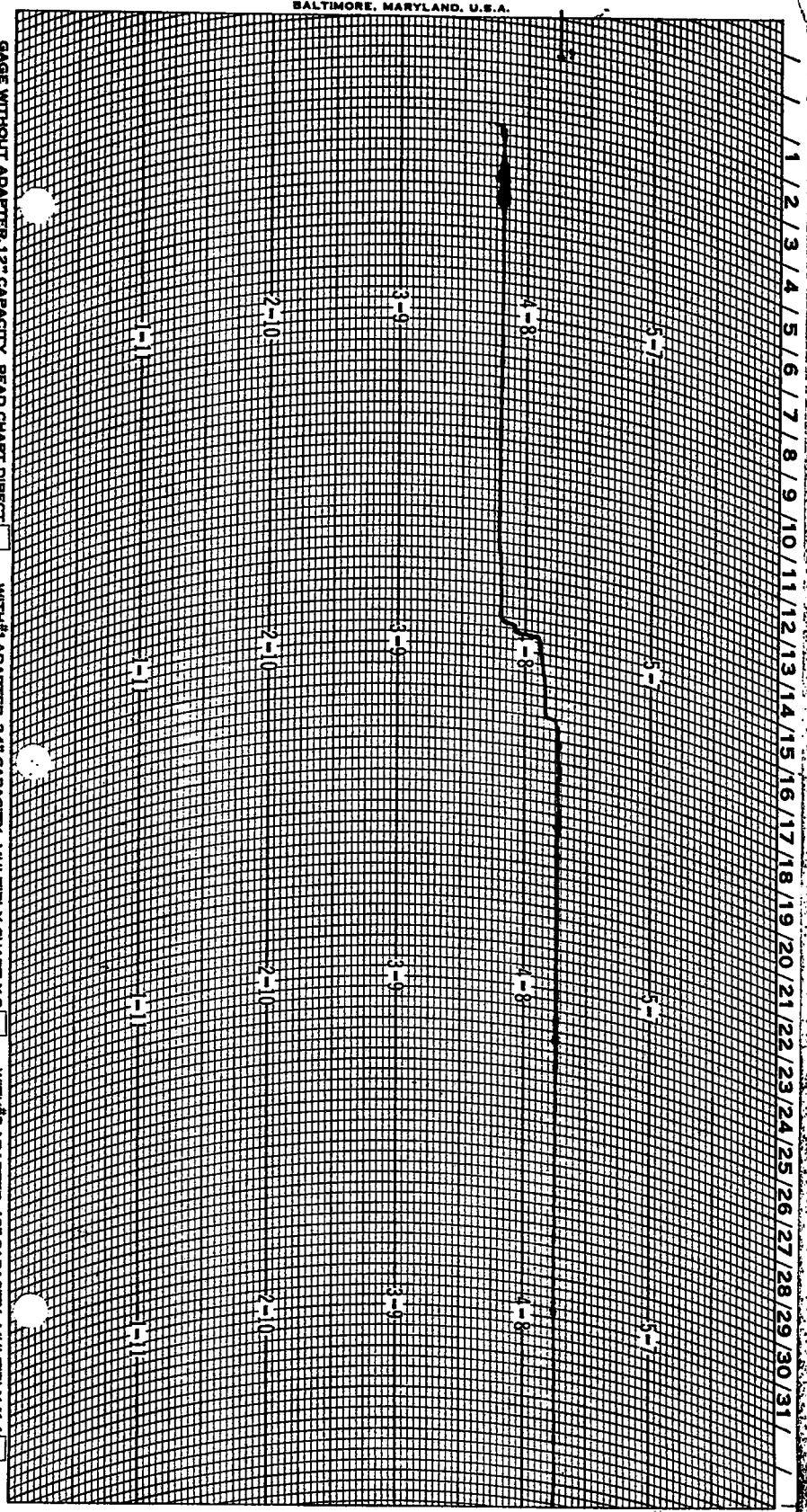

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OBSERVER R Fry ON 2:58 ~~A.M.~~ P.M. 5-7 19 0

STATION OFF 2:30 ~~A.M.~~ P.M. 6-5

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CHART NO. 15627

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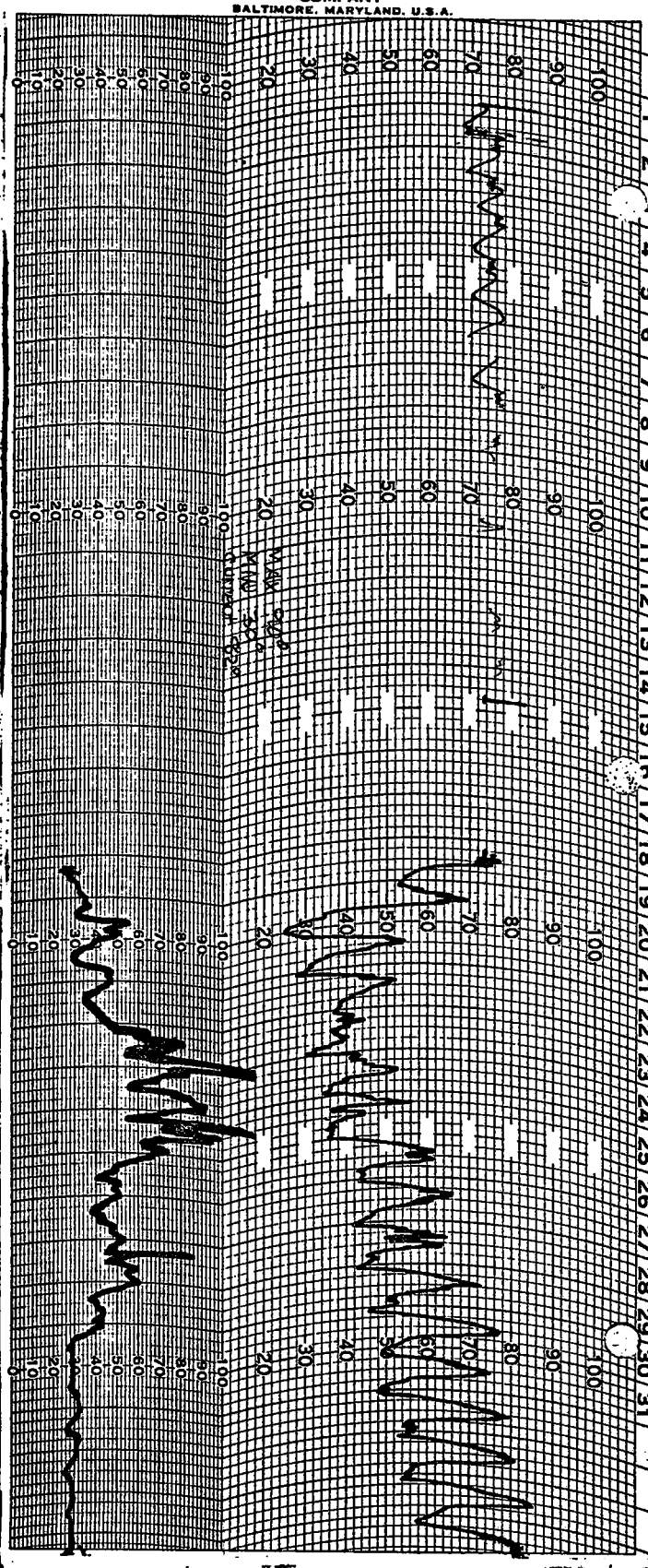

OBSERVER SEMBORSKI ON 2:35 ~~PM~~ AM 6/5 1989

STATION OFF 2:12 ~~PM~~ AM 7/5 89

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12-INCH DUAL TRAVERSE MONTHLY-861 HRS.
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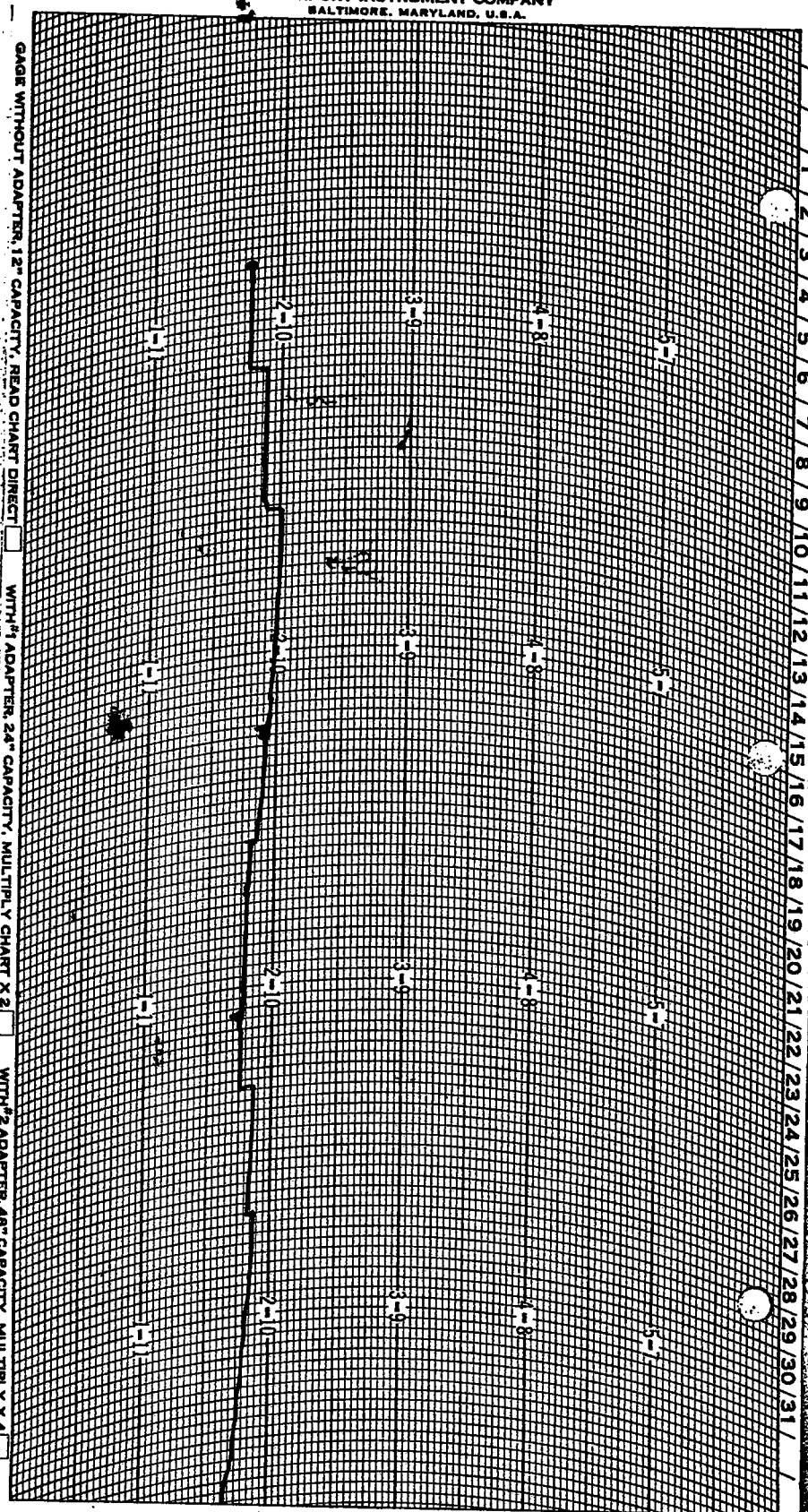

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OBSERVER Semborski ON 2:30 AM/PM 6/5 1989

STATION OFF 2:07 AM/PM 7-5 1989

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MONTHLY-861 HRS.

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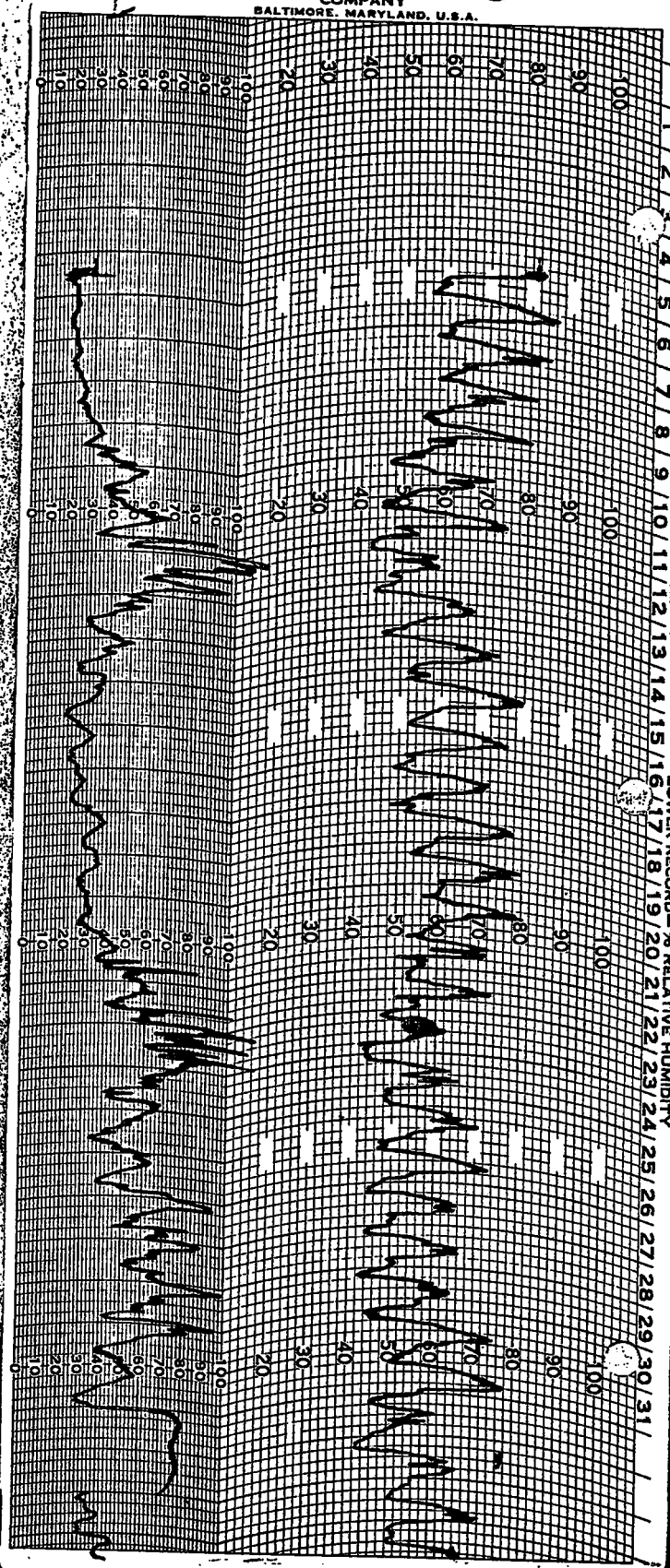

OBSERVER RC Fry ON 2:13 AM (P.M.) 7-5 1989

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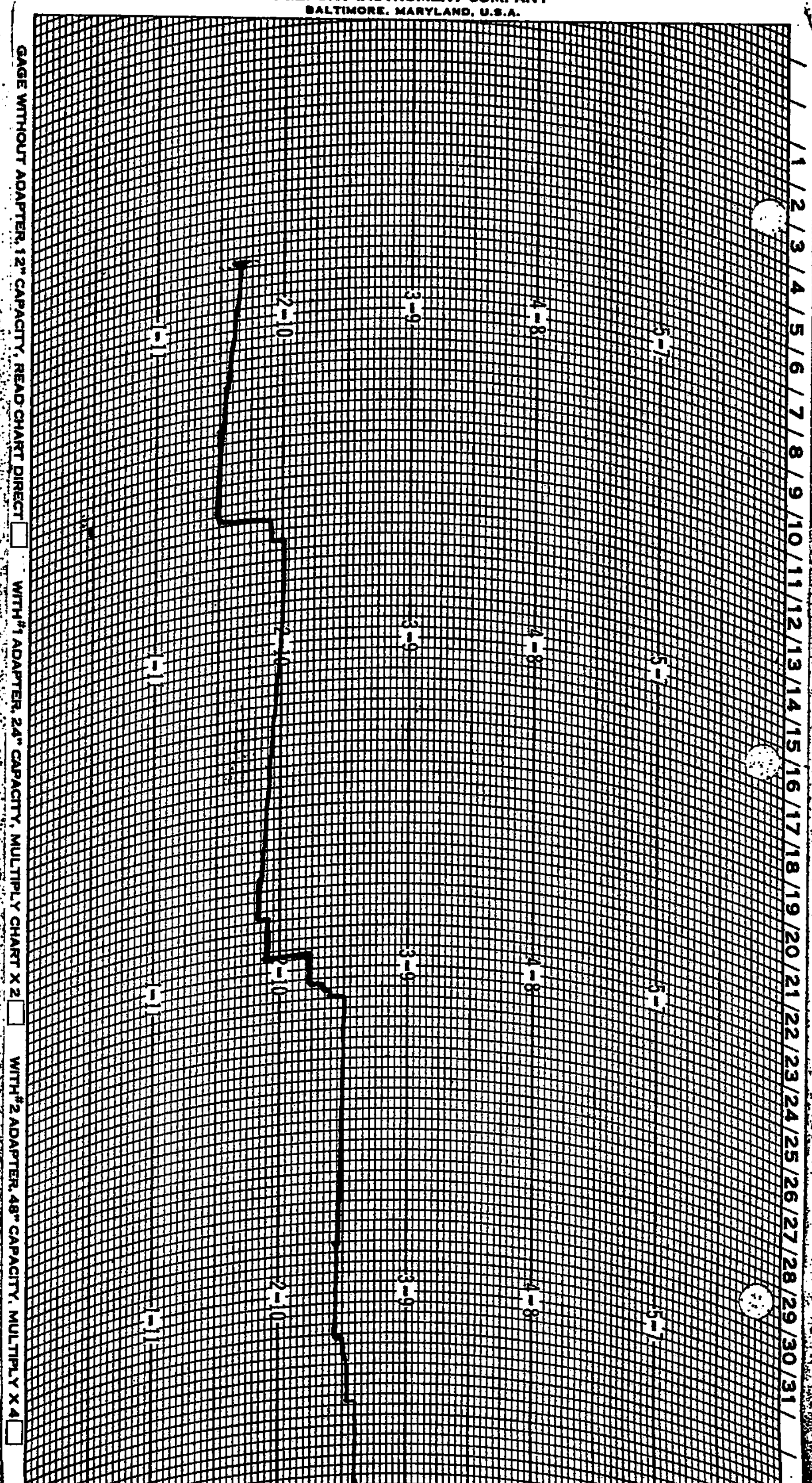
CHART NO. 15668

12-INCH DUAL TRAVERSE MONTHLY-861 HRS.

UNIVERSAL RAIN GAGE

BELFORT INSTRUMENT COMPANY

BALTIMORE, MARYLAND, U.S.A.



OBSERVER R C Fry ON 2:10 AM 7-5 1989

STATION East Mtn OFF 1:45 AM 8-4 1989

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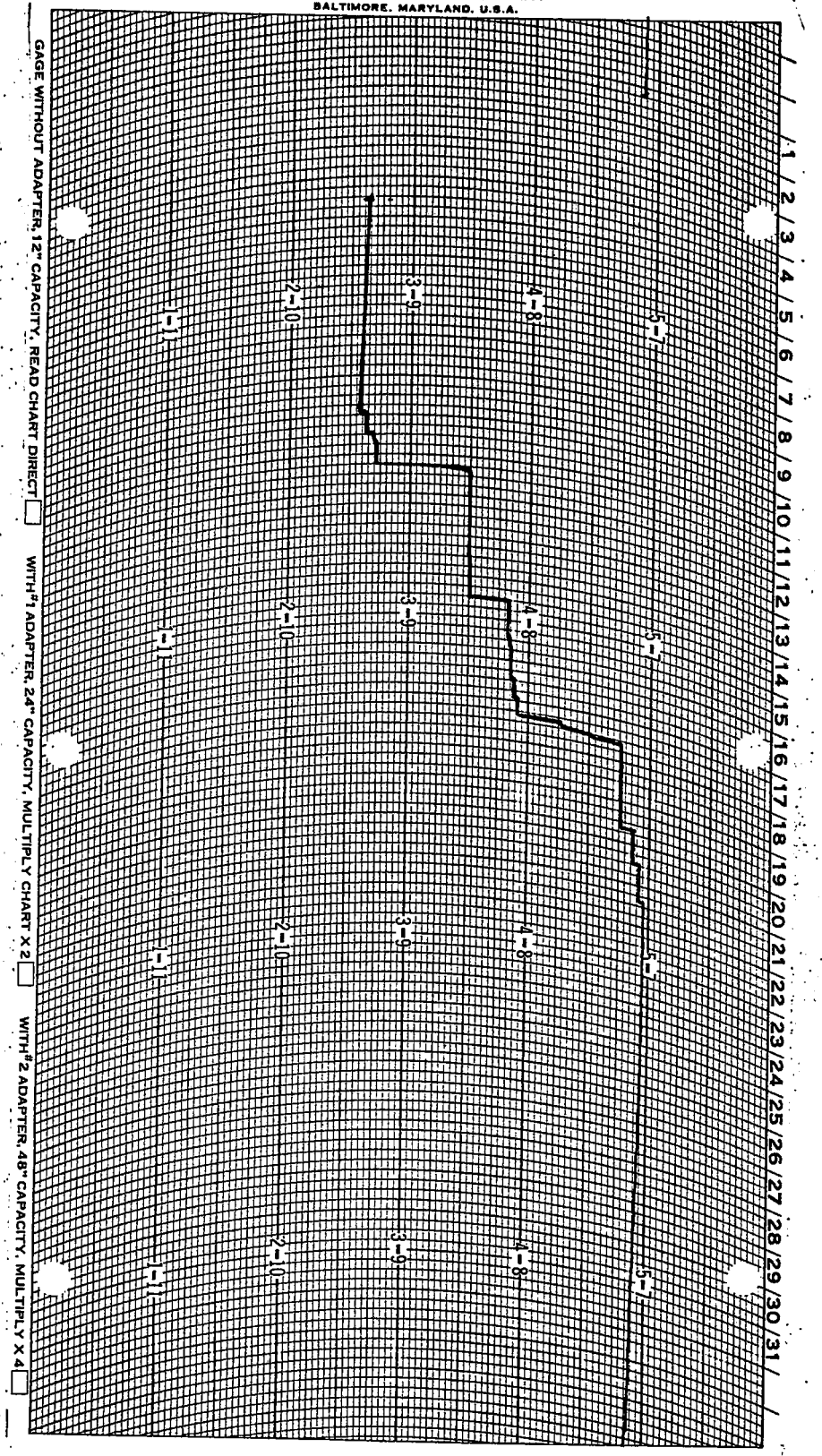
UNIVERSAL RAIN GAGE

BELFORT INSTRUMENT COMPANY
BALTIMORE, MARYLAND, U.S.A.



OBSERVER KLS ON 1:50 A.M. P.M. 8-4 1989

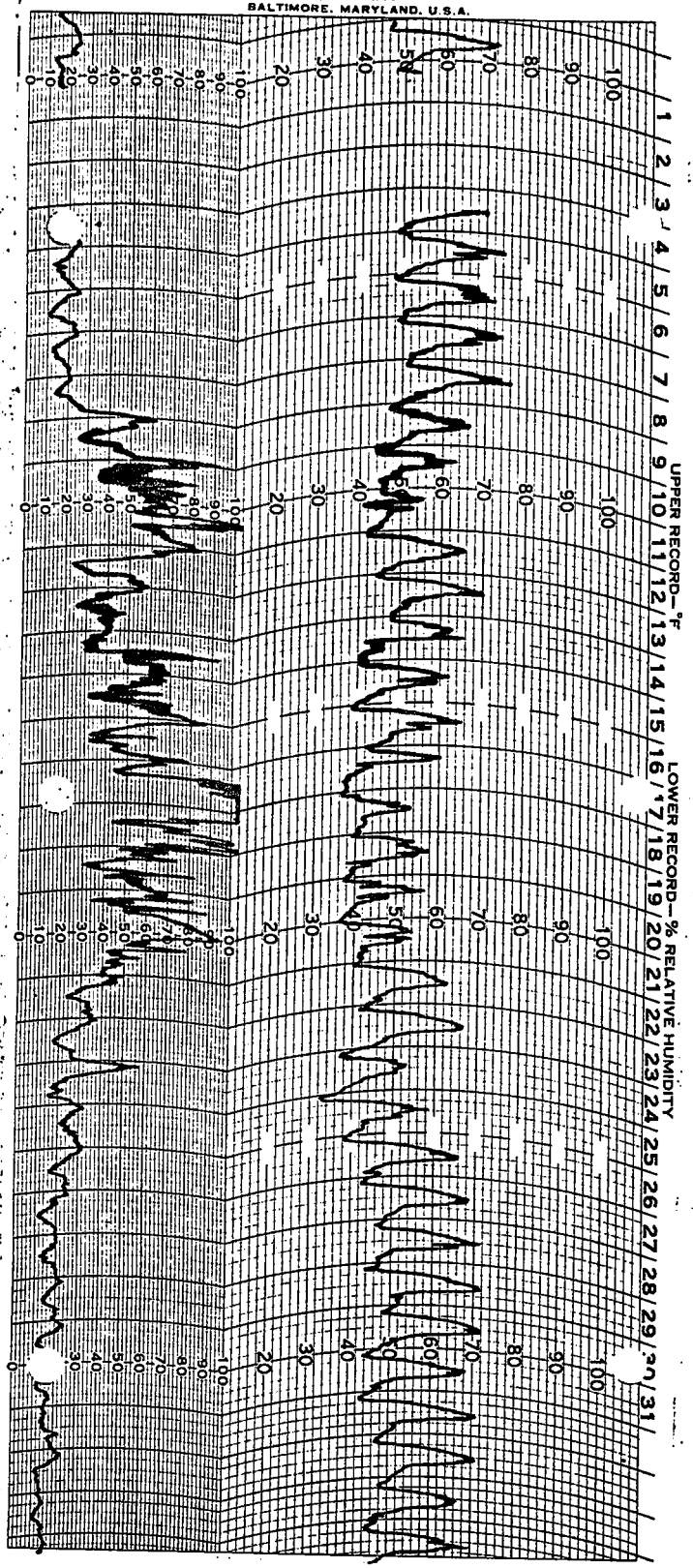
STATION EAST MTN OFF 920 A.M. P.M. 9-6 1989

CHART NO. 15627

MONTHLY-861 HRS.

BELFORT INSTRUMENT COMPANY

BALTIMORE, MARYLAND, U.S.A.



OBSERVER KS ON 1:55 A.M. P.M. 8-4 19 89

STATION EAST MTN OFF 9:30 A.M. P.M. 9-6 19 89

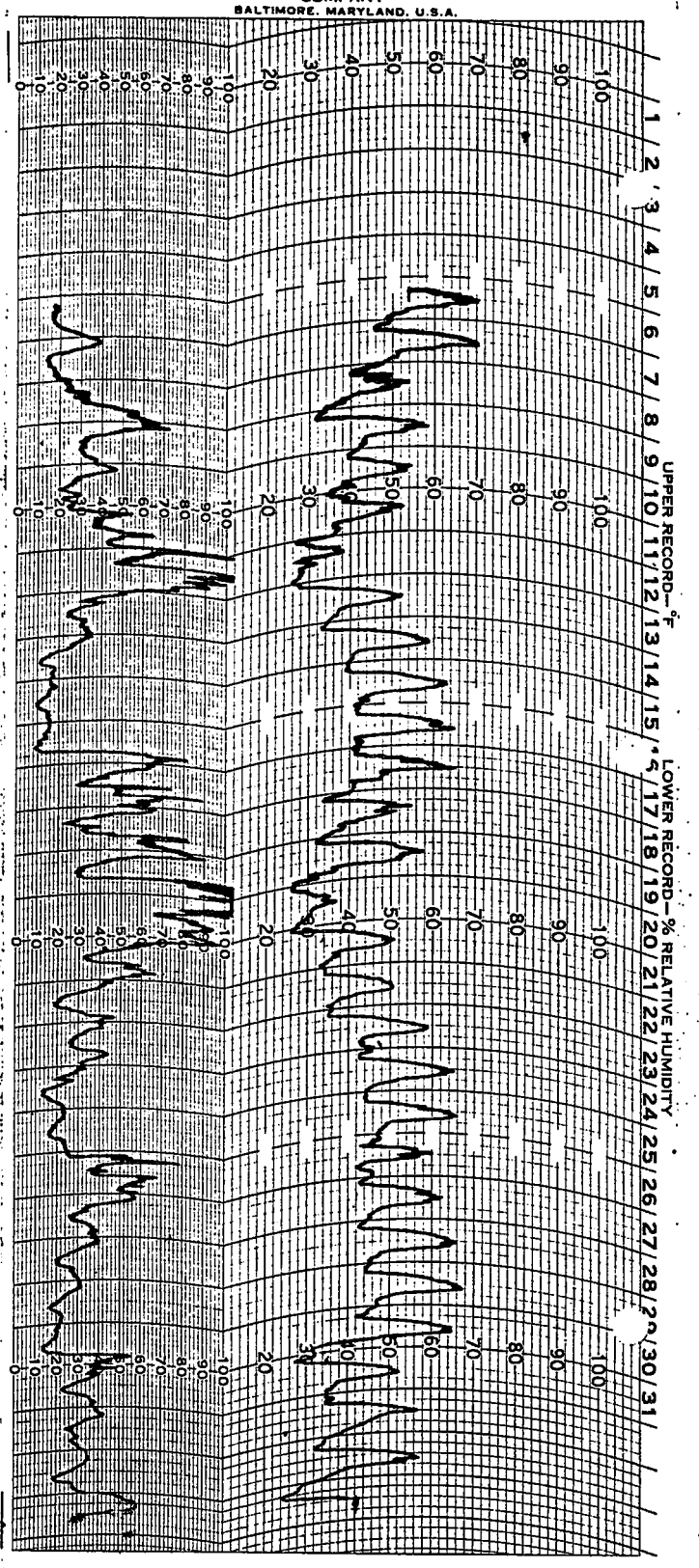
HYGROTHERMOGRAPH

CHART NO. 15627

MONTHLY-861 HRS.

BELFORT INSTRUMENT COMPANY

BALTIMORE, MARYLAND, U.S.A.



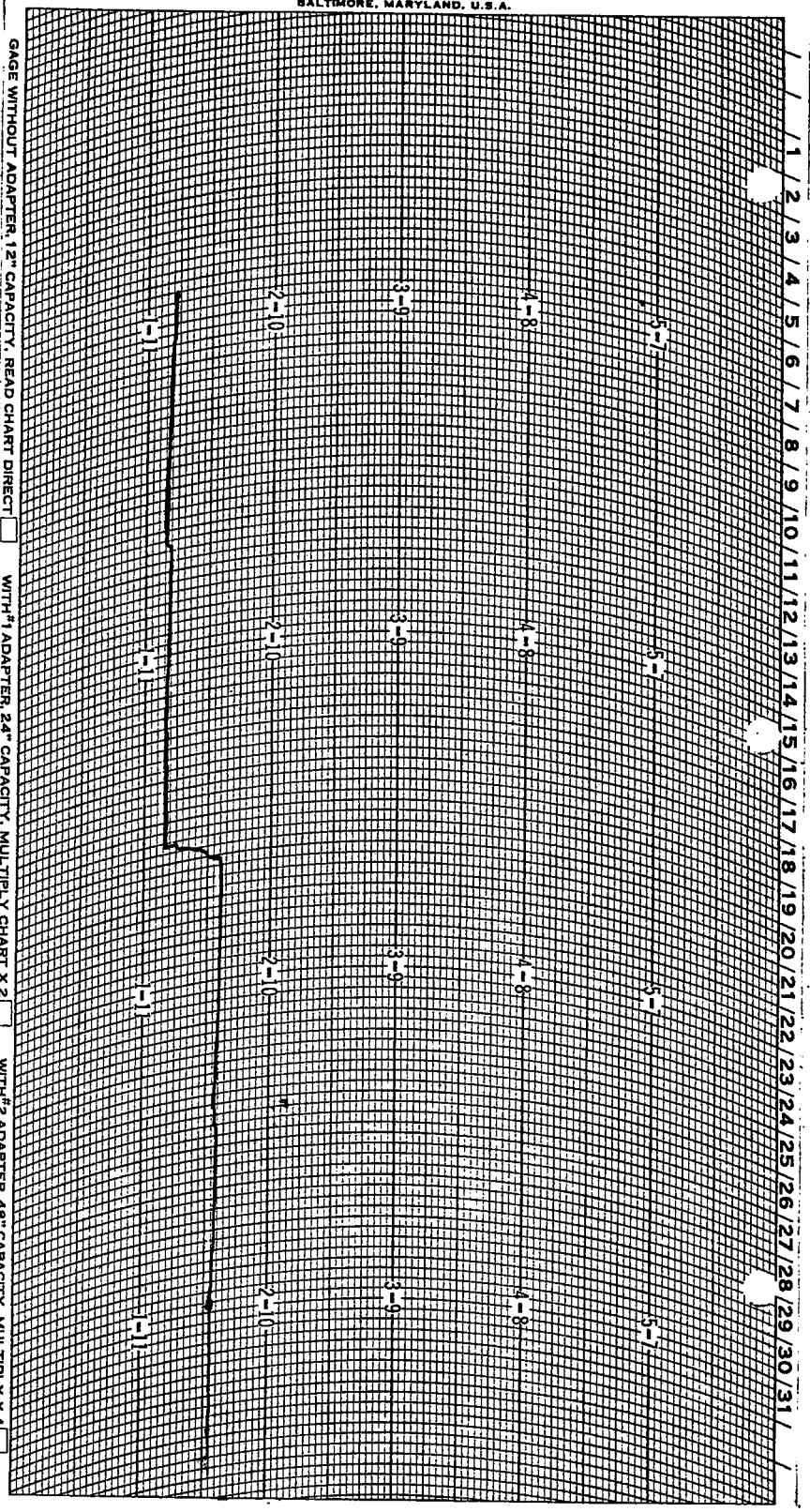
OBSERVER SEMBURSKI ON 930 A.M. P.M. 9/6 1987

STATION EAST MTN OFF 1:22 A.M. P.M. 10-9 19

UNIVERSAL RAIN GAGE

BELFORT INSTRUMENT COMPANY

BALTIMORE, MARYLAND, U.S.A.



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OBSERVER SEMBORSKI ON 920 A.M. P.M. 9/6 19 89

STATION EAST MTN. OFF 1:18 A.M. P.M. 10-4 19 89

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HYGROTHERMOGRAPH

CHART NO. 15627

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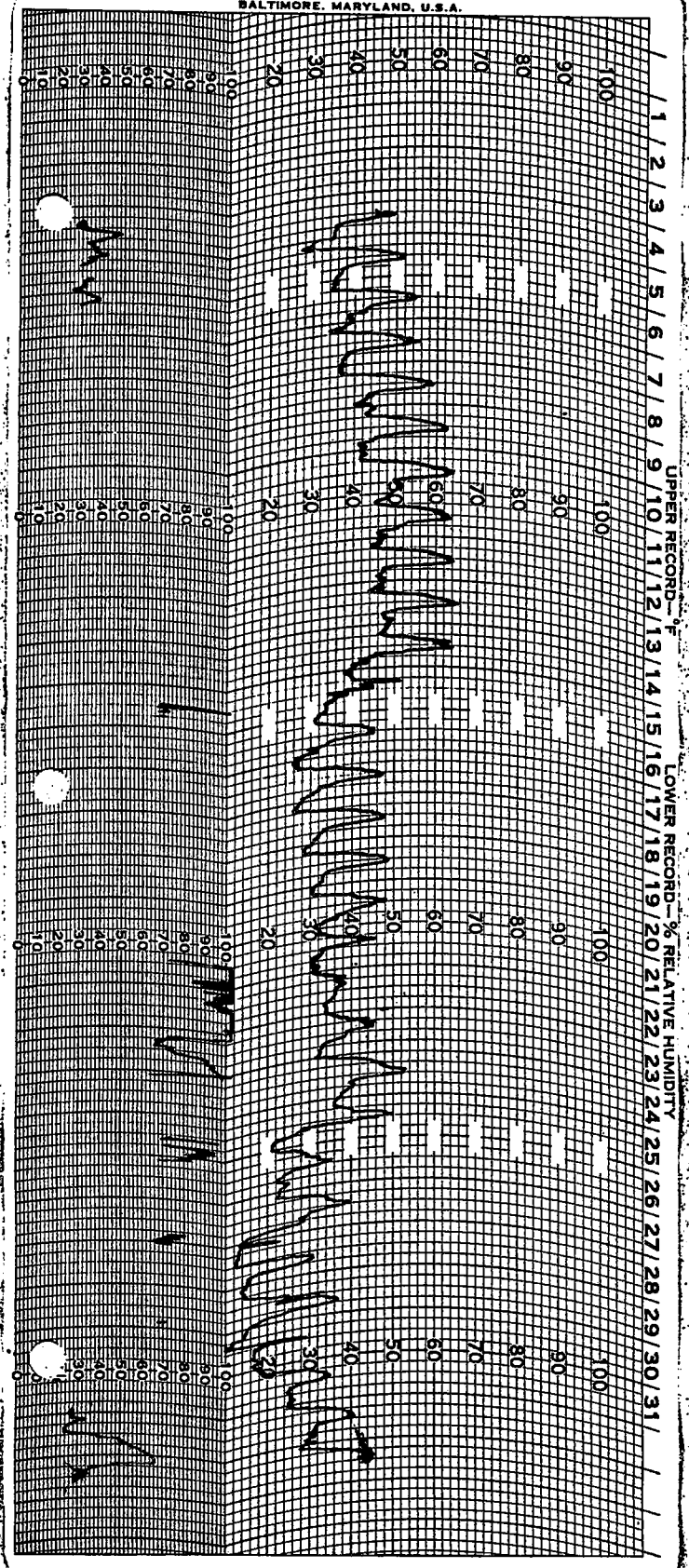

OBSERVER Fry ON 1:23 ~~A.M.~~ P.M. 10-4 1989

East Mtn 2:00 ~~A.M.~~ 11-4-89

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CHART NO. 15668

12-INCH DUAL TRAVERSE MONTHLY-861 HRS.
UNIVERSAL RAIN GAGE

BELFORT INSTRUMENT COMPANY
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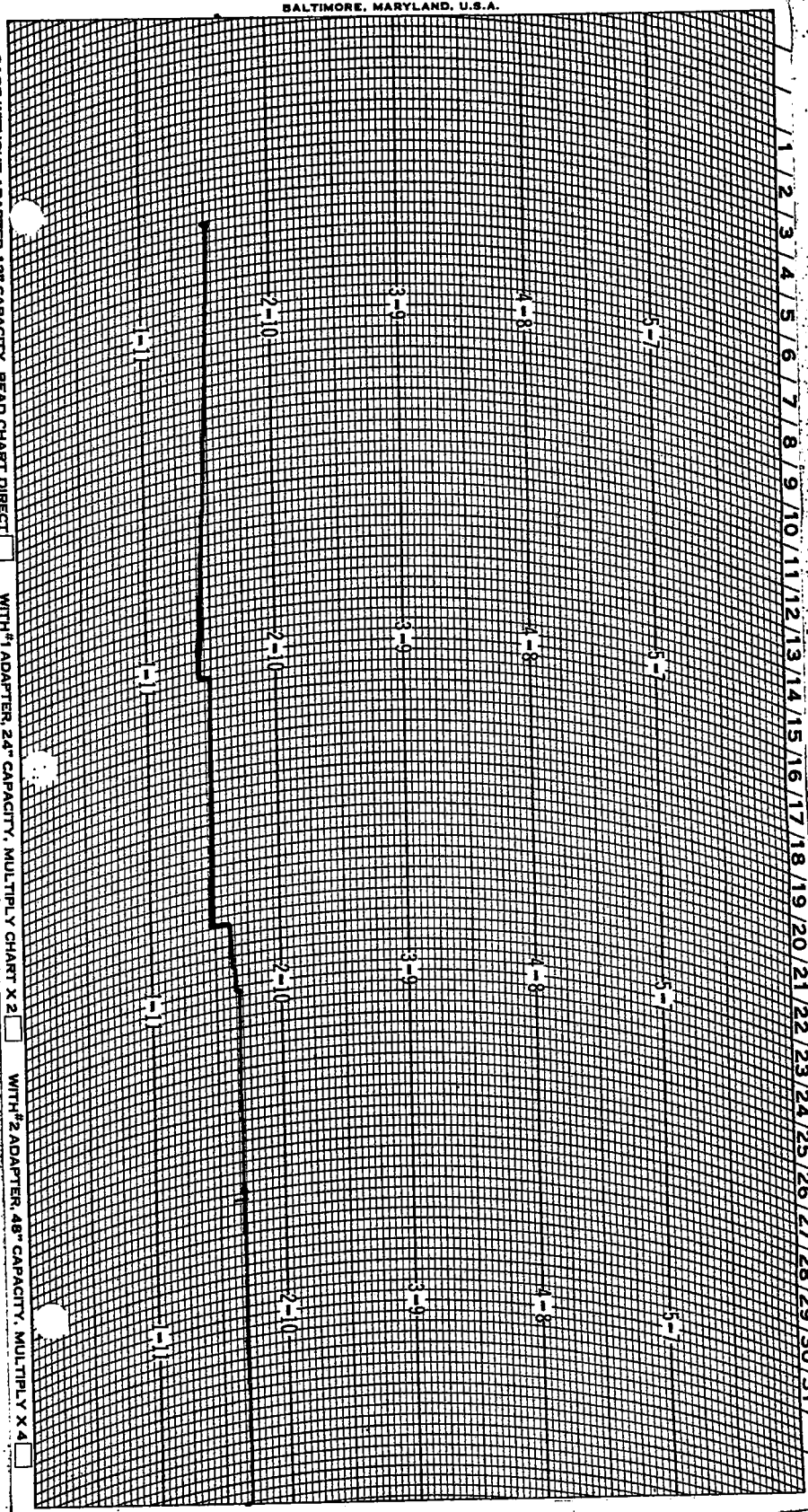

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OBSERVER Fry ON 1:18 A.M. P.M. 10-4 19 89

STATION East Mtn OFF 2:00 A.M. P.M. 11-4-89 19

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MONTHLY-861 HRS.

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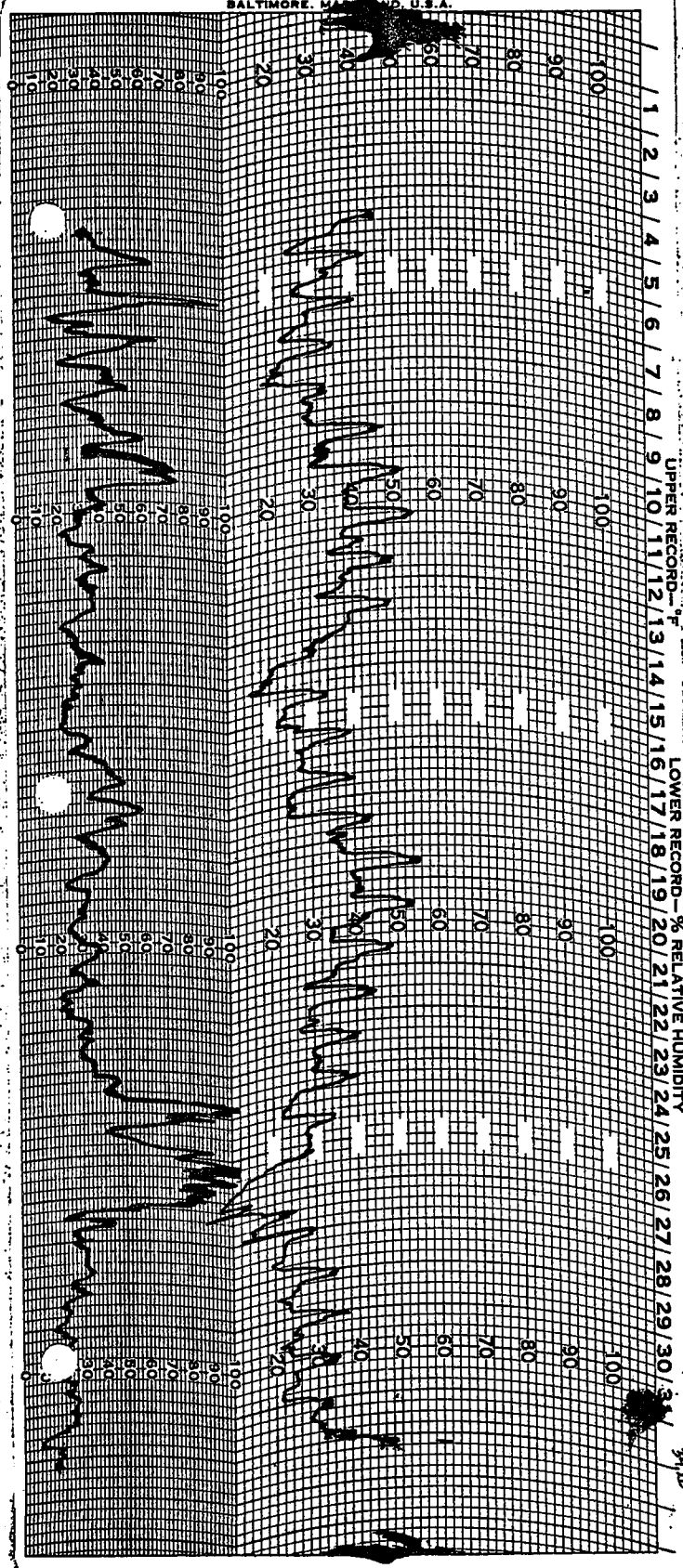

OBSERVER R C Fry ON 2:00 A.M. P.M. 12-4 19 89

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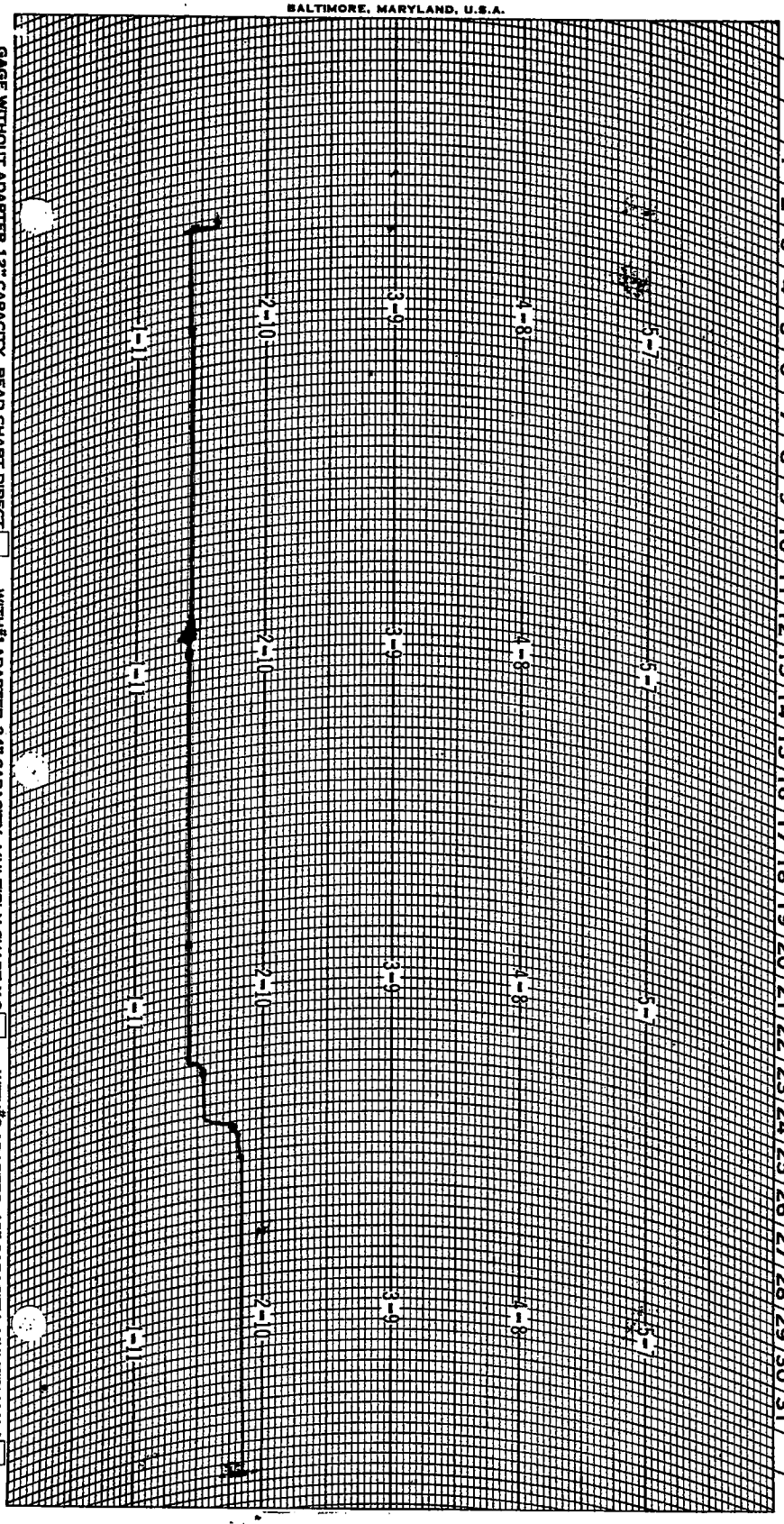
CHART NO. 15668

12-INCH DUAL TRAVERSE MONTHLY-861 HRS.
UNIVERSAL RAIN GAGE

BELFORT INSTRUMENT COMPANY
BALTIMORE, MARYLAND, U.S.A.



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OBSERVER RC FRY ON 2:00 ~~A.M.~~ P.M. 11-4 1989

TION East Metal 2:00 ~~A.M.~~ 12-4 89

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HYGROTHERMOGRAPH

CHART NO. 15627

MONTHLY-861 HRS.

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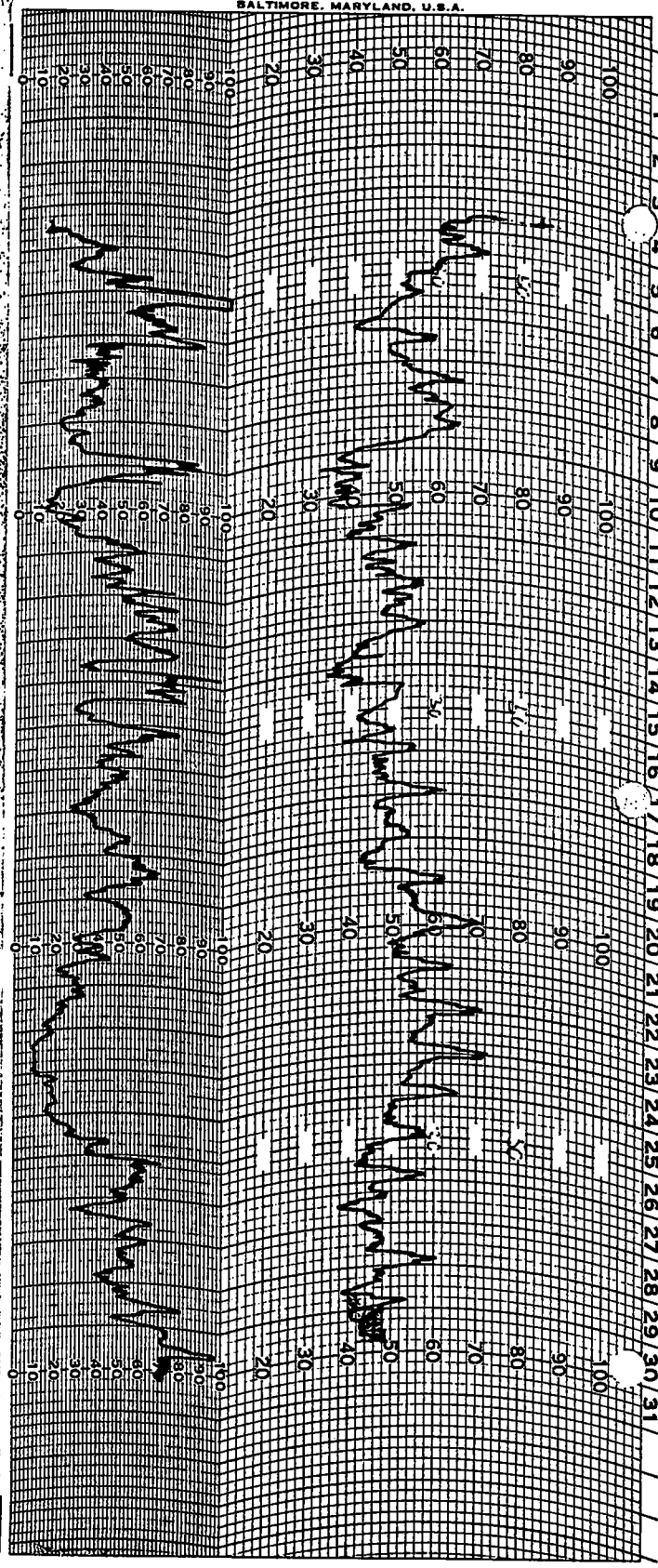
BALTIMORE, MARYLAND, U.S.A.



OBSERVER R FRY ON 12:10 A.M. P.M. 12 4 19 87

STATION East Mtn 2145 A.M. P.M. 1-2 90

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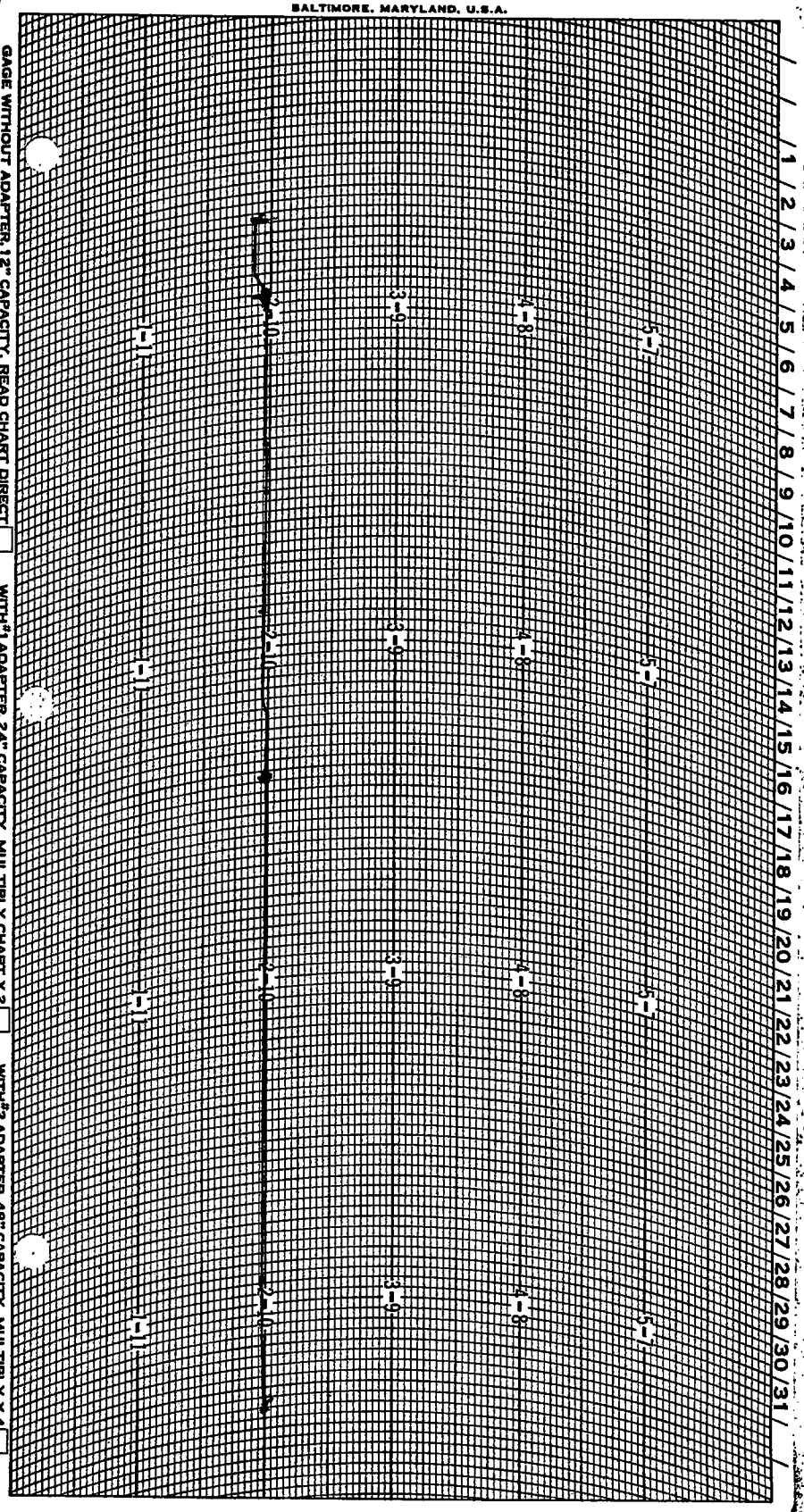
CHART NO. 15668

12-INCH DUAL TRAVERSE MONTHLY-861 HRS.

UNIVERSAL RAIN GAGE

BELFORT INSTRUMENT COMPANY

BALTIMORE, MARYLAND, U.S.A.



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OBSERVER R C Fry

STATION East Mtn

ON 2:15 ~~A.M.~~ P.M. 12-4 1989

OFF 1140 ~~A.M.~~ P.M. 1-2 1990

APPENDIX M

UTAH POWER & LIGHT COMPANY
MINING DIVISION - TECHNICAL SERVICES
HYDROLOGIC MONITORING PROGRAM
DEER CREEK, WILBERG/COTTONWOOD, and DES-BEE-DOVE MINES

I. Monitoring Locations

A. Surface Water Hydrology (see Map HM-1 for locations listed below)

1. Cottonwood Creek Drainage System
   a. Cottonwood Canyon Creek - USGS Flume: 700 feet North, 200 feet East of the Southwest corner of Section 31, Township 17 South, Range 7 East.
   b. Grimes Wash
      (1) Right Fork: (Approximately 1500 feet upstream from the inlet culvert for the disturbed area.) 550 feet North, 1500 feet West of the Southwest corner of Section 22, Township 17 South, Range 7 East.
      (2) Left Fork: (Approximately 50 feet upstream from the inlet culvert for the disturbed area.) 200 feet South, 2350 feet East of the Northwest corner of Section 27, Township 17 South, Range 7 East.
      (3) Below the mine: (Approximately 500 feet downstream from the outlet culvert below the disturbed area.) 1770 feet South, 1820 feet West of the Northeast corner of Section 27, Township 17 South, Range 7 East.
      (4) Reclamation Monitoring: In addition to location (3) above, monitoring will occur at a point immediately above the sediment ponds (see Map 4-1).

2. Huntington Creek Drainage System
   a. Huntington Creek: UP&L's Environmental Department monitors the following four sites along Huntington Creek:
      (1) Below Electric Lake*
      (2) Above the Forks*
      (3) Above the power plant diversion
      (4) Below the power plant

      * Not listed on map due to scale.

b. Deer Creek

(1) Above the mine: (Approximately 600 feet upstream from the mine facility.) 200 feet North, 800 feet West of the Southeast corner of Section 10, Township 17 South, Range 7 East.

(2) At Permit: (Approximately 5,000 feet downstream from the mine facility.) 480 feet North, 3360 feet East of the Northwest corner of Section 1, Township 17 South, Range 7 East.

(3) Below the Mine: (Approximately 12,000 feet downstream from the mine facility.) 480 feet South, 3360 feet East of the Northwest corner of Section 1, Township 17 South, Range 7 East.

c. Meetinghouse Canyon - South Fork: (Approximately 200 feet upstream from the north and south convergence.) 800 feet North, 1500 feet East of the Southwest corner of Section 35, Township 16 South, Range 7 East.

d. Rilda Canyon:

(1) RCF-1 - Rilda Canyon - Right Fork: 400 feet South, 200 feet West of the Northeast corner of Section 30, Township 16 South, Range 7 East.

(2) RCL1 - Rilda Canyon - Left Fork: 2400 feet North, 2100 feet West of the Southeast corner of Section 29, Township 16 South, Range 7 East.

(3) RCF2 - Rilda Canyon: 2500 feet South, 400 feet West of the Northeast corner of Section 29, Township 16 South, Range 7 East.

(4) RCF3 - Rilda Canyon: 2550 feet South, 1000 feet East of the Northeast corner of Section 28, Township 16 South, Range 7 East.

(5) RCW4 - Rilda Canyon: 850 feet North, 1900 feet West of the Southeast corner of Section 26, Township 16 South, Range 7 East.

3. Reclamation Monitoring: Following stage 1 final reclamation backfilling and grading monitoring will be conducted at points immediately above and below the last sediment pond(s).

B. Groundwater Hydrology

1. East Mountain Springs (see Map HM-5 for spring locations)

Burnt Tree *+
Elk Spring *+
Sheba Springs *+

Ted's Tub
79-2
79-10 *+
79-15
79-23 *+
79-24
79-26 *+
79-28 (Flag Lake)
79-29 *+
79-32
79-34
79-35 *+
79-38
79-40
80-41
80-43
80-44 *+
80-46 *+
80-47
80-48
82-51
82-52 *+
84-56 *+
89-60 (Alpine Spring)
89-61
89-65
89-66
89-67
89-68

* Recession Study Springs
\+ Baseline analysis performed in 1986 and will be repeted every five years.

2. Piezometric Data
   a. Surface
      (1) Rilda Canyon (see Map HM-1 for locations)
         P1
         P2
         P3
         P4
         P5
         EM-47
      (2) Cottonwood Canyon Creek
         EM-31
   b. Underground: In-Mine
      (1) Deer Creek Mine (see Map HM-2 for locations)
         (a) DCP1 3rd N xc-8
         (b) DCP2 3rd N xc-29
         (c) DCP3 3rd N xc-55
         (d) DCP4 1st W xc-29
      (2) Wilberg/Cottonwood Mine (see Map HM-3 for locations)
         (a) WCP1 5th W xc-16
         (b) WCP2 3rd S xc-14
         (c) WCP3 3rd S xc-44

3. In-Mine
   a. Deer Creek Mine (see Map HM-2 for locations)
      (a) 3rd North xc-41
      (b) 3rd North xc-65 (TW-10)
   b. Wilberg/Cottonwood Mines (see Map HM-3 for locations)
      (a) 2nd South xc-11
      (b) 4th East xc-24

4. Waste Rock Wells (see Map HM-1 for locations)
   a. Deer Creek
   b. Cottonwood

II. Monitoring Schedule

A. Field Measurement: Listed below are the sites which will be monitored by UP&L Mining Division in accordance with the guidelines established by DOGM; i.e.,
   - Date and Time
   - Flow
   - pH
   - Temperature
   - Conductivity
   - Dissolved oxygen (perennial streams only)

1. Cottonwood Canyon Creek
   a. Cottonwood Canyon Creek - USGS Flume
   b. Grimes Wash
      (1) Right Fork
      (2) Left Fork
      (3) Below the mine

2. Huntington Canyon Drainage
   a. Deer Creek
      (1) Above the mine
      (2) At Permit Boundary
      (3) Below the mine
   b. Meetinghouse Canyon - South Fork
   c. Rilda Canyon
      (1) RCF1
      (2) RCF3
      (3) RCW4

3. East Mountain Springs

4. In-Mine
   a. Deer Creek
   b. Wilberg/Cottonwood

5. Waste Rock Wells
   a. Deer Creek
   b. Cottonwood

All sites will be monitored monthly except for East Mountain Springs, in-mine locations, and waste rock wells. East Mountain Springs will be field tested during the months of July and October. In addition, the Recession Study Springs (denoted by asterisks in the Monitoring Location section) will be field tested from July through October. In-mine locations will be field tested for all field parameters except pH, conductivity, and dissolved oxygen. Waste rock wells will be field tested quarterly.

B. Quality Sampling (Laboratory Measurements)

1. Surface Water Hydrology: Water samples will be collected and analyzed quarterly (one sample at low flow and high flow) during the first or second week of the quarter. Parameters analyzed are those listed in the DOGM Guidelines for Surface Water Quality (see Table #1). Quarterly sampling was initiated during March 1988 and will continue throughout the year; i.e., June, September, and December. Baseline analysis was performed in 1986 and will be repeated every five years thereafter.
   a. Cottonwood Creek Drainage, Grimes Wash
      (1) Right Fork
      (2) Left Fork
      (3) Below the mine
   b. Huntington Creek Drainage
      (1) Deer Creek
         (a) Above the mine
         (b) Below the mine
      (2) Meetinghouse Canyon - South Fork
      (3) Rilda Canyon
         (a) RCF1
         (b) RCF3
         (c) RCW4

2. Groundwater Hydrology
   a. East Mountain Springs: Water samples will be collected and analyzed during the months of July and October. Parameters analyzed are those listed in the DOGM Guidelines for Groundwater Water Quality (see Table #2). In addition, the Recession Study Springs (denoted by asterisks in the Monitoring Location section) will be sampled monthly for the following parameters:
      (1) Total Hardness
      (2) Carbonate
      (3) Total Manganese
   b. In-Mine: Two water samples will be collected and analyzed per mine quarterly. Parameters analyzed are those listed in the DOGM Guidelines for Groundwater Water Quality (see Table #2).
   c. Waste Rock Wells: One water sample will be collected and analyzed per location quarterly. Parameters analyzed are those listed in the DOGM Guidelines for Groundwater Water Quality (see Table #2).

III. Annual Reports

All data collected regarding the hydrology of East Moun-tain will be summarized by the applicant in an annual Hydro-logic Monitoring Report. Copies of the report will be submitted to the OSM; U.S. Forest Service; and the Utah State Division of Oil, Gas and Mining. In addition, any raw data collected will be submitted to the Utah State Division of Oil, Gas and Mining on a quarterly basis.

TABLE 1

SURFACE WATER BASELINE, OPERATIONAL, AND POSTMINING WATER QUALITY PARAMETER LIST

FIELD MEASUREMENTS:

- * - Water Levels or Flow
- * - pH
- * - Specific Conductivity (umhos/cm)
- * - Temperature (degrees Centigrade)
- * - Dissolved Oxygen (ppm) [perennial streams only]

LABORATORY MEASUREMENTS: (mg/l) [Major, minor ions and trace elements are to be analyzed in total and dissolved forms.]

- * - Total Dissolved Solids
- # * - Total Settleable Solids
- # * - Total Suspended Solids
- * - Total Hardness (as $CaCO_3$)
- * Acidity ($CaCO_3$)
- * - Alkalinity - Total
- - Aluminum (Al)
- - Arsenic (As)
- - Barium (Ba)
- - Boron (B)
- * - Carbonate (CO_3^{-2})
- * - Bicarbonate (HCO_3^-)
- - Cadmium (Cd)
- * - Calcium (Ca)
- * - Chloride (Cl^-)
- - Chromium (Cr)
- * - Conductivity
- - Copper (Cu)
- * - Dissolved Oxygen
- - Fluoride (F^-)
- * - Iron (Fe) - Total and Dissolved
- - Lead (Pb)
- * - Magnesium (Mg)
- * - Total Manganese (Mn)
- - Mercury (Hg)
- - Molybdenum (Mo)
- - Nickel (Ni)
- - Nitrogen: Ammonia (HN_3)
- - Nitrate (NO_2)
- - Nitrite (NO_3)
- * - Oil and Grease
- * - pH
- * - Potassium (K)
- - Phosphate (PO_4^{-3})
- - Selenium (Se)
- * - Sodium (Na)
- * - Sulfate (SO_4^{-2})
- - Sulfide (S^-)
- - Zinc (Zn)
- * - Cation-Anion Balance

Sampling Period:

- Baseline
- * Operational, Postmining
- # Construction

Sampling Locations:

Deer Creek	1)	Above Mine
	2)	Below Mine
Grimes Wash	1)	Right Fork
	2)	Left Fork
	3)	Below Mine
Meetinghouse Canyon		Left Fork
Rilda Canyon	1)	RCF1
	2)	RCF3
	3)	RCW4

TABLE 2

GROUNDWATER BASELINE, OPERATIONAL, AND POSTMINING WATER QUALITY PARAMETER LIST

FIELD MEASUREMENTS:

	* -	Water Levels or Flow
	* -	Water Levels or Flow
	* -	pH
	* -	Specific Conductivity (umhos/cm)
	* -	Temperature (degrees Centigrade)

LABORATORY MEASUREMENTS: (mg/l) [Major, minor ions and trace elements are to be analyzed in dissolved form only.)

	* -	Total Dissolved Solids
	* -	Total Suspended Solids
+	* -	Total Hardness (as $CaCO_3$)
	* -	Alkalinity - Total
	-	Aluminum (Al)
	-	Arsenic (As)
	-	Barium (Ba)
	-	Boron (B)
+	* -	Carbonate (CO_3^{-2})
	* -	Bicarbonate (HCO_3)
	-	Cadmium (Cd)
	* -	Calcium (Ca)
	* -	Chloride (Cl^-)
	-	Chromium (Cr)
	* -	Conductivity
	-	Copper (Cu)
	* -	Dissolved Oxygen
	-	Fluoride (F^-)
	* -	Iron (Fe)
	-	Lead (Pb)
	* -	Magnesium (Mg)
+	* -	Manganese (Mn)
	-	Mercury (Hg)
	-	Molybdenum (Mo)
	-	Nickel (Ni)
	-	Nitrogen: Ammonia (NH_3)
	-	Nitrate (NO_2)
	-	Nitrite (NO_3)
	* -	pH
	* -	Potassium (K)
	-	Phosphate (PO_4^{-3})
	-	Selenium (Se)
	* -	Sodium (Na)
	* -	Sulfate (SO_4^{-2})
	-	Sulfide (S^-)
	-	Zinc (Zn)
	* -	Cation/Anion Balance

Sampling Period:

- Baseline
* Operational, Postmining
+ Modified Operational

Sampling Locations:

In-Mine
  Deer Creek
  Wilberg/Cottonwood
East Mountain Springs
Waste Rock Wells
  Deer Creek
  Wilberg/Cottonwood

TABLE 3

MINE DISCHARGE AND SEDIMENT POND

FIELD MEASUREMENTS:

*	x	-	Water Levels or Flow
*	x	-	pH
*	x	-	Specific Conductivity (umhos/cm)
*	x	-	Temperature

LABORATORY MEASUREMENTS: (mg/l) [Major, minor ions and trace elements are to be analyzed in dissolved form only.)

*	x	-	Total Dissolved Solids
*		-	Total Settleable Solids
*	x	-	Total Suspended Solids
*	x	-	Total Hardness (as $CaCO_3$)
*	x	-	Acidity ($CaCO_3$)
*	x	-	Alkalinity - Total
		-	Aluminum (Al)
		-	Arsenic (As)
		-	Barium (Ba)
		-	Boron (B)
*	x	-	Carbonate (CO_3^{-2})
*	x	-	Bicarbonate (HCO_3^-)
		-	Cadmium (Cd)
*	x	-	Calcium (Ca)
*	x	-	Chloride (Cl^-)
		-	Chromium (Cr)
*	x	-	Conductivity
		-	Copper (Cu)
*	x	-	Dissolved Oxygen
		-	Fluoride (F^-)
*	x	-	Iron (Fe) - Total and Dissolved
		-	Lead (Pb)
*	x	-	Magnesium (Mg)
*	x	-	Total Manganese (Mn)
		-	Mercury (Hg)
		-	Molybdenum (Mo)
		-	Nickel (Ni)
		-	Nitrogen: Ammonia (NH_3)
		-	Nitrate (NO_2)
		-	Nitrite (NO_3)
*	x	-	Oil and Grease
*	x	-	pH
*	x	-	Potassium (K)
		-	Phosphate (PO_4^{-3})
		-	Selenium (Se)
*	x	-	Sodium (Na)
*	x	-	Sulfate (SO_4^{-2})
		-	Sulfide (S^-)
		-	Zinc (Zn)
*	x	-	Cation/Anion Balance

Sampling Period:

- \- Baseline
- * Sediment Pond Discharge
- x Mine Discharge

Sampling Locations:

Mine Discharge
- Deer Creek
- Wilberg/Cottonwood
  - 1) Grimes Wash
  - 2) Miller Canyon

Sediment Ponds
- Deer Creek
- Des-Bee-Dove
- Wilberg/Cottonwood

YEAR 1989-1990

			LOCATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
SURFACE HYDROLOGY	COTTONWOOD HUNTINGTON	CREEK DRAINAGE SYSTEM	COTTONWOOD CANYON CREEK	field	field	field	field	field	field	field	field	field	field	field	field
			GRIMES WASH	TABLE 1											
			RIGHT FORK	field	field	operational	field	field	operational	field	field	operational	field	field	operational
			LEFT FORK	field	field	operational	field	field	operational	field	field	operational	field	field	operational
			BELOW MINE	field	field	operational	field	field	operational	field	field	operational	field	field	operational
		CREEK DRAINAGE SYSTEM	DEER CREEK	TABLE 1											
			ABOVE MINE	field	field	operational	field	field	operational	field	field	operational	field	field	operational
			@ PERMIT	field	field	field	field	field	field	field	field	field	field	field	field
			BELOW MINE	field	field	operational	field	field	operational	field	field	operational	field	field	operational
			MEETINGHOUSE CANYON	TABLE 1 field	field	operational	field	field	operational	field	field	operational	field	field	operational
			RILDA CANYON	TABLE 1											
			FLUME 1 RCF1	field	field	operational	field	field	baseline	field	field	operational	field	field	baseline
			FLUME 2 RCF2	field	field	field	field	field	field	field	field	field	field	field	field
			FLUME 3 RCF3	field	field	operational	field	field	baseline	field	field	operational	field	field	baseline
			WEIR 4 RCW4	field	field	operational	field	field	baseline	field	field	operational	field	field	baseline
			RCL1	field	field	field	field	field	field	field	field	field	field	field	field
GROUNDWATER HYDROLOGY			EAST MOUNTAIN SPRINGS							operational *		operational *			
			RECESSION STUDY SPRINGS								modified operational	modified operational			
			IN-MINE												
			DEER CREEK			operational			operational			operational			operational
			WILBERG/ COTTONWOOD			operational			operational			operational			operational

* includes recession study springs

YE[illegible] - 1991
(Baseline monitoring preceding repermitting)

			LOCATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
SURFACE	HYDROLOGY	COTTONWOOD CREEK DRAINAGE SYSTEM	COTTONWOOD CANYON CREEK	field	field	field	field	field	field	field	field	field	field	field	field
			GRIMES WASH												
			RIGHT FORK	field	field	operational	field	field	baseline	field	field	operational	field	field	baseline
			LEFT FORK	field	field	operational	field	field	baseline	field	field	operational	field	field	baseline
			BELOW MINE	field	field	operational	field	field	baseline	field	field	operational	field	field	baseline
		HUNTINGTON CREEK DRAINAGE SYSTEM	DEER CREEK												
			ABOVE MINE	field	field	operational	field	field	baseline	field	field	operational	field	field	baseline
			@ PERMIT	field	field	field	field	field	field	field	field	field	field	field	field
			BELOW MINE	field	field	operational	field	field	baseline	field	field	operational	field	field	baseline
			MEETINGHOUSE CANYON	field	field	operational	field	field	baseline	field	field	operational	field	field	baseline
			RILDA CANYON	TABLE 1											
			FLUME 1 RCF1	field	field	operational	field	field	baseline	field	field	operational	field	field	baseline
			FLUME 2 RCF2	field	field	field	field	field	field	field	field	field	field	field	field
			FLUME 3 RCF3	field	field	operational	field	field	baseline	field	field	operational	field	field	baseline
			WEIR 4 RCW4	field	field	operational	field	field	baseline	field	field	operational	field	field	baseline
			RCL1	field	field	field	field	field	field	field	field	field	field	field	field
GROUNDWATER	HYDROLOGY		EAST MOUNTAIN SPRINGS							operational *		operational *			
			RECESSION STUDY SPRINGS								modified operational	modified operational			
			IN-MINE												
			DEER CREEK			operational			baseline			operational			operational
			WILBERG/ COTTONWOOD			operational			baseline			operational			operational

YEAR -- 1989-1990

LOCATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
MINE DISCHARGE												
TABLE 3												
DEER CREEK	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational
TABLE 3 - WILBERG/COTTONWOOD												
Grimes Wash	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational
Miller Canyon	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational
SEDIMENT PONDS												
TABLE 3												
DEER CREEK	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational
TABLE 3 - DES-BEE-DOVE	Sampled on an as-needed basis											
TABLE 3 - WILBERG/COTTONWOOD												
Wilberg Mine	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational
Cottonwood Canyon	Sampled on an as-needed basis											

WASTE ROCK WELLS

TABLE 3 - DEER CREEK				
DCWR 1	baseline	operational	baseline	operational
TABLE 3 - WILBERG/COTTONWOOD				
WCWR 1	baseline	operational	baseline	operational

YEAR -- 1991

LOCATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
MINE DISCHARGE												
TABLE 3												
DEER CREEK	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational
TABLE 3 - WILBERG/COTTONWOOD												
Grimes Wash	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational
Miller Canyon	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational
SEDIMENT PONDS												
TABLE 3												
DEER CREEK	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational
TABLE 3 - DES-BEE-DOVE	Sampled on an as-needed basis											
TABLE 3 - WILBERG/COTTONWOOD												
Wilberg Mine	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational	operational
Cottonwood Canyon	Sampled on an as-needed basis											
WASTE ROCK WELLS												
TABLE 3 - DEER CREEK												
DCWR 1	baseline			operational			baseline			operational		
TABLE 3 - WILBERG/COTTONWOOD												
WCWR 1	baseline			operational			baseline			operational		